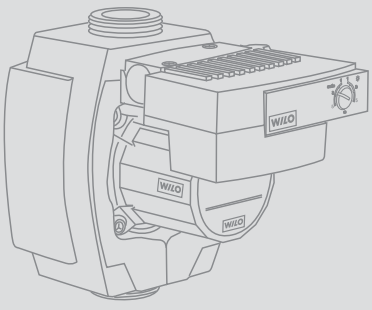
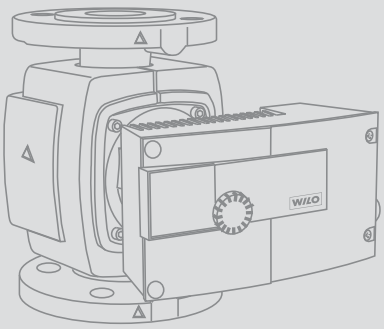
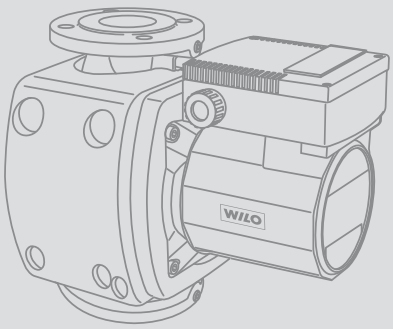
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Catalogue Heating, Air-conditioning, Cooling

Circulation Pumps

Glandless Pumps
and Accessories,
Package Heat Exchanger Assembly

Catalogue A1 – 50 Hz – 2009

A1



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Wilo-Jet WJ	Wilo-Sub TWI 5-SE P e> P	Wilo-SilentMaster	Wilo-Sub TWU 3	Wilo-RainSystem AF Comfort	Wilo-Comfort-Vario COR	Wilo-Stratos ECO	Wilo-Safe	Wilo-Star-Z 15 TT	Wilo-DrainLift Con	Wilo-Stratos	Wilo-Drain TM/TMW 32 Twister	Wilo-DrainLift S
B1	B1	B1	B1	B1	B4	A1	A1	A1	C3	A1	C1	C3



1	2	3	4	5	6	7	8	9	10
Wilo-EMU KS	Wilo-RainSystem AF 150	Wilo-Comfort-Vario COR 4	Wilo-Stratos-D	Wilo-CronoLine-IL-E	Wilo-TOP-Z	Wilo-Stratos	Wilo-CronoBloc-BL	Wilo-DrainLift M	Wilo-DrainLift WS
C1	B1	B4	A1	A2	A1	A1	A3	C3	C3

Programme overview and fields of applications

Glandless pumps

	Pump type	Main field of application						Page
Heating, air-conditioning, cooling								
High-efficiency pumps – Single pumps	Wilo-Stratos ECO	S/M	–	S/M	–	–	–	43
	Wilo-Stratos	M/C	–	–	C	M/C	–	50
– Double pumps	Wilo-Stratos-D	C	–	–	C	C	–	68
Energy-saving pumps – Single pumps	Wilo-Star-E	S/M	–	S	–	–	–	86
	Wilo-TOP-E	M/C	–	–	–	–	–	93
– Double pumps	Wilo-TOP-ED	C	–	–	–	–	–	109
Automatic pumps – Single pumps	Wilo-Smart	S/M	–	S/M	S	–	–	126
Standard pumps – Single pumps	Wilo-Star-RS	S/M	–	–	S/M	–	–	144
	Wilo-AXL (maximum 2440 1/min)	M/C	–	–	–	–	–	154
	Wilo-TOP-RL (maximum 2660 1/min)	M/C	–	–	C	–	–	159
	Wilo-SE (maximum 2880 1/min)	M/C	–	–	C	–	–	166
☞	**Wilo-TOP-S** (maximum 2880 1/min)	M/C	–	–	C	–	–	173
	Wilo-TOP-D (maximum 1400 1/min)	M/C	–	–	C	–	–	199
– Double pumps	Wilo-Star-RSD	S/M	–	–	S/M	–	–	212
☞	**Wilo-TOP-SD** (maximum 2850 1/min)	C	–	–	C	–	–	218
	Wilo-SE-TW (maximum 2880 1/min)	–	–	–	C	–	–	244
Secondary hot water circulation								
High-efficiency pumps – Single pumps	Wilo-Stratos ECO-Z	–	M	–	–	–	–	257
	Wilo-Stratos-Z	–	M/C	M/C	C	M/C	–	264
– Double pumps	Wilo-Stratos-ZD	C	–	–	C	C	–	276
Standard pumps – Single pumps	Wilo-Star-Z 15	–	S	–	–	–	–	289
	Wilo-Star-Z 20/25	–	M	M	–	–	–	289
	Wilo-TOP-Z (maximum 2850 1/min)	–	M/C	M/C	–	–	–	300
- Special single pumps	Wilo-VeroLine-IP-Z	M/C	M/C	M/C	M/C	–	–	313
Solar thermal, geothermal energy								
High-efficiency pumps – Single pumps	Wilo-Stratos ECO-ST	–	–	–	–	S/M	–	324
Standard pumps – Single pumps	Wilo-Star-ST	–	–	–	–	S/M	–	336
	Wilo-Star-RSG	–	–	–	–	–	S/M	344

Key:

- – Not applicable
- **S** Single- and two-family houses
- **M** Multi-family houses
- **C** Commercial

☞ **New in the programme or series extension or modification**

Fields of application:

- Heating
- Secondary hot water circulation
- Floor heating
- Air-conditioning/cooling
- Solar thermal
- Geothermal energy systems

Best in energy saving.*



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Wilo-Stratos ECO high-efficiency pump.

*With a grade of 1.3, the Wilo-Stratos ECO is even a test winner in terms of energy efficiency:
- 23 % lower energy consumption than the runner-up.
- savings of up to 3,000 Euros in 20 years compared to uncontrolled heating pumps.

Very good? We call this Pumpen Intelligenz.



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Pumpen Intelligenz.

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Wilo-Stratos ECO, Stratos, Stratos-D
Wilo-Star-E, TOP-E, TOP-ED, Smart
Wilo-Star-RS, AXL, TOP-RL, SE, TOP-S, TOP-D
Wilo-Star-RSD, TOP-SD, SE-TW

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Wilo-Stratos ECO-Z, Stratos-Z
Wilo-Star-Z, TOP-Z, VeroLine-IP-Z

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Wilo-Star-ST, Star-RSG

Service/accessories systems 351

Wilo-TOP motor technology, circuit diagrams
Switching plugs, service units
Pipe unions, adapter fittings
Wilo-thermal insulation shells, ClimaForm
Wilo-Safe-WS, DrainLift Con

Switchgears and control devices 373
Pump management Wilo-Control 437

Wilo-S1.../S2..., SK, SD, VR-HVAC, CR, CRn, CC-HVAC
Wilo-IF-Module Stratos
IR-Modul, IR-Monitor, Protect-Modul-C
Wilo-Control AnaCon/DigiCon/DigiCon-A
Wilo-Control bus box, CAN bus line

Heating, air-conditioning, cooling

Contents

Heating, air-conditioning, cooling

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General notes and abbrevaitions

Abbreviations used and what they mean

Abbreviation	Meaning
1~	1-phase current
3~	3-phase current
Autopilot	Automatic adjustment of the pump output in set-back phases, e. g. boiler setback operation during the night
blsf	Blocking current-proof, no motor protection necessary
CAN	CAN (Controller Area Network) – Multi master bus system, in which several equal CAN-devices may communicate via a 2-core bus within very short cycle times. The Wilo-CAN bus includes a CANopen Standard (EN 50325-4) which is independent of the supplier.
DM	Three-phase motor, 3~
DN	Nominal diameter of the flange connection
Δp	Pressure loss
Δp-c	Control mode for constant differential pressure
Δp-T	Control mode for differential pressure control depending on the fluid temperature
Δp-v	Control mode for variable differential pressure
ΔT	Control mode for differential temperature
EBM	Individual run signal
ECM technology	Electronically commutated motor with new damp-room enclosure, newly developed glandless drive concept for high-efficiency pumps
EM	Single-phase motor, 1~
EnEV	German Energy Conservation Legislation
ESM	Individual fault signal
Ext. Off	"Overriding Off" control input
Ext. Min	Control input „Overriding Min", e. g. for setback operation without Autopilot
FI	Residual current-operated protective device
BA	Building automation
GRD/GLRD	Mechanical seal
°dH	Degree of German water hardness; formerly used unit for assessing the water hardness. Is no longer used since the SI-unit mmol/l has been introduced. Conversion: 1 °dH = 0.1783 mmol/l
H	Delivery head
IF	Interface
Int. MS	Internal motor protection: Pumps with internal protection against unacceptably high winding temperatures
IR	Infrared interface

Abbreviation	Meaning
KDS	Capacitor
KLF	PTC thermistor sensor
KTL-coating	Electrophoretic painting (cataphoretic coating): Painting with high adhesive strength for long-lasting corrosion protection
KTW	Approval for products with plastics, for use in potable water applications
LON	Local Operating Network (open, standardised data bus system independent of manufacturer in LON-Works networks)
mmol/l	Millimol per litre; SI-unit for assessing the water hardness (total hardness or concentration of alkaline earth ions)
MOT	Motor module (drive motor + impeller+ terminal box/ electronic module) for replacement of TOP-...-series
P_1	Power consumption (power supplied from the grid)
PLR	Pump master computer, Wilo-specific data interface
Q (=$\dot{V}$)	Volume flow
RMOT	Spare motor (drive motor + impeller + terminal box/ electronics module) for replacement
SBM	Run signal or collective run signal
SSM	Fault signal or collective fault signal
Control input 0 – 10 V	Analogue input for external activation of functions
TrinkwV 2001	German Drinking Water Ordinance of 2001 (valid from 01.01.2003)
VDI 2035	VDI guideline for preventing damage in hot-water heating installations
Wilo-Control	Building automation management with pumps and accessories
WRAS	Water Regulations Advisory Scheme (potable water approval for Great Britain and Northern Ireland)
WSK	Thermal winding contacts (in motor for monitoring the winding temperature, full motor protection by additional tripping unit)
▲	Operating mode of double pumps: Individual operation of the relevant operating pump
▲+▲	Operating mode of double pumps: Parallel operation of both pumps
Ⓜ	Number of poles of electric motors: 2-pole motor = approx. 2900 rpm at 50 Hz
Ⓜ	Number of poles of electric motors: 4-pole motor = approx. 1450 rpm at 50 Hz
Ⓜ	Number of poles of electric motors: 6-pole motor = approx. 950 rpm at 50 Hz

Material designations and their meaning

Material	Meaning
1.4021	Chrome steel X20Cr13
1.4034	Chrome steel X46Cr13
1.4057	Chrome steel X17CrNi16-2
1.4122	Chrome steel X39CrMo17-1
1.4301	Chromium nickel steel X5CrNi18-10
1.4305	Chromium nickel steel X8CrNiS18-9
1.4306	Chromium nickel steel X2CrNi19-11
1.4401	Chromium nickel molybdenum steel X5CrNiMo17-12-2
1.4408	Chromium nickel molybdenum steel GX5CrNiMo19-11-2
1.4462	Chromium nickel molybdenum steel X2CrNiMoN22-5-3
1.4541	Chromium nickel steel with titanium addition X6CrNiTi18-10
1.4542	Chromium nickel steel with copper and niobium addition X5CrNiCuNb16-4
1.4571	Chromium nickel steel with titanium addition X6CrNiMoTi17-12-2
Abrasite	Chilled cast iron for use with heavily abrasive fluids
Al	Aluminium
Ceram	Liquid ceramic coating; coating with very high adhesive strength for long-lasting corrosion protection
COMPOSITE	High-strength plastic material
EN-GJL	Cast iron (with lamellar graphite)
EN-GJS	Cast iron (with spheroidal cast iron)
G-CuSn10	Zinc-free bronze
GfK	Glass fibre reinforced plastic
GG	see EN-GJL
GTW	Special cast iron: white malleable cast iron
GGG	see EN-GJS
Inox	stainless steel
NiAl-Bz	Nickel aluminium bronze
PPO	Trade name: Noryl, fibreglass-reinforced plastic
PP-GF30	Polypropylene, reinforced with 30% fibreglass
PUR	Polyurethane
SiC	Silicon carbide
ST	Steel
V2A	Material group, e.g. 1.4301, 1.4306
V4A	Material group, e.g. 1.4404, 1.4571

Wear and tear

Pumps or parts of pumps are subject to wear in accordance with state-of-the-art technology (DIN 31051/DIN-EN 13306). This wear may vary depending on operating parameters (temperature, pressure, speed, water condition) and installation/usage situation and may result in the malfunction or failure at different times of the above-mentioned products/components including their electrical/electronical ciruitry.
Wear parts are all components subject to rotary or dynamic strain including electronic components under tension, in particular:

- Seals (incl. mechanical seal), seal ring
- Stuffing box
- Bearing and shaft
- Impellers and pump part
- Ball race and wear ring
- Wear ring / wear plate
- Macerator
- Capacitor
- Relay / contactor / switch
- Electronic circuits, semiconductor components etc.

Pumps and continuous-flow machines (lie submersible mixers and recirculation pumps), as well as their components with coatings (cataphoresis coating, 2K- or Ceram-coating) are subject to constant wear due to the abrasive fluid contents. It is for that reason that the coating is also listed with the wearing parts contained in these units!

We do not accept liability for faults or defects arising from natural tear and wear.

Note

In accordance with **German Energy Saving Ordinance [Energieeinspar-Verordnung EnEV]** as of the 1.2.2002 at boiler outputs from 25 kW, heating pumps are to be equipped with switchgears for automatic performance control or **electronically controlled pumps** are to be installed.
In accordance with **TrinkwV 2001** and **DIN 50930-6**, only circulating pumps with corrosion-resistant pump housings made of stainless steel or red brass (CC 499K) are to be utilised in secondary hot water circulation systems.

Pump replacement

Detailed information on the subject of "Replacing heating pumps" can be found in the current Wilo replacement guide for heating pumps.

Wilo – General terms of delivery and service

The latest version of our general terms of delivery and service can be found on the Internet at

www.wilo.com/agb

Planning guide

Glandless pumps (general)

Pump selection: General remarks

Circulation pumps should always be selected so that the specified duty point is located at or as near as possible to the point of maximum efficiency (optimum volume flow) of the maximum speed H/Q pump curve.

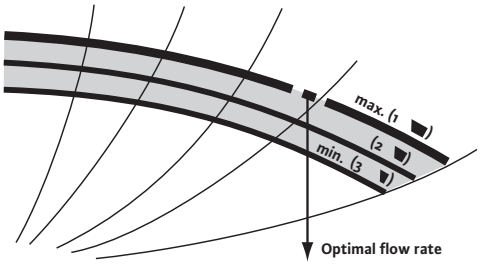


Fig.: Pump curve

If the specified duty point lies between two pump curves, then the smaller pump is always to be selected:

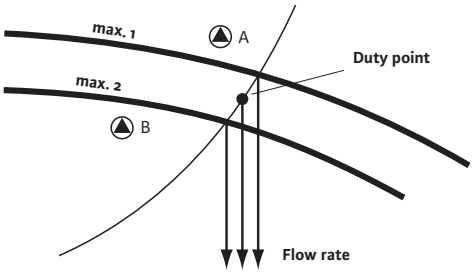


Fig.:Pump selection

The resulting volume flow reduction has no appreciable effect on the actual heating output in heating systems. This applies to pumps for cooling systems.

Pump selection: Secondary hot water circulation systems

Pump selection

- In order to ensure the correct configuration of the secondary hot water circulation system, the pipe system must be designed in accordance with DIN 1988 as well as DVGW worksheets W 551 to W 553.
- The volume flow should be determined according to the specifications in the standard and the DVGW guideline.
- If the hydraulic duty point is between two pump curves, then the next largest circulation pump or speed stage is to be selected in accordance with DVGW worksheet W 553.
- The heat losses in the ascending and circulation secondary hot water pipes are to be reduced to a minimum by appropriate insulation.

Since most secondary hot water circulation systems permit periodic circulation pump deactivation (as a rule at night), a clock timer should be included in the standard equipment for automatic ON/OFF operation.
The German energy savings ordinance (EnEV) demands periodic pump activation/deactivation. Legionellae switching of the heat generator or the heating controller are to be observed and taken into account during programming.

Maximum secondary hot water temperature

In view of the hardness-forming components contained in the water, secondary hot water circulation systems should not be operated at temperatures above 65 °C.
This limit is required to avoid the formation of lime deposits.

Circulation pipe

Wilo recommends the installation of a check valve in order to prevent faulty circulation and to prevent gravity circulation in pumps that have been shut down.

Controls for automatic time-dependent activation/deactivation: Wilo-SK 601 switchgear for pumps of the Wilo-TOP-Z series



Fig.: Wilo-SK 601 switchgear

- Wall-mounted installation version, protection class IP 31
- Direct connection for single-phase pumps (EM) without thermal winding contact (WSK)
  For three-phase pumps or for single-phase pumps with WSK, only in combination with Wilo-SK 602 or contactor
- Clock timer for On/Off day programme with 15-minute switching intervals
  Clock timer in special version with day/week programme and battery backup (120 hours), with digital display

Variable speed control

Experience shows that variable speed control is only required in circulation pumps in secondary hot water circulation systems for the basic adjustment of the performance. An automatic speed control is not required. A time-dependent activation/deactivation should however be provided for each installation.

Motor protection

Blocking current-proof pumps and pumps with internal protection against unacceptably high winding temperatures do not require motor protection. All other pumps have integrated full motor protection, including trip electronics or full motor protection (WSK) in combination with the Wilo-SK 602/SK 622 tripping units.

Pump duty splitting

General notes on double pumps

- Two pump heads mounted in a common housing, hydraulically separated by a switchover valve
- Specific design characteristics like with corresponding single pump series
- Replacement of an equally powerful single pump with identical installation dimensions
- Wide range of applications due to standard 3-stage switching

Pump duty splitting

Splitting the assigned maximum design output to a **double pump in parallel operation** enables - particularly in terms of heating - significantly improved **adaptability to partial-load conditions** and **optimum economic efficiency**. The partial-load pump output to be achieved on average during the season, i.e. for more than 85% of the heating season is sufficient for the operation of **one pump only**; **the second pump** is available for **parallel operation** for occasional full-load requirements.

Benefits of splitting the output between two pumps:

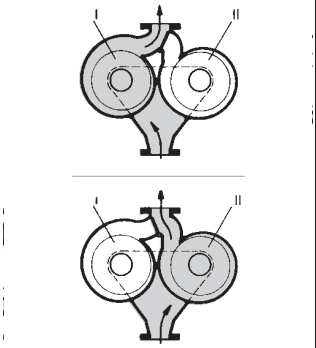
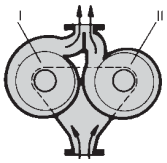
- Reduction of the operating costs by between 50% and 70%
- Increased reliability due to the constant availability of a standby unit ready for operation

The individual performance maps for double pumps featured in the relevant chapters specify the hydraulic performance values for both individual and parallel operation.

Operating modes for double pumps

Double pumps are suitable for operation in either of two basically different operating modes:

- Main/standby mode
- Parallel operation

Main/standby mode (RESERVE)	Parallel operation (ADDITION)
	
Pump I or Pump II in operation	Both pumps in operation
The version-specific pump output is provided by whichever one of the two pumps is acting as the main pump; the second pump remains on standby, ready for time- or fault-actuated switchover.	The version-specific pump output is provided by both pumps operating in parallel. One pump can be switched off during partial-load operation.

Flow rates in pipe and pump

The flow rate of the fluid in the pipework is determined by the cross-section sizes. The values listed below should not be exceeded:

Nominal connection diameter DN [∅ mm]	Flow rate v [m/s]
In building installations	
Up to Rp 1¼ or DN 32	Up to 1.2
DN 40 and DN 50	Up to 1.5
DN 65 and DN 80	Up to 1.8
DN 100 and greater	Up to 2.0
In long-distance heating pipes	2.5 to a maximum of 3.5

The flow rates [m/s] in the pump are specified in all duty charts for Wilo pumps as a function of the pump output.

Viscous fluids

All pump curves included in the catalogue apply to the pumping of water (kinematic viscosity = 1 mm^2/s). If fluids of different density and/or viscosity are pumped (e.g. water-glycol mixtures), the hydraulic values of the pump and the pipe system will deviate. Documents on the **calculation of the correction values for the selection of the pumps** can be obtained from Wilo.
Correction values for the pipe system (increased pressure loss, specific thermal output deficit) cannot be provided by the pump manufacturer. They must be calculated by the planning engineer in cooperation with the chemical additive suppliers and the manufacturers of the valves.

Minimum inlet pressure for the prevention of cavitation

To prevent cavitation (vapour bubble formation within the pump), it is necessary to maintain a sufficiently high over pressure (suction head) at the pump suction port in relation to the vapour pressure of the fluid being pumped.
The minimum suction heads are listed in the respective tables for all glandless pumps. These reference values apply to heating systems up to 130 °C feed temperature and installation locations up to 300 m above sea level. Addition for higher altitudes: 0.1 m/ 100 m height increase.
The values must be increased accordingly when pumping fluids of higher temperatures or lower densities, where there is greater flow resistance on the pump suction side, and in regions of lower atmospheric pressures.

Planning guide

Glandless pumps (general)

Notes on installation and operation

Permitted ambient temperature: 0 °C to +40 °C

Installation

Installation inside a building

Glandless pumps must be installed in dry, well-ventilated, frost-free rooms.

Installation outside a building (outdoor installation)

The glandless pumps of the following series are suitable for outdoor installation:

- Wilo Stratos/-D
- Wilo TOP-S/-SD
- Wilo TOP-RL
- Wilo SE / SE-TW

The following conditions must be complied with:

- Installation of the pump in a sump (e.g. light sump, ring sump) with cover or in a cabinet/housing for protection against the weather
- Avoidance of direct sunlight on the pump
- Protection of the pump against rain Dripping water from above is permitted provided that the electrical connection has been established in accordance with the installation and operating instructions and the terminal box has been properly sealed
- Provide adequate ventilation/heating in situations where the permitted ambient temperature is exceeded or fallen short of
- Permissible ambient temperature for outdoor installation:

Stratos/-D:	-10 °C to +40 °C
TOP-S/-SD:	-20 °C to +40 °C
TOP-RL:	-20 °C to +40 °C
Wilo-SE / SE-TW:	-20 °C to +40 °C

Condensation water

All standard pumps for cold water operation that are intended for applications up to -10 °C/-20 °C are fully condensation-proof. The grey cast iron pump housing of the following series is used for surface finishing:

- Stratos/Stratos-D
- TOP-E/-ED
- TOP-S/-SD
- TOP-D
- TOP-RL
- AXL/SE/SE-TW

with a special coating: (cataphoretic coating).
The benefits of this coating are:

- Optimum corrosion protection against condensation formation on the pump housings in cold-water installations
- Very high scratch and impact resistance

With Wilo-TOP-E/-ED pumps, the fluid temperature must always be the same as or higher than the ambient temperature to prevent condensation water formation.

Intermittent operation

The series

- Stratos/Stratos-D/Stratos-Z/Stratos-ZD
- Star-RS/RSD
- TOP-S/-SD
- TOP-D
- TOP-Z
- TOP-RL
- AXL/SE/SE-TW

can also be used for intermittent operation.

Operating pressure

The maximum system pressure (operating pressure) and the flange versions for the pumps are listed in the relevant tables. All flanges on glandless pumps (except Stratos, Stratos-Z, Stratos-D and Stratos-ZD) have pressure-measurement connections R $^{1}/_{8}$

Connections

Screw-end pumps

Screw-end pumps are equipped with connecting threads in accordance with DIN EN ISO 228, Part 1. Seals are included in the scope of delivery.
Pipe unions with pipe thread in accordance with DIN EN 10226-1 must be ordered separately.

DIN 2999 (pipe thread sealing in the thread)	DIN EN ISO 228/1 (sealing pipe thread with flat gasket on longitudinal side)
Female pipe thread Rp 1½	Female pipe thread G 1½
Male pipe thread R 1½	Male pipe thread G 1½

Flange-end pumps

The pump flanges are designed in accordance with DIN 2531, DIN 2533 or DIN EN 1092-2. Detailed information is provided for the respective pump series.

Combination flange pumps

Flange-end pumps with combination flanges can be mounted with counter flanges PN 6 and PN 16 in accordance with DIN or DIN EN up to and including DN 65. The installation of a combination flange with a combination flange is not permitted. Screws with a tensile strength class of 4.6 or higher must be used for the flanged connections. The washers included in the scope of delivery must be fitted between heads of the screws/nuts and the combination flange.
Recommended screw lengths:

Thread	Tightening torque	Minimum screw length	
		DN 32/DN 40	DN 50/DN 65
Flange connection PN 6			
M12	40 Nm	55 mm	60 mm
Flange connection PN 10			
M16	95 Nm	60 mm	65 mm

Motor

Glandless pump motors with protection class:

• Wilo-Stratos series	IP 44
• Wilo-EasyStar series	IP 42
• Wilo-ClassicStar series	IP 44
• Wilo-TOP range	IP 44
• Remaining pump range	IP 42
• Insulation class	F/H
• Emitted interference	EN 61000-6-3
• Interference resistance	EN 61000-6-2

Electrical connection

- All Wilo pumps are made for a voltage of 230 V or 400 V (tolerance ±10%) in accordance with DIN IEC 60038.
- All Wilo pumps made after 01. January 1995 have been labelled with the CE marking in accordance with the EU Machinery Directive.
- When pumps are used in systems with fluid temperatures above 90°C, a suitably heat-resistant connecting pipe must be used.

Electronic performance control

Heating pumps are, due to their high annual operating hours, among the largest power-consuming appliances in buildings.
Automatic pump performance control helps drastically to reduce power consumption in heating pumps. Reductions of up to 50% can thus be achieved. Compared to standard pumps, high-efficiency pumps can even save up to 80% electricity costs.
All operating states, in particular in the partial load range that is typical for heating systems, can be optimised hydraulically by means of automatic pump performance control.
A further significant effect connected with the prevention of a rise in pump pressure is the avoidance of flow noise in thermostatic valves.

German Energy Savings Ordinance, EnEV

In the context of the legal measures for the reduction of CO_2 emissions, with regard to the electricity consumption of heating circulation pumps, the legislator has stipulated in the EnEV that circulation pumps installed after 1. February 2002 with a nominal thermal output exceeding 25 kW must be equipped in such a way that the electrical power consumption is automatically adjusted to the specific pumping operation requirements in at least three stages.
Even though the EnEV does not demand the use of an automatic pump output controller for pumps with a nominal thermal output below 25 kW, it is nevertheless the case that by far the greater potential savings in terms of electricity and CO_2 are to be found in the one- and two-family house sector, i.e. with installations below 25 kW.
The pump output controller does not replace the need for the correct dimensioning of the circulation pump. The installed pump output must also be checked when the pump is replaced. Controlled pumps that are slightly overdimensioned do not pose any risk if they are correctly set to the nominal load requirement.

Standards/directives

- CE marking (all Wilo pumps)
- Certification according to:
  - ISO 9001,
  - ISO 14001,
  - VDA 6.4

Pump curves

The pump curves apply to water at +20°C and a kinematic viscosity of 1 mm^2/s.
The pump curves take the European voltages of 230 V and 400 V into account.

Pump control

When Wilo pumps are operated with control devices or module accessories, the electrical operating conditions in accordance with VDE 0160 are to be complied with.
When operating glandless and glanded pumps with brands of frequency converters other than those supplied by Wilo, output filters for reducing motor noise and for preventing harmful voltage peaks are to be used and the following limit values are to be complied with:

- Glandless pumps with $P_2 \leq 2.2$ kW and glanded pumps with $P_2 \leq 1.1$ kW
  rate of voltage rise du/dt < 500 V/µs
  voltage peaks û < 650 V
  For glandless pump motors, sine filters (LC filters) are recommended for noise reduction instead of du/dt filters (RC filters).
- Glanded pumps with $P_2 > 1.1$ kW
  rate of voltage rise du/dt < 500 V/µs
  voltage peaks û < 850 V

Installations with long cable lengths (l > 10 m) between converter and motor may increase the du/dt and û levels (resonance). The same applies to operation with more than 4 units using a common power supply. The output filters must be designed by the manufacturer of the frequency converter or the filter supplier. If losses in the motor are caused by the frequency converter, the pumps are to be run at a maximum of 95 % of their nominal speed. If glandless pumps of the TOP-S/-SD, TOP-D and TOP-Z series are operated on one frequency converter, the following limit values at the connection terminals of the pumps must not be fallen short of:
U_{min} = 150 V
f_{min} = 30 Hz

Minimum volume flow

Larger pumps require a minimum flow rate to ensure trouble-free operation. Operating against a closed slide valve, volume flow Q = 0 m3/h, can lead to overheating inside the pump.

- Limit conditions for pump operation at Q = 0 m^3/h:
  up to P_2 = 1 kW are unproblematic if the fluid temperature is 10 K below the maximum permissible fluid temperature.
- Above $P_2 > 1$ kW permanent operation, a minimum volume flow of Q = 10 % Qnominal is required
  For the limit ranges, please consult Wilo.

Motor protection

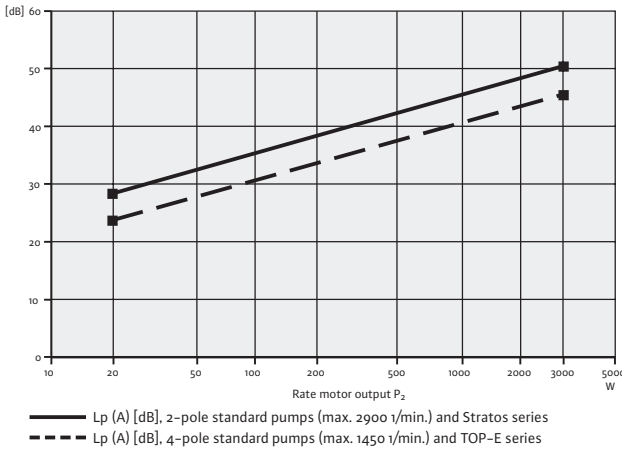
The selection of the right motor protection is a decisive factor for the service life and operational reliability of a circulation pump. Motor protection switches are no longer suitable for pumps with selectable speeds, since their motors have deviating nominal currents in the different stages, which require fuses for each of these stages.
All circulation pumps are either

- blocking current-proof
- provided with internal protection against unacceptably high winding temperatures
- with full motor protection by thermal winding contacts (WSK) and separate Wilo tripping unit (e.g. Wilo-SK 602/SK 622)
- with full motor protection by an integrated tripping mechanism
  For the exact equipment, see the "Motor data" table.

No other motor protection is required by the customer, unless demanded by the regional electricity supply company.

Sound pressure level

Glandless pumps are low-noise due to their design. Their air-borne noise values with measuring-surface sound pressure level Lp (A) [dB] depend on the motor power output, and are determined under normal operating conditions.



Thermal insulation for heating applications

All Wilo-Stratos/Stratos-Z, Wilo-TOP-E/-S/-Z/-D and Stratos ECO single pumps are standard-equipped with insulation shells to prevent any loss of heat at the pump housing.
Material: EPP, polypropylene foam
Thermal conductivity: 0.04 W/m K in accordance with DIN 2612
Flammability: Class B2 in accordance with DIN 4102; FMVSS 302
When insulating the pump onsite, care must be taken to cover the pump up to the top edge of the pump housing only (the motor must be left uncovered).

Insulation for air-conditioning/cooling applications

If pumps from the series
- Stratos, Stratos-D, Stratos-Z
- TOP-S/-SD
- TOP-D
- TOP-Z
- TOP-RL
- SE/SE-TW

are used in air-conditioning/cooling applications, no diffusion-proof insulation is permitted to cover the drain labyrinth between the pump housing and the motor. That ensures that any condensate having possibly accumulated in the motor can drain off freely through the condensate drain openings in the motor housing.
The Wilo-ClimaForm diffusion-proof insulation available as accessory for the Stratos, TOP-S, TOP-RL and SE series for the insulation of pump housings in cold water applications ensures this automatically due to its specific design.

Wilo-ClimaForm:
- Water vapour diffusion resistance μ > 7000
- Normal flammability, in accordance with DIN 4102-B2
- Part 1 Quality monitoring in accordance with DIN 18200

Quality and safety marks

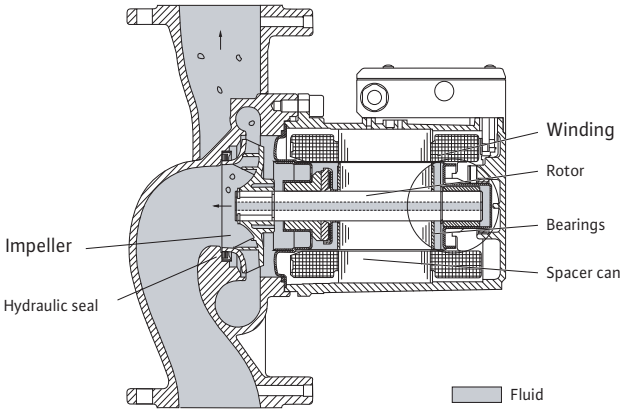
For pump types:
- Star-E 25/..., -E 30/...,
- Stratos ECOStar-RS 25/..., -RS 30/...,
- RSD 30/...,
- Star-Z 20/1, -Z 25/6

Certificate of conformity

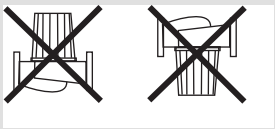
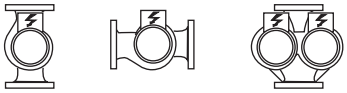
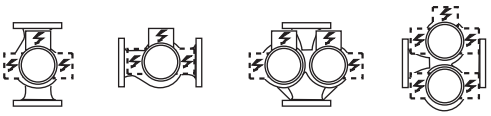
Available on request at additional charge for all glandless circulation pumps of the series:
- Stratos, Stratos-D, Stratos-Z, Stratos-ZD
- TOP-E/-ED
- TOP-S/-SD
- TOP-D
- TOP-Z
- TOP-RL
- SE/SE-TW
- **Certificate of conformity 2.1**
  Content: Certification that the supplied product complies with the order, without details of test results.
- **Certificate of conformity 2.2**
  Content: Certification that the supplied product complies with the order, with details of series test results.
- **Acceptance test certificate 3.1B**
  Content: Certification that the supplied product complies with the order, with details of test results actually measured on the product. The required test scope must be specified in advance.

Special versions
Pumps for other voltages or 60 Hz frequency possible on request (at additional charge).
Other materials and versions (RG, PN 16) for pumps are listed in the pump tables.

The glandless circulation pump
With this design, all rotating components inside the canned motor run in the pumped fluid. The required shaft seal in conventional pump types achieved by the use of stuffing boxes or mechanical seals is omitted. The pumped fluid lubricates the shaft bearings and cools the components of the electric motor.
The electrical part of the pump motor (stator with winding) is separated from the encapsulated rotor compartment by means of an encapsulated motor cartridge (with the TOP Wilo series) and/or by a can sealed off with O-rings.



Installation positions for glandless pumps[1)]

Installation positions not permitted	Permitted without restrictions All energy-saving pumps, infinitely variable control	Permitted without restrictions All standard and secondary hot water circulation pumps, 1 or 3 speed stages
		

[1)] Installation positions for Wilo-Stratos/-Stratos-Z/-Stratos-D/-Stratos-ZD see "High-efficiency pump planning guide

Additional terminal box positions for single and double pumps

Pump types								
Energy-saving pumps								
Star-E 20 (25, 30)	•	–	•	–				
TOP-E 25 (30)/1-7 TOP-E 30/1-10 TOP-E 40/1-4 TOP-E 50/1-6	•	–	•	–				
TOP-ED 32/1-7 TOP-ED 40/1-7 TOP-ED 50/1-6	–	–	–	–	•	–	–	•
Standard and secondary hot water circulation pumps								
Star-RS, Star-Z	•	•	•	•	–	–	–	–
Stratos ECO-Z	•	–	•	–	–	–	–	–
Star-RSD	–	–	–	–	•	•	•	•

Install pumps under stress-free conditions. Applicable to all operating conditions.
TOP-ED double pumps cannot be used for additional installation positions due to the inclined arrangement of the terminal boxes.
Please consult Wilo.

Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

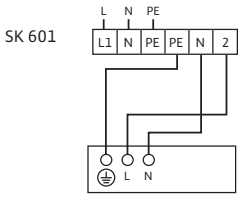
Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

	New pump type															
	Switchgear connection possible according to wiring diagram														Accessories: Modules	
															Wilo-IF-Module alternating current	
	Wilo-TOP-S Wilo-TOP-Z Wilo-TOP-RL Wilo-SE				Wilo-TOP-SD Wilo-SE-TW or 2 x Wilo-TOP-S 2 x Wilo-TOP-Z 2 x Wilo-TOP-RL 2 x Wilo-SE				Wilo TOP-D				Wilo-TOP-E Stratos Stratos-Z	Wilo-TOP-ED Stratos-D Stratos-ZD or 2 x TOP-E 2 x Stratos 2 x Stratos-Z	Wilo-TOP-E Stratos Stratos-Z	Wilo-TOP-ED Stratos-D Stratos-ZD or 2 x TOP-E 2 x Stratos 2 x Stratos-Z
	1~		3~		1~		3~		1~		3~		1~	1~	1~	1~
Available Wilo switchgear	IP	WSK SSM	IP	SSM	IP	WSK SSM	IP	SSM	IP	WSK	IP	WSK				
SK 601	A	B	C [1]	D [1]	A	B	C [1]	D [1]	T	V	X [1]	Y	E	E	Yes	Yes
SK 602/622	F	G	H	I	F	G	H	I	U	W	X1	Y1	J	J	Yes	Yes
SK 632	–	–	K	L	–	–	K	L	–	–	K	L	–	–	Yes	Yes
S2R 3D	–	–	–	–	M	N	O	P	–	–	–	–	–	Q or R	Yes	Yes
AR/DR/CR	–	–	–	S	–	–	–	S	–	–	–	–	–	–	–	–

IP: Internal protection against unacceptably high winding temperatures, WSK: Thermal winding contacts SSM: Collective fault signal

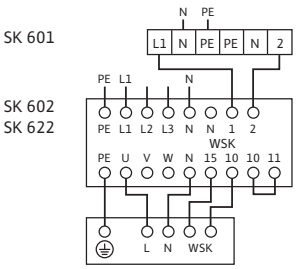
– = connection not possible,
[1] Only in conjunction with contactor and/or Wilo-SK 602/622; SK602/622 can also be used as On/Off switch or contactor

Wiring diagram A
power supply 1~230 V/N/50 Hz



1)Wilo-TOP-S/-Z/-SD/-RL

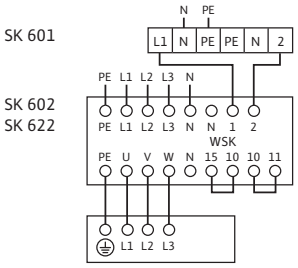
Wiring diagram B
power supply 1~230 V/N/50 Hz



1) 3) Wilo-TOP-S/-Z/-SD

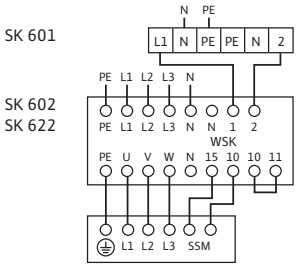
Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

Wiring diagram C
power supply 3~400 V/N/50 Hz



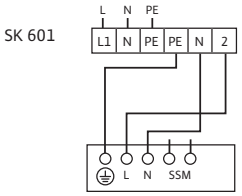
1) 3) Wilo-TOP-S/-Z/-SD

Wiring diagram D
power supply 3~400 V/N/50 Hz



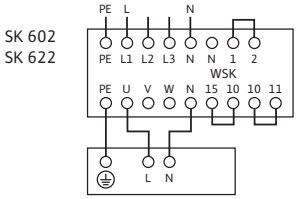
1) 2) 3) Wilo-TOP-S/-Z/-SD

Wiring diagram E
power supply 1~230 V/N/50 Hz



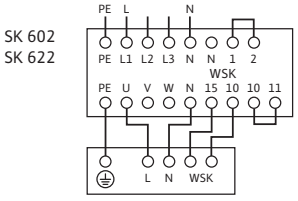
1)Wilo-TOP-E/-ED

Wiring diagram F
power supply 1~230 V/N/50 Hz



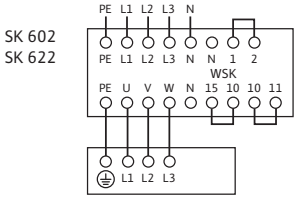
1)Wilo-TOP-S/-Z/-SD/-RL

Wiring diagram G
power supply 3~400 V/N/50 Hz



1) 3) Wilo-TOP-S/-Z/-SD

Wiring diagram H
power supply 3~400 V/N/50 Hz

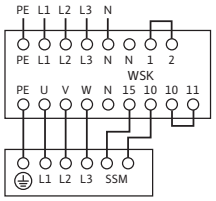


1)Wilo-TOP-S/-Z/-SD

Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

Wiring diagram I
power supply 3~400 V/N/50 Hz

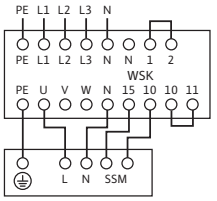
SK 602
SK 622



1) 2) 3) Wilo-TOP-S/-Z/-SD

Wiring diagram J
power supply 3~400 V/N/50 Hz or 1~230 V/N/50 Hz

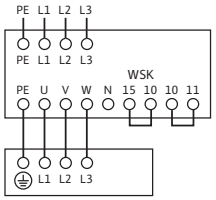
SK 602
SK 622



1) 2) 3) Wilo-TOP-E/-ED
Wilo-Stratos/-Z/-D/-ZD

Wiring diagram K
power supply 3~400 V/N/50 Hz

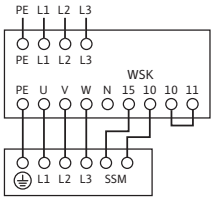
SK 632



1)Wilo-TOP-S/-Z/-SD

Wiring diagram L
power supply 3~400 V/N/50 Hz

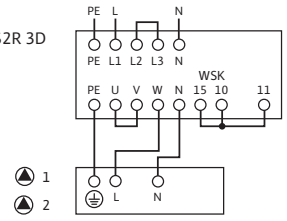
SK 632



1) 2) Wilo-TOP-S/-Z/-SD

Wiring diagram M
power supply 1~230 V/N/50 Hz

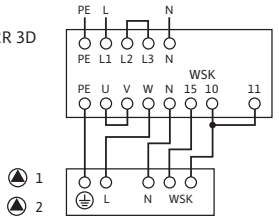
S2R 3D



1) 3) Wilo-TOP-S/-Z/-SD/-RL

Wiring diagram N
power supply 1~230 V/N/50 Hz

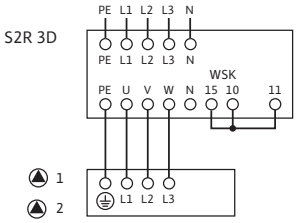
S2R 3D



1)Wilo-TOP-S/-Z/-SD

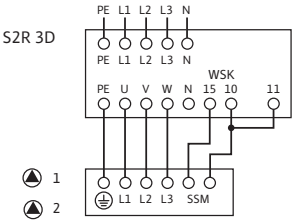
Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

Wiring diagram O
power supply 3~400 V/N/50 Hz



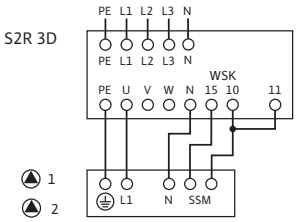
1)Wilo-TOP-S/-Z/-SD

Wiring diagram P
power supply 3~400 V/N/50 Hz



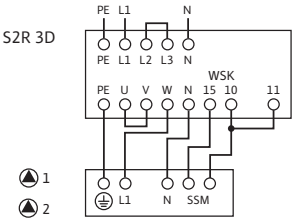
1) 2) Wilo-TOP-S/-Z/-SD

Wiring diagram Q
power supply 3~400 V/N/50 Hz



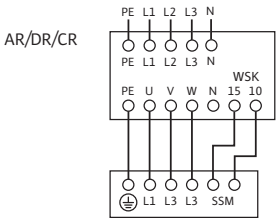
1) 2) Wilo-TOP-E/-ED
Wilo-Stratos/-Z/-D/-ZD

Wiring diagram R
power supply 1~230 V/N/50 Hz



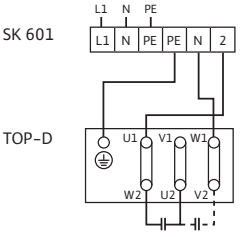
1) 2) Wilo-TOP-E/-ED
Wilo-Stratos/-Z/-D/-ZD

Wiring diagram S
power supply 3~400 V/N/50 Hz



1)Wilo-TOP-S/-Z/-SD

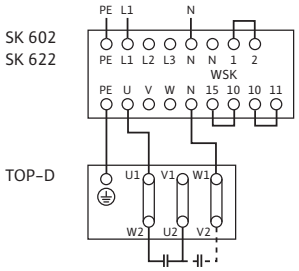
Wiring diagram T
power supply 1~230 V/N/50 Hz



1)

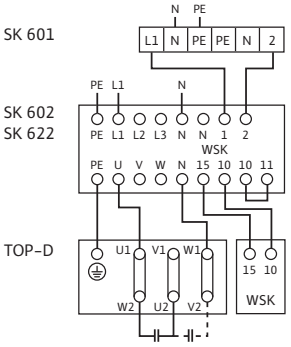
Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

Wiring diagram U
power supply 1~230 V/N/50 Hz



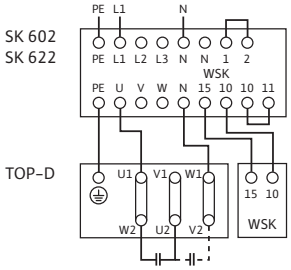
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Wiring diagram V
power supply 1~230 V/N/50 Hz



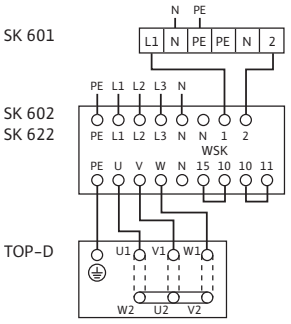
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Wiring diagram W
power supply 1~230 V/N/50 Hz



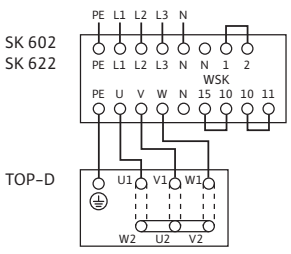
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Wiring diagram X
power supply 3~400 V/N/50 Hz



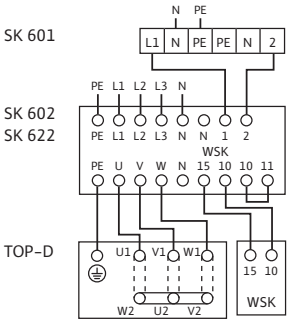
1) 3)

Wiring diagram X1
power supply 3~400 V/N/50 Hz



1)

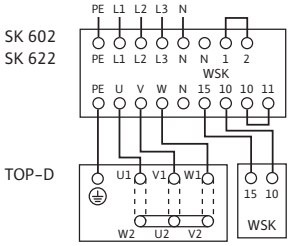
Wiring diagram Y
power supply 3~400 V/N/50 Hz



1) 3)

Connection of Wilo-TOP... and -Stratos ... to Wilo switchgear provided onsite

Wiring diagram Y1
power supply 3~400 V/N/50 Hz



1) 3)

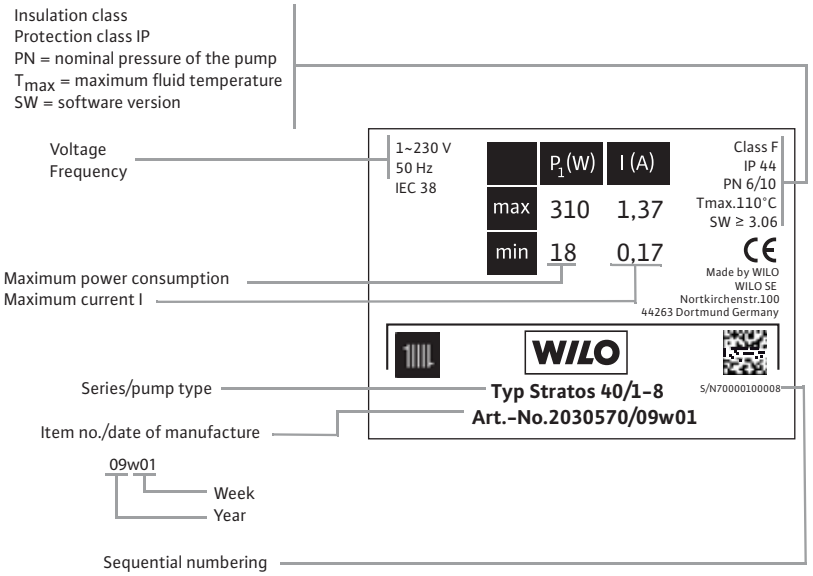
1) Automatic restart after a power failure
2) After an overload fault trip of the pump (TOP or Stratos), acknowledge the fault first at the pump, then at the switchgear
3) SK 622 additionally with terminals for collective run signals and collective fault signals.
On replacing a three-phase pump (3~400 V) with a single-phase pump (1~230 V) ensure protective multiple earthing.

Consultation with Wilo is required when installing Wilo pumps in conjunction with Wilo switchgears not listed or with switchgears not supplied by Wilo. For terminal circuit diagrams for Wilo circulation pumps, see the "Service/accessories" chapter or the pump data.

Planning guide

Designation key

Name plate designation of the Wilo-Stratos series

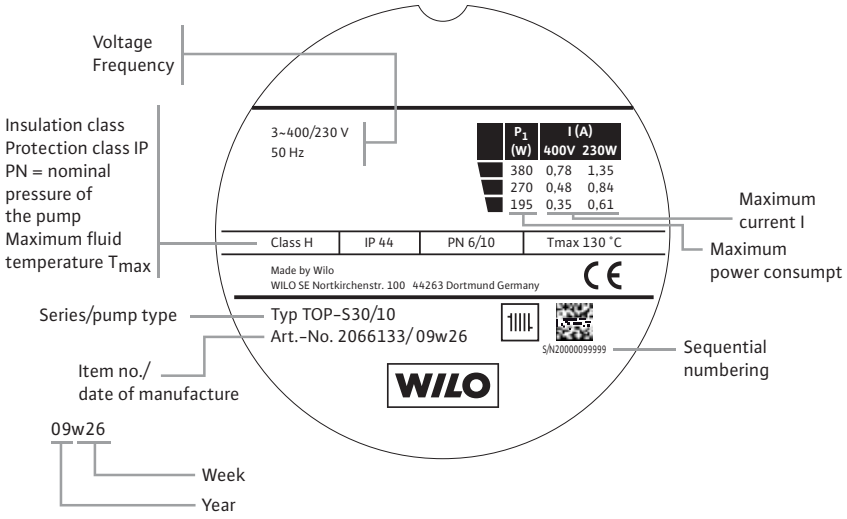


Series design

Series code for the Wilo Stratos range

Type Wilo...	Version
	High-efficiency pumps, infinitely variable speed
Stratos	Single pump
Stratos-D	Double pump
Stratos-Z	Single pump for secondary hot water circulation systems
Stratos-ZD	Double pump for secondary hot water circulation systems

Name plate designation of the Wilo-TOP range

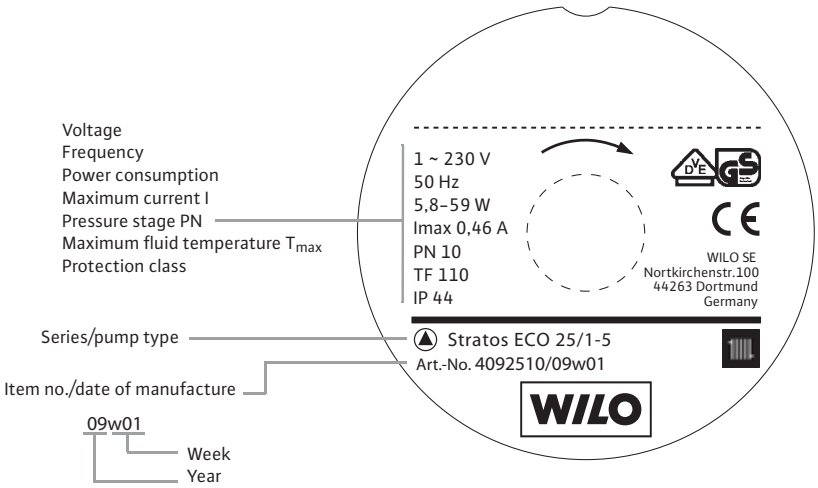


Series design

Series code for the Wilo-TOP range

Type Wilo...	Version
	Energy-saving pumps, infinitely variable speed
TOP-E	Single pump
TOP-ED	Double pump
	Standard pumps, 2 or 3 speed stages
TOP-S/-RL, SE	Single pump
TOP-SD, SE-TW	Double pump
	Standard pumps, 1 speed stage
TOP-D	Single pump
	Circulation pumps for secondary hot water circulation systems, 3 speed stages
TOP-Z	Single pump

Name plate designation, Wilo-Stratos ECO, Wilo-Star



Series design

Series codes for the Wilo Star and Wilo Stratos ECO ranges

Type Wilo...	Version
	High-efficiency pumps, infinitely variable speed
Stratos ECO	Single pump
Stratos ECO	Ventilation pump
	Energy-saving pumps, infinitely variable speed
Star-E	Single pump
	Standard pump, 3 speed stages
Star-RS	Single pump
Star-RSD	Double pump
Star-RSL	Ventilation pump
	Secondary hot water circulation pumps
Star-Z	Single pumps, 1 or 3 speed stages
	Solar thermal pumps
Stratos ECO-ST	Single pump, high-efficiency version for solar thermal systems
Star-ST	Single pumps, 3 speed stages, for solar thermal systems
Star-RSG	Single pumps, 3 speed stages, for geothermal energy systems

Name plate designation of special versions

On request, some pumps can be supplied in the following special versions at additional charge (the type of the special version is indicated on the name plate):

- **130** Pump with short overall length
- **RG** Red brass version

Example

Type Wilo...	Special version
Star-RS 25/4 RG	Star-RS 24/4 with red brass housing

Planning guide

Designation key

Type key

High-efficiency pumps
Example: Wilo-Stratos 30/1-12

Stratos	Screw-end or flange-end pump	Infinitely variable, electronically controlled
Stratos-D	Flange double pump	Infinitely variable, electronically controlled
Stratos-Z	Screw-end or flange-end pump for secondary hot water circulation systems	Infinitely variable, electronically controlled
Stratos-ZD	Flange double pump for secondary hot water circulation systems	Infinitely variable, electronically controlled
Stratos ECO	Screw-end pump, high-efficiency version, specially designed for 1-6-family houses	Infinitely variable, electronically controlled
Stratos ECO-Z	Screw-end pump, high-efficiency version for secondary hot water circulation systems	
30/	Nominal connection diameter	
1-12	Nominal delivery head range (m)	
BMS	Version with the option of connection to a building management system	
ST	Version with special hydraulics for use in solar thermal installations	
L	Ventilation pump	

Energy-saving pumps
Example: Wilo-Star-E 25/1-5 SSM, Wilo TOP-E 50/1-6

Star-E	Screw-end pump	Infinitely variable, electronically controlled
Star-EP	Screw-end pump with red brass housing for floor heating systems	Infinitely variable, electronically controlled
Star-EL	Screw-end pump with connection for automatic ventilation	Infinitely variable, electronically controlled
TOP-E	Screw-end or flange-end pump	Infinitely variable, electronically controlled
TOP-ED	Flange double pump	Infinitely variable, electronically controlled
25/	Nominal connection diameter	
1-5	Nominal delivery head range (m)	
SSM	Version with collective fault signal	

Standard pumps, max. 2800 rpm
Example: Wilo-Star-RS 25/6, Wilo-TOP-S 50/4

Star-RS	Screw-end pump	3 speed stages, can be switched over manually
Star-RSD	Double screw-end pump	3 speed stages, can be switched over manually
Star-Z	Screw-end pump for secondary hot water circulation systems	1/3 speed stages, can be switched over manually
Star-ST	Screw-end pump for solar thermal systems	3 speed stages, can be switched over manually
Star-RSG	Version with special hydraulics for use in geothermal systems	3 speed stages, can be switched over manually
TOP-S	Screw-end or flange-end pump	2 or 3 speed stages, can be switched over manually
TOP-RL SE	Screw-end or flange-end pump	3 speed stages, can be switched over manually
TOP-Z	Screw-end or flange-end pump for secondary hot water circulation systems	3 speed stages, can be switched over manually
TOP-SD	Screw-end or flange-end double pump	2 or 3 speed stages, can be switched over manually
SE-TW	Screw-end or flange-end double pump	3 speed stages, can be switched over manually
25/	Nominal connection diameter	
6	Nominal delivery head (m) at Q = 0 m^3/h	
EM	Version with single-phase motor	
DM	Version with three-phase motor	
L	Ventilation pump	

Standard pumps, max. 1400 rpm
Example: Wilo-TOP-D 40

TOP-D	Screw-end and flange-end pump	1 speed stage
30	Nominal connection diameter	

Subject to change 09/2008 WILO SE

Energy efficiency class

In the context of the Kyoto Agreement, European governments in particular are pursuing the goal of drastically reducing CO_2 emissions. Energy labelling, particularly for high-consumption household devices such as washing machines and refrigerators, is prescribed as an important control element for providing the end consumer with an aid for making decisions in favour of energy-saving appliances.
Due to the fact that heating circulation pumps are among the biggest individual electricity consumers in household use because of their long running times, leading European heating pump manufacturers have voluntarily declared their intention of henceforth attaching energy labels to their heating pumps. This makes it possible for users and end consumers to recognise, on the basis of an already familiar classification system, whether a heating circulation pump in use is especially energy-efficient.
The classification of the energy efficiency of heating pumps is carried out by means of a technical measuring procedure, which provides the Energy Efficiency Index, EEI. The smaller the EEI, the less electrical energy the pump consumes and the more favourable the energy classification.

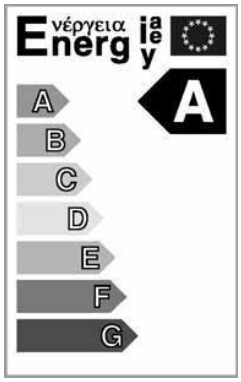


Fig.: Energy label for heating circulation pumps, Example: Energy class A

Energy class	Energy Efficiency Index
A	EEI < 0.4
B	0.4 ≤ EEI < 0.6
C	0.6 ≤ EEI < 0.8
D	0.8 ≤ EEI < 1.0
E	1.0 ≤ EEI < 1.2
F	1.2 ≤ EEI < 1.4
G	1.4 ≤ EEI

Table: Classification of the Energy Efficiency Index into 7 different energy categories.

The following tables list the corresponding energy class for all heating pumps to be labelled, which is incorporated in the energy label on the packaging. In accordance with the lettering system familiar from household appliances, A is the best possible and G is the worst possible of the energy classes.
A comparison of hydraulically similar pumps with different energy classifications reveals that there is a difference of approximately 22% in terms of energy consumption between two sequentially numbered energy classes. Accordingly, an energy class A pump requires on average only around 33% of the electrical energy consumed by a class D pump.
Even though the energy requirements of a class A pump are very high, high-efficiency energy class A pumps have in the meantime become available for use throughout the entire performance range from single-family houses to large buildings.

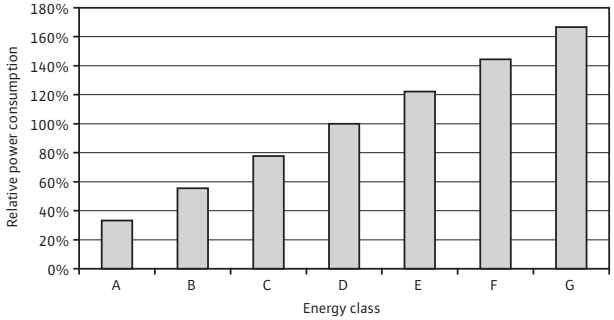


Fig.: Comparison of the energy consumption rates of pumps with the same hydraulic output

Planning guide

EEI classifications

EEI classification – Single pumps/double pumps (field of application: Single-family and two-family houses– Single pumps/double pumps										
Nominal diameter	Wilo-Stratos ECO...	EEI class	Wilo-Star-E...	EEI class	Wilo-Smart...	EEI class	Wilo-Star-RS...	EEI class	Wilo-Star-RSD...	EEI class
DN 15 (Rp ½)	–	–	15/1-3	–	15/4	B	15/4	B	–	–
	–	–	15/1-5	–	15/6	B	15/6	C	–	–
DN 25 (Rp 1)	25/1-3	A	25/1-3	B	25/4	B	25/2	C	–	–
	25/1-5	A	25/1-5	B	25/6	B	25/4	B	–	–
	–	–	–	–	–	–	25/6	C	–	–
	–	–	–	–	–	–	25/7	D	–	–
	–	–	–	–	–	–	25/8	D	–	–
DN 30 (Rp 1 ¼)	30/1-3	A	30/1-3	B	–	–	30/2	C	–	–
	30/1-5	A	30/1-5	B	30/4	B	30/4	B	30/4	D
	–	–	–	–	30/6	B	30/6	C	30/6	D
	–	–	–	–	–	–	30/7	D	–	–
	–	–	–	–	–	–	30/8	D	–	–

EEI classification – Single pumps (range of applications: multi-family house, commercial applications)						
Nominal diameter	Wilo-Stratos...	EEI class	Wilo-TOP-E...	EEI class	Wilo-TOP-S...	EEI class
DN 25 (Rp 1)	25/1-6	A	25/1-7	C	25/5 1~/3~	D/D
	25/1-8	A	–	–	25/7 1~/3~	D/D
	–	–	–	–	25/10 1~/3~	D/D
	–	–	–	–	25/13 1~/3~	F/F
DN 30 (Rp 1 ¼)	30/1-6	A	30/1-7	C	30/4 1~/3~	D/D
	30/1-8	A	30/1-10	C	30/5 1~/3~	D/D
	30/1-12	A	–	–	30/7 1~/3~	D/D
	–	–	–	–	30/10 1~/3~	D/D
DN 32	32/1-12	A	–	–	–	–
DN 40	40/1-4	A	40/1-4	C	40/4 1~/3~	D/D
	40/1-8	A	40/1-10	B	40/7 1~/3~	D/C
	40/1-12	A	–	–	40/10 1~/3~	D/C
	–	–	–	–	40/15 1~/3~	D/D
DN 50	50/1-8	A	50/1-6	C	50/4 1~/3~	D/D
	50/1-9	A	50/1-7	B	50/7 1~/3~	C/C
	50/1-12	A	50/1-10	B	50/10 1~/3~	C/C
	–	–	–	–	50/15	C
DN 65	65/1-9	A	65/1-10	B	65/7 1~/3~	C
	65/1-12	A	–	–	65/10 1~/3~	C
	–	–	–	–	65/13	C
	–	–	–	–	65/15	C
DN 80	80/1-12	A	80/1-10	B	80/7 1~/3~	C
	–	–	–	–	80/10	C
	–	–	–	–	80/15	C
	–	–	–	–	80/20	C
DN 100	100/1-12	A	100/1-10	B	100/10	C

EEI classification – Single pumps (range of applications: multi-family houses, commercial applications) (continued)

Nominal diameter	Wilo-TOP-D...	EEI class	Wilo-TOP-RL...	EEI class	Wilo-AXL...	EEI class	Wilo-SE...	EEI class
DN 25 (Rp 1)	–	–	25/7.5	E	80-25-130	D	125-N	D
DN 30 (Rp 1 ¼)	30 1~/3~	G/F	30/4	D	–	–	110-N	D
	–	–	30/6.5	E	–	–	–	–
	–	–	30/7.5	E	–	–	–	–
DN 32	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
DN 40	40 1~/3~	E/E	40/4	D	–	–	150-N	D
	–	–	–	–	–	–	200-N	D
DN 50	50 1~/3~	E/E	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
DN 65	65 1~/3~	E/E	–	–	–	–	–	–
DN 80	80 1~/3~	E/E	–	–	–	–	–	–
DN 100	100 1~/3~	E/E	–	–	–	–	–	–
DN 125	125	D	–	–	–	–	–	–

EEI classification – double pumps (field of application: multi-family house, commercial applications)

Nominal diameter	Wilo-Stratos-D....	EEI class	Wilo-TOP-ED...	EEI class	Wilo-TOP-SD...	EEI class	Wilo-SE-TW...	EEI class
DN 25 (Rp 1)	–	–	–	–	–	–	–	–
DN 30 (Rp 1 ¼)	–	–	–	–	30/5 1~/3~	D/D	125-N-TW	D
DN 32	32/1-8	A	32/1-7	C	32/7 1~/3~	E/D	–	–
	32/1-12	A	–	–	32/10 1~/3~	D/D	–	–
DN 40	40/1-8	A	40/1-7	C	40/3 1~/3~	E/D	150-N-TW	E
	40/1-12	A	40/1-10	B	40/7 1~/3~	D/D	200-N-TW	E
	–	–	–	–	40/10 1~/3~	E/C	–	–
	–	–	–	–	40/15 1~/3~	E/D	–	–
DN 50	50/1-8	A	50/1-6	C	50/7 1~/3~	F/D	–	–
	50/1-12	A	50/1-7	B	50/10 1~/3~	E/D	–	–
	–	–	50/1-10	B	50/15	D	–	–
DN 65	65/1-12	A	65/1-10	B	65/10 1~/3~	F/D	–	–
	–	–	–	–	65/13	D	–	–
	–	–	–	–	65/15	D	–	–
DN 80	80/1-12	A	80/1-10	B	80/7 1~	F	–	–
	–	–	–	–	80/10	D	–	–
	–	–	–	–	80/15	C	–	–
	–	–	–	–	80/20	C	–	–
DN 100	–	–	–	–	–	–	–	–
DN 125	–	–	–	–	–	–	–	–

Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

Planning guide:
Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
Wilo Stratos is the first high-efficiency pump in glandless design with the following advantages:
- Up to 80% electricity savings compared to standard pumps
- For all heating, air-conditioning and cooling systems in the temperature range of -10 °C to +110 °C
- Automatic adjustment of the pump output to continuously varying load conditions of the hydraulic system
- Prevention of flow noise
- Safety and comfort during installation and operation

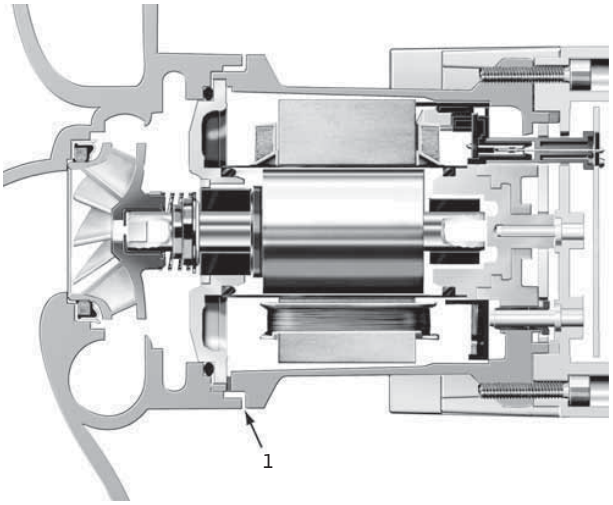
Field of application
The Wilo-Stratos series is used as a high-efficiency pump in circulation systems for heating, ventilation and air-conditioning systems in commercially-used residential and functional buildings:
- Large residential buildings
- Apartment blocks
- Residential complexes
- Hospitals
- Schools
- Administrative office buildings
- Real estate developments

Temperature range
Fluid temperature range of -10 °C to +110 °C without restriction at an ambient temperature of -10 °C to a maximum of +40 °C.

Heating application
In nearly all circulation systems, correctly sized controlled glandless pumps ensure adequate heat supply at all times at significantly reduced energy costs, while at the same time preventing noise generation.
Controlled heating circulation pumps have been mandated by law under the German energy savings ordinance (EnEV)since 01.01.2002 for a nominal thermal output exceeding 25 kW.
Due to its corrosion-resistant pump housing made of red brass, the Wilo Stratos-Z pump is particularly suitable for installations with possible oxygen entry such as floor heating systems made of plastic tubing.

Thermal insulation for heating
The Wilo-Stratos/-Stratos-Z single pump series are equipped as standard with a thermal insulation shell for the prevention of heat losses through the pump housing. The PP material used, foamed polypropylene, has the following properties:
- Environmental compatibility: easily recyclable
- Thermal resistance: up to 120 °C
- Heat transmission coefficient: 0.04 W/mK in accordance with DIN 52612
- Flammability: Class B2 in accordance with DIN 4102 (normal flammability)
  Normally flammable materials are permitted for use in heated rooms in Germany in accordance with fire prevention regulations as long as a minimum clearance of 20 cm is maintained between them and the fireplace.

Air-conditioning/cooling application
The restriction for conventional variable speed pumps in terms of the dependency of the fluid temperature on the ambient temperature does not apply to the Wilo Stratos pump.
Condensation forms on cold surfaces if the fluid temperature is lower than the ambient temperature. The Wilo Stratos pump can also be used in such cases. It is designed in such a way that damage to electrical parts caused by condensation water is avoided.



1 Drain labyrinth for condensation water

Insulation for air-conditioning/cooling
If the pump housing is given diffusion-proof insulation onsite, the insulation may not cover the drain labyrinth between pump housing and motor. That ensures that any condensate having possibly accumulated in the motor can drain off freely through the condensate drain openings in the motor housing.
The diffusion-proof Wilo-ClimaForm insulation available as accessory for the Wilo-Stratos series for the purpose of insulating pump housings in cold water applications ensures this automatically due to its specific design.

Corrosion-proof pump design
Corrosion-proof designs are required for e.g. cooling ceilings or ceiling heating panels. For these applications, the pump housing is coated.
As an alternative, the Wilo-Stratos-Z with its corrosion-resistant pump housing made of red brass can be used as the highest-quality version available.

Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

Secondary hot water circulation application (Wilo-Stratos-Z/Stratos-ZD)

Pumps which are used in secondary hot water circulation systems are subject to specific requirements that are fulfilled by the Wilo-Stratos-Z/Stratos-ZD series:

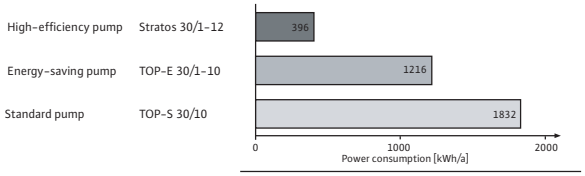
- The fluids are potable water and water for food-processing companies in accordance with TrinkwV 2001 (German drinking water ordinance). Any formation of lime deposits is taken into account by the design, meaning that a total carbonate hardness of 20°d is permissible at max. fluid temperature of +80 °C.
- All plastic parts that come into contact with the pumped fluid comply with KTW recommendations.
- The differential pressure control modes Δp-c and Δp-v enable the automatic adjustment of the pump output in volume flow-variable secondary hot water circulation systems with thermostatically controlling line shut-off valves.
- The manual control mode enables the optimum manual adjustment of the pump output to the constant volume flow circulation system. This can be done with the Wilo IR-Monitor for example. The criterion for this is the temperature of the secondary hot water in the circulation pipe, which must not be more than 5 K below the storage temperature when it enters the secondary hot water storage tank.

High-efficiency pumps

The efficiency of the hydraulics and motor determine the pump's overall efficiency. Both components were doubled with the Wilo Stratos pump compared to the glandless pumps previously used in building services, thus resulting in a considerable improvement. The applied ECM technology drastically reduces the annual power consumption, That results in considerable savings compared to conventional pumps.

Annual power consumption of a heating pump (DN 30) with setback operation*

Comparison of different pump types



* Load profile with 5500 operating hours per year:

2% (110 hrs.) at 100% Q_N (peak load)
25% (1375 hrs.) at 65% Q_N (partial load)
40% (2200 hrs.) at 30% Q_N (low load)
33% (1815 hrs.) setback operation

ECM technology

The new ECM technology is the basis for the outstanding efficiency of Wilo Stratos pumps. It Including:

EC motor

EC stands for electronically commutated motor. Its basis is a synchronous motor with permanent magnet rotor. The rotating stator's magnetic field is generated by electronic commutation, meaning that the stator windings are specifically activated for the interaction of the electrical and magnetic poles.

Comparison of the motor components



Wilo-TOP-E with AC motor



Wilo-Stratos with EC motor

There are the following benefits:

- The magnetic field required in the rotor does not need to be generated with any losses.
- Especially in the partial load range (up to 98% of the operating time), the difference in efficiency is even greater than it already is in the full load range compared to an asynchronous motor.
- Higher speeds are possible compared to an asynchronous motor. This results in the reduction of the size and weight of the pump with similar hydraulics.

Wet rotor encapsulation

The rotor of the glandless pump motor runs in the fluid. This fluid lubricates the bearings and cools the motor. The current-carrying stator is separated from the fluid by a can, referred to as wet rotor encapsulation. This wet rotor encapsulation has a direct effect on the efficiency

- due to the size of the necessary gap between stator and rotor,
- and due to the magnetic resistance of the selected can material.

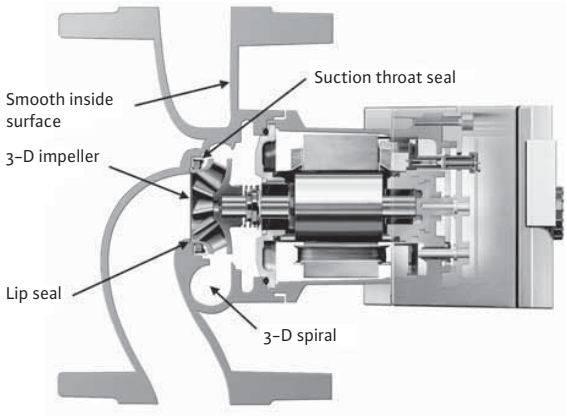
The improvement in terms of efficiency of the Wilo Stratos pump here is the result of:

- Reduction of the air gap and
- Application of an innovative can material with smaller losses to the magnetic flux between stator and rotor.

Hydraulic optimisation

The hydraulic conditions are optimised by means of a 3D spiral housing and 3D impeller as well as a smooth surface in the pump housing (cataphoretic coating). The suction throat seal between impeller and pump housing reduces radial gap losses. Axial losses are reduced by the sealing lip on the longitudinal side of the impeller.

Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

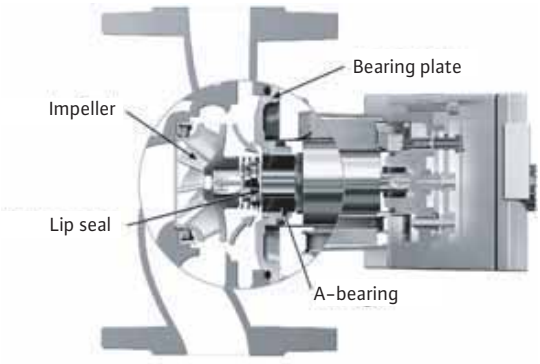


Automatic performance control
The volume flow pumped through a circulation pump depends on the thermal output/cooling output requirement of the system being supplied.
This requirement varies according to:
- Climatic changes
- User behaviour
- External heat influence
- Influence of hydraulic control devices, etc.

The circulation pump designed for maximum load status is adapted the relevant system operating state by means of a continuous comparison of the setpoint and the actual value. This automatic control adjusts the pump output and thus also the power consumption continuously to actual requirements.
Electricity savings of up to 80% compared to conventional standard pumps can be achieved by the sum of the measures described here implemented with Wilo-Stratos high-efficiency pumps.

Automatic ventilation

The rotor space is ventilated automatically by the filter and flow channel system. As the fluid flows into the rotor space, a filter plug in the shaft and a filter disc in the bearing plate reduce the ingress of the smallest abrasive particles.
The seal between impeller and bearing plate prevents dirt from accumulating in the A-bearing gap on the motor side.



This has the following benefits:
- The automatic ventilation of the rotor space is accelerated, thus reducing both dry-running times and ventilation noise.
- Damage to the radial bearings or to the can is reduced by the filtering feature.

Motor protection

The standard integrated protection device reliably protects the pump, in all settings, against excess temperature, excess current and blocking.
This has the following advantage:
- No external motor protection switch is required. The connecting instructions of the local electricity supply companies are to be observed.

If, in the case of replacement, there is a motor protection switch in the electrical installation that cannot be bridged, then it is to be set to the maximum current specified on the name plate.

Manual control panel

Operating button
The Wilo-Stratos pump is operated by means of the proven red-button technology (one-button operation). The important basic functions can be set easily and safely, directly at the pump.

Non-position-dependent display
Important information during the operation of the pump is indicated at all times by the pump display that is read at the front and is independent of its position. The extension of the manual control panel for special applications is provided by the operating and service unit, Wilo-IR-Monitor, via wireless communication.

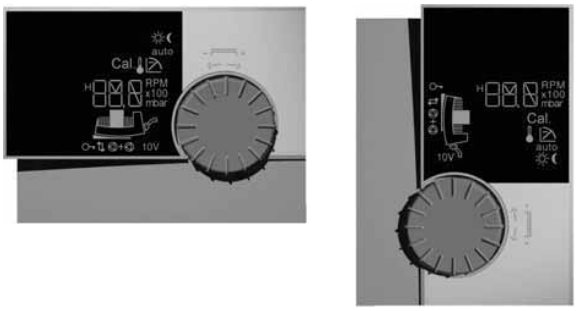


Fig.: All symbols can be read in horizontal or vertical installation

Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

Control modes

Control mode Δp-c
In Δp-c control mode, the electronic module keeps the differential pressure generated by the pump constant at the set differential pressure setpoint HS over the permissible volume flow range.

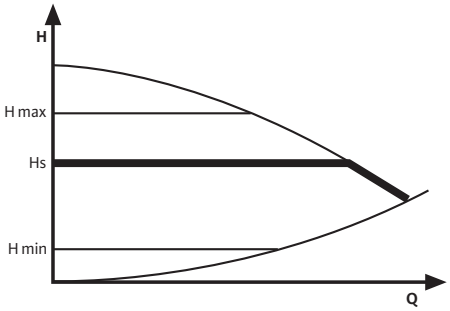


Fig.: Control mode Δp-c

Control mode Δp-v
In Δp-v control mode, the electronic module changes the differential pressure setpoint to be maintained by the pump in linear fashion between Hs and ½ Hs. The differential pressure setpoint value H varies with the volume flow Q.

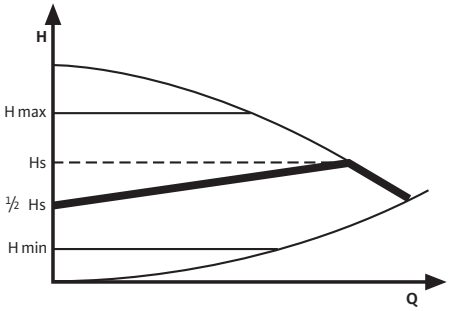


Fig.: Control mode Δp-v

Control mode Δp-T
In control mode Δp-T (programmable with IR-Module, IR-Monitor, LON or CAN), the electronic module changes the differential pressure setpoint to be maintained by the pump according to the measured fluid temperature. This temperature-controlled differential pressure control mode can be used in constant-volume (e.g. single-pipe) systems and variable-delivery systems with varying feed temperatures. With the reverse effect, the Δp-T control mode supports the condensing boiler technology, provided the pump is installed in the return pipe of the system.

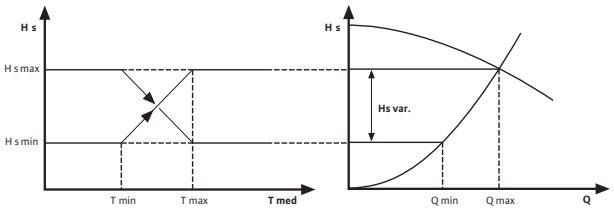


Fig.: Control mode Δp-T

Operating modes

Autopilot operating mode (automatic setback function)

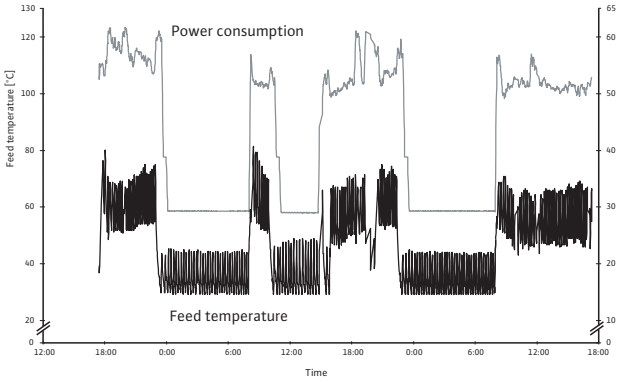
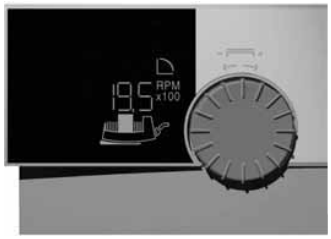


Fig.: Measurement of an electronic pump with automatic setback operation

The patented setback method via fuzzy control enables the further optimisation of the output requirement of the pump under low-load conditions of the heating system. During times when the pump performance is not required (when the heating water reaches a specific lower temperature, e.g. due to the reduction of the feed temperature by the weather-/time-controlled heating controller), the pump switches to a reduced constant speed.
This has the following advantage:

- This operating mode offers additional savings of up to 25 % compared to conventional heating circulation pumps with infinitely variable control.

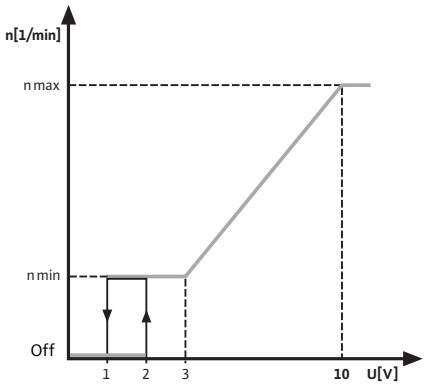
Manual operating mode
The manual operating mode deactivates the control function in the electronics module. The pump speed can be manually set to a constant value (for the setting range, see the pump motor data).



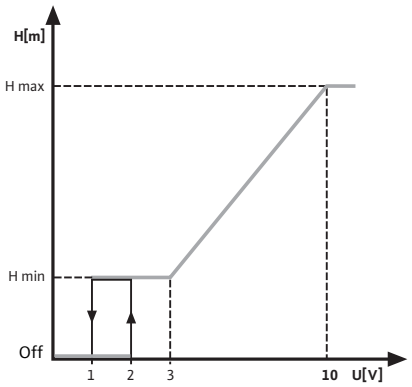
Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

DDC operating mode
In DDC operation, the comparison of the actual value/setpoint required for controlling is performed by an external controller. An analogue signal (0 - 10 V) is supplied to the Wilo Stratos pump from the external controller as a correcting variable. The current speed is shown on the pump display, manual operation of the pump is deactivated.

Required accessories: Stratos IF-Module (see also Chapter: "Wilo-Control pump management systems").



Remote setpoint adjustment operating mode
The setpoint for controlling the internal differential pressure (Δp-c, Δp-v) is preset for the Wilo Stratos pump by an analogue signal, 0 - 10 V. Required accessories: Stratos IF-Module (see also Chapter: "Wilo-Control pump management systems").



BA connection

The Wilo Stratos pumps have standard and optional interfaces for connection to external monitoring units (e.g. BA building automation or DDC installations).

Collective fault signal, SSM
A collective fault signal is available as potential-free contact, designed as NC contact in accordance with VDI 3814.
Contact load:
- Permitted minimum: 12 V DC, 10 mA,
- Permitted maximum: 250 V AC, 1 A.

The contact is closed under the following conditions:
- The pump is without current
- There is no fault
- Total failure of the control module

The contact is open under the following conditions:
- The pump is powered and there is one of the following faults:
  - Excess motor temperature
  - Excess control module temperature
  - Excess current
  - Pump blockage
  - Short circuit and earth leakage
  - Faulty contact between motor/control module
  - Mains undervoltage
  - Mains overvoltage
  - Electronics faults

Accessories

IF-Module Stratos CAN
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with serial, digital CAN interface for connection to a CAN bus system and double pump interface for communication with an additional Stratos PLR IF-Module.

IF-Module Stratos LON
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with serial, digital LON interface for connection to LONWorks networks and double pump interface for communication with an additional Stratos PLR IF-Module.

IF-Module Stratos PLR
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with serial, digital PLR interface for connection to the BA building automation via Wilo interface converter or onsite coupling modules and double pump interface for communication with an additional Stratos PLR IF-Module.

IF-Module Stratos Ext. Off
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with "Overriding Off" control input, 0 - 10 V control input and double pump interface for communication with an additional Stratos PLR IF-Module.

IF-Module Stratos Ext. Min
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with "Overriding Min." control input (setback operation without Autopilot), 0 - 10 V control input and double pump interface for communication with an additional Stratos PLR IF-Module.

IF-Module Stratos SBM
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with "SBM" collective run signal, 0 - 10 V control input and double pump interface for communication with an additional Stratos SBM IF-Module.

IF-Module Stratos Ext. Off/SBM
(also see Chapter: "Wilo-Control pump management systems")
Retrofit module with "Overriding Off" control input, "SBM" collective run signal and double pump interface for communication with an additional Stratos Ext. Off/SBM IF-Module.

Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

Dual pump management

With the new high-efficiency pumps, automatic double pump control is possible without an external control device. Required accessories: 2 Stratos IF-Modules (for optional module combinations, see catalogue section: "Wilo-Control pump management systems").
The following operating modes are possible due to the intelligent dual pump management system with one Wilo-Stratos-D double pump or two Wilo Stratos single pumps:

- **Standby operation**
  The version-specific pump output is provided by one pump, the other pump remains available on standby for time-actuated (24 hours of pure operating time) or fault-actuated switchover.
  Standby operation can be performed by all double pumps and all single pumps (2 x identical type).

- **Parallel operation (in manual control mode only, n = const.)**
  The version-specific pump output is provided by both pumps in parallel operation. The power adjustment is achieved by the synchronous operation of both pumps. Parallel operation can be performed by all double pumps and all single pumps (2 x identical type).

- **Efficiency-optimised peak-load operation**
  During peak-load operation, the hydraulic output is split up between both units of the double pump. During low-load operation (only the base-load pump is running) the second pump is ready on standby.
  The peak-load pump is also cut in during efficiency-optimised operation if load conditions require a higher pump output. Efficiency-optimised cut-in takes place when the total power consumption P_1 of both pumps is below the power consumption P_1 of one pump. From this point onwards both pumps are run up synchronously to their maximum speed (nominal speed).
  Time-dependent pump cycling (24 hours of pure operating time) assigns the basic-load function to the pumps alternately. This operating mode (load-sensitive activation/deactivation) achieves additional energy savings compared to conventional peak-load operation.
  Efficiency-optimised peak-load operation is possible with all double pumps, as well as with two identical single pumps, if an equivalent double pump type exists.

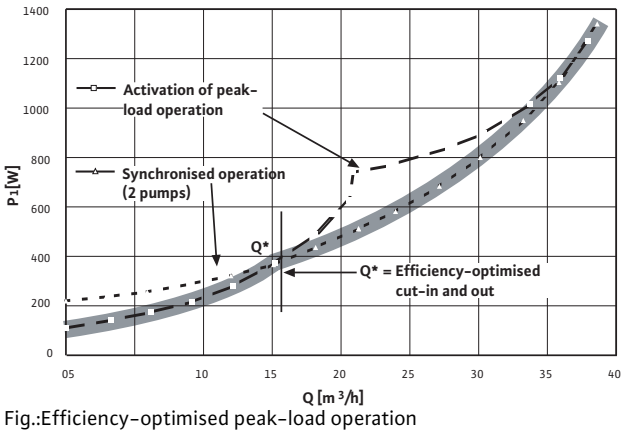


Fig.:Efficiency-optimised peak-load operation

Infrared monitoring

The Wilo Stratos pumps are equipped with a powerful IR interface for wireless remote control and remote diagnosis.



Fig.: Wilo-IR-Module

All basic functions of Stratos pumps can be simply adjusted directly at the pump via the manual control panel (one-button operation). The IR-Module is available in combination with a commercially available PDA/Pocket PC or the self-sufficient IR-Monitor as operating and service units for IR communication. Both devices provide important additional functions that go beyond the actual pump capabilities.

The Wilo-IR-Module operating and service units (with PDA/Pocket PC) or Wilo-IR-Monitor for:
- Inaccessibly installed pumps
- Comprehensive operating information
- Detailed fault diagnosis
- Statistical functions
- Special settings/control modes for special requirements
- Protection against unauthorised access
- Rotation monitoring unit for all pumps and standard motors (only IR-Monitor)
- Storage of pump data records (only IR-Module with PDA/Pocket PC)

Like the Stratos pumps, the IR-Monitor is equipped with a one-button control and an LC display. A user program with a graphical user interface runs on the PDA/Pocket PC.

Wilo-Stratos / Stratos-Z / Stratos-D / Stratos-ZD

Application in compact distributors

In narrow spaces, the control module can set in a vertical position by turning the motor. Dimension b4 (see Chapter: "Dimensions, weights") applies as the minimum clearance (x) for the installation of the thermal insulation shells.



Fig.:Simplified illustration, installation dimensions of additional valves must be taken into account.

Installation and electrical connection

The installation of the Wilo-Stratos pump is uncomplicated, since the flanges are well accessible due to the position of the control module and since the terminal space is also accessible from the front. The pump and module installation positions enable highly variable installations.

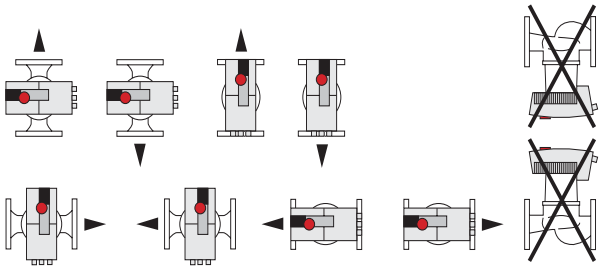
All high-efficiency pumps of the Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD series can be connected to the following voltages and frequencies:

- 1~230 V, 50/60 Hz, tolerance in accordance with DIN IEC 60038 ± 10%
- 3~230 V, 50/60 Hz, tolerance in accordance with DIN IEC 60038 ± 10%

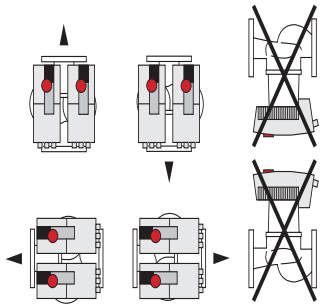


Permitted installation positions

Single pumps:



Double pumps:



Operation on residual-current devices (RCD)

The operation of the Wilo-Stratos series on residual-current devices in accordance with DIN EN 61008-1 is permitted without any impairment of the operation of the residual-current device (DIN VDE 0160). Suitable RCD circuit-breakers are indicated by ⍰ or ⍰.

Wilo-Stratos ECO / ECO-BMS / ECO-Z / ECO-Z-BMS / ECO-ST

Wilo-Stratos ECO, Stratos ECO-BMS, Stratos ECO-Z, Stratos ECO-Z-BMS, Stratos ECO-ST

The Wilo-Stratos ECO series with the versions Stratos ECO-BMS, ECO-Z, ECO-Z-BMS and ECO-ST are extensions of the previously described Wilo Stratos series with the following advantages:

- Up to 80% energy savings compared to standard pumps
- Stratos ECO and ECO-BMS versions for all heating systems in the temperature range of +15 °C to +110 °C
- Stratos ECO-ST version for solar thermal systems in the temperature range of +15 °C to +110 °C
- Automatic adjustment of pump output to continuously varying load conditions of the hydraulic system
- Prevention of flow noise
- Safety and comfort during installation and operation

Field of application

The Wilo-Stratos ECO, ECO-BMS and ECO-ST series are suitable for use as high-efficiency pumps in circulation systems for heating and in solar-powered systems in 1-6-family houses.

Temperature range

Fluid temperature range from +15 °C to +110 °C for ambient temperatures from 0 °C to max. +40 °C.

Heating application

Due to their corrosion-resistant pump housing made of red brass, the Wilo-Stratos ECO pumps in RG version are particularly suitable for installations subject to possible oxygen entry, e.g. floor heating systems with heating surfaces made of plastic tubing.

Thermal insulation for heating applications

The pumps of the Wilo-Stratos ECO series (apart from Stratos ECO-ST) are standard-equipped with thermal insulation shells for the prevention of thermal losses through the pump housing. The EPP material used (foamed polypropylene) has the following properties:

- Environmental compatibility: easily recyclable
- Thermal resistance: up to 120 °C
- Heat transmission coefficient: 0.04 W/mK in accordance with DIN 52612
- Flammability: Class B2 in accordance with DIN 4102 (normal flammability)
  Normally flammable materials are permitted for use in heated rooms in Germany in accordance with fire prevention regulations as long as a minimum clearance of 20 cm is maintained between them and the fireplace.

Secondary hot water circulation application (Wilo-Stratos ECO-Z, ECO-Z-BMS)

Pumps used in secondary hot water circulation systems are subject to specific requirements that are fulfilled by the Wilo-Stratos ECO-Z and ECO-Z-BMS series:

- The fluids are potable water and water for food-processing companies in accordance with TrinkwV 2001 (German drinking water ordinance). Any formation of lime deposits is taken into account by the design, meaning that a total carbonate hardness of 20°d is permissible at max. fluid temperature of +65 °C.
- All plastic parts that come into contact with the pumped fluid comply with KTW recommendations.

Automatic ventilation

The rotor space is ventilated automatically by the filter and flow channel system. As the fluid flows into the rotor space, a filter plug in the shaft and a filter disc in the bearing plate prevent the ingress of the smallest abrasive particles.
The seal between impeller and bearing plate prevents dirt from accumulating in the A-bearing gap on the motor side.
This has the following benefits:

- The automatic ventilation of the rotor space is accelerated, thus reducing both dry-running times and ventilation noise.
- Damage to the radial bearings or to the can is avoided by the filtering feature.

Motor protection

The standard integrated protection device reliably protects the pump, in all settings, against excess temperature, excess current and blocking.
This has the following advantage:

- No external motor protection switch is required. The connecting instructions of the local electricity supply companies are to be observed.
  If, in the case of replacement, there is a motor protection switch in the electrical installation that cannot be bridged, then it is to be set to the maximum current specified on the name plate.

Manual control panel

Operating button

All versions of the Wilo-Stratos ECO series are operated using the proven red-button technology (one-button operation). The important basic functions can thus be safely and comfortably set and adjusted.

Control mode Δp-v

In Δp-v control mode, the electronic module changes the differential pressure setpoint to be maintained by the pump in linear fashion between Hs and ½ Hs. The differential pressure setpoint value H varies with the volume flow Q.

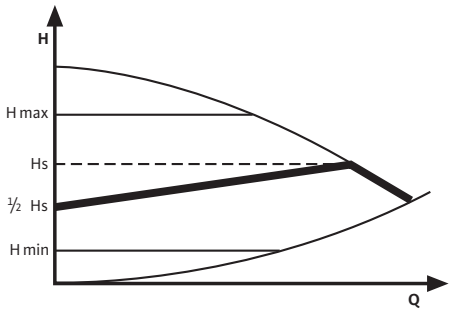


Fig.: Control mode Δp-v

Wilo-Stratos ECO / ECO-BMS / ECO-Z / ECO-Z-BMS / ECO-ST

Autopilot operating mode (automatic setback function)

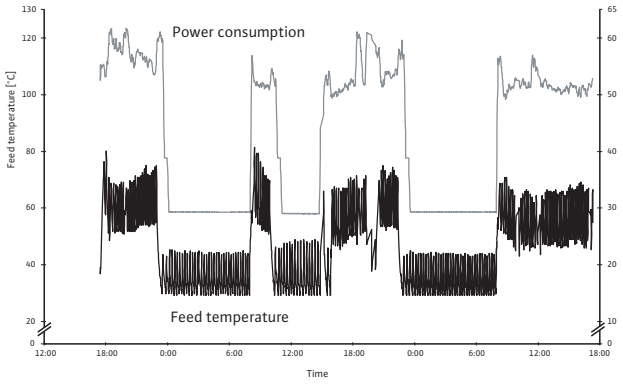


Fig.: Measurement of an electronic pump with automatic setback operation

The patented setback method via fuzzy control enables the further optimisation of the output requirement of the pump under low-load conditions of the heating system. During times when the pump performance is not required (when the heating water reaches a specific lower temperature, e.g. due to the reduction of the feed temperature by the weather-controlled/time-controlled heating controller), the pump switches to a reduced constant speed.
This has the following advantage:
- This operating mode offers additional savings of up to 25 % compared to conventional heating circulation pumps with infinitely variable control.

BA connection (for Stratos ECO-BMS, ECO-Z-BMS and ECO-ST)

For the connection to external monitoring units (e.g. building automation BA or DDC systems), the Wilo-Stratos ECO-BMS, ECO-Z-BMS and ECO-ST versions are standard-equipped with a collective fault signal, the External OFF function and the 0 – 10 V control input.

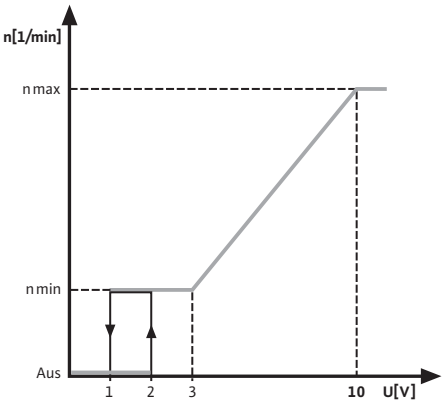
Collective fault signal, SSM
A collective fault signal is available as potential-free contact, designed as NC contact in accordance with VDI 3814.
Contact load:
- Permitted minimum: 12 V DC, 10 mA,
- Permitted maximum: 250 V AC, 1 A.

The contact is closed under the following conditions:
- The pump is without current
- There is no fault
- Total failure of the control module

The contact is open under the following conditions:
- The pump is powered and there is one of the following faults:
  - Excess motor temperature
  - Excess control module temperature
  - Excess current
  - Pump blockage
  - Short circuit and earth leakage
  - Faulty contact between motor/control module
  - Mains undervoltage
  - Mains overvoltage
  - Electronics faults

Control input, 0 – 10 V
During DDC operation, the comparison of the actual value/setpoint required for controlling is performed by an external controller. An analogue signal (0 – 10 V) is sent to the Wilo Stratos ECO-BMS/ECO-Z-BMS and ECO-ST as correcting variable from the external controller.

As an alternative, a fixed speed can be set locally using the red button.



External OFF control input
Input for potential-free NC contact.
The pump operates in auto control mode when the contact is closed.
An open contact stops the pump.

Wilo-Star-E, Wilo TOP-E, TOP-ED

Wilo-Star-E series

The energy-saving pumps of the Wilo-Star-E series cover the entire performance range for one-family to six-family houses. They can be used with all conventional pipe systems (single-pipe and twin-pipe heating systems) and offer the option of adjusting the delivery head setpoints between 0.5 m and 5 m.

Control technology, Wilo Star-E

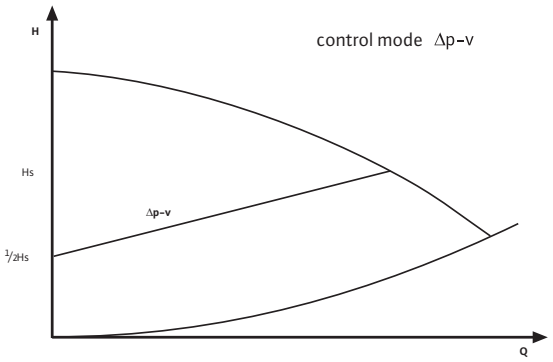


Fig.: Control mode Δp-v

Control mode Δp variable (Δp-v):
In Δp-v control mode, the electronic module changes the differential pressure setpoint to be maintained by the pump in linear fashion between Hs and ½ Hs. The differential pressure setpoint value H varies with the volume flow Q.

Standards
The Wilo energy-saving pumps are distinguished by proven standards such as the "red-button technology" for the practical pre-adjustment of the delivery head.

Wilo-TOP-E/-ED series

The world's first electronically controlled circulation pump with standard integrated pump display and manual control panel (one-button operation). It comes as standard with the unique, patented "Autopilot" automatic setback control facility based on the latest fuzzy technology.
Without external switchgears, the automatic infinitely variable differential-pressure control offers:

- Energy savings of up to 50% and thus reduced operating costs and reduced CO_2 emissions
- Elimination of noise from thermostatic valves.

The Wilo TOP-E series is available for the entire performance range from Rp 1 to DN 100 and is suitable for a fluid temperature up to T_{max} = 110 °C

Manual control panel

The manual control panel can be used to configure the basic functions of the Wilo-TOP-E/-ED pumps:

- On/Off switch
- Control mode (Δp-c, Δp-v, controller)
- Differential pressure setpoint
- Automatic setback to minimum speed
- Double pump function (main/standby or parallel operation)

All operating states as well as a wide range of fault and alarm signals (fault signals result in immediate shutdown) are indicated directly on the standard series pump display.

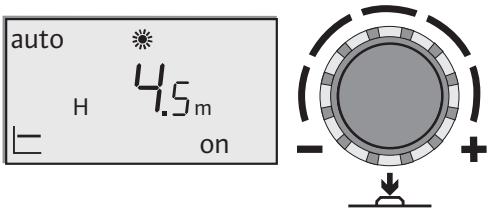


Fig.:Manual control panel (pump display and operating knob)

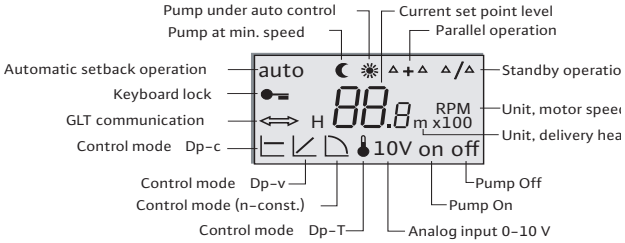


Fig.: Symbols on pump display

Auto control mode
Infinitely variable differential pressure control according to the set differential pressure setpoint. Combined operating and display panel directly on the terminal box for:

- Pre-selection of various control modes
- Setpoint setting in m (the lower setpoint value is 1 m)
- Indication of the actual operating status on a graphic display
- Indication of fault and warning signals.

Control mode Δp-c
In Δp-c control mode, the electronic module keeps the differential pressure generated by the pump constant at the set differential pressure setpoint HS over the permissible volume flow range
.

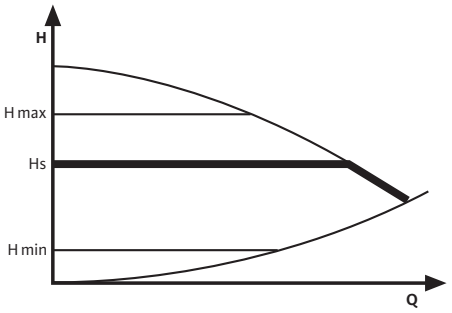


Fig.: Control mode Δp-c

Control mode Δp-v
In Δp-v control mode, the electronic module changes the differential pressure setpoint to be maintained by the pump in linear fashion between Hs and ½ Hs. The differential pressure setpoint value H varies with the volume flow Q.

Wilo-Star-E, Wilo TOP-E, TOP-ED

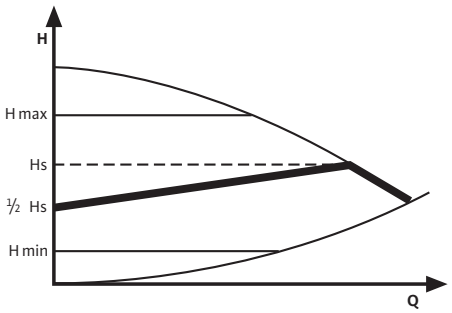


Fig.:Control mode Δp-v

Control mode Δp-T
In Δp-T control mode (programmable with IR-Module, IR-Monitor, LON or CAN), the electronic module changes the differential pressure setpoint to be maintained by the pump according to the measured fluid temperature. This temperature-controlled differential pressure control mode can be used in constant-volume (e.g. single-pipe) systems and variable-delivery systems with varying feed temperature. With the reverse effect, the Δp-T control mode supports the condensing boiler technology, provided the pump is installed in the return pipe of the system.

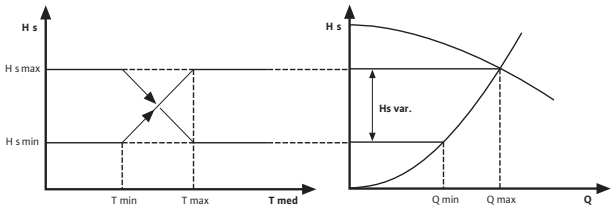


Fig.:Control mode Δp-T

"Autopilot" automatic setback operation

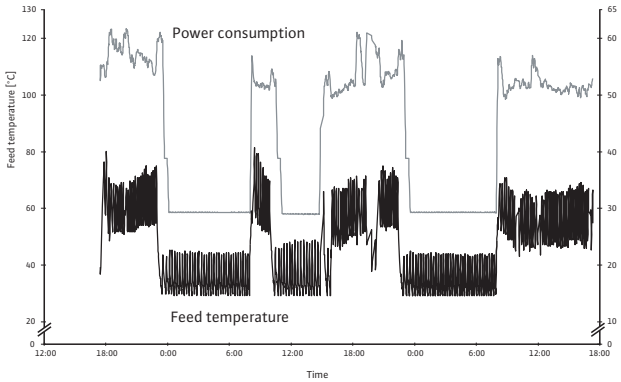
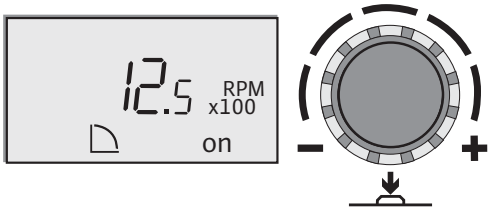


Fig.:Measurement of an electronic pump with automatic setback operation

The patented setback method via fuzzy control further optimises the power input requirements of the pump during periods of low-load demand of heating systems. During periods when no pump output is required (e.g. reduction of feed temperature by weather-/time-controlled heating controller) the pump output is set back to a reduced constant speed.
This has the following advantage:
- This operating mode offers additional savings of up to 25 % compared to conventional heating circulation pumps with infinitely variable control.

Manual control mode



The manual control mode deactivates the control in the module. The speed of the pump can be set manually to a constant value between 800 and 2800 rpm.

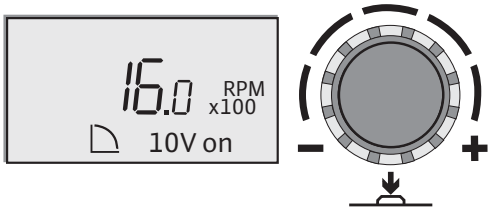
BA connection
The Wilo-TOP-E/-ED pumps have standard and optional interfaces for connection to external monitoring units (e.g. DDC/BA).

Collective fault signal, SSM
All pumps of the Wilo TOP-E/-ED series are equipped with a potential-free contact (NC contact in accordance with VDI 3814) for collective fault signals.
Contact load:
- Permitted minimum: 12 V C, 10 mA
- Permitted maximum: 250 V AC, 1 A
- The collective fault signal is used to indicate faults caused by:
- Excess motor temperature
- Excess module temperature
- Excess current
- Blocking
- Short circuit and earth leakage

Neither a mains failure nor a total failure of the electronics is interpreted as a fault. The pump resumes operation automatically after the resumption of the electricity supply from the mains.

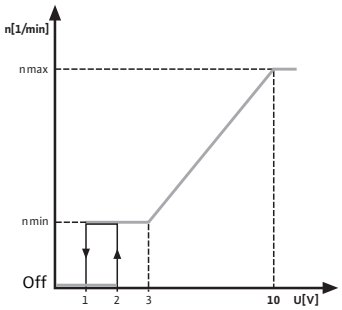
Overriding Off control input
The Wilo TOP-E/-ED pumps with a nominal motor power above P_2 = 350 W have an Ext. Off control input for deactivation via external control units. This control input overrides all other control commands (contact open: pump off).
Wilo TOP-E/-ED pumps with a smaller capacity can be switched via the mains power cable.

Analogue input, 0 – 10 V



With Wilo TOP-E/-ED pumps with a nominal motor power above P_2 = 350 W, the speed can be adjusted in manual control mode according to an external control voltage (0 – 10 V). Controlling is deactivated in the electronic module in this operating mode.

Wilo-Star-E, Wilo TOP-E, TOP-ED



Standard "IF-Module" interface
The Wilo-IF-Module can be retrofitted in the terminal boxes of the Wilo-TOP-E/-ED pumps as an option. The Wilo-IF-Module provides extensive operating data of the Wilo-TOP-E/-ED pumps. This data can be transferred with the Wilo-specific serial digital PLR interface of the PLR IF-Module by means of a two-wire connection via interface converter or company-specific coupling modules to modern building automation systems (BA).
The LON IF-Module can be used to transfer this data by means of a two-wire connection via a manufacturer-neutral, open LONWorks network to modern BA systems.

Dual pump management

With the Wilo energy-saving pumps, automatic double pump control is also possible without an external control device.
Required accessories: 2 IF-Modules (for optional module combinations, see catalogue section: "Wilo-Control pump management systems").
The following operating modes are possible due to the intelligent dual pump management system with one Wilo-TOP-ED or two Wilo-TOP-E pumps:

- **Standby operation**
  The version-specific pump output is provided by one pump, the other pump remains available on standby for time-actuated (24 hours of pure operating time) or fault-actuated switchover.
  Standby operation can be performed by all double pumps and all single pumps (2 x identical type).

- **Parallel operation (in manual control mode only, n = const.)**
  The version-specific pump output is provided by both pumps in parallel operation. The power adjustment is achieved by the synchronous operation of both pumps. Parallel operation can be performed by all double pumps and all single pumps (2 x identical type).

- **Efficiency-optimised peak-load operation**
  During peak-load operation, the hydraulic output is split up between both units of the double pump. During low load operation (only the base-load pump is running) the second pump is ready on standby.
  The peak-load pump is also cut in during efficiency-optimised operation if load conditions require a higher pump output. Efficiency-optimised cut-in takes place when the total power consumption P_1 of both pumps is below the power consumption P_1 of one pump. From this point onwards both pumps are run up synchronously to their maximum speed (nominal speed).
  Time-dependent pump cycling (24 hours of pure operating time) assigns the basic-load function to the pumps alternately. This operating mode (load-sensitive activation/deactivation) achieves additional energy savings compared to conventional peak-load operation.
  Efficiency-optimised peak-load operation is possible with all double pumps, as well as with two identical single pumps, if an equivalent double pump type exists.

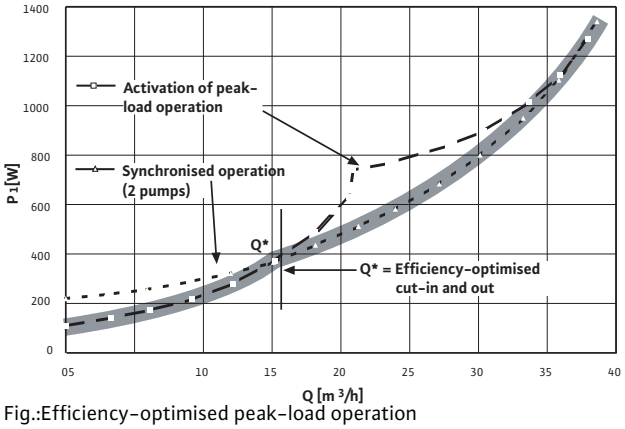


Fig.:Efficiency-optimised peak-load operation

Infrared monitoring

TOP-E/-ED pumps are equipped with a powerful IR interface for wireless remote control and remote diagnosis.



Fig.: Wilo-IR-Module

All basic functions of the TOP-E/-ED pumps can be adjusted with ease directly at the pump via the manual control panel (one-button operation).
The IR-Module is available in combination with a commercially available PDA/Pocket PC or the self-sufficient IR-Monitor as operating and service units for IR communication. Both devices provide important additional functions that go beyond the actual pump capabilities.

The Wilo-IR-Module operating and service units (with PDA/Pocket PC) or Wilo-IR-Monitor for:
- Inaccessibly installed pumps
- Extensive operating information
- Detailed fault diagnosis
- Statistical functions
- Special settings/control modes for special requirements
- Protection against unauthorised access
- Rotation monitoring unit for all pumps and standard motors (only IR-Monitor)
- Storage of pump data records (only IR-Module with PDA/Pocket PC)

Like the TOP-E/-ED pumps, the IR-Monitor is equipped with a one-button control and an LC display. The main operating function of the IR-Monitor corresponds to the operation at the pump itself. A user program with a graphical user interface runs on the PDA/Pocket PC.

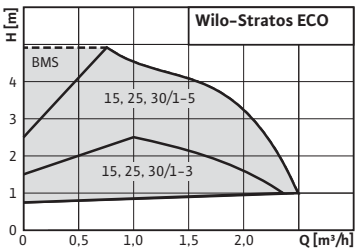
Operation on residual-current devices (RCD)

The operation of the Wilo-TOP-E/-ED series on residual-current devices in accordance with DIN EN 61008-1 is permitted without any impairment of the operation of the residual-current device (DIN VDE 0160). Suitable RCD circuit-breakers are indicated by ⊠ or ⊠.

Series overview Wilo-Stratos ECO, Stratos, Stratos-D

Series: Wilo-Stratos ECO

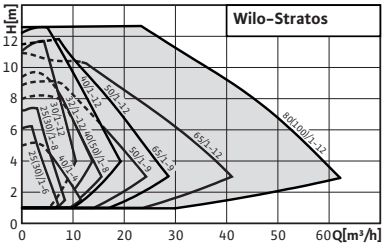




> **Design**
Glandless circulation pump with threaded connection and EC motor with automatic power adjustment
> **Application**
Hot-water heating systems of all kinds, industrial circulation systems

Series: Wilo-Stratos

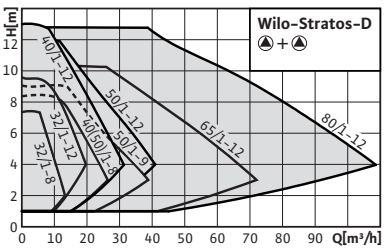




> **Design**
Glandless circulation pump with screwed connection or flange connection, EC motor with automatic power adjustment.
> **Application**
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems.

Series: Wilo-Stratos-D





> **Design**
Glandless double circulation pump with flange connection, EC motor with automatic power adjustment
> **Application**
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Stratos ECO, Stratos, Stratos-D

Series: Wilo-Stratos ECO

> Special features/product benefits
- Energy efficiency class A
- Up to 80% electricity savings compared to circulation pumps without speed control
- High-efficiency pump especially for single and two-family houses, as well as for two to six-family houses
- Maximum efficiency due to ECM technology
- Very high starting torque for reliable starting
- Quick connection with spring clips
- Only 5.8 W min. power consumption
- Standard thermal insulation for heating applications

> More information

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• Technical data	45
• Pump curves	47
• Terminal diagrams, motor data	48
• Dimensions, weights	49
• Service/accessories	349
• Switchgears and control devices	371
• Wilo-Control pump management systems	435

Series: Wilo-Stratos

> Special features/product benefits
- Energy efficiency class A
- Maximum efficiency due to ECM technology
- Up to 80% electricity savings compared to uncontrolled circulation pumps
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display, combination flanges PN 6/PN 10 (for DN 32 to DN 65)
- Standard thermal insulation for heating applications
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Can be used in cooling/air-conditioning systems without ambient temperature limits
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Remote control via infrared interface (IR-Module/IR-Monitor)

> More information

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• Wilo-Control pump management systems	435

Series: Wilo-Stratos-D

> Special features/product benefits
- Energy efficiency class A
- Maximum efficiency due to ECM technology
- Up to 80% electricity savings compared to circulation pumps without speed control
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display, combination flanges PN 6/PN 10 (for DN 32 to DN 65)
- Can be used in cooling/air-conditioning systems without ambient temperature limits
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Remote control via infrared interface (IR-Module/IR-Monitor)
- Integrable dual pump management due to retrofit Stratos IF-Modules:
  - Main/standby mode with fault-dependent switchover
  - Efficiency-optimised peak-load operation

> More information

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Equipment/function Wilo-Stratos ECO, Stratos

	Wilo-Stratos ECO	Wilo-Stratos
Operating modes		
Speed-stage switching	–	–
Manual control mode (n=constant)	• (only Stratos ECO...-BMS)	•
Δp-c for constant differential pressure	• (only Stratos ECO...-BMS)	•
Δp-v for variable differential pressure	•	•
Δp-T for temperature-controlled differential pressure	–	• (programmable via IR-Module, IR-Monitor, LON or CAN)
Manual functions		
Operating mode setting	• (only Stratos ECO...-BMS)	•
Differential-pressure setpoint setting	•	•
Autopilot	•	•
Pump ON/OFF setting	• (only Stratos ECO...-BMS)	•
Speed setting (manual control mode)	• (only Stratos ECO...-BMS)	•
Setting the speed stages	–	–
Automatic functions		
Infinitely variable power adjustment according to the operating mode	•	•
Autopilot	•	•
Deblocking function	• -	•
Soft start	•	•
Safety control	•	–
Full motor protection with integrated trip electronics	–	•
External control functions		
Overriding Off	• (only Stratos ECO...-BMS)	• Possible with Stratos IF-Modules (accessories)
Overriding Min	–	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• (only Stratos ECO...-BMS)	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• (only Stratos ECO...-BMS)	• Possible with Stratos IF-Modules (accessories)

Equipment/function Wilo-Stratos ECO, Stratos

	Wilo-Stratos ECO	Wilo-Stratos
Signal and display functions		
Single/collective fault signal (potential-free NC contact)	–	–
Collective fault signal (potential-free NC contact)	• (only Stratos ECO...-BMS)	•
Individual run signal (potential-free NO contact)	–	• Possible with Stratos IF-Modules (accessories)
Thermal winding contact (WSK, potential-free NC contact)	•	–
Fault signal light	• (only Stratos ECO...-BMS)	•
Direction-of-rotation control light	–	–
LC display for indication of pump data and fault codes	–	•
Data exchange		
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	•
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	• Possible with Stratos IF-Modules (accessories)
Serial digital LON interface for connection to a LONWORKS network	–	• Possible with Stratos IF-Modules (accessories)
Serial digital CAN interface for connection to a CAN bus system	-	• Possible with Stratos IF-Modules (accessories)
Dual pump management (double pump or 2 x single pump)		
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	• Various combinations with Stratos IF-Modules (accessories) possible
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	• Various combinations with Stratos IF-Modules (accessories) possible
Equipment/scope of delivery		
Wrench attachment point on pump body	•	• (threaded pipe union pumps with $P_2 \leq 100W$)
Twin switch-over valve in pump housing	–	–
Cable lead-in possible on both sides	•	–
Wilo quick connection with spring clips	•	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	• (only Stratos ECO-L)	–
Plug-in position for optional extension with Wilo-IF-Modules	–	•

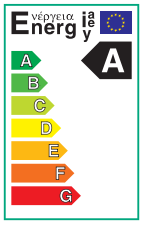
Equipment/function Wilo-Stratos ECO, Stratos

	Wilo-Stratos ECO	Wilo-Stratos
Blocking current-proof motor	•	–
Including seals for threaded connection (loose)	•	•
Including installation and operating instructions	•	•
Including thermal insulation	•	•
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	•
Including 1.8 m connecting cable with shock-proof plug	–	–
Integrated non-return valve	–	–
Integrated ball shut-off valve	–	–
Including clock timer	–	–
Particle filter	•	–

• = available, – = not available

Series description Wilo-Stratos ECO







Design
Glandless circulation pump with threaded connection and EC motor with automatic power adjustment

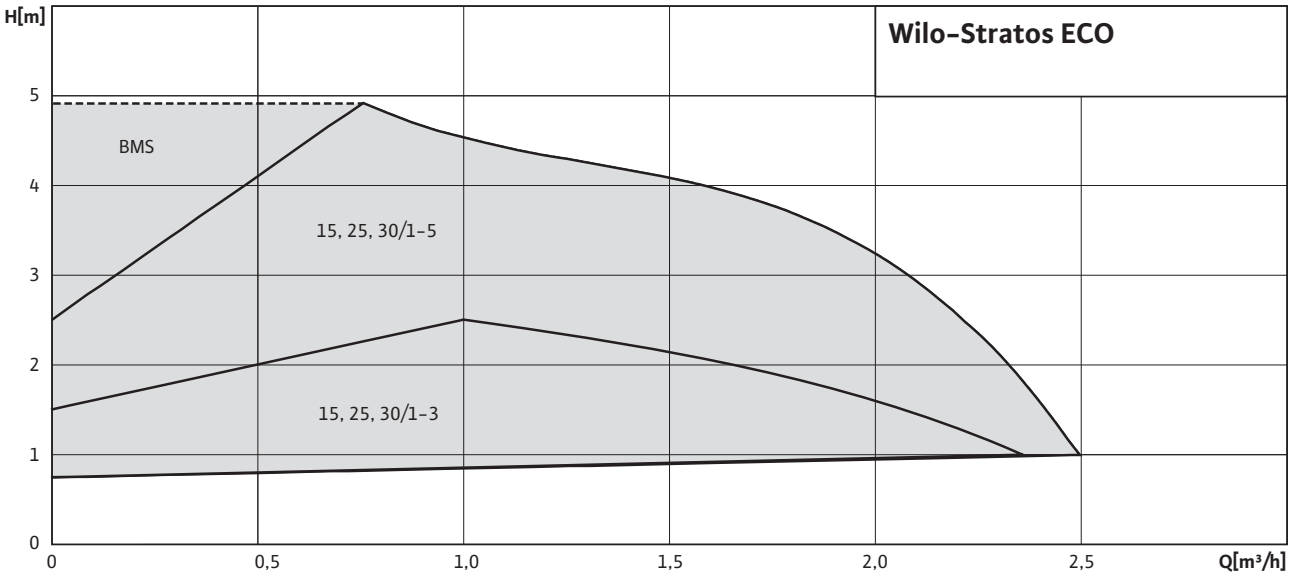
Application
Hot-water heating systems of all kinds, industrial circulation systems

Type key

Example:	**Wilo-Stratos ECO 30/1-3**
Stratos ECO	High-efficiency pump (screw-end pump)
30/	Nominal connection diameter
1-3	Nominal delivery head range [m]

Options
- Stratos ECO 25/1-5-130: Version with short overall length of 130 mm
- Stratos ECO 25/1-5 RG: Version with red brass housing
- Stratos ECO 25/1-5 BMS: Version with Building Management System, can be connected to building automation
- Stratos ECO-L 25/1-5: Version as ventilation pump

Special features/product benefits
- Energy efficiency class A
- Up to 80% electricity savings compared to circulation pumps without speed control
- High-efficiency pump especially for single and two-family houses, as well as for two to six-family houses
- Maximum efficiency due to ECM technology
- Very high starting torque for reliable starting
- Quick connection with spring clips
- Only 5.8 W min. power consumption
- Standard thermal insulation for heating applications



Series description Wilo-Stratos ECO

Equipment/function

Operating modes
- Manual control mode (n=constant) (only Stratos ECO...BMS)
- Δ p-c for constant differential pressure (only Stratos ECO...BMS)
- Δ p-v for variable differential pressure

Manual functions
- Setting of operating mode (only Stratos ECO...BMS)
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting
- Pump ON/OFF setting (only Stratos ECO...BMS)
- Setting of speed (manual control mode) (only Stratos ECO...BMS)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Safety control

External control functions
- "Overriding Off" control input (only Stratos ECO...BMS)
- "Analogue In 0 – 10 V" control input (remote speed adjustment) (only Stratos ECO...BMS)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment) (only Stratos ECO...BMS)

Signal and display functions
- Collective fault signal (potential-free NC contact) (only Stratos ECO...BMS)
- Fault signal light (only Stratos ECO...BMS)

Equipment
- Wrench attachment point on pump body
- Cable lead-in possible on both sides
- Quick connection with spring clips
- Integrated air extraction fitting for automatic rapid ventilation Rp 3/8 (only Stratos ECO-L)
- Blocking current-proof motor
- Particle filter

Scope of delivery
- Pump
- Thermal insulation
- Seals
- Installation and operating instructions

Accessories
- Screwed connections

Technical data Wilo-Stratos ECO

	Wilo-Stratos ECO ...											
	15/1-3	15/1-5	25/1-3	25/1-3-130	25/1-5	25/1-5-130	25/1-5-RG	25/1-5-BMS	-L 25/1-5	30/1-3	30/1-5	30/1-5-BMS
Approved fluids (other fluids on request)												
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–	–	–	–
Output												
Delivery head max. [m]	3.0	5.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0	5.0
Max. volume flow [m^3/h]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Permitted field of application												
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	• + 15 to + 110											
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• + 15 to + 95											
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–											
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C in short-term operation 2 h [°C]	–	–	–	–	–	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	–	–	–	–	–	–	–	–	–	–	–	–
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	–	–	–	–	–	–	–	–	–	–	–	–
Pipe connections												
Screwed connection Rp	½	½	1	1	1	1	1	1	1	1¼	1¼	1¼
Nominal flange diameter DN	–	–	–	–	–	–	–	–	–	–	–	–
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–	–	–	–	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–	–	–	–

Technical data Wilo-Stratos ECO

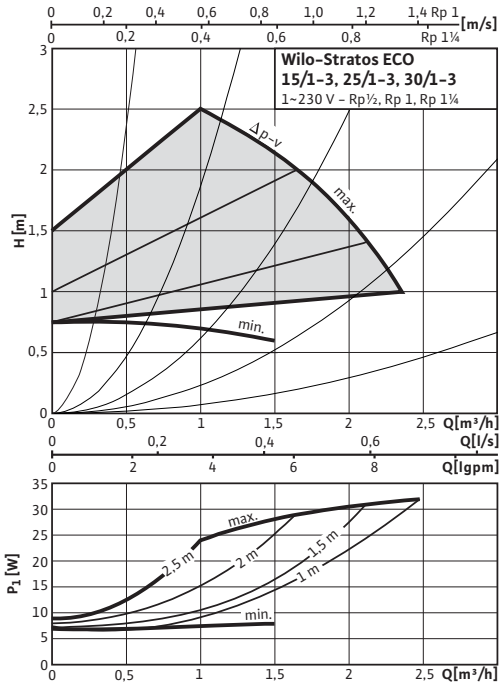
	Wilo-Stratos ECO ...											
	15/1-3	15/1-5	25/1-3	25/1-3-130	25/1-5	25/1-5-130	25/1-5-RG	25/1-5-BMS	-L 25/1-5	30/1-3	30/1-5	30/1-5-BMS
Electrical connection												
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–	–	–	–	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–	–	–	–	–	–
Mains frequency	50	50	50	50	50	50	50	50	50	50	50	50
Motor/electronics												
Electromagnetic compatibility	EN 61800-3											
Emitted interference	EN 61000-6-3											
Interference resistance	EN 61000-6-2											
Power electronics	Pulse package control											
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F	F	F	F	F	F
Materials												
Pump housing	Grey cast iron (EN-GJL-200)						Red brass (CC 499K) according to DIN EN 1982 and according to TrinkwV2001 (drinking water ordinance)	Grey cast iron (EN-GJL-200)				
Impeller	Plastic (PP – 40% GF)											
Pump shaft	Stainless steel											
Bearing	Carbon, metal impregnated											
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature												
Minimum suction head at 50°C	1	1	1	1	1	1	1	1	1	1	1	1
Minimum suction head at 95°C	3	3	3	3	3	3	3	3	3	3	3	3
Minimum suction head at 110°C	10	10	10	10	10	10	10	10	10	10	10	10

• = available, – = not available

Pump curves Wilo–Stratos ECO

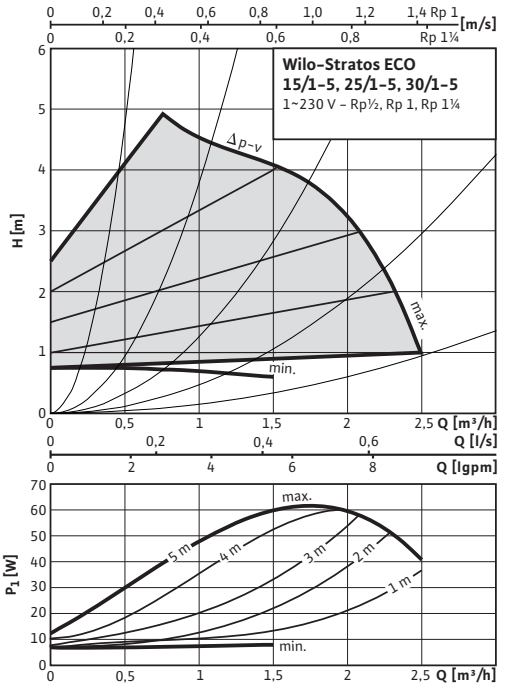
Wilo–Stratos ECO 15/1–3, 25/1–3, 30/1–3

Δp–v (variable)



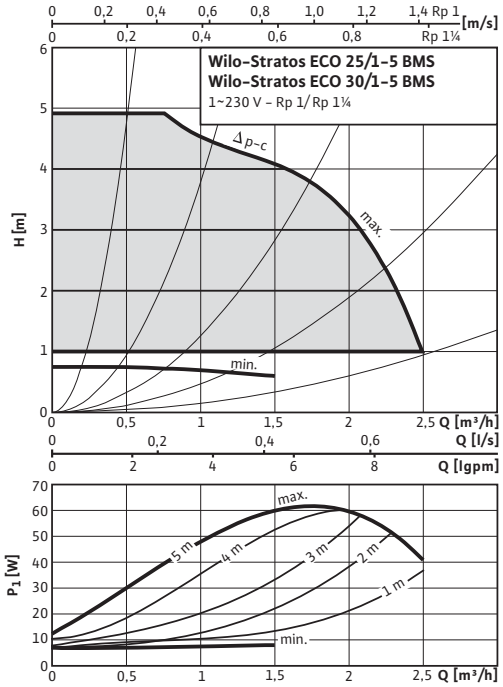
Wilo–Stratos ECO 15/1–5, 25/1–5, 30/1–5, ECO–L 25/1–5

Δp–v (variable)

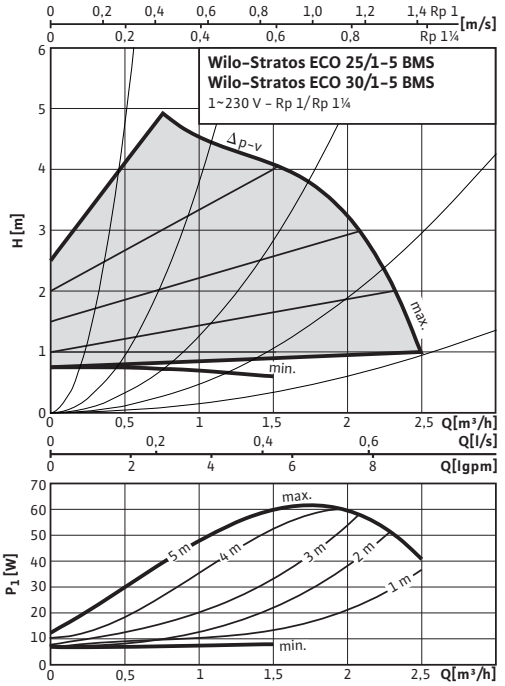


Wilo–Stratos ECO 25/1–5 BMS, 30/1–5 BMS

Δp–c (constant)

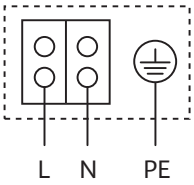


Δp–v (variable)



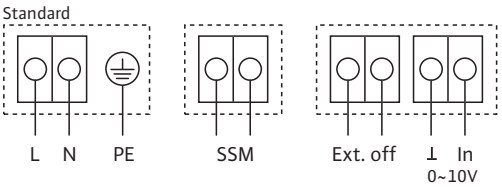
Terminal diagram, motor data Wilo-Stratos ECO

Terminal diagram A



Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Terminal diagram B



1~ 230 V, 50 Hz

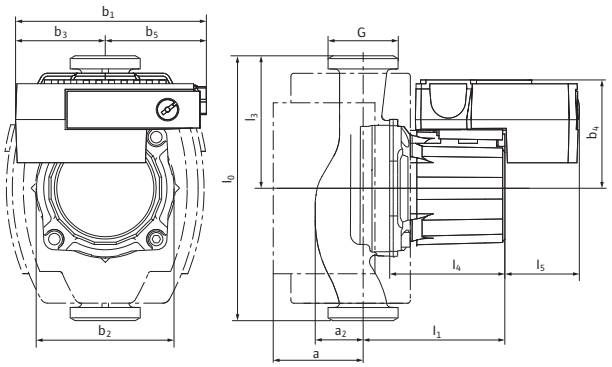
Single-phase motor, 2-pole, 1~230 V, 50 Hz

Motor data

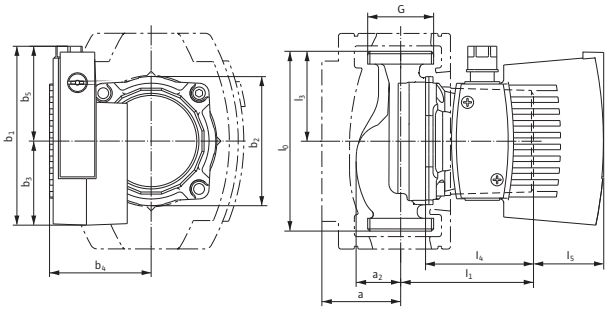
Wilo-Stratos ECO ...	Speed range	Power consumption	Max. current	Motor protection	Threaded cable connection	Wiring diagram
	–	P_1	I	–	PG	–
	[rpm]	[W]	[A]	–	[PG]	–
15/1-3	1400 - 2700	5.8 - 32	0.30	not required (blocking current-proof)	1x11	A
15/1-5	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
25/1-3	1400 - 2700	5.8 - 32	0.30	not required (blocking current-proof)	1x11	A
25/1-3-130	1400 - 2700	5.8 - 32	0.30	not required (blocking current-proof)	1x11	A
25/1-5	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
25/1-5-130	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
25/1-5-RG	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
25/1-5-BMS	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x7/1x9/1x11	B
-L 25/1-5	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
30/1-3	1400 - 2700	5.8 - 32	0.30	not required (blocking current-proof)	1x11	A
30/1-5	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
30/1-5-BMS	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x7/1x9/1x11	B

Dimensions, weights Wilo–Stratos ECO

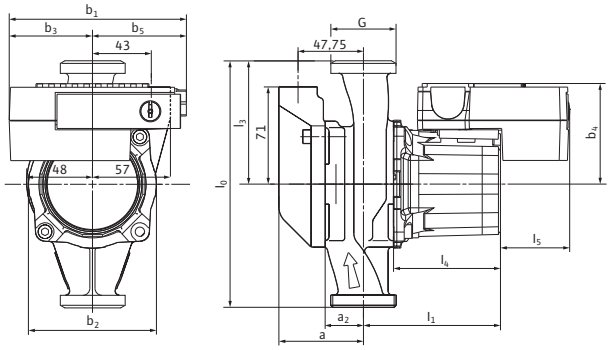
Dimension drawing A



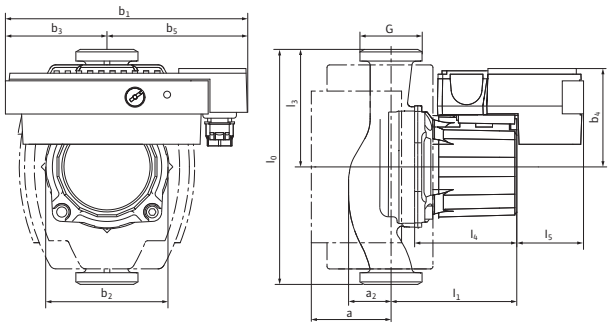
Dimension drawing B



Dimension drawing C



Dimension drawing D

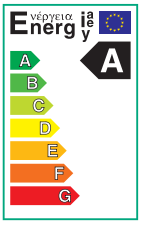


Dimensions, weights

Wilo–Stratos ECO …	Pipe connection	Thread	Dimensions												Weight approx.	Dimension drawing
	Rp	G	l_0	l_1	l_3	l_4	l_5	A	a_2	b_1	b_2	b_3	b_4	b_5	M	–
	–		[mm]												[kg]	–
15/1–3	½	1	130	96	65	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.3	B
15/1–5	½	1	130	96	65	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.3	B
25/1–3	1	1½	180	96	90	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.6	A
25/1–3–130	1	1½	130	96	65	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.5	B
25/1–5	1	1½	180	96	90	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.6	A
25/1–5–130	1	1½	130	96	65	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.5	B
25/1–5–RG	1	1½	180	96	90	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.5	A
25/1–5–BMS	1	1½	180	96	90	78	55.0	33	57	185.5	93.5	78	75.0	107.5	2.9	C
–L 25/1–5	1	1½	180	100	90	78	50.5	62	–	116.0	93.5	69	73.5	61.0	3.0	D
30/1–3	1¼	2	180	96	90	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.7	A
30/1–5	1¼	2	180	96	90	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.8	A
30/1–5–BMS	1¼	2	180	96	90	78	55.0	33	57	185.5	93.5	78	75.0	107.5	3.1	D

Series description Wilo-Stratos





Design
Glandless circulation pump with screwed connection or flange connection, EC motor with automatic power adjustment.

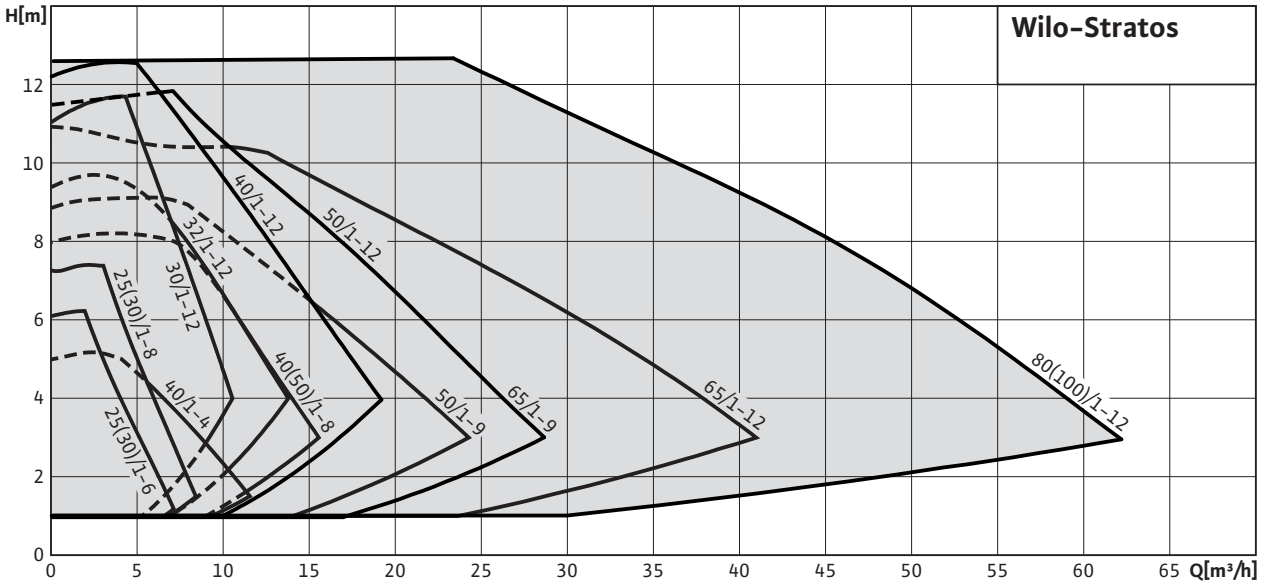
Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems.

Type key

Example:	**Wilo Stratos 30/1-12**
Stratos	High-efficiency pump (screw-end or flange-end pump), electronically controlled
30/	Nominal connection diameter
1-12	Nominal delivery head range [m]

Options
- Special versions for operating pressure PN 16 (at additional charge)

Special features/product benefits
- Energy efficiency class A
- Maximum efficiency due to ECM technology
- Up to 80% electricity savings compared to uncontrolled circulation pumps
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display, combination flanges PN 6/PN 10 (for DN 32 to DN 65)
- Standard thermal insulation for heating applications
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Can be used in cooling/air-conditioning systems without ambient temperature limits
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Remote control via infrared interface (IR-Module/IR-Monitor)



Subject to change 09/2008 WILO SE

Series description Wilo-Stratos

Equipment/function

Operating modes
- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure (programmable via IR-Module, IR-Monitor, LON or CAN)

Manual functions
- Operating mode setting
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting
- Pump ON/OFF setting
- Speed setting (manual control mode)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Full motor protection with integrated trip electronics

External control functions
- "Overriding Off" control input (possible with Stratos IF-Modules)
- "Overriding Min" control input (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote speed adjustment) (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment) (possible with Stratos IF-Modules)

Signal and display functions
- Collective fault signal (potential-free NC contact)
- Individual run signal (potential-free NO contact) (possible with Stratos IF-Modules)
- Fault signal light
- LC display for indication of pump data and fault codes

Data exchange
- Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)
- Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling module (possible with Stratos IF-Modules)
- Serial digital LON interface for connection to a LONWORKS network (possible with Stratos IF-Modules)
- Serial digital CAN interface for connection to a CAN bus system (possible with Stratos IF-Modules)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): Various combinations possible with Stratos IF-Modules (accessory)
- Parallel operation (efficiency-optimised peak-load cut-in and out): Various combinations possible with Stratos IF-Modules (accessory)

Equipment
- Wrench attachment point on pump body (for threaded pipe union pumps with P2 < 100 W)
- Plug-in position for optional extension with Wilo-IF-Modules

Scope of delivery
- Pump
- Including seals for threaded connection
- Including installation and operating instructions
- Including washers for flange screws (for nominal connection diameters DN 32 – DN 65)

Accessories
- Screwed connections with screw thread
- Pump cold water insulation Wilo-ClimaForm
- IR-Module
- IR-Monitor
- IF-Modules Stratos: PLR, LON, CAN, Ext. Off, Ext. Min., SBM, Ext. Off/SBM
- Analogue interface converter AnaCon
- Digital interface converter DigiCon/DigiCon-A

Technical data Wilo-Stratos

	Wilo-Stratos ...								
	25/1-6	**25/1-8**	**30/1-6**	**30/1-8**	**30/1-12**	**32/1-12**	**40/1-4**	**40/1-8**	**40/1-12**
Approved fluids (other fluids on request)									
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–
Output									
Delivery head max. [m]	6	7	6	7	11	9	5	8	12
Max. volume flow [m^3/h]	7	8	7	8	13	17	11	18	23
Permitted field of application									
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-								
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-10 up to +110								
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–								
Temperature range for applications in secondary hot water circulation systems at ambient temperature of +40 °C in short-term operation 2 h [°C]	-	-	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	10	10	10	10	10	6/10	6/10	6/10	6/10
Special version for operating pressure, p_{max}	16	16	16	16	16	16	16	16	16
Pipe connections									
Screwed connection Rp	1	1	1¼	1¼	1¼	-	-	-	-
Nominal flange diameter DN	–	–	–	–	–	32	40	40	40
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	•	•	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–
Electrical connection									
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-	-	-	-	-	-
Mains frequency	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60

Technical data Wilo–Stratos

	Wilo–Stratos …								
	25/1–6	**25/1–8**	**30/1–6**	**30/1–8**	**30/1–12**	**32/1–12**	**40/1–4**	**40/1–8**	**40/1–12**
Motor/electronics									
Electromagnetic compatibility	EN 61800–3								
Emitted interference	EN 61000–6–3								
Interference resistance	EN 61000–6–2								
Power electronics	Frequency converter								
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F	F	F
Materials									
Pump housing	Grey cast iron (EN–GJL–200)					Grey cast iron (EN–GJL–250)			
Impeller	Plastic (PPS – 40% GF)								
Pump shaft	Stainless steel (X46Cr13)								
Bearing	Carbon, metal impregnated								
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature									
Minimum suction head at 50°C	3	3	3	3	3	3	3	3	5
Minimum suction head at 95°C	10	10	10	10	10	10	10	10	12
Minimum suction head at 110°C	16	16	16	16	16	16	16	16	18

• = available, – = not available

Technical data Wilo-Stratos

	Wilo-Stratos ...						
	50/1-8	**50/1-9**	**50/1-12**	**65/1-9**	**65/1-12**	**80/1-12**	**100/1-12**
Approved fluids (other fluids on request)							
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–
Output							
Delivery head max. [m]	8	9	11	11	10	13	13
Max. volume flow [m^3/h]	18	29	29	29	47	67	67
Permitted field of application							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-						
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-10 up to +110						
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–						
Temperature range for applications in secondary hot water circulation systems at ambient temperature of +40 °C in short-term operation 2 h [°C]	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	6/10	6/10	6/10	6/10	6/10	6	6
Special version for operating pressure, p_{max}	16	16	16	16	16	10/16	10/16
Pipe connections							
Screwed connection Rp	-	-	-	-	-	-	-
Nominal flange diameter DN	50	50	50	65	65	80	100
Flange for counter flange PN 6, standard version	–	–	–	–	–	•	•
Flange for counter flange PN 16, special version	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•	•	•	•	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–
Electrical connection							
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	230	230	230	230	230	230	230
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-	-	-	-
Mains frequency	50/60	50/60	50/60	50/60	50/60	50/60	50/60

Technical data Wilo–Stratos

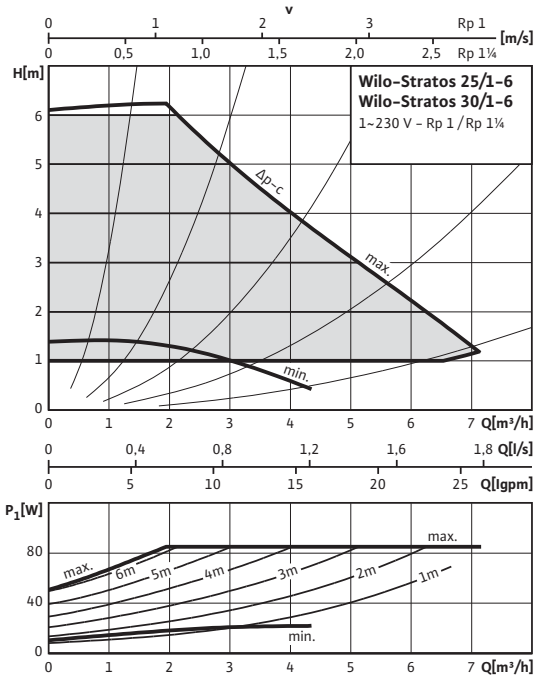
	Wilo–Stratos …						
	50/1–8	**50/1–9**	**50/1–12**	**65/1–9**	**65/1–12**	**80/1–12**	**100/1–12**
Motor/electronics							
Electromagnetic compatibility	EN 61800–3						
Emitted interference	EN 61000–6–3						
Interference resistance	EN 61000–6–2						
Power electronics	Frequency converter						
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F
Materials							
Pump housing	Grey cast iron (EN–GJL–250)						
Impeller	Plastic (PPS – 40% GF)				Plastic (PP – 50% GF)		
Pump shaft	Stainless steel (X46Cr13)						
Bearing	Carbon, metal impregnated						
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature							
Minimum suction head at 50°C	3	5	5	5	7	7	7
Minimum suction head at 95°C	10	12	12	12	15	15	15
Minimum suction head at 110°C	16	18	18	18	23	23	23

• = available, – = not available

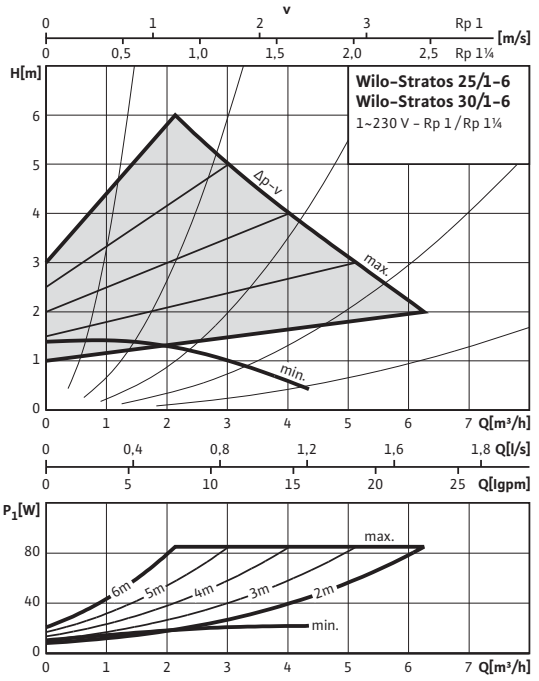
Pump curves Wilo–Stratos

Wilo–Stratos 25/1–6 – 30/1–6

Δp–c (constant)

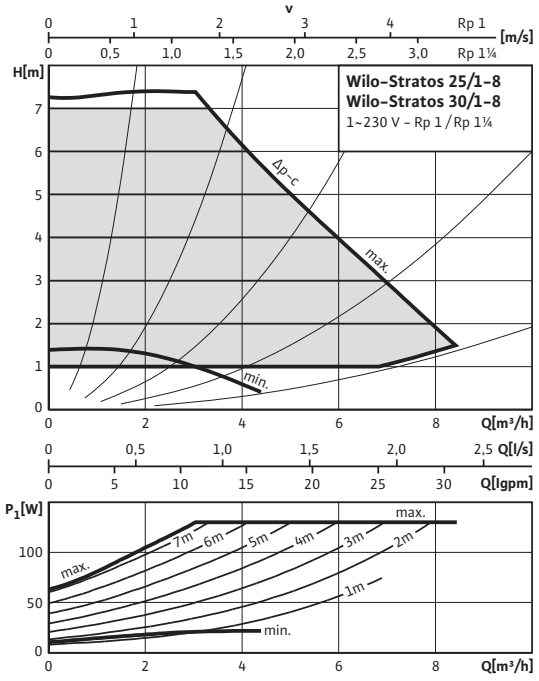


Δp–v (variable)

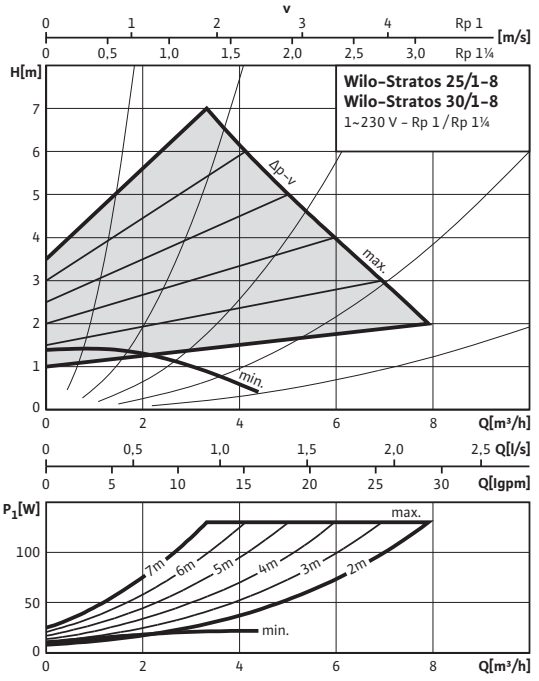


Wilo–Stratos 25/1–8 – 30/1–8

Δp–c (constant)



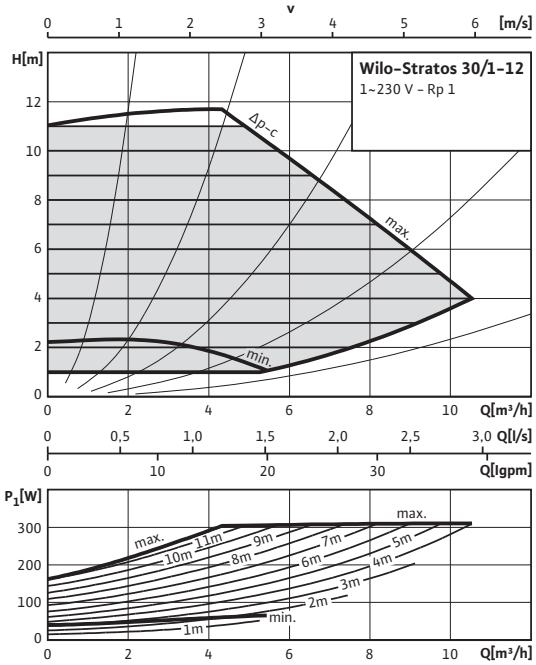
Δp–v (variable)



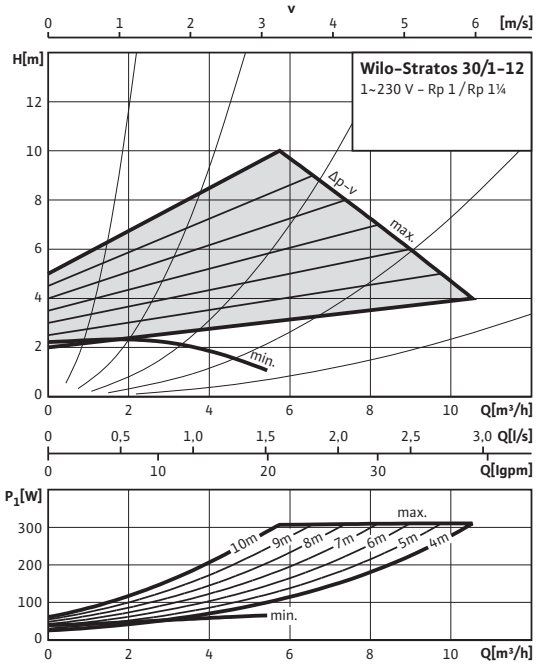
Pump curves Wilo–Stratos

Wilo–Stratos 30/1–12

Δp–c (constant)

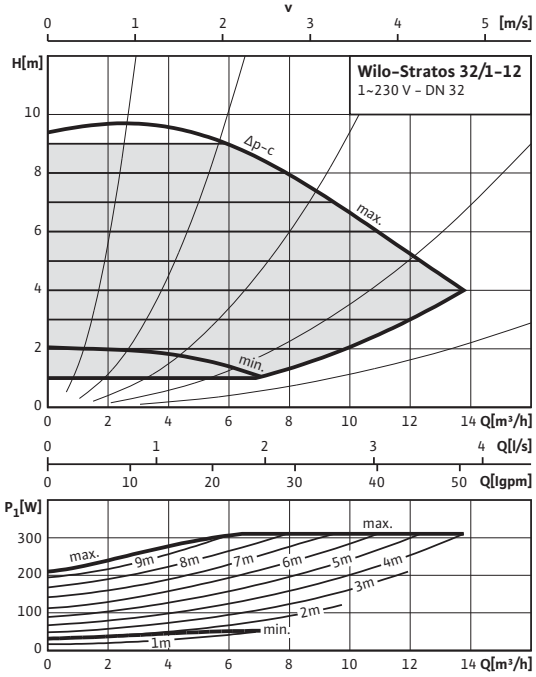


Δp–v (variable)

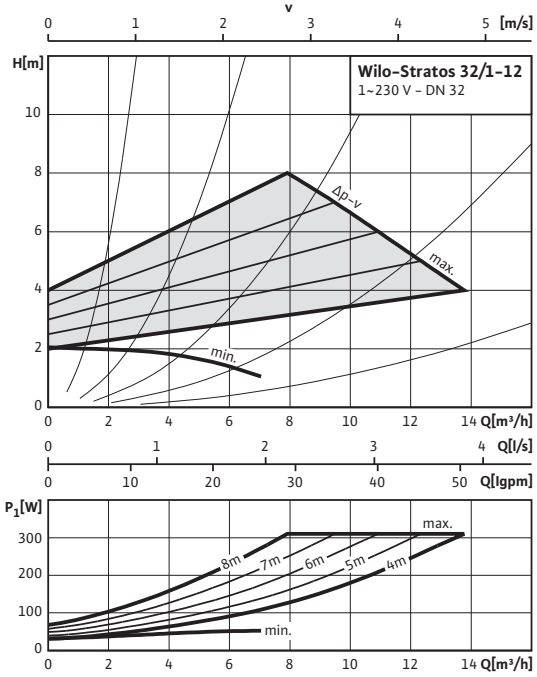


Wilo–Stratos 32/1–12

Δp–c (constant)



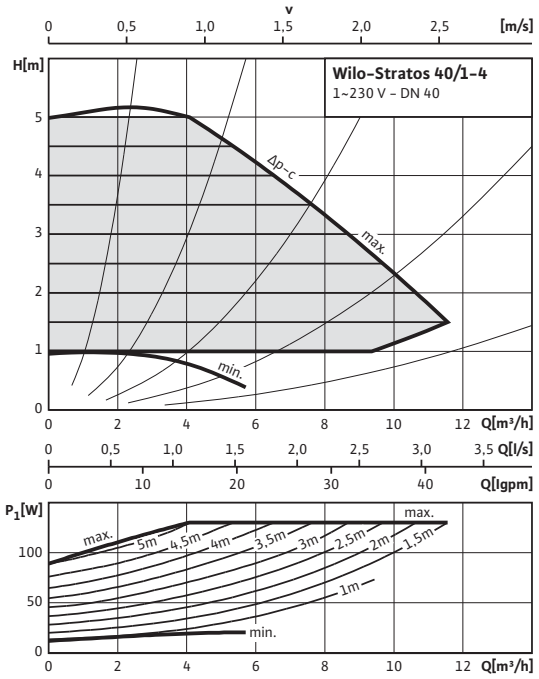
Δp–v (variable)



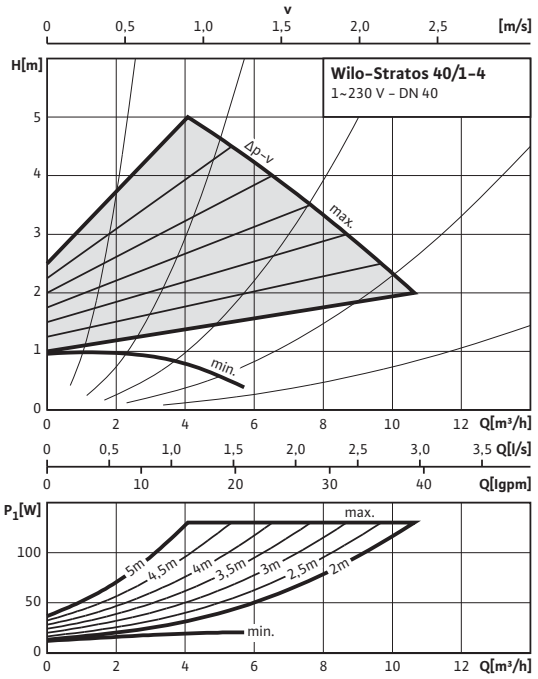
Pump curves Wilo-Stratos

Wilo-Stratos 40/1-4

Δp-c (constant)

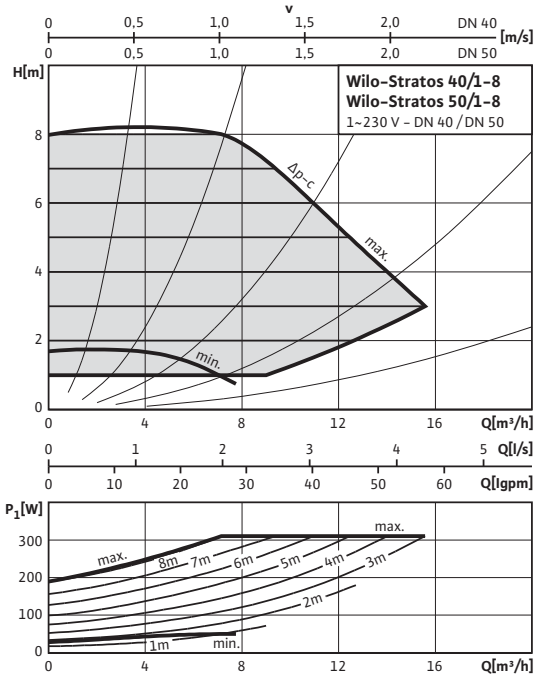


Δp-v (variable)

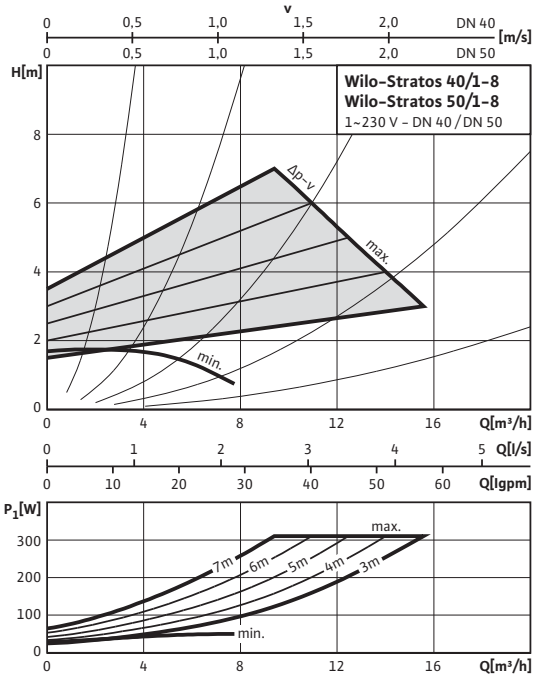


Wilo-Stratos 40/1-8, 50/1-8

Δp-c (constant)



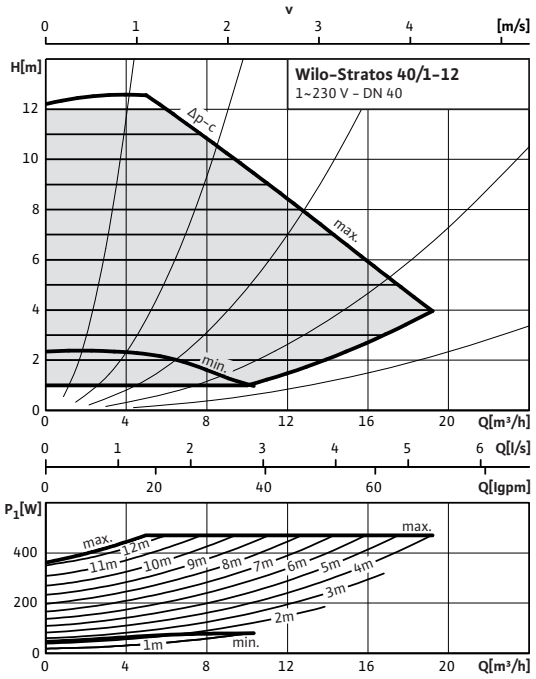
Δp-v (variable)



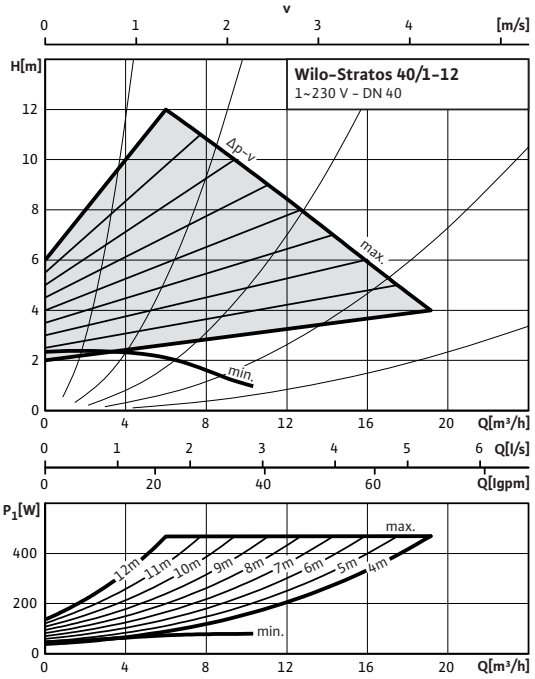
Pump curves Wilo–Stratos

Wilo–Stratos 40/1–12

Δp–c (constant)

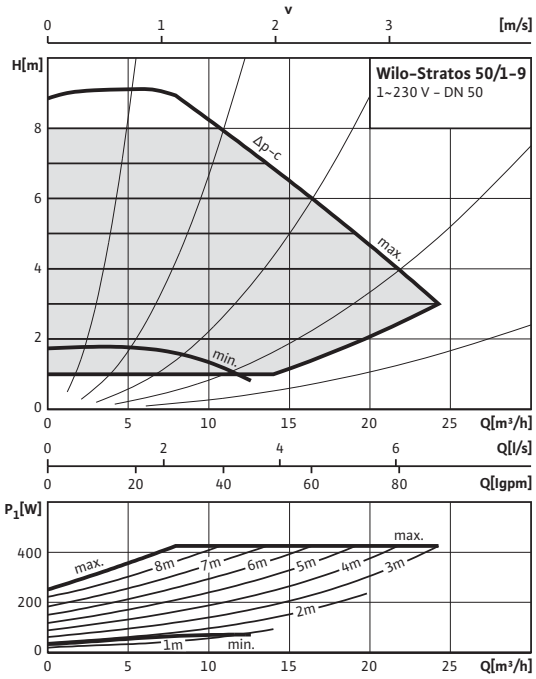


Δp–v (variable)

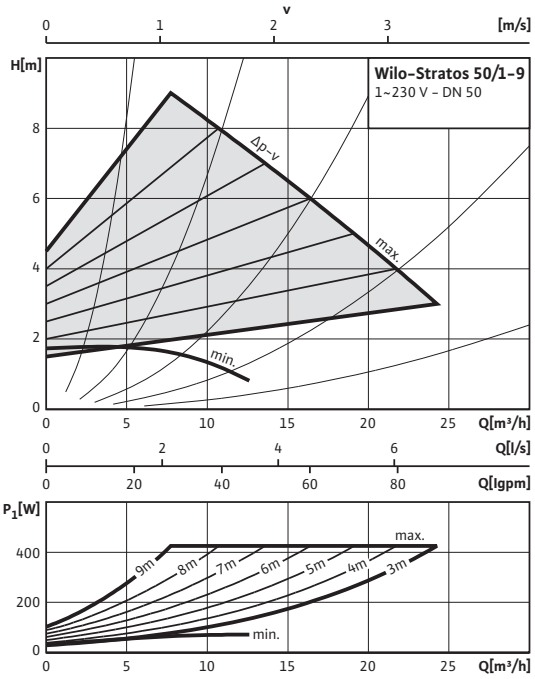


Wilo–Stratos 50/1–9

Δp–c (constant)



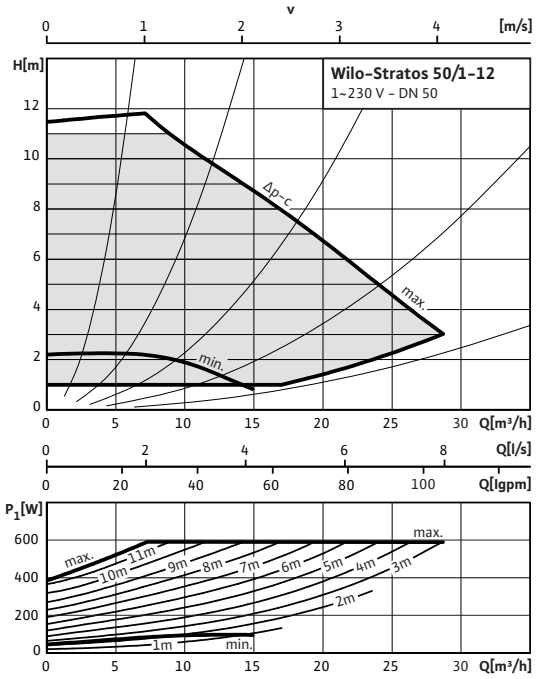
Δp–v (variable)



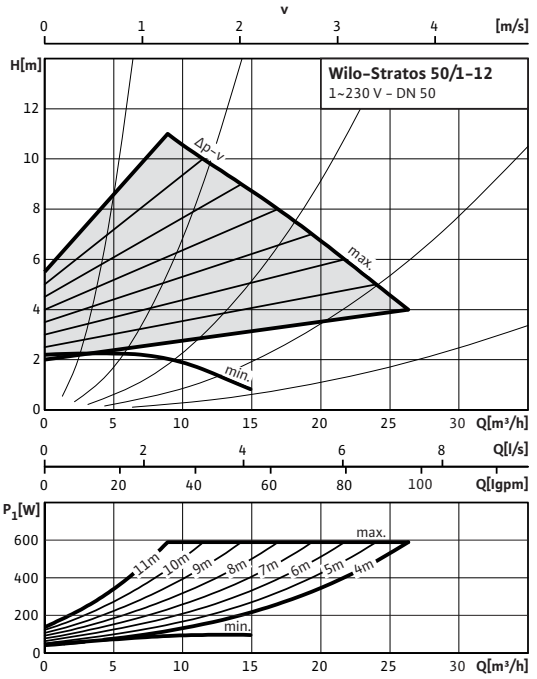
Pump curves Wilo–Stratos

Wilo–Stratos 50/1–12

Δp–c (constant)

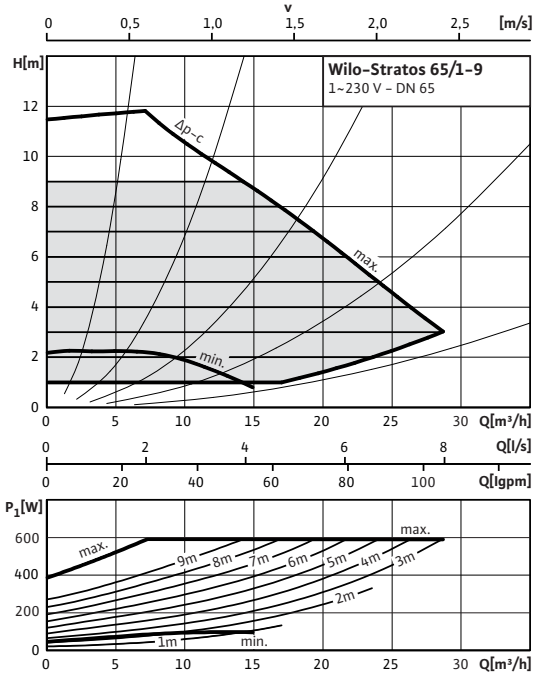


Δp–v (variable)

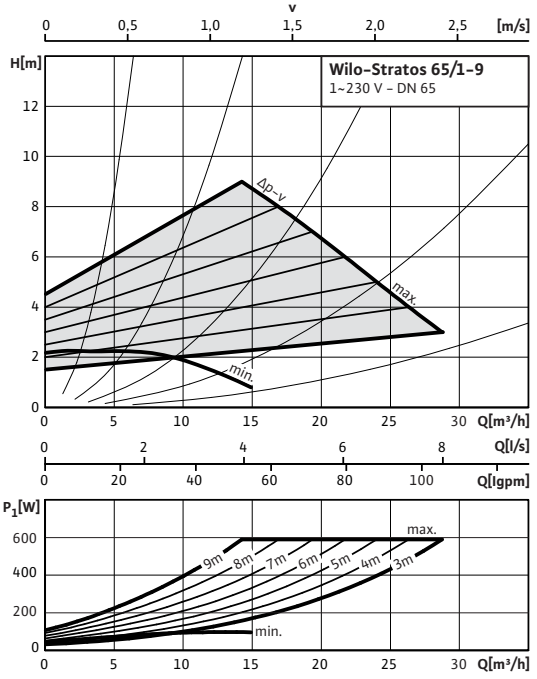


Wilo–Stratos 65/1–9

Δp–c (constant)



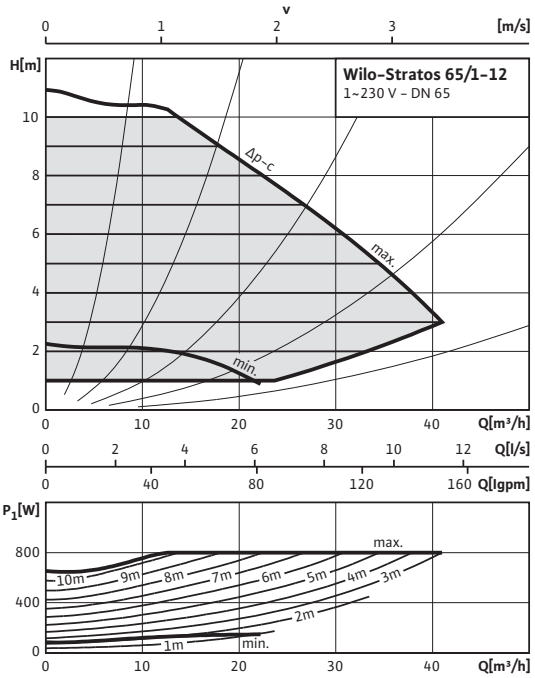
Δp–v (variable)



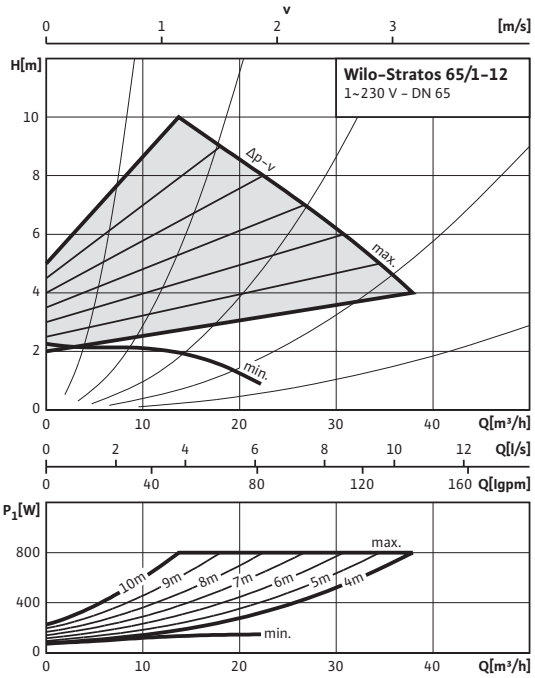
Pump curves Wilo–Stratos

Wilo–Stratos 65/1–12

Δp–c (constant)

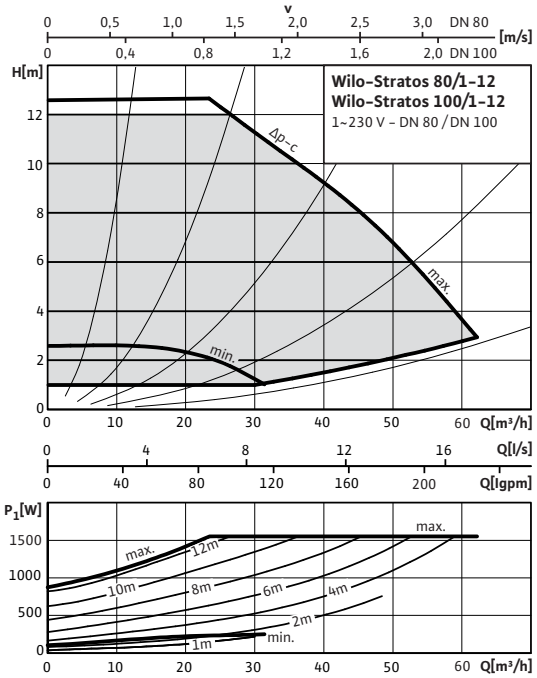


Δp–v (variable)

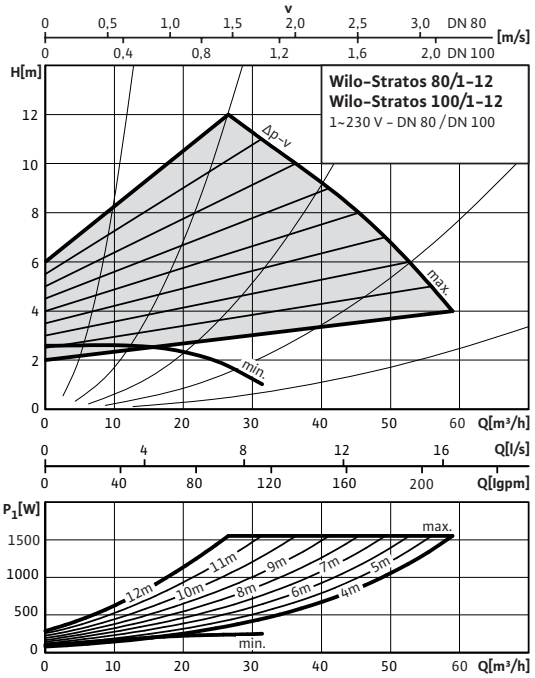


Wilo–Stratos 80/1–12, 100/1–12

Δp–c (constant)



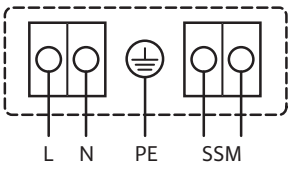
Δp–v (variable)



Terminal diagram, motor data Wilo-Stratos

Terminal diagram

Standard



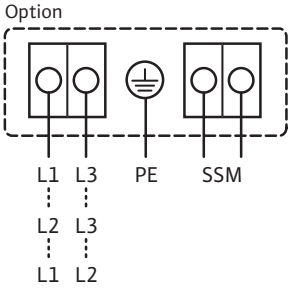
1~ 230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo TOP-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: "Pump management Wilo TOP-Control"

Terminal diagram

Option



3~230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo TOP-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: " Wilo TOP-Control pump management "

Motor data

Wilo-Stratos ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection
	P_2	n	P_1	I			–	PG
	[W]	[rpm]	[W]	[A]			–	[PG]
25/1-6	65	1400 - 3400	9 - 85	0.13 - 0.78	0.13 - 0.78	-	integrated	1x7/1x9/ 1x13.5
25/1-8	100	1400 - 3700	9 - 130	0.13 - 1.20	0.13 - 1.20	-	integrated	1x7/1x9/ 1x13.5
30/1-6	65	1400 - 3400	9 - 85	0.13 - 0.78	0.13 - 0.78	-	integrated	1x7/1x9/ 1x13.5
30/1-8	100	1400 - 3700	9 - 130	0.13 - 1.20	0.13 - 1.20	-	integrated	1x7/1x9/ 1x13.5
30/1-12	200	1600 - 4800	16 - 310	0.16 - 1.37	0.16 - 1.37	-	integrated	1x7/1x9/ 1x13.5

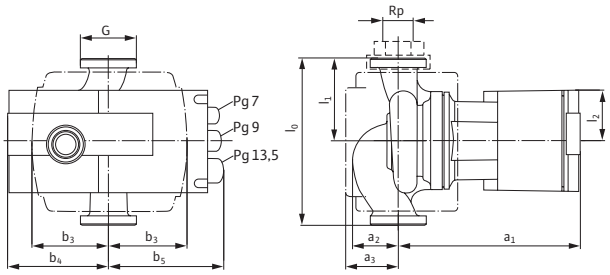
Terminal diagram, motor data Wilo–Stratos

Motor data

Wilo–Stratos …	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection
	P_2	n	P_1	I			–	PG
	[W]	[rpm]	[W]	[A]			–	[PG]
32/1–12	200	1600 – 4800	16 – 310	0.16 – 1.37	0.16 – 1.37	–	integrated	1x7/1x9/ 1x13.5
40/1–4	100	1600 – 3700	14 – 130	0.16 – 1.20	0.16 – 1.20	–	integrated	1x7/1x9/ 1x13.5
40/1–8	200	1800 – 4800	18 – 310	0.17 – 1.37	0.17 – 1.37	–	integrated	1x7/1x9/ 1x13.5
40/1–12	350	1400 – 4600	25 – 470	0.20 – 2.05	0.20 – 2.05	–	integrated	1x7/1x9/ 1x13.5
50/1–8	200	1800 – 4800	18 – 310	0.17 – 1.37	0.17 – 1.37	–	integrated	1x7/1x9/ 1x13.5
50/1–9	350	1400 – 4100	25 – 430	0.20 – 1.88	0.20 – 1.88	–	integrated	1x7/1x9/ 1x13.5
50/1–12	500	1400 – 4600	25 – 590	0.20 – 2.60	0.20 – 2.60	–	integrated	1x7/1x9/ 1x13.5
65/1–9	500	1400 – 4600	25 – 590	0.20 – 2.60	0.20 – 2.60	–	integrated	1x7/1x9/ 1x13.5
65/1–12	650	950 – 3300	38 – 800	0.30 – 3.50	0.30 – 3.50	–	integrated	1x7/1x9/ 1x13.5
80/1–12	1300	900 – 3300	40 – 1550	0.32 – 6.80	0.32 – 6.80	–	integrated	1x7/1x9/ 1x13.5
100/1–12	1300	900 – 3300	40 – 1550	0.32 – 6.80	0.32 – 6.80	–	integrated	1x7/1x9/ 1x13.5

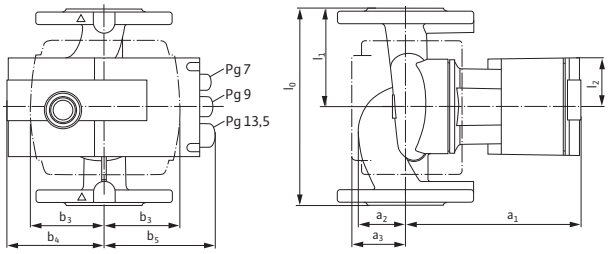
Dimensions, weights Wilo-Stratos

Dimension drawing A



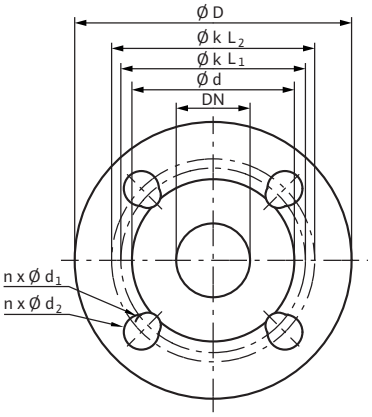
Permitted installation positions, see Planning guide
Important: With vertical module configuration, the threaded cable connection projects above the pump connection (total dimension: dimension b_5 + max. 9 mm)!

Dimension drawing B

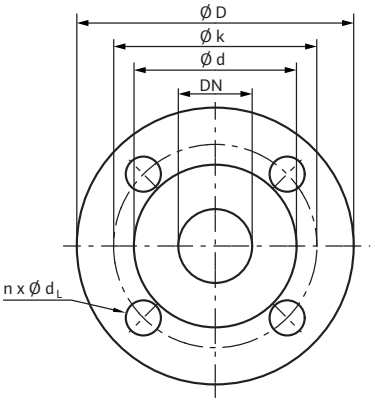


Permitted installation positions, see Planning guide
Important: With vertical module configuration, the threaded cable connection projects above the pump connection (total dimension: dimension b_5 + max. 9 mm)!

Dimension drawing Flange A



Dimension drawing Flange B



Dimensions, weights

Wilo-Stratos ...	Rated pressure	Nominal flange diameter	Pipe connection	Thread	Dimensions									Weight approx.	Dimension drawing
	PN	DN	Rp	G	l_0	l_1	l_2	a_1	a_2	a_3	b_3	b_4	b_5	M	–
	[bar]	–			[mm]									[kg]	–
25/1-6	10	–	1	1½	180	90	49	182	43	56	76	89	114	4.1	A
25/1-8	10	–	1	1½	180	90	49	182	43	56	76	89	114	4.1	A
30/1-6	10	–	1¼	2	180	90	49	182	43	56	76	89	114	4.2	A
30/1-8	10	–	1¼	2	180	90	49	182	43	56	76	89	114	4.2	A
30/1-12	10	–	1¼	2	180	90	55	201	50	56	82	106	120	5.5	A
32/1-12	6/10	32	-	–	220	110	55	204	48	65	82	106	120	9.0	B
40/1-4	6/10	40	-	–	220	110	49	177	57	70	79	89	114	8.3	B
40/1-8	6/10	40	-	–	220	110	55	203	53	63	82	106	120	9.2	B
40/1-12	6/10	40	-	–	250	125	66	252	62	84	96	120	136	14.0	B

Dimensions, weights Wilo-Stratos

Dimensions, weights

Wilo-Stratos ...	Rated pressure	Nominal flange diameter	Pipe connection	Thread	Dimensions									Weight approx.	Dimension drawing
	PN	DN	Rp	G	l_0	l_1	l_2	a_1	a_2	a_3	b_3	b_4	b_5	M	–
	[bar]	–			[mm]									[kg]	–
50/1-8	6/10	50	–	–	240	120	55	208	49	65	82	106	120	10.6	B
50/1-9	6/10	50	–	–	280	140	66	256	62	83	96	120	136	15.5	B
50/1-12	6/10	50	–	–	280	140	66	256	62	83	96	120	136	15.5	B
65/1-9	6/10	65	–	–	280	140	66	256	62	83	96	120	136	17.5	B
65/1-12	6/10	65	–	–	340	170	78	325	87	107	120	157	164	29.0	B
80/1-12	6	80	–	–	360	180	78	329	90	114	127	157	164	31.0	B
80/1-12	10	80	–	–	360	180	78	329	90	114	127	157	164	31.0	B
100/1-12	6	100	–	–	360	180	78	339	80	104	127	157	164	34.0	B
100/1-12	10	100	–	–	360	180	78	339	80	104	127	157	164	34.0	B

Flange dimensions

Wilo-Stratos ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/Ø d_{L2}	n x Ø d_L	–
	–		[mm]				[pcs. x mm]		–
32/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	32	140	76	90/100	–	4 x 14 / 19	-	A
40/1-4	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	–	4 x 14 / 19	-	A
40/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	–	4 x 14 / 19	-	A
40/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	–	4 x 14 / 19	-	A
50/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
50/1-9	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
50/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
65/1-9	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	65	185	118	130/145	–	4 x 14 / 19	-	A
65/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	65	185	118	130/145	–	4 x 14 / 19	-	A
80/1-12	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	132	-	150	-	4 x 19	B
80/1-12	Flange PN16 (according to EN 1092-2)	80	200	132	-	160	-	8 x 19	B
100/1-12	Flange PN 6 (PN 16 design, according to EN 1092-2)	100	220	156	-	170	-	4 x 19	B
100/1-12	Flange PN16 (according to EN 1092-2)	100	220	156	-	180	-	8 x 19	B

Equipment/function Wilo-Stratos-D

	Wilo-Stratos-D
Operating modes	
Speed-stage switching	–
Manual control mode (n=constant)	•
Δp-c for constant differential pressure	•
Δp-v for variable differential pressure	•
Δp-T for temperature-controlled differential pressure	• (programmable via IR-Module, IR-Monitor, LON or CAN)
Manual functions	
Operating mode setting	•
Differential-pressure setpoint setting	•
Autopilot	•
Pump ON/OFF setting	•
Speed setting (manual control mode)	•
Setting the speed stages	–
Automatic functions	
Infinitely variable power adjustment according to the operating mode	•
Autopilot	•
Deblocking function	•
Soft start	•
Safety control	–
Full motor protection with integrated trip electronics	•
External control functions	
Overriding Off	• Possible with Stratos IF-Modules (accessories)
Overriding Min	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• Possible with Stratos IF-Modules (accessories)
Signal and display functions	
Single/collective fault signal (potential-free NC contact)	• (programmable with the IR-Monitor)
Collective fault signal (potential-free NC contact)	•
Individual run signal (potential-free NO contact)	• Possible with Stratos IF-Modules (accessories)
Thermal winding contact (WSK, potential-free NC contact)	–
Fault signal light	•

Equipment/function Wilo-Stratos-D

	Wilo-Stratos-D
Direction-of-rotation control light	–
LC display for indication of pump data and fault codes	•
Data exchange	
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	•
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	• Possible with Stratos IF-Modules (accessories)
Serial digital LON interface for connection to a LONWORKS network	• Possible with Stratos IF-Modules (accessories)
Serial digital CAN interface for connection to a CAN bus system	• Possible with Stratos IF-Modules (accessories)
Dual pump management (double pump or 2 x single pump)	
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	• Various combinations with Stratos IF-Modules (accessories) possible
Parallel operation (efficiency-optimised peak-load cut-in and out)	• Various combinations with Stratos IF-Modules (accessories) possible
Equipment/scope of delivery	
Wrench attachment point on pump body	–
Twin switch-over valve in pump housing	•
Cable lead-in possible on both sides	–
Wilo quick connection with spring clips	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–
Plug-in position for optional extension with Wilo-IF-Modules	•
Blocking current-proof motor	–
Including seals for threaded connection (loose)	–
Including installation and operating instructions	•
Including thermal insulation	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	•
Including 1.8 m connecting cable with shock-proof plug	–
Integrated non-return valve	–
Integrated ball shut-off valve	–
Including clock timer	–
Particle filter	–

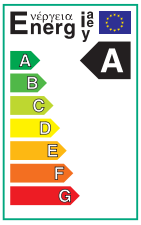
• = available, – = not available

Heating, air-conditioning, cooling

High-efficiency pumps (double pumps)

Series description Wilo-Stratos-D





Design

Glandless double circulation pump with flange connection, EC motor with automatic power adjustment

Application

Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Type key

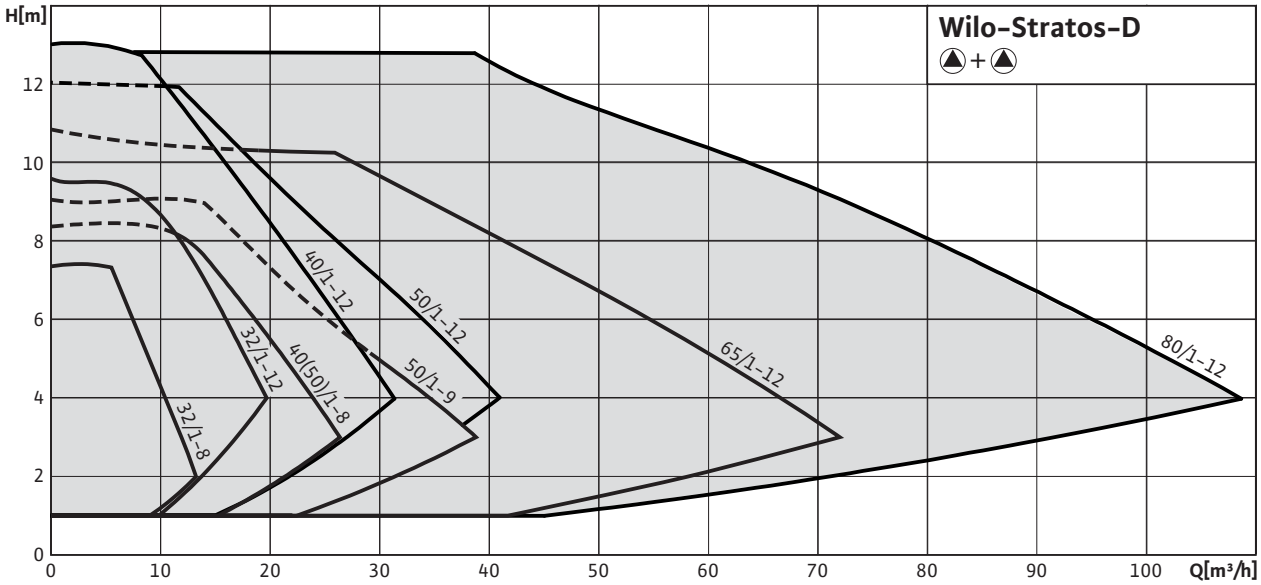
Example:	**Stratos-D 40/1-8**
Stratos	High-efficiency pump (flange-end pump), electronically controlled
D	Double pump
40/	Nominal connection diameter
1-8	Nominal delivery head range [m]

Options

- Special versions for operating pressure PN 16 (at additional charge)

Special features/product benefits

- Energy efficiency class A
- Maximum efficiency due to ECM technology
- Up to 80% electricity savings compared to circulation pumps without speed control
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display, combination flanges PN 6/PN 10 (for DN 32 to DN 65)
- Can be used in cooling/air-conditioning systems without ambient temperature limits
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Remote control via infrared interface (IR-Module/IR-Monitor)
- Integrable dual pump management due to retrofit Stratos IF-Modules:
  - Main/standby mode with fault-dependent switchover
  - Efficiency-optimised peak-load operation



Subject to change 09/2008 WILO SE

Series description Wilo-Stratos-D

Equipment/function

Operating modes
- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure (programmable via IR-Module, IR-Monitor, LON or CAN)

Manual functions
- Operating mode setting
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting
- Pump ON/OFF setting
- Speed setting (manual control mode)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Full motor protection with integrated trip electronics

External control functions
- "Overriding Off" control input (possible with Stratos IF-Modules)
- "Overriding Min" control input (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote speed adjustment) (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment) (possible with Stratos IF-Modules)

Signal and display functions
- Individual / collective fault signal (potential-free NC contact) (programmable with the IR-Monitor)
- Collective fault signal (potential-free NC contact)
- Individual run signal (potential-free NO contact) (possible with Stratos IF-Modules)
- Fault signal light
- LC display for indication of pump data and fault codes

Data exchange
- Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)
- Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling module (possible with Stratos IF-Modules)
- Serial digital LON interface for connection to a LONWorks network (possible with Stratos IF-Modules)
- Serial digital CAN interface for connection to a CAN bus system (possible with Stratos IF-Modules)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): Various combinations possible with Stratos IF-Modules (accessory)
- Parallel operation (efficiency-optimised peak-load cut-in and out): Various combinations possible with Stratos IF-Modules (accessory)

Equipment
- Twin switch-over valve in pump housing
- Plug-in position for optional extension with Wilo-IF-Modules

Scope of delivery
- Pump
- Including installation and operating instructions
- Including washers for flange screws (for nominal connection diameters DN 32 – DN 65)

Accessories
- IR-Module
- IR-Monitor
- IF-Modules Stratos: PLR, LON, CAN, Ext. Off, Ext. Min., SBM, Ext. Off/SBM
- Analogue interface converter AnaCon
- Digital interface converter DigiCon/DigiCon-A

Technical data Wilo-Stratos-D

	Wilo-Stratos-D ...								
	32/1-8	**32/1-12**	**40/1-8**	**40/1-12**	**50/1-8**	**50/1-9**	**50/1-12**	**65/1-12**	**80/1-12**
Approved fluids (other fluids on request)									
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–
Output									
Delivery head max. [m]	7	10	8	12	8	9	12	11	13
Max. volume flow [m^3/h]	13	21	26	33	26	42	42	73	105
Permitted field of application									
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–								
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-10 up to +110								
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–								
Temperature range for applications in secondary hot water circulation systems at ambient temperature of +40 °C in short-term operation 2 h [°C]	-	-	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6
Special version for operating pressure, p_{max}	16	16	16	16	16	16	16	16	10/16
Pipe connections									
Screwed connection Rp	-	-	-	-	-	-	-	-	-
Nominal flange diameter DN	32	32	40	40	50	50	50	65	80
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	•
Flange for counter flange PN 16, special version	•	•	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•	•	•	•	•	•	•	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–
Electrical connection									
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-	-	-	-	-	-
Mains frequency	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60

Technical data Wilo–Stratos–D

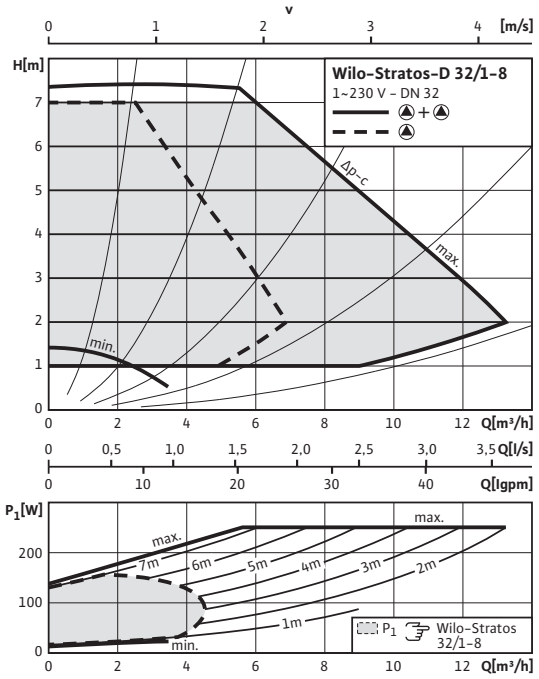
	Wilo–Stratos–D …								
	32/1–8	**32/1–12**	**40/1–8**	**40/1–12**	**50/1–8**	**50/1–9**	**50/1–12**	**65/1–12**	**80/1–12**
Motor/electronics									
Electromagnetic compatibility	EN 61800–3								
Emitted interference	EN 61000–6–3								
Interference resistance	EN 61000–6–2								
Power electronics	Frequency converter								
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F	F	F
Materials									
Pump housing	Grey cast iron (EN–GJL–250)								
Impeller	Plastic (PPS – 40% GF)							Plastic (PP – 50% GF)	
Pump shaft	Stainless steel (X46Cr13)								
Bearing	Carbon, metal impregnated								
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature									
Minimum suction head at 50°C	3	3	3	5	3	5	5	7	7
Minimum suction head at 95°C	10	10	10	12	10	12	12	15	15
Minimum suction head at 110°C	16	16	16	18	16	18	18	23	23

• = available, – = not available

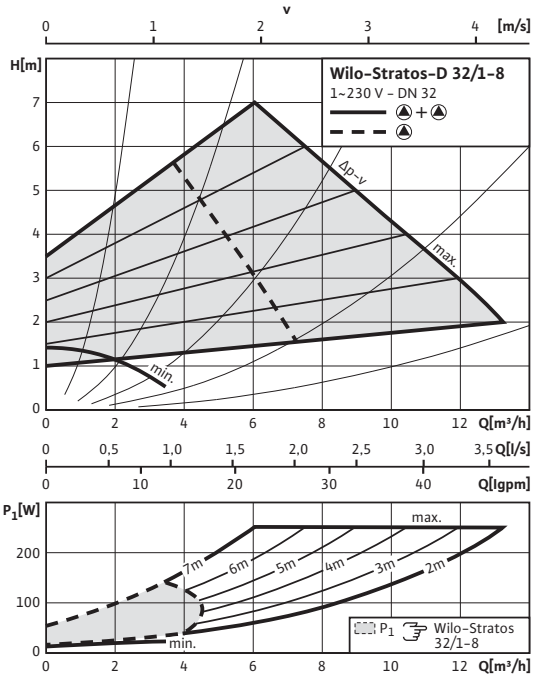
Pump curves Wilo–Stratos–D

Wilo–Stratos–D 32/1–8

Δp–c (constant)

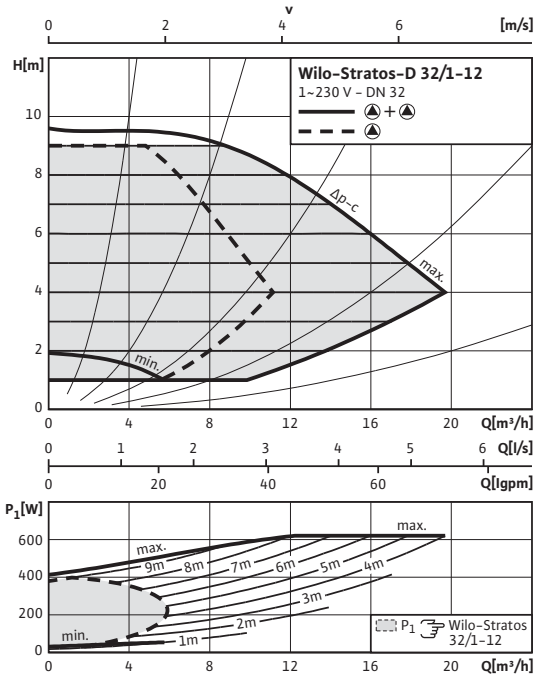


Δp–v (variable)

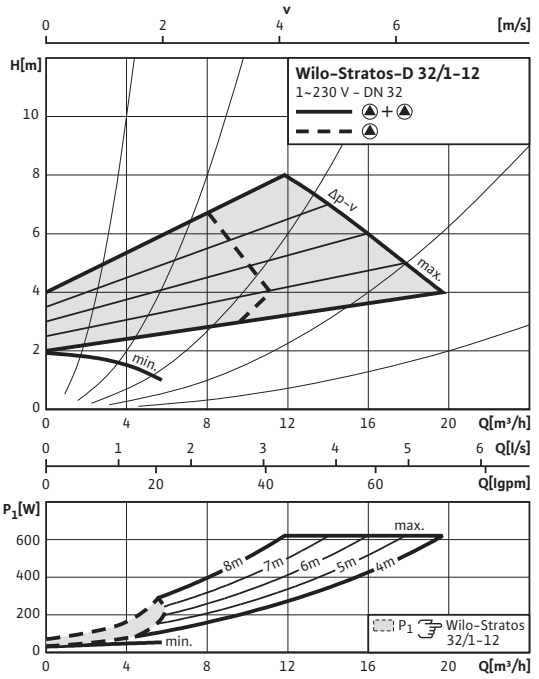


Wilo–Stratos–D 32/1–12

Δp–c (constant)



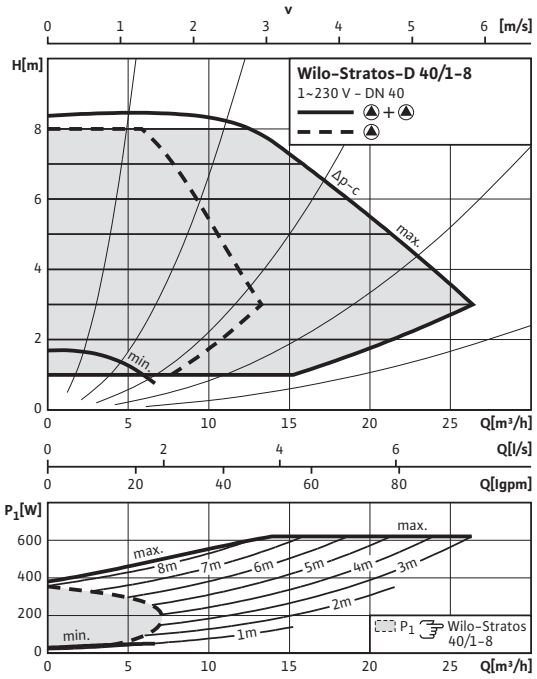
Δp–v (variable)



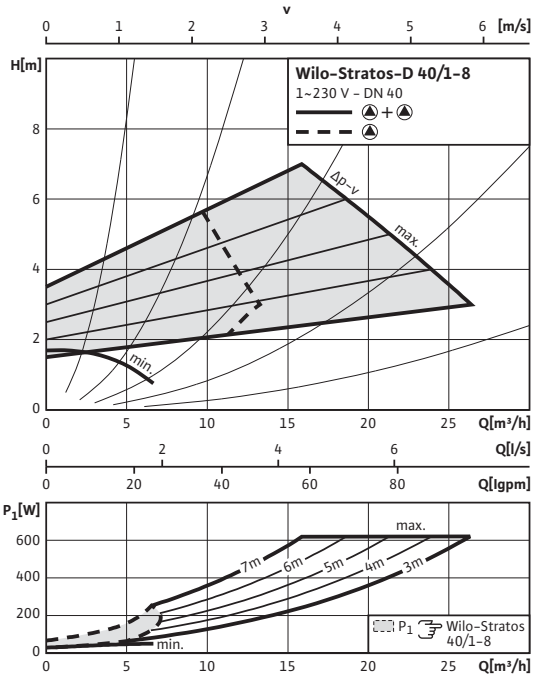
Pump curves Wilo–Stratos–D

Wilo–Stratos–D 40/1–8

Δp–c (constant)

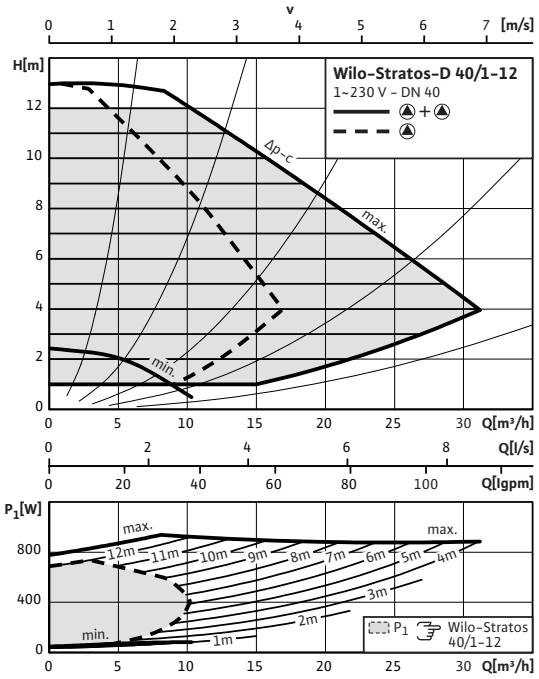


Δp–v (variable)

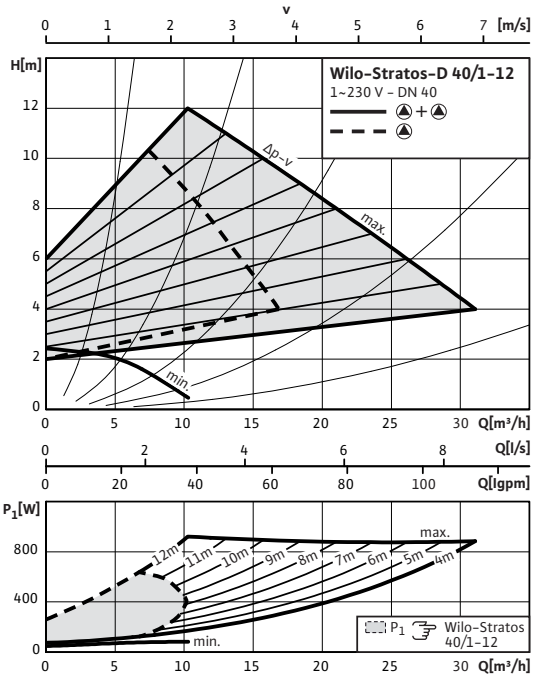


Wilo–Stratos–D 40/1–12

Δp–c (constant)



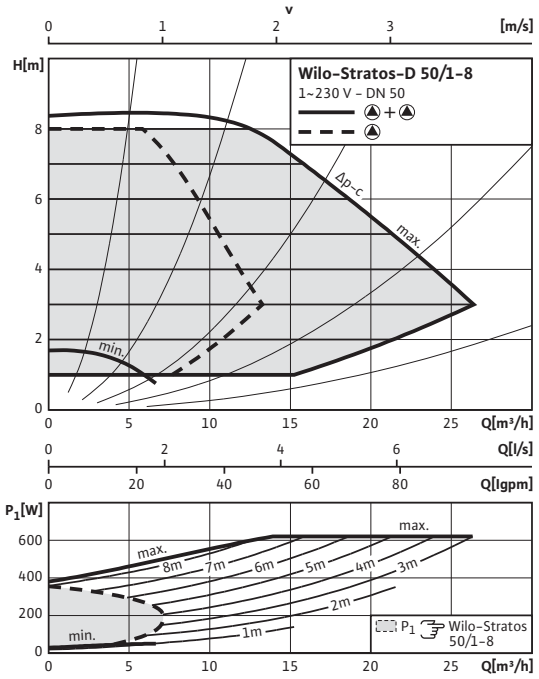
Δp–v (variable)



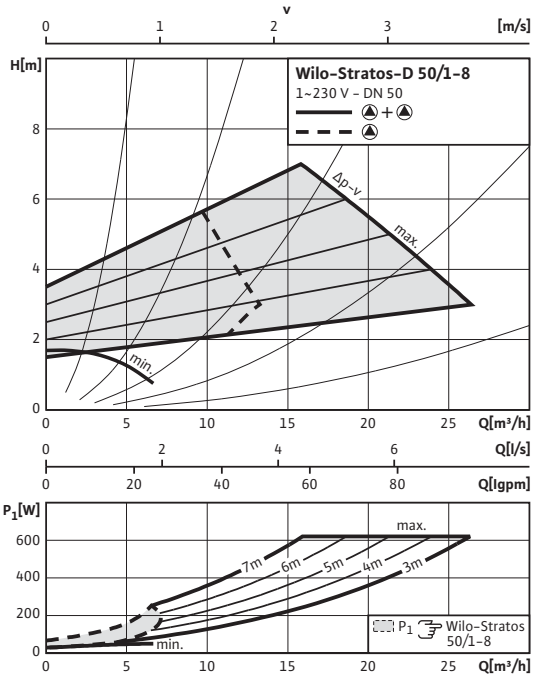
Pump curves Wilo-Stratos-D

Wilo-Stratos-D 50/1-8

Δp-c (constant)

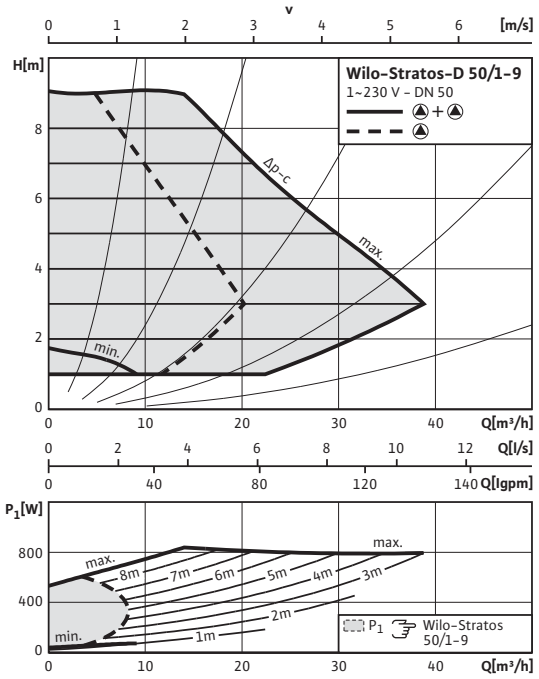


Δp-v (variable)

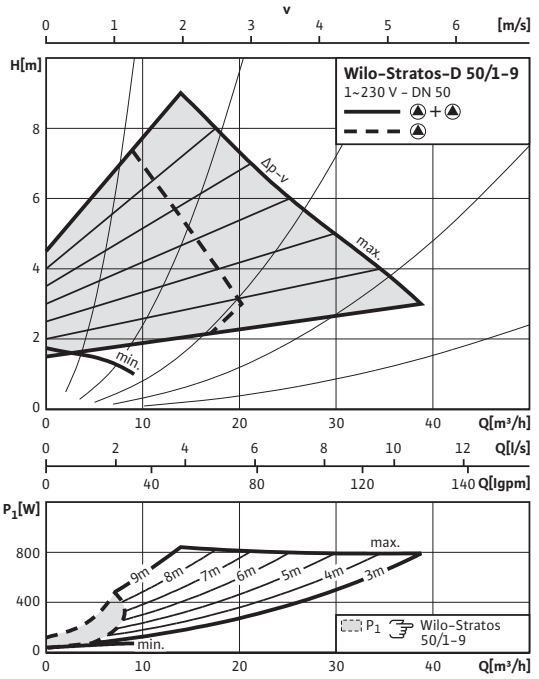


Wilo-Stratos-D 50/1-9

Δp-c (constant)



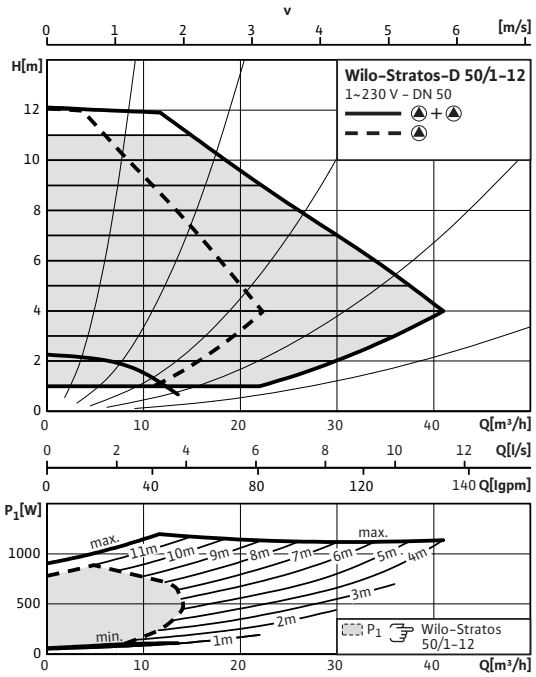
Δp-v (variable)



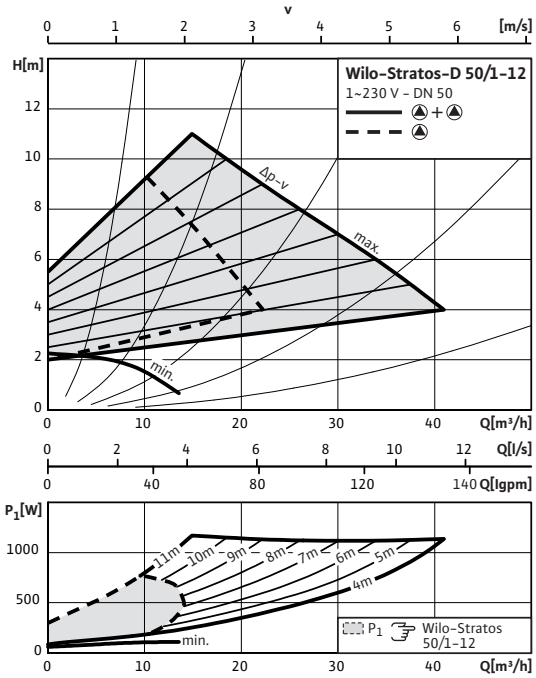
Pump curves Wilo–Stratos–D

Wilo–Stratos–D 50/1–12

Δp–c (constant)

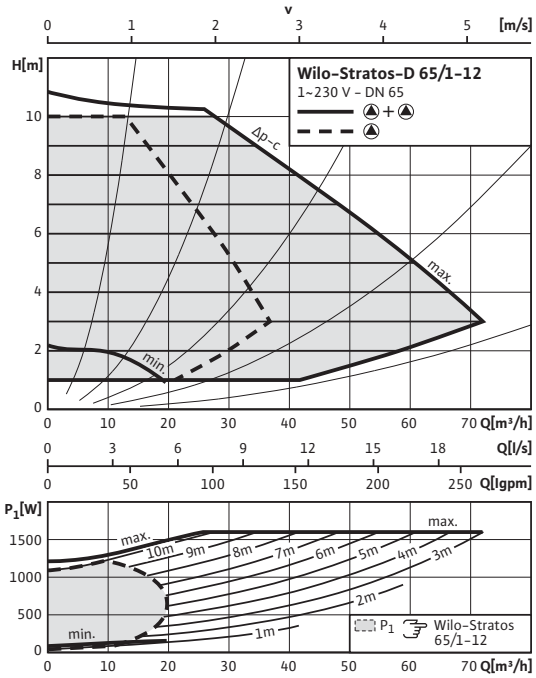


Δp–v (variable)

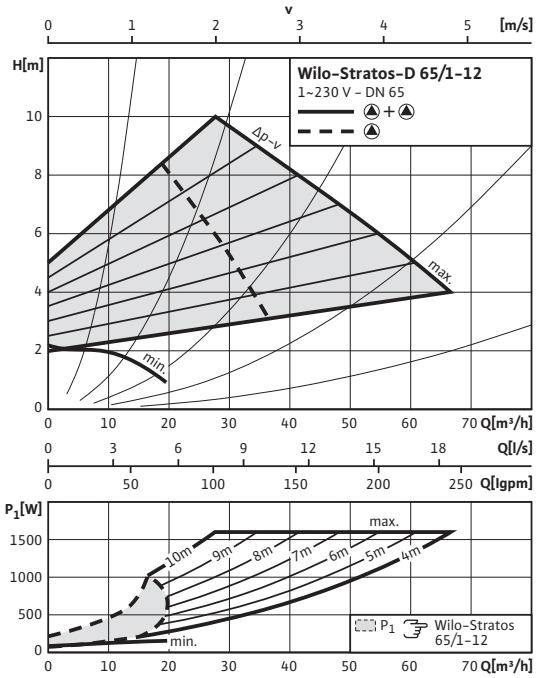


Wilo–Stratos–D 65/1–12

Δp–c (constant)



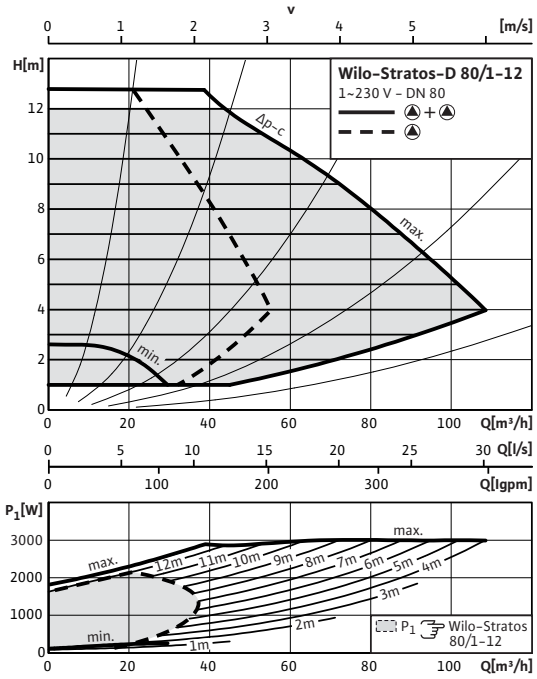
Δp–v (variable)



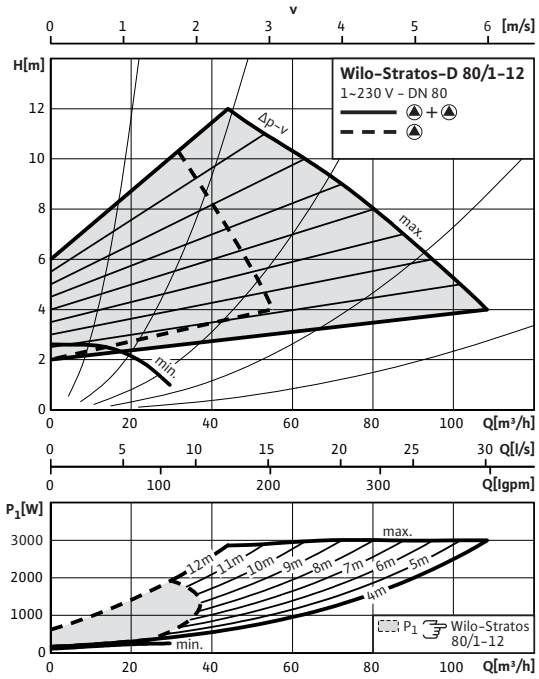
Pump curves Wilo-Stratos-D

Wilo-Stratos-D 80/1-12

Δp-c (constant)



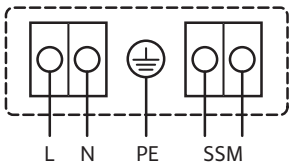
Δp-v (variable)



Terminal diagram, motor data Wilo-Stratos-D

Terminal diagram

Standard



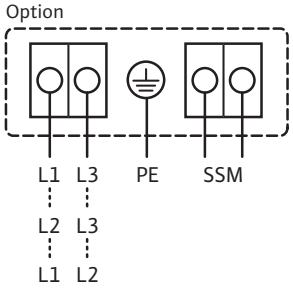
1~ 230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814,
load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo TOP-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: "Pump management Wilo TOP-Control"

Terminal diagram

Option



3~230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814,
load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo TOP-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: " Wilo TOP-Control pump management "

Motor data

Wilo-Stratos-D ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection
	P_2	n	P_1	I			–	PG
	[W]	[rpm]	[W]	[A]			–	[PG]
32/1-8	100	1400 - 3700	9 - 130	0.13 - 1.20	0.13 - 1.20	-	integrated	1x7/1x9/ 1x13.5
32/1-12	200	1600 - 4800	16 - 310	0.16 - 1.37	0.16 - 1.37	-	integrated	1x7/1x9/ 1x13.5
40/1-8	200	1800 - 4800	18 - 310	0.17 - 1.37	0.17 - 1.37	-	integrated	1x7/1x9/ 1x13.5
40/1-12	350	1400 - 4600	25 - 470	0.20 - 2.05	0.20 - 2.05	-	integrated	1x7/1x9/ 1x13.5
50/1-8	200	1800 - 4800	18 - 310	0.17 - 1.37	0.17 - 1.37	-	integrated	1x7/1x9/ 1x13.5

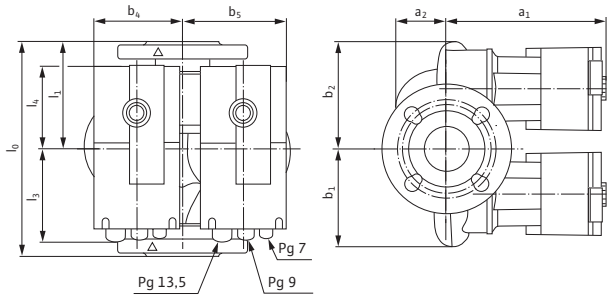
Terminal diagram, motor data Wilo-Stratos-D

Motor data

Wilo-Stratos-D ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection
	P_2	n	P_1	I			–	PG
	[W]	[rpm]	[W]	[A]			–	[PG]
50/1-9	350	1400 - 4100	25 - 430	0.20 - 1.88	0.20 - 1.88	-	integrated	1x7/1x9/ 1x13.5
50/1-12	500	1400 - 4600	25 - 590	0.20 - 2.60	0.20 - 2.60	-	integrated	1x7/1x9/ 1x13.5
65/1-12	650	950 - 3300	38 - 800	0.30 - 3.50	0.30 - 3.50	-	integrated	1x7/1x9/ 1x13.5
80/1-12	1300	900 - 3300	40 - 1550	0.32 - 6.80	0.32 - 6.80	-	integrated	1x7/1x9/ 1x13.5
80/1-12	1300	900 - 3300	40 - 1550	0.32 - 6.80	0.32 - 6.80	-	integrated	1x7/1x9/ 1x13.5

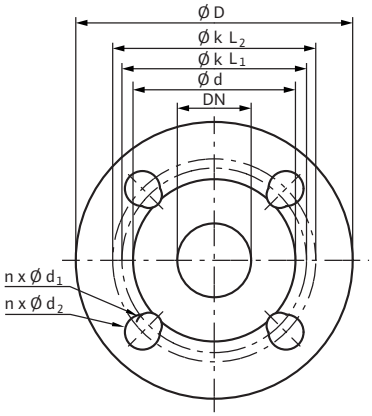
Dimensions, weights Wilo–Stratos–D

Dimension drawing A

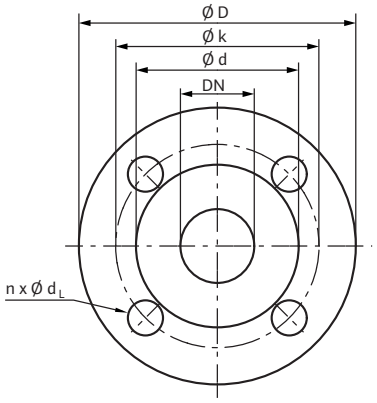


Permitted installation positions, see Planning guide
Important: The threaded cable connection projects above the pump connection
(total dimension: dimension l_3 + max. 9 mm)!

Dimension drawing Flange A



Dimension drawing Flange B



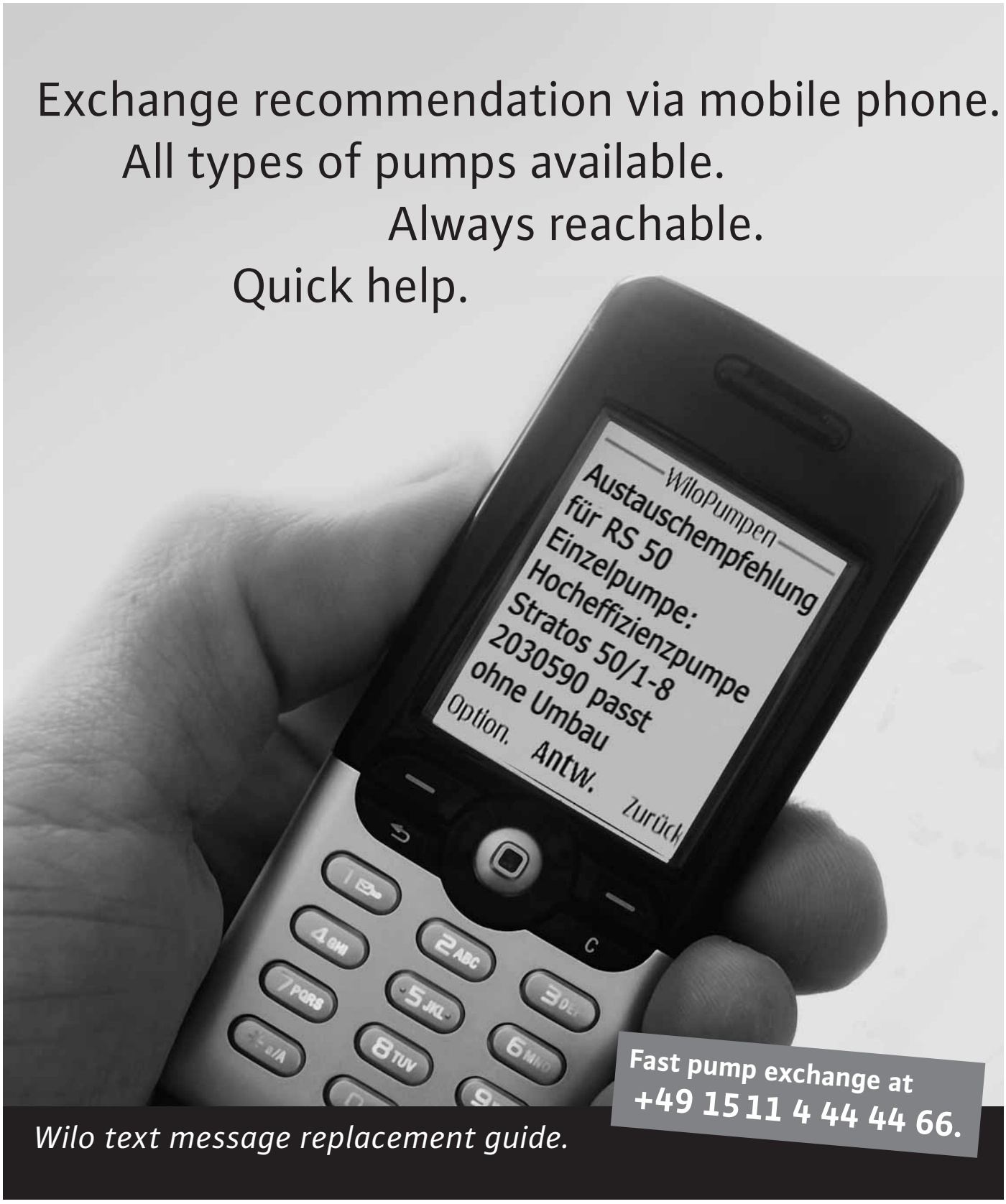
Dimensions, weights

Wilo–Stratos–D …	Rated pressure	Nominal flange diameter	Dimensions										Weight approx.	Dimension drawing
	PN	DN	l_0	l_1	l_3	l_4	a_1	a_2	b_1	b_2	b_4	b_5	M	–
	[bar]	–	[mm]										[kg]	–
32/1–8	6/10	32	220	110	114	89	182	44	112	106	107	107	12.0	A
32/1–12	6/10	32	220	110	120	106	204	57	117	130	110	130	16.5	A
40/1–8	6/10	40	220	110	120	106	200	64	125	138	115	135	17.0	A
40/1–12	6/10	40	250	125	136	120	252	62	151	144	145	145	25.0	A
50/1–8	6/10	50	240	120	120	106	204	61	123	135	113	132	19.0	A
50/1–9	6/10	50	280	140	136	120	256	62	159	148	145	145	27.0	A
50/1–12	6/10	50	280	140	136	120	256	62	159	148	145	145	27.0	A
65/1–12	6/10	65	340	170	164	156	325	88	209	196	188	188	52.8	A
80/1–12	6	80	360	180	164	156	329	100	235	221	203	203	61.0	A
80/1–12	10	80	360	180	164	156	329	100	235	221	203	203	61.0	A

Dimensions, weights Wilo-Stratos-D

Flange dimensions

Wilo-Stratos-D ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/Ø d_{L2}	n x Ø d_L	–
	–		[mm]				[pcs. x mm]		–
32/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	32	140	76	90/100	–	4 x 14 / 19	-	A
32/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	32	140	76	90/100	–	4 x 14 / 19	-	A
40/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	–	4 x 14 / 19	-	A
40/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	–	4 x 14 / 19	-	A
50/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
50/1-9	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
50/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
65/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	65	185	118	130/145	–	4 x 14 / 19	-	A
80/1-12	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	132	-	150	-	4 x 19	B
80/1-12	Flange PN16 (according to EN 1092-2)	80	200	132	-	160	-	8 x 19	B



With the Wilo text message replacement guide, you will now get individual recommendations sent to your mobile phone – and that 24 hours a day, 7 days a week. After a simple text message query with the pump designation (e.g., S 50/100), Wilo will send you the ideal exchange product solution within a maximum of 20 seconds with all installation and fitting information, including the order numbers. Advanced? We call this Pumpen Intelligenz.

www.wilo.com

WILO

Pumpen Intelligenz.

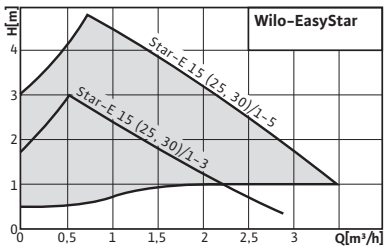
Heating, air-conditioning, cooling

Energy-saving pumps (single pumps)

Series overview Wilo-Star-E, TOP-E, TOP-ED

Series: Wilo-Star-E



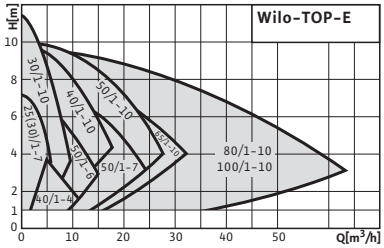


> Design
Glandless circulation pump with screwed connection and automatic power adjustment

> Application
Hot-water heating systems of all kinds, industrial circulation systems

Series: Wilo-TOP-E



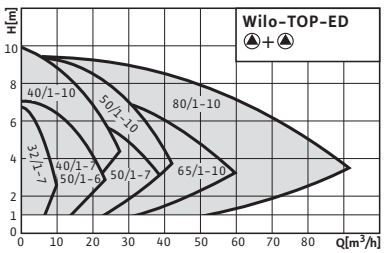


> Design
Glandless circulation pump with screwed connection or flange connection and automatic power adjustment

> Application
Hot-water heating systems of all kinds industrial circulation systems

Series: Wilo-TOP-ED





> Design
Glandless double circulation pump with flange connection and automatic power adjustment

> Application
Hot-water heating systems of all kinds and industrial circulation systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Star-E, TOP-E, TOP-ED

Series: Wilo-Star-E

> Special features/product benefits
- Energy-saving pump especially for single and two-family houses, as well as for two to six-family houses.
- Up to 50% electricity savings compared to uncontrolled heating pumps
- Simple installation due to of wrench attachment point on pump body and quick connection with spring clips
- Simple operation. Factory setting suitable for 90 % of all heating system requirements. The "red button" allows individual settings to be made for specific systems.
- Activated Autopilot offers automatic adjustment of pump output during boiler setback operation
- Prevents irritating flow noise in the heating system
- Operational reliability due to deblocking function and safety control

> More information

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• Pump curves	90
• Terminal diagrams, motor data	91
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• Service/accessories	351

Series: Wilo-TOP-E

> Special features/product benefits
- Infinitely variable power adjustment and several control functions for energy-saving operation (up to 50% electricity savings compared to uncontrolled heating pumps)
- Autopilot for automatic setback operation by means of self-teaching "Fuzzy Logic"
- Simple operation due to standard integrated pump display and manual control panel (one-button operation)
- Remote control and remote querying of pump functions with Wilo IR-Module/IR-Monitor possible
- System extension due to retrofit LON and PLR communication modules

> More information

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Series: Wilo-TOP-ED

> Special features/product benefits
- Infinitely variable power adjustment and several control functions for energy-saving operation (up to 50% electricity savings compared to uncontrolled heating pumps)
- Autopilot for automatic setback operation by means of self-teaching "Fuzzy Logic"
- Simple operation by means of standard integrated pump display and manual operation level (one-button operation)
- Remote control and remote querying of pump functions with Wilo IR-Module/IR-Monitor possible
- System extension due to retrofit LON and PLR communication modules
- Integrable dual pump management due to retrofit IF-Modules:
  - Main/standby mode with fault-dependent switchover
  - Efficiency-optimised peak-load operation

> More information

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• Wilo-Control pump management systems	437

Equipment/function Wilo-Star-E, TOP-E

	Wilo-Star-E ...	Wilo-TOP-E ...
Operating modes		
Speed-stage switching	–	–
Manual control mode (n=constant)	–	•
Δp-c for constant differential pressure	–	•
Δp-v for variable differential pressure	–	•
Δp-T for temperature-controlled differential pressure	–	• (programmable via IR-Module, IR-Monitor or LON)
Manual functions		
Operating mode setting	–	•
Differential-pressure setpoint setting	•	•
Autopilot	•	•
Pump ON/OFF setting	–	•
Speed setting (manual control mode)	–	•
Setting the speed stages	–	–
Automatic functions		
Infinitely variable power adjustment according to the operating mode	•	•
Autopilot	•	•
Deblocking function	•	•
Soft start	•	• (not for TOP-E 25(30)/1-7, TOP-E 30/1-10, TOP-E 40/1-4 and TOP-E 50/1-6)
Safety control	•	–
Full motor protection with integrated trip electronics	–	•
External control functions		
Overriding Off	–	• (not for TOP-E25(30)/1-7, TOP-E 30/1-10, TOP-E 40/1-4 and TOP-E 50/1-6)
Overriding Min	–	–
Analogue In 0 ... 10 V	–	• (not for TOP-E25(30)/1-7, TOP-E 30/1-10, TOP-E 40/1-4 and TOP-E 50/1-6)
Analogue In 0 ... 10 V	–	–
Signal and display functions		
Single/collective fault signal (potential-free NC contact)	–	–
Collective fault signal (potential-free NC contact)	–	•
Individual run signal (potential-free NO contact)	–	–
Thermal winding contact (WSK, potential-free NC contact)	–	–

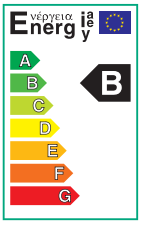
Equipment/function Wilo-Star-E, TOP-E

	Wilo-Star-E ...	Wilo-TOP-E ...
Fault signal light	–	•
Direction-of-rotation control light	–	–
LC display for indication of pump data and fault codes	–	•
Data exchange		
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	•
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	• Possible with IF-Modules (accessories)
Serial digital LON interface for connection to a LONWORKS network	–	• Possible with IF-Modules (accessories)
Serial digital CAN interface for connection to a CAN bus system		–
Dual pump management (double pump or 2 x single pump)		
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	• Various combinations with IF-Modules (accessories) possible (see Chapter: "Wilo-Control pump management systems")
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	• Various combinations with IF-Modules (accessories) possible (see Chapter: "Wilo-Control pump management systems")
Equipment/scope of delivery		
Wrench attachment point on pump body	•	–
Twin switch-over valve in pump housing	–	–
Cable lead-in possible on both sides	•	–
Wilo quick connection with spring clips	•	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	•
Blocking current-proof motor	•	–
Including seals for threaded connection (loose)	•	•
Including installation and operating instructions	•	•
Including thermal insulation	–	•
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	•
Including 1.8 m connecting cable with shock-proof plug	–	–
Integrated non-return valve	–	–
Integrated ball shut-off valve	–	–
Including clock timer	–	–

• = available, – = not available

Series description Wilo-Star-E







Design
Glandless circulation pump with screwed connection and automatic power adjustment

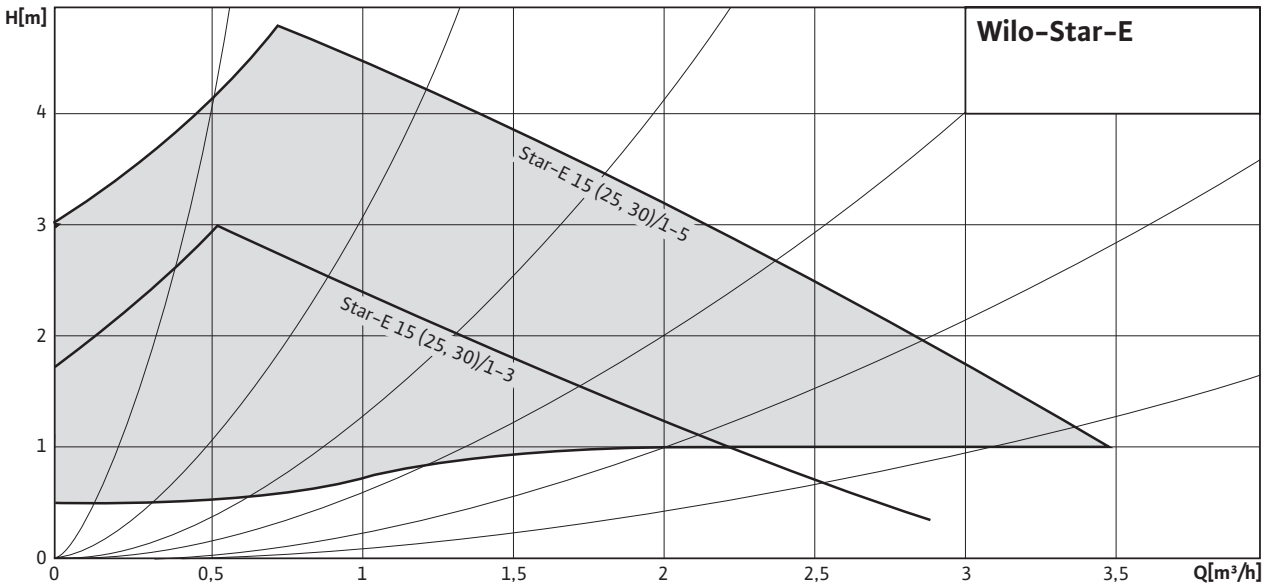
Application
Hot-water heating systems of all kinds, industrial circulation systems

Type key

Example:	**Star-E 25/1-3**
Star-E	Energy-saving pump
25/	Nominal diameter R1
1-3	Nominal delivery head range 1 to 3 m

Special features/product benefits
- Energy-saving pump especially for single and two-family houses, as well as for two to six-family houses.
- Up to 50% electricity savings compared to uncontrolled heating pumps
- Simple installation due to wrench attachment point on pump body and quick connection with spring clips
- Simple operation. Factory setting suitable for 90 % of all heating system requirements. The "red button" allows individual settings to be made for specific systems.
- Activated Autopilot offers automatic adjustment of pump output during boiler setback operation
- Prevents irritating flow noise in the heating system
- Operational reliability due to deblocking function and safety control

Options
- Wilo Star-E 15(25)...-130: Pump with short overall length of 130 mm



Series description Wilo-Star-E

Equipment/function

Operating modes
- Δp-v for variable differential pressure

Manual functions
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Safety control

Equipment
- Wrench attachment point on pump body
- Cable lead-in possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Pump
- Seals
- Installation and operating instructions

Accessories
- Screwed connections
- Thermal insulation shells

Technical data Wilo-Star-E

	Wilo-Star-E ...							
	15/1-3	**15/1-5**	**25/1-3**	**25/1-3-130**	**25/1-5**	**25/1-5-130**	**30/1-3**	**30/1-5**
Approved fluids (other fluids on request)								
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–
Output								
Delivery head max. [m]	3	5	3	3	5	5	3	5
Max. volume flow [m^3/h]	2.5	3.5	2.5	2.5	3.5	3.5	2.5	3.5
Permitted field of application								
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	• + 15 to + 110							
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	+15 up to +110							
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	-	-	-	-	-	-	-	-
Pipe connections								
Screwed connection Rp	½	½	1	1	1	1	1¼	1¼
Nominal flange diameter DN	-	-	-	-	-	-	-	-
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–
Electrical connection								
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–	–
Mains frequency	50	50	50	50	50	50	50	50

Technical data Wilo-Star-E

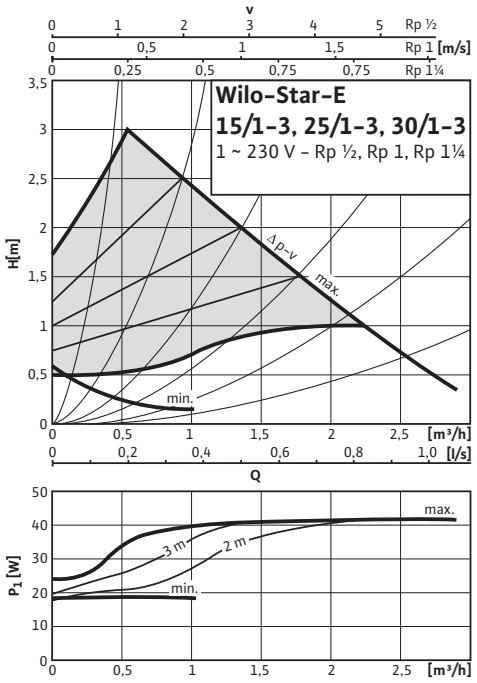
	Wilo-Star-E ...							
	15/1-3	**15/1-5**	**25/1-3**	**25/1-3-130**	**25/1-5**	**25/1-5-130**	**30/1-3**	**30/1-5**
Motor/electronics								
Electromagnetic compatibility	EN 61800-3							
Emitted interference	EN 61000-6-3							
Interference resistance	EN 61000-6-2							
Power electronics	Pulse package control							
Protection class	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42
Insulation class	F	F	F	F	F	F	F	F
Materials								
Pump housing	Grey cast iron (EN-GJL-200)							
Impeller	Plastic (PP - 40% GF)							
Pump shaft	Stainless steel (X40Cr13)							
Bearing	Carbon, metal impregnated							
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature								
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum suction head at 110°C	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

• = available, – = not available

Pump curves Wilo–Star–E

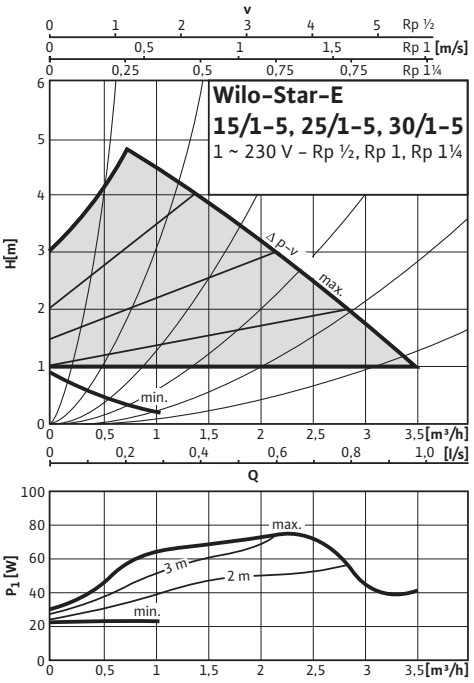
Wilo–Star–E 15/1–3, 25/1–3, 30/1–3

Δp–v (variable)



Wilo–Star–E 15/1–5, 25/1–5, 30/1–5

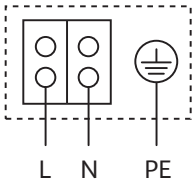
Δp–v (variable)



Subject to change 09/2008 WILO SE

Terminal diagram, motor data Wilo-Star-E

Terminal diagram A



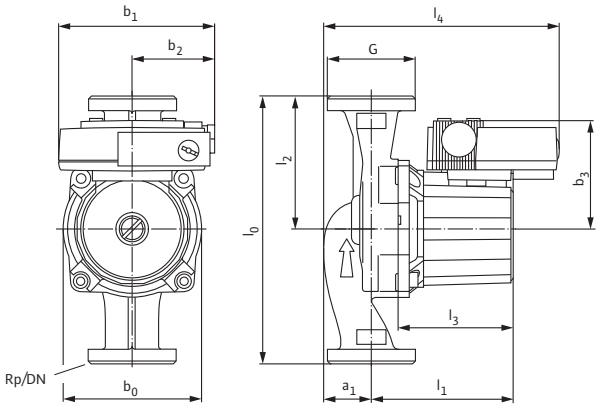
Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Motor data

Wilo-Star-E ...	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Capacitor	Threaded cable connection
	n	P_1	I			–	C	PG
	[rpm]	[W]	[A]			–	[µF/VDB]	[PG]
15/1-3	710 - 2350	20-42	0.22	-	-	not required (blocking current-proof)	1.7/400	11
15/1-5	620 - 2680	27-72	0.31	-	-	not required (blocking current-proof)	2.0/400	11
25/1-3	710 - 2350	20-42	0.22	-	-	not required (blocking current-proof)	1.7/400	11
25/1-3-130	710 - 2350	20-42	0.22	-	-	not required (blocking current-proof)	1.7/400	11
25/1-5	620 - 2680	27-72	0.31	-	-	not required (blocking current-proof)	2.0/400	11
25/1-5-130	620 - 2680	27-72	0.31	-	-	not required (blocking current-proof)	2.0/400	11
30/1-3	710 - 2350	20-42	0.22	-	-	not required (blocking current-proof)	1.7/400	11
30/1-5	620 - 2680	27-72	0.31	-	-	not required (blocking current-proof)	2.0/400	11

Dimensions, weights Wilo-Star-E

Dimension drawing

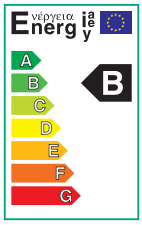


Dimensions, weights

Wilo-Star-E ...	Screwed connection	Thread	Dimensions										Weight approx.
	Rp	G	l_0	l_1	l_3	l_4	l_5	A	b_1	b_2	b_3	b_4	M
	–		[mm]										[kg]
15/1-3	½	1	130	96	65	78	31	33	103	93.5	56	75	2.3
15/1-5	½	1	130	96	65	78	31	33	103	93.5	56	79	2.5
25/1-3	1	1½	180	96	90	78	31	33	103	93.5	56	75	2.4
25/1-3-130	1	1½	130	96	65	78	31	33	103	93.5	56	75	2.3
25/1-5	1	1½	180	96	90	78	31	34	103	93.5	56	79	2.5
25/1-5-130	1	1½	180	96	65	78	31	34	103	93.5	56	79	2.5
30/1-3	1¼	2	180	96	90	78	31	33	103	93.5	56	75	2.5
30/1-5	1¼	2	180	96	90	78	31	34	103	93.5	56	79	2.8

Series description Wilo-TOP-E





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

Design
Glandless circulation pump with screwed connection or flange connection and automatic power adjustment

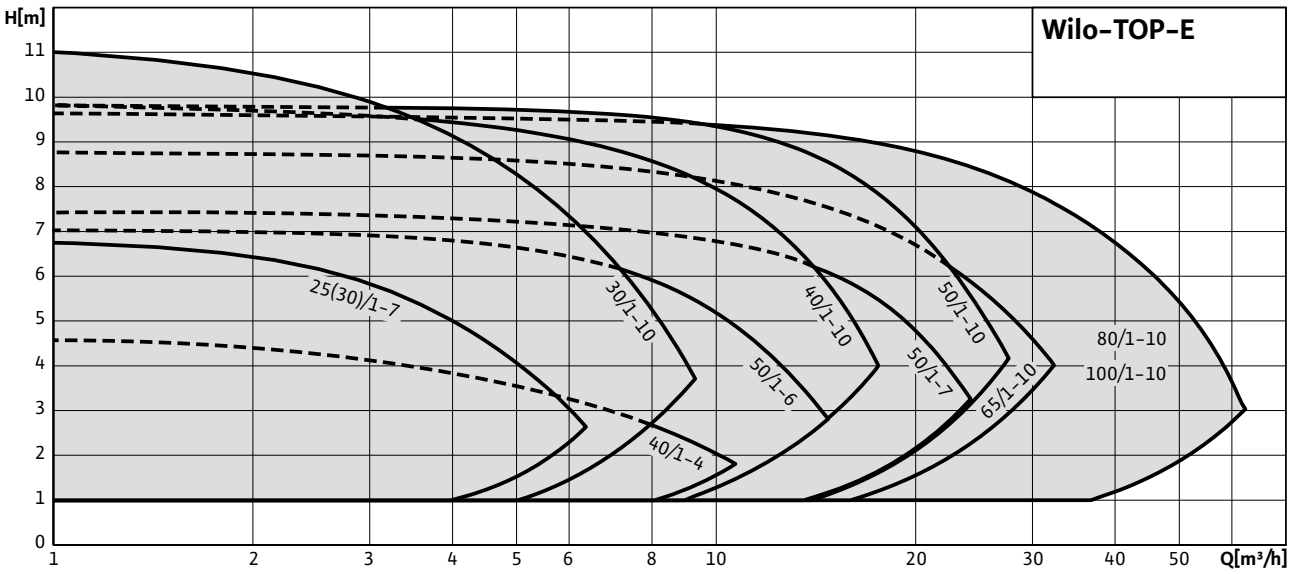
Application
Hot-water heating systems of all kinds industrial circulation systems

Type key

Example:	**TOP-E 40/1-10**
TOP-E	Energy-saving pump (screw-end or flange-end pump), electronically controlled
40/	Nominal connection diameter
1-10	Nominal delivery head range [m]

Options
- Special versions for operating pressure PN 16 (at additional charge)
- Special versions with housing made of red brass (at additional charge)

Special features/product benefits
- Infinitely variable power adjustment and several control functions for energy-saving operation (up to 50% electricity savings compared to uncontrolled heating pumps)
- Autopilot for automatic setback operation by means of self-teaching "Fuzzy Logic"
- Simple operation due to standard integrated pump display and manual control panel (one-button operation)
- Remote control and remote querying of pump functions with Wilo IR-Module/IR-Monitor possible
- System extension due to retrofit LON and PLR communication modules



Series description Wilo-TOP-E

Equipment/function

Operating modes
- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure (programmable via IR-Module, IR-Monitor or LON)

Manual functions
- Operating mode setting
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting
- Pump ON/OFF setting
- Speed setting (manual control mode)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start (not for TOP-E 25(30)/1-7, TOP-E 30/1-10, TOP-E 40/1-4 and TOP-E 50/1-6)
- Full motor protection with integrated trip electronics

External control functions
- "Overriding Off" control input (not for TOP-E 25(30)/1-7, TOP-E 30/1-10, TOP-E 40/1-4 and TOP-E 50/1-6)
- "Analogue In 0 - 10 V" control input (remote speed adjustment) (not for TOP-E 25(30)/1-7, TOP-E 30/1-10, TOP-E 40/1-4 and TOP-E 50/1-6)

Signal and display functions
- Collective fault signal (potential-free NC contact)
- Fault signal light
- LC display for indication of pump data and fault codes

Data exchange
- Infrared interface for wireless data exchange with IR-Module/IR-Monitor
- PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules; possible with IF-Modules (accessories)
- Serial digital LON interface for connection to a LONWorks network; possible with IF-Modules (accessories)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): Various combinations possible with IF-Modules (accessories)
- Parallel operation (efficiency-optimised peak-load cut-in and out): Various combinations possible with IF-Modules (accessories)

Equipment
- Plug-in position for optional extension with Wilo-IF-Modules

Scope of delivery
- Pump
- Including thermal insulation
- Including seals for threaded connection
- Including washers for flange screws (for nominal connection diameters DN 32 - DN 65)
- Installation and operating instructions

Accessories
- Screwed connections with screw thread
- IR-Module
- IR-Monitor
- IF-Modules: PLR, LON
- Analogue interface converter AnaCon
- Digital interface converter DigiCon/DigiCon-A

Technical data Wilo-TOP-E

	Wilo-TOP-E ...										
	25/1-7	30/1-7	30/1-10	40/1-4	40/1-10	50/1-6	50/1-7	50/1-10	65/1-10	80/1-10	100/1-10
Approved fluids (other fluids on request)											
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–	–	–
Output											
Delivery head max. [m]	7	7	11	4	10	7	7	10	9	10	10
Max. volume flow [m^3/h]	6.5	6.5	9	11	18	15	24	27	32	62	62
Permitted field of application											
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-										
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +110										
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–	–	–	–	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	–	–	–	–	–	–	–	–	–	–	–
Standard version for operating pressure, p_{max}	10	10	10	6/10	6/10	6/10	6/10	6/10	6/10	6	6
Special version for operating pressure, p_{max}	–	–	16	–	16	16	16	16	16	10/16	10/16
Pipe connections											
Screwed connection Rp	1	1¼	1¼	–	–	–	–	–	–	–	–
Nominal flange diameter DN	–	–	–	40	40	50	50	50	65	80	100
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	–	•	•
Flange for counter flange PN 16, special version	–	–	–	•	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	•	•	•	•	•	•	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–	–	–
Electrical connection											
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	230	230	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–	–	–	–	–
Mains frequency	50	50	50	50	50	50	50	50	50	50	50

Technical data Wilo-TOP-E

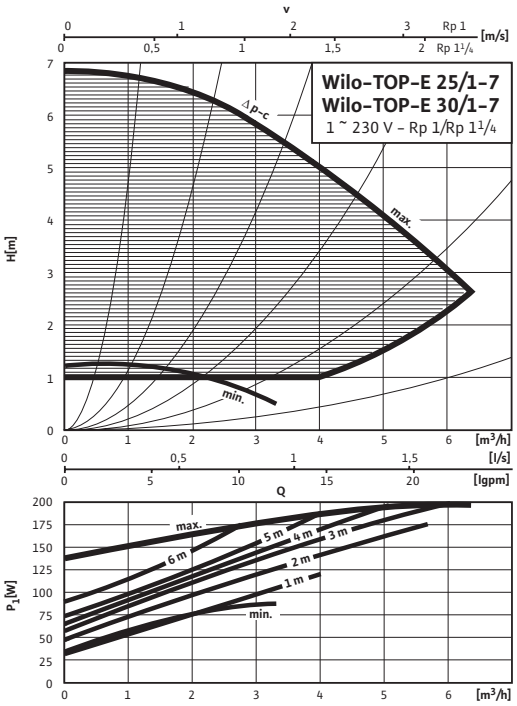
	Wilo-TOP-E ...										
	25/1-7	30/1-7	30/1-10	40/1-4	40/1-10	50/1-6	50/1-7	50/1-10	65/1-10	80/1-10	100/1-10
Motor/electronics											
Electromagnetic compatibility	–										
Emitted interference	EN 61000-6-3										
Interference resistance	EN 61000-6-2										
Power electronics	High-frequency PWM procedure				Frequency converter	High-frequency PWM procedure	Frequency converter				
Protection class	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43
Insulation class	F	F	F	F	F	F	F	F	F	F	F
Materials											
Pump housing	Grey cast iron (EN-GJL-200) TOP-E 30/1-7: Also as special version in red brass (CC499K)			Grey cast iron (EN-GJL-250) TOP-E 50/1-7, TOP-E 65/1-10, TOP E-80/1-10: Also as special version in red brass (CC499K)							
Impeller	Plastic (PP – 50% GF)										
Pump shaft	Stainless steel (X46Cr13)										
Bearing	Carbon, metal impregnated										
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature											
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	3.0	3.0	3.0	3.0	3.0
Minimum suction head at 95°C	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum suction head at 110°C	11.0	11.0	11.0	11.0	11.0	11.0	16.0	16.0	16.0	16.0	16.0

• = available, – = not available

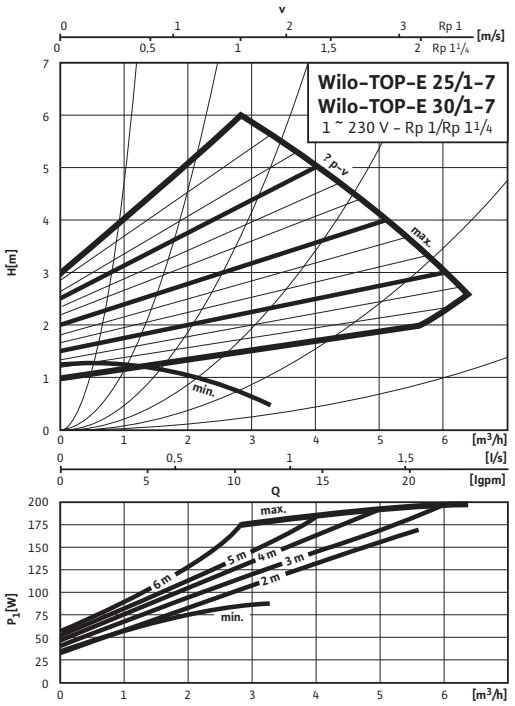
Pump curves Wilo–TOP–E

Wilo–TOP–E 25/1–7 – 30/1–7

Δp–c (constant)

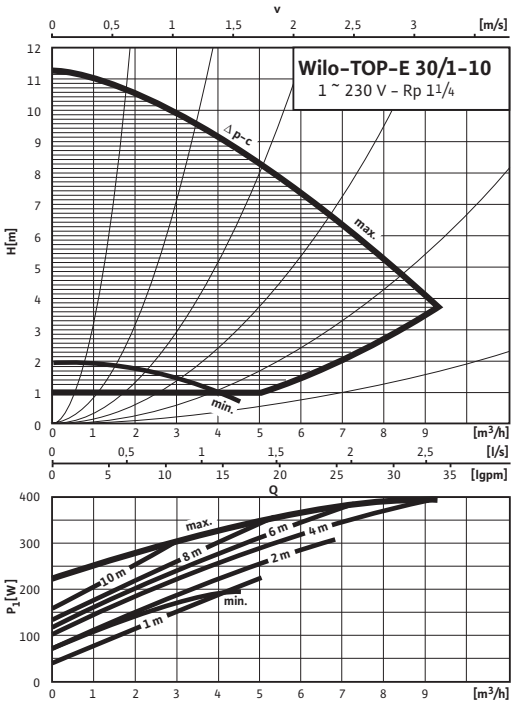


Δp–v (variable)

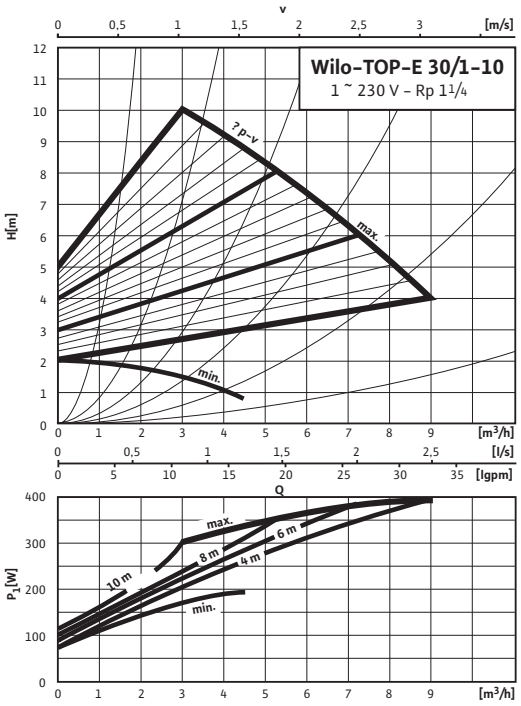


Wilo–TOP–E 30/1–10

Δp–c (constant)



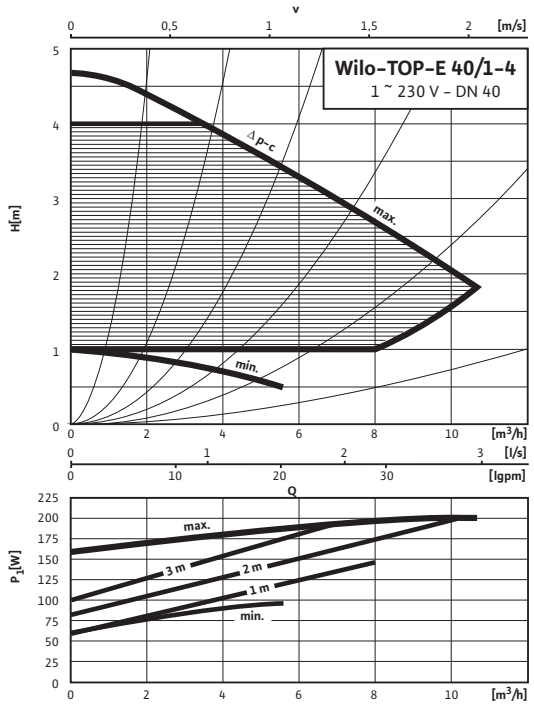
Δp–v (variable)



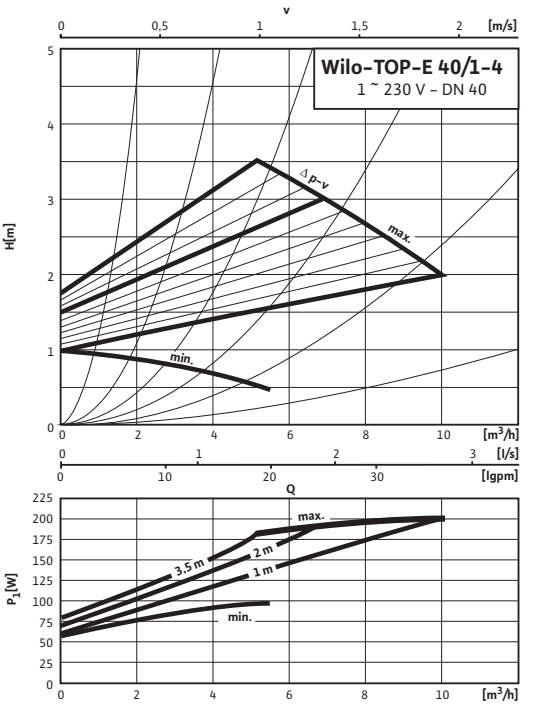
Pump curves Wilo–TOP–E

Wilo–TOP–E 40/1–4

Δp–c (constant)

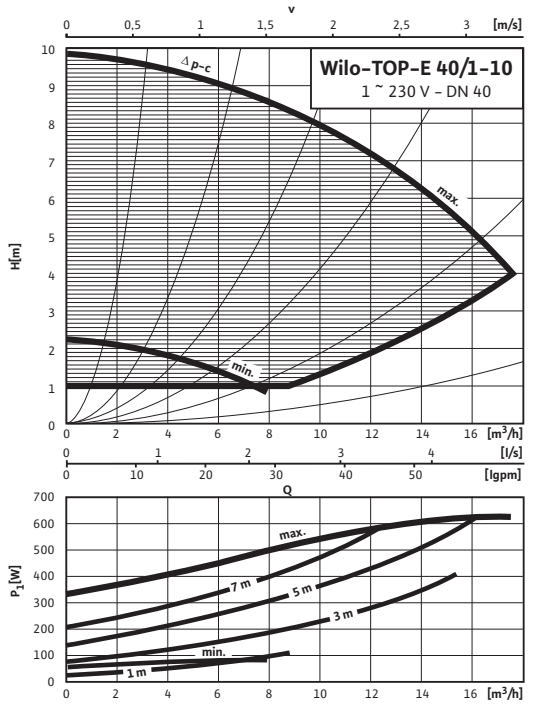


Δp–v (variable)

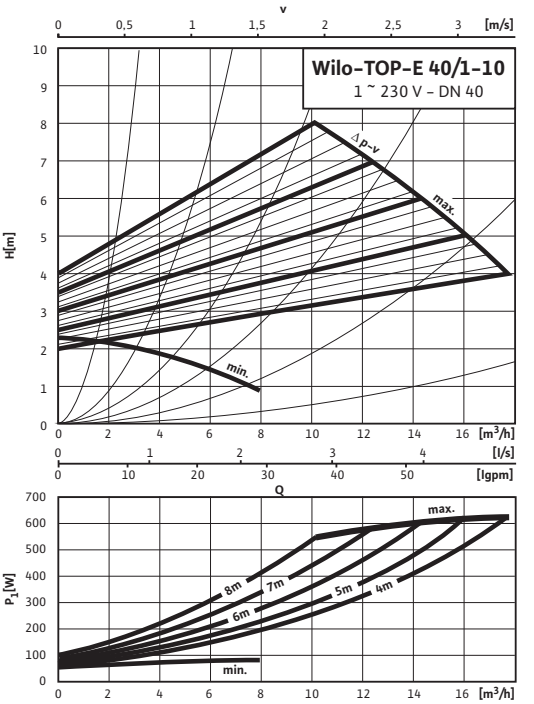


Wilo–TOP–E 40/1–10

Δp–c (constant)



Δp–v (variable)

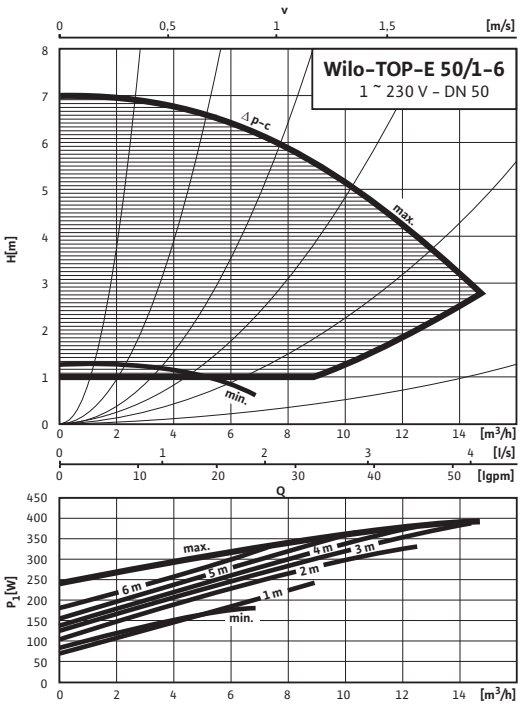


Subject to change 09/2008 WILO SE

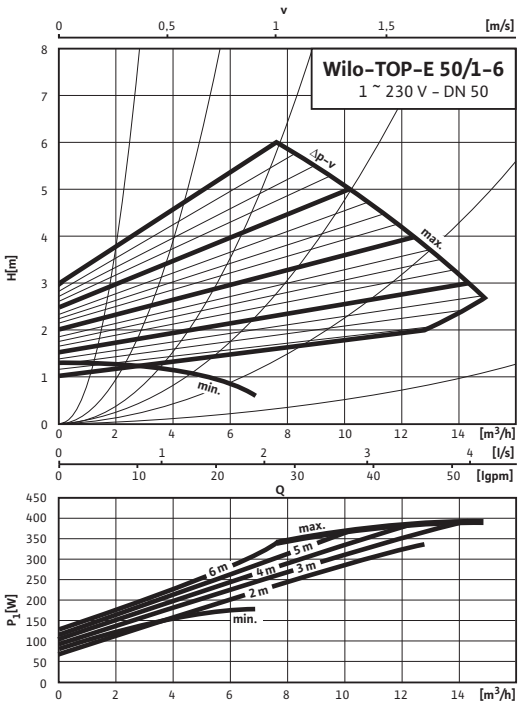
Pump curves Wilo–TOP–E

Wilo–TOP–E 50/1–6

Δp–c (constant)

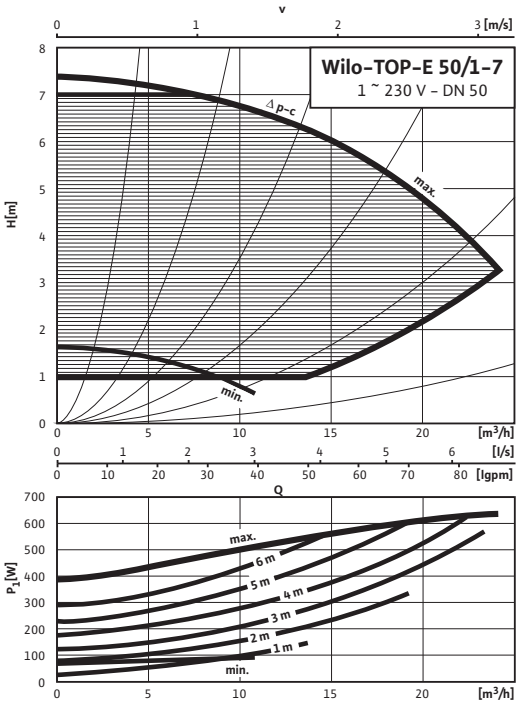


Δp–v (variable)

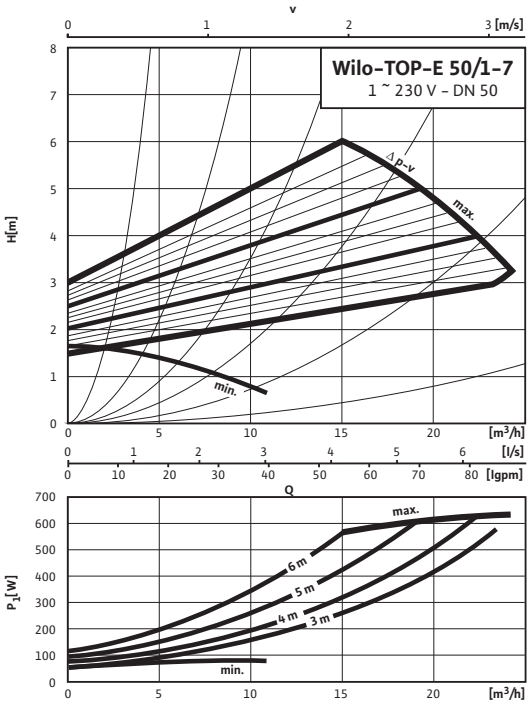


Wilo–TOP–E 50/1–7

Δp–c (constant)



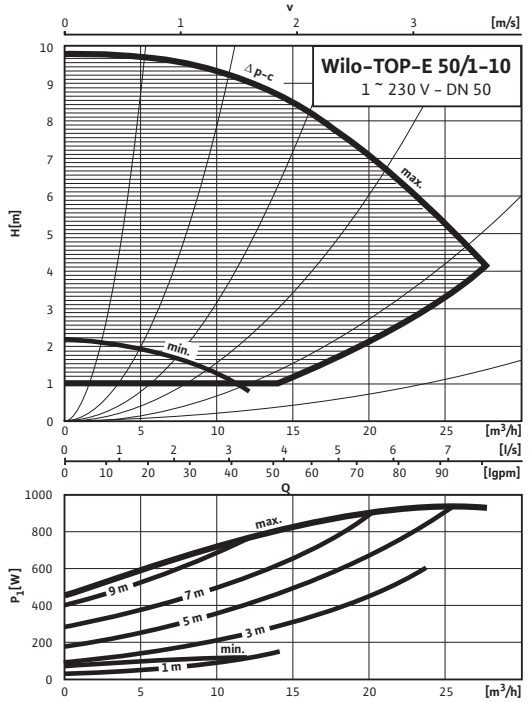
Δp–v (variable)



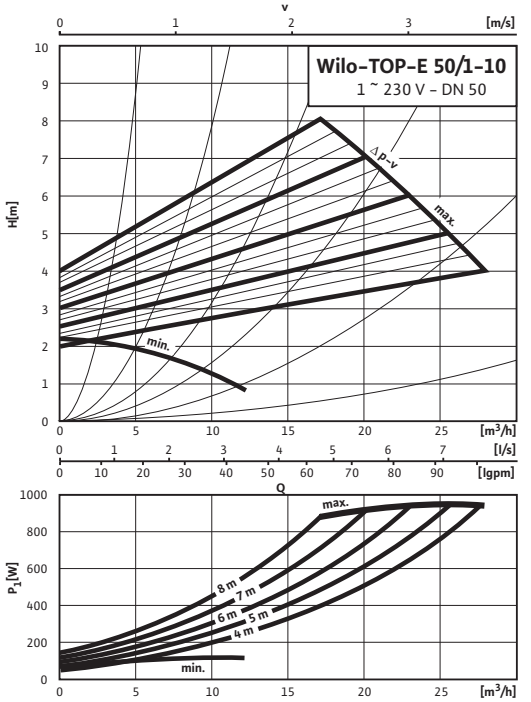
Pump curves Wilo–TOP–E

Wilo–TOP–E 50/1–10

Δp–c (constant)

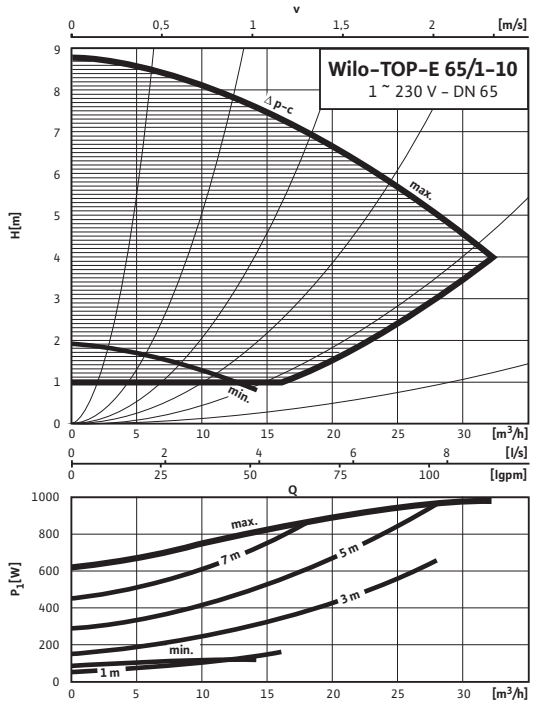


Δp–v (variable)

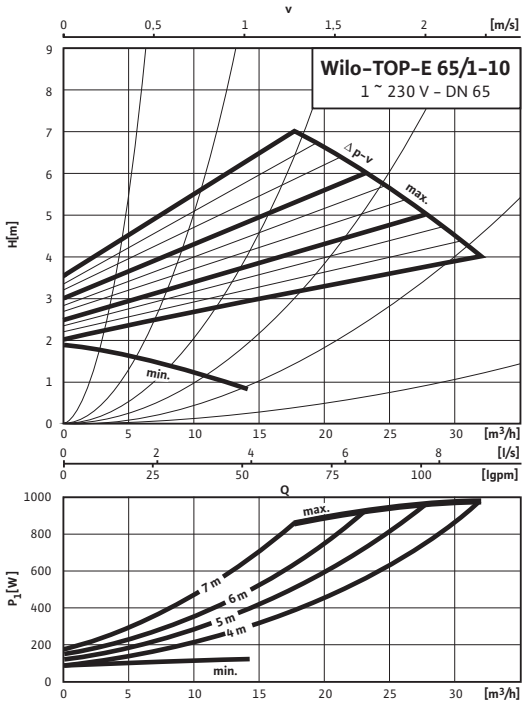


Wilo–TOP–E 65/1–10

Δp–c (constant)



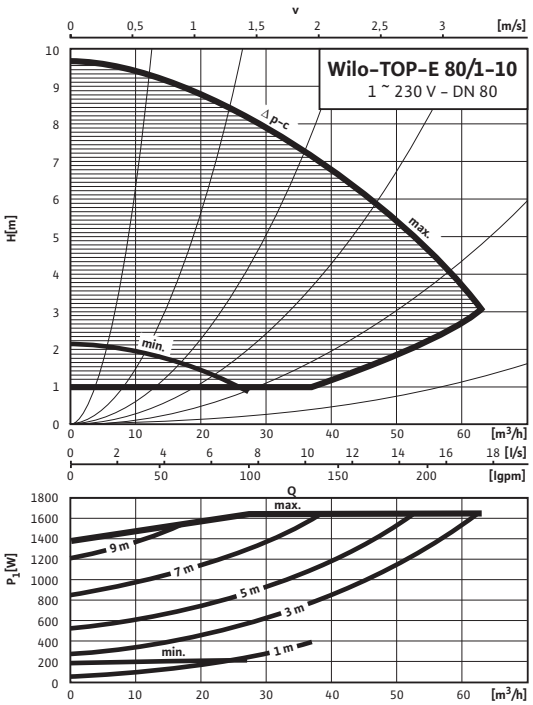
Δp–v (variable)



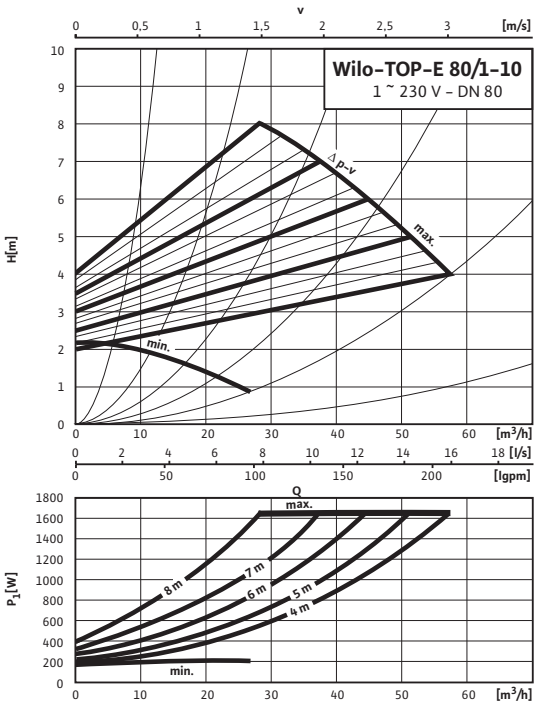
Pump curves Wilo–TOP–E

Wilo–TOP–E 80/1–10

Δp–c (constant)

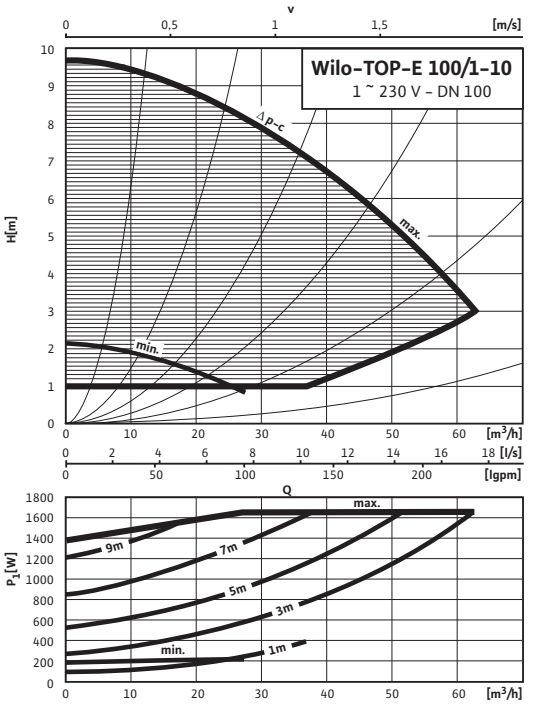


Δp–v (variable)

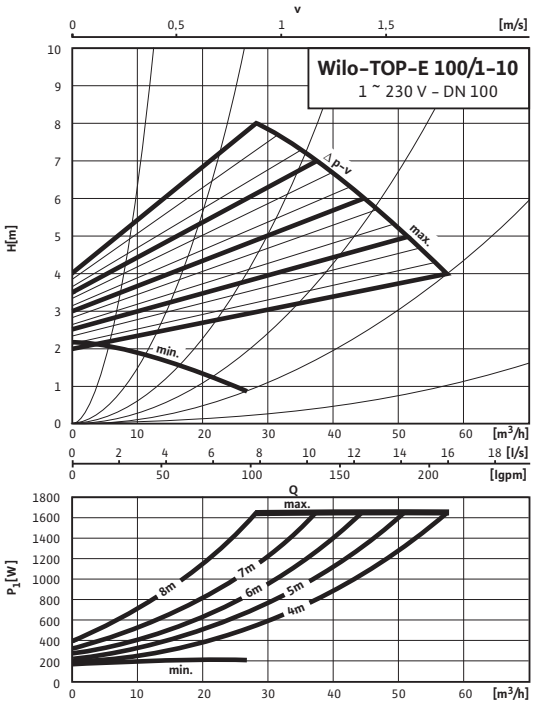


Wilo–TOP–E 100/1–10

Δp–c (constant)

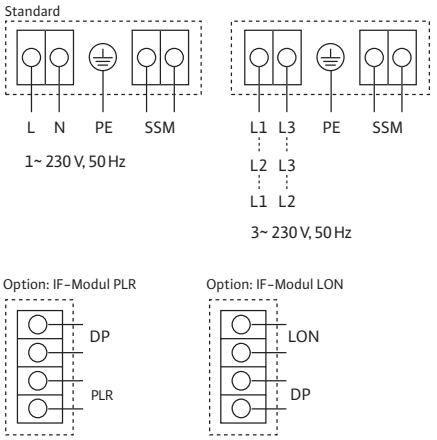


Δp–v (variable)



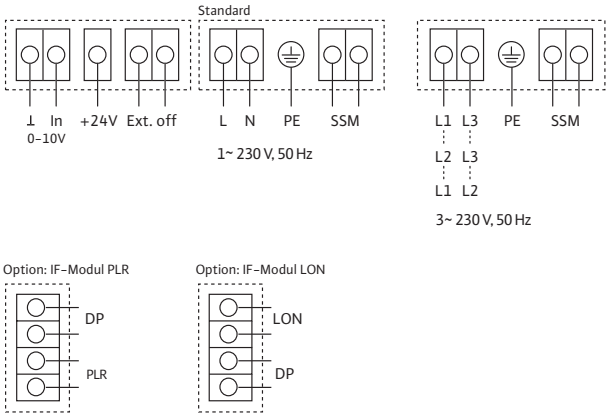
Terminal diagram, motor data Wilo-TOP-E

Terminal diagram A



DP: Dual pump management (2 pumps)
PLR: Serial digital BA interface
LON: Serial digital LONWORKS interface
SSM: Collective fault signal (NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"

Terminal diagram B



DP: Dual pump management (2 pumps)
PLR: Serial digital BA interface
LON: Serial digital LONWORKS interface
SSM: Collective fault signal (NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"
⊥/In: Control input, 0-10 V, for speed controller operation
+24V: Auxiliary voltage
Ext. off: Override "Off" control input for ext. potential-free contact (NC contact):
Contact closed: Pump enabled,
Contact open: Pump "Off"

Motor data

Wilo-TOP-E ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1	I			–	PG	–
	[W]	[rpm]	[W]	[A]			–	[PG]	–
25/1-7	90	1000 – 2800	30 – 200	0.20 – 0.90	0.20 – 0.90	–	integrated	1x13.5/1x9/1x7	A
30/1-7	90	1000 – 2800	30 – 200	0.20 – 0.90	0.20 – 0.90	–	integrated	1x13.5/1x9/1x7	A
30/1-10	180	900 – 2800	45 – 400	0.25 – 1.80	0.25 – 1.80	–	integrated	1x13.5/1x9/1x7	A
40/1-4	90	1250 – 2700	60 – 200	0.30 – 0.90	0.30 – 0.90	–	integrated	1x13.5/1x9/1x7	A
40/1-10	350	850 – 2850	25 – 625	0.18 – 2.75	0.18 – 2.75	–	integrated	1x13.5/1x9/1x7	B

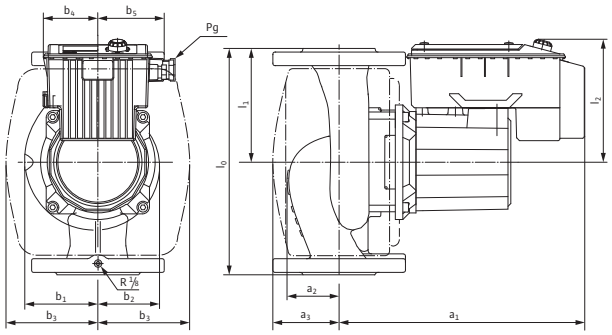
Terminal diagram, motor data Wilo–TOP–E

Motor data

Wilo–TOP–E …	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1	I			–	PG	–
	[W]	[rpm]	[W]	[A]			–	[PG]	–
50/1–6	180	1000 – 2800	70 – 390	0.35 – 1.70	0.35 – 1.70	–	integrated	1x13.5/1x9/1x7	A
50/1–7	350	850 – 2850	25 – 645	0.18 – 2.81	0.18 – 2.81	–	integrated	1x13.5/1x9/1x7	B
50/1–10	450	850 – 2850	30 – 930	0.28 – 4.10	0.28 – 4.10	–	integrated	1x13.5/1x9/1x7	B
65/1–10	570	850 – 2850	35 – 980	0.27 – 4.31	0.27 – 4.31	–	integrated	1x13.5/1x9/1x7	B
80/1–10	1100	850 – 2850	60 – 1650	0.33 – 7.20	0.33 – 7.20	–	integrated	1x13.5/1x9/1x7	B
100/1–10	1100	850 – 2850	60 – 1650	0.33 – 7.20	0.33 – 7.20	–	integrated	1x13.5/1x9/1x7	B

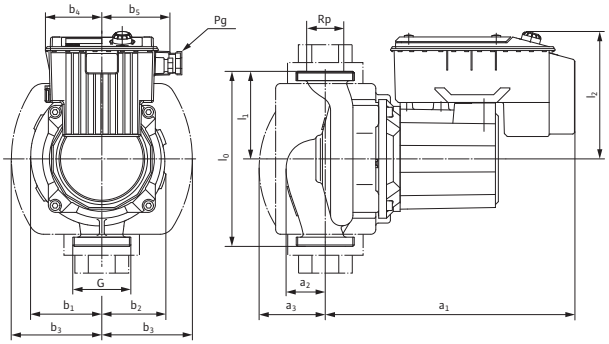
Dimensions, weights Wilo-TOP-E

Dimension drawing A



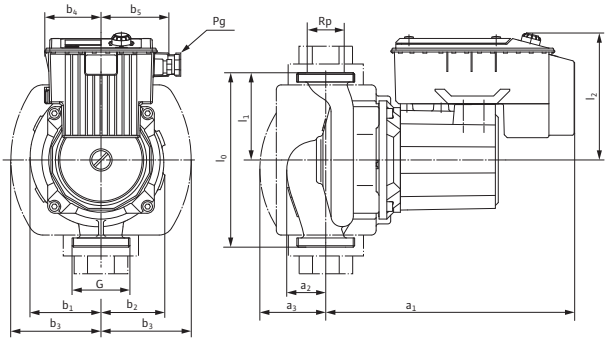
Permitted installation positions, see Planning guide

Dimension drawing B



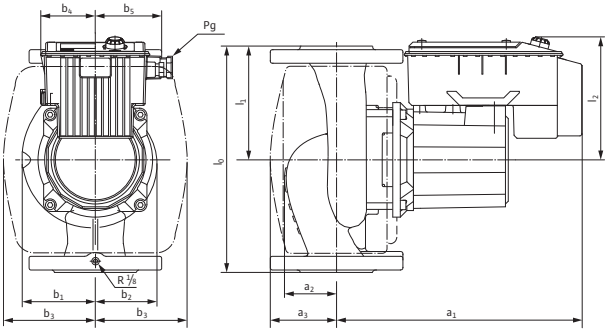
Permitted installation positions, see Planning guide

Dimension drawing C



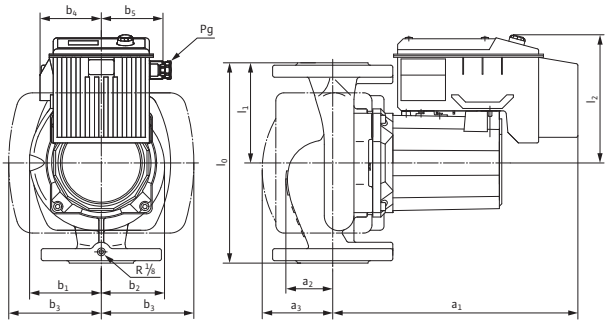
Permitted installation positions, see Planning guide

Dimension drawing D



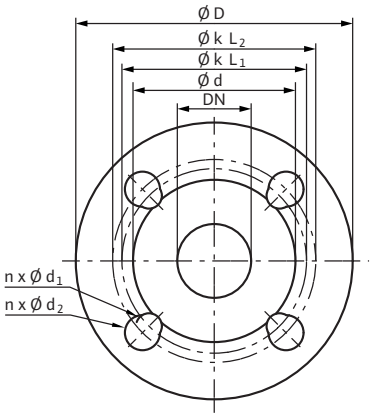
Permitted installation positions, see Planning guide

Dimension drawing E

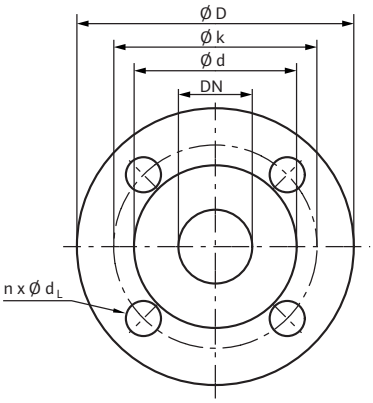


Dimensions, weights Wilo-TOP-E

Dimension drawing Flange A



Dimension drawing Flange B



Dimensions, weights

Wilo-TOP-E ...	Rated pressure	Pipe connection	Nominal flange diameter	Thread	Dimensions							Weight approx.	Dimension drawing
	PN	Rp	DN	G	l_0	a_1	a_2	l_1	b_1	b_2	b_3	M	–
	[bar]	–			[mm]							[kg]	–
25/1-7	10	1	–	1½	180	225	34	90	66	57	80	5.5	C
30/1-7	10	1¼	–	2	180	232	34	90	66	57	88	5.5	C
30/1-10	10	1¼	–	2	180	257	40	90	73	66	93	7.5	B
40/1-4	6/10	-	40	–	220	237	54	110	83	60	103	10.0	A
40/1-10	6/10	-	40	–	250	306	57	125	90	87	115	15.5	E
50/1-6	6/10	-	50	–	240	275	39	120	78	62	112	13.0	D
50/1-7	6/10	-	50	–	280	314	63	140	91	74	119	17.5	E
50/1-10	6/10	-	50	–	280	337	69	140	101	86	123	19.5	E
65/1-10	6/10	-	65	–	340	368	78	170	118	98	136	26.0	E
80/1-10	6	-	80	–	360	371	95	180	135	109	159	30.5	E
80/1-10	10	-	80	–	360	371	95	180	135	109	159	32.5	E
100/1-10	6	-	100	–	360	371	95	180	135	109	159	31.0	E
100/1-10	10	-	100	–	360	371	95	180	135	109	159	33.0	E

Dimensions, weights Wilo-TOP-E

Flange dimensions

Wilo-TOP-E ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/Ø d_{L2}	n x Ø d_L	–
	–		[mm]				[pcs. x mm]		–
40/1-4	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	88	100/110	–	4 x 14 / 19	-	A
40/1-10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	88	100/110	–	4 x 14 / 19	-	A
50/1-6	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	102	100/125	–	4 x 14 / 19	-	A
50/1-7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	102	100/125	–	4 x 14 / 19	-	A
50/1-10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	102	100/125	–	4 x 14 / 19	-	A
65/1-10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	65	185	122	130/145	–	4 x 14 / 19	-	A
80/1-10	Flange PN 6 (according to DIN 2531)	80	190	128	-	150	-	4 x 19	B
80/1-10	Flange PN 16 (according to DIN 2533, drilled according to EN 1092-2)	80	200	138	-	160	-	8 x 19	B
100/1-10	Flange PN 6 (according to DIN 2531)	100	210	148	-	170	-	4 x 19	B
100/1-10	Flange PN 16 (according to DIN 2533, drilled according to EN 1092-2)	100	220	158	-	180	-	8 x 19	B

n = number of drilled holes

Equipment/function Wilo-TOP-ED

	Wilo-TOP-ED ...
Operating modes	
Speed-stage switching	–
Manual control mode (n=constant)	•
Δp-c for constant differential pressure	•
Δp-v for variable differential pressure	•
Δp-T for temperature-controlled differential pressure	• (programmable via IR-Module, IR-Monitor or LON)
Manual functions	
Operating mode setting	•
Differential-pressure setpoint setting	•
Autopilot	•
Pump ON/OFF setting	•
Speed setting (manual control mode)	•
Setting the speed stages	–
Automatic functions	
Infinitely variable power adjustment according to the operating mode	•
Autopilot	•
Deblocking function	•
Soft start	• (not for TOP-ED 32/1-7, TOP-ED 40/1-7 and TOP-ED 50/1-6)
Safety control	–
Full motor protection with integrated trip electronics	•
External control functions	
Overriding Off	• (not for TOP-ED 32/1-7, TOP-ED 40/1-7 and TOP-ED 50/1-6)
Overriding Min	–
Analogue In 0 ... 10 V	• (not for TOP-ED 32/1-7, TOP-ED 40/1-7 and TOP-ED 50/1-6)
Analogue In 0 ... 10 V	–
Signal and display functions	
Single/collective fault signal (potential-free NC contact)	• (programmable with the IR-Module/IR-Monitor)
Collective fault signal (potential-free NC contact)	•
Individual run signal (potential-free NO contact)	–
Thermal winding contact (WSK, potential-free NC contact)	–
Fault signal light	•
Direction-of-rotation control light	–

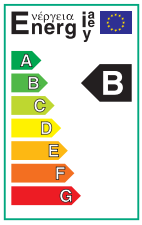
Equipment/function Wilo-TOP-ED

	Wilo-TOP-ED ...
LC display for indication of pump data and fault codes	•
Data exchange	
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	•
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	• Possible with IF-Modules (accessories)
Serial digital LON interface for connection to a LONWORKS network	• Possible with IF-Modules (accessories)
Serial digital CAN interface for connection to a CAN bus system	–
Dual pump management (double pump or 2 x single pump)	
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	• Various combinations with IF-Modules (accessories) possible (see Chapter: "Wilo-Control pump management systems")
Parallel operation (efficiency-optimised peak-load cut-in and out)	• Various combinations with IF-Modules (accessories) possible (see Chapter: "Wilo-Control pump management systems")
Equipment/scope of delivery	
Wrench attachment point on pump body	–
Twin switch-over valve in pump housing	•
Cable lead-in possible on both sides	–
Wilo quick connection with spring clips	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–
Plug-in position for optional extension with Wilo-IF-Modules	•
Blocking current-proof motor	–
Including seals for threaded connection (loose)	–
Including installation and operating instructions	•
Including thermal insulation	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	•
Including 1.8 m connecting cable with shock-proof plug	–
Integrated non-return valve	–
Integrated ball shut-off valve	–
Including clock timer	–

• = available, – = not available

Series description Wilo-TOP-ED





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

Design
Glandless double circulation pump with flange connection and automatic power adjustment

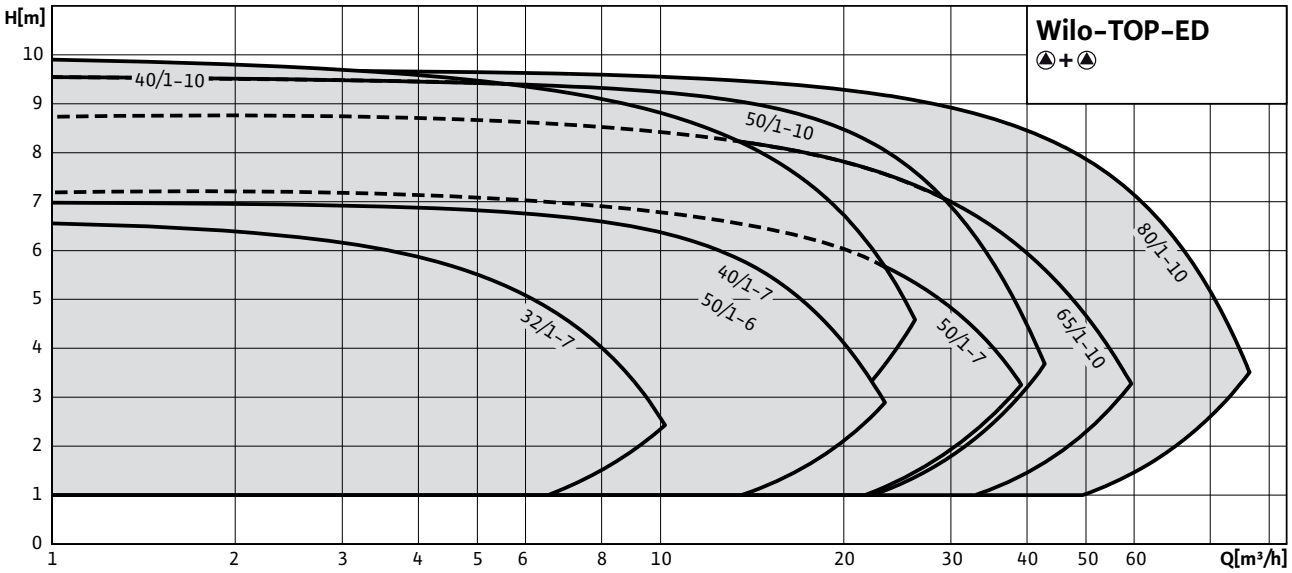
Application
Hot-water heating systems of all kinds and industrial circulation systems

Type key

Example:	**TOP-ED 40/1-10**
TOP-ED	Energy-saving pump (double flange-end pump), electronically controlled
40/	Nominal connection diameter
1-10	Nominal delivery head range [m]

Options
- Special versions for operating pressure PN 16 (at additional charge)

Special features/product benefits
- Infinitely variable power adjustment and several control functions for energy-saving operation (up to 50% electricity savings compared to uncontrolled heating pumps)
- Autopilot for automatic setback operation by means of self-teaching "Fuzzy Logic"
- Simple operation by means of standard integrated pump display and manual operation level (one-button operation)
- Remote control and remote querying of pump functions with Wilo IR-Module/IR-Monitor possible
- System extension due to retrofit LON and PLR communication modules
- Integrable dual pump management due to retrofit IF-Modules:
  - Main/standby mode with fault-dependent switchover
  - Efficiency-optimised peak-load operation



Series description Wilo-TOP-ED

Equipment/function

Operating modes
- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure (programmable via IR-Module, IR-Monitor or LON)

Manual functions
- Setting of operating mode
- Setting of differential-pressure setpoint
- Setting of "Autopilot" (automatic setback operation)
- Pump ON/OFF setting
- Speed setting (manual control mode)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start (not for TOP-ED 32/1-7, TOP-ED 40/1-4 and TOP-ED 50/1-6)
- Full motor protection with integrated trip electronics

External control functions
- "Overriding Off" control input (not for TOP-ED 32/1-7, TOP-ED 40/1-4 and TOP-ED 50/1-6)
- "Analogue In 0 - 10 V" control input (remote speed adjustment) (not for TOP-ED 32/1-7, TOP-ED 40/1-4 and TOP-ED 50/1-6)

Signal and display functions
- Individual / collective fault signal (potential-free NC contact) (programmable with the IR-Monitor)
- Collective fault signal (potential-free NC contact)
- Fault signal light
- LC display for indication of pump data and fault codes

Data exchange
- Infrared interface for wireless data exchange with IR-Module/IR-Monitor
- Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling modules; possible with IF-Modules (accessory)
- Serial digital LON interface for connection to a LONWorks network; possible with IF-Modules (accessory)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): Various combinations possible with IF-Modules (accessory)
- Parallel operation (efficiency-optimised peak-load cut-in and out): Various combinations possible with IF-Modules (accessory)

Equipment/scope of delivery
- Twin switch-over valve in pump housing
- Plug-in position for optional extension with Wilo-IF-Modules

Scope of delivery
- Pump
- Including seals for threaded connection (loose)
- Including installation and operating instructions
- Including washers for flange screws (for nominal connection diameters DN 32 - DN 65)

Accessories
- Mounting brackets for pump fixation
- IR-Module
- IR-Monitor
- IF-Modules: PLR, LON
- Analogue interface converter AnaCon
- Digital interface converter DigiCon/DigiCon-A

Technical data Wilo-TOP-ED

	Wilo-TOP-ED ...							
	32/1-7	**40/1-7**	**40/1-10**	**50/1-6**	**50/1-7**	**50/1-10**	**65/1-10**	**80/1-10**
Approved fluids (other fluids on request)								
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–
Output								
Delivery head max. [m]	7	7	10	7	7	10	9	10
Max. volume flow [m^3/h]	10.0	23.0	27.0	24.0	39.0	43.0	59.0	93.0
Permitted field of application								
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-							
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +110							
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6
Special version for operating pressure, p_{max}	-	16	16	16	16	16	16	10/16
Pipe connections								
Screwed connection Rp	-	-	-	-	-	-	-	-
Nominal flange diameter DN	32	40	40	50	50	50	65	80
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	•
Flange for counter flange PN 16, special version	–	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•	•	•	•	•	•	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	•	•
Support-bracket mounting (with horizontal shaft only), special version	–	•	•	•	•	•	–	–
Electrical connection								
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-	-	-	-	-
Mains frequency	50	50	50	50	50	50	50	50

Technical data Wilo-TOP-ED

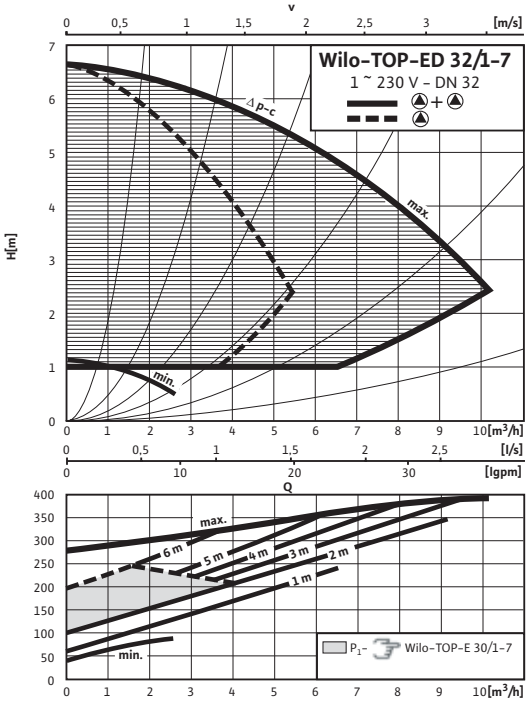
	Wilo-TOP-ED ...							
	32/1-7	**40/1-7**	**40/1-10**	**50/1-6**	**50/1-7**	**50/1-10**	**65/1-10**	**80/1-10**
Motor/electronics								
Electromagnetic compatibility	–							
Emitted interference	EN 61000-6-3							
Interference resistance	EN 61000-6-2							
Power electronics	High-frequency PWM procedure		Frequency converter	High-frequency PWM procedure	Frequency converter			
Protection class	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43	IP 43
Insulation class	F	F	F	F	F	F	F	F
Materials								
Pump housing	Grey cast iron (EN-GJL-250)							
Impeller	Plastic (PP – 50% GF)							
Pump shaft	Stainless steel (X46Cr13)							
Bearing	Carbon, metal impregnated							
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature								
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	3.0	3.0	3.0	3.0
Minimum suction head at 95°C	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0
Minimum suction head at 110°C	11.0	11.0	11.0	11.0	16.0	16.0	16.0	16.0

• = available, – = not available

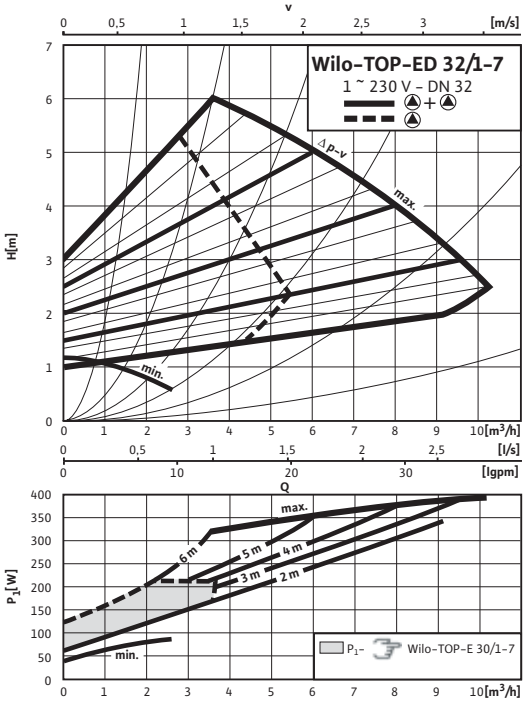
Pump curves Wilo–TOP–ED

Wilo–TOP–ED 32/1–7

Δp–c (constant)

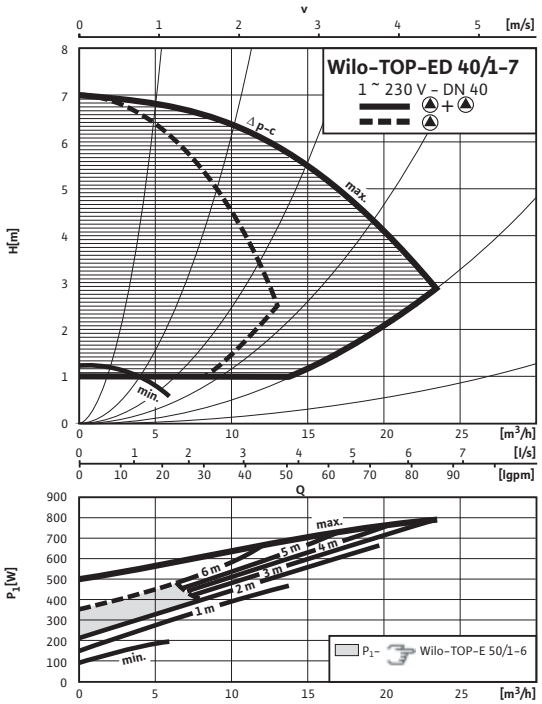


Δp–v (variable)

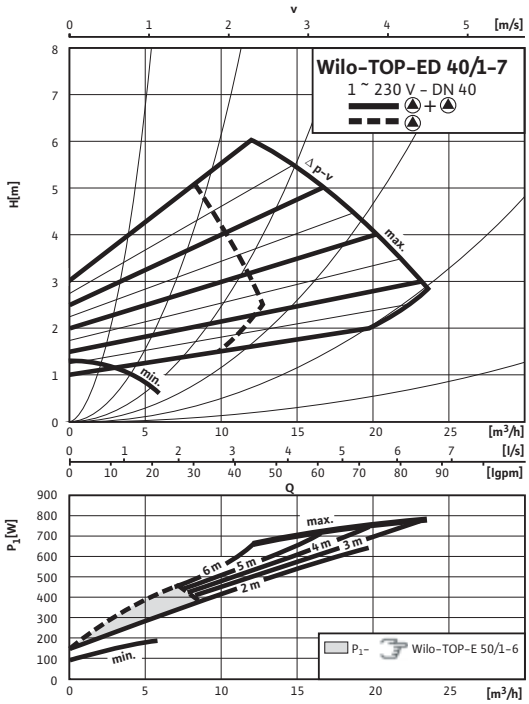


Wilo–TOP–ED 40/1–7

Δp–c (constant)



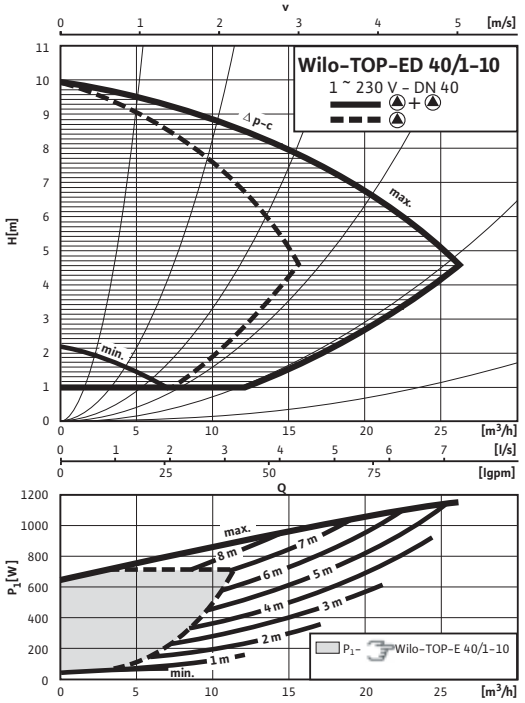
Δp–v (variable)



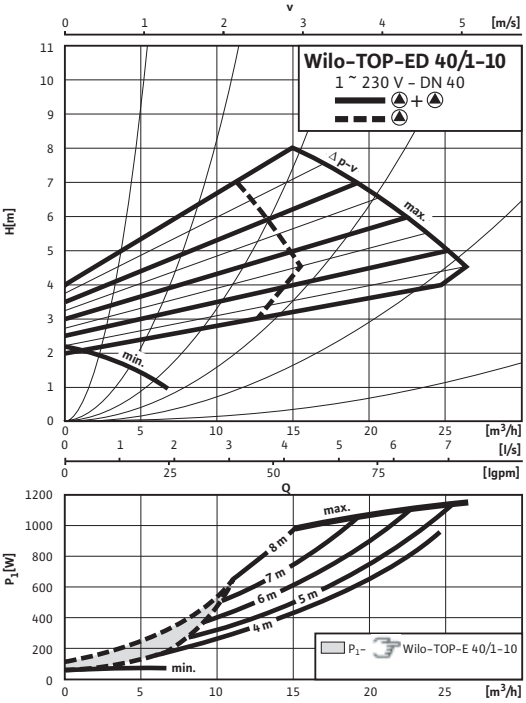
Pump curves Wilo-TOP-ED

Wilo-TOP-ED 40/1-10

Δp-c (constant)

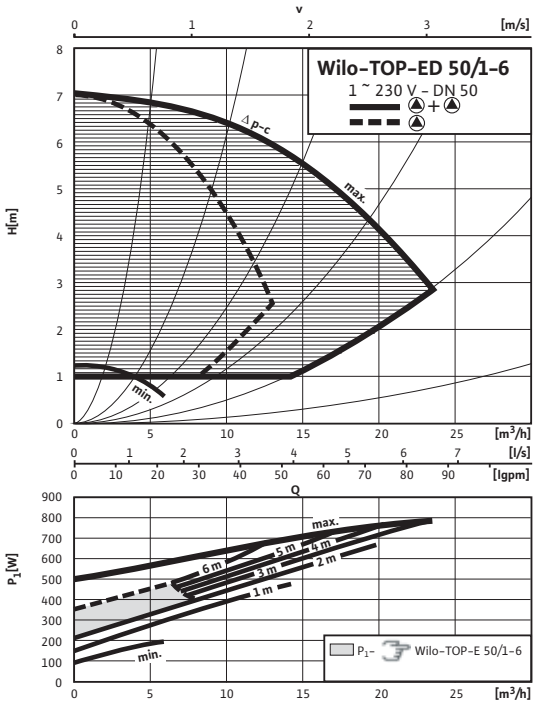


Δp-v (variable)

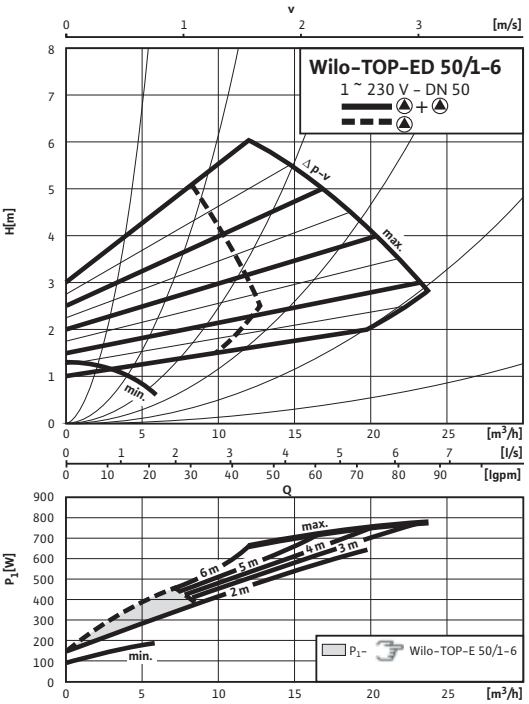


Wilo-TOP-ED 50/1-6

Δp-c (constant)



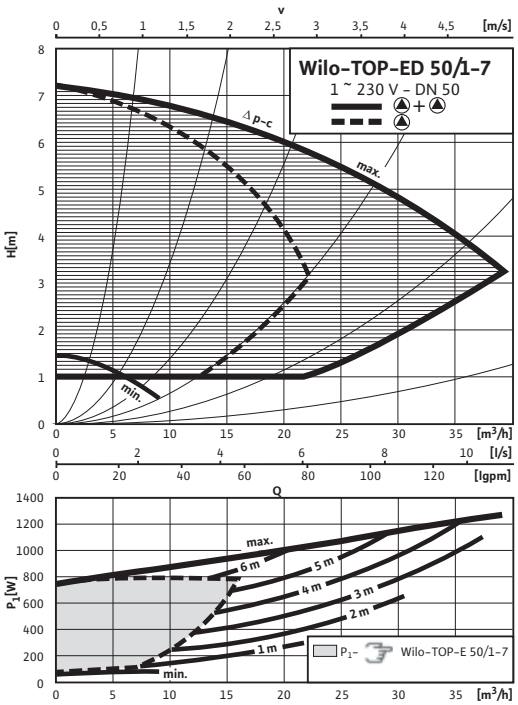
Δp-v (variable)



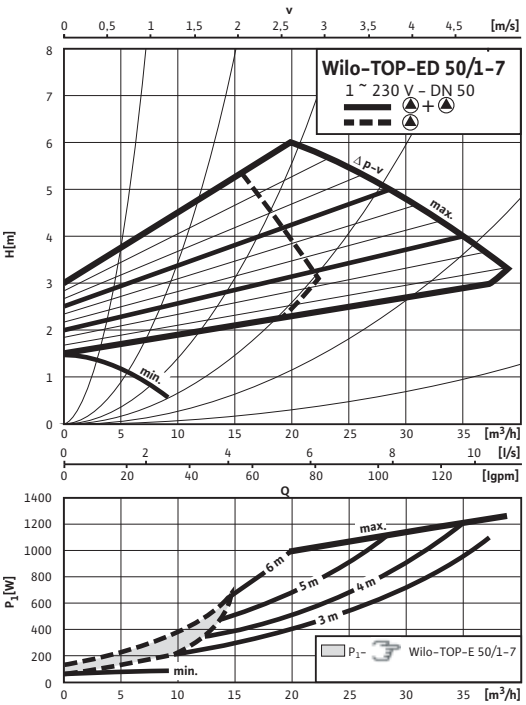
Pump curves Wilo-TOP-ED

Wilo-TOP-ED 50/1-7

Δp-c (constant)

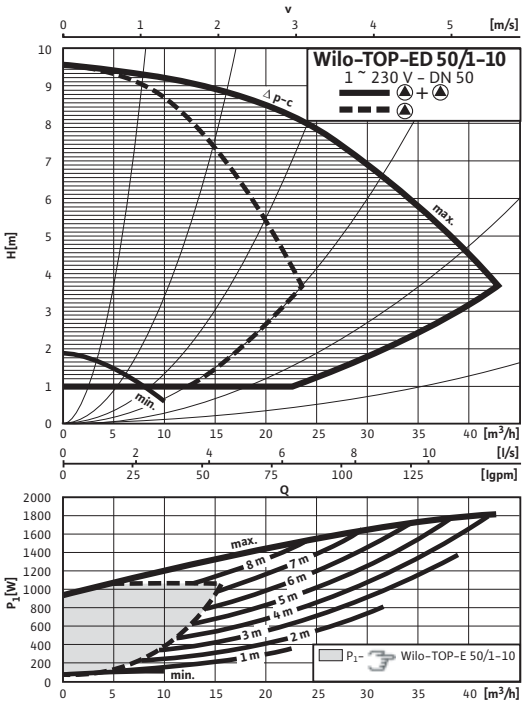


Δp-v (variable)

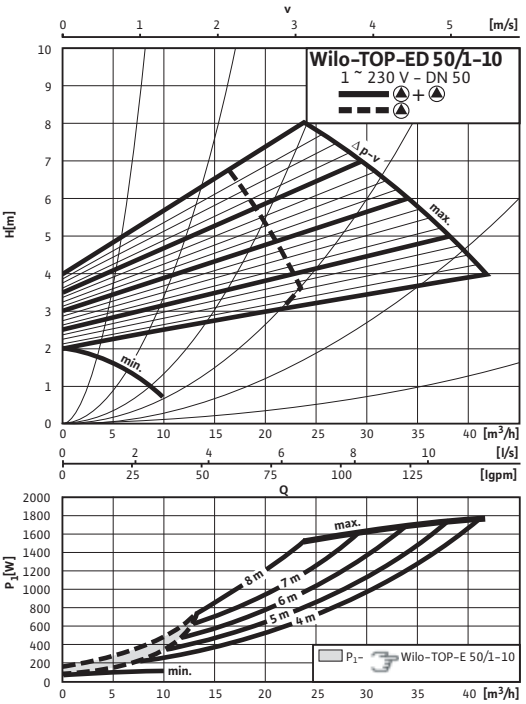


Wilo-TOP-ED 50/1-10

Δp-c (constant)



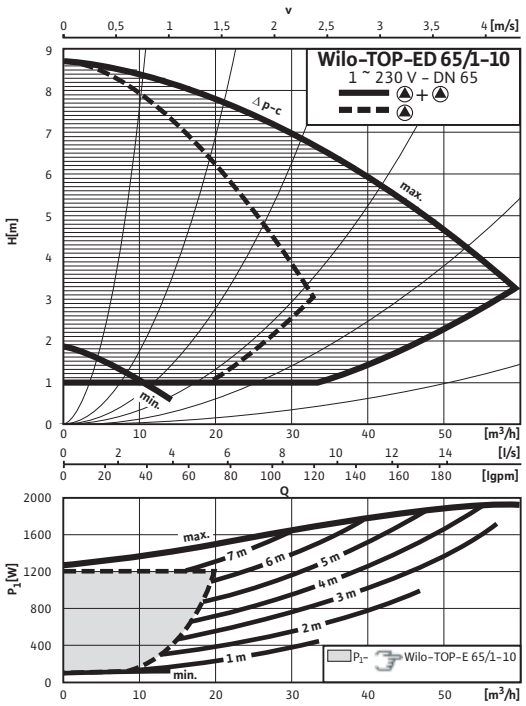
Δp-v (variable)



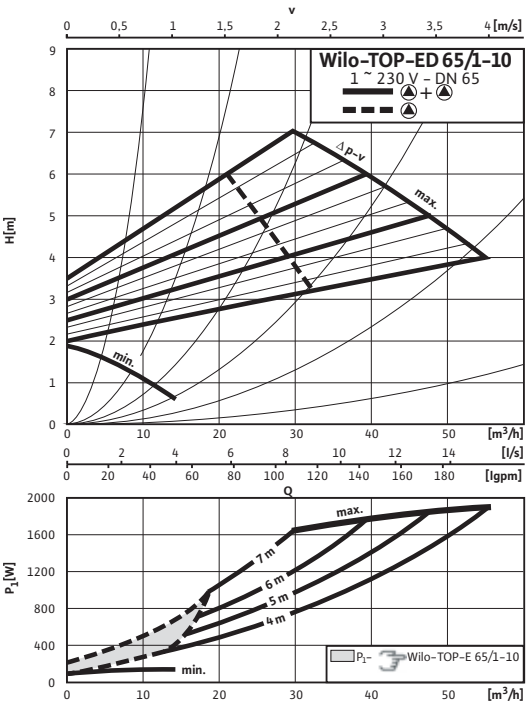
Pump curves Wilo-TOP-ED

Wilo-TOP-ED 65/1-10

Δp-c (constant)

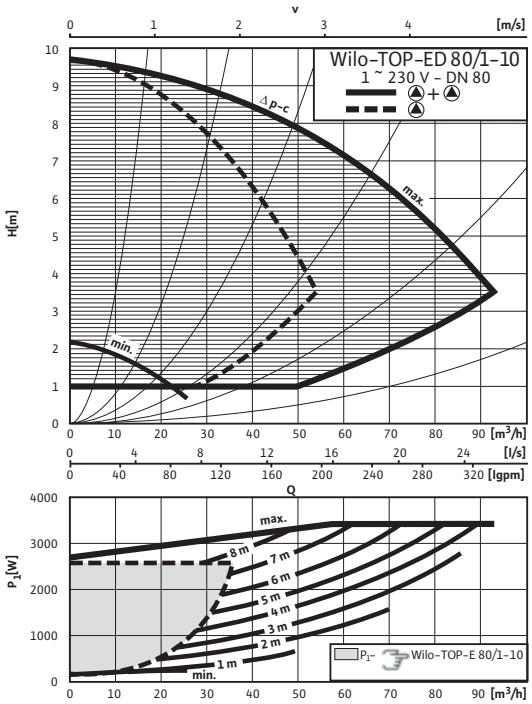


Δp-v (variable)

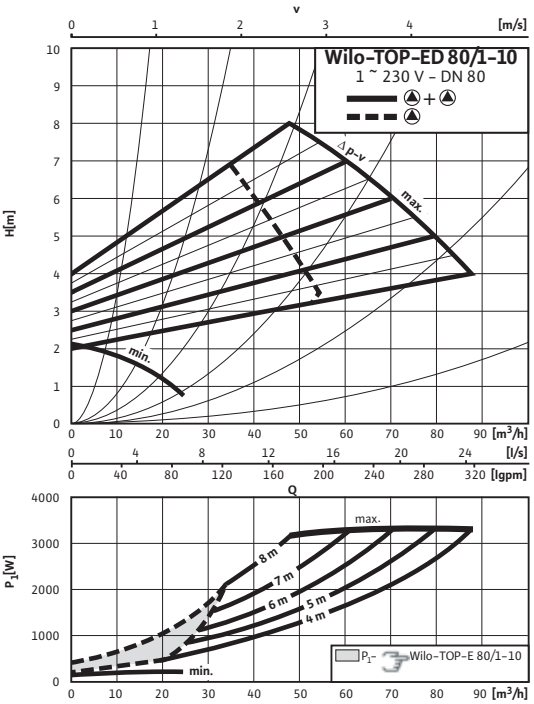


Wilo-TOP-ED 80/1-10

Δp-c (constant)

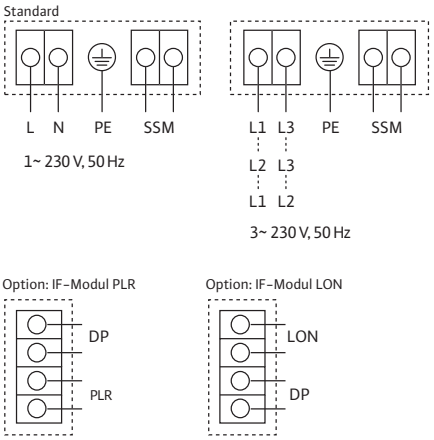


Δp-v (variable)



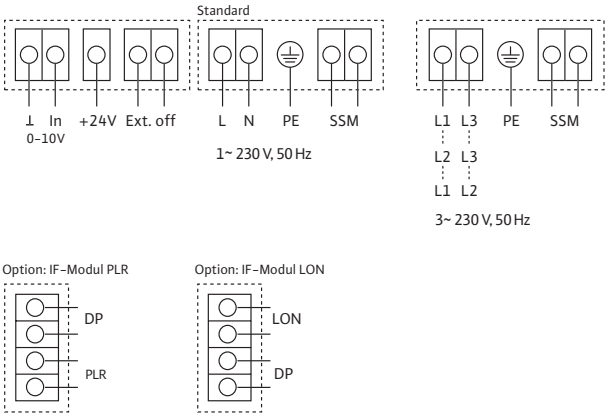
Terminal diagram, motor data Wilo-TOP-ED

Terminal diagram A



DP: Dual pump management (2 pumps)
PLR: Serial digital BA interface
LON: Serial digital LONWORKS interface
SSM: Collective fault signal (NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"

Terminal diagram B



DP: Dual pump management (2 pumps)
PLR: Serial digital BA interface
LON: Serial digital LONWORKS interface
SSM: Collective fault signal (NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"
⊥/In: Control input, 0-10 V, for speed controller operation
+24V: Auxiliary voltage
Ext. off: Override "Off" control input for ext. potential-free contact (NC contact):
Contact closed: Pump enabled,
Contact open: Pump "Off"

Motor data

Wilo-TOP-ED ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1	I			–	PG	–
	[W]	[rpm]	[W]	[A]			–	[PG]	–
32/1-7	90	1000 – 2800	30 – 200	0.20 – 0.90	0.20 – 0.90	–	integrated	1x13.5/1x9/1x7	A
40/1-7	180	1000 – 2800	70 – 390	0.35 – 1.70	0.35 – 1.70	–	integrated	1x13.5/1x9/1x7	A
40/1-10	350	850 – 2850	25 – 625	0.18 – 2.75	0.18 – 2.75	–	integrated	1x13.5/1x9/1x7	B
50/1-6	180	1000 – 2800	70 – 390	0.35 – 1.70	0.35 – 1.70	–	integrated	1x13.5/1x9/1x7	A
50/1-7	350	850 – 2850	25 – 645	0.18 – 2.81	0.18 – 2.81	–	integrated	1x13.5/1x9/1x7	B

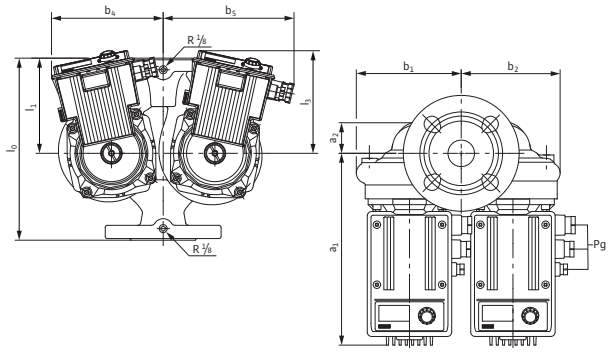
Terminal diagram, motor data Wilo-TOP-ED

Motor data

Wilo-TOP-ED ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1	I			–	PG	–
	[W]	[rpm]	[W]	[A]			–	[PG]	–
50/1-10	450	850 - 2850	30 - 930	0.28 - 4.10	0.28 - 4.10	-	integrated	1x13.5/1x9/1x7	B
65/1-10	570	850 - 2850	35 - 980	0.27 - 4.31	0.27 - 4.31	-	integrated	1x13.5/1x9/1x7	B
80/1-10	1100	850 - 2850	60 - 1650	0.33 - 7.20	0.33 - 7.20	-	integrated	1x13.5/1x9/1x7	B

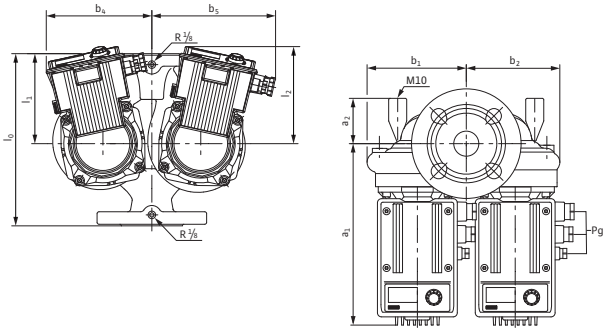
Dimensions, weights Wilo-TOP-ED

Dimension drawing A



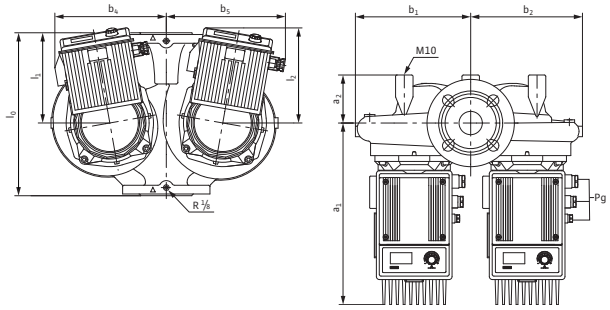
Permitted installation positions, see Planning guide

Dimension drawing B



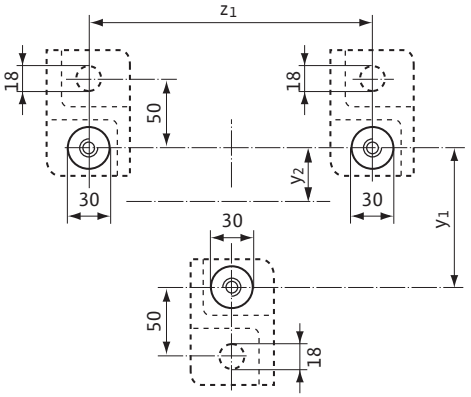
Permitted installation positions, see Planning guide

Dimension drawing C



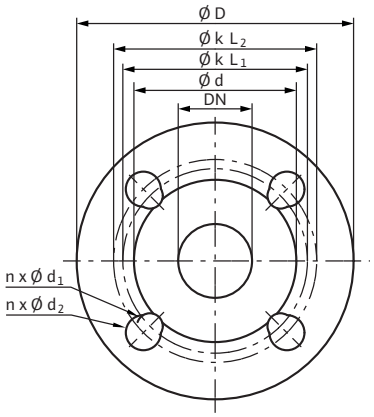
Permitted installation positions, see Planning guide

Dimension drawing D – Bracket diagram

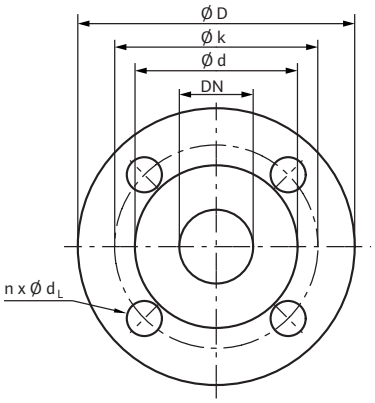


Dimensions, weights Wilo-TOP-ED

Dimension drawing Flange A



Dimension drawing Flange B



Dimensions, weights

Wilo-TOP-ED ...	Nominal flange diameter	Rated pressure	Dimensions												Weight approx.	Dimension drawing
	DN	PN	l_0	l_1	l_2	a_1	a_2	b_1	b_2	b_4	b_5	y_1	y_2	z_1	M	–
	–	[bar]	[mm]												[kg]	–
32/1-7	32	6/10	220	115	124	232	38	127	120	135	158	–	–	–	15.0	A
40/1-7	40	6/10	250	135	133	266	75	145	135	152	175	108	11	172	22.0	B/D
40/1-10	40	6/10	250	135	165	306	75	178	172	182	195	132	35	225	32.0	C/D
50/1-6	50	6/10	280	160	132	275	83	149	139	152	175	113	11	172	24.0	B/D
50/1-7	50	6/10	280	160	165	314	83	179	169	182	195	132	30	225	33.5	C/D
50/1-10	50	6/10	280	155	192	337	83	198	192	192	215	157	50	228	38.0	C/D
65/1-10	65	6/10	340	185	203	368	93	223	209	202	226	162	25	225	51.0	C/D
80/1-10	80	6	360	205	202	371	100	249	231	219	234	180	43	240	59.5	C/D
80/1-10	80	10	360	205	202	371	100	249	231	219	234	180	43	240	61.0	C/D

Note for support-bracket mounting:
Drilled holes with M10 threads for support-bracket mounting are available on request for all **TOP-ED 40** and **TOP-ED 50** versions

Dimensions, weights Wilo-TOP-ED

Flange dimensions

Wilo-TOP-ED ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/Ø d_{L2}	n x Ø d_L	–
	–		[mm]				[pcs. x mm]		–
32/1-7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	32	140	78	90/100	–	4 x 14 / 19	-	A
40/1-7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	88	100/110	–	4 x 14 / 19	-	A
40/1-10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	88	100/110	–	4 x 14 / 19	-	A
50/1-6	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	102	100/125	–	4 x 14 / 19	-	A
50/1-7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	102	100/125	–	4 x 14 / 19	-	A
50/1-10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	102	100/125	–	4 x 14 / 19	-	A
65/1-10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	65	185	122	130/145	–	4 x 14 / 19	-	A
80/1-10	Flange PN 6 (according to DIN 2531)	80	190	128	-	150	-	4 x 19	B
80/1-10	Flange PN 16 (according to DIN 2533, drilled according to EN 1092-2)	80	200	138	-	160	-	8 x 19	B

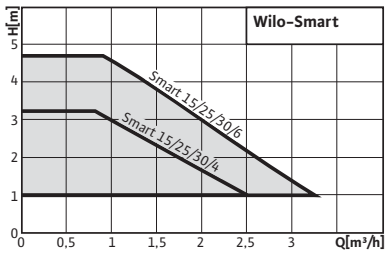
n = number of drilled holes

Series overview Wilo-Smart

Series: Wilo-Smart







Glandless circulation pump with screwed connection and automatic power adjustment

> Application

Hot-water heating systems of all kinds, industrial circulation systems

Version ...RG with pump housing made of red brass

Series overview Wilo-Smart

Series: Wilo-Smart

> Special features/product benefits
- Simple pipe connection due to the safe and practical wrench attachment point on the pump body.
- Safe electrical connection due to ergonomically optimised terminal box. Quick connection with spring clips.
- Simple operation. Factory setting suitable for 80% of all heating system requirements. Simple selection of the three pre-programmed control channels with the "red button".
- The automatic controller of the Wilo-Smart prevents flow noise in the heating system and reduces electricity consumption.
- Operational reliability due to automatic deblocking function. A special bronze filter prevents particles from penetrating the motor compartment.

> More information **Page**

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- Terminal diagrams, motor data 131
- Dimensions, weights 132
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Equipment/function

	Wilo-Smart ...
Operating modes	
Speed-stage switching	•
Manual control mode (n=constant)	–
Δp-c for constant differential pressure	•
Δp-v for variable differential pressure	–
Δp-T for temperature-controlled differential pressure	–
Manual functions	
Operating mode setting	–
Differential-pressure setpoint setting	•
Autopilot	–
Pump ON/OFF setting	–
Speed setting (manual control mode)	–
Setting the speed stages	•
Automatic functions	
Infinitely variable power adjustment according to the operating mode	–
Autopilot	–
Deblocking function	•
Soft start	–
Safety control	–
Full motor protection with integrated trip electronics	–
External control functions	
Overriding Off	–
Overriding Min	–
Analogue In 0 ... 10 V	–
Analogue In 0 ... 10 V	–
Signal and display functions	
Single/collective fault signal (potential-free NC contact)	–
Collective fault signal (potential-free NC contact)	–
Individual run signal (potential-free NO contact)	–
Thermal winding contact (WSK, potential-free NC contact)	–
Fault signal light	–
Direction-of-rotation control light	–
LC display for indication of pump data and fault codes	–

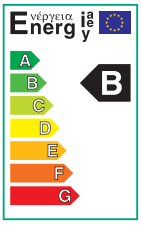
Equipment/function

	Wilo-Smart ...
Data exchange	
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–
Serial digital LON interface for connection to a LONWORKS network	–
Serial digital CAN interface for connection to a CAN bus system	–
Dual pump management (double pump or 2 x single pump)	
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–
Parallel operation (efficiency-optimised peak-load cut-in and out)	–
Equipment/scope of delivery	
Wrench attachment point on pump body	•
Twin switch-over valve in pump housing	–
Cable lead-in possible on both sides	–
Wilo quick connection with spring clips	•
Built-in air extraction fitting for automatic rapid ventilation Rp $^{3}/_{8}$	–
Plug-in position for optional extension with Wilo-IF-Modules	–
Blocking current-proof motor	•
Including seals for threaded connection (loose)	•
Including installation and operating instructions	•
Including thermal insulation	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–
Including 1.8 m connecting cable with shock-proof plug	–
Integrated non-return valve	–
Integrated ball shut-off valve	–
Including clock timer	–

• = available, – = not available

Series description Wilo-Smart





Design
Glandless circulation pump with screwed connection and automatic power adjustment

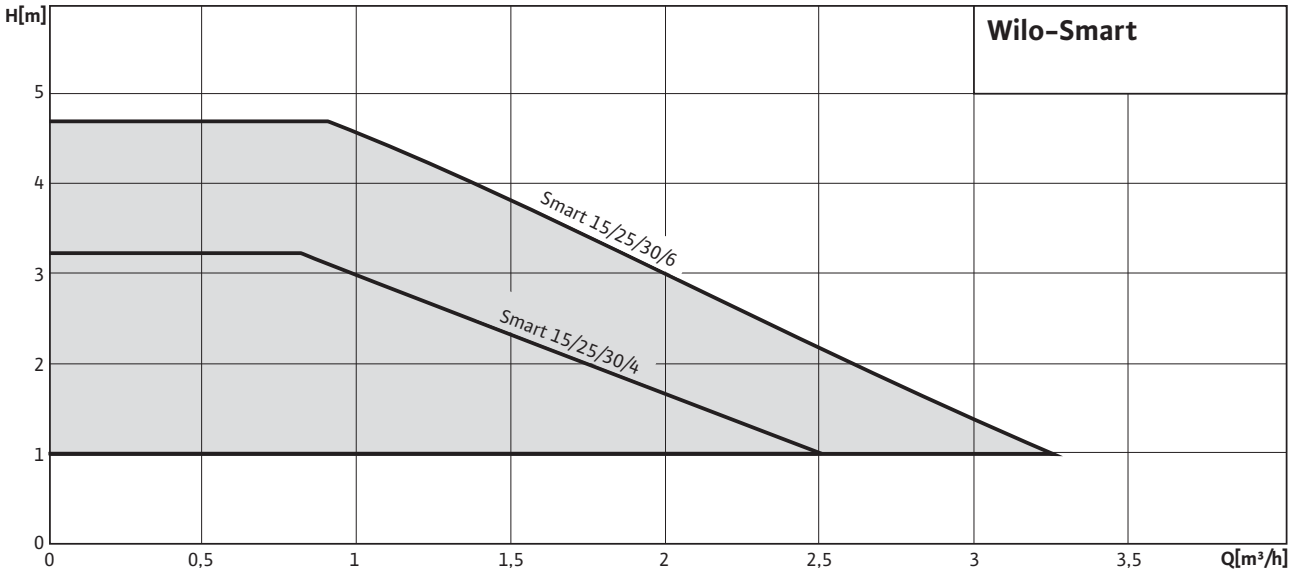
Application
Hot-water heating systems of all kinds, industrial circulation systems

Type key

Example:	**Smart 25/4**
Smart	Automatic pump
25	Nominal diameter R1
4	Max. delivery head 4 m

Options
- Wilo Smart 25/4-130 and 25/6-130: Pump with short over-all length of 130 mm
- Available with pump housing in red brass as version ...RG

Special features/product benefits
- Simple pipe connection due to the safe and practical wrench attachment point on the pump body.
- Safe electrical connection due to ergonomically optimised terminal box. Quick connection with spring clips.
- Simple operation. Factory setting suitable for 80% of all heating system requirements. Simple selection of the three pre-programmed control channels with the "red button".
- The automatic controller of the Wilo-Smart prevents flow noise in the heating system and reduces electricity consumption.
- Operational reliability due to automatic deblocking function. A special bronze filter prevents particles from penetrating the motor compartment.



Series description Wilo-Smart

Equipment/function

Operating modes
- Speed-stage switching
- Differential pressure control
- Δp-c for constant differential pressure

Manual functions
- Control channel adjustment (3 control channels)

Automatic functions
- Deblocking function
- Safety control

Equipment
- Wrench attachment point on pump body
- Quick connection with spring clips
- Blocking current-proof motor
- Particle filter

Scope of delivery
- Pump
- Seals
- Installation and operating instructions

Technical data Wilo-Smart

	Wilo-Smart ...									
	15/4	**15/6**	**25/4**	**25/4-130**	**25/4-RG**	**25/6**	**25/6-130**	**25/6-RG**	**30/4**	**30/6**
Approved fluids (other fluids on request)										
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–	–
Output										
Delivery head max. [m]	4	6	4	4	4	6	6	6	4	6
Max. volume flow [m^3/h]	2.5	3.5	2.5	2.5	2.5	3.5	3.5	3.5	2.5	3.5
Permitted field of application										
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	•									
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-									
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–	–	–	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	–	–	–	–	–	–	–	–	–	–
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	–	–	–	–	–	–	–	–	–	–
Pipe connections										
Screwed connection Rp	½	½	1	1	1	1	1	1	1¼	1¼
Nominal flange diameter DN	15	15	25	25	25	25	25	25	30	30
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–	–	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–	–
Electrical connection										
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–	–	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–	–	–	–
Mains frequency	50	50	50	50	50	50	50	50	50	50

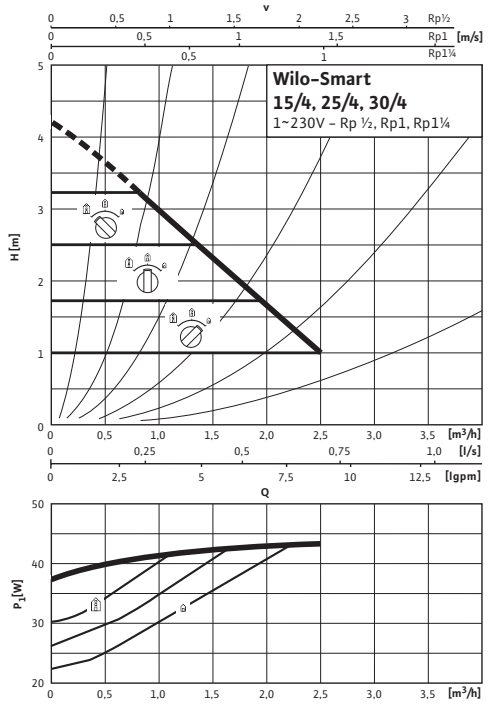
Technical data Wilo-Smart

	Wilo-Smart ...									
	15/4	**15/6**	**25/4**	**25/4-130**	**25/4-RG**	**25/6**	**25/6-130**	**25/6-RG**	**30/4**	**30/6**
Motor/electronics										
Electromagnetic compatibility	EN 61800-3									
Emitted interference	-									
Interference resistance	-									
Power electronics	-	-	-	-	-	-	-	-	-	-
Protection class	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42	IP 42
Insulation class	F	F	F	F	F	F	F	F	F	F
Materials										
Pump housing	Grey cast iron (EN-GJL-200)				Red brass (CC 499K) according to DIN EN 1982 and according to TrinkwV2001 (drinking water ordinance)	Grey cast iron (EN-GJL-200)		Red brass (CC 499K) according to DIN EN 1982 and according to TrinkwV2001 (drinking water ordinance)	Grey cast iron (EN-GJL-200)	
Impeller	Plastic (PP - 40% GF)									
Pump shaft	Stainless steel									
Bearing	Carbon, metal impregnated									
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature										
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

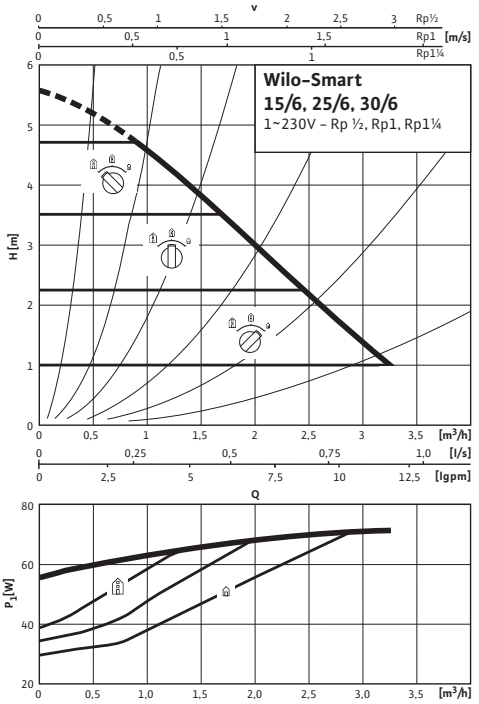
• = available, - = not available

Pump curves Wilo–Smart

Wilo–Smart 15/4, 25/4, 30/4

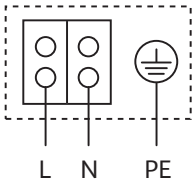


Wilo–Smart 15/6, 25/6, 30/6



Terminal diagram, motor data Wilo–Smart

Terminal diagramA



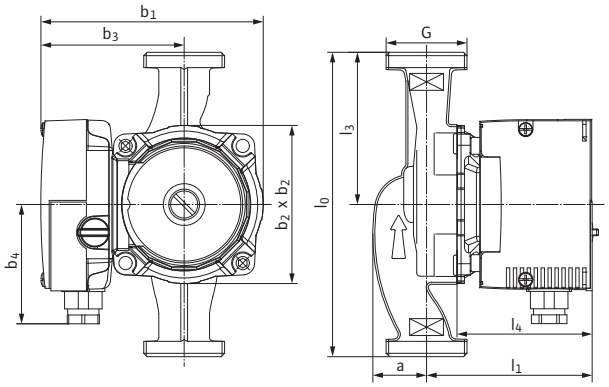
Blocking current–proof motor
Single–phase motor (EM) 2–pole – 1~230 V, 50 Hz
With built–in capacitor

Motor data

Wilo–Smart …	Speed	Power consumption	Max. current	Motor protection	Capacitor	Threaded cable connection
	n	P_1	I	–	C	PG
	[rpm]	[W]	[A]	–	[µF/VDB]	[PG]
15/4	1595 – 2700	49.0 38.0 23.5	0.11–0.22	not required (blocking current–proof)	1.7/400	11
15/6	1250 – 2800	72.0 30.0	0.14–0.31	not required (blocking current–proof)	2.0/400	11
25/4	1595 – 2700	49.0 38.0 23.5	0.11–0.22	not required (blocking current–proof)	1.7/400	11
25/4–130	1595 – 2700	49.0 38.0 23.5	0.11–0.22	not required (blocking current–proof)	1.7/400	11
25/4–RG	1595 – 2700	49.0 38.0 23.5	0.11–0.22	not required (blocking current–proof)	1.7/400	11
25/6	1250 – 2800	72.0 30.0	0.14–0.31	not required (blocking current–proof)	2.0/400	11
25/6–130	1250 – 2800	72.0 30.0	0.14–0.31	not required (blocking current–proof)	2.0/400	11
25/6–RG	1250 – 2800	72.0 30.0	0.14–0.31	not required (blocking current–proof)	2.0/400	11
30/4	1595 – 2700	49.0 38.0 23.5	0.11–0.22	not required (blocking current–proof)	1.7/400	11
30/6	1250 – 2800	72.0 30.0	0.14–0.31	not required (blocking current–proof)	2.0/400	11

Dimensions, weights Wilo-Smart

Dimension drawing



Motor horizontal
Terminal box positions for 3, 6, 9 and 12 o'clock possible

Dimensions, weights

Wilo-Smart ...	Pipe connection	Thread	Dimensions									Weight approx.
	Rp	G	l_0	l_1	l_3	l_4	A	b_1	b_2	b_3	b_4	M
	–		[mm]									[kg]
15/4	½	1	130	96	65	78	33	117	93.5	71	85	2.3
15/6	½	1	130	96	65	78	33	117	93.5	71	88	2.4
25/4	1	1½	180	96	90	78	33	117	93.5	71	85	2.3
25/4-130	1	1½	130	96	65	78	33	117	93.5	71	85	2.3
25/4-RG	1	1½	180	96	90	78	33	117	93.5	71	85	2.3
25/6	1	1½	180	96	90	78	33	117	93.5	71	88	2.4
25/6-130	1	1½	130	96	65	78	33	117	93.5	71	88	2.4
25/6-RG	1	1½	180	96	90	78	33	117	93.5	71	88	2.4
30/4	1¼	2	180	96	90	78	33	117	93.5	71	85	2.4
30/6	1¼	2	180	96	90	78	33	117	93.5	71	88	2.5

Multiply proven technology.
For heating and air-conditioning systems.
In single and multi-family houses.
Convenient and reliable.



Wilo-Star-RS.

The Wilo-Star-RS is an extremely reliable standard pump for utilisation in single and multi-family houses. It offers perfected pump technology for the highest demands on heating and air-conditioning systems, and has already proven itself multiple times during their many years of use. The Wilo-Star-RS can be installed very easily. And, with its three speed stages, it can be optimally adapted to loads at any time.
Perfect? We call this Pumpen Intelligenz.



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Pumpen Intelligenz.

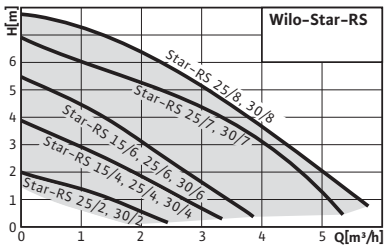
Heating, air-conditioning, cooling

Standard pumps (single pumps)

Series overview Wilo-Star-RS, AXL, TOP-RL

Series: Wilo-Star-RS



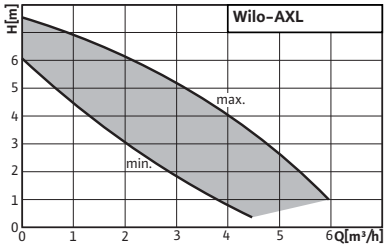


> Design
Glandless circulation pump with threaded connection. Preselectable speed stages for power adjustment

> Application
Hot-water heating systems of all kinds, industrial circulation systems, cold water systems and air-conditioning systems

Series: Wilo-AXL



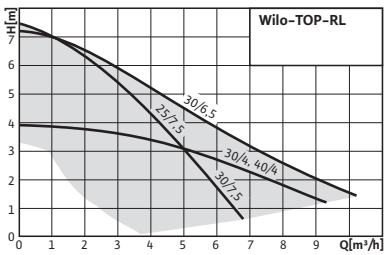


> Design
Glandless circulation pump with threaded connection, preselectable speed stages for power adjustment

> Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Series: Wilo-TOP-RL





> Design
Glandless circulation pump with threaded or flange connection, preselectable speed stages for power adjustment

> Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Star-RS, AXL, TOP-RL

Series: Wilo-Star-RS

> Special features/product benefits
- Suitable for any installation position with horizontal shaft; terminal box in 3-6-9-12 o'clock position
- Three pre-selectable speed stages for load adjustment
- Easy and safe installation due to practical wrench attachment point on pump body
- Simplified electrical installation due to terminal box with removable threaded cable connection that can be used on both sides; Quick connection with spring clips

> More information **Page**

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- Pump curves 148
- Terminal diagrams, motor data 150
- Dimensions, weights 152
- Service/accessories 351
- Switchgears and control devices ... 373

Series: Wilo-AXL

> Special features/product benefits
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Pump with short overall length of 130 mm

> More information **Page**

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Series: Wilo-TOP-RL

> Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Manual power adjustment with 3 speed stages.
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 40)
- Protection class IP 44

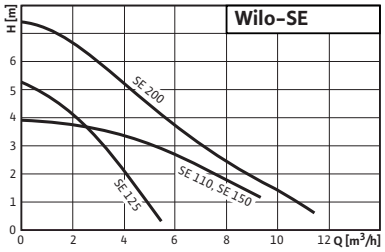
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Series overview Wilo-SE, TOP-S, TOP-D

Series: Wilo-SE

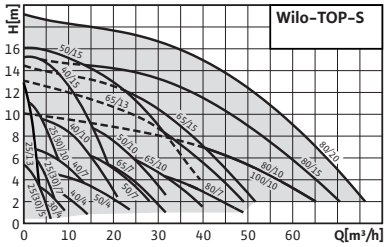




> Design
Glandless circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment.
> Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Series: Wilo-TOP-S

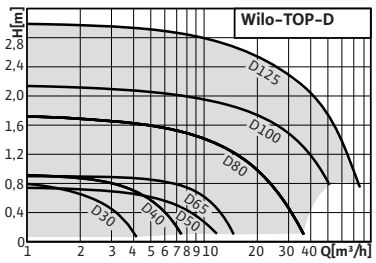




> Design
Glandless circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment.
> Application
Hot-water heating systems of all kinds, industrial circulation systems, air-conditioning systems and closed cooling circuits

Series: Wilo-TOP-D





> Design
Glandless circulation pump with screwed connection or flange connection.
> Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Subject to change 09/2008 WILO SE

Series overview Wilo-SE, TOP-S, TOP-D

Series: Wilo-SE

> Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Manual power adjustment with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 40)
- With kit including seal for length compensation between the connection adapters from 244 mm to 250 mm. Standard for all pump types with flange connection
- Protection class IP 44

> More information

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Series: Wilo-TOP-S

> Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Manual power adjustment with 2 speed stages (for pumps 1~230 V with P_2≥350 W) or with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- With thermal insulation as standard
- Simple installation due to combination flange PN 6/PN 10 (for DN 40 to DN 65)
- Cable feed in to terminal box possible on both sides (from P_2≥180 W) with integrated strain relief device
- Protection class IP 44

> More information

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Series: Wilo-TOP-D

> Special features/product benefits
- For installations with low pipework resistances, can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Universal application for various mains operations:
  - 3~400 V as standard connection
  - 3~230 V with modification of the terminal assignment
  - 1~230 V with application of a capacitor (accessory)
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- With thermal insulation as standard
- Simple installation due to combination flange PN 6/PN 10 (for DN 40 to DN 65)
- Cable feed into terminal box possible on both sides (from P_2 ≥ 60 W) with integrated strain relief device
- Protection class IP 44

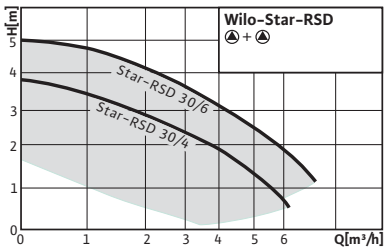
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Series overview Wilo-Star-RSD, TOP-SD, SE-TW

Series: Wilo-Star-RSD



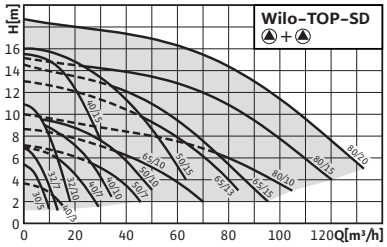


> Design
Glandless circulation double pump with threaded connection; preselectable speed stages for power adjustment

> Application
Hot-water heating systems of all kinds, industrial circulation systems, cold-water systems and air-conditioning systems

Series: Wilo-TOP-SD



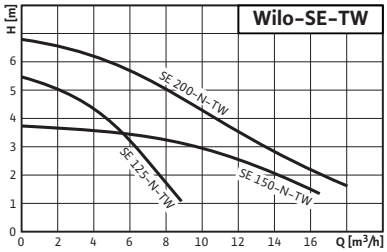


> Design
Glandless double circulation pump with flange connection (TOP-SD 30/5 with screwed connection).

> Application
Hot-water heating systems of all kinds, industrial circulation systems, air-conditioning systems and closed cooling circuits

Series: Wilo-SE-TW





> Design
Glandless double circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment

> Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Star-RSD, TOP-SD, SE-TW

Series: Wilo-Star-RSD

> Special features/product benefits
- Double pump for single or parallel operation
- Suitable for any installation position with horizontal shaft; terminal box in 3-6-9-12 o'clock position
- Increased reliability in individual operation due to the constant availability of a standby unit ready for operation

> More information **Page**

- Planning guide 8
- Equipment/function 209
- Series description 212
- Technical data 214
- Pump curves 216
- Terminal diagrams, motor data 217
- Service/accessories 349
- Switchgears and control devices 373

Series: Wilo-TOP-SD

> Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20°C to +130°C
- Double pump for main/standby mode or parallel operation
- Manual power adjustment with 2 speed stages (for pumps 1~230 V with P_2≥350 W) or with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 32 to DN 65)
- Cable feed into terminal box possible on both sides (from P2 ≥ 180 W) with integrated strain relief device
- Protection class IP 44

> More information **Page**

- Planning guide 8
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- Pump curves 224
- Terminal diagrams, motor data 238
- Dimensions, weights 241
- Service/accessories 349
- Switchgears and control devices 373
- Wilo-Control pump management systems 437

Series: Wilo-SE-TW

> Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20°C to +130°C
- Double pump for main/standby mode or parallel operation
- Manual power adjustment with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 40)
- With kit including seal for length compensation between the connection adapters from 244 mm to 250 mm. Standard for all pump types with flange connection
- Protection class IP 44

> More information **Page**

- Planning guide 8
- Equipment/function 209
- Series description 244
- Technical data 246
- Pump curves 248
- Terminal diagrams, motor data 250
- Dimensions, weights 251
- Service/accessories 349
- Switchgears and control devices 373
- Wilo-Control pump management systems 437

Equipment/function Wilo-Star-RS, AXL, TOP-RL, SE

	Wilo-Star-RS ...	Wilo-AXL ...	Wilo-TOP-RL ...	Wilo-SE ...
Operating modes				
Speed-stage switching	•	•	•	•
Manual control mode (n=constant)	–	–	–	–
Δp-c for constant differential pressure	–	–	–	–
Δp-v for variable differential pressure	–	–	–	–
Δp-T for temperature-controlled differential pressure	–	–	–	–
Manual functions				
Operating mode setting	–	–	–	–
Differential-pressure setpoint setting	–	–	–	–
Autopilot	–	–	–	–
Pump ON/OFF setting	–	–	–	–
Speed setting (manual control mode)	–	–	–	–
Setting the speed stages	3	2	3	3
Automatic functions				
Infinitely variable power adjustment according to the operating mode	–	–	–	–
Autopilot	–	–	–	–
Deblocking function	–	–	–	–
Soft start	–	–	–	–
Safety control	–	–	–	–
Full motor protection with integrated trip electronics	–	–	• (for all types with Wilo-Protect-Module C)	• (for all types with Wilo-Protect-Module C)
External control functions				
Overriding Off	–	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Overriding Min	–	–	–	–
Analogue In 0 ... 10 V	–	–	–	–
Analogue In 0 ... 10 V	–	–	–	–
Signal and display functions				
Single/collective fault signal (potential-free NC contact)	–	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Collective fault signal (potential-free NC contact)	–	–	•	•
Individual run signal (potential-free NO contact)	–	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Thermal winding contact (WSK, potential-free NC contact)	–	–	–	–

Equipment/function Wilo-Star-RS, AXL, TOP-RL, SE

	Wilo-Star-RS ...	Wilo-AXL ...	Wilo-TOP-RL ...	Wilo-SE ...
Fault signal light	–	–	•	•
Direction-of-rotation control light	–	–	–	–
LC display for indication of pump data and fault codes	–	–	–	–
Data exchange				
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	–	–	–
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	–	–	–
Serial digital LON interface for connection to a LONWORKS network	–	–	–	–
Serial digital CAN interface for connection to a CAN bus system		–	–	–
Dual pump management (double pump or 2 x single pump)				
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	–	–	–
Equipment/scope of delivery				
Wrench attachment point on pump body	•	–	–	–
Twin switch-over valve in pump housing	–	–	–	–
Cable lead-in possible on both sides	•	–	–	–
Wilo quick connection with spring clips	•	–	–	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	–	–	–
Blocking current-proof motor	•	•	–	–
Including seals for threaded connection (loose)	•	–	•	•
Including installation and operating instructions	•	•	•	•
Including thermal insulation	–	–	–	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	–	–	• (for nominal connection diameter DN 40)
Including 1.8 m connecting cable with shock-proof plug	–	–	–	–
Integrated non-return valve	–	–	–	–
Integrated ball shut-off valve	–	–	–	–
Including clock timer	–	–	–	–

• = available, – = not available

Equipment/function Wilo-TOP-S, TOP-D

	Wilo-TOP-S ...	Wilo-TOP-D ...
Operating modes		
Speed-stage switching	•	–
Manual control mode (n=constant)	–	–
Δp-c for constant differential pressure	–	–
Δp-v for variable differential pressure	–	–
Δp-T for temperature-controlled differential pressure	–	–
Manual functions		
Operating mode setting	–	–
Differential-pressure setpoint setting	–	–
Autopilot	–	–
Pump ON/OFF setting	–	–
Speed setting (manual control mode)	–	–
Setting the speed stages	3 (2 for 1~ with P_2≥350 W)	1
Automatic functions		
Infinitely variable power adjustment according to the operating mode	–	–
Autopilot	–	–
Deblocking function	–	–
Soft start	–	–
Safety control	–	–
Full motor protection with integrated trip electronics	•	–
External control functions		
Overriding Off	• (optional for all types with Wilo-Protect-Module C)	–
Overriding Min	–	–
Analogue In 0 ... 10 V	–	–
Analogue In 0 ... 10 V	–	–
Signal and display functions		
Single/collective fault signal (potential-free NC contact)	• (optional for all types with Wilo-Protect-Module C)	–
Collective fault signal (potential-free NC contact)	•	–
Individual run signal (potential-free NO contact)	• (optional for all types with Wilo-Protect-Module C)	–
Thermal winding contact (WSK, potential-free NC contact)	• (only for 1~ pumps with P_2 = 180 W)	• (for TOP-D 65 to TOP-D 125)
Fault signal light	•	–

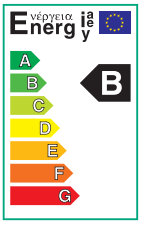
Equipment/function Wilo-TOP-S, TOP-D

	Wilo-TOP-S ...	Wilo-TOP-D ...
Direction-of-rotation control light	• (only for 3~pumps)	•
LC display for indication of pump data and fault codes	–	–
Data exchange		
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	–
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	–
Serial digital LON interface for connection to a LONWORKS network	–	–
Serial digital CAN interface for connection to a CAN bus system	–	–
Dual pump management (double pump or 2 x single pump)		
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	• (optional for all types with Wilo-Protect-Module C)	–
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	–
Equipment/scope of delivery		
Wrench attachment point on pump body	–	–
Twin switch-over valve in pump housing	–	–
Cable lead-in possible on both sides	• (only for 1~ pumps and 3~ pumps with $P_2 \geq 180$ W)	• (for TOP-D 65 to TOP-D 125)
Wilo quick connection with spring clips	–	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	–
Blocking current-proof motor	–	• (only for TOP-D 30, 40, 50)
Including seals for threaded connection (loose)	•	•
Including installation and operating instructions	•	•
Including thermal insulation	•	•
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	•	•
Including 1.8 m connecting cable with shock-proof plug	–	–
Integrated non-return valve	–	–
Integrated ball shut-off valve	–	–
Including clock timer	–	–

• = available, – = not available

Series description Wilo-Star-RS







Design
Glandless circulation pump with threaded connection. Pre-selectable speed stages for power adjustment

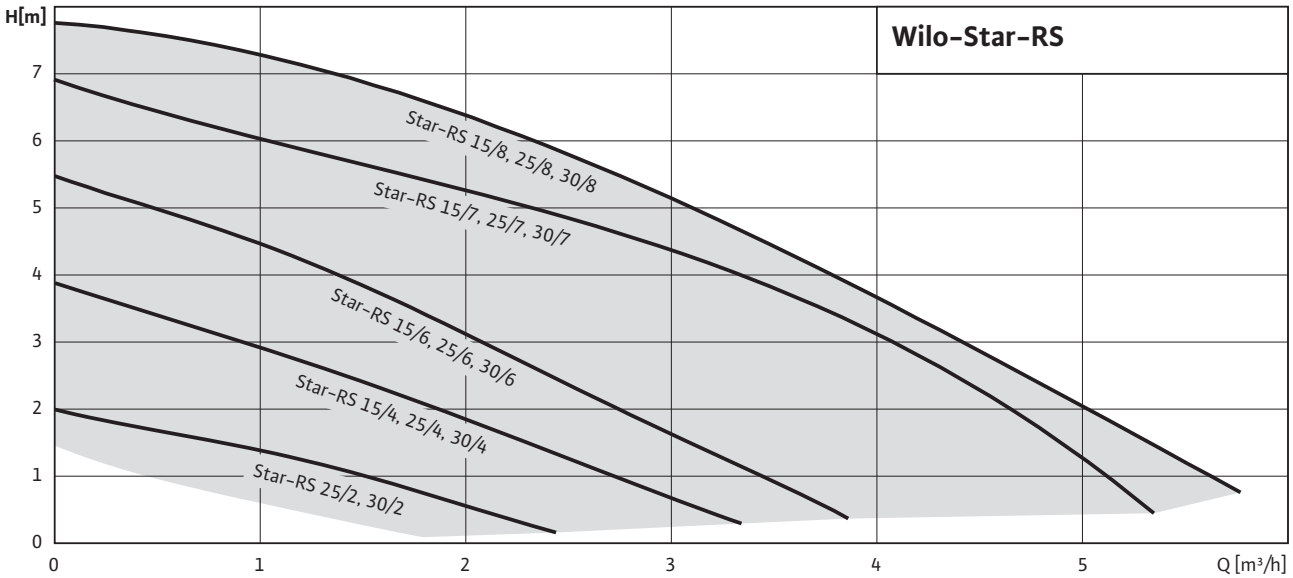
Application
Hot-water heating systems of all kinds, industrial circulation systems, cold water systems and air-conditioning systems

Type key

Example:	**Wilo Star-RS 25/4**
Star-RS	Standard pump (screw-end pump)
25/	Nominal connection diameter R
4	Nominal delivery head [m] at Q = 0 m^3/h

Options
- Version ...RG with housing made of red brass
- Version ... -130 with short overall length of 130 mm
- RSL version with connection for rapid ventilation.

Special features/product benefits
- Suitable for any installation position with horizontal shaft; terminal box in 3-6-9-12 o'clock position
- Three pre-selectable speed stages for load adjustment
- Easy and safe installation due to practical wrench attachment point on pump body
- Simplified electrical installation due to terminal box with removable threaded cable connection that can be used on both sides; quick connection with spring clips



Subject to change 09/2008 WILO SE

Series description Wilo-Star-RS

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting of speed stages (3 speed stages)

Equipment
- Wrench attachment point on pump body
- Cable lead-in possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Pump
- Seals
- Installation and operating instructions

Accessories
- Screwed connections
- Thermal insulation shells

Technical data Wilo-Star-RS

	Wilo-Star-RS ...											
	15/4	**15/6**	**25/2**	**25/4**	**25/6**	**25/7**	**25/8**	**30/2**	**30/4**	**30/6**	**30/7**	**30/8**
Approved fluids (other fluids on request)												
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–	–	–	–
Output												
Delivery head max. [m]	4	6	2	4	6	7	8	2	4	6	7	8
Max. volume flow [m^3/h]	3.5	4	2.5	3.5	4	5	5.5	2.5	3.5	4	5	5.5
Permitted field of application												
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–											
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-10 up to +110						-10 up to +95	-10 up to +110				-10 up to +95
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–	–	–	–	–	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	–	–	–	–	–	–	–	–	–	–	–	–
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	–	–	–	–	–	–	–	–	–	–	–	–
Pipe connections												
Screwed connection Rp	½	½	1	1	1	1	1	1¼	1¼	1¼	1¼	1¼
Nominal flange diameter DN	15	15	25	25	25	25	25	30	30	30	32	32
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–	–	–	–	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–	–	–	–
Electrical connection												
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–	–	–	–	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–	–	–	–	–	–
Mains frequency	50	50	50	50	50	50	50	50	50	50	50	50

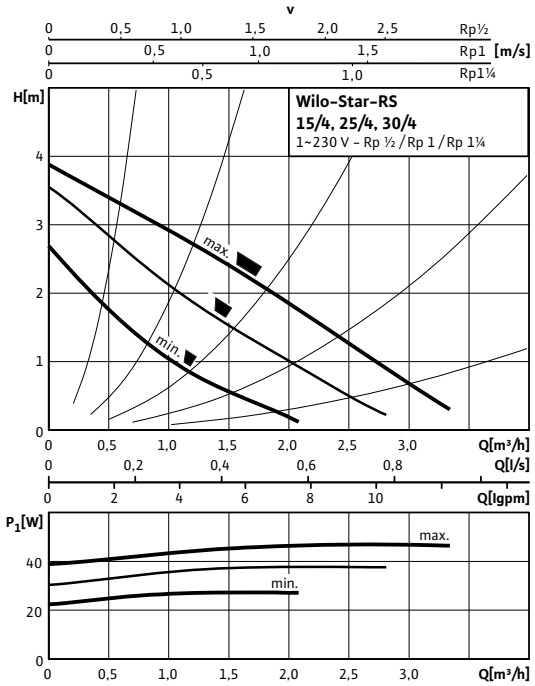
Technical data Wilo-Star-RS

	Wilo-Star-RS ...											
	15/4	**15/6**	**25/2**	**25/4**	**25/6**	**25/7**	**25/8**	**30/2**	**30/4**	**30/6**	**30/7**	**30/8**
Motor/electronics												
Electromagnetic compatibility	EN 61800-3											
Emitted interference	EN 61000-6-3											
Interference resistance	EN 61000-6-2											
Power electronics	–	–	–	–	–	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F	F	F	F	F	F
Materials												
Pump housing	Grey cast iron (EN-GJL-200)					Grey cast iron		Grey cast iron (EN-GJL-200)			Grey cast iron	
Impeller	Plastic (PP – 40% GF)					Fibreglass-reinforced PP		Plastic (PP – 40% GF)			Fibreglass-reinforced PP	
Pump shaft	Stainless steel (X40Cr13)											
Bearing	Carbon, metal impregnated											
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature												
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum suction head at 110°C	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum suction head at 130°C	–	–	–	–	–	–	–	–	–	–	–	–

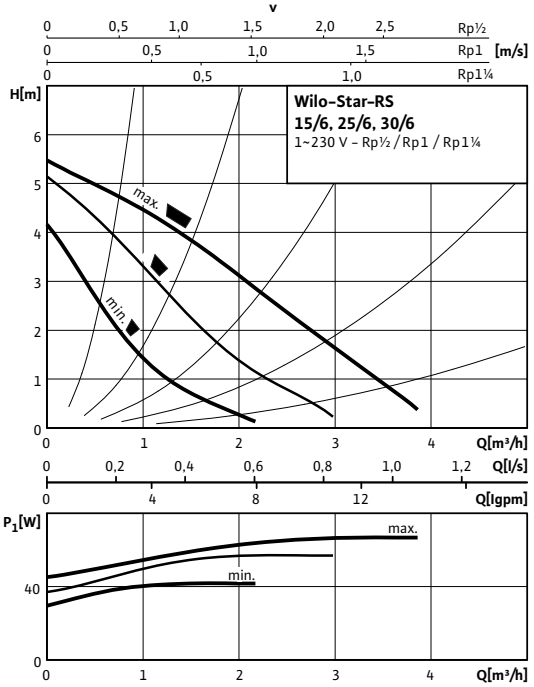
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Pump curves Wilo–Star–RS

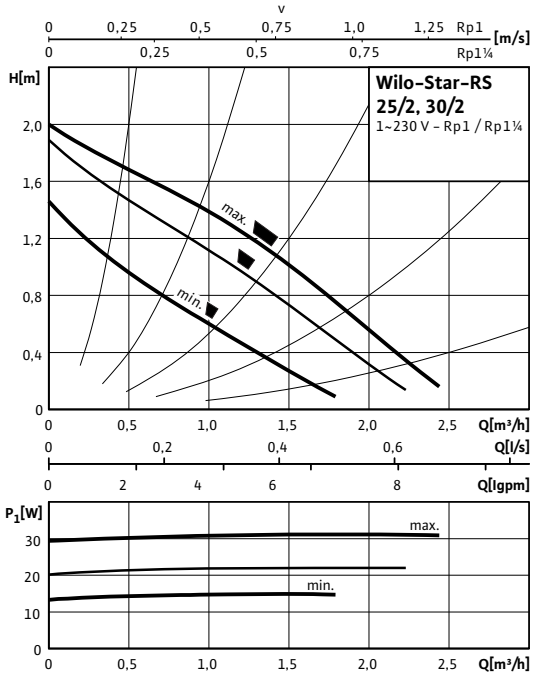
Wilo–Star–RS 15/4, 25/4, 30/4



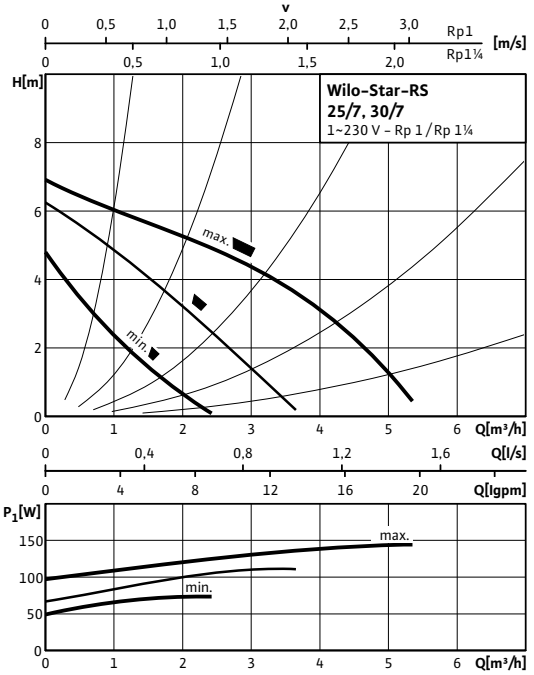
Wilo–Star–RS 15/6, 25/6, 30/6



Wilo–Star–RS 25/2, 30/2

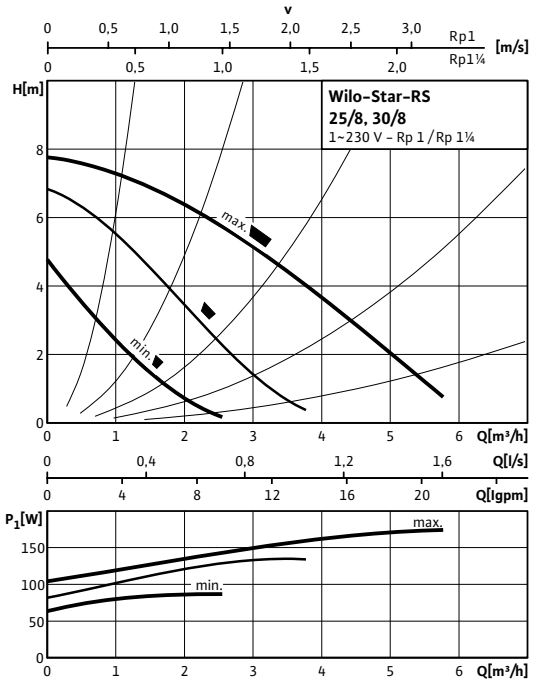


Wilo–Star–RS 25/7 – 30/7



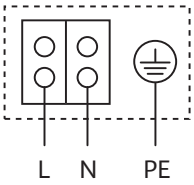
Pump curves Wilo–Star–RS

Wilo–Star–RS 25/8 – 30/8



Terminal diagram, motor data Wilo-Star-RS

Terminal diagram A



Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Motor data

Wilo-Star-RS ...	Nominal motor power	Speed	Power consumption	Max. current	Motor protection	Capacitor	Threaded cable connection
	P_2	n	P_1	I	–	C	PG
	[W]	[rpm]	[W]	[A]	–	[µF/VDB]	[PG]
15/4	15.5	max. 2720	48	0.21	not required (blocking current-proof)	1.7/400	1x11
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
15/6	38	max. 2750	84	0.36	not required (blocking current-proof)	2.6/400	1x11
	21	2650	61	0.28			
	11	min. 2350	43	0.2			
25/2	7	max. 2600	45	0.2	not required (blocking current-proof)	1.6/400	1x11
	4	2500	30	0.13			
	1.5	min. 2200	18	0.08			
25/4	15.5	max. 2720	48	0.21	not required (blocking current-proof)	1.7/400	1x11
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
25/4-130	15.5	max. 2720	48	0.21	not required (blocking current-proof)	1.7/400	1x11
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
25/4-RG	15.5	max. 2720	48	0.21	not required (blocking current-proof)	1.7/400	1x11
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
RSL 25/4-3H	15,5	max. 2720	48	0,21	not required (blocking current-proof)	1,7/400	1x11
	9,5	2630	38	0,17			
	5,5	min. 2350	28	0,13			
RSL 25/6	26	max. 2750	63	0,28	not required (blocking current-proof)	2,0/400	1x11
	17.5	2630	54	0.23			
	10.5	min. 2350	41	0.18			
25/6	38	max. 2750	84	0.36	not required (blocking current-proof)	2.6/400	1x11
	21	2650	61	0.28			
	11	min. 2350	43	0.2			

Terminal diagram, motor data Wilo-Star-RS

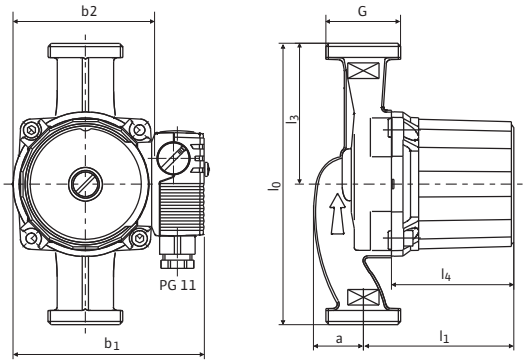
Motor data

Wilo-Star-RS …	Nominal motor power	Speed	Power consumption	Max. current	Motor protection	Capacitor	Threaded cable connection
	P_2	n	P_1	I	–	C	PG
	[W]	[rpm]	[W]	[A]	–	[µF/VDB]	[PG]
25/6-130	38	max. 2750	84	0.36	not required (blocking current-proof)	2.6/400	1x11
	21	2650	61	0.28			
	11	min. 2350	43	0.2			
25/6-RG	38	max. 2750	84	0.36	not required (blocking current-proof)	2.6/400	1x11
	21	2650	61	0.28			
	11	min. 2350	43	0.2			
25/7	57	max. 2800	132	0.58	not required (blocking current-proof)	3.5/400	1x11
	29.5	2650	92	0.42			
	13.5	min. 2300	62	0.3			
25/8	64	max. 2760	151	0.76	not required (blocking current-proof)	3.5/400	1x11
	35	2404	113	0.6			
	19	min. 2122	81	0.4			
30/2	7	max. 2600	45	0.2	not required (blocking current-proof)	1.6/400	1x11
	4	2500	30	0.13			
	1.5	min. 2200	18	0.08			
30/4	15.5	max. 2720	48	0.21	not required (blocking current-proof)	1.7/400	1x11
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
30/6	38	max. 2750	84	0.36	not required (blocking current-proof)	2.6/400	1x11
	21	2650	61	0.28			
	11	min. 2350	43	0.2			
30/7	57	max. 2800	132	0.58	not required (blocking current-proof)	3.5/400	1x11
	29.5	2650	95	0.42			
	13.5	min. 2300	68	0.3			
30/8	64	max. 2760	151	0.76	not required (blocking current-proof)	3.5/400	1x11
	35	2404	113	0.6			
	19	min. 2122	81	0.4			

Observe name plate data!

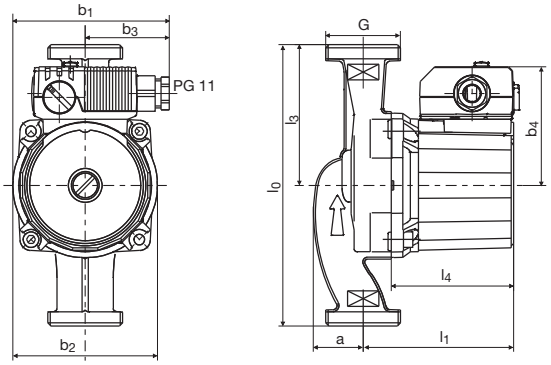
Dimensions, weights Wilo-Star-RS

Dimension drawing A



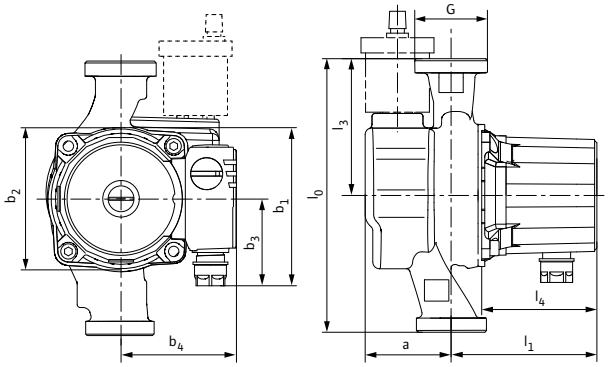
Motor horizontal
Terminal box positions for 3, 6, 9 and 12 o'clock possible
On delivery, terminal box position is at 3 o'clock

Dimension drawing B



Motor horizontal
Terminal box positions for 3, 6, 9 and 12 o'clock possible

Dimension drawing C



Dimensions, weights

Wilo-Star-RS ...	Pipe connection	Thread	Dimensions									Weight approx.	Dimension drawing
	Rp	G	l_0	l_1	l_3	l_4	A	b_1	b_2	b_3	b_4	M	–
	–		[mm]									[kg]	–
15/4	½	1	130	96	65	78	34	104	93.5	58	73	2.4	A
15/6	½	1	130	96	65	78	33	104	93.5	58	76	2.5	A
25/2	1	1½	180	96	90	78	34	104	93.5	58	73	2.2	B
25/4	1	1½	180	96	90	78	34	104	93.5	58	73	2.2	B
25/4-130	1	1½	130	96	65	78	34	104	93.5	58	73	2.2	A
25/4-RG	1	1½	180	96	90	78	34	104	93.5	58	73	2.6	B
RSL 25/4-3H	1	1½	180	96	90	78	56	104	93.5	57.2	76	3.1	C
RSL 25/6	1	1½	180	96	90	78	33	104	93.5	58	76	2.4	B

Dimensions, weights Wilo-Star-RS

Dimensions, weights

Wilo-Star-RS ...	Pipe connection	Thread	Dimensions									Weight approx.	Dimension drawing
	Rp	G	l_0	l_1	l_3	l_4	A	b_1	b_2	b_3	b_4	M	–
	–		[mm]									[kg]	–
25/6-130	1	1½	130	96	65	78	33	104	93.5	58	76	2.4	A
25/6-RG	1	1½	180	96	90	78	33	104	93.5	58	76	2.6	B
25/6	1	1½	180	100	90	78	62	101	93.5	54	79	3.4	B
25/7	1	1½	180	109	90	91	32	101	93.5	54	79	2.7	B
25/8	1	1½	180	119	90	88	34	113	93.5	54	76	3.3	B
30/2	1¼	2	180	96	90	78	34	104	93.5	58	73	2.2	B
30/4	1¼	2	180	96	90	78	34	104	93.5	58	73	2.4	B
30/6	1¼	2	180	96	90	78	33	104	93.5	58	76	2.7	B
30/7	1¼	2	180	109	90	91	32	101	93.5	54	79	3.0	B
30/8	1¼	2	180	119	90	88	34	113	93.5	54	76	3.5	B

Series description Wilo-AXL



Design
Glandless circulation pump with threaded connection, preselectable speed stages for power adjustment

Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo-AXL 80/25**
AXL	Standard pump (screw-end pump)
80 /	Nominal delivery head/10 [m] when Q = 0 m^3/h
25	Nominal connection width

Special features/product benefits
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Pump with short overall length of 130 mm

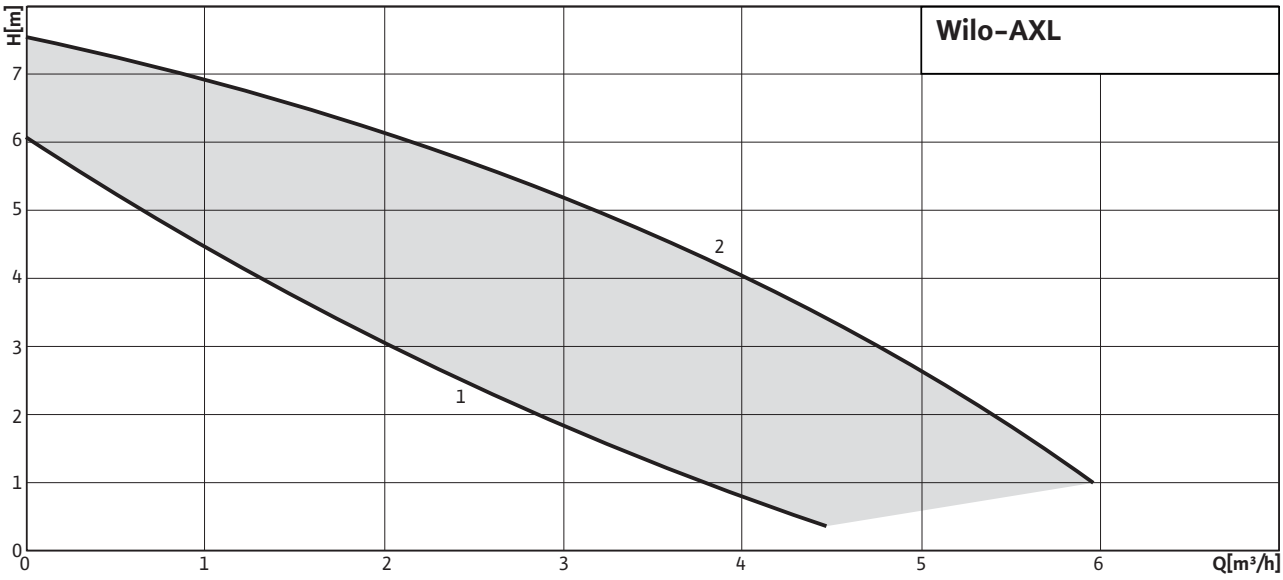
Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting of speed stages (2 speed stages)

Scope of delivery
- Pump
- Seals
- Installation and operating instructions

Accessories
- Screwed connections



Subject to change 09/2008 WILO SE

Technical data Wilo-AXL

	Wilo-AXL ...
Approved fluids (other fluids on request)	
Heating water (in accordance with VDI 2035)	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–
Output	
Delivery head max. [m]	8
Max. volume flow [m^3/h]	5.5
Permitted field of application	
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +120
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-
Standard version for operating pressure, p_{max}	-
Special version for operating pressure, p_{max}	-
Pipe connections	
Screwed connection Rp	1
Nominal flange diameter DN	–
Flange for counter flange PN 6, standard version	–
Flange for counter flange PN 16, special version	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–
Support-bracket mounting (with horizontal shaft only), standard version	–
Support-bracket mounting (with horizontal shaft only), special version	–
Electrical connection	
Mains connection 1 ~ [V], standard version	-
Mains connection 3 ~ [V], standard version	400
Mains connection 3 ~ [V], with optional switching plug	-
Mains frequency	50

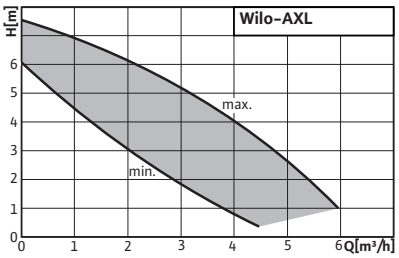
Technical data Wilo-AXL

	Wilo-AXL ...
Motor/electronics	
Electromagnetic compatibility	–
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2
Power electronics	–
Protection class	IP 42
Insulation class	H
Materials	
Pump housing	Grey cast iron (EN-GJL-200)
Impeller	Plastic (PPE), trade name: Noryl
Pump shaft	Stainless steel (X46Cr13)
Bearing	Carbon, metal impregnated
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature	
Minimum suction head at 50°C	0.5
Minimum suction head at 95°C	3.0
Minimum suction head at 110°C	10.0
Minimum suction head at 130°C	–

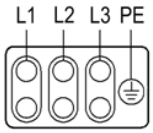
• = available, – = not available

Pump curves, Terminal diagram, motor data Wilo-AXL

Wilo-AXL 80/25-130

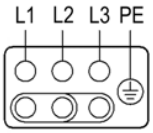


Terminal diagram A



Mains connection 3~400 V, 50 Hz
Blocking current-proof, no motor protection necessary

Terminal diagram B



Mains connection 3~400 V, 50 Hz
Blocking current-proof, no motor protection necessary

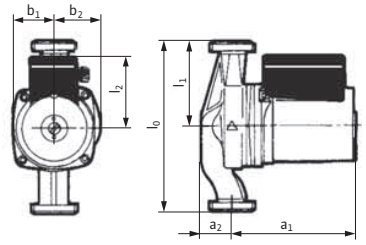
Motor data

Wilo-AXL ...	Nominal motor power	Speed	Input power max	Current at 3~400V	Wiring diagram
	P_2	n_{max}	P	I	–
	[W]	[rpm]	[W]	[A]	–
80/25-130	80	2440	190	0.38	A
		1710	100	0.18	B

Observe name plate!
Current I: Motor protection switch onsite setting

Dimensions, weights Wilo-AXL

Dimension drawing



Permitted installation positions, see Planning guide

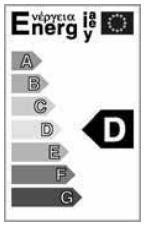
Dimensions, weights

Wilo-AXL …	Pipe connection	Nominal flange diameter	Thread	Overall length	Dimensions						Weight approx.
	Rp	DN	G	l_0	l_1	l_2	a_1	a_2	b_1	b_2	M
	–			[mm]							[kg]
80/25-130	1	–	1½	130	65	84	140	27	50	50	4.0

Subject to change 09/2008 WILO SE

Series description Wilo-TOP-RL





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

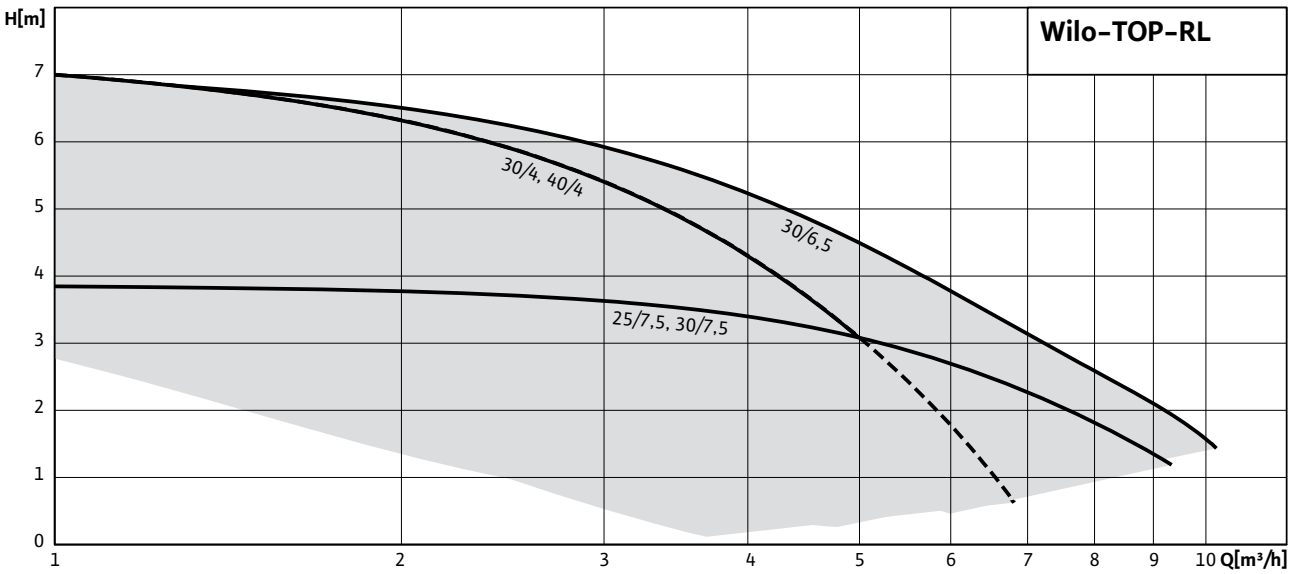
Design
Glandless circulation pump with threaded or flange connection, preselectable speed stages for power adjustment

Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo TOP-RL 40/4**
TOP-RL	Standard pump (screw-end or flange-end pump)
40/	Nominal connection diameter
4	Nominal delivery head [m] at Q = 0 m^3/h

Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Manual power adjustment with 3 speed stages.
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 40)
- Protection class IP 44



Series description Wilo-TOP-RL

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting of speed stages (3 speed stages)

Automatic functions
- Full motor protection with integrated trip electronics (optional for all types with Wilo-Protect-Module C)

External control functions
- "Overriding Off" control input (optional for all types with Wilo-Protect-Module C)

Signal and display functions
- Individual/collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Individual run signal (potential-free NO contact) (optional for all types with Wilo-Protect-Module C)
- Fault signal light (optional for all types with Wilo-Protect-Module C)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover / time-dependent pump cycling) (optional for all types with Wilo-Protect-Module C)

Scope of delivery
- Pump
- Seals for threaded connection
- Including washers for flange bolts (for nominal connection diameter DN 40)
- Installation and operating instructions

Accessories
- Screwed connections
- Pump cold water insulation Wilo ClimaForm
- Wilo-Protect-Module C for single pump (1~230 V)

Technical data Wilo-TOP-RL

	Wilo-TOP-RL ...				
	25/7,5	**30/4**	**30/6,5**	**30/7,5**	**40/4**
Approved fluids (other fluids on request)					
Heating water (in accordance with VDI 2035)	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–
Output					
Delivery head max. [m]	7.5	4	7	7.5	4.5
Max. volume flow [m^3/h]	6.5	9.0	10.0	6.5	14.0
Permitted field of application					
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-				
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)				
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-
Standard version for operating pressure, p_{max}	-	-	-	-	-
Special version for operating pressure, p_{max}	-	-	-	-	-
Pipe connections					
Screwed connection Rp	1	1¼	1¼	1¼	-
Nominal flange diameter DN	-	-	-	-	40
Flange for counter flange PN 6, standard version	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–
Electrical connection					
Mains connection 1 ~ [V], standard version	230	230	230	230	230
Mains connection 3 ~ [V], standard version	-	-	-	-	-
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-	-
Mains frequency	50	50	50	50	50

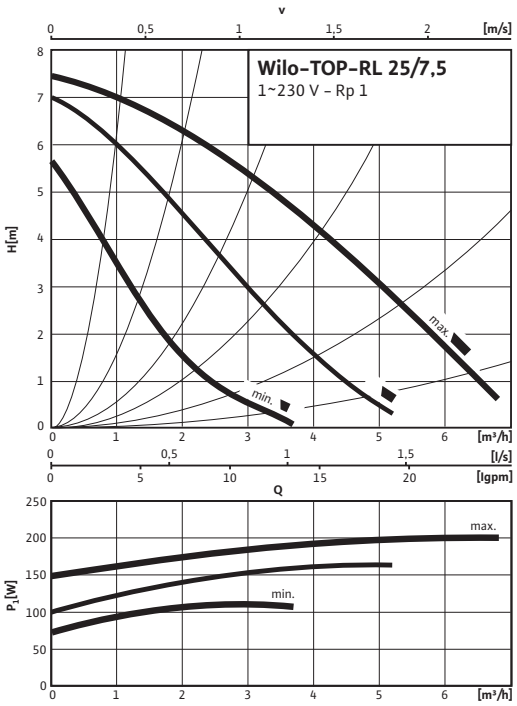
Technical data Wilo-TOP-RL

	Wilo-TOP-RL ...				
	25/7,5	**30/4**	**30/6,5**	**30/7,5**	**40/4**
Motor/electronics					
Electromagnetic compatibility	–				
Emitted interference	EN 61000-6-3				
Interference resistance	EN 61000-6-2				
Power electronics	–				
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H
Materials					
Pump housing	Grey cast iron (EN-GJL-200)				Grey cast iron (EN-GJL-250)
Impeller	Plastic (PPE), trade name: Noryl				
Pump shaft	Stainless steel (X46Cr13)				
Bearing	Carbon, metal impregnated				
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature					
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	5.0	5.0	5.0	5.0	5.0
Minimum suction head at 110°C	11.0	11.0	11.0	11.0	11.0
Minimum suction head at 130°C	24	24	24	24	24

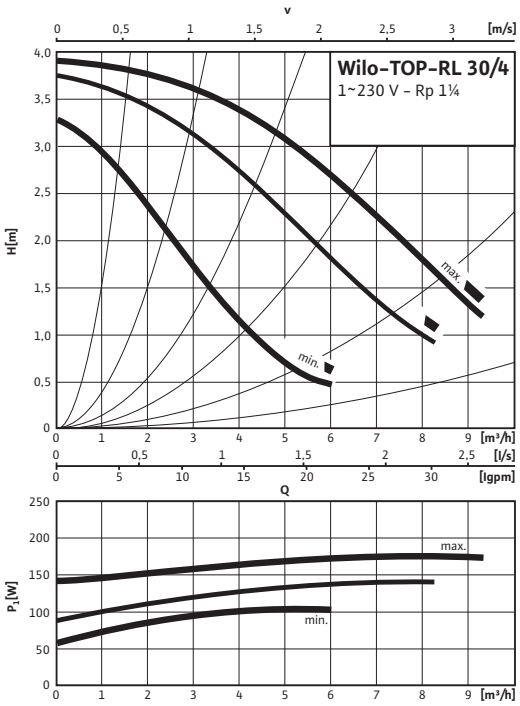
• = available, – = not available

Pump curves Wilo–TOP–RL

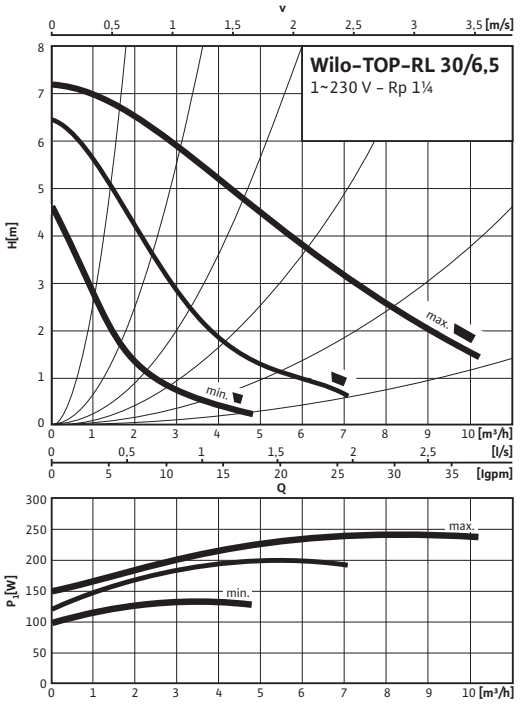
Wilo–TOP–RL 25/7,5



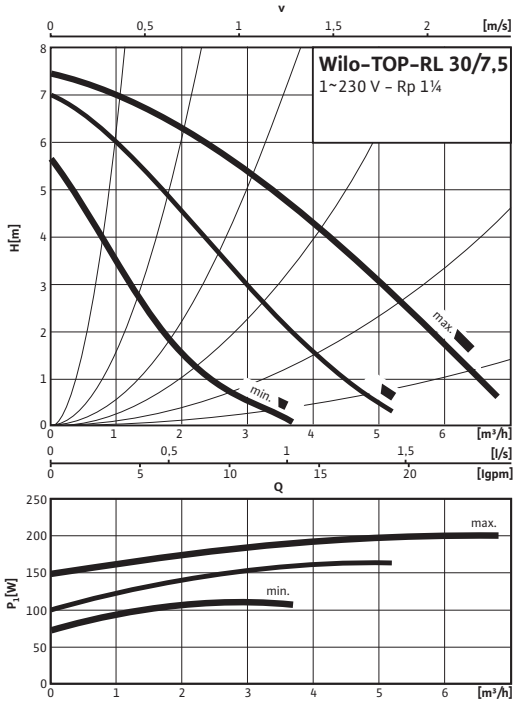
Wilo–TOP–RL 30/4



Wilo–TOP–RL 30/6,5

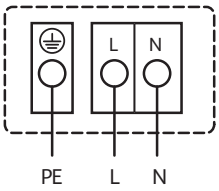


Wilo–TOP–RL 30/7,5



Terminal diagram, motor data Wilo-TOP-RL

Terminal diagram A / motor protection A



Mains connection 1~230 V, 50 Hz

Internal protection against unacceptably high winding temperatures
Triggering: Internal interruption of motor voltage
Reset: Automatic after motor has cooled down

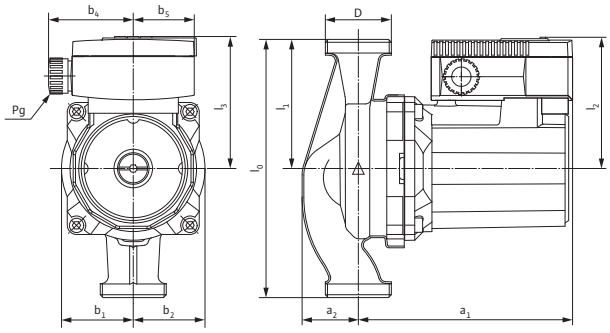
Motor data

Wilo-TOP-RL ...	Nominal motor power	Speed	Power c onsumption	Current at 1~230V	Capacitor	Threaded cable connection
	P_2	n	P_1	I	C	PG
	[W]	[rpm]	[W]	[A]	[µF/VDB]	[PG]
25/7,5	80	max. 2420 1950 min. 1350	205	1 0.8 0.6	5/400	1x13.5
30/4	70	max. 2660 2340 min. 1710	180	0.85 0.75 0.55	5/400	1x13.5
30/6,5	100	max. 2160 1480 min. 1100	245	1.2 1 0.65	5/400	1x13.5
30/7,5	80	max. 2420 1950 min. 1350	205	1 0.8 0.6	5/400	1x13.5
40/4	80	max. 2660 2330 min. 1700	180	0.85 0.75 0.55	5/400	1x13.5

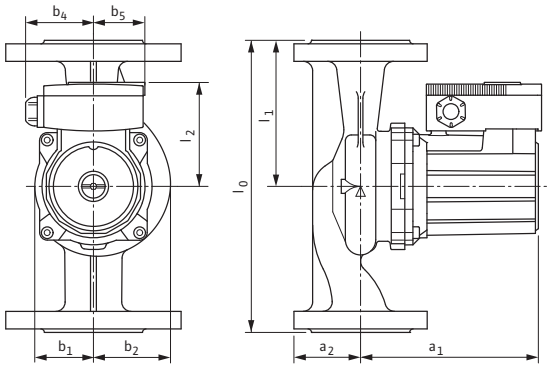
Observe name plate data!
Current I: Motor protection switch onsite setting

Dimensions, weights Wilo–TOP–RL

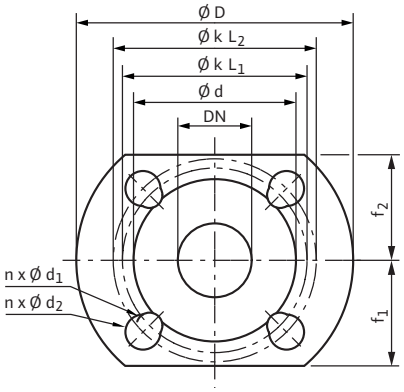
Dimension drawing A



Dimension drawing B



Dimension drawing Flange F



Dimensions, weights

Wilo–TOP–RL …	Pipe connection	Thread	Dimensions									Weight approx.
	Rp	G	l_0	l_1	l_2	a_1	a_2	b_1	b_2	b_4	b_5	M
	–		[mm]									[kg]
25/7,5	1	1½	180	90	92	150	40	50	52	60	44	3.9
30/4	1¼	2	180	90	92	156	50	53	65	60	44	4.1
30/6,5	1¼	2	180	90	92	156	50	50	65	60	43	4.7
30/7,5	1¼	2	180	90	92	150	40	50	52	60	44	4.0
40/4	-	–	250	125	92	156	60	54	66	60	43	8.0

Flange dimensions

Wilo–TOP–RL …	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	f_1	f_2	Ø d	Ø k_{L1}/k_{L2}	n x Ø d_{L1}/Ø d_{L2}	–
	–		[mm]					[pcs. x mm]	–
40/4	Flange PN16 (according to EN 1092–2)	40	150	65	65	84	100/110	4 x 14 / 19	F

n = number of drilled holes

Series description Wilo-SE



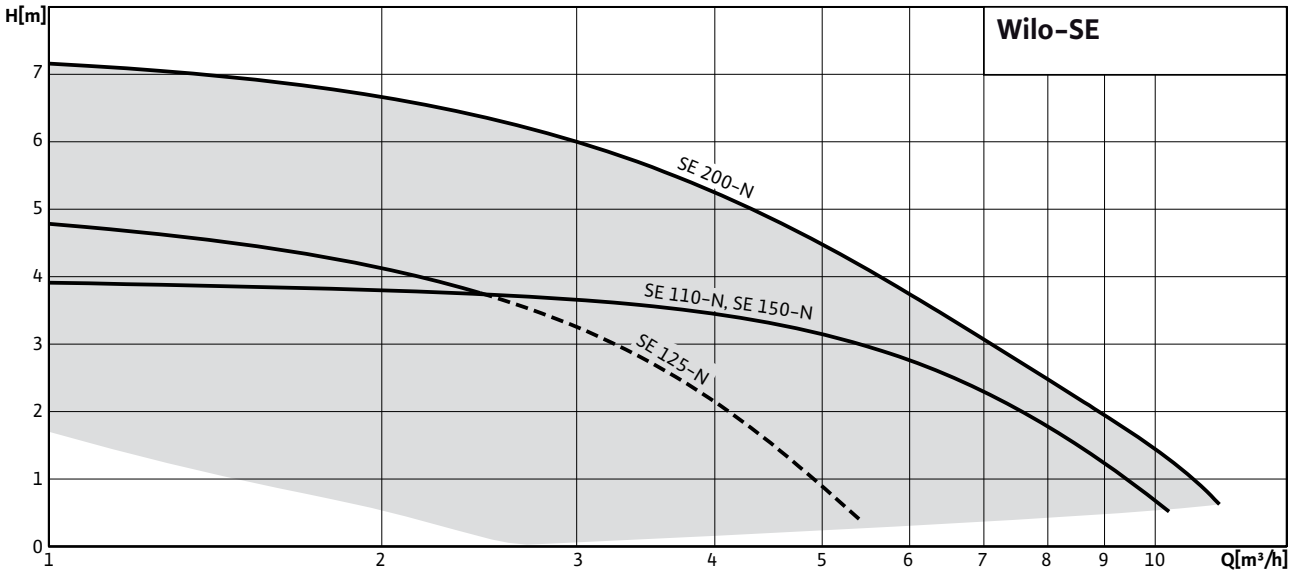
Design
Glandless circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment.

Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo-SE 150-N**
SE	Standard pump (screwed connection or flange-end pump)
150	Type of construction
n	Modified version

Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Manual power adjustment with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 40)
- With kit including seal for length compensation between the connection adapters from 244 mm to 250 mm. Standard for all pump types with flange connection
- Protection class IP 44



Series description Wilo-SE

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting of speed stages (3 speed stages)

External control functions
- "Overriding Off" control input (optional for all types with Wilo-Protect-Module C)

Signal and display functions
- Individual/collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Individual run signal (potential-free NO contact) (optional for all types with Wilo-Protect-Module C)
- Fault signal light (optional for all types with Wilo-Protect-Module C)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover / time-dependent pump cycling) (optional for all types with Wilo-Protect-Module C)

Scope of delivery
- Pump
- Seals for threaded connection
- Washers for flange screws (for nominal connection diameter 40)
- Installation and operating instructions

Accessories
- Screwed connections with screw thread
- Pump cold water insulation Wilo ClimaForm
- Wilo-Protect-Module C for single pump (1~230 V)

Technical data Wilo-SE

	Wilo-SE ...			
	110-N	**125-N**	**150-N**	**200-N**
Approved fluids (other fluids on request)				
Heating water (in accordance with VDI 2035)	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–
Output				
Delivery head max. [m]	4	5	4	7
Max. volume flow [m^3/h]	9	5	10	11
Permitted field of application				
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-			
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)			
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-
Standard version for operating pressure, p_{max}	10	10	10	10
Special version for operating pressure, p_{max}	-	-	-	-
Pipe connections				
Screwed connection Rp	1¼	1	-	-
Nominal flange diameter DN	–	–	40	40
Flange for counter flange PN 6, standard version	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–
Electrical connection				
Mains connection 1 ~ [V], standard version	230	230	230	230
Mains connection 3 ~ [V], standard version	-	-	-	-
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-
Mains frequency	50	50	50	50

Technical data Wilo-SE

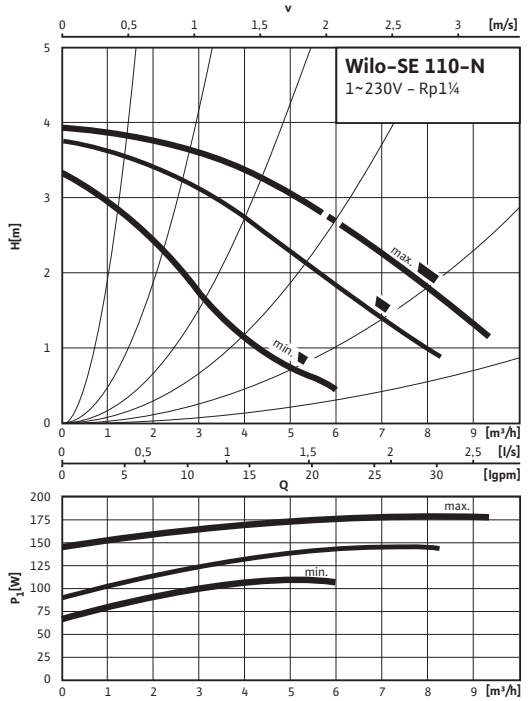
	Wilo-SE …			
	110-N	**125-N**	**150-N**	**200-N**
Motor/electronics				
Electromagnetic compatibility	–			
Emitted interference	EN 61000-6-3			
Interference resistance	EN 61000-6-2			
Power electronics	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H
Materials				
Pump housing	Grey cast iron (EN-GJL-200)		Grey cast iron (EN-GJL-250)	
Impeller	Plastic (PPE), trade name: Noryl			
Pump shaft	Stainless steel (X40Cr13)			
Bearing	Carbon, metal impregnated			
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature				
Minimum suction head at 50°C	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	5.0	5.0	5.0	5.0
Minimum suction head at 110°C	11.0	11.0	11.0	11.0
Minimum suction head at 130°C	24	24	24	24

• = available, – = not available

Pump curves Wilo–SE

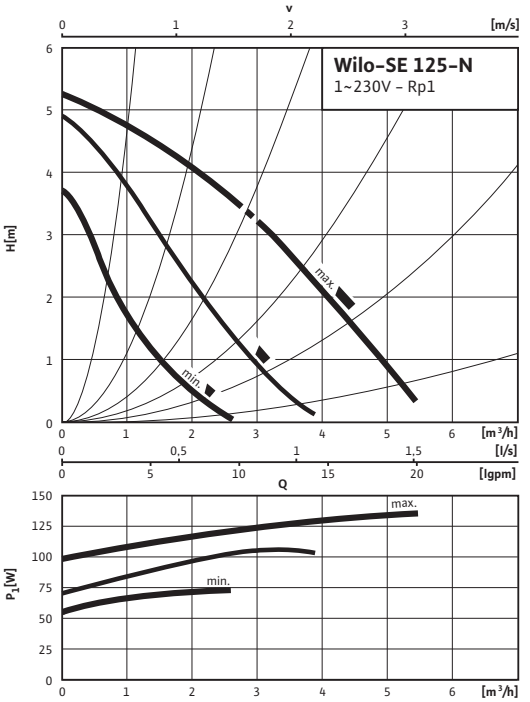
Wilo–SE 110–N

Individual operation



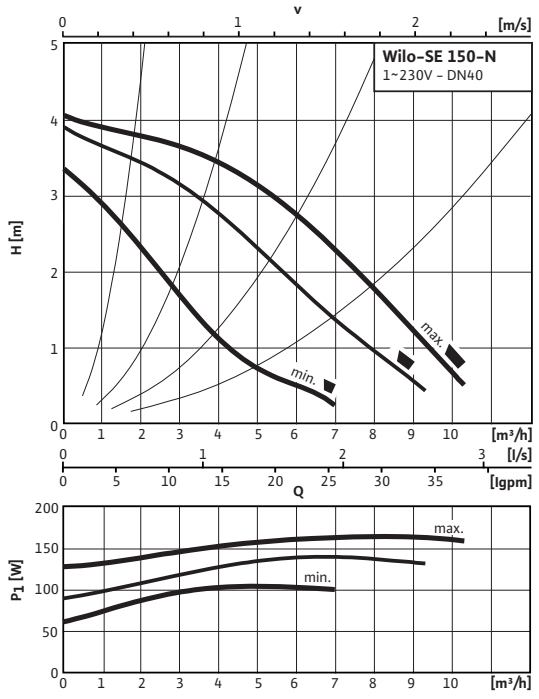
Wilo–SE 125–N

Individual operation



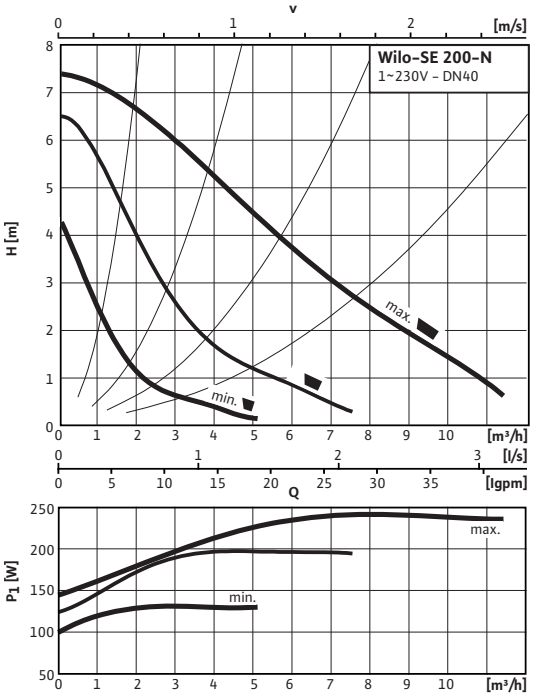
Wilo–SE 150–N

Individual operation



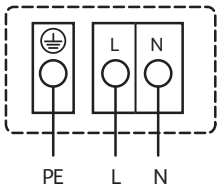
Wilo–SE 200–N

Individual operation



Terminal diagram, motor data Wilo-SE

Terminal diagram A / motor protection A



Mains connection 1~230 V, 50 Hz

Internal protection against unacceptably high winding temperatures
Triggering: Internal interruption of motor voltage
Reset: Automatic after motor has cooled down

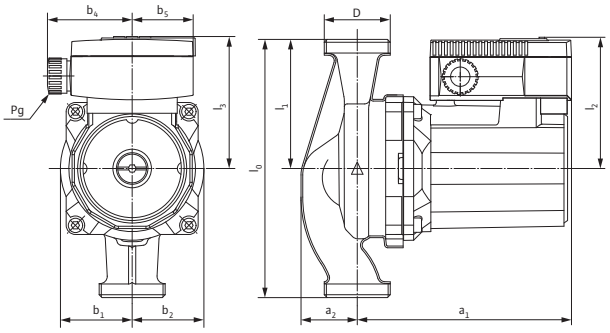
Motor data

Wilo-SE ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Capacitor	Threaded cable connection
	P_2	n	P_1	I	C	PG
	[W]	[rpm]	[W]	[A]	[µF/VDB]	[PG]
110-N	70	max. 2660 2340 min. 1710	180	0.85 0.75 0.55	5.0/400	1x13.5
125-N	50	max. 2320 1640 min. 1200	140	0.65 0.55 0.35	3.7/400	1x13.5
150-N	80	max. 2660 2330 min. 1700	180	0.85 0.75 0.55	5.0/400	1x13.5
200-N	100	max. 2080 1410 min. 900	245	1.2 1 0.7	5.0/400	1x13.5

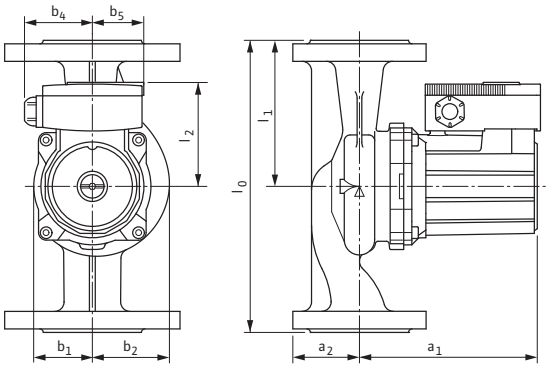
Observe name plate data!
Current I: Motor protection switch onsite setting

Dimensions, weights Wilo-SE

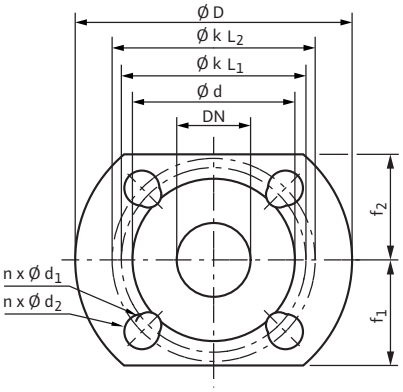
Dimension drawing A



Dimension drawing B



Dimension drawing Flange F



Dimensions, weights

Wilo-SE ...	Pipe connection	Nominal flange diameter	Thread	Dimensions									Weight approx.	Dimension drawing
	Rp	DN	G	l_0	l_1	l_2	a_1	a_2	b_1	b_2	b_4	b_5	M	–
	–			[mm]									[kg]	–
110-N	1¼	–	2	180	90	92	156	50	53	65	60	44	4.1	A
125-N	1	–	1½	180	90	92	150	40	50	52	60	44	3.7	A
150-N	-	40	–	244	125	92	156	60	54	66	60	43	7.3	B
200-N	-	40	–	244	125	92	156	60	54	66	60	43	7.9	B

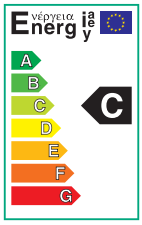
Flange dimensions

Wilo-SE ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	f_1	f_2	Ø d	Ø k_{L1}/k_{L2}	n x Ø d_{L1}/Ø d_{L2}	–
	–		[mm]					[pcs. x mm]	–
150-N	Flange PN16 (according to EN 1092-2)	40	150	65	65	84	100/110	4 x 14 / 19	F
200-N	Flange PN16 (according to EN 1092-2)	40	150	65	65	84	100/110	4 x 14 / 19	F

n = number of drilled holes

Series description Wilo-TOP-S





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

Design
Glandless circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment.

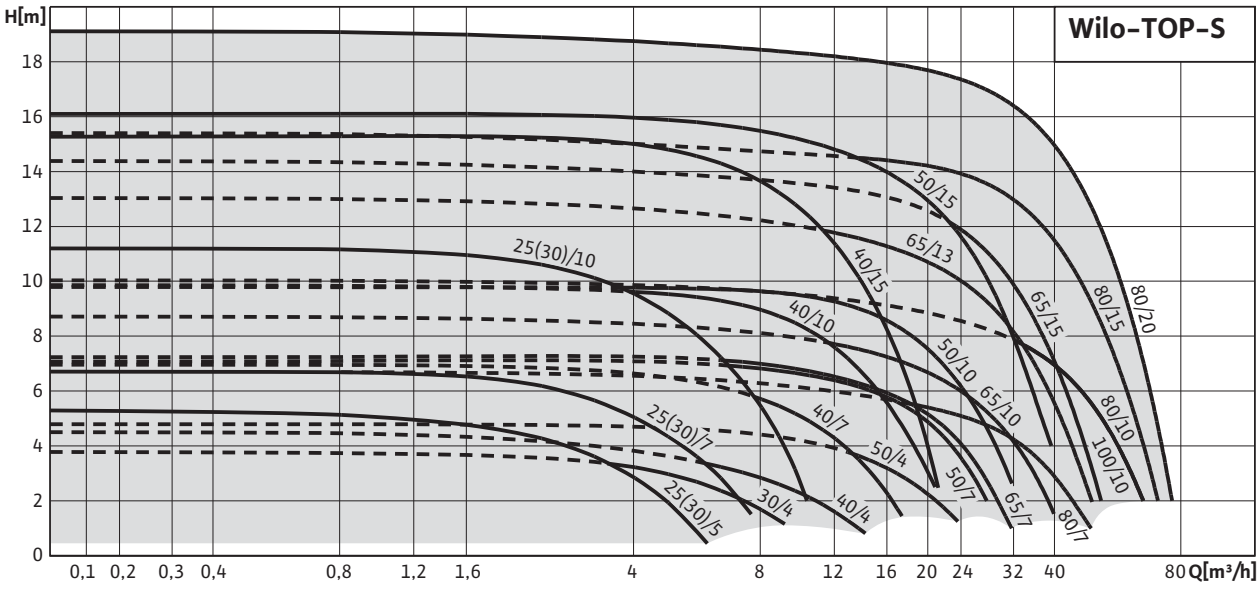
Application
Hot-water heating systems of all kinds, industrial circulation systems, air-conditioning systems and closed cooling circuits

Type key

Example:	**TOP-S 40/10**
TOP-S	Standard pump (screw-end or flange-end pump)
40/	Nominal connection diameter
10	Nominal delivery head range [m] at Q = 0 m^3/h

Options
- Special version for operating pressure PN 16 (at additional charge)
- Version for special voltages on request.

Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Manual power adjustment with 2 speed stages (for pumps 1~230 V with $P_2 \geq 350$ W) or with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- With thermal insulation as standard
- Simple installation due to combination flange PN 6/PN 10 (for DN 40 to DN 65)
- Cable feed in to terminal box possible on both sides (from $P_2 \geq 180$ W) with integrated strain relief device
- Protection class IP 44



Series description Wilo-TOP-S

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting the speed stages: 3 speed stages (2 speed stages for 1~pumps with $P_2 \geq 350$ W)

Automatic functions
- Full motor protection with integrated trip electronics (standard equipment only for 3~pumps with $P_2 \geq 180$ W and 1~pumps with $P_2 \geq 350$ W, optional for all types with Wilo-Protect-Module C)

External control functions
- "Overriding Off" control input (optional for all types with Wilo-Protect-Module C)

Signal and display functions
- Individual/collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C) collective fault signal (potential-free NC contact) (standard equipment only for 3~pumps with $P_2 \geq 180$ W and 1~pumps with $P_2 \geq 350$ W, optional for all types with Wilo-Protect-Module C)
- Individual run signal (potential-free NO contact) (optional for all types with Wilo-Protect-Module C)
- Thermal winding contact (WSK, potential-free NC contact) (only for 1~pumps with $P_2 = 180$ W)
- Fault signal light (standard equipment only for 3~pumps with $P_2 \geq 180$ W and 1~pumps with $P_2 \geq 350$ W, optional for all types with Wilo-Protect-Module C)
- Direction-of-rotation control light

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): optional for all types with Wilo-Protect-Module C

Equipment
- Cable lead-in possible from both sides (only for 1~pumps and 3~pumps with $P_2 \geq 180$ W)

Scope of delivery
- Pump
- Thermal insulation
- Including seals for threaded connection
- Washers for flange screws (for nominal connection diameters DN 40 - DN 65)
- Installation and operating instructions

Accessories
- Screwed connections with screw thread
- For pumps 3~400 V:
  - Switching plug 3~230 V, 50 Hz
  - Wilo-Protect-Module C, 3~400 V
- For pumps 1~230 V:
  - Wilo-SK 602/SK 622 tripping unit for full motor protection
  - Wilo-Protect-Module C, 1~230 V
- Pump cold water insulation Wilo ClimaForm

Technical data Wilo-TOP-S

	Wilo-TOP-S ...							
	25/5	**25/7**	**25/10**	**25/13**	**30/4**	**30/5**	**30/7**	**30/10**
Approved fluids (other fluids on request)								
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–
Output								
Delivery head max. [m]	5	7	11.5	13	4	5	7	11.5
Max. volume flow [m^3/h]	5	7.5	10.3	4	9	5	7.5	10
Permitted field of application								
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-							
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)			-20 up to +110 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)			
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	-	-	16	-	-	-	-	16
Pipe connections								
Screwed connection Rp	1	1	1	1	1¼	1¼	1¼	1¼
Nominal flange diameter DN	–	–	–	–	–	–	–	–
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	-	-	-	-	-	-	-	-
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–

Technical data Wilo-TOP-S

	Wilo-TOP-S ...							
	25/5	**25/7**	**25/10**	**25/13**	**30/4**	**30/5**	**30/7**	**30/10**
Electrical connection								
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	400	400	400	400	400	400	400	400
Mains connection 3 ~ [V], with optional switching plug	230	230	230	230	230	230	230	230
Mains frequency	50	50	50	50	50	50	50	50
Motor/electronics								
Electromagnetic compatibility	–							
Emitted interference	EN 61000-6-3							
Interference resistance	EN 61000-6-2							
Power electronics	–	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H	H
Materials								
Pump housing	Grey cast iron (EN-GJL-200)							
Impeller	Plastic (PPE), trade name: Noryl	Plastic (PP – 50% GF)		Plastic (PPE), trade name: Noryl			Plastic (PP – 50% GF)	
Pump shaft	Stainless steel (X46Cr13)							
Bearing	Carbon, metal impregnated							
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature								
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	5	5	5	5	5	5	5	5
Minimum suction head at 110°C	11	11	11	11	11	11	11	11
Minimum suction head at 130°C	24	24	24	–	24	24	24	24

• = available, – = not available

Technical data Wilo-TOP-S

	Wilo-TOP-S ...									
	40/4	**40/7**	**40/10**	**40/15**	**50/4**	**50/7**	**50/10**	**50/15**	**65/7**	**65/10**
Approved fluids (other fluids on request)										
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–	–
Output										
Delivery head max. [m]	4.5	7	10	15	5	7	10	16	7	8
Max. volume flow [m^3/h]	14	16.5	21	21	23	28	32	39	32	40
Permitted field of application										
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-									
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)									
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/10	6/10
Special version for operating pressure, p_{max}	16	16	16	16	16	16	16	16	16	16
Pipe connections										
Screwed connection Rp	-	-	-	-	-	-	-	-	-	-
Nominal flange diameter DN	40	40	40	40	50	50	50	50	65	65
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	•	•	•	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•	•	•	•	•	•	•	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	•	•	•	•	•	•	•	•	•	•
Electrical connection										
Mains connection 1 ~ [V], standard version	230	230	-	-	230	-	-	-	-	-
Mains connection 3 ~ [V], standard version	400	400	400	400	400	400	400	400	400	400
Mains connection 3 ~ [V], with optional switching plug	230	230	230	230	230	230	230	230	230	230
Mains frequency	50	50	50	50	50	50	50	50	50	50

Technical data Wilo-TOP-S

	Wilo-TOP-S ...									
	40/4	**40/7**	**40/10**	**40/15**	**50/4**	**50/7**	**50/10**	**50/15**	**65/7**	**65/10**
Motor/electronics										
Electromagnetic compatibility	–									
Emitted interference	EN 61000-6-3									
Interference resistance	EN 61000-6-2									
Power electronics	–	–	–	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H	H	H	H
Materials										
Pump housing	Grey cast iron (EN-GJL-250)									
Impeller	Plastic (PP – 50% GF)									
Pump shaft	Stainless steel (X46Cr13)									
Bearing	Carbon, metal impregnated									
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature										
Minimum suction head at 50°C	0.5	0.5	0.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum suction head at 95°C	5	5	5	10	10	10	10	10	10	10
Minimum suction head at 110°C	11	11	11	16	16	16	16	16	16	16
Minimum suction head at 130°C	24	24	24	29	29	29	29	29	29	29

• = available, – = not available

Technical data Wilo-TOP-S

	Wilo-TOP-S ...						
	65/13	**65/15**	**80/7**	**80/10**	**80/15**	**80/20**	**100/10**
Approved fluids (other fluids on request)							
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–
Output							
Delivery head max. [m]	13	15	7	10	15.5	19	10
Max. volume flow [m^3/h]	49	52	49	65	70	76.5	65
Permitted field of application							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-						
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)				-20 up to +110		-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	6/10	6/10	6	6	6	6	6
Special version for operating pressure, p_{max}	16	16	10/16	10/16	10/16	10/16	10/16
Pipe connections							
Screwed connection Rp	-	-	-	-	-	-	-
Nominal flange diameter DN	65	65	80	80	80	80	100
Flange for counter flange PN 6, standard version	–	–	•	•	•	•	•
Flange for counter flange PN 16, special version	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	•	•	•	•	•	•	•

Technical data Wilo-TOP-S

	Wilo-TOP-S ...						
	65/13	**65/15**	**80/7**	**80/10**	**80/15**	**80/20**	**100/10**
Electrical connection							
Mains connection 1 ~ [V], standard version	–	–	–	–	–	–	–
Mains connection 3 ~ [V], standard version	400	400	400	400	400	400	400
Mains connection 3 ~ [V], with optional switching plug	230	230	230	230	–	–	230
Mains frequency	50	50	50	50	50	50	50
Motor/electronics							
Electromagnetic compatibility	–						
Emitted interference	EN 61000-6-3						
Interference resistance	EN 61000-6-2						
Power electronics	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H
Materials							
Pump housing	Grey cast iron (EN-GJL-250)						
Impeller	Plastic (PP - 50% GF)						
Pump shaft	Stainless steel (X46Cr13)						
Bearing	Carbon, metal impregnated						
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature							
Minimum suction head at 50°C	3.0	3.0	3.0	3.0	9.0	9.0	3.0
Minimum suction head at 95°C	10	10	10	10	18	18	10
Minimum suction head at 110°C	16	16	16	16	23	23	16
Minimum suction head at 130°C	29	29	29	29	36	36	29

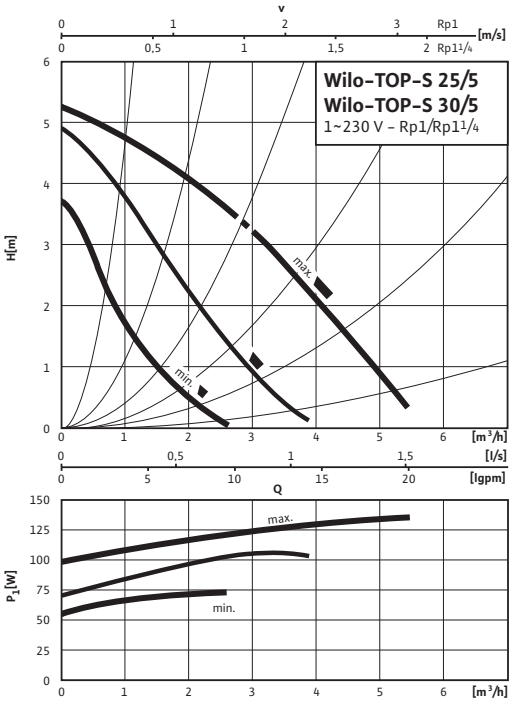
• = available, – = not available

Subject to change 09/2008 WILO SE

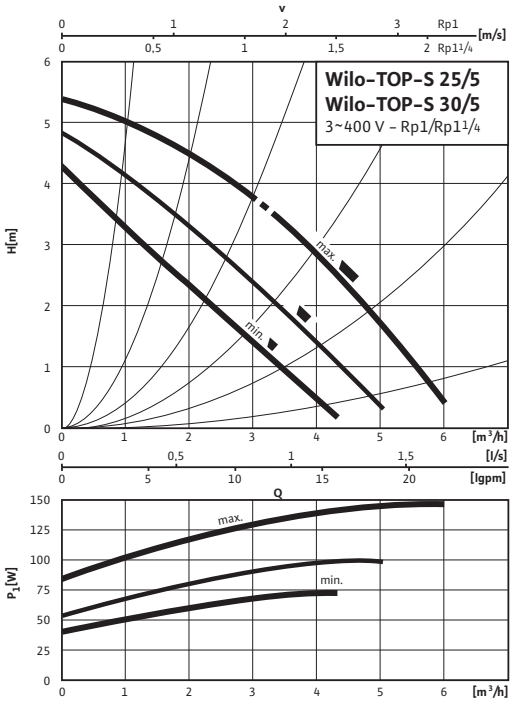
Pump curves Wilo–TOP–S

Wilo–TOP–S 25/5, 30/5

Single–phase current

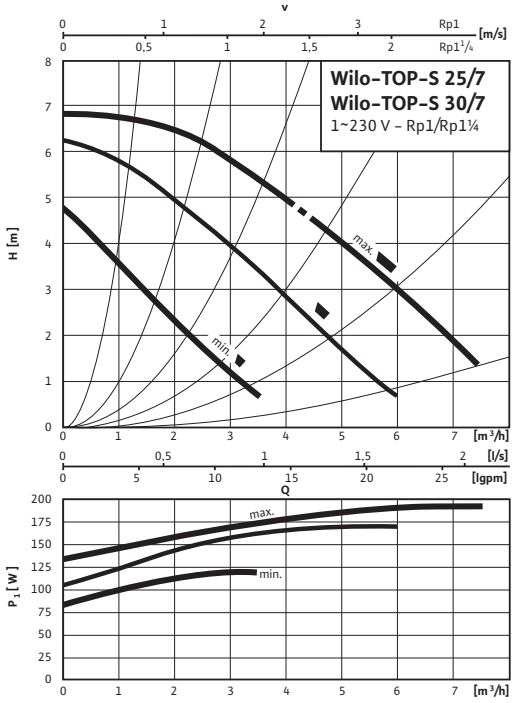


Three–phase current

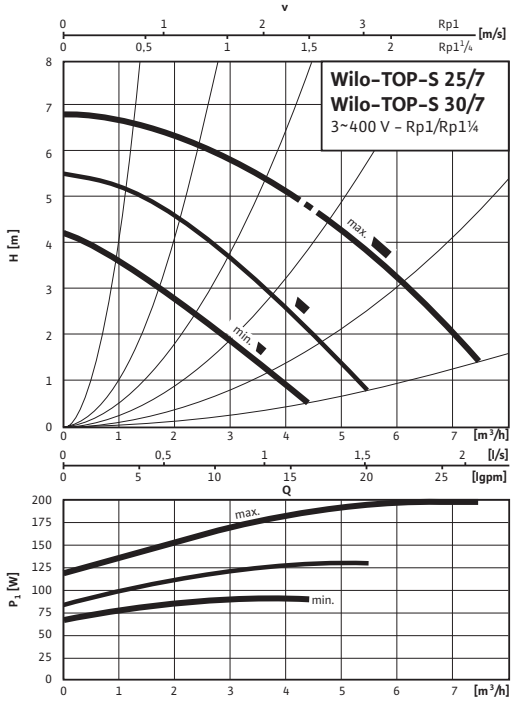


Wilo–TOP–S 25/7, 30/7

Single–phase current



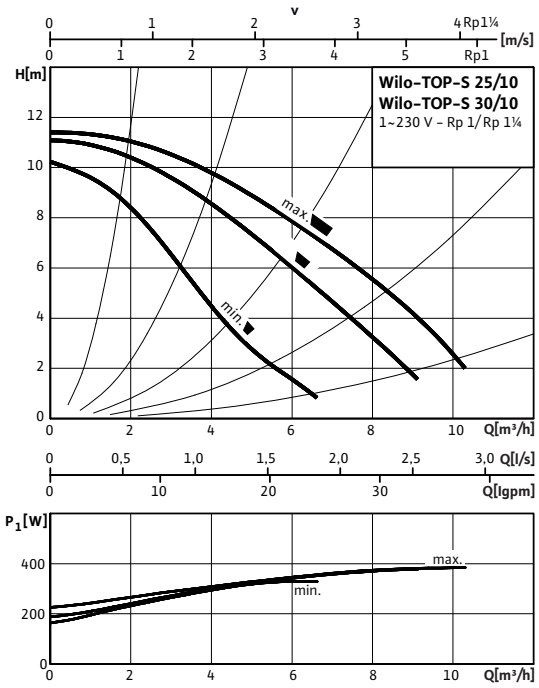
Three–phase current



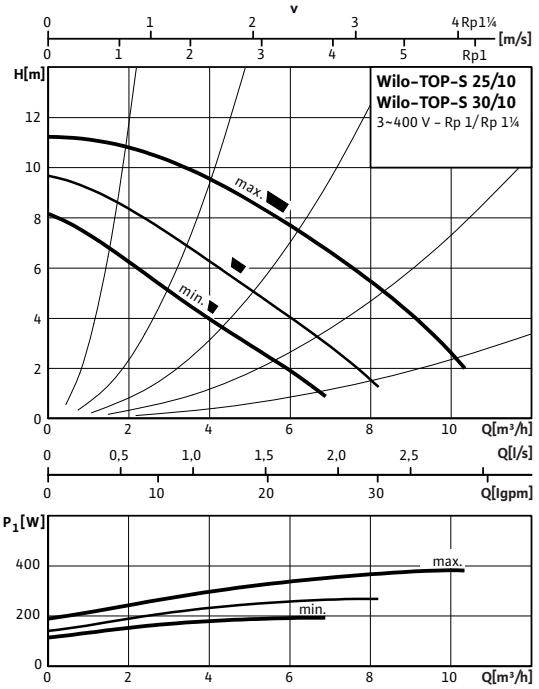
Pump curves Wilo–TOP–S

Wilo–TOP–S 25/10, 30/10

Single–phase current

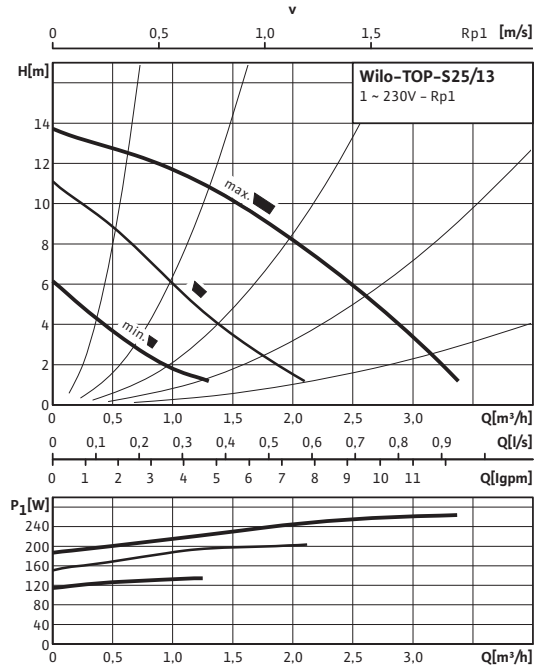


Three–phase current

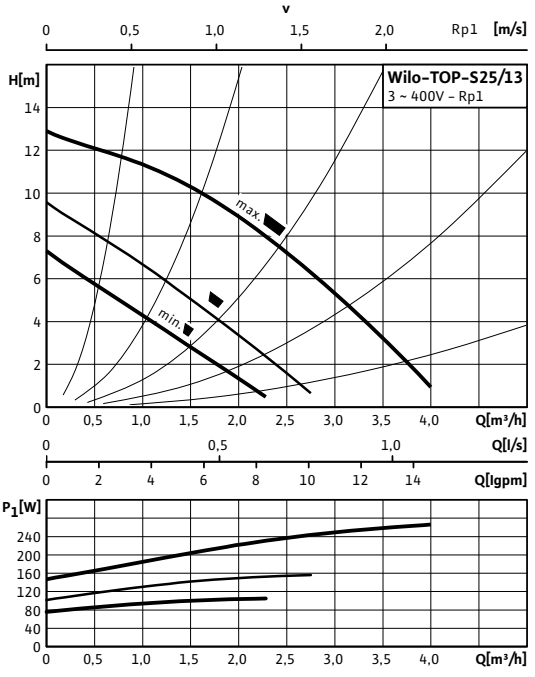


Wilo–TOP–S 25/13

Single–phase current



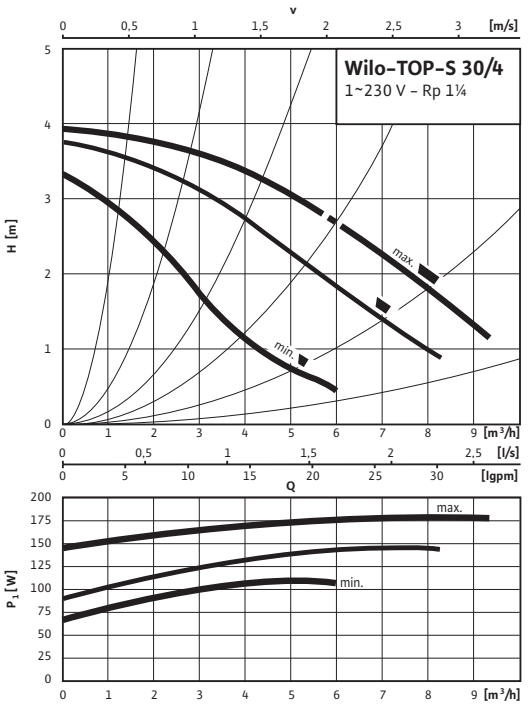
Three–phase current



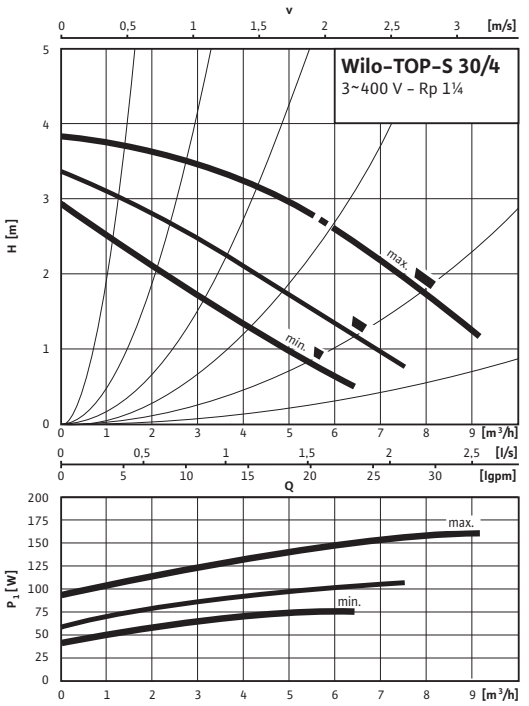
Pump curves Wilo–TOP–S

Wilo–TOP–S 30/4

Single–phase current

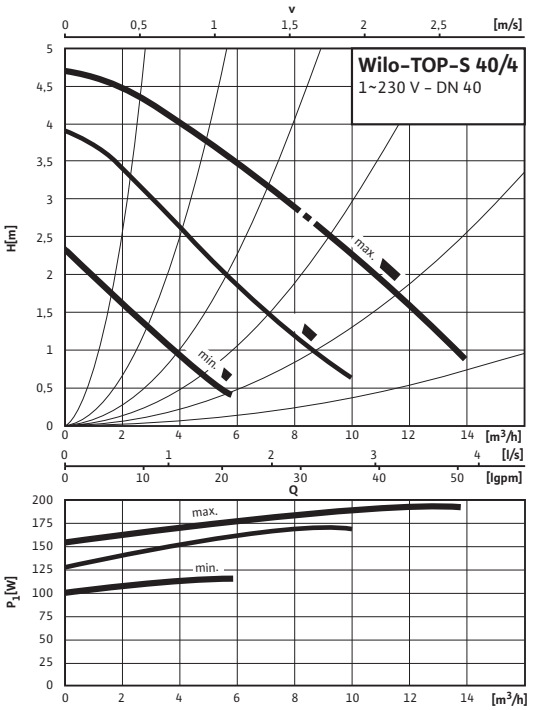


Three–phase current

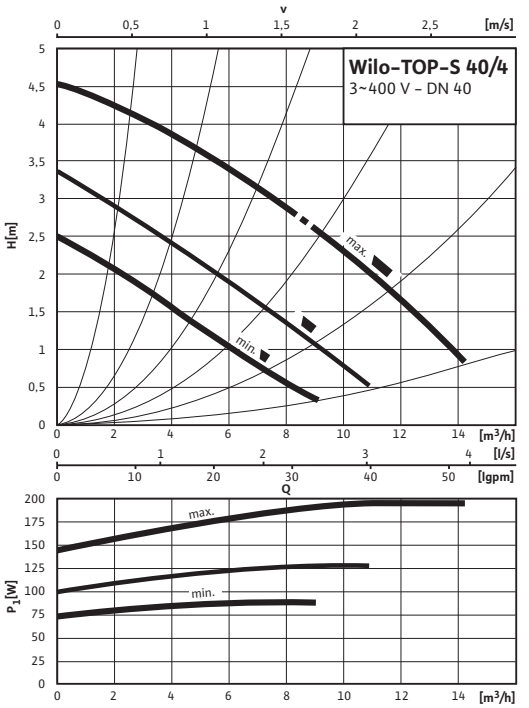


Wilo–TOP–S 40/4

Single–phase current



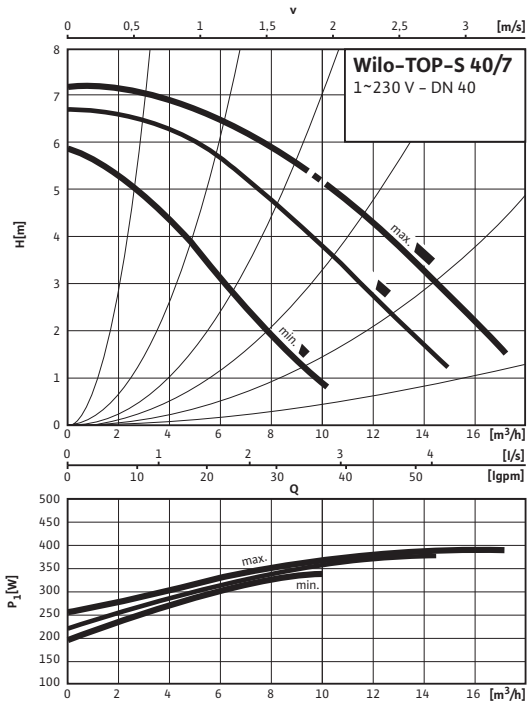
Three–phase current



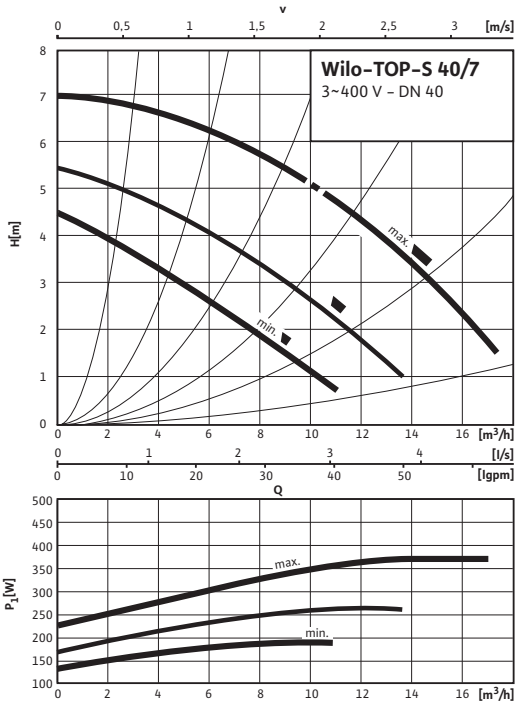
Pump curves Wilo–TOP–S

Wilo–TOP–S 40/7

Single–phase current

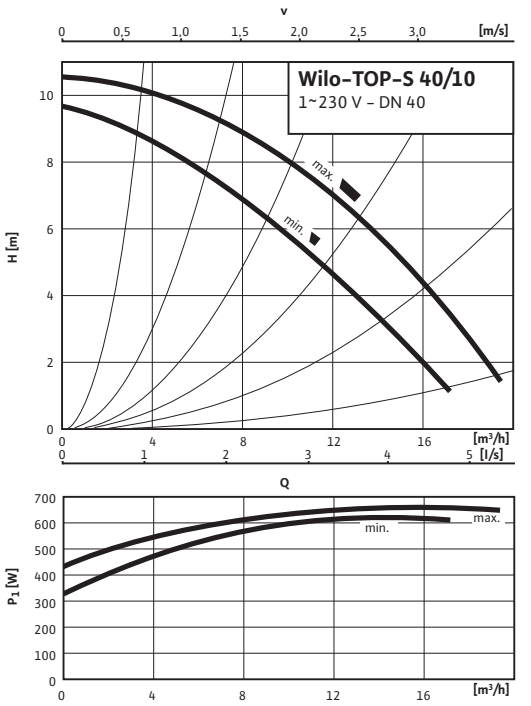


Three–phase current

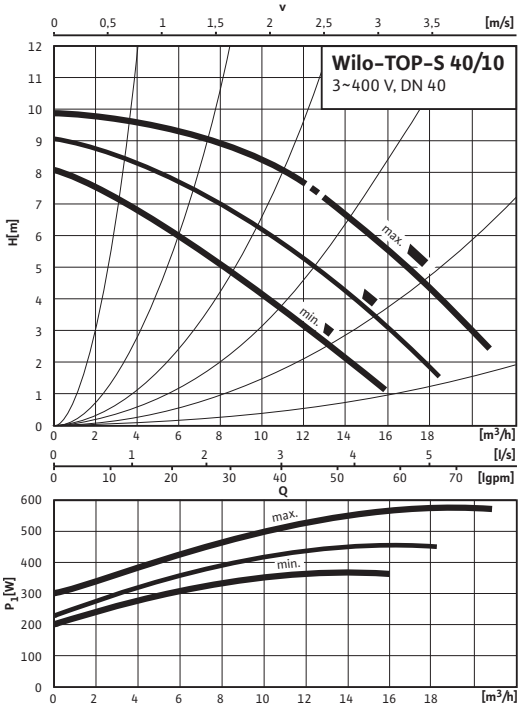


Wilo–TOP–S 40/10

Single–phase current



Three–phase current

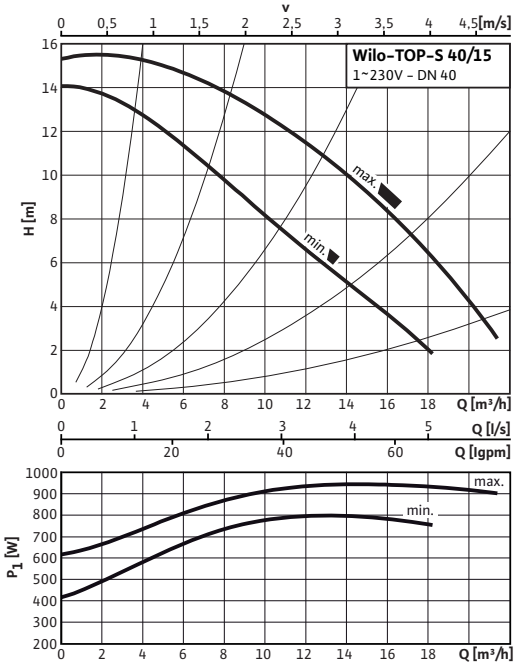


Subject to change 09/2008 WILO SE

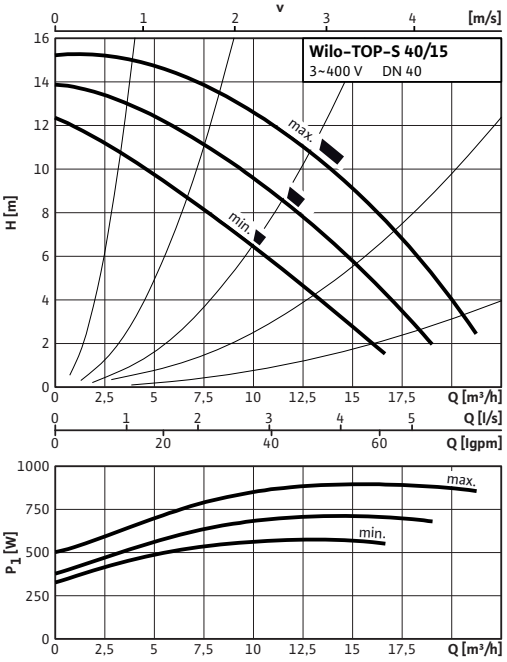
Pump curves Wilo–TOP–S

Wilo–TOP–S 40/15

Single–phase current

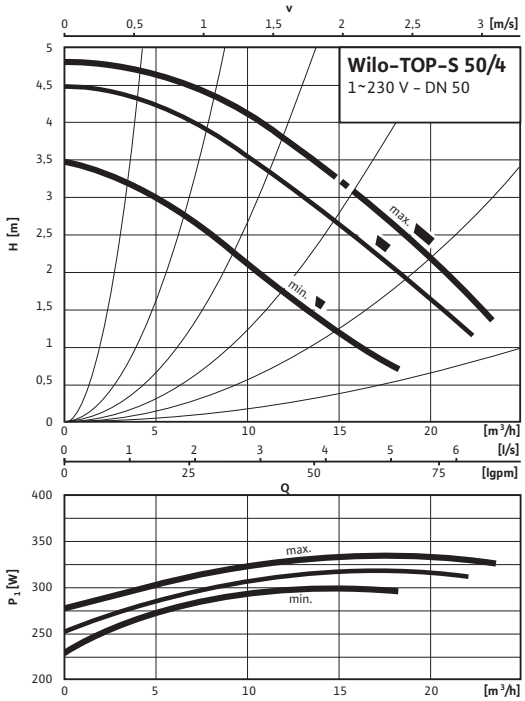


Three–phase current

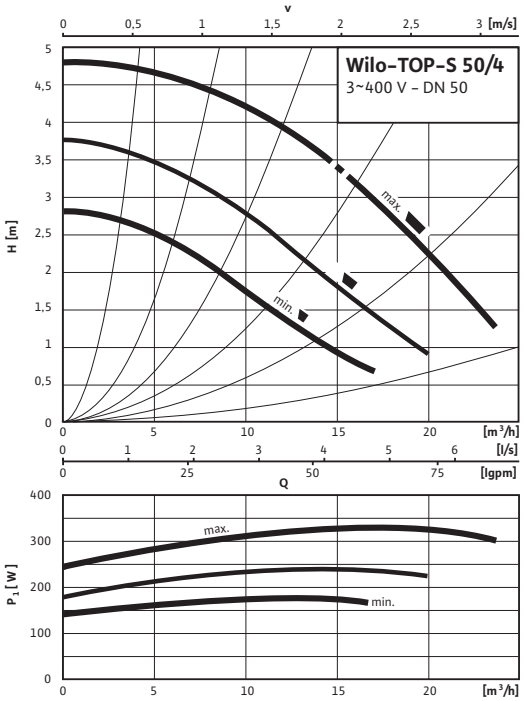


Wilo–TOP–S 50/4

Single–phase current



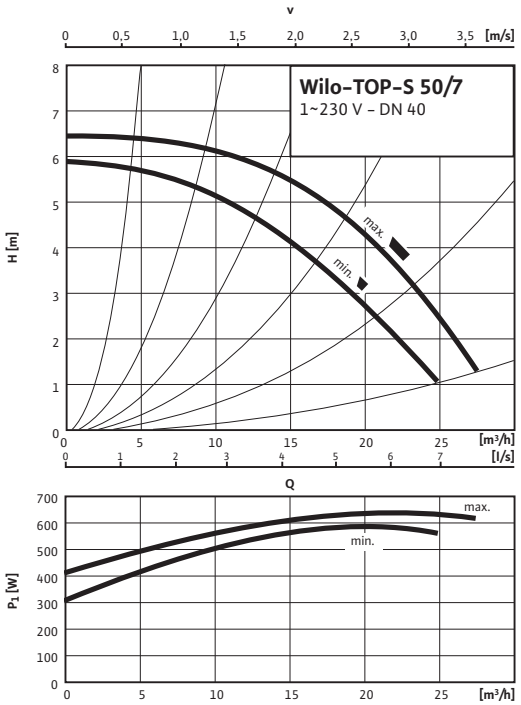
Three–phase current



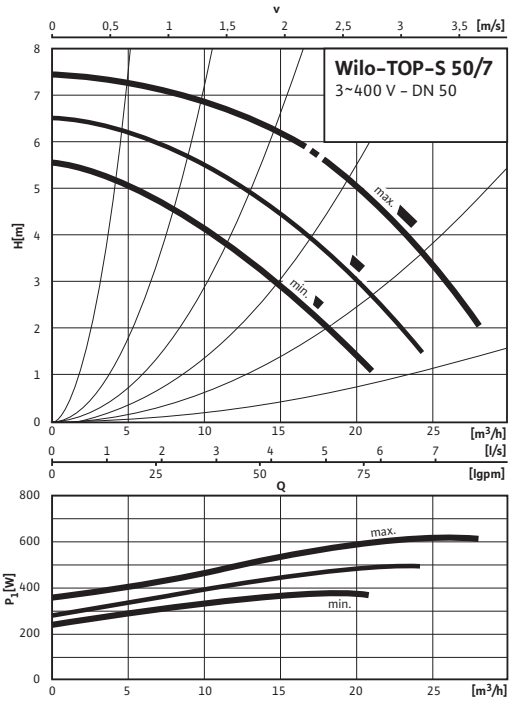
Pump curves Wilo–TOP–S

Wilo–TOP–S 50/7

Single–phase current

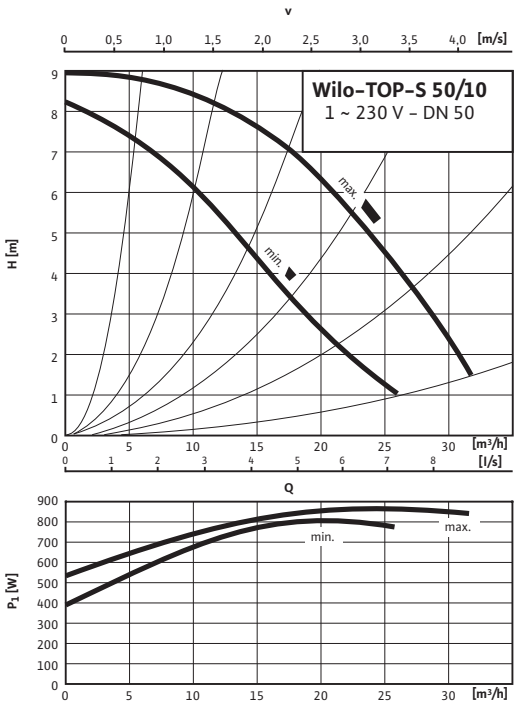


Three–phase current

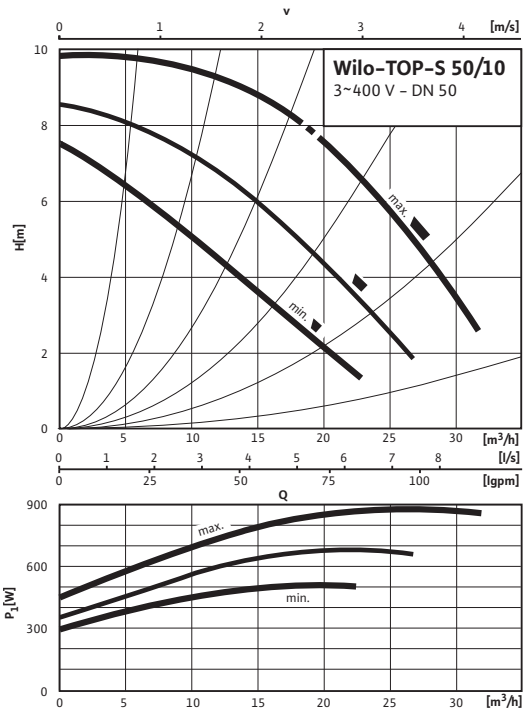


Wilo–TOP–S 50/10

Single–phase current



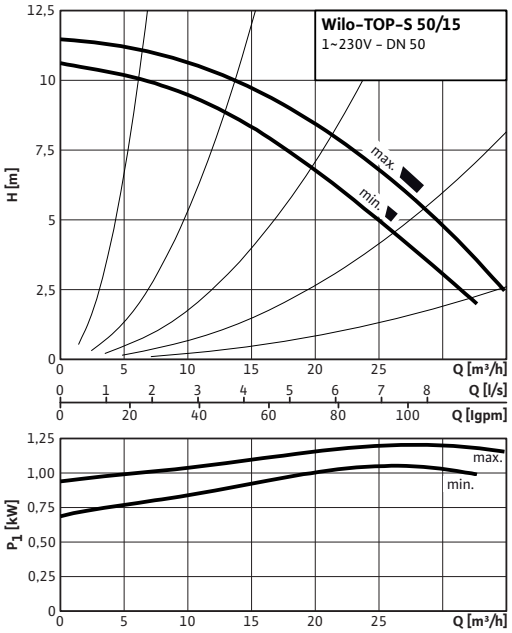
Three–phase current



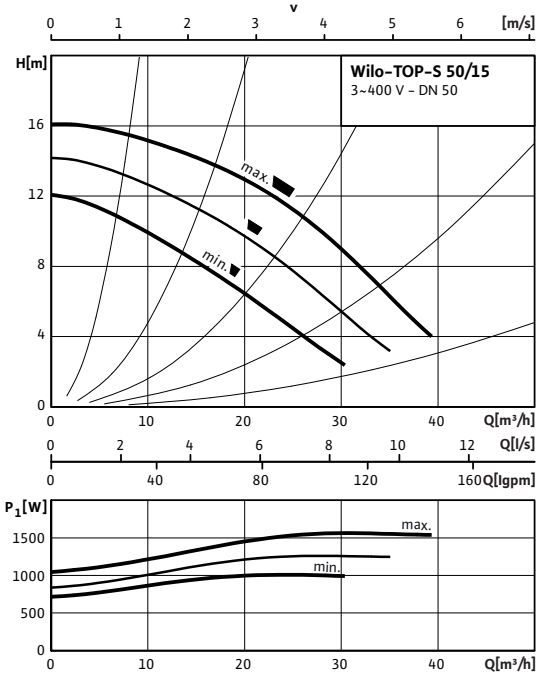
Pump curves Wilo–TOP–S

Wilo–TOP–S 50/15

Single–phase current

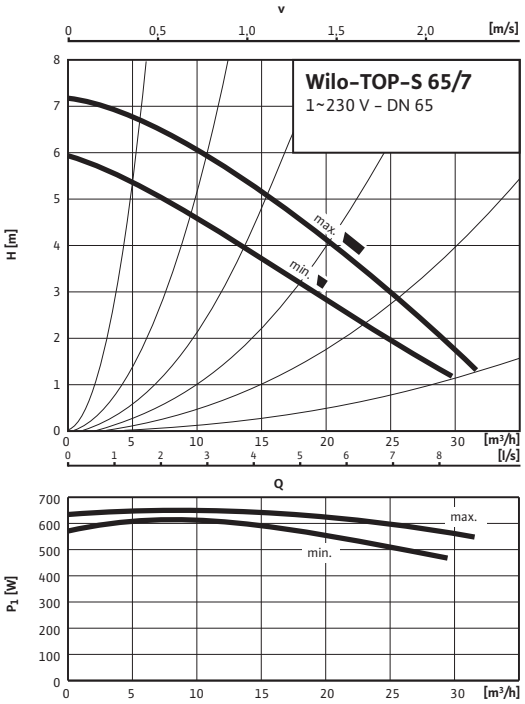


Three–phase current

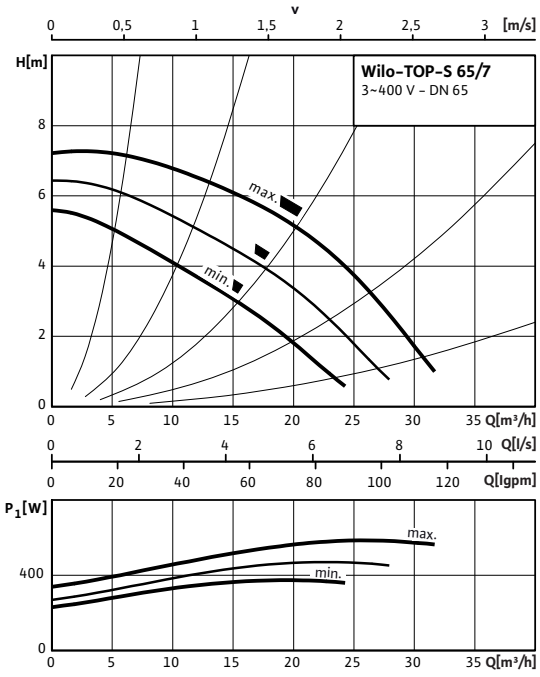


Wilo–TOP–S 65/7

Single–phase current



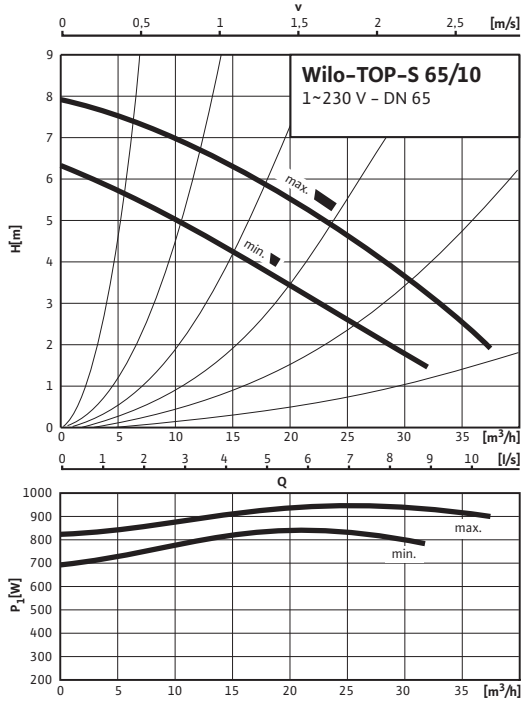
Three–phase current



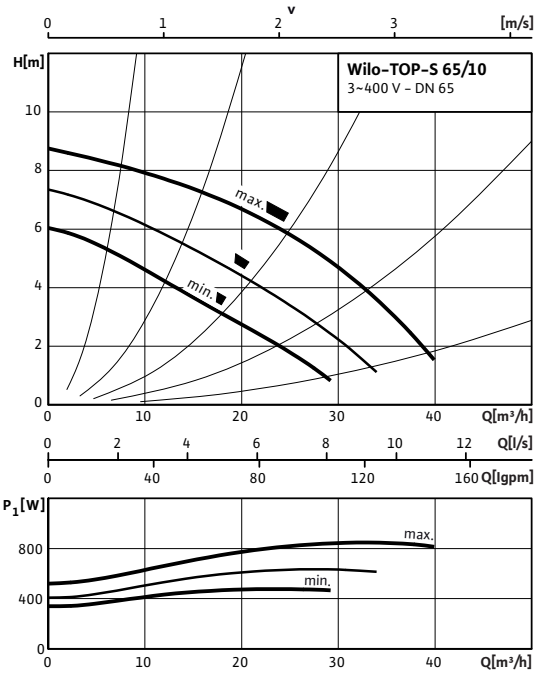
Pump curves Wilo–TOP–S

Wilo–TOP–S 65/10

Single–phase current

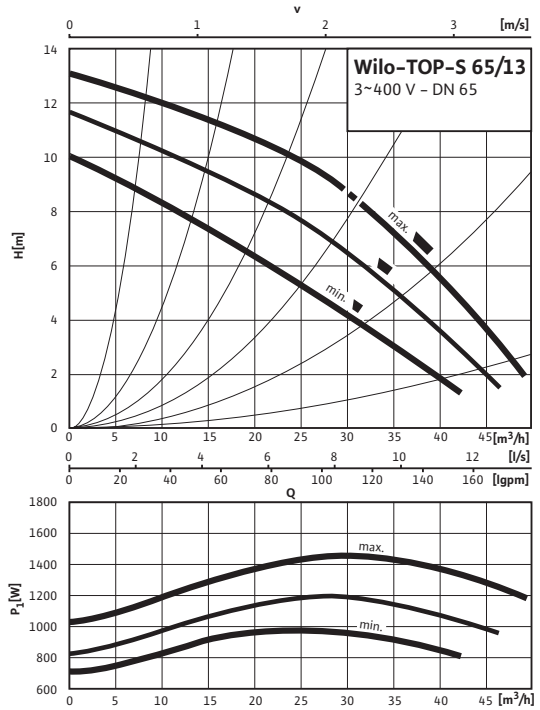


Three–phase current

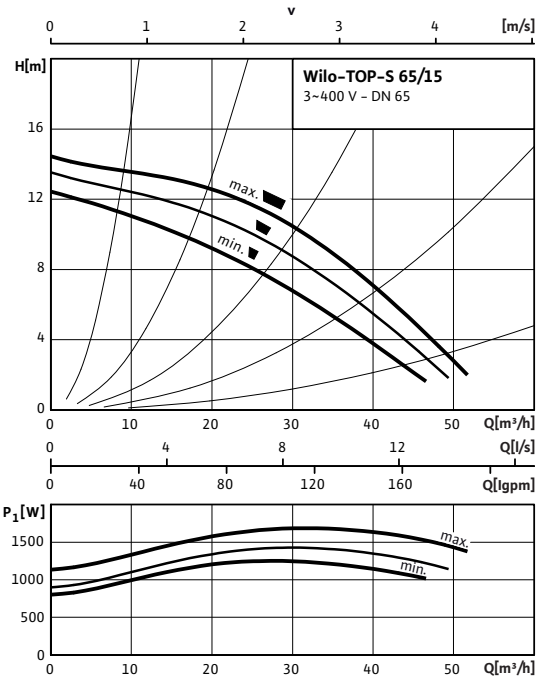


Wilo–TOP–S 65/13

Three–phase current



Three–phase current

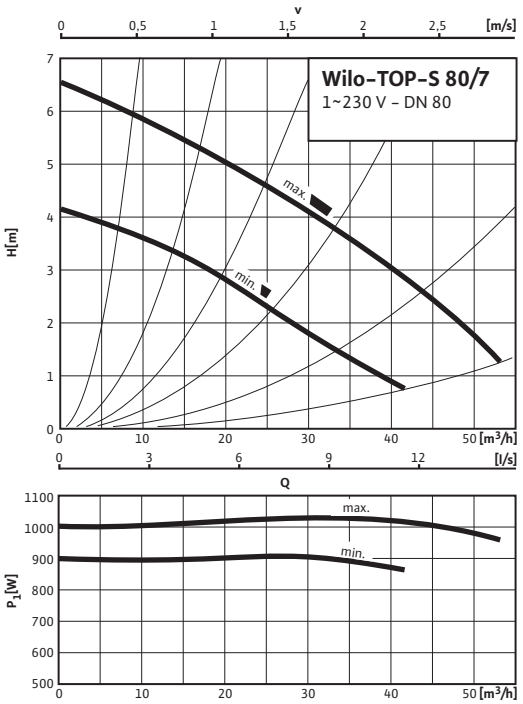


Subject to change 09/2008 WILO SE

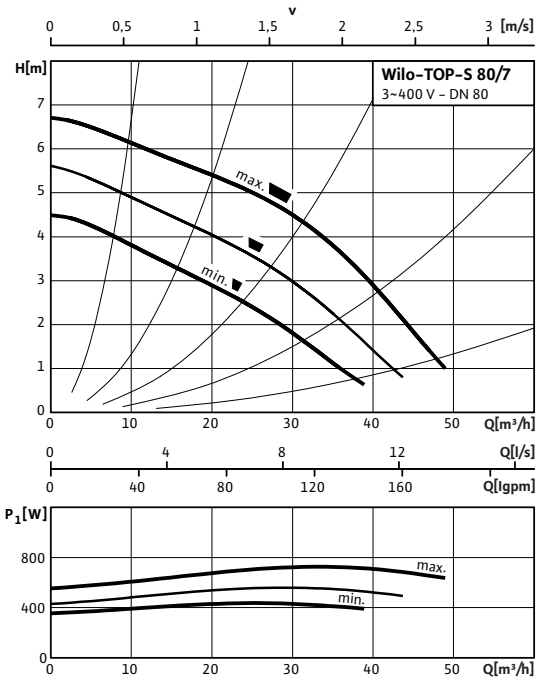
Pump curves Wilo–TOP–S

Wilo–TOP–S 80/7

Single–phase current

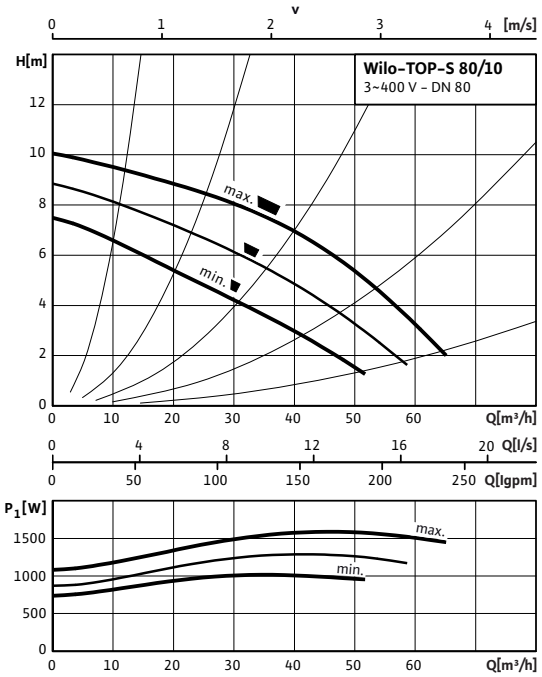


Three–phase current

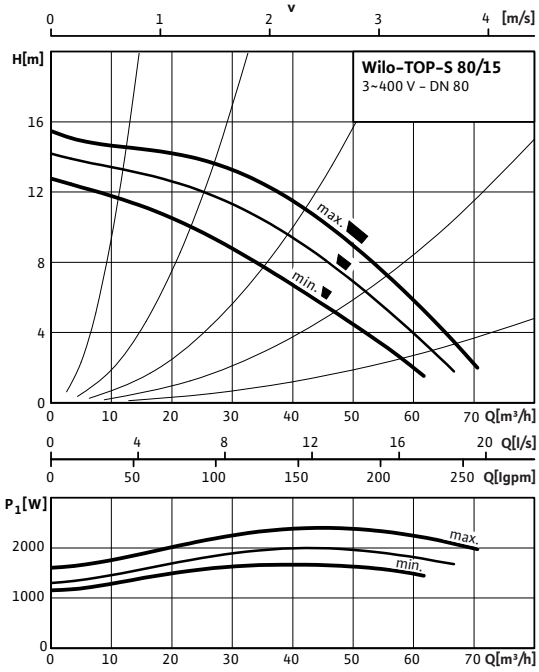


Wilo–TOP–S 80/10

Three–phase current



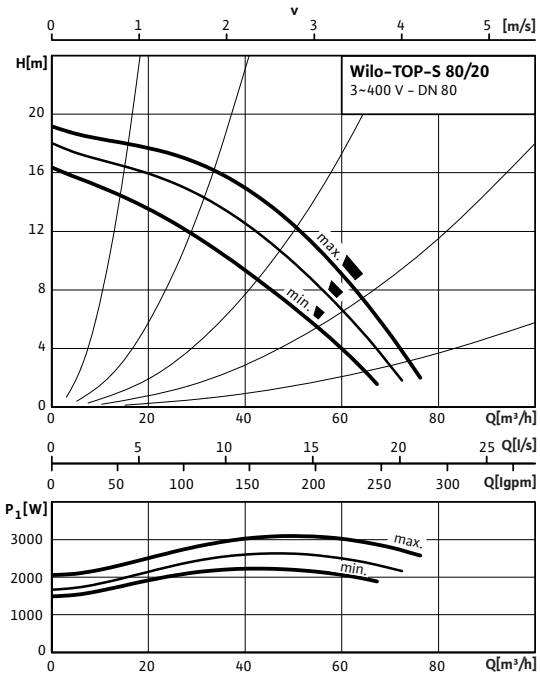
Three–phase current



Pump curves Wilo–TOP–S

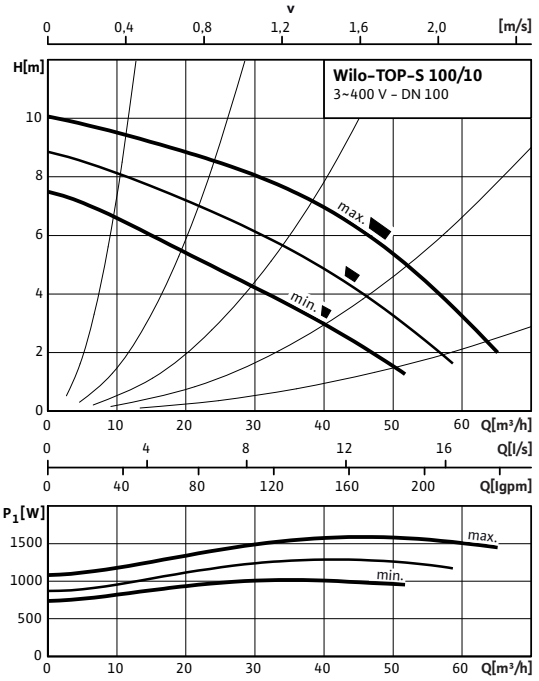
Wilo–TOP–S 80/20

Three–phase current



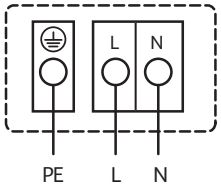
Wilo–TOP–S 100/10

Three–phase current



Terminal diagram, motor data Wilo-TOP-S

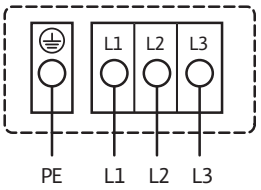
Terminal diagram A / motor protection A



Mains connection 1~230 V, 50 Hz

Internal protection against unacceptably high winding temperatures
Triggering: Internal interruption of motor voltage
Reset: Automatic after motor has cooled down

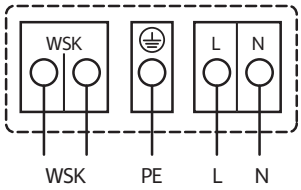
Terminal diagram B / motor protection B



Mains connection 3~400 V, 50 Hz
3~230 V, 50 Hz (with optional switching plug 3~230 V)
internal protection against unacceptably high winding temperatures

Triggering:Internal interruption of a motor phase
Reset:Disconnect mains voltage, allow motor to cool down,
switch mains voltage back on again

Terminal diagram C / motor protection C

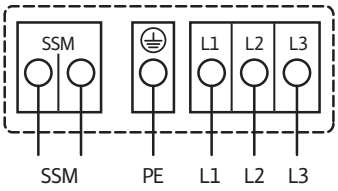


Mains connection 1~230 V, 50 Hz

WSK = thermal winding contact
Full motor protection at all speed stages with optional tripping unit
Wilo-SK 602/SK 622/Protect Module C or other switchgear/control devices with WSK connection option
Triggering: External tripping at switchgear/control device
Reset: Manual reset at switchgear/control device necessary

(Wiring diagram with SK 602/622, see "Service/Accessories")

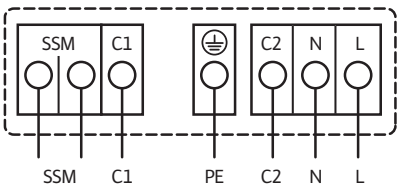
Terminal diagram D / motor protection D



Mains connection 3~400 V, 50 Hz
3~230 V, 50 Hz (with optional switching plug 3~230 V)
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

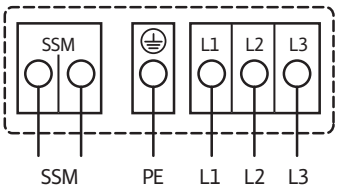
Terminal diagram F / motor protection F



Mains connection 1~230 V, 50 Hz
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

Terminal diagram E / motor protection E



Mains connection 3~400 V, 50 Hz
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

Terminal diagram, motor data Wilo-TOP-S

Motor data

Wilo-TOP-S ...	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Current at 1~230V	Current at 3~400V	Current at 3~230V	Capacitor	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/ VDB]	–	[PG]	–
25/5 (1-phase-motor)	50	max. 2320 1640 min. 1200	100 – 140 75 – 110 55 – 75	–	0.65 0.55 0.35	–	–	3.7/400	A	1x13.5	A
25/5 (3-phase-motor)	50	max. 2650 2190 min. 1890	–	85 – 150 55 – 100 40 – 75	–	0.40 0.20 0.15	0.65 0.35 0.25	-	B	1x13.5	B
25/7 (1-phase-motor)	90	max. 2600 2300 min. 1800	140 – 195 110 – 175 85 – 120	–	0.95 0.87 0.62	–	–	5.0/400	A	1x13.5	A
25/7 (3-phase-motor)	90	max. 2600 2100 min. 1750	–	120 – 200 85 – 130 65 – 90	–	0.45 0.25 0.17	0.78 0.43 0.30	-	B	1x13.5	B
25/10 (1-phase-motor)	180	max. 2700 2550 min. 2400	225 – 390 190 – 385 165 – 335	–	1.9 1.87 1.72	–	–	8.0/400	C	2x13.5	C
25/10 (3-phase-motor)	180	max. 2650 2250 min. 1950	–	190 – 380 140 – 270 115 – 195	–	0.78 0.48 0.35	1.35 0.84 0.61	-	D	2x13.5	D
25/13 (1-phase-motor)	100	max. 2680 2380 min. 1800	183 – 260 150 – 200 112 – 130	–	1.24 0.96 0.65	–	–	6.0/400	A	1x13.5	A
25/13 (3-phase-motor)	100	max. 2680 2380 min. 1750	–	145 – 265 100 – 160 75 – 105	–	0.53 0.28 0.19	0.92 0.48 0.33	-	B	1x13.5	B
30/4 (1-phase-motor)	70	max. 2660 2340 min. 1710	145 – 180 95 – 150 70 – 110	–	0.85 0.75 0.55	–	–	5.0/400	A	1x13.5	A
30/4 (3-phase-motor)	70	max. 2610 2120 min. 1810	–	95 – 160 60 – 105 40 – 75	–	0.40 0.20 0.15	0.65 0.35 0.25	-	B	1x13.5	B
30/5 (1-phase-motor)	50	max. 2320 1640 min. 1200	110 – 140 75 – 110 55 – 75	–	0.65 0.55 0.35	–	–	3.7/400	A	1x13.5	A
30/5 (3-phase-motor)	50	max. 2650 2190 min. 1890	–	85 – 150 55 – 100 40 – 75	–	0.40 0.20 0.15	0.65 0.35 0.25	-	B	1x13.5	B
30/7 (1-phase-motor)	90	max. 2600 2300 min. 1800	140 – 195 110 – 175 85 – 120	–	0.95 0.87 0.62	–	–	5.0/400	A	1x13.5	A
30/7 (3-phase-motor)	90	max. 2600 2100 min. 1750	–	120 – 200 85 – 130 65 – 90	–	0.45 0.25 0.17	0.78 0.43 0.30	-	B	1x13.5	B

Subject to change 09/2008 WILO SE

Terminal diagram, motor data Wilo–TOP–S

Motor data

Wilo–TOP–S …	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Current at 1~230V	Current at 3~400V	Current at 3~230V	Capacitor	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/ VDB]	–	[PG]	–
30/10 (1–phase–motor)	180	max. 2700 2550 min. 2400	225 – 390 190 – 385 165 – 335	–	1.9 1.87 1.72	–	–	8.0/400	C	2x13.5	C
30/10 (3–phase–motor)	180	max. 2650 2250 min. 1950	–	190 – 380 140 – 270 115 – 195	–	0.78 0.48 0.35	1.35 0.84 0.61	–	D	2x13.5	D
40/4 (1–phase–motor)	90	max. 2500 2100 min. 1600	155 – 195 130 – 175 100 – 120	–	0.95 0.87 0.62	–	–	5.0/400	A	1x13.5	A
40/4 (3–phase–motor)	90	max. 2550 2050 min. 1700	–	145 – 195 100 – 130 70 – 90	–	0.45 0.25 0.17	0.78 0.43 0.30	–	B	1x13.5	B
40/7 (1–phase–motor)	180	max. 2650 2450 min. 2200	250 – 390 220 – 380 200 – 330	–	1.93 1.88 1.7	–	–	8.0/400	C	2x13.5	C
40/7 (3–phase–motor)	180	max. 2600 2100 min. 1800	–	220 – 370 165 – 260 130 – 185	–	0.76 0.47 0.33	1.31 0.81 0.57	–	D	2x13.5	D
40/10 (1–phase–motor)	350	max. 2800 min. 2600	430 – 680 310 – 610	–	3.47 3.18	–	–	16.0/ 400	F	2x13.5	F
40/10 (3–phase–motor)	350	max. 2800 2500 min. 2200	–	300 – 585 230 – 465 200 – 365	–	1.17 0.82 0.65	2.02 1.43 1.12	–	D	2x13.5	D
40/15 (1–phase–motor)	570	max. 2800 min. 2500	615 – 945 415 – 800	–	4.57 4.2	–	–	25.0/ 400	F	2x13.5	F
40/15 (3–phase–motor)	570	max. 2800 2500 min. 2150	–	500 – 905 375 – 720 325 – 585	–	1.84 1.30 1.05	3.19 2.25 1.82	–	D	2x13.5	D
50/4 (1–phase–motor)	180	max. 2650 2450 min. 1950	280 – 330 255 – 320 235 – 290	–	1.62 1.61 1.51	–	–	8.0/400	C	2x13.5	C
50/4 (3–phase–motor)	180	max. 2600 2100 min. 1700	–	245 – 330 190 – 240 145 – 180	–	0.71 0.44 0.32	1.23 0.76 0.56	–	D	2x13.5	D
50/7 (1–phase–motor)	350	max. 2800 min. 2600	460 – 690 360 – 630	–	3.49 3.35	–	–	16.0/ 400	F	2x13.5	F
50/7 (3–phase–motor)	350	max. 2800 2450 min. 2150	–	360 – 610 285 – 470 245 – 375	–	1.19 0.83 0.66	2.06 1.43 1.14	–	D	2x13.5	D
50/10 (1–phase–motor)	450	max. 2800 min. 2450	515 – 820 360 – 730	–	3.94 3.72	–	–	25.0/ 400	F	2x13.5	F
50/10 (3–phase–motor)	450	max. 2700 2300 min. 2000	–	450 – 880 330 – 680 280 – 500	–	1.73 1.20 0.89	3.00 2.09 1.54	–	D	2x13.5	D

Terminal diagram, motor data Wilo-TOP-S

Motor data

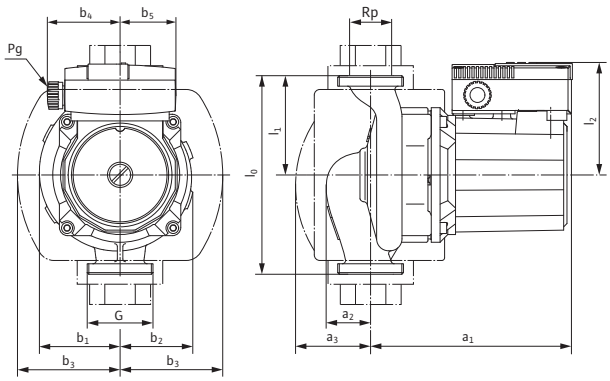
Wilo-TOP-S ...	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Current at 1~230V	Current at 3~400V	Current at 3~230V	Capacitor	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/ VDB]	–	[PG]	–
50/15 (3-phase-motor)	1100	max. 2800 2500 min. 2200	–	1060 - 1570 830 - 1260 720 - 1005	–	3.13 2.25 1.81	5.43 3.90 3.14	-	D	2x13.5	D
65/7 (1-phase-motor)	350	max. 2800 min. 2550	460 - 690 350 - 630	–	3.49 3.35	–	–	16.0/ 400	F	2x13.5	F
65/7 (3-phase-motor)	350	max. 2800 2450 min. 2150	–	340 - 590 270 - 470 235 - 375	–	1.16 0.82 0.66	2.01 1.42 1.14	-	D	2x13.5	D
65/10 (1-phase-motor)	450	max. 2800 min. 2450	580 - 790 440 - 690	–	3.78 3.51	–	–	25.0/ 400	F	2x13.5	F
65/10 (3-phase-motor)	450	max. 2650 2250 min. 1950	–	525 - 845 410 - 630 340 - 470	–	1.67 1.10 0.83	2.89 1.91 1.44	-	D	2x13.5	D
65/13 (3-phase-motor)	1100	max. 2800 2550 min. 2250	–	1000 - 1450 810 - 1180 700 - 960	–	2.93 2.10 1.74	5.07 3.64 3.00	-	D	2x13.5	D
65/15 (3-phase-motor)	1300	max. 2850 2700 min. 2500	–	1140 - 1685 910 - 1425 810 - 1240	–	3.41 2.52 2.18	5.91 4.36 3.78	-	D	2x13.5	D
80/7 (1-phase-motor)	450	max. 2800 min. 2350	640 - 800 505 - 700	–	3.85 3.59	–	–	25.0/ 400	F	2x13.5	F
80/7 (3-phase-motor)	450	max. 2700 2400 min. 2100	–	560 - 730 430 - 560 350 - 440	–	1.53 1.00 0.79	2.65 1.74 1.36	-	D	2x13.5	D
80/10 (3-phase-motor)	1100	max. 2800 2500 min. 2150	–	1100 - 1590 880 - 1290 745 - 1015	–	3.13 2.29 1.84	5.43 3.96 3.19	-	D	2x13.5	D
80/15 (3-phase-motor)	1800	max. 2900 2700 min. 2450	–	1600 - 2400 1300 - 2000 1160 - 1680	–	4.85 3.63 3.25	–	-	E	2x13.5	E
80/20 (3-phase-motor)	2200	max. 2900 2750 min. 2500	–	2050 - 3120 1670 - 2650 1480 - 2270	–	6.10 4.80 4.35	–	-	E	2x13.5	E
100/10 (3-phase-motor)	1100	max. 2800 2500 min. 2150	–	1100 - 1590 880 - 1290 745 - 1015	–	3.13 2.29 1.84	5.43 3.96 3.19	-	D	2x13.5	D

Observe name plate data!
Current I: Motor protection switch onsite setting

Note:
Mains connection 3~230 V with optional switching plug (accessory)

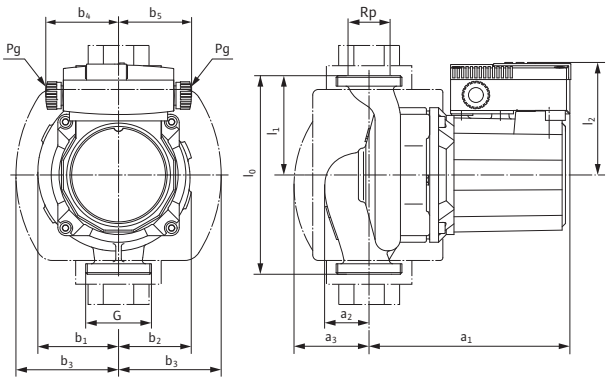
Dimensions, weights Wilo-TOP-S

Dimension drawing A



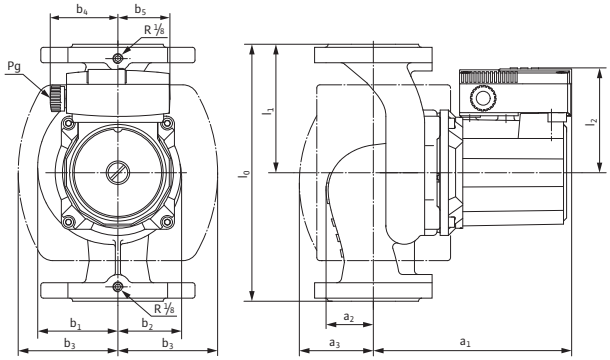
Permitted installation positions, see Planning guide

Dimension drawing B



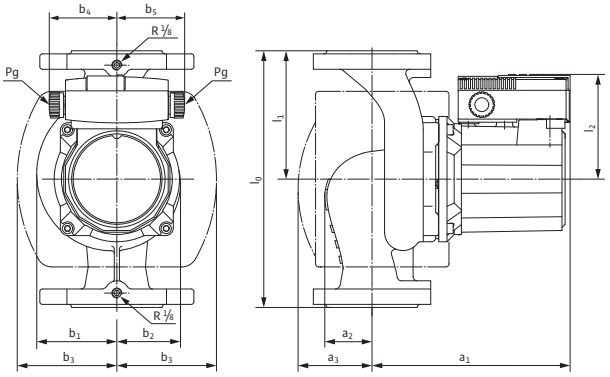
Permitted installation positions, see Planning guide

Dimension drawing C



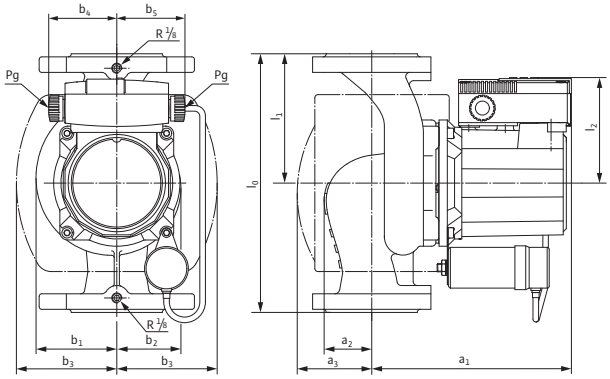
Permitted installation positions, see Planning guide

Dimension drawing D



Permitted installation positions, see Planning guide

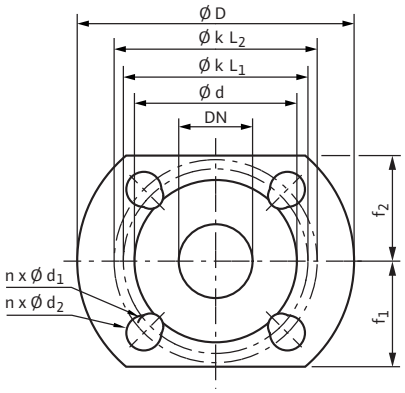
Dimension drawing E



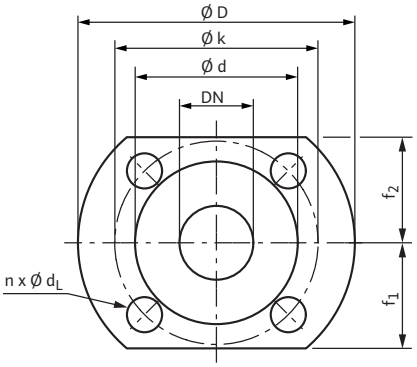
Permitted installation positions, see Planning guide

Dimensions, weights Wilo-TOP-S

Dimension drawing Flange F



Dimension drawing Flange G



Dimensions, weights

Wilo-TOP-S ...	Rated pressure	Pipe connection	Nominal flange diameter	Thread	Dimensions									Weight approx.	Dimension drawing
	PN	Rp	DN	G	l_0	l_2	a_1	a_2	b_1	b_2	b_3	b_4	b_5	M	–
	[bar]	–			[mm]									[kg]	–
25/5	10	1	–	1½	180	92	150	40	50	52	88	60	44	5.0	A
25/7	10	1	–	1½	180	92	165	34	66	56	80	60	44	5.0	A
25/10	10	1	–	1½	180	102	172	45	69	68	92	66	66	6.3	B
25/13	10	1	–	1½	180	92	156	30	68	64	89	60	44	5.2	A
30/4	10	1¼	–	2	180	92	156	50	53	65	88	60	44	5.0	A
30/5	10	1¼	–	2	180	92	150	40	50	52	88	60	44	5.0	A
30/7	10	1¼	–	2	180	92	172	34	66	57	88	60	44	5.0	A
30/10	10	1¼	–	2	180	102	172	45	69	69	92	66	66	6.3	B
40/4	6/10	–	40	–	220	90	178	54	84	60	102	53	44	9.5	C
40/7	6/10	–	40	–	250	102	193	46	78	68	102	66	66	11.0	D
40/10	6/10	–	40	–	250	109	216	59	90	80	117	66	66	14.7	D
40/15	6/10	–	40	–	250	119	258	55	99	86	137	66	66	20.8	D
50/4	6/10	–	50	–	240	102	200	53	94	68	117	66	66	13.1	D
50/7	6/10	–	50	–	280	109	224	65	91	77	125	66	66	16.6	D
50/10	6/10	–	50	–	280	109	222	71	101	87	125	66	66	17.8	D
50/15	6/10	–	50	–	340	119	242	81	105	90	139	66	66	24.9	D
65/7	6/10	–	65	–	280	109	226	67	95	79	125	66	66	18.5	D
65/10	6/10	–	65	–	340	109	241	67	110	89	132	66	66	21.0	D
65/13	6/10	–	65	–	340	119	254	81	118	98	142	66	66	27.2	D
65/15	6/10	–	65	–	340	119	254	81	118	98	142	66	66	30.4	D
80/7	6	–	80	–	360	109	227	80	116	89	140	66	66	23.4	E
80/7	10	–	80	–	360	109	227	80	116	89	140	66	66	23.2	D
80/10	6	–	80	–	360	119	256	95	135	107	162	66	66	30.1	D
80/10	10	–	80	–	360	119	256	95	135	107	162	66	66	30.1	D
80/15	6	–	80	–	360	143	316	89	129	108	152	66	66	42.1	D
80/15	10	–	80	–	360	143	316	89	129	108	152	66	66	42.1	D

Dimensions, weights Wilo–TOP–S

Dimensions, weights

Wilo–TOP–S …	Rated pressure	Pipe connec–tion	Nominal flange diameter	Thread	Dimensions									Weight approx.	Dimen–sion drawing
	PN	Rp	DN	G	l_0	l_2	a_1	a_2	b_1	b_2	b_3	b_4	b_5	M	–
	[bar]	–			[mm]									[kg]	–
80/20	6	–	80	–	360	143	316	89	129	108	152	66	66	45.5	D
80/20	10	–	80	–	360	143	316	89	129	108	152	66	66	45.5	D
100/10	6	–	100	–	360	119	256	96	135	108	162	66	66	33.2	D
100/10	10	–	100	–	360	119	256	96	135	108	162	66	66	33.2	D

Flange dimensions

Wilo–TOP–S …	Flange	Nominal flange diameter	Pump flange dimensions								Dimen–sion drawing, flange
	–	DN	Ø D	f_1	f_2	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/ Ø d_{L2}	n x Ø d_L	–
	–		[mm]						[pcs. x mm]		–
40/4	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	40	150	65	65	84	100/110	–	4 x 14 / 19	–	F
40/7	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	40	150	65	65	84	100/110	–	4 x 14 / 19	–	F
40/10	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	40	150	65	65	84	100/110	–	4 x 14 / 19	–	F
40/15	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	40	150	65	65	84	100/110	–	4 x 14 / 19	–	F
50/4	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	50	165	70	70	99	110/125	–	4 x 14 / 19	–	F
50/7	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	50	165	70	70	99	110/125	–	4 x 14 / 19	–	F
50/10	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	50	165	70	75	99	110/125	–	4 x 14 / 19	–	F
50/15	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	50	165	75	83	99	110/125	–	4 x 14 / 19	–	F
65/7	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	65	185	80	80	118	130/145	–	4 x 14 / 19	–	F
65/10	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	65	185	80	80	118	130/145	–	4 x 14 / 19	–	F
65/13	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	65	185	80	80	118	130/145	–	4 x 14 / 19	–	F
65/15	Combination flange PN6/ 10 (PN 16 flange according to EN 1092–2)	65	185	80	80	118	130/145	–	4 x 14 / 19	–	F

Dimensions, weights Wilo-TOP-S

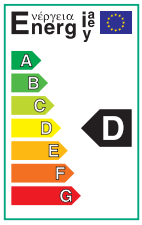
Flange dimensions

Wilo-TOP-S ...	Flange	Nominal flange diameter	Pump flange dimensions								Dimension drawing, flange
	–	DN	Ø D	f_1	f_2	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/ Ø d_{L2}	n x Ø d_L	–
	–		[mm]						[pcs. x mm]		–
80/7	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	90	90	132	-	150	-	4 x 19	G
80/7	Flange PN16 (according to EN 1092-2)	80	200	90	90	132	-	160	-	8 x 19	G
80/10	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	90	98	132	-	150	-	4 x 19	G
80/10	Flange PN16 (according to EN 1092-2)	80	200	90	98	132	-	160	-	8 x 19	G
80/15	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	90	90	132	-	150	-	4 x 19	G
80/15	Flange PN16 (according to EN 1092-2)	80	200	90	90	132	-	160	-	8 x 19	G
80/20	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	90	90	132	-	150	-	4 x 19	G
80/20	Flange PN16 (according to EN 1092-2)	80	200	90	90	132	-	160	-	8 x 19	G
100/10	Flange PN 6 (PN 16 design, according to EN 1092-2)	100	220	100	100	156	-	170	-	4 x 19	G
100/10	Flange PN16 (according to EN 1092-2)	100	220	100	100	156	-	180	-	8 x 19	G

n = number of drilled holes

Series description Wilo-TOP-D





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

Design
Glandless circulation pump with screwed connection or flange connection.

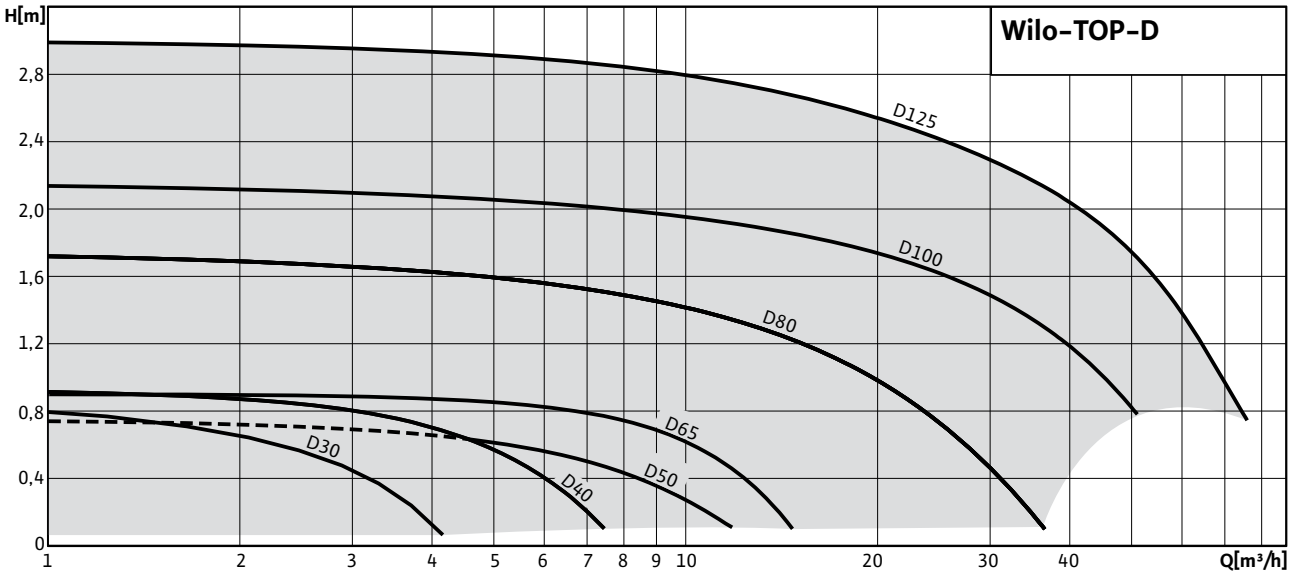
Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo TOP-D 40**
TOP-D	Standard pump (screw-end pump or flange-end pump)
40	Nominal connection diameter

Options
- Versions for special voltages on request
- Special version for operating pressure PN 16 (at additional charge)

Special features/product benefits
- For installations with low pipework resistances, can be used in heating systems and in cooling/air-conditioning systems from -20 °C to +130 °C
- Universal application for various mains operations:
  - 3~400 V as standard connection
  - 3~230 V with modification of the terminal assignment
  - 1~230 V with application of a capacitor (accessory)
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- With thermal insulation as standard
- Simple installation due to combination flange PN 6/PN 10 (for DN 40 to DN 65)
- Cable feed into terminal box possible on both sides (from $P_2 \geq 60$ W) with integrated strain relief device
- Protection class IP 44



Series description Wilo-TOP-D

Equipment/function

Manual functions
- Setting the speed stages: 1 speed stage

Signal and display functions
- Thermal winding contact (WSK, potential-free NC contact) for TOP-D 65 to TOP-D 125
- Direction-of-rotation control light

Equipment
- Cable lead-in possible from both sides with TOP-D 65 to TOP 125
- Blocking current-proof motor (only for TOP-D 30, 40, 50)

Scope of delivery
- Pump
- Thermal insulation
- Including seals for threaded connection
- Washers for flange screws (for nominal connection diameters DN 32 - DN 65)
- Installation and operating instructions

Accessories
- Screwed connections with screw thread
- Condenser for AC current operation 1~230 V
- Wilo-SK-C2 condenser switchbox
- Wilo-SK 602 tripping unit

Technical data Wilo-TOP-D

	Wilo-TOP-D ...						
	30	**40**	**50**	**65**	**80**	**100**	**125**
Approved fluids (other fluids on request)							
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–
Output							
Delivery head max. [m]	0.9	0.95	0.75	0.9	1.8	2.3	2.9
Max. volume flow [m^3/h]	4	7	11.5	14	35	51	75
Permitted field of application							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-						
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: 140)						
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	- -	- -	- -	- -	- -	- -	- -
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	10	6/10	6/10	6/10	6	6	6
Special version for operating pressure, p_{max}	-	-	-	16	10/16	10/16	10/16
Pipe connections							
Screwed connection Rp	1¼	-	-	-	-	-	-
Nominal flange diameter DN	-	40	50	65	80	100	125
Flange for counter flange PN 6, standard version	–	–	–	–	•	•	•
Flange for counter flange PN 16, special version	-	-	-	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	•	•	•	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–
Electrical connection							
Mains connection 1 ~ [V], standard version	230 (possible with external capacitor, see terminal diagram)						-
Mains connection 3 ~ [V], standard version	400 (230 possible by rearranging the bridges, see terminal diagram)						
Mains connection 3 ~ [V], special version on order	–	–	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	-	-	-	-	-	-	-
Mains frequency	50	50	50	50	50	50	50

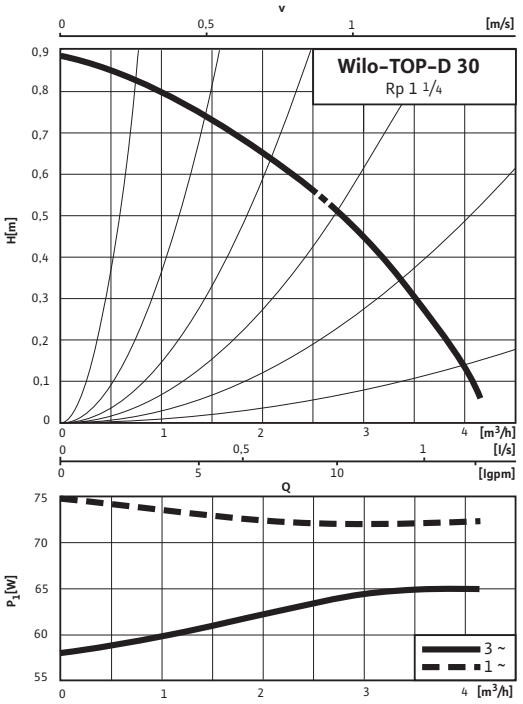
Technical data Wilo-TOP-D

	Wilo-TOP-D ...						
	30	**40**	**50**	**65**	**80**	**100**	**125**
Motor/electronics							
Electromagnetic compatibility	–						
Emitted interference	EN 61000-6-3						
Interference resistance	EN 61000-6-2						
Power electronics	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H
Materials							
Pump housing	Grey cast iron (EN-GJL-200)	Grey cast iron (EN-GJL-250)					
Impeller	Plastic (PP – 50% GF)						
Pump shaft	Stainless steel (X46Cr13)						
Bearing	Carbon, metal impregnated						
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature							
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	2.0	2.0	2.0	2.0	3.0	3.0	3.0
Minimum suction head at 110°C	8.0	8.0	8.0	8.0	9.0	9.0	9.0
Minimum suction head at 130°C	21	21	21	21	22	22	22

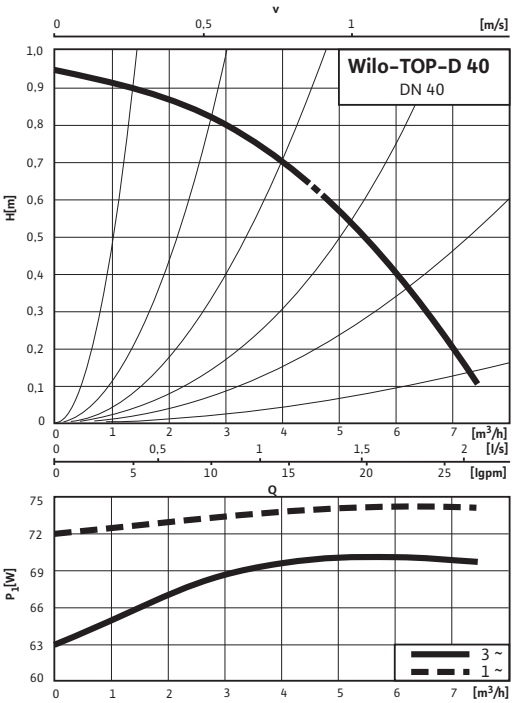
• = available, – = not available

Pump curves Wilo–TOP–D

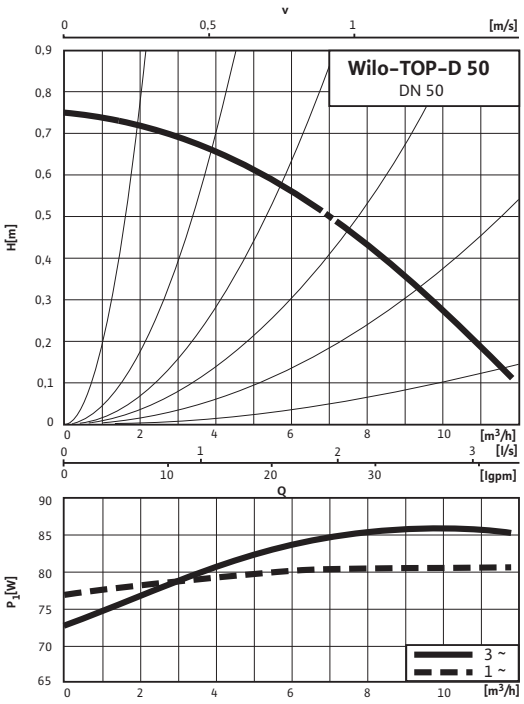
Wilo–TOP–D 30



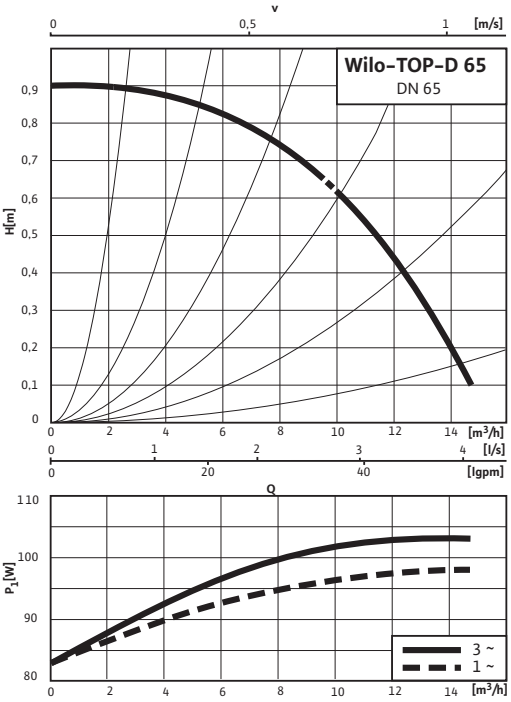
Wilo–TOP–D 40



Wilo–TOP–D 50

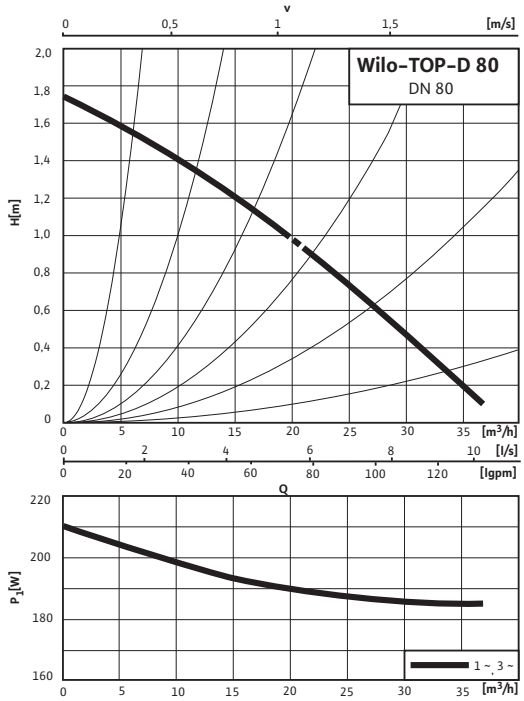


Wilo–TOP–D 65

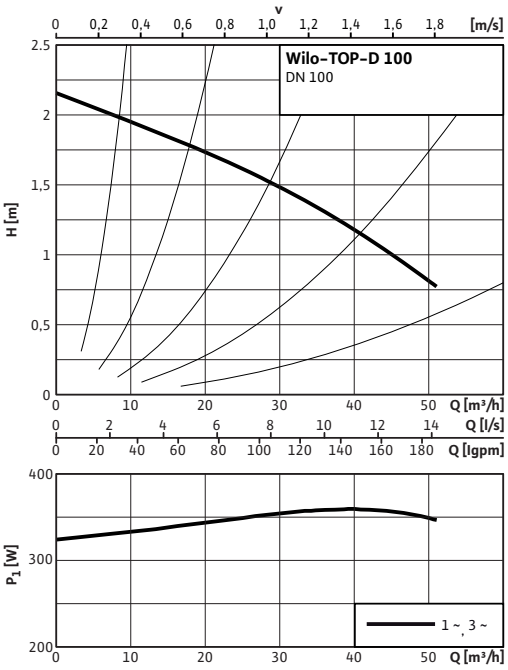


Pump curves Wilo-TOP-D

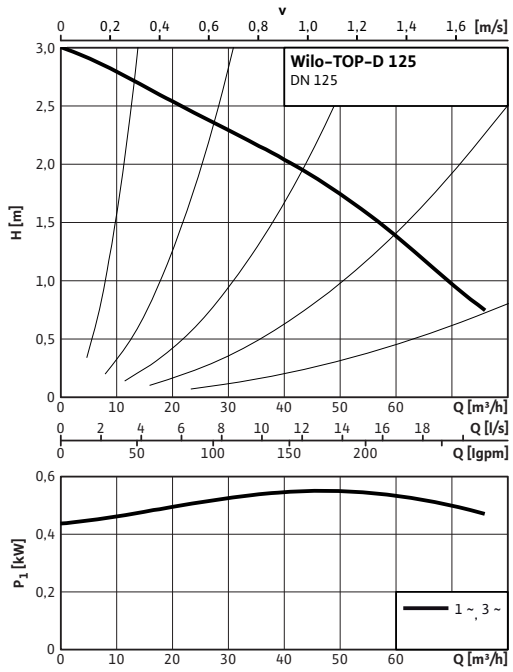
Wilo-TOP-D 80



Wilo-TOP-D 100

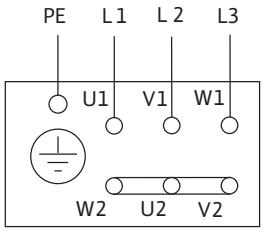


Wilo-TOP-D 125



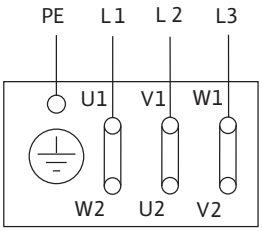
Terminal diagram, motor data Wilo-TOP-D

Terminal diagram A / motor protection A



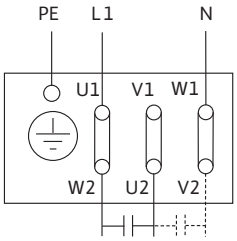
Mains connection 3~400 V, 50 Hz
Blocking current-proof, no motor protection necessary

Terminal diagram B / motor protection B



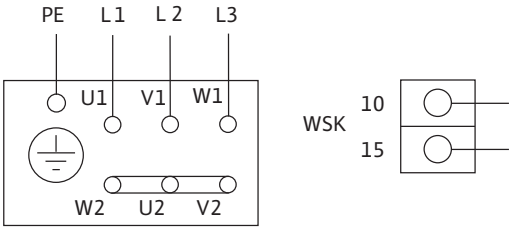
Mains connection 3~230 V, 50 Hz
Blocking current-proof, no motor protection necessary

Terminal diagram C / motor protection C



Mains connection 1~230 V, 50 Hz
Steinmetz switching: Motor terminals in Δ connection
attached capacitor (accessory)
Blocking current-proof, no motor protection necessary

Terminal diagram D / motor protection D

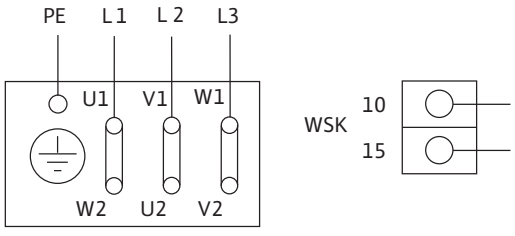


Mains connection 3~400 V, 50 Hz with WSK

WSK = thermal winding contact
Full motor protection with optional tripping unit Wilo-SK 602/
Wilo-SK 622 or other switchgear/control devices with WSK connection option
Triggering:External tripping at switchgear/control device
Reset: Manual reset at switchgear/control device necessary

(Wiring diagram with SK 602/SK 622 see "Service/Accessories")

Terminal diagram E / motor protection E

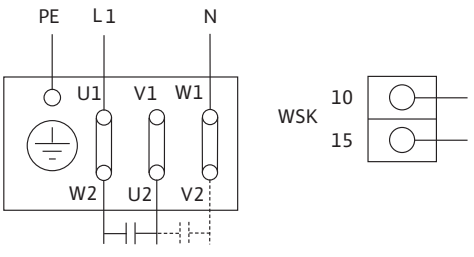


Mains connection 3~230 V, 50 Hz with WSK

WSK = thermal winding contact
Full motor protection with optional tripping unit Wilo-SK 602/
Wilo-SK 622 or other switchgear/control devices with WSK connection option
Triggering:External tripping at switchgear/control device
Reset: Manual reset at switchgear/control device necessary

(Wiring diagram with SK 602/SK 622 see "Service/Accessories")

Terminal diagram F / motor protection F



Mains connection 1~230 V, 50 Hz with WSK
Steinmetz switching: Motor terminals in Δ connection; attached capacitor (accessory)
WSK = thermal winding contact
Full motor protection with optional tripping unit Wilo-SK 602/
Wilo-SK 622 or other switchgear/control devices with WSK connection option
Triggering:External tripping at switchgear/control device
Reset: Manual reset at switchgear/control device necessary

(Wiring diagram with SK 602/SK 622 see "Service/Accessories")

Terminal diagram, motor data Wilo-TOP-D

Motor data

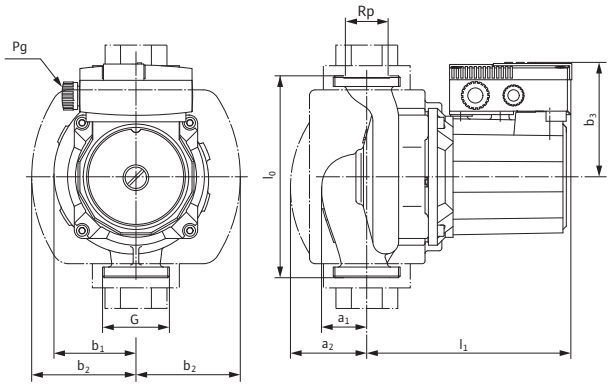
Wilo-TOP-D ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~400V	Current at 3~230V	Motor protection	Capacitor	Threaded cable connection	Wiring diagram
	P_2	n_{max}	P_1	I			–	C	PG	–
	[W]	[rpm]	[W]	[A]			–	[µF/VDB]	[PG]	–
30 (AC connection)	20	1350	72 – 75	0.40	–	–	not required (blocking current-proof)	5/240	1x13.5/ 1x9	C
30 (3-phase-motor, 4-pole)	20	1350	58 – 65	–	0.20	0.35	not required (blocking current-proof)	–	1x13.5/ 1x9	A B
40 (AC connection)	20	1300	72 – 74	0.37	–	–	not required (blocking current-proof)	5/240	1x13.5/ 1x9	C
40 (3-phase-motor, 4-pole)	20	1300	63 – 70	–	0.20	0.35	not required (blocking current-proof)	–	1x13.5/ 1x9	A B
50 (AC connection)	20	1150	77 – 81	0.40	–	–	not required (blocking current-proof)	5/240	–	C
50 (3-phase-motor, 4-pole)	20	1150	73 – 86	–	0.20	0.35	not required (blocking current-proof)	–	1x13.5/ 1x9	A B
65 (AC connection)	60	1350	83 – 98	0.57	–	–	F	6/240	–	F
65 (3-phase-motor, 4-pole)	60	1350	83 – 103	–	0.35	0.60	D, E	–	2x13.5/ 1x9	D E
80 (AC connection)	120	1400	185 – 210	1.20	–	–	F	14/280	–	F
80 (3-phase-motor, 4-pole)	120	1400	185 – 210	–	0.64	1.11	D, E	–	2x13.5/ 1x9	D E
100 (AC connection)	220	1350	325 – 360	1.78	–	–	F	20/400	–	F
100 (3-phase-motor, 4-pole)	220	1350	325 – 360	–	0.88	1.53	D, E	–	2x13.5/ 1x9	D E
125 (3-phase-motor, 4-pole)	320	1260	440 – 550	–	1.22	2.11	D, E	–	2x13.5/ 1x9	D E

Observe name plate data!
Current I: Motor protection switch onsite setting

Note on AC current connection:
3-phase motor with Steinmetz switching

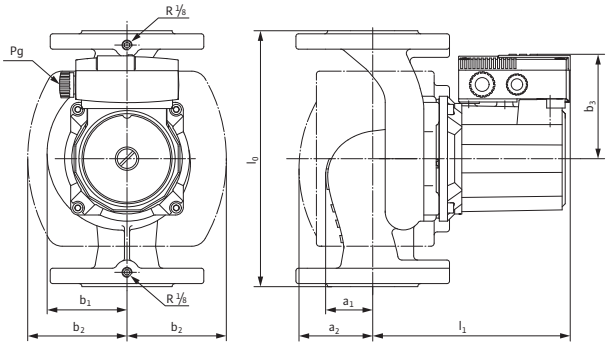
Dimensions, weights Wilo-TOP-D

Dimension drawing A



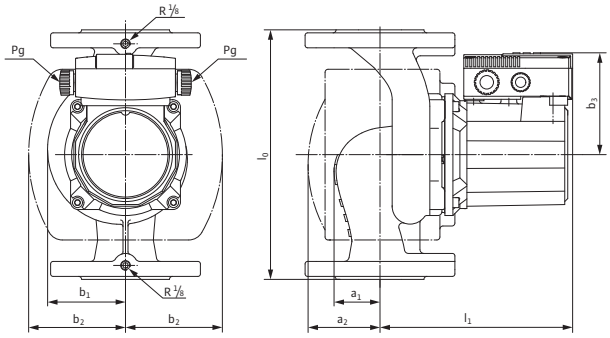
Permitted installation positions, see Planning guide

Dimension drawing B



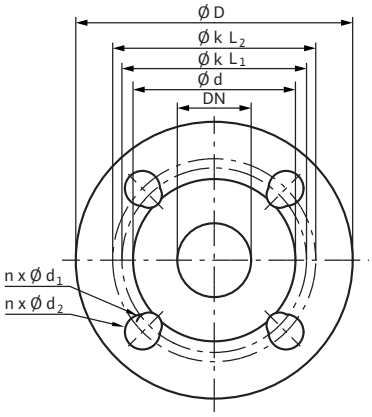
Permitted installation positions, see Planning guide

Dimension drawing C

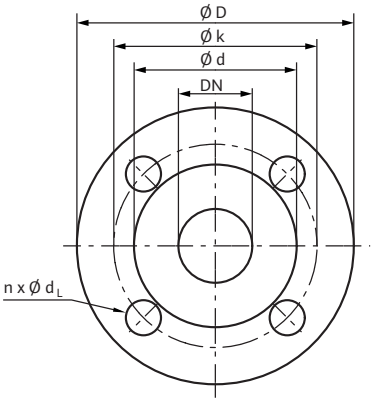


Permitted installation positions, see Planning guide

Dimension drawing Flange A



Dimension drawing Flange B



Dimensions, weights Wilo-TOP-D

Dimensions, weights

Wilo-TOP-D ...	Pipe connection	Nominal flange diameter	Thread	Dimensions							Weight approx.	Dimension drawing
	Rp	DN	G	l_0	a_1	a_2	l_1	b_1	b_2	b_3	M	–
	–			[mm]							[kg]	–
30	1¼	–	2	180	172	34	90	66	57	88	5.0	A
40	–	40	–	220	178	54	110	83	60	103	9.5	B
50	–	50	–	240	185	51	120	93	57	112	11.0	B
65	–	65	–	280	199	52	140	93	64	112	16.0	C
80	–	80	–	330	246	86	165	145	92	167	25.5	C
100	–	100	–	380	279	89	190	159	115	182	34.5	C
125	–	125	–	450	290	96	225	183	132	210	48.0	C

Flange dimensions

Wilo-TOP-D ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/Ø d_{L2}	n x Ø d_L	–
	–		[mm]				[pcs. x mm]		–
40	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	88	100/110	–	4 x 14 / 19	-	A
50	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	–	4 x 14 / 19	-	A
65	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	65	185	118	130/145	–	4 x 14 / 19	-	A
80	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	200	132	-	150	-	4 x 19	B
80	Flange PN16 (according to EN 1092-2)	80	200	132	-	160	-	8 x 19	B
100	Flange PN 6 (PN 16 design, according to EN 1092-2)	100	220	156	-	170	-	4 x 19	B
100	Flange PN16 (according to EN 1092-2)	100	220	156	-	180	-	8 x 19	B
125	Flange PN 6 (PN 16 design, according to EN 1092-2)	125	250	184	-	200	-	8 x 19	B
125	Flange PN16 (according to EN 1092-2)	125	250	184	-	210	-	8 x 19	B

n = number of drilled holes

Equipment/function Wilo-Star-RSD, TOP-SD, SE-TW

	Wilo-Star-RSD ...	Wilo-TOP-SD ...	Wilo-SE-TW ...
Operating modes			
Speed-stage switching	•	•	•
Manual control mode (n=constant)	–	–	–
Δp-c for constant differential pressure	–	–	–
Δp-v for variable differential pressure	–	–	–
Δp-T for temperature-controlled differential pressure	–	–	–
Manual functions			
Operating mode setting	–	–	–
Differential-pressure setpoint setting	–	–	–
Autopilot	–	–	–
Pump ON/OFF setting	–	–	–
Speed setting (manual control mode)	•	–	–
Setting the speed stages	3	3 (2 for 1~pumps with $P_2 \geq 350$ W)	3
Automatic functions			
Infinitely variable power adjustment according to the operating mode	–	–	–
Autopilot	–	–	–
Deblocking function	–	–	–
Soft start	–	–	–
Safety control	–	–	–
Full motor protection with integrated trip electronics	–	•	• (optional for all types with Wilo-Protect-Module C)
External control functions			
Overriding Off	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Overriding Min	–	–	–
Analogue In 0 ... 10 V	–	–	–
Analogue In 0 ... 10 V	–	–	–
Signal and display functions			
Single/collective fault signal (potential-free NC contact)	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Collective fault signal (potential-free NC contact)	–	•	• (optional for all types with Wilo-Protect-Module C)
Individual run signal (potential-free NO contact)	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)

Equipment/function Wilo-Star-RSD, TOP-SD, SE-TW

	Wilo-Star-RSD ...	Wilo-TOP-SD ...	Wilo-SE-TW ...
Thermal winding contact (WSK, potential-free NC contact)	–	• (only for 1~ pumps with P_2 = 180 W)	–
Fault signal light	–	•	• (optional for all types with Wilo-Protect-Module C)
Direction-of-rotation control light	–	• (only for 3~pumps)	–
LC display for indication of pump data and fault codes	–	–	–
Data exchange			
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	–	–
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	–	–
Serial digital LON interface for connection to a LONWORKS network	–	–	–
Serial digital CAN interface for connection to a CAN bus system		–	–
Dual pump management (double pump or 2 x single pump)			
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	• (optional for all types with Wilo-Protect-Module C)	• (optional for all types with Wilo-Protect-Module C)
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	–	–
Equipment/scope of delivery			
Wrench attachment point on pump body	–	–	–
Twin switch-over valve in pump housing	•	•	•
Cable lead-in possible on both sides	•	• (only for 1~ pumps and 3~ pumps with $P_2 \geq 180$ W)	–
Wilo quick connection with spring clips	•	–	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	–	–
Blocking current-proof motor	•	–	–
Including seals for threaded connection (loose)	•	• (only for TOP-SD 30/5)	• (only for SE 125-N-TW)
Including installation and operating instructions	•	•	•
Including thermal insulation	–	–	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	•	•

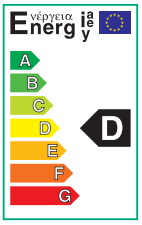
Equipment/function Wilo-Star-RSD, TOP-SD, SE-TW

	Wilo-Star-RSD ...	Wilo-TOP-SD ...	Wilo-SE-TW ...
Including 1.8 m connecting cable with shock-proof plug	–	–	–
Integrated non-return valve	–	–	–
Integrated ball shut-off valve	–	–	–
Including clock timer	–	–	–

• = available, – = not available

Series description Wilo-Star-RSD





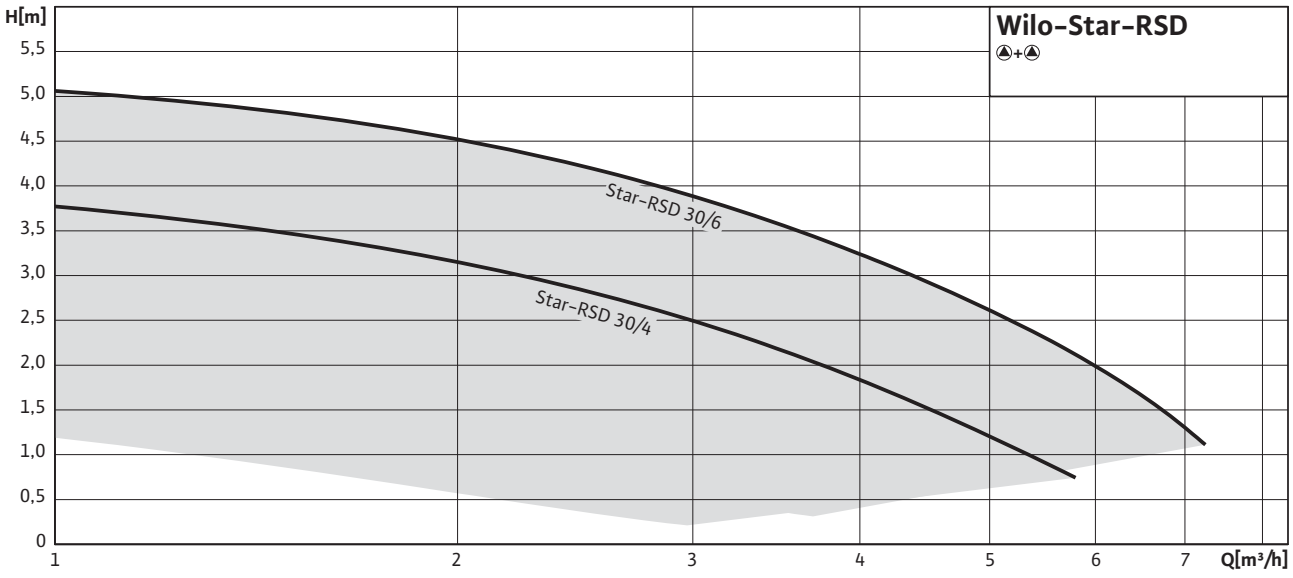
Design
Glandless circulation double pump with threaded connection; preselectable speed stages for power adjustment

Application
Hot-water heating systems of all kinds, industrial circulation systems, cold-water systems and air-conditioning systems

Type key
Example: **Wilo-Star-RSD 30/4**

Star-RSD	Standard pump (screw-end pump)
D	Double pump
30 /	Nominal connection width
4	Nominal delivery head [m] when Q = 0 m^3/h

Special features/product benefits
- Double pump for single or parallel operation
- Suitable for any installation position with horizontal shaft; terminal box in 3-6-9-12 o'clock position
- Increased reliability in individual operation due to the constant availability of a standby unit ready for operation



Subject to change 09/2008 WILO SE

Series description Wilo-Star-RSD

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Selection of speed stages (3 speed stages)

Equipment
- Double switchover valve in pump housing
- Cable entry possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Double pump
- Seals
- Installation and operating instructions

Accessories
- Screwed connections
- S2R3D switchgear for time-dependent pump alteration and/or adding circuit

Technical data Wilo-Star-RSD

	Wilo-Star-RSD ...	
	30/4	**30/6**
Approved fluids (other fluids on request)		
Heating water (in accordance with VDI 2035)	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–
Output		
Delivery head max. [m]	4	5
Max. volume flow [m^3/h]	6.0	7.0
Permitted field of application		
Temperature range for applications in heating, ventilation & air-conditioning systems	-	-
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–	–
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• - 10 to + 110	• - 10 to + 110
Temperature range for applications in secondary hot water circulation systems	-	-
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	- -	- -
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-
Standard version for operating pressure, p_{max}	10	10
Special version for operating pressure, p_{max}	-	-
Pipe connections		
Screwed connection Rp	1¼	1¼
Nominal flange diameter DN	30	30
Flange for counter flange PN 6, standard version	–	–
Flange for counter flange PN 16, special version	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–

Technical data Wilo-Star-RSD

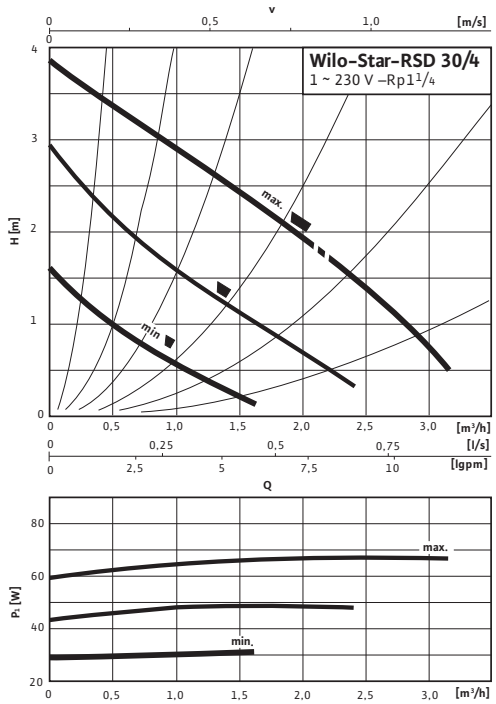
	Wilo-Star-RSD ...	
	30/4	**30/6**
Electrical connection		
Mains connection 1 ~ [V], standard version	230	230
Mains connection 3 ~ [V], standard version	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–
Mains frequency	50	50
Motor/electronics		
Electromagnetic compatibility	EN 61800-3	EN 61800-3
Emitted interference	EN 61000-6-3	EN 61000-6-3
Interference resistance	EN 61000-6-2	EN 61000-6-2
Power electronics	-	-
Protection class	IP 44	IP 44
Insulation class	F	F
Materials		
Pump housing	Grey cast iron (EN-GJL-200)	Grey cast iron (EN-GJL-200)
Impeller	Plastic	Plastic
Pump shaft	Stainless steel (X40Cr13)	Stainless steel (X40Cr13)
Bearing	Carbon, metal impregnated	Carbon, metal impregnated
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature		
Minimum suction head at 50°C	0.5	0.5
Minimum suction head at 95°C	3.0	3.0
Minimum suction head at 110°C	10.0	10.0

• = available, – = not available

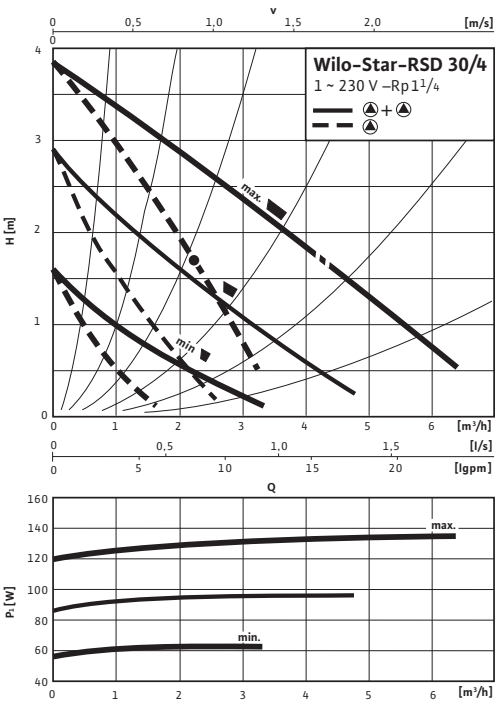
Pump curves Wilo-Star-RSD

Wilo-Star-RSD 30/4

Individual operation

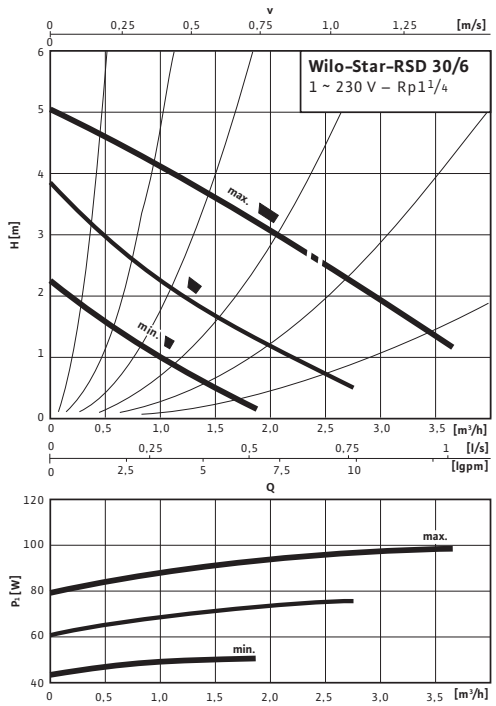


Parallel operation

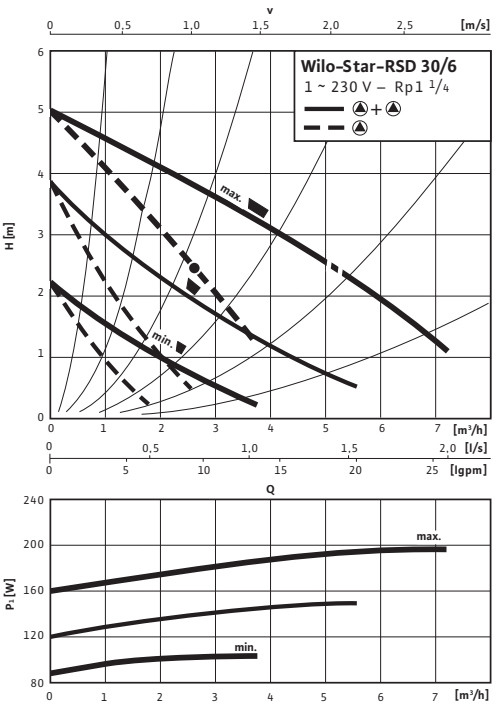


Wilo-Star-RSD 30/6

Individual operation

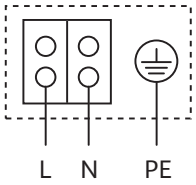


Parallel operation

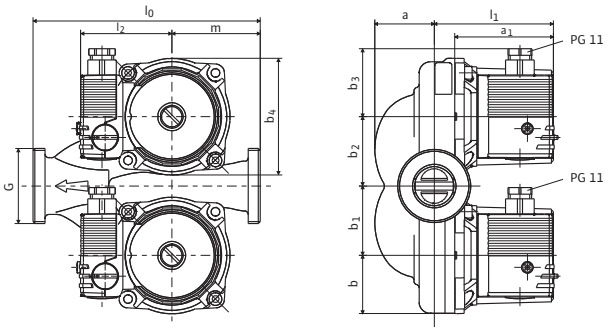


Terminal diagram, motor data, dimensions, weights Wilo-Star-RSD

Terminal diagram



Dimension drawing



Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Motor data

Wilo-Star-RSD ...	Nominal motor power	Speed range	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Capacitor	Threaded cable connection
	P_2	–	P_1	I			–	C	PG
	[W]	[rpm]	[W]	[A]			–	[µF/VDB]	[PG]
30/4	23 13 7	1100-2200	60 - 67 43 - 47 29 - 31	0.29 0.21 0.14	–	–	not required (blocking current-proof)	2.0/400	1x11
30/6	38 21 11	1100-2200	80 - 96 60 - 72 43 - 49	0.41 0.32 0.22	–	–	not required (blocking current-proof)	2.6/400	1x11

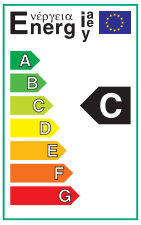
Observe name plate data!

Dimensions, weights

Wilo-Star-RSD ...	Screwed connection	Thread	Dimensions										Weight approx.
	Rp	G	l_0	l_1	l_2	A	a_1	b	b_1	b_2	b_3	b_4	M
	–		[mm]										[kg]
30/4	1¼	2	180	94	73	47	78	46	101	93.5	54	75	5.3
30/6	1¼	2	180	94	76	47	78	46	101	93.5	55	79	5.5

Series description Wilo-TOP-SD





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

Design
Glandless double circulation pump with flange connection (TOP-SD 30/5 with screwed connection).

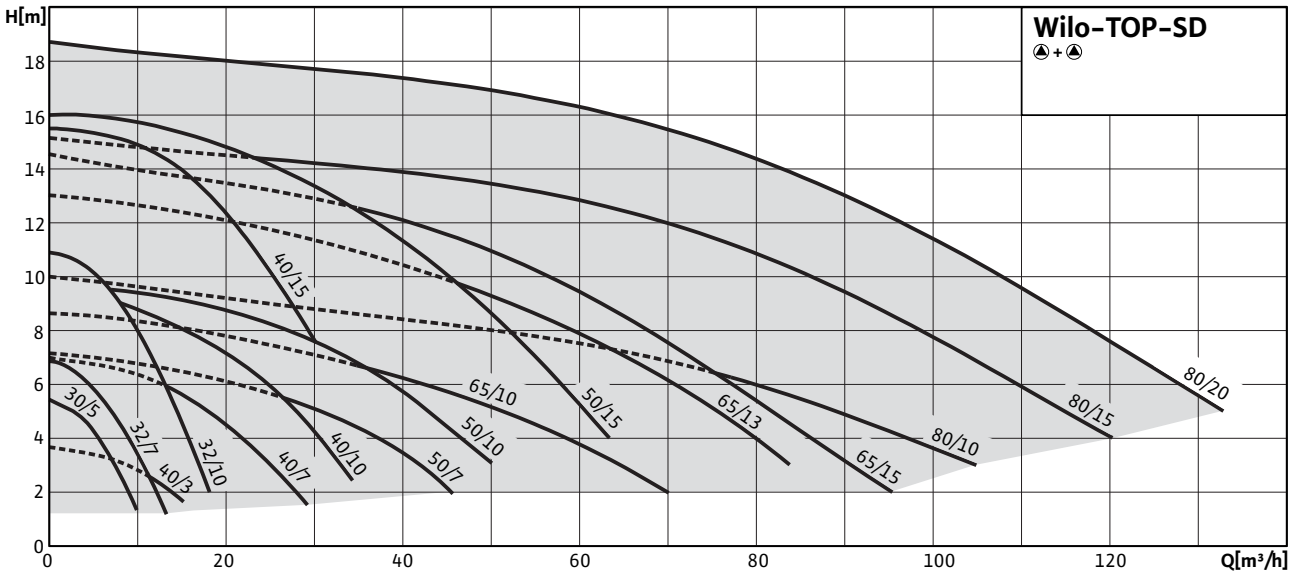
Application
Hot-water heating systems of all kinds, industrial circulation systems, air-conditioning systems and closed cooling circuits

Type key

Example:	**Wilo TOP-SD 40/7**
TOP-SD	Standard double pump (flange-end pump, TOP-SD 30/5 with threaded connection)
40/	Nominal connection diameter
7	Nominal delivery head [m] at Q = 0 m^3/h

Options
- Special versions for operating pressure PN 16 (at additional charge)
- Versions for special voltages on request

Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20°C to +130°C
- Double pump for main/standby mode or parallel operation
- Manual power adjustment with 2 speed stages (for pumps 1~230 V with $P_2 \geq 350$ W) or with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 32 to DN 65)
- Cable feed into terminal box possible on both sides (from P2 ≥ 180 W) with integrated strain relief device
- Protection class IP 44



Subject to change 09/2008 WILO SE

Series description Wilo-TOP-SD

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting the speed stages: 3 speed stages

Automatic functions
- Full motor protection with integrated trip electronics (standard equipment only for 3~pumps with P2≥180 W, optional for all types with Wilo-Protect-Module C)

External control functions
- "Overriding Off" control input (optional for all types with Wilo-Protect-Module C)

Signal and display functions
- Individual/collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Collective fault signal (potential-free NC contact) (standard equipment only for 3~pumps with P2≥180 W, optional for all types with Wilo-Protect-Module C)
- Individual run signal (potential-free NO contact) (optional for all types with Wilo-Protect-Module C)
- Thermal winding contact (WSK, potential-free NC contact) (only for 1~pumps with P2 = 180 W)
- Fault signal light (standard equipment only for 3~pumps with P2 = 180 W, optional for all types with Wilo-Protect-Module C)
- Direction of rotation control lamp (standard equipment only for 3~pumps)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): optional for all types with Wilo-Protect-Module C

Equipment
- Twin switch-over valve in pump housing
- Cable lead-in possible from both sides (only for 1~pumps and 3~pumps with P2≥180 W)

Scope of delivery
- Double pump
- Including seals for threaded connection (only for TOP-SD 30/5)
- Including washers for flange screws (for nominal connection diameters DN 32 – DN 65)
- Installation and operating instructions

Accessories
- Screwed connections for screw thread (for TOP-SD 30/5)
- Mounting brackets for pump fixation
- For pumps 3~400 V:
  - Switching plug 3~230 V (2 plugs required),
  - Wilo-Protect-Module C 3~400 V (2 modules required)
- For pumps 1~230 V:
  - Wilo tripping unit SK 602/SK 622
  - Wilo-Protect-Module C 1~230 V (2 modules required)

Technical data Wilo-TOP-SD

	Wilo-TOP-SD ...						
	30/5	**32/7**	**32/10**	**40/3**	**40/7**	**40/10**	**40/15**
Approved fluids (other fluids on request)							
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–
Output							
Delivery head max. [m]	5.5	7	10.6	3.5	7	10	15
Max. volume flow [m^3/h]	10	13	11.3	16	28	34	33
Permitted field of application							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–						
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)						
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	–	–	–	–	–	–	–
Standard version for operating pressure, p_{max}	10	6/10	6/10	6/10	6/10	6/10	6/10
Special version for operating pressure, p_{max}	–	–	16	–	16	16	16
Pipe connections							
Screwed connection Rp	1¼	–	–	–	–	–	–
Nominal flange diameter DN	–	32	32	40	40	40	40
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	•	–	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	•	•	•	•	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	•
Support-bracket mounting (with horizontal shaft only), special version	–	–	•	•	•	•	–
Electrical connection							
Mains connection 1 ~ [V], standard version	230	230	230	230	230	–	–
Mains connection 3 ~ [V], standard version	400	400	400	400	400	400	400
Mains connection 3 ~ [V], with optional switching plug	230	230	230	230	230	230	230
Mains frequency	50	50	50	50	50	50	50

Technical data Wilo–TOP–SD

	Wilo–TOP–SD ...						
	30/5	**32/7**	**32/10**	**40/3**	**40/7**	**40/10**	**40/15**
Motor/electronics							
Electromagnetic compatibility	–						
Emitted interference	EN 61000–6–3						
Interference resistance	EN 61000–6–2						
Power electronics	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H
Materials							
Pump housing	Grey cast iron (EN–GJL–200)	Grey cast iron (EN–GJL–250)					
Impeller	Plastic (PPE), trade name: Noryl	Plastic (PP – 50% GF)		Plastic (PPE), trade name: Noryl	Plastic (PP – 50% GF)		
Pump shaft	Stainless steel (X46Cr13)						
Bearing	Carbon, metal impregnated						
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature							
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	3.0
Minimum suction head at 95°C	5	5	5	5	5	5	10
Minimum suction head at 110°C	11	11	11	11	11	11	16
Minimum suction head at 130°C	24	24	24	24	24	24	29

• = available, – = not available

Technical data Wilo-TOP-SD

	Wilo-TOP-SD ...									
	50/7	**50/10**	**50/15**	**65/10**	**65/13**	**65/15**	**80/7**	**80/10**	**80/15**	**80/20**
Approved fluids (other fluids on request)										
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–	–	–
Output										
Delivery head max. [m]	7	9.5	16	8.5	13	14.5	6.5	10	15	18.7
Max. volume flow [m^3/h]	45	50	61	70	83	95	80	105	120	120
Permitted field of application										
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-									
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)								-20 up to +110	
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-	-	-	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-	-	-	-	-	-	-
Standard version for operating pressure, p_{max}	6/10	6/10	6/10	6/10	6/10	6/10	6	6	10	10
Special version for operating pressure, p_{max}	16	16	16	16	16	16	16	10/16	10/16	10/16
Pipe connections										
Screwed connection Rp	-	-	-	-	-	-	-	-	-	-
Nominal flange diameter DN	50	50	50	65	65	65	80	80	80	80
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	•	•	–	–
Flange for counter flange PN 16, special version	•	•	•	•	•	•	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•	•	•	•	•	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	•	•	•	•	•	•	•	•
Support-bracket mounting (with horizontal shaft only), special version	•	•	–	–	–	–	–	–	–	–
Electrical connection										
Mains connection 1 ~ [V], standard version	-	-	-	-	-	-	230	-	-	-
Mains connection 3 ~ [V], standard version	400	400	400	400	400	400	400	400	400	400
Mains connection 3 ~ [V], with optional switching plug	230	230	230	230	230	230	230	230	–	–
Mains frequency	50	50	50	50	50	50	50	50	50	50

Technical data Wilo–TOP–SD

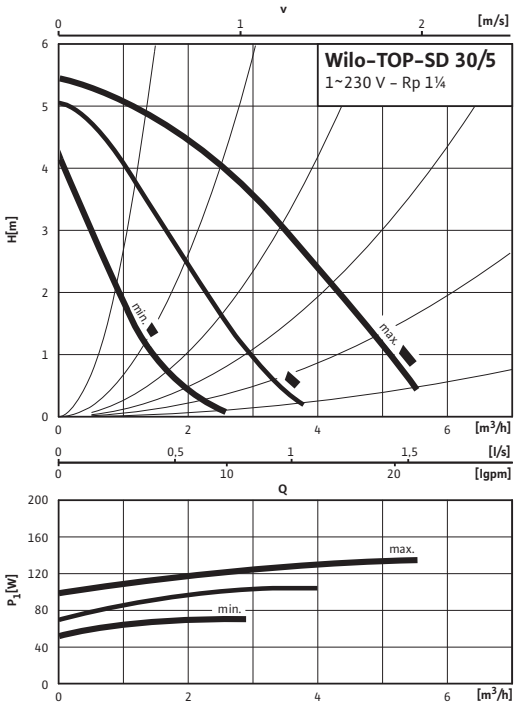
	Wilo–TOP–SD …									
	50/7	**50/10**	**50/15**	**65/10**	**65/13**	**65/15**	**80/7**	**80/10**	**80/15**	**80/20**
Motor/electronics										
Electromagnetic compatibility	–									
Emitted interference	EN 61000–6–3									
Interference resistance	EN 61000–6–2									
Power electronics	–	–	–	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H	H	H	H
Materials										
Pump housing	Grey cast iron (EN–GJL–250)									
Impeller	Plastic (PP – 50% GF)									
Pump shaft	Stainless steel (X46Cr13)									
Bearing	Carbon, metal impregnated									
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature										
Minimum suction head at 50°C	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	9.0	9.0
Minimum suction head at 95°C	10	10	10	10	10	10	10	10	18	18
Minimum suction head at 110°C	16	16	16	16	16	16	16	16	23	23
Minimum suction head at 130°C	29	29	29	29	29	29	29	29	36	36

• = available, – = not available

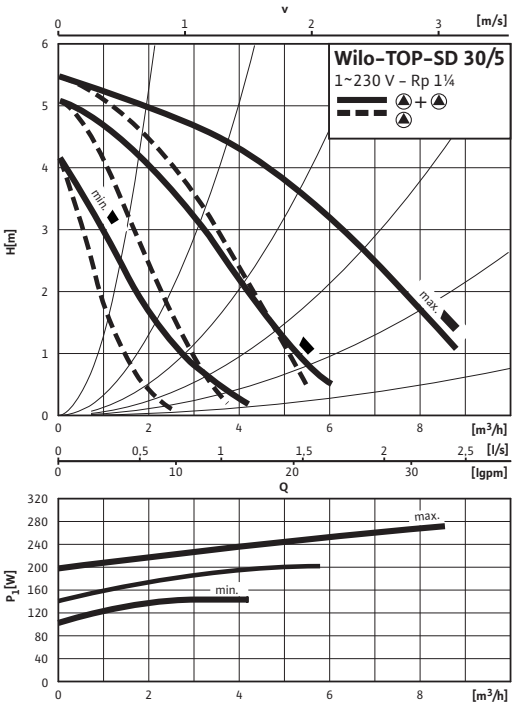
Pump curves Wilo-TOP-SD

Wilo-TOP-SD 30/5

Single-phase current - individual operation

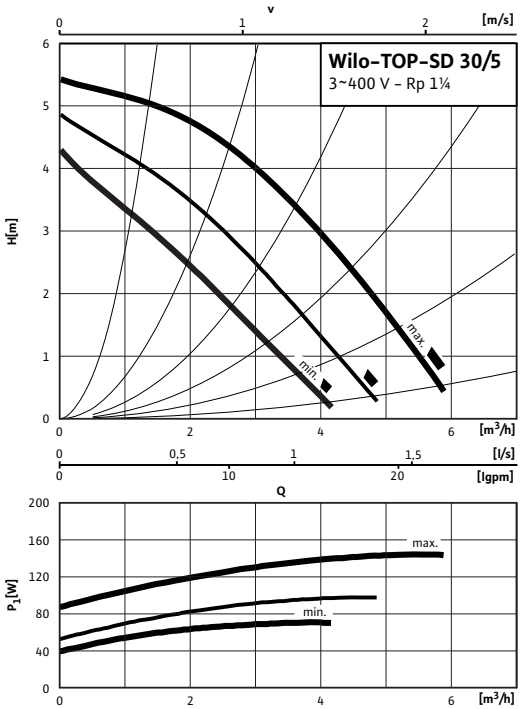


Single-phase current - parallel operation

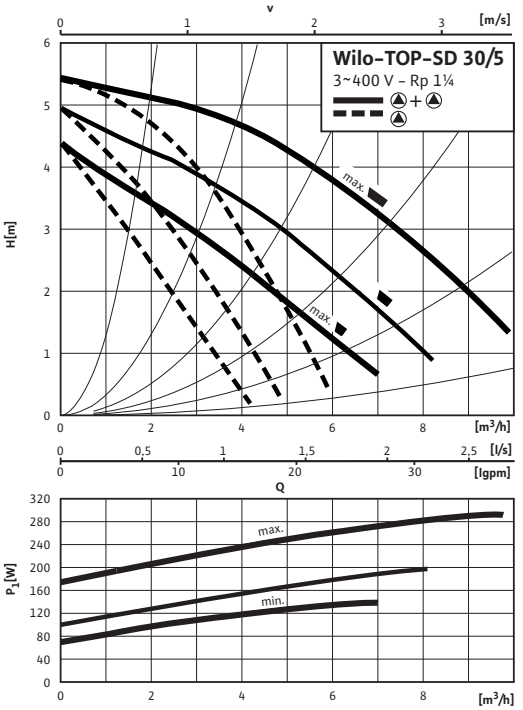


Wilo-TOP-SD 30/5

Three-phase current - individual operation



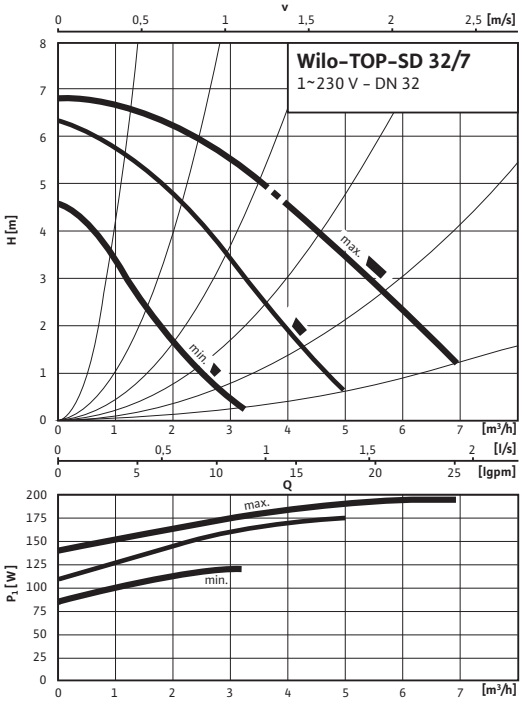
Three-phase current - parallel operation



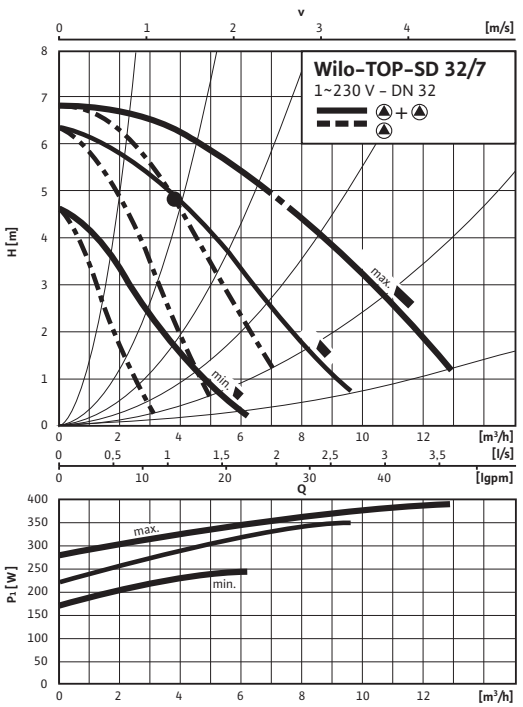
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 32/7

Single–phase current – individual operation

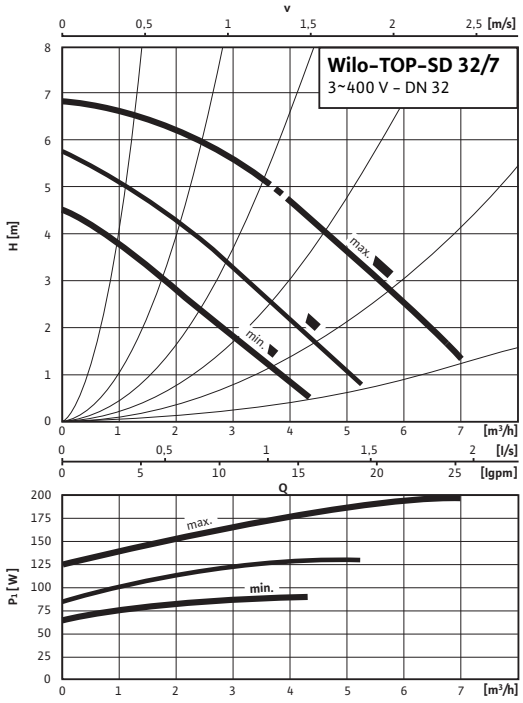


Single–phase current – parallel operation

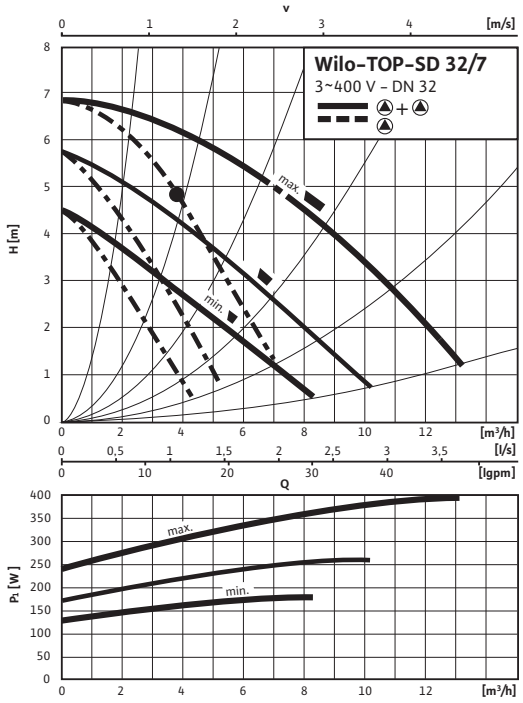


Wilo–TOP–SD 32/7

Three–phase current – individual operation



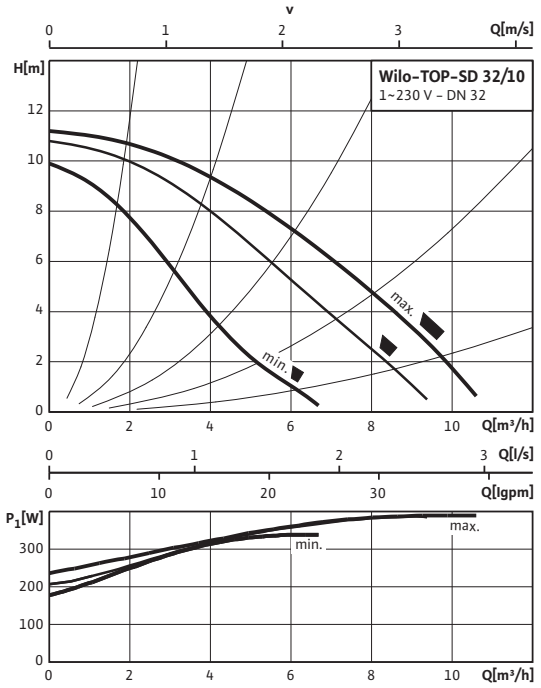
Three–phase current – parallel operation



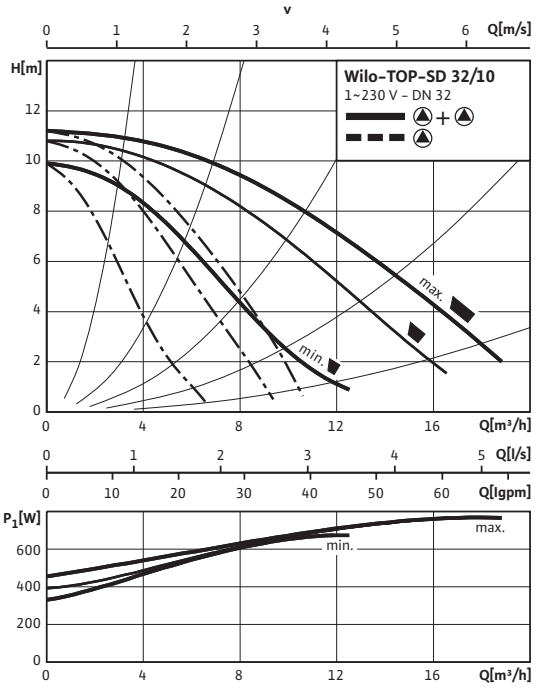
Pump curves Wilo-TOP-SD

Wilo-TOP-SD 32/10

Single-phase current - individual operation

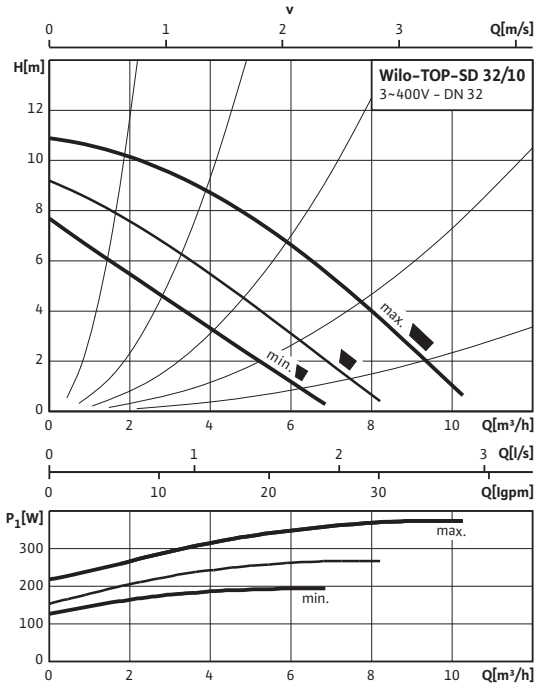


Single-phase current - parallel operation

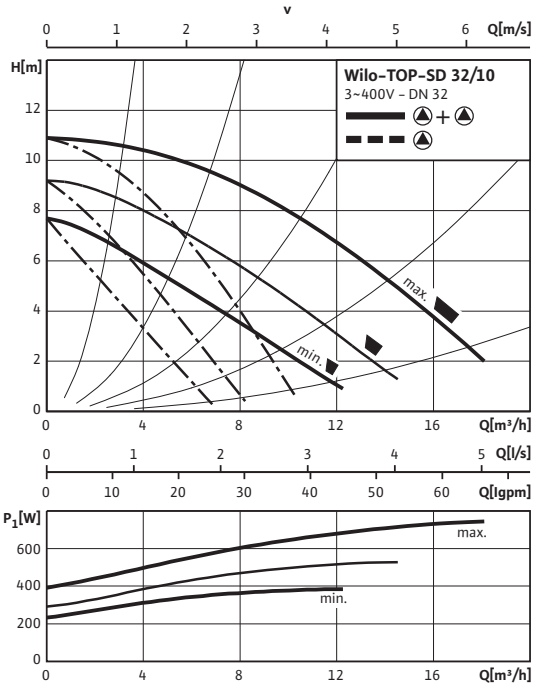


Wilo-TOP-SD 32/10

Three-phase current - individual operation



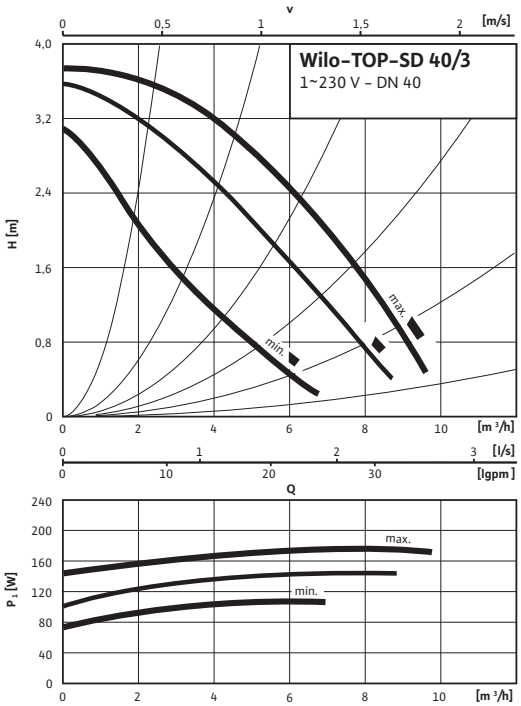
Three-phase current - parallel operation



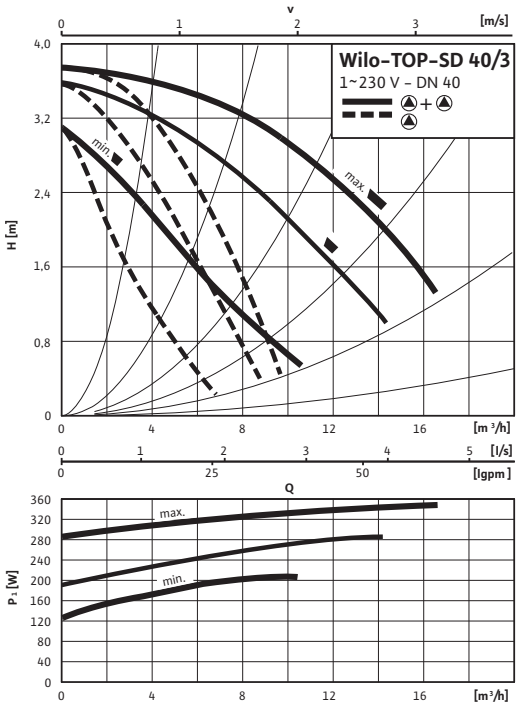
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 40/3

Single–phase current – individual operation

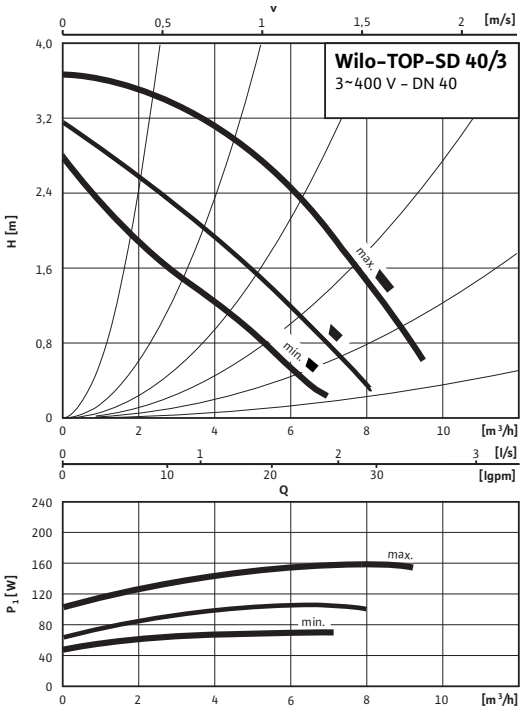


Single–phase current – parallel operation

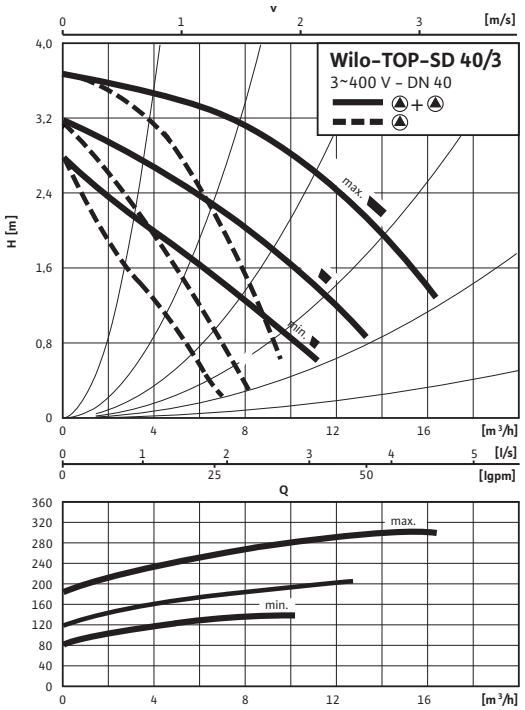


Wilo–TOP–SD 40/3

Three–phase current – individual operation



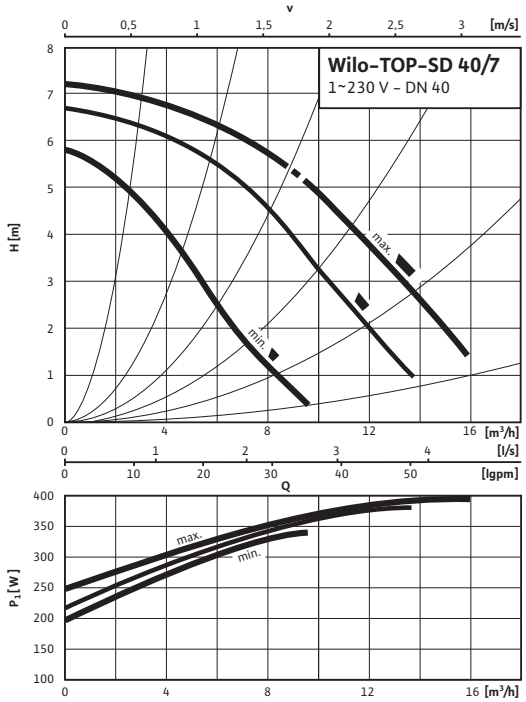
Three–phase current – parallel operation



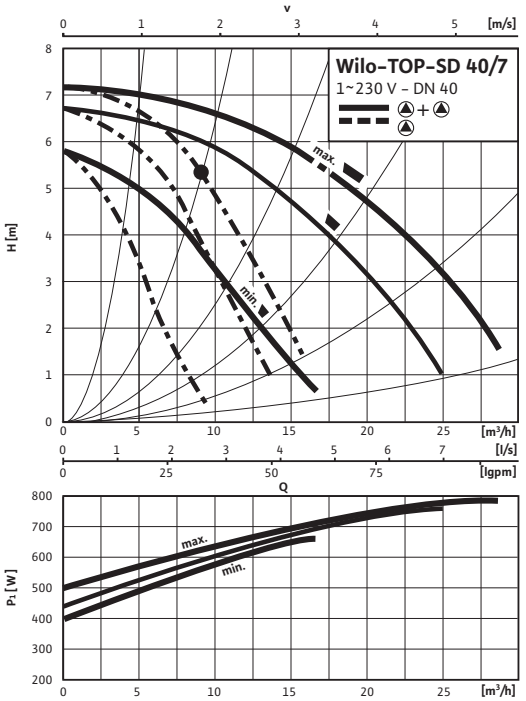
Pump curves Wilo-TOP-SD

Wilo-TOP-SD 40/7

Single-phase current - individual operation

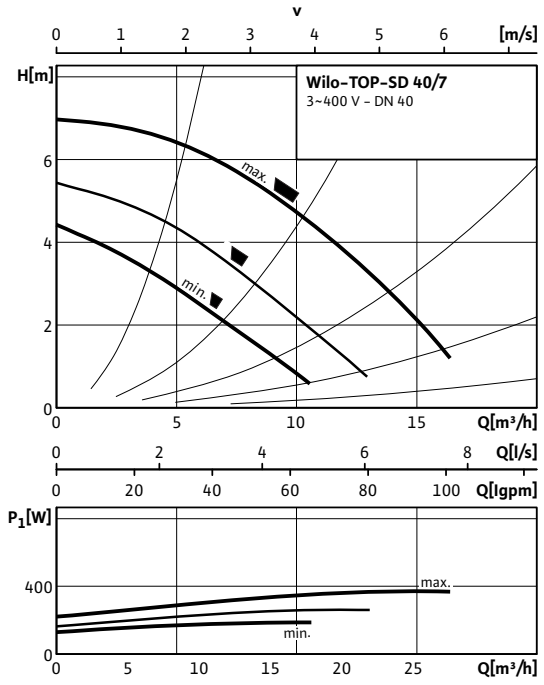


Single-phase current - parallel operation

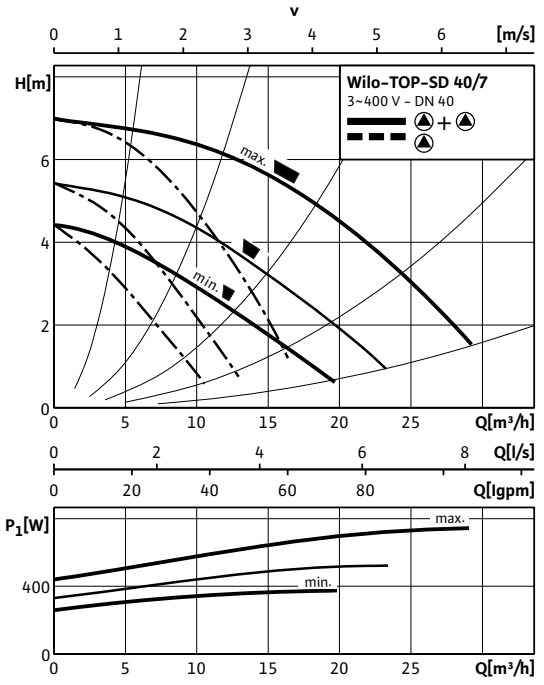


Wilo-TOP-SD 40/7

Three-phase current - individual operation



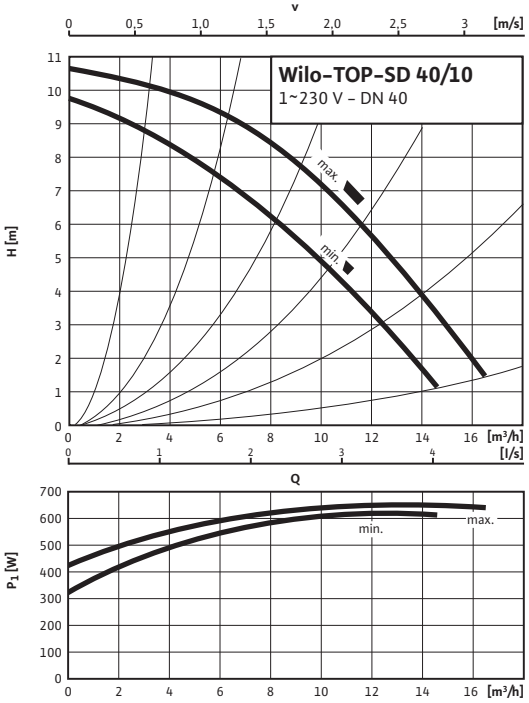
Three-phase current - parallel operation



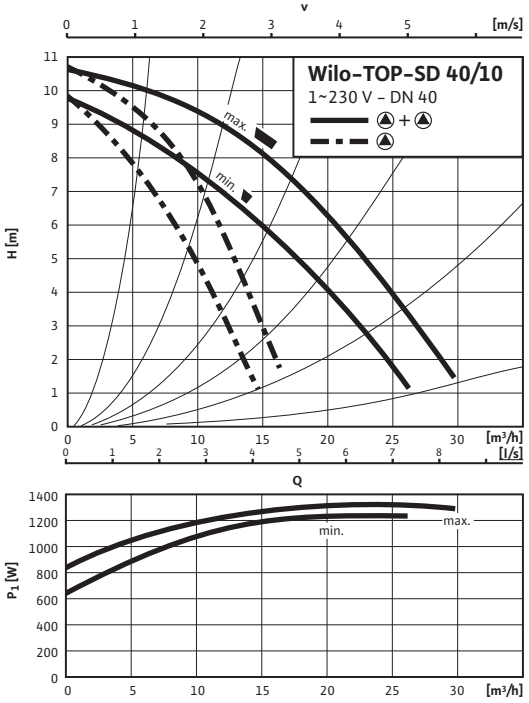
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 40/10

Single–phase current – individual operation

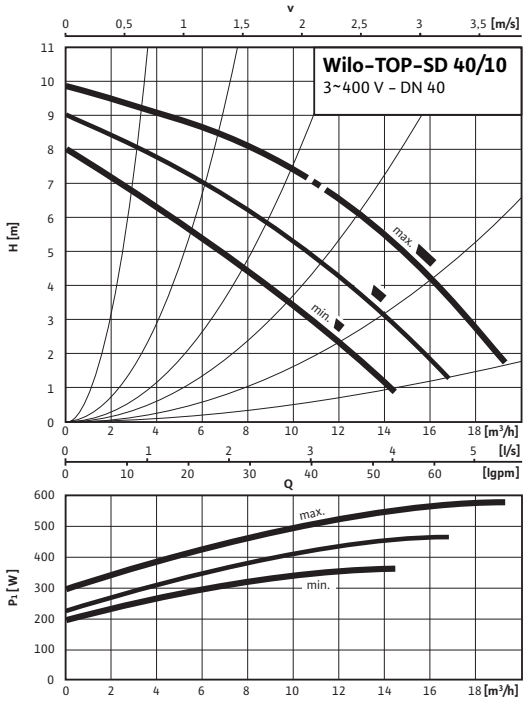


Single–phase current – parallel operation

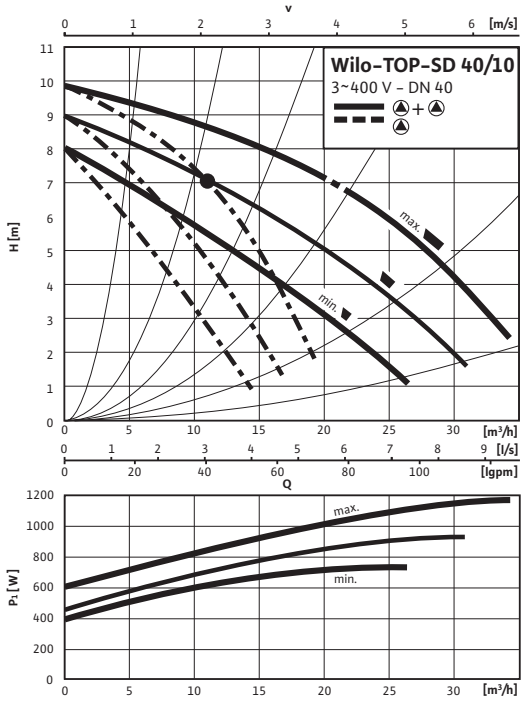


Wilo–TOP–SD 40/10

Three–phase current – individual operation



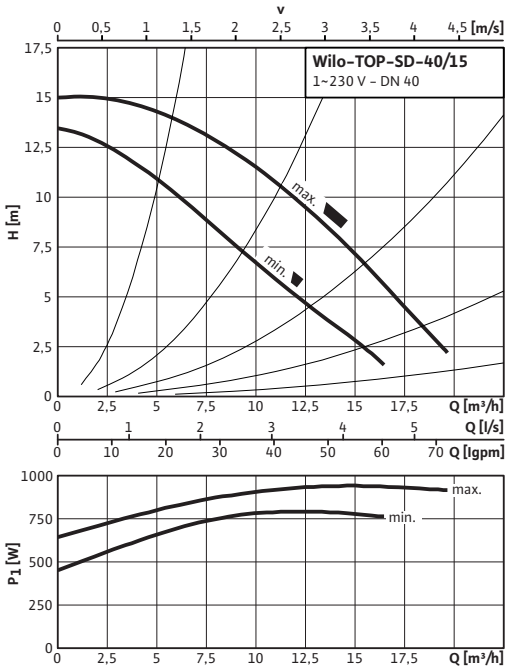
Three–phase current – parallel operation



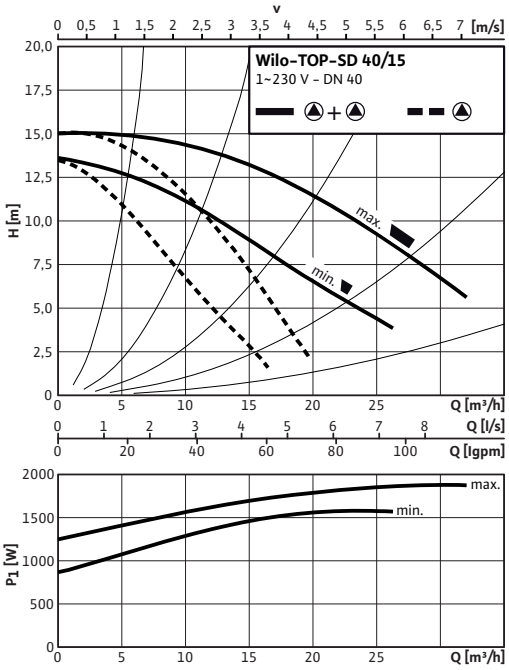
Pump curves Wilo-TOP-SD

Wilo-TOP-SD 40/15

Single-phase current - individual operation

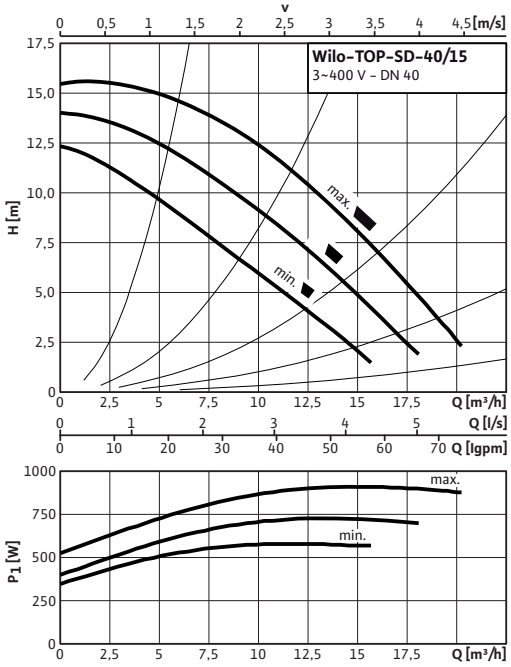


Single-phase current - parallel operation

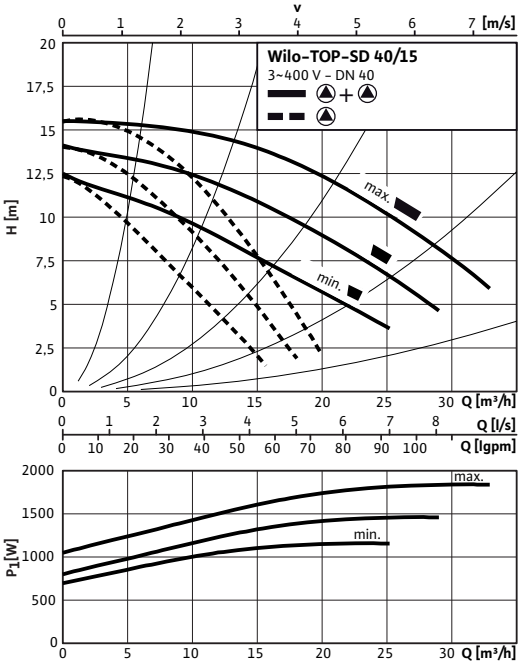


Wilo-TOP-SD 40/15

Three-phase current - individual operation



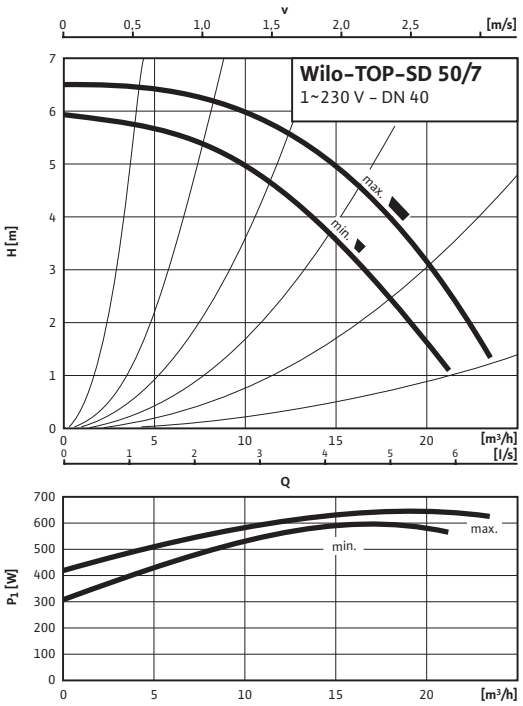
Three-phase current - parallel operation



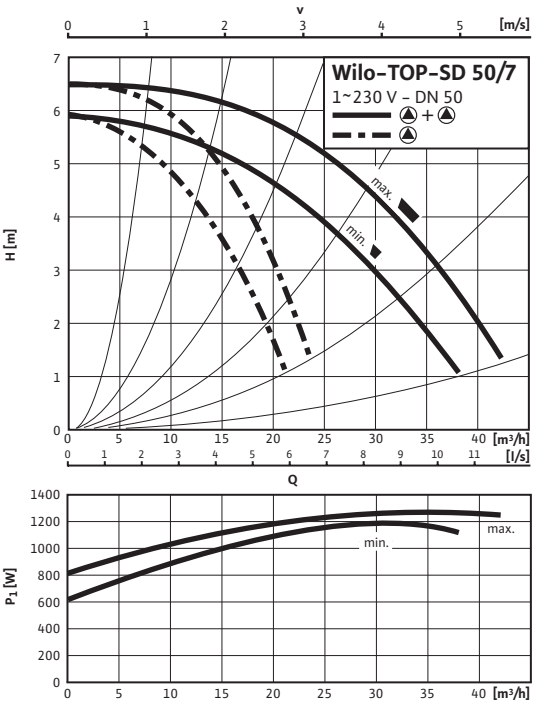
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 50/7

Single–phase current – individual operation

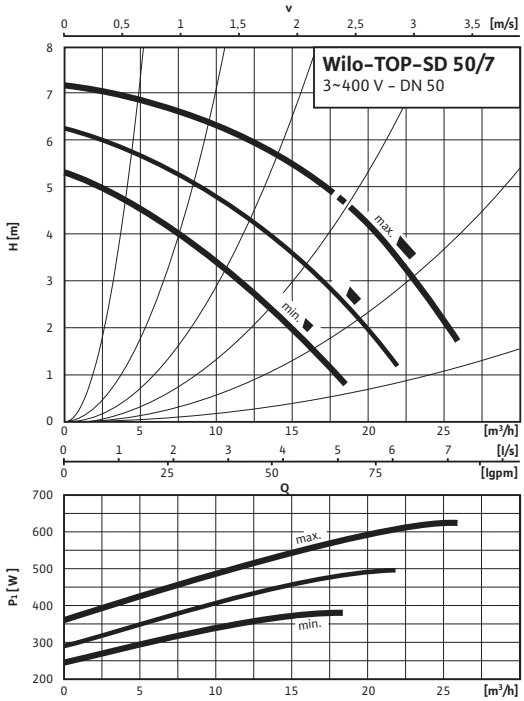


Single–phase current – parallel operation

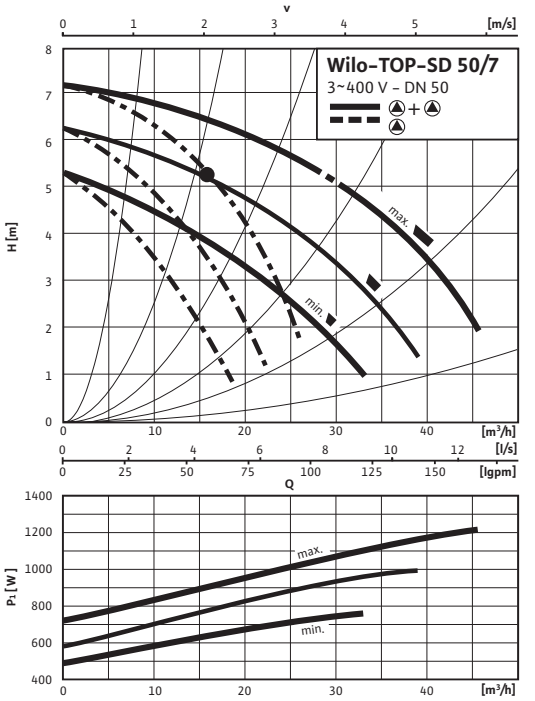


Wilo–TOP–SD 50/7

Three–phase current – individual operation



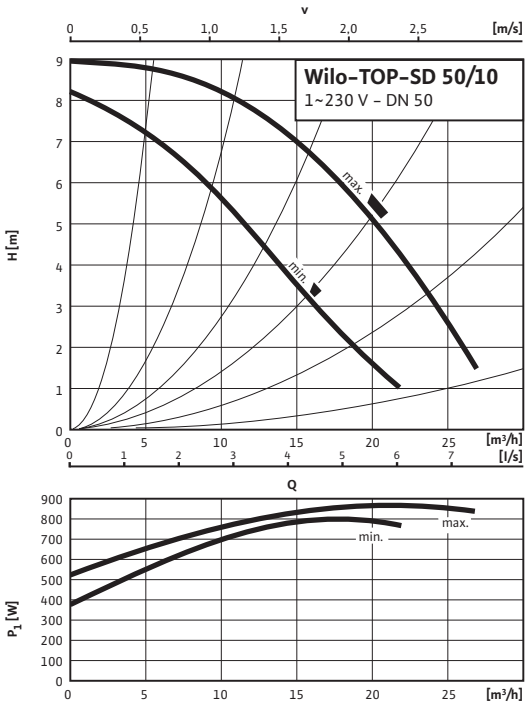
Three–phase current – parallel operation



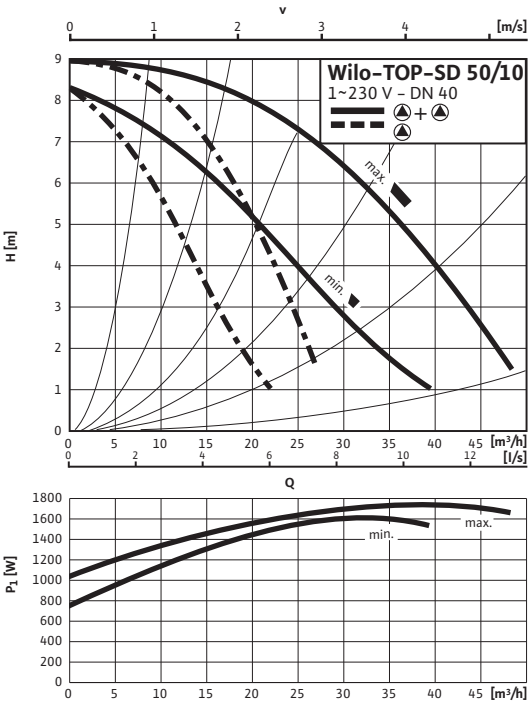
Pump curves Wilo-TOP-SD

Wilo-TOP-SD 50/10

Single-phase current - individual operation

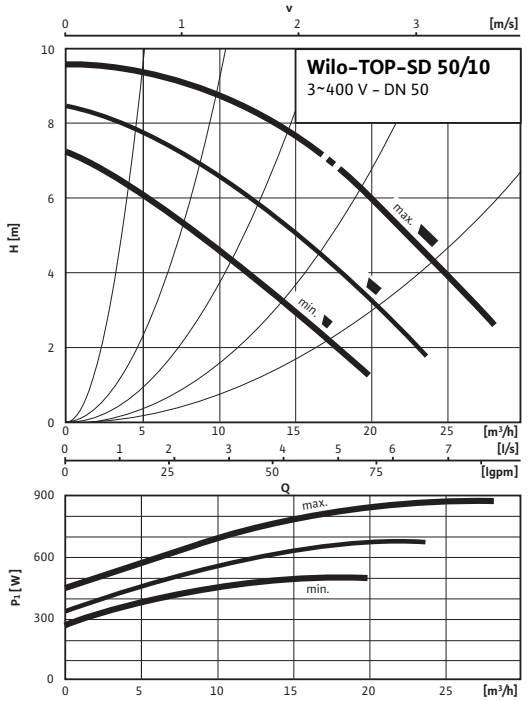


Single-phase current - parallel operation

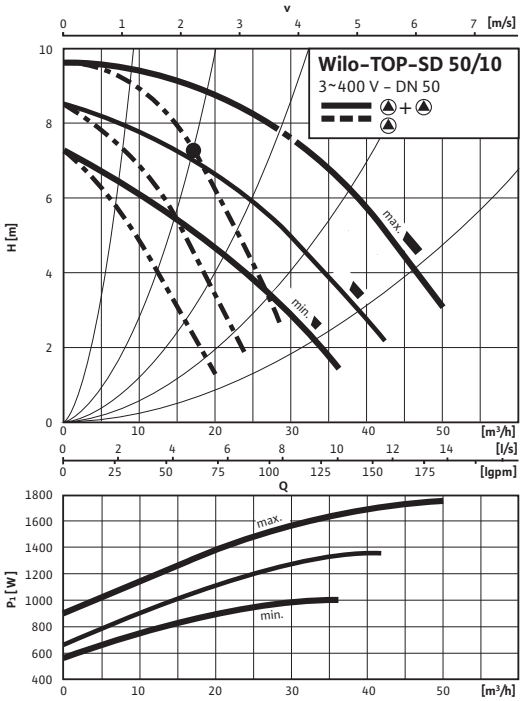


Wilo-TOP-SD 50/10

Three-phase current - individual operation



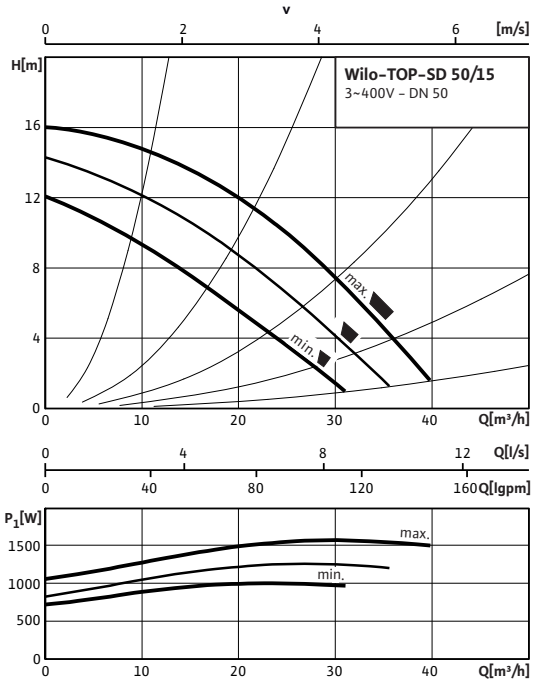
Three-phase current - parallel operation



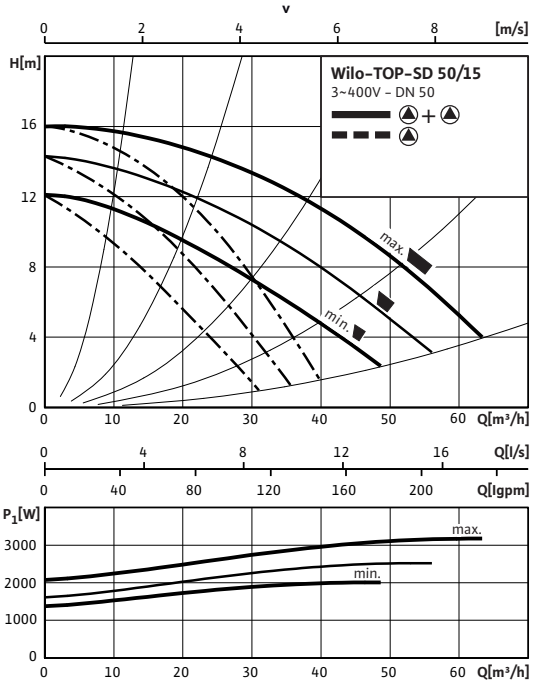
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 50/15

Three–phase current – individual operation

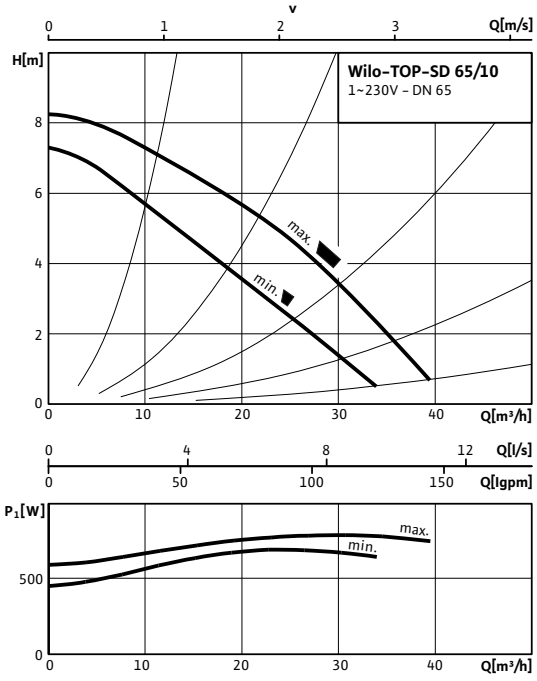


Three–phase current – parallel operation

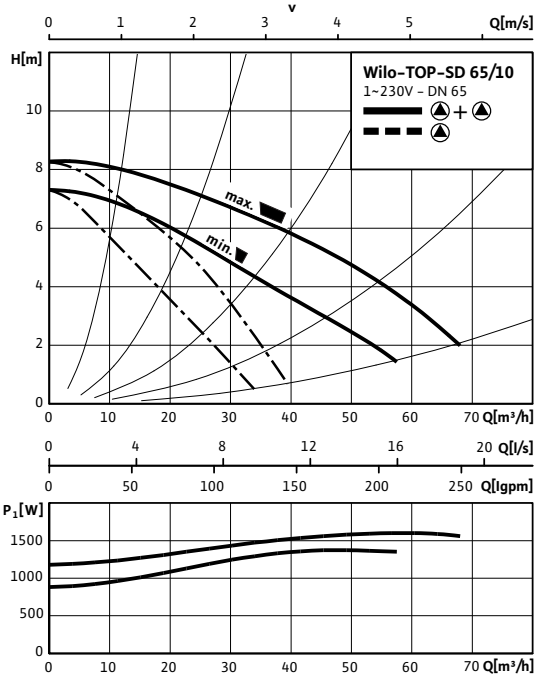


Wilo–TOP–SD 65/10

Single–phase current – individual operation



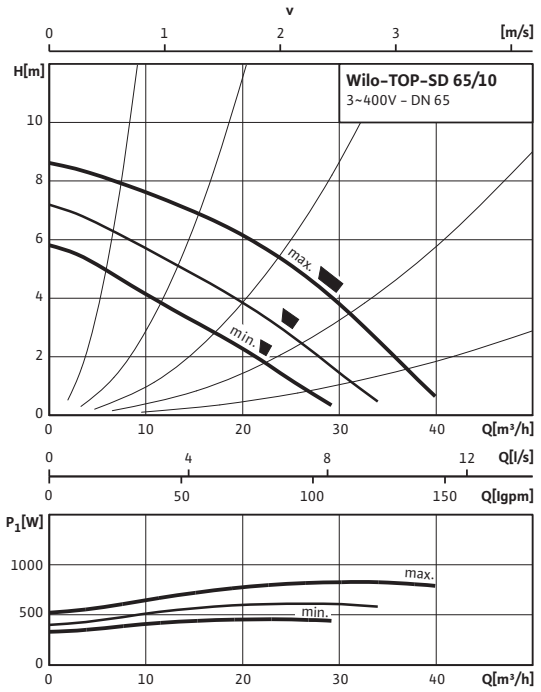
Single–phase current – parallel operation



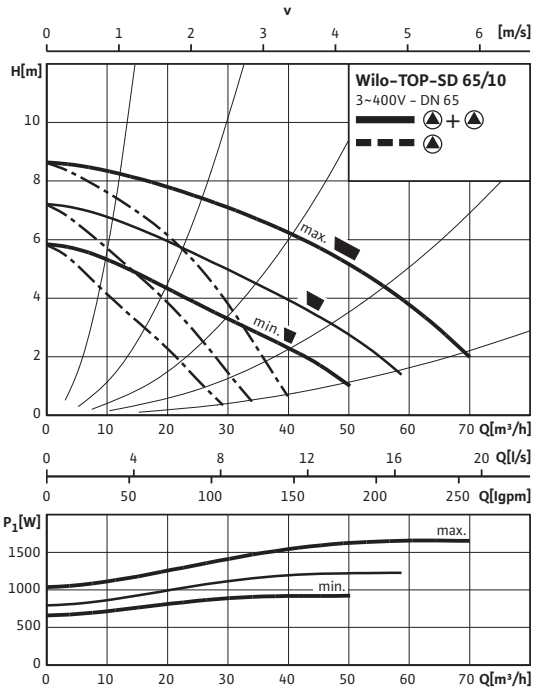
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 65/10

Three–phase current – individual operation

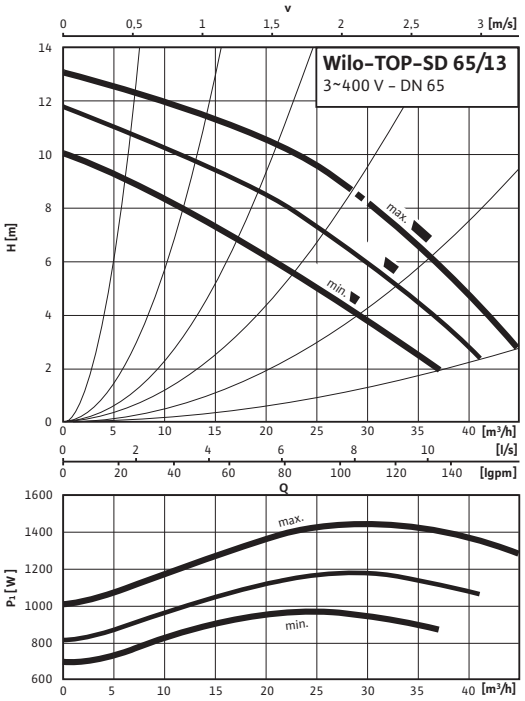


Three–phase current – parallel operation

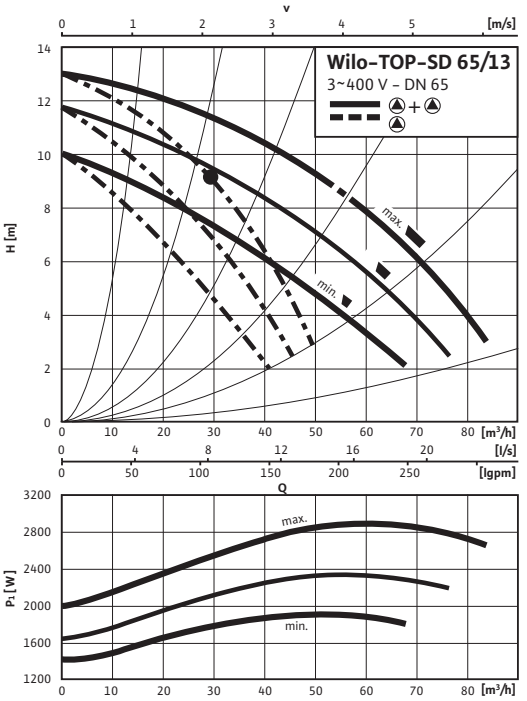


Wilo–TOP–SD 65/13

Three–phase current – individual operation



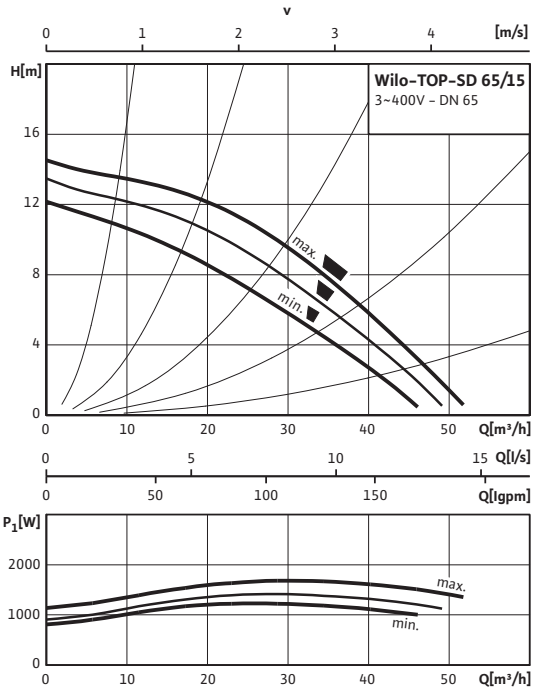
Three–phase current – parallel operation



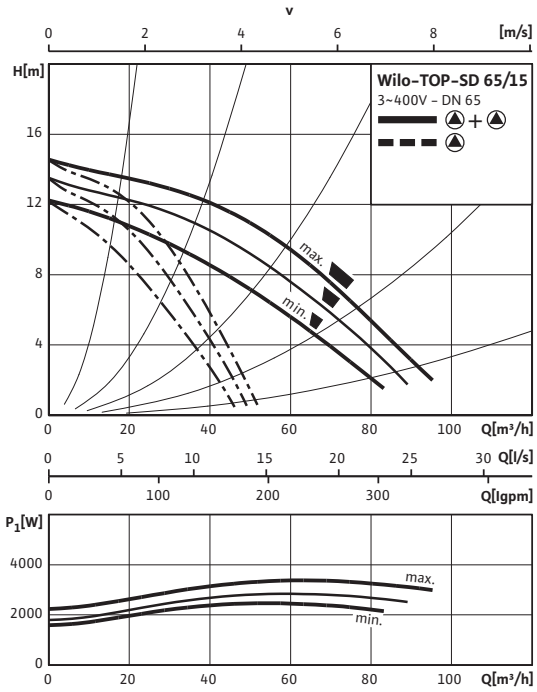
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 65/15

Three–phase current – individual operation

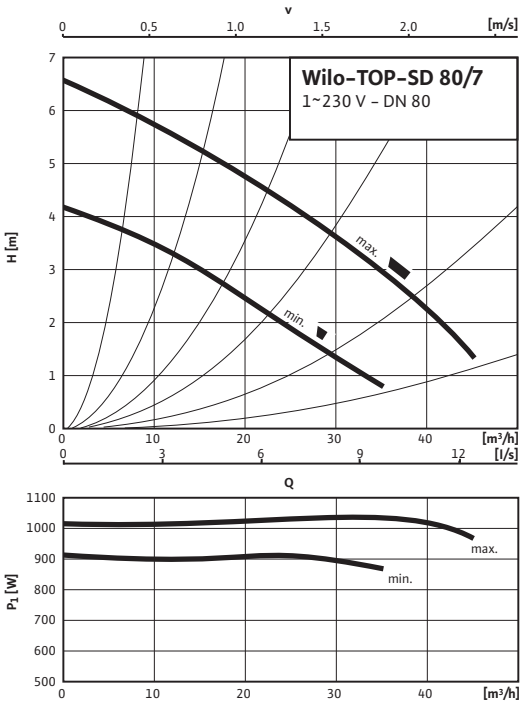


Three–phase current – parallel operation

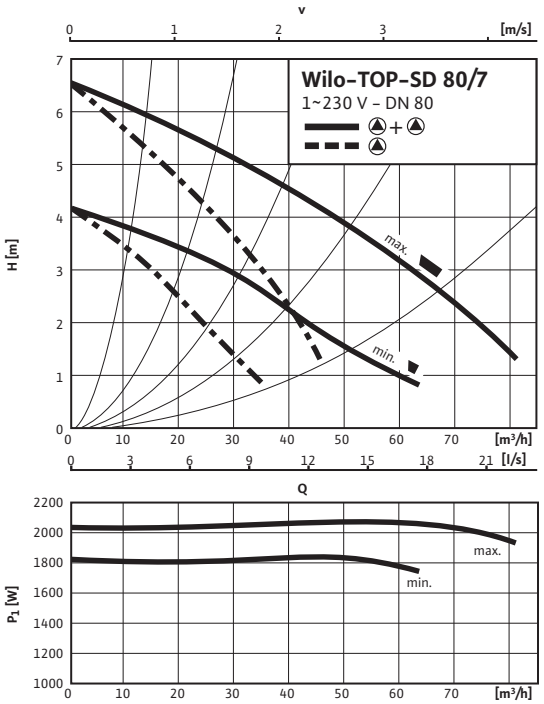


Wilo–TOP–SD 80/7

Single–phase current – individual operation



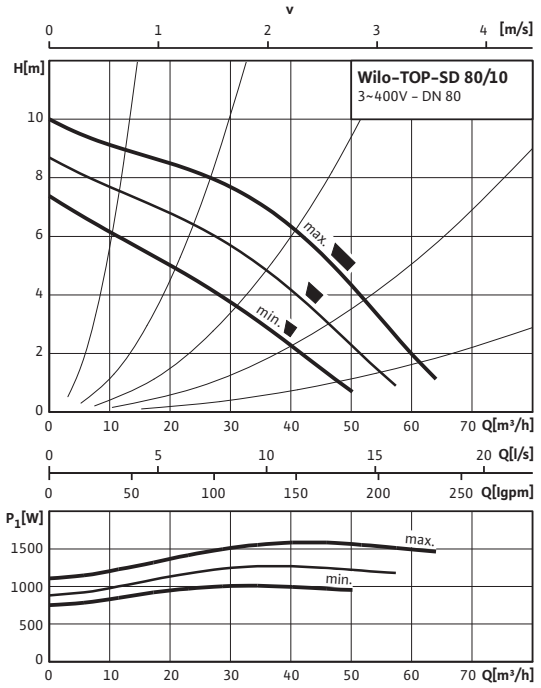
Single–phase current – parallel operation



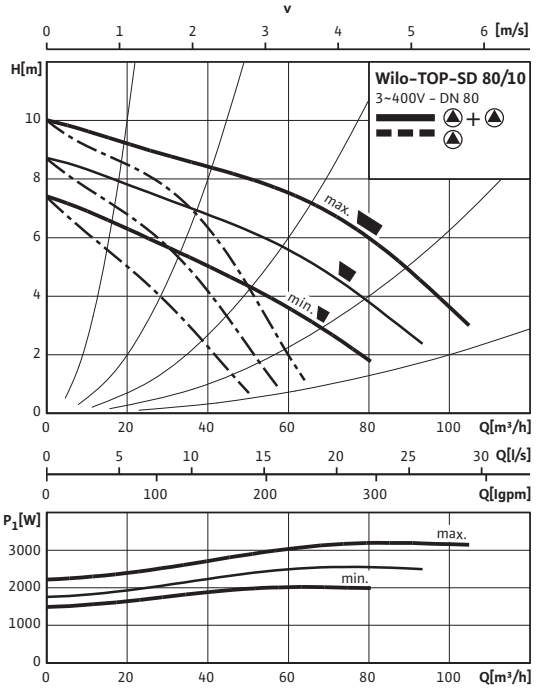
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 80/10

Three–phase current – individual operation

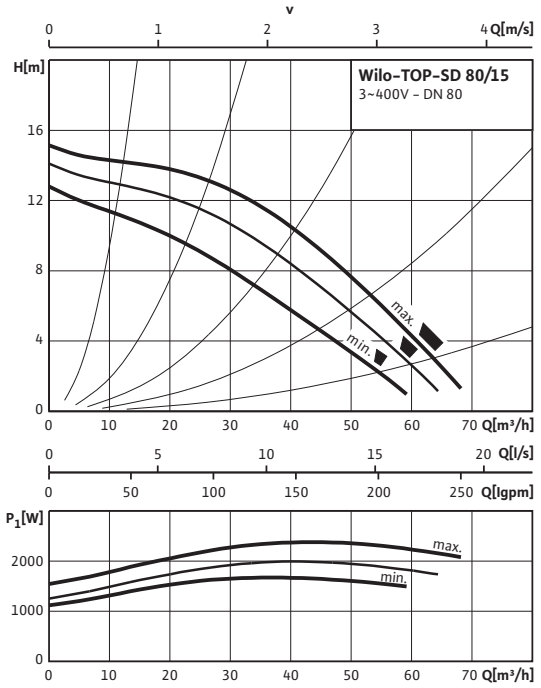


Three–phase current – parallel operation

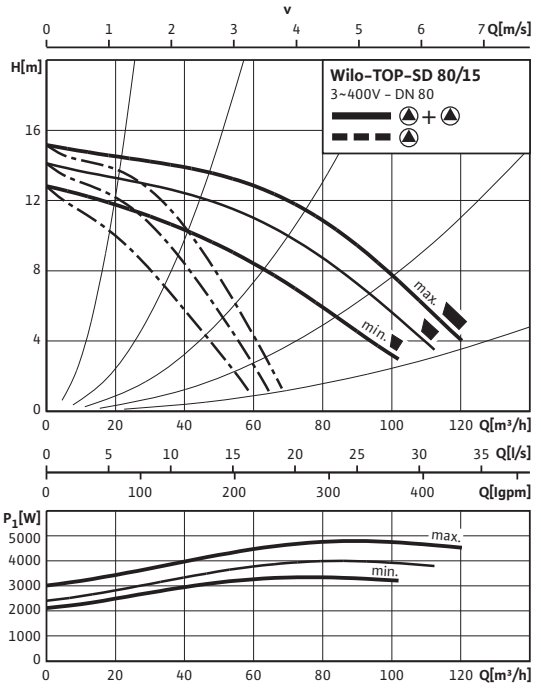


Wilo–TOP–SD 80/15

Three–phase current – individual operation



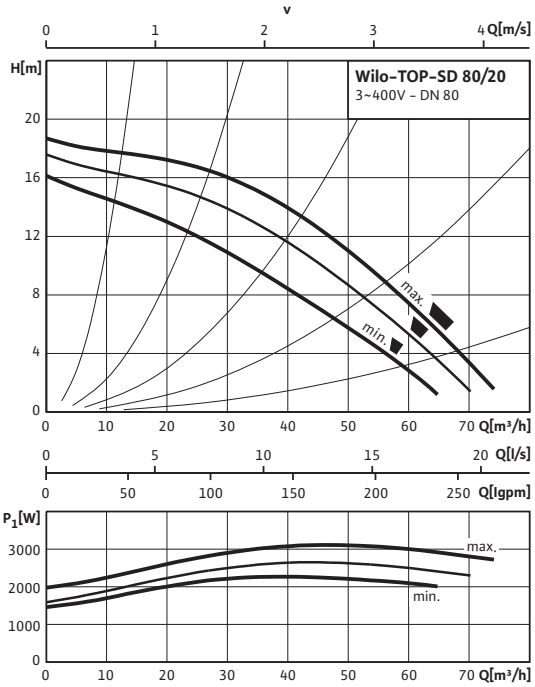
Three–phase current – parallel operation



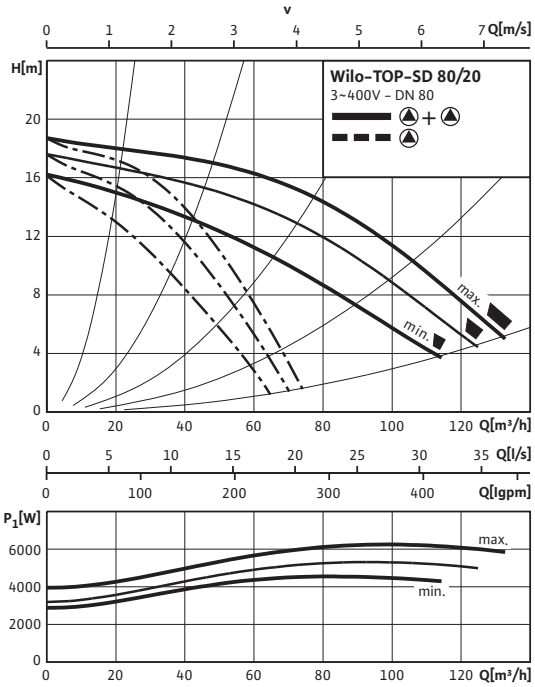
Pump curves Wilo–TOP–SD

Wilo–TOP–SD 80/20

Three–phase current – individual operation

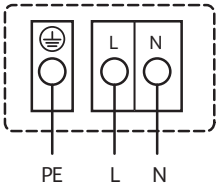


Three–phase current – parallel operation



Terminal diagram, motor data Wilo-TOP-SD

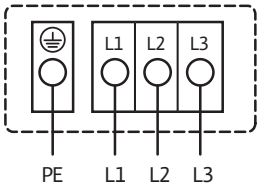
Terminal diagram A / motor protection A



Mains connection 1~230 V, 50 Hz

Internal protection against unacceptably high winding temperatures
Triggering: Internal interruption of motor voltage
Reset: Automatic after motor has cooled down

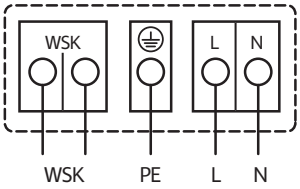
Terminal diagram B / motor protection B



Mains connection 3~400 V, 50 Hz
3~230 V, 50 Hz (with optional switching plug 3~230 V)
internal protection against unacceptably high winding temperatures

Triggering:Internal interruption of a motor phase
Reset:Disconnect mains voltage, allow motor to cool down,
switch mains voltage back on again

Terminal diagram C / motor protection C

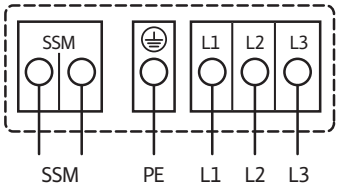


Mains connection 1~230 V, 50 Hz

WSK = thermal winding contact
Full motor protection at all speed stages with optional tripping unit Wilo-SK 602/SK 622/Protect Module C or other switchgear/control devices with WSK connection option
Triggering: External tripping at switchgear/control device
Reset: Manual reset at switchgear/control device necessary

(Wiring diagram with SK 602/622, see "Service/Accessories")

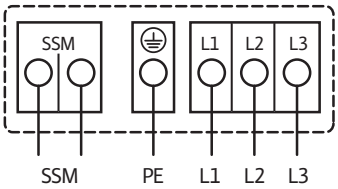
Terminal diagram D / motor protection D



Mains connection 3~400 V, 50 Hz
3~230 V, 50 Hz (with optional switching plug 3~230 V)
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

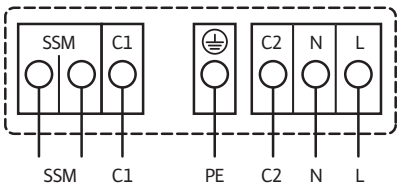
Terminal diagram E / motor protection E



Mains connection 3~400 V, 50 Hz
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

Terminal diagram F / motor protection F



Mains connection 3~400 V, 50 Hz
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

Terminal diagram, motor data Wilo–TOP–SD

Motor data

Wilo–TOP–SD …	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Cur–rent at 1~230V	Cur–rent at 3~400V	Cur–rent at 3~230V	Capaci–tor	Motor protec–tion	Threaded cable connection	Wir–ing di–agram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/ VDB]	–	[PG]	–
30/5 (1–phase–motor)	50	max. 2320 1640 min. 1200	100 – 140 75 – 110 55 – 75	–	0.65 0.55 0.35	–	–	3.7/400	A	1x13.5	A
30/5 (3–phase–motor)	50	max. 2650 2190 min. 1890	–	85 – 150 55 – 100 40 – 75	–	0.40 0.20 0.15	0.65 0.35 0.25	–	B	1x13.5	B
32/7 (1–phase–motor)	90	max. 2600 2300 min. 1800	140 – 195 110 – 175 85 – 120	–	0.95 0.87 0.62	–	–	5.0/400	A	1x13.5	A
32/7 (3–phase–motor)	90	max. 2600 2100 min. 1750	–	120 – 200 85 – 130 65 – 90	–	0.45 0.25 0.17	0.78 0.43 0.30	–	B	1x13.5	B
32/10 (1–phase–motor)	180	max. 2600 2500 min. 2300	260 – 410 210 – 395 185 – 340	–	2.05 1.95 1.75	–	–	8.0/400	C	2x13.5	C
32/10 (3–phase–motor)	180	max. 2650 2250 min. 1950	–	190 – 380 140 – 270 115 – 195	–	0.78 0.48 0.35	1.35 0.84 0.61	–	D	2x13.5	D
40/3 (1–phase–motor)	70	max. 2660 2340 min. 1710	145 – 180 95 – 150 70 – 110	–	0.85 0.75 0.55	–	–	5.0/400	A	1x13.5	A
40/3 (3–phase–motor)	70	max. 2610 2120 min. 1810	–	95 – 160 60 – 105 40 – 75	–	0.40 0.20 0.15	0.65 0.35 0.25	–	B	1x13.5	B
40/7 (1–phase–motor)	180	max. 2650 2450 min. 2200	250 – 390 220 – 380 200 – 330	–	1.93 1.88 1.70	–	–	8.0/400	C	2x13.5	C
40/7 (3–phase–motor)	180	max. 2600 2100 min. 1800	–	220 – 370 165 – 260 130 – 185	–	0.76 0.47 0.33	1.31 0.81 0.57	–	D	2x13.5	D
40/10 (1–phase–motor)	350	max. 2800 min. 2600	430 – 680 310 – 610	–	3.47 3.18	–	–	16.0/400	F	2x13.5	F
40/10 (3–phase–motor)	350	max. 2800 2500 min. 2200	–	300 – 585 230 – 465 200 – 365	–	1.17 0.82 0.65	2.02 1.43 1.12	–	D	2x13.5	D
40/15 (1–phase–motor)	570	max. 2800 min. 2500	615 – 945 415 – 800	–	4.57 4.2	–	–	25.0/400	F	2x13.5	F
40/15 (3–phase–motor)	570	max. 2800 2500 min. 2150	–	500 – 905 375 – 720 325 – 585	–	1.84 1.30 1.05	3.19 2.25 1.82	–	D	2x13.5	D
50/7 (1–phase–motor)	350	max. 2800 min. 2600	460 – 690 360 – 630	–	3.49 3.35	–	–	16.0/400	F	2x13.5	F

Terminal diagram, motor data Wilo-TOP-SD

Motor data

Wilo-TOP-SD ...	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Current at 1~230V	Current at 3~400V	Current at 3~230V	Capacitor	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/ VDB]	–	[PG]	–
50/7 (3-phase-motor)	350	max. 2800 2450 min. 2150	–	360 – 610 285 – 470 245 – 375	–	1.19 0.83 0.66	2.06 1.43 1.14	–	D	2x13.5	D
50/10 (1-phase-motor)	450	max. 2800 min. 2450	515 – 820 360 – 730	–	3.94 3.72	–	–	25.0/400	F	2x13.5	F
50/10 (3-phase-motor)	450	max. 2700 2300 min. 2000	–	450 – 880 330 – 680 280 – 500	–	1.73 1.20 0.89	3.00 2.09 1.54	–	D	2x13.5	D
50/15 (3-phase-motor)	1100	max. 2800 2500 min. 2200	–	1060 – 1570 830 – 1260 720 – 1005	–	3.13 2.25 1.81	5.43 3.90 3.14	–	D	2x13.5	D
65/10 (1-phase-motor)	450	max. 2800 min. 2450	580 – 790 440 – 690	–	3.78 3.51	–	–	25.0/400	F	2x13.5	F
65/10 (3-phase-motor)	450	max. 2650 2250 min. 1950	–	525 – 845 410 – 630 340 – 470	–	1.67 1.10 0.83	2.89 1.91 1.44	–	D	2x13.5	D
65/13 (3-phase-motor)	1100	max. 2800 2550 min. 2250	–	1000 – 1450 810 – 1180 700 – 960	–	2.93 2.10 1.74	5.07 3.64 3.00	–	D	2x13.5	D
65/15 (3-phase-motor)	1300	max. 2850 2700 min. 2500	–	1140 – 1685 910 – 1425 810 – 1240	–	3.41 2.52 2.18	5.91 4.36 3.78	–	D	2x13.5	D
80/7 (1-phase-motor)	450	max. 2800 min. 2350	640 – 800 505 – 700	–	3.85 3.59	–	–	25.0/400	F	2x13.5	F
80/10 (3-phase-motor)	1100	max. 2800 2500 min. 2150	–	1100 – 1590 880 – 1290 745 – 1015	–	3.13 2.29 1.84	5.43 3.96 3.19	–	D	2x13.5	D
80/15 (3-phase-motor)	1800	max. 2900 2700 min. 2450	–	1600 – 2400 1300 – 2000 1160 – 1680	–	4.85 3.63 3.25	–	–	E	2x13.5	E
80/20 (3-phase-motor)	2200	max. 2900 2750 min. 2500	–	2050 – 3120 1670 – 2650 1480 – 2270	–	6.10 4.80 4.35	–	–	E	2x13.5	E

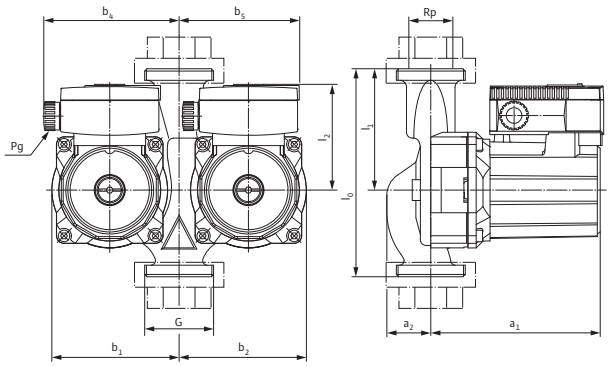
Observe name plate data!
Current I: Motor protection switch onsite setting

Note:
3~230 V only with optional switching plug (accessory)

Subject to change 09/2008 WILO SE

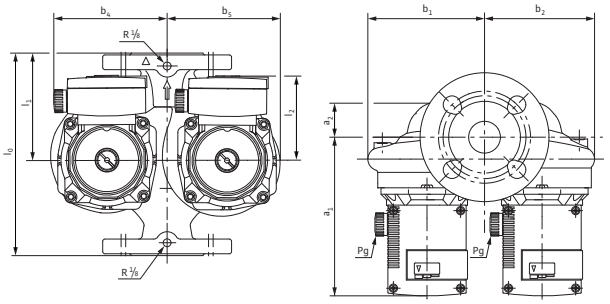
Dimensions, weights Wilo-TOP-SD

Dimension drawing A



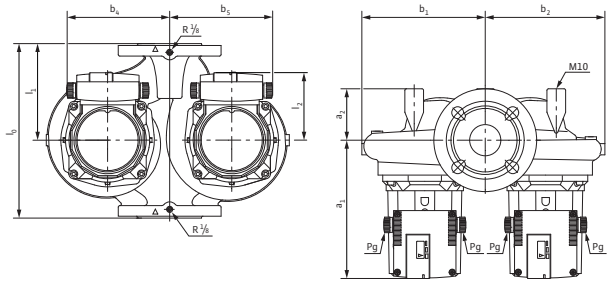
Permitted installation positions, see Planning guide

Dimension drawing B



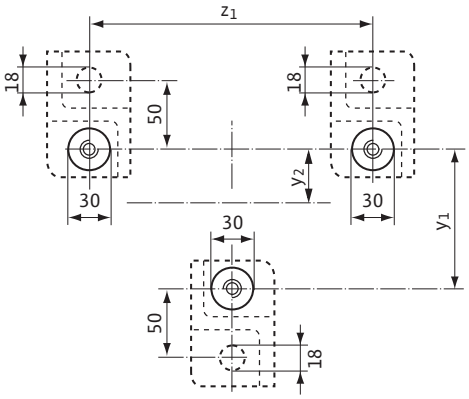
Permitted installation positions, see Planning guide

Dimension drawing C

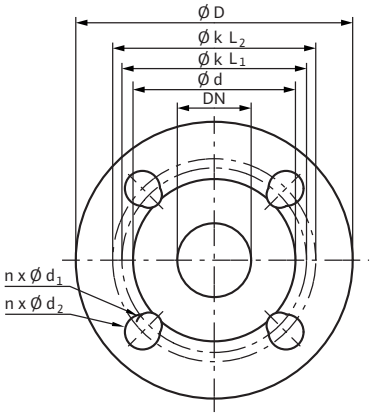


Permitted installation positions, see Planning guide

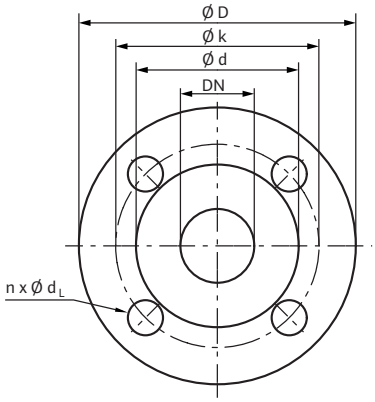
Dimension drawing D – Bracket diagram



Dimension drawing Flange A

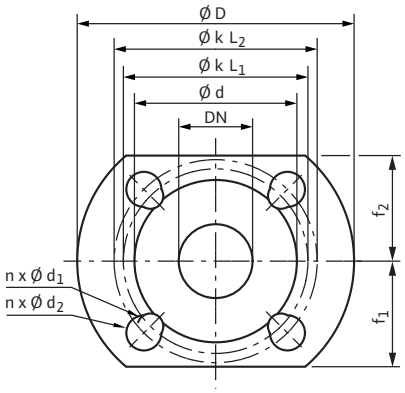


Dimension drawing Flange B

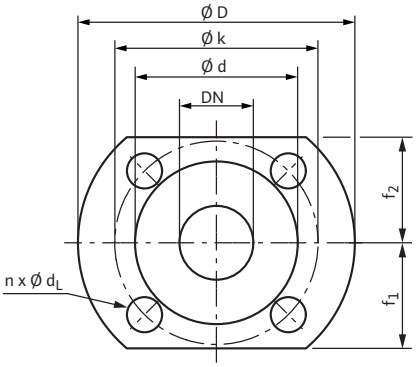


Dimensions, weights Wilo-TOP-SD

Dimension drawing Flange F



Dimension drawing Flange G



Dimensions, weights

Wilo-TOP-SD ...	Rated pressure	Pipe connection	Nominal flange diameter	Thread	Dimensions												Weight approx.	Dimension drawing
	PN	Rp	DN	G	l_0	l_1	l_2	a_1	a_2	b_1	b_2	b_4	b_5	y_1	y_2	z_1	M	–
	[bar]	–			[mm]												[kg]	–
30/5	10	1¼	–	2	180	105	92	150	40	112	112	120	102.5	–	–	–	8.5	A
32/7	6/10	-	32	–	220	115	99	172	38	126	119	123	107.0	–	–	–	14.0	B
32/10	6/10	-	32	–	220	110	102	172	60	144	143	141	141.0	107	11	172	19.2	C/D
40/3	6/10	-	40	–	244	135	92	156	75	126	133	123	107.0	108	14	154	14.0	B
40/7	6/10	-	40	–	250	135	102	193	75	150	140	141	141.0	108	11	172	21.2	C/D
40/10	6/10	-	40	–	250	135	109	216	75	178	172	153	153.0	132	35	225	29.0	C/D
40/15	6/10	-	40	–	250	125	119	258	65	200	195	172	172.0	132	25	225	38.9	C/D
50/7	6/10	-	50	–	280	160	109	224	83	179	169	153	153.0	132	30	225	31.0	C/D
50/10	6/10	-	50	–	280	155	109	222	83	198	192	163	163.0	157	50	228	33.5	C/D
50/15	6/10	-	50	–	340	170	119	243	86	209	200	173	173.0	184	30	252	50.0	C/D
65/10	6/10	-	65	–	340	170	109	241	80	214	201	172	172.0	180	25	225	38.5	C/D
65/13	6/10	-	65	–	340	185	119	254	93	223	210	172	172.0	162	25	225	50.0	C/D
65/15	6/10	-	65	–	340	185	119	254	93	223	210	172	172.0	162	25	225	55.5	C/D
80/10	6	-	80	–	360	205	119	256	100	249	231	184	184.0	180	43	240	57.1	C/D
80/10	10	-	80	–	360	205	119	256	100	249	231	184	184.0	180	43	240	57.1	C/D
80/15	6	-	80	–	360	180	143	318	90	259	248	201	201.0	185	20	270	78.6	C/D
80/15	10	-	80	–	360	180	143	318	90	259	248	201	201.0	185	20	270	78.6	C/D
80/20	6	-	80	–	360	180	143	318	90	259	248	201	201.0	185	20	270	85.1	C/D
80/20	10	-	80	–	360	180	143	318	90	259	248	201	201.0	185	20	270	85.1	C/D

Note:
M10 drilled hole for support-bracket mounting available on request for types
TOP-SD 32/10, TOP-SD 40/3, TOP-SD 40/7, TOP-SD 40/10, TOP-SD 50/7, TOP-SD 50/10.

Dimensions, weights Wilo–TOP–SD

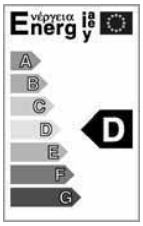
Flange dimensions

Wilo–TOP–SD …	Flange	Nominal flange diameter	Pump flange dimensions								Dimension drawing, flange
	–	DN	Ø D	f_1	f_2	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/ Ø d_{L2}	n x Ø d_L	–
	–		[mm]						[pcs. x mm]		–
32/7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	32	140	–	–	78	90/100	–	4 x 14 / 19	–	A
32/10	Combination flange PN6/10 (PN 16 flange according to EN 1092–2)	32	140	60	60	76	90/100	–	4 x 14 / 19	–	F
40/3	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	–	–	88	100/110	–	4 x 14 / 19	–	A
40/7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	–	–	88	100/110	–	4 x 14 / 19	–	A
40/10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	40	150	–	–	88	100/110	–	4 x 14 / 19	–	A
40/15	Combination flange PN6/10 (PN 16 flange according to EN 1092–2)	40	150	65	65	84	100/110	–	4 x 14 / 19	–	F
50/7	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	–	–	102	100/125	–	4 x 14 / 19	–	A
50/10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	50	165	–	–	102	100/125	–	4 x 14 / 19	–	A
50/15	Combination flange PN6/10 (PN 16 flange according to EN 1092–2)	50	165	70	70	99	110/125	–	4 x 14 / 19	–	F
65/10	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	65	185	80	80	118	130/145	–	4 x 14 / 19	–	F
65/13	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	65	185	–	–	122	130/145	–	4 x 14 / 19	–	A
65/15	Combination flange PN6/10 (PN 16 flange according to DIN 2533)	65	185	–	–	122	130/145	–	4 x 14 / 19	–	A
80/7	Flange PN 6 (PN 16 design, according to EN 1092–2)	80	200	90	90	132	–	150	–	4 x 19	G
80/10	Flange PN 6 (PN 16 design, according to EN 1092–2)	80	200	–	–	132	–	150	–	4 x 19	B
80/10	Flange PN16 (according to EN 1092–2)	80	200	–	–	132	–	160	–	8 x 19	B
80/15	Flange PN 6 (PN 16 design, according to EN 1092–2)	80	200	90	90	132	–	150	–	4 x 19	G
80/15	Flange PN16 (according to EN 1092–2)	80	200	90	90	132	–	160	–	8 x 19	G
80/20	Flange PN 6 (PN 16 design, according to EN 1092–2)	80	200	90	90	132	–	150	–	4 x 19	G
80/20	Flange PN16 (according to EN 1092–2)	80	200	90	90	132	–	160	–	8 x 19	G

n = number of drilled holes

Series description Wilo-SE-TW





> Note
EEI classification for each pump type, see Chapter: "Planning guide"

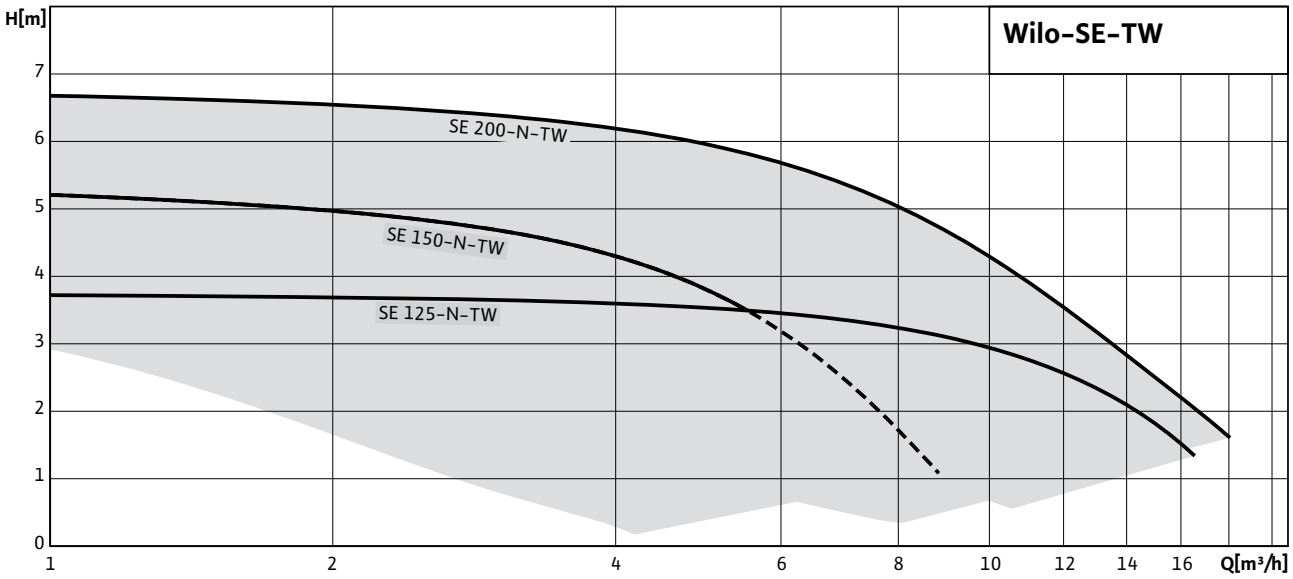
Design
Glandless double circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment

Application
Hot-water heating systems of all kinds, air-conditioning systems, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo-SE 150-N-TW**
SE	Standard pump (screwed connection or flange-end pump)
150	Type of construction
n	Modified version
TW	Double pump (double pump)

Special features/product benefits
- Can be used in heating systems and in cooling/air-conditioning systems from -20°C to +130°C
- Double pump for main/standby mode or parallel operation
- Manual power adjustment with 3 speed stages
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- Simple installation due to combination flange PN 6/PN 10 (for DN 40)
- With kit including seal for length compensation between the connection adapters from 244 mm to 250 mm. Standard for all pump types with flange connection
- Protection class IP 44



Series description Wilo-SE-TW

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting of speed stages (3 speed stages)

Automatic functions
- Full motor protection with integrated trip electronics (optional for all types with Wilo-Protect-Module C)

External control functions
- "Overriding Off" control input (optional for all types with Wilo-Protect-Module C)

Signal and display functions
- Individual/collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Individual run signal (potential-free NO contact) (optional for all types with Wilo-Protect-Module C)
- Fault signal light (optional for all types with Wilo-Protect-Module C)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover / time-dependent pump cycling) (optional for all types with Wilo-Protect-Module C)

Equipment
- Twin switch-over valve in pump housing

Scope of delivery
- Pump
- Including seals with threaded connection (only for SE 125-N-TW)
- Including washers for flange bolts (for nominal connection diameter DN 40)
- Installation and operating instructions

Accessories
- Screwed connections with screw thread
- Wilo-Protect-Module C 1~230 V (2 modules required)

Technical data Wilo-SE-TW

	Wilo-SE-TW ...		
	125-N-TW	**150-N-TW**	**200-N-TW**
Approved fluids (other fluids on request)			
Heating water (in accordance with VDI 2035)	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–
Output			
Delivery head max. [m]	5.5	4	7
Max. volume flow [m^3/h]	9	16	18
Permitted field of application			
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-		
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +130 (in short-term operation 2 h: +140) (for applications with Wilo-Protect-Module C: -20 to +110)		
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	- -	- -	- -
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-
Standard version for operating pressure, p_{max}	10	6/10	10
Special version for operating pressure, p_{max}	-	-	-
Pipe connections			
Screwed connection Rp	1¼	-	-
Nominal flange diameter DN	-	40	40
Flange for counter flange PN 6, standard version	–	–	–
Flange for counter flange PN 16, special version	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	•	•
Electrical connection			
Mains connection 1 ~ [V], standard version	230	230	230
Mains connection 3 ~ [V], standard version	-	-	-
Mains connection 3 ~ [V], with optional switching plug	-	-	-
Mains frequency	50	50	50

Technical data Wilo-SE-TW

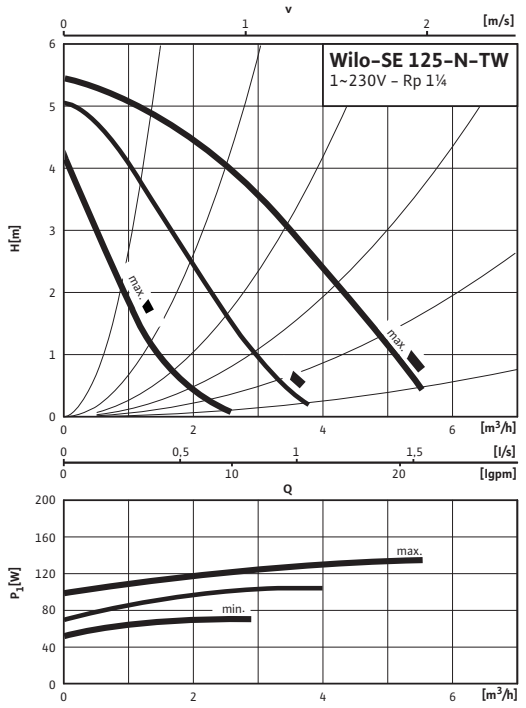
	Wilo-SE-TW ...		
	125-N-TW	**150-N-TW**	**200-N-TW**
Motor/electronics			
Electromagnetic compatibility	–		
Emitted interference	EN 61000-6-3		
Interference resistance	EN 61000-6-2		
Power electronics	–	–	–
Protection class	IP 44	IP 44	IP 44
Insulation class	H	H	H
Materials			
Pump housing	Grey cast iron (EN-GJL-200)	Grey cast iron (EN-GJL-250)	
Impeller	Plastic (PPE), trade name: Noryl		
Pump shaft	Stainless steel (X40Cr13)		
Bearing	Carbon, metal impregnated		
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature			
Minimum suction head at 50°C	0.5	0.5	0.5
Minimum suction head at 95°C	5.0	5.0	5.0
Minimum suction head at 110°C	11.0	11.0	11.0
Minimum suction head at 130°C	24	24	24

• = available, – = not available

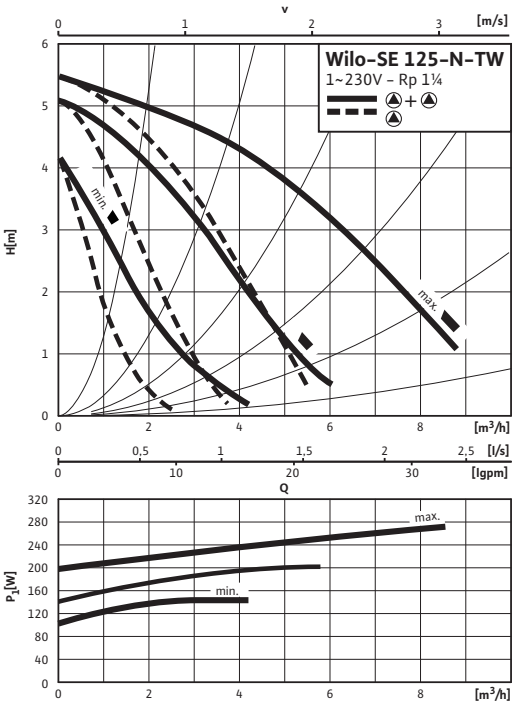
Pump curves Wilo-SE-TW

Wilo-SE 125-N-TW

Individual operation

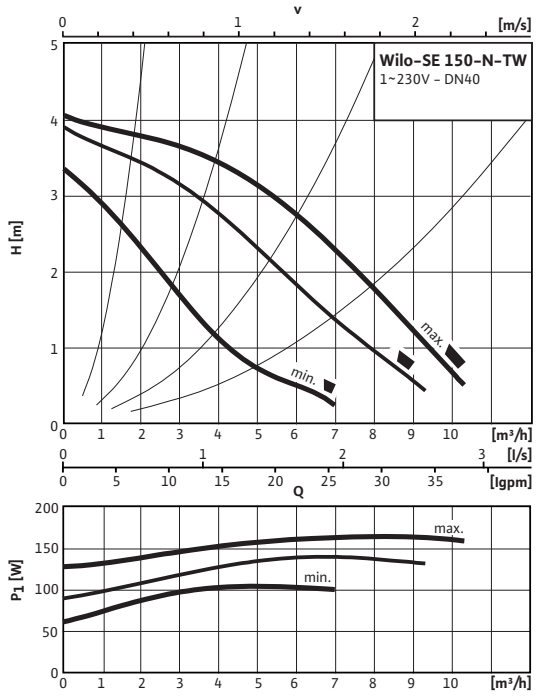


Parallel operation

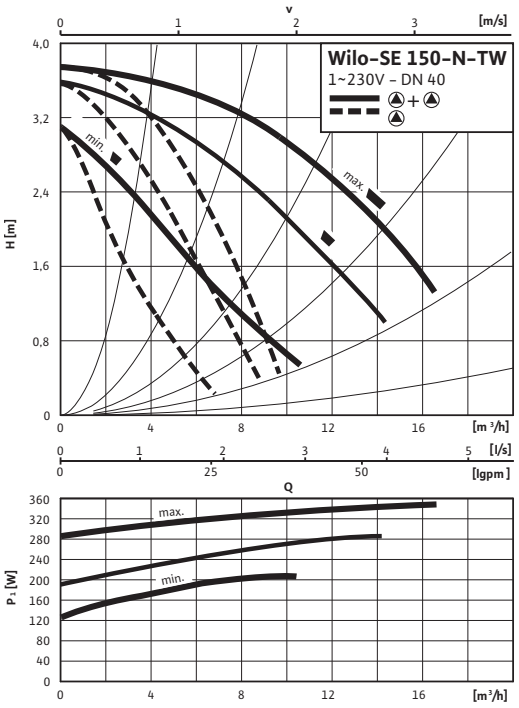


Wilo-SE 150-N-TW

Individual operation



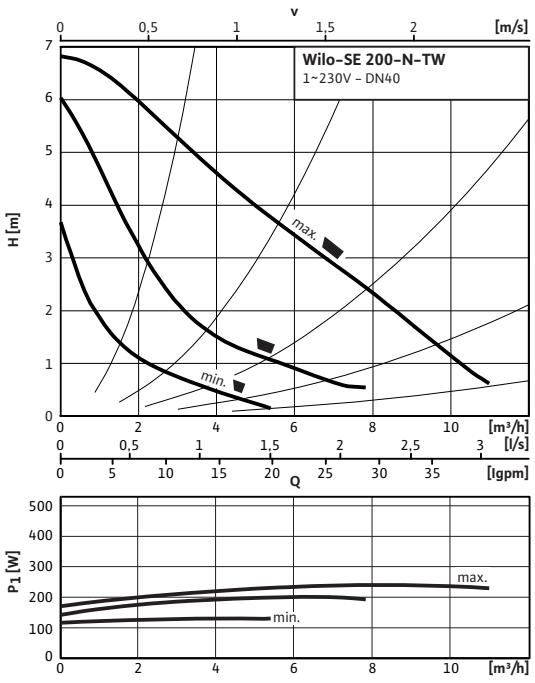
Parallel operation



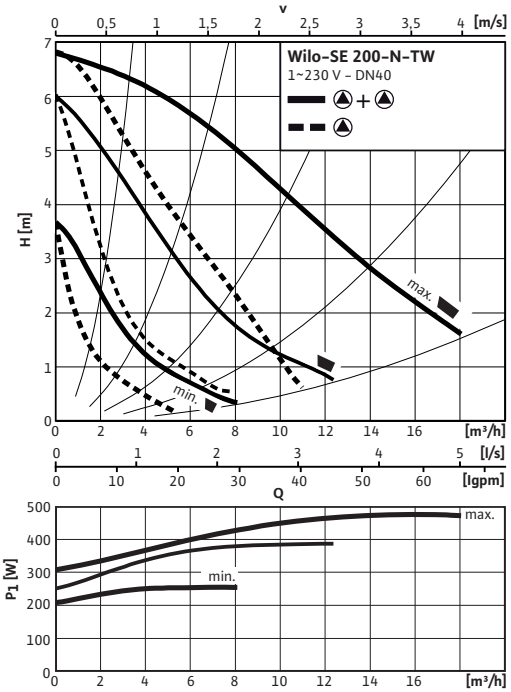
Pump curves Wilo-SE-TW

Wilo-SE 200-N-TW

Individual operation

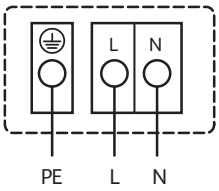


Parallel operation



Terminal diagram, motor data Wilo-SE-TW

Terminal diagram A / motor protection A



Mains connection 1~230 V, 50 Hz

Internal protection against unacceptably high winding temperatures
Triggering: Internal interruption of motor voltage
Reset: Automatic after motor has cooled down

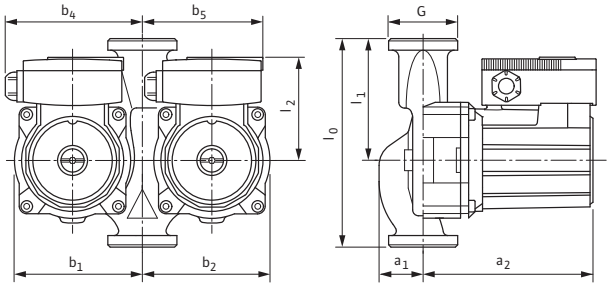
Motor data

Wilo-SE-TW ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Capacitor	Threaded cable connection
	P_2	n	P_1	I	C	PG
	[W]	[rpm]	[W]	[A]	[µF/VDB]	[PG]
125-N-TW	50	max. 2320 1640 min. 1200	140	0.65 0.55 0.35	3.7/400	1x13.5
150-N-TW	70	max. 2660 2340 min. 1710	180	0.85 0.75 0.55	5.0/400	1x13.5
200-N-TW	100	max. 2160 1480 min. 1100	245	1.2 1 0.65	5.0/400	1x13.5

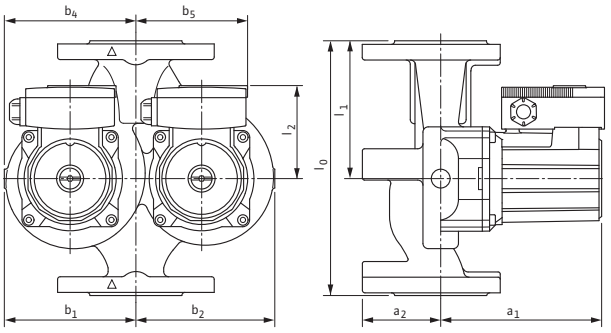
Observe name plate data!
Current I: Motor protection switch onsite setting

Dimensions, weights Wilo-SE-TW

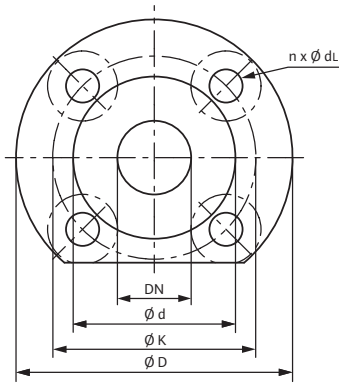
Dimension drawing A



Dimension drawing B



Dimension drawing Flange C



Dimensions, weights

Wilo-SE-TW …	Pipe connection	Nominal flange diameter	Thread	Dimensions									Weight approx.	Dimension drawing
	Rp	DN	G	l_0	l_1	l_2	a_1	a_2	b_1	b_2	b_4	b_5	M	–
	–			[mm]									[kg]	–
125-N-TW	1¼	–	2	180	105	92	150	40	112	112	120	102.5	8.0	A
150-N-TW	-	40	–	244	135	92	156	75	126	133	123	107	15.0	B
200-N-TW	-	40	–	244	135	92	156	75	126	133	123	107	15.6	B

Flange dimensions

Wilo-SE-TW …	Flange	Nominal flange diameter	Pump flange dimensions					Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_L	–
	–		[mm]				[pcs. x mm]	–
150-N-TW	Flange PN 10 (according to EN 1092)	40	150	88	100/110	–	-	C
200-N-TW	Flange PN 10 (according to EN 1092)	40	150	88	100/110	–	-	C

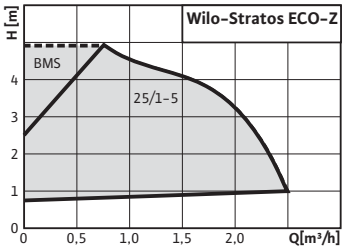
Secondary hot water circulation

High-efficiency pumps (double pumps)

Series overview Wilo-Stratos ECO-Z, Stratos-Z, Stratos-ZD

Series: Wilo-Stratos ECO-Z





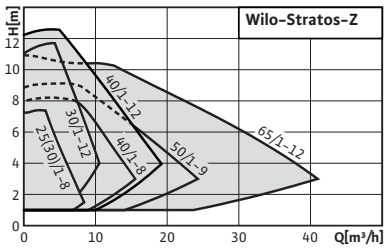
> Design
Glandless circulation pump with screwed connection and automatic power adjustment

> Application
Secondary hot water circulation systems and similar systems in industrial and building services



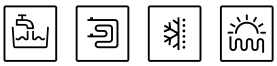
Series: Wilo-Stratos-Z





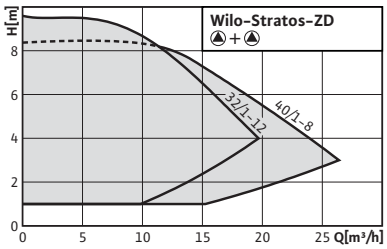
> Design
Glandless circulation pump with screwed connection or flange connection, EC motor with automatic power adjustment.

> Application
Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds, air-conditioning, closed cooling circuits, industrial circulation systems



Series: Wilo-Stratos-ZD





> Design
Glandless circulation double pump with flange connection, EC motor and automatic power adjustment

> Application
Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds, air-conditioning, closed cooling circuits, industrial circulation systems



Subject to change 09/2008 WILO SE

Series overview Wilo-Stratos ECO-Z, Stratos-Z, Stratos-ZD

Series: Wilo-Stratos ECO-Z

> Special features/product benefits
- Corrosion-resistant pump housing made of red brass for systems where oxygen entry is possible
- Optimum handling due to front operation, variable installation positions
- Automatic setback operation (Autopilot)
- Automatic adjustment of the pump output in secondary hot water circulation systems with variable volume flow
- Very high starting torque for reliable starting
- All plastic parts that come into contact with the fluid fulfil KTW recommendations
- Min. electrical power consumption: only 5.8 W
- Thermal insulation as standard

> More information **Page**

- Planning guide 8
- Equipment/function 254
- Series description 257
- Technical data 259
- Pump curves 261
- Terminal diagrams, motor data 262
- Dimensions, weights 263
- Service/accessories 351
- Switchgears and control devices 373

Series: Wilo-Stratos-Z

> Special features/product benefits
- Maximum efficiency due to ECM technology
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display
- Combination flanges PN 6/PN 10 (for DN 40 to DN 65)
- Thermal insulation as standard
- Corrosion-resistant pump housing made of red brass for systems where oxygen entry is possible
- Automatic adjustment of the pump output secondary hot water circulation systems with variable volume flow with thermostatically controlling line shut-off valves
- Manual control mode allows the pump output to be ideally adjusted to the system for secondary hot water circulation systems with constant volume flow
- System extension due to retrofit communication modules LON, CAN, PLR, etc.

> More information **Page**

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- Wilo-Control pump management systems 437

Series: Wilo-Stratos-ZD

> Special features/product benefits
- Maximum efficiency due to ECM technology
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display. Combination flanges PN 6/PN 10 (for DN 32 to DN 40)
- Automatic adjustment of the pump output in secondary hot water circulation systems with variable volume flow with thermostatically controlling line shut-off valves
- Manual control mode allows the pump output to be ideally adjusted to the system for constant volume flow circulation systems
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Integrable dual pump management due to retrofit Stratos IF-Modules for:
  - Main/standby mode with fault-dependent switchover
  - Efficiency-optimised peak-load operation
- Remote control via infrared interface (IR-Module/IR-Monitor)

> More information **Page**

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Secondary hot water circulation

High-efficiency pumps (single pumps)

Equipment/function Wilo-Stratos ECO-Z, Stratos-Z

	Wilo-Stratos ECO-Z	Wilo-Stratos-Z
Operating modes		
Speed-stage switching	–	–
Manual control mode (n=constant)	• (only Stratos ECO-Z...-BMS)	•
Δp-c for constant differential pressure	• (only Stratos ECO-Z...-BMS)	•
Δp-v for variable differential pressure	•	•
Δp-T for temperature-controlled differential pressure	–	• (programmable via IR-Module, IR-Monitor, LON or CAN)
Manual functions		
Operating mode setting	• (only Stratos ECO-Z...-BMS)	•
Differential-pressure setpoint setting	•	•
Autopilot	•	•
Pump ON/OFF setting	• (only Stratos ECO-Z...-BMS)	•
Speed setting (manual control mode)	• (only Stratos ECO-Z...-BMS)	•
Setting the speed stages	–	–
Automatic functions		
Infinitely variable power adjustment according to the operating mode	•	•
Autopilot	•	•
Deblocking function	•	•
Soft start	•	•
Safety control	•	–
Full motor protection with integrated trip electronics	–	•
External control functions		
Overriding Off	• (only Stratos ECO-Z...-BMS)	• Possible with Stratos IF-Modules (accessories)
Overriding Min	–	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• (only Stratos ECO-Z...-BMS)	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• (only Stratos ECO-Z...-BMS)	• Possible with Stratos IF-Modules (accessories)

Subject to change 09/2008 WILO SE

Equipment/function Wilo-Stratos ECO-Z, Stratos-Z

	Wilo-Stratos ECO-Z	Wilo-Stratos-Z
Signal and display functions		
Single/collective fault signal (potential-free NC contact)	–	–
Collective fault signal (potential-free NC contact)	• (only Stratos ECO-Z...-BMS)	•
Individual run signal (potential-free NO contact)	–	• Possible with Stratos IF-Modules (accessories)
Thermal winding contact (WSK, potential-free NC contact)	–	–
Fault signal light	• (only Stratos ECO-Z...-BMS)	•
Direction-of-rotation control light	–	–
LC display for indication of pump data and fault codes	–	•
Data exchange		
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	•
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	• Possible with Stratos IF-Modules (accessories)
Serial digital LON interface for connection to a LONWORKS network	–	• Possible with Stratos IF-Modules (accessories)
Serial digital CAN interface for connection to a CAN bus system	-	• Possible with Stratos IF-Modules (accessories)
Dual pump management (double pump or 2 x single pump)		
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	• Various combinations with Stratos IF-Modules (accessories) possible
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	• Various combinations with Stratos IF-Modules (accessories) possible
Equipment/scope of delivery		
Wrench attachment point on pump body	•	• (threaded pipe union pumps with $P_2 \leq 100W$)
Twin switch-over valve in pump housing	–	–
Cable lead-in possible on both sides	•	–
Wilo quick connection with spring clips	•	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	•

Secondary hot water circulation

High-efficiency pumps (single pumps)

Equipment/function Wilo-Stratos ECO-Z, Stratos-Z

	Wilo-Stratos ECO-Z	Wilo-Stratos-Z
Blocking current-proof motor	•	–
Including seals for threaded connection (loose)	•	•
Including installation and operating instructions	•	•
Including thermal insulation	•	•
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	•
Including 1.8 m connecting cable with shock-proof plug	–	–
Integrated non-return valve	–	–
Integrated ball shut-off valve	–	–
Including clock timer	–	–
Particle filter	•	–

• = available, – = not available

Series description Wilo-Stratos ECO-Z



Design
Glandless circulation pump with screwed connection and automatic power adjustment

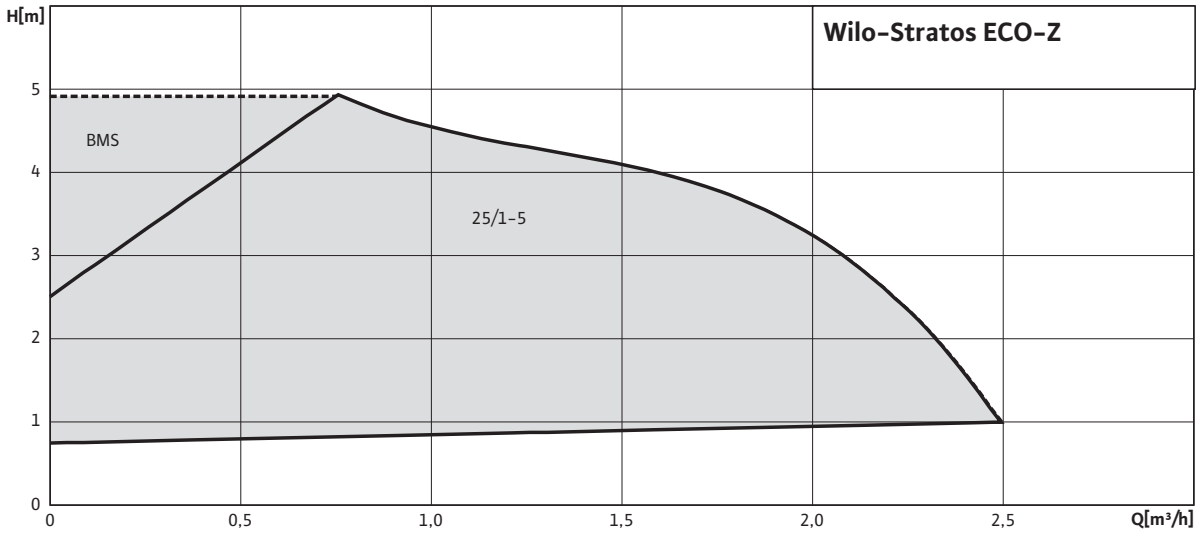
Application
Secondary hot water circulation systems and similar systems in industrial and building services

Type key

Example:	**Wilo Stratos ECO-Z 25/1-5**
Stratos ECO	High-efficiency pump (screw-end pump)
-Z	Secondary hot water circulation
25/	Nominal connection diameter
1-5	Nominal delivery head range [m]

Options
- As ...-BMS version suitable for linkup to external monitoring units (e.g. BA building automation or DDC installations). The Stratos ECO-Z BMS version displays as standard a collective fault signal, the function "External OFF" and the control input "0-10 V".

Special features/product benefits
- Corrosion-resistant pump housing made of red brass for systems where oxygen entry is possible
- Optimum handling due to front operation, variable installation positions
- Automatic setback operation (Autopilot)
- Automatic adjustment of the pump output in secondary hot water circulation systems with variable volume flow
- Very high starting torque for reliable starting
- All plastic parts that come into contact with the fluid fulfil KTW recommendations
- Min. electrical power consumption: only 5.8 W
- Thermal insulation as standard



Secondary hot water circulation

High-efficiency pumps (single pumps)

Series description Wilo-Stratos ECO-Z

Equipment/function

Operating modes
- Manual control mode (n=constant) (only Stratos ECO-Z...-BMS)
- Δp-c for constant differential pressure (only Stratos ECO-Z...BMS)
- Δp-v for variable differential pressure

Manual functions
- Operating mode setting (only Stratos ECO-Z...BMS)
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting
- Pump ON/OFF setting (only Stratos ECO-Z...BMS)
- Speed setting (manual control mode) (only Stratos ECO-Z...-BMS)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Safety control

External control functions
- "Overriding Off" control input (only Stratos ECO-Z...BMS)
- "Analogue In 0 – 10 V" control input (remote speed adjustment) (only Stratos ECO-Z...-BMS)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment) (only Stratos ECO-Z...-BMS)

Signal and display functions
- Collective fault signal (potential-free NC contact) (only Stratos ECO-Z...-BMS)
- Fault signal light (only Stratos ECO-Z...-BMS)

Equipment
- Wrench attachment point on pump body
- Cable lead-in possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Pump
- Thermal insulation
- Seals
- Installation and operating instructions

Accessories
- Screwed connections

Subject to change 09/2008 WILO SE

Technical data Wilo-Stratos ECO-Z

	Wilo-Stratos ECO-Z ...	
	25/1-5	**25/1-5-BMS**
Approved fluids (other fluids on request)		
Heating water (in accordance with VDI 2035)	–	–
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	–	–
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	•	•
Output		
Delivery head max. [m]	5	5
Max. volume flow [m^3/h]	3	3
Permitted field of application		
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–	
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	–	
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	+15 up to +65	
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C in short-term operation 2 h [°C]	70	70
Maximum permissible total hardness in secondary hot water circulation systems [°d]	20	20
Standard version for operating pressure, p_{max}	10	10
Special version for operating pressure, p_{max}	-	-
Pipe connections		
Screwed connection Rp	1	1
Nominal flange diameter DN	25	25
Flange for counter flange PN 6, standard version	–	–
Flange for counter flange PN 16, special version	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–
Electrical connection		
Mains connection 1 ~ [V], standard version	230	230
Mains connection 3 ~ [V], standard version	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–
Mains frequency	50	50

Secondary hot water circulation

High-efficiency pumps (single pumps)

Technical data Wilo-Stratos ECO-Z

	Wilo-Stratos ECO-Z ...	
	25/1-5	**25/1-5-BMS**
Motor/electronics		
Electromagnetic compatibility	EN 61800-3	
Emitted interference	EN 61000-6-3	
Interference resistance	EN 61000-6-2	
Power electronics	Pulse package control	
Protection class	IP 44	IP 44
Insulation class	F	F
Materials		
Pump housing	Red brass (CC 491K) according to DIN EN 1982 and according to TrinkwV 2001 (drinking water ordinance)	
Impeller	Polypropylene	
Pump shaft	Stainless steel	
Bearing	Carbon, synthetic resin impregnated	
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature		
Minimum suction head at 50°C	1	1
Minimum suction head at 95°C	3	3

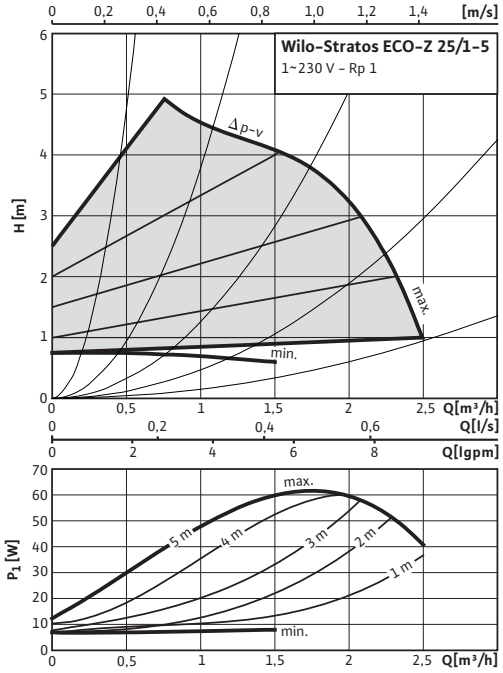
• = available, – = not available

Subject to change 09/2008 WILO SE

Pump curves Wilo-Stratos ECO-Z

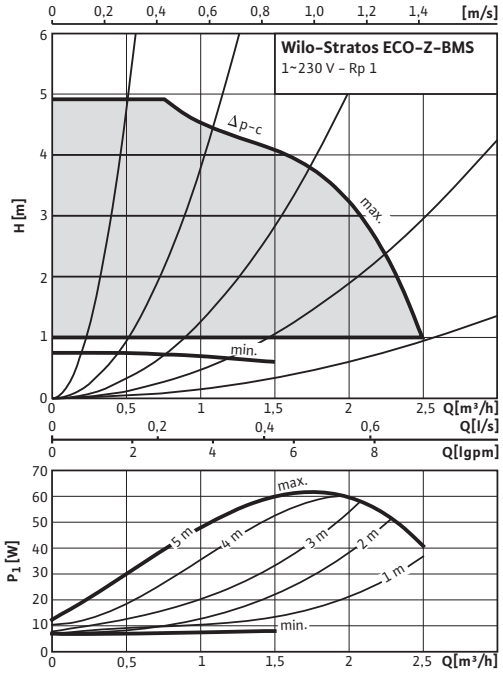
Wilo-Stratos ECO-Z 25/1-5

Δp-v (variable)

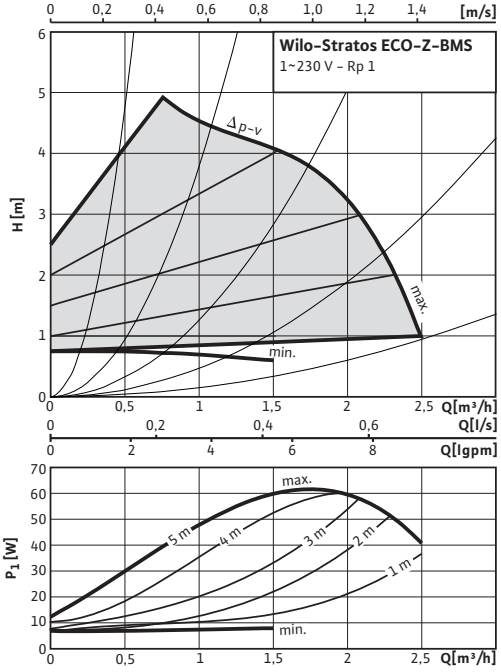


Wilo-Stratos ECO-Z 25/1-5 BMS

Δp-c (constant)

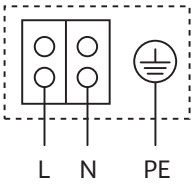


Δp-v (variable)



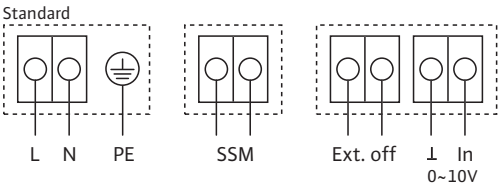
Terminal diagram, motor data Wilo-Stratos ECO-Z

Terminal diagram A



Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Terminal diagram B



1~ 230 V, 50 Hz

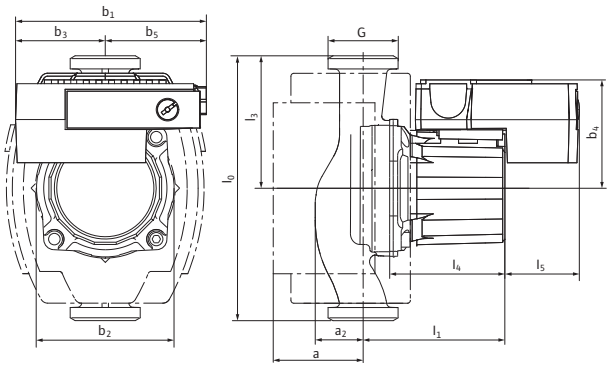
Single-phase motor, 2-pole, 1~230 V, 50 Hz

Motor data

Wilo-Stratos ECO-Z ...	Speed range	Power consumption	Max. current	Motor protection	Threaded cable connection	Wiring diagram
	–	P_1	I	–	PG	–
	[rpm]	[W]	[A]	–	[PG]	–
25/1-5	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x11	A
25/1-5-BMS	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x7/1x9/1x11	B

Dimensions, weights Wilo-Stratos ECO-Z

Dimension drawing



Dimensions, weights

Wilo-Stratos ECO-Z ...	Pipe connection	Thread	Dimensions												Weight approx.
	Rp	G	l_0	l_1	l_3	l_4	l_5	A	a_2	b_1	b_2	b_3	b_4	b_5	M
	–		[mm]												[kg]
25/1-5	1	1½	180	96	90	78	50.5	34	57	133.0	93.5	69	73.5	64.0	2.8
25/1-5-BMS	1	1½	180	96	90	78	55.0	33	57	185.5	93.5	78	75.0	107.5	3.1

Secondary hot water circulation

High-efficiency pumps (single pumps)

Series description Wilo-Stratos-Z



Design
Glandless circulation pump with screwed connection or flange connection, EC motor with automatic power adjustment.

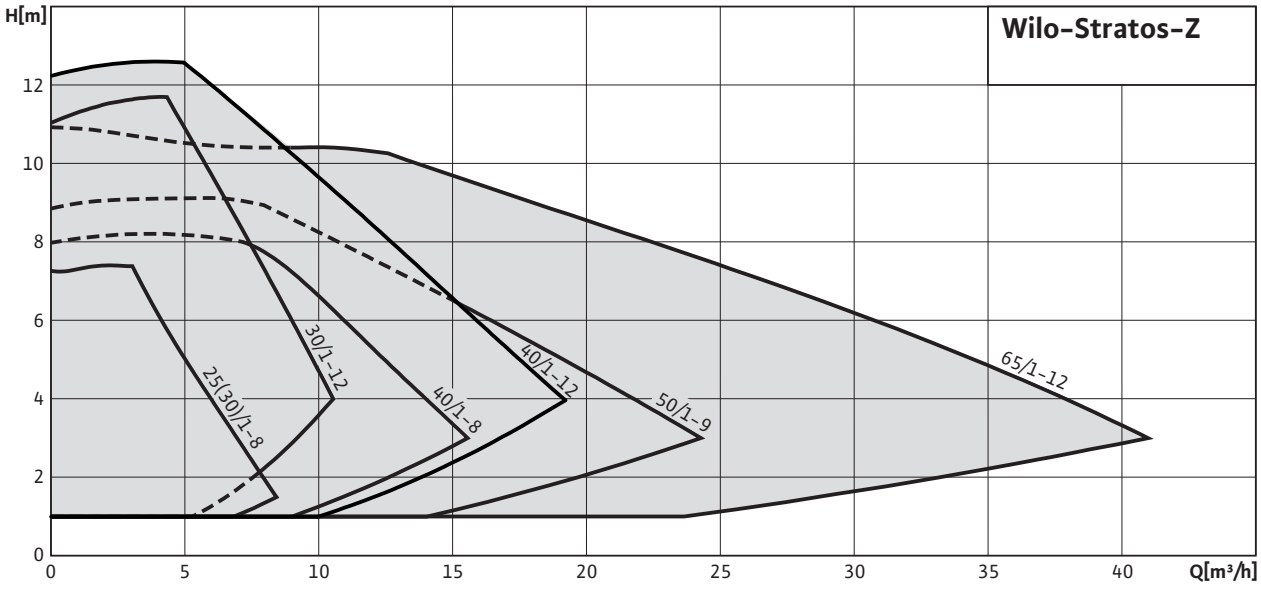
Application
Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds, air-conditioning, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo Stratos-Z 40/1-8**
Stratos	High-efficiency pump (screw-end or flange-end pump), electronically controlled
Z	Single pump for secondary hot water circulation
40/	Nominal connection diameter
1-8	Nominal delivery head range [m]

Options
- Special versions for operating pressure PN 16 (at additional charge)
- Can also be used for 1~230 V/60 Hz

Special features/product benefits
- Maximum efficiency due to ECM technology
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display
- Combination flanges PN 6/PN 10 (for DN 40 to DN 65)
- Thermal insulation as standard
- Corrosion-resistant pump housing made of red brass for systems where oxygen entry is possible
- Automatic adjustment of the pump output secondary hot water circulation systems with variable volume flow with thermostatically controlling line shut-off valves
- Manual control mode allows the pump output to be ideally adjusted to the system for secondary hot water circulation systems with constant volume flow
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Remote control via infrared interface (IR-Module/IR-Monitor)



Subject to change 09/2008 WILO SE

Series description Wilo-Stratos-Z

Equipment/function

Operating modes
- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure (programmable via IR-Module, IR-Monitor, LON or CAN)

Manual functions
- Setting of operating mode
- Setting of differential-pressure setpoint
- Setting of "Autopilot" (automatic setback operation)
- Pump ON/OFF setting
- Speed setting (manual control mode)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Full motor protection with integrated trip electronics

External control functions
- "Overriding Off" control input (possible with Stratos IF-Modules)
- "Overriding Min" control input (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote speed adjustment) (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment) (possible with Stratos IF-Modules)

Signal and display functions
- Collective fault signal (potential-free NC contact)
- Individual run signal (potential-free NO contact) (possible with Stratos IF-Modules)
- Fault signal light
- LC display for indication of pump data and fault codes

Data exchange
- Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)
- Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling module (possible with Stratos IF-Modules)
- Serial digital LON interface for connection to a LONWorks network (possible with Stratos IF-Modules)
- Serial digital CAN interface for connection to a CAN bus system (possible with Stratos IF-Modules)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): Various combinations possible with Stratos IF-Modules (accessory)
- Parallel operation (efficiency-optimised peak-load cut-in and out): Various combinations possible with Stratos IF-Modules (accessory)

Equipment
- Wrench attachment point on pump body (for threaded pipe union pumps with P2≤100 W)
- Plug-in position for optional extension with Wilo-IF-Modules

Scope of delivery
- Pump
- Including seals for threaded connection (loose)
- Including installation and operating instructions
- Including thermal insulation
- Including washers for flange screws (for nominal connection diameters DN 32 – DN 65)

Accessories
- Screwed connection for threaded connection
- Pump cold water insulation Wilo ClimaForm
- IR-Module
- IR-Monitor
- Stratos IF-Modules: PLR, LON, CAN, Ext. Off, Ext. Min., SBM, Ext. Off/SBM
- Analogue interface converter AnaCon
- Digital interface converter DigiCon/DigiCon-A

Secondary hot water circulation

High-efficiency pumps (single pumps)

Technical data Wilo-Stratos-Z

	Wilo-Stratos-Z ...						
	25/1-8	**30/1-8**	**30/1-12**	**40/1-8**	**40/1-12**	**50/1-9**	**65/1-12**
Approved fluids (other fluids on request)							
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	• (expect pumps in cast iron)						
Output							
Delivery head max. [m]	7	7	11	8	12	9	10
Max. volume flow [m^3/h]	8	8	13	18	23	29	47
Permitted field of application							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–						
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-10 up to +110						
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	0 up to +80						
Temperature range for applications in secondary hot water circulation systems at ambient temperature of +40 °C in short-term operation 2 h [°C]	–	–	–	–	–	–	–
Maximum permissible total hardness in secondary hot water circulation systems [°d]	20	20	20	20	20	20	20
Standard version for operating pressure, p_{max}	10	10	10	6/10	6/10	6/10	6/10
Special version for operating pressure, p_{max}	16	16	16	16	16	16	16
Pipe connections							
Screwed connection Rp	1	1¼	1¼	–	–	–	–
Nominal flange diameter DN	-	-	-	40	40	50	65
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	•	•	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	•	•	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–
Electrical connection							
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	230	230	230	230	230	230	230
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–
Mains frequency	50/60	50/60	50/60	50/60	50/60	50/60	50/60

Technical data Wilo-Stratos-Z

	Wilo-Stratos-Z ...						
	25/1-8	**30/1-8**	**30/1-12**	**40/1-8**	**40/1-12**	**50/1-9**	**65/1-12**
Motor/electronics							
Electromagnetic compatibility	EN 61800-3						
Emitted interference	EN 61000-6-3						
Interference resistance	EN 61000-6-2						
Power electronics	Frequency converter						
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F
Materials							
Pump housing (standard version)	Red brass (CC 499K) according to DIN EN 1982, according to TrinkwV2001						
Impeller	Plastic (PPS - 40% GF)						Plastic (PPE - 30% GF)
Pump shaft	Stainless steel (X39CrMo17-1)						
Bearing	Carbon, synthetic resin impregnated						
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature							
Minimum suction head at 50°C	3	3	3	3	5	5	7
Minimum suction head at 95°C	10	10	10	10	12	12	15
Minimum suction head at 110°C	16	16	16	16	18	18	23

• = available, - = not available

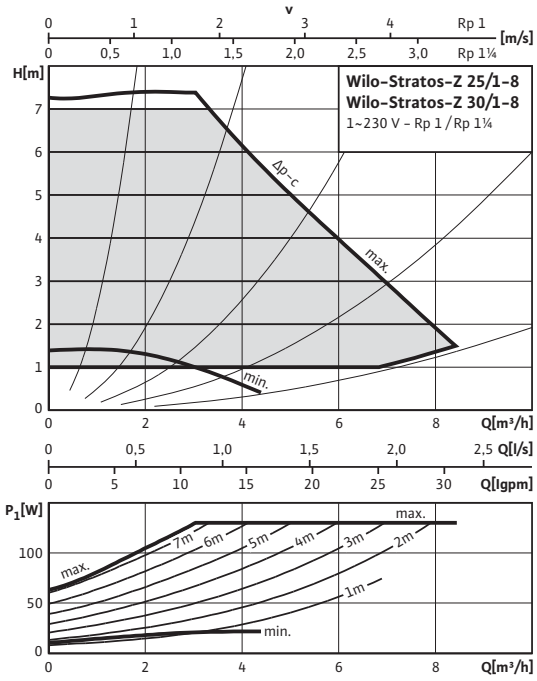
Secondary hot water circulation

High-efficiency pumps (single pumps)

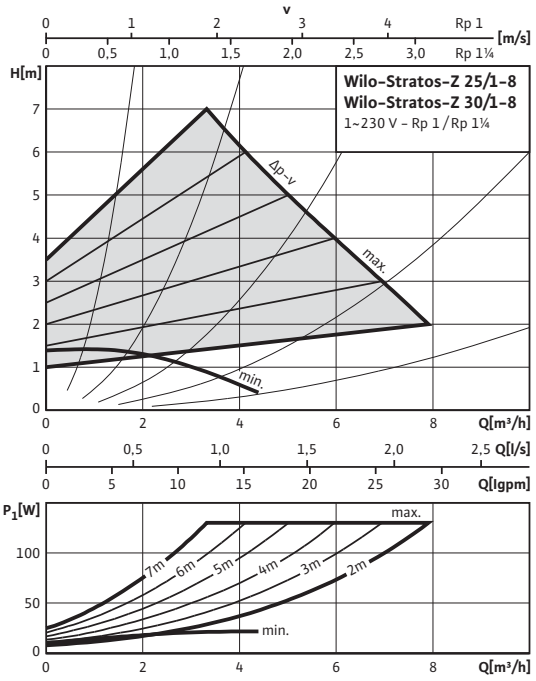
Pump curves Wilo-Stratos-Z

Wilo-Stratos-Z 25/1-8 – 30/1-8

Δp-c (constant)

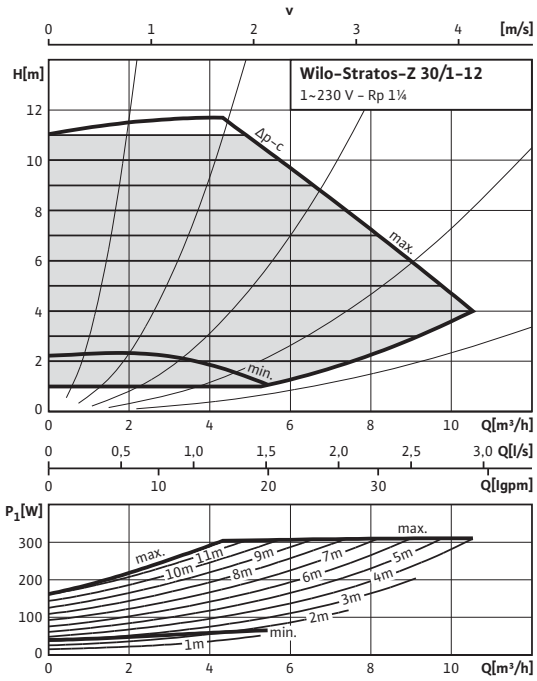


Δp-v (variable)

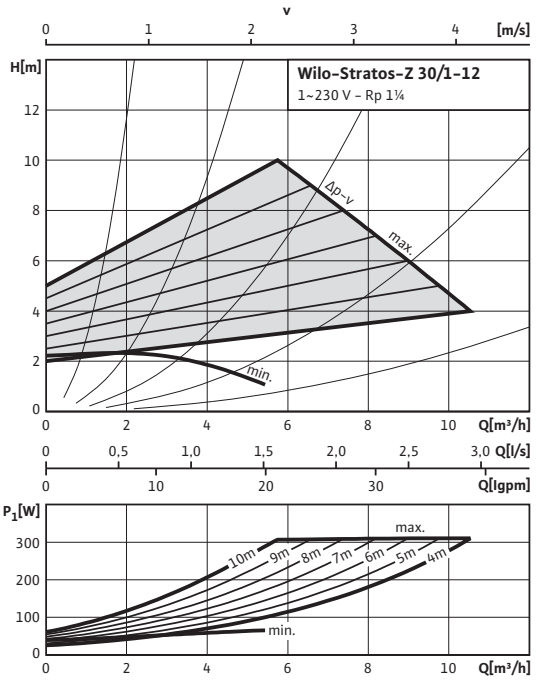


Wilo-Stratos-Z 30/1-12

Δp-c (constant)



Δp-v (variable)

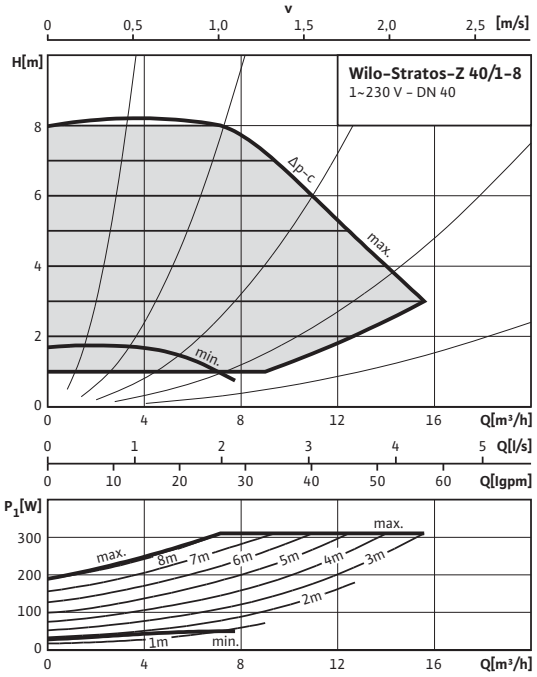


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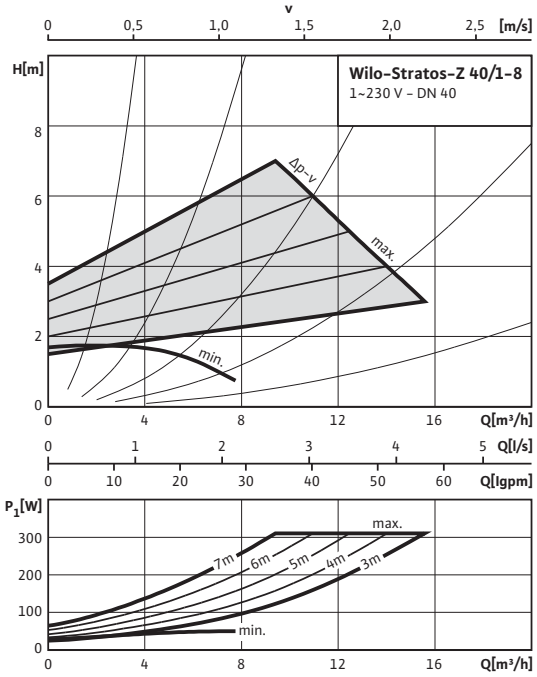
Pump curves Wilo-Stratos-Z

Wilo-Stratos-Z 40/1-8

Δp-c (constant)

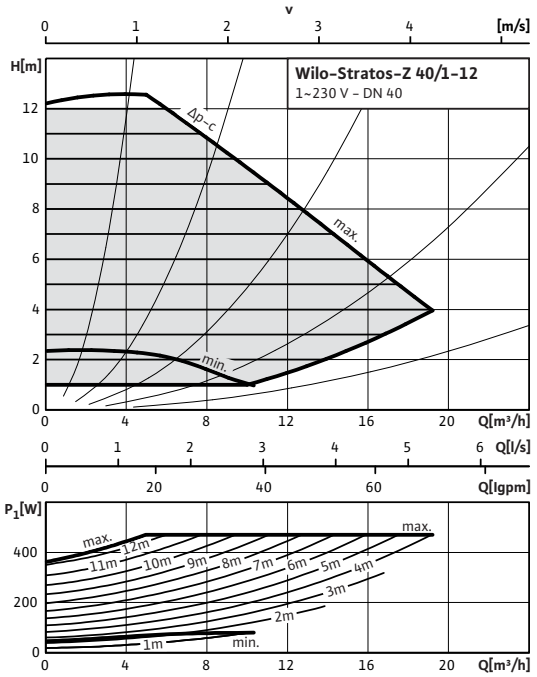


Δp-v (variable)

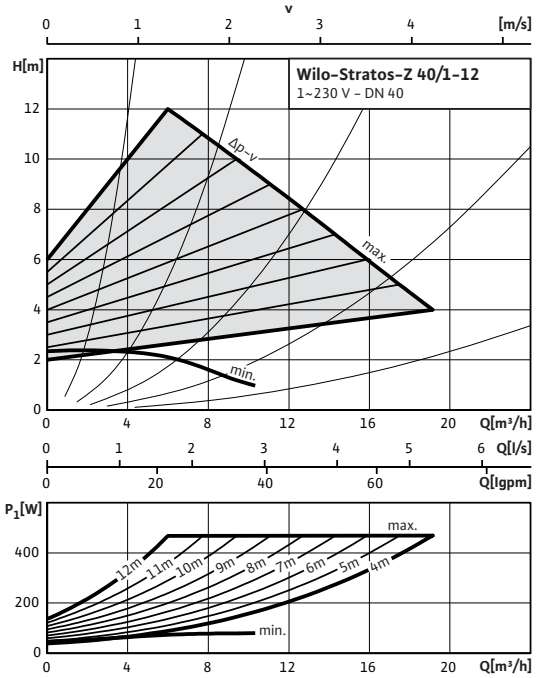


Wilo-Stratos-Z 40/1-12

Δp-c (constant)



Δp-v (variable)



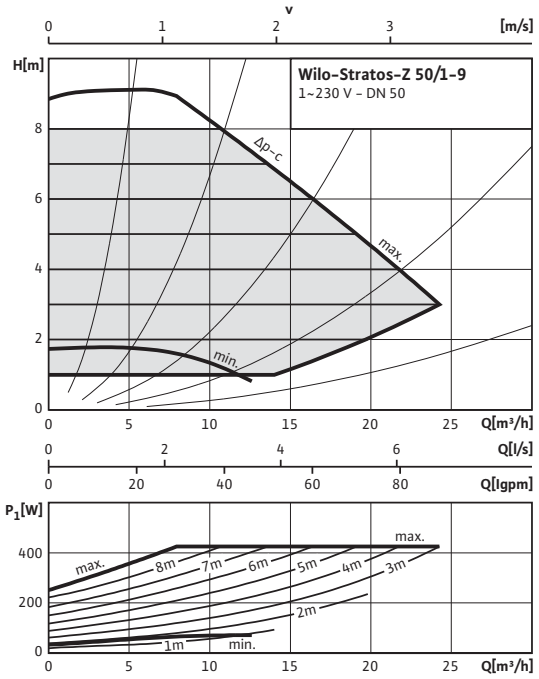
Secondary hot water circulation

High-efficiency pumps (single pumps)

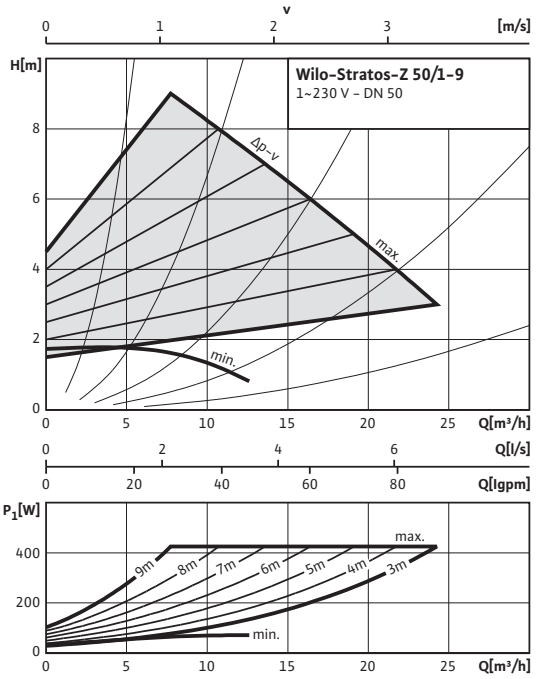
Pump curves Wilo-Stratos-Z

Wilo-Stratos-Z 50/1-9

Δp-c (constant)

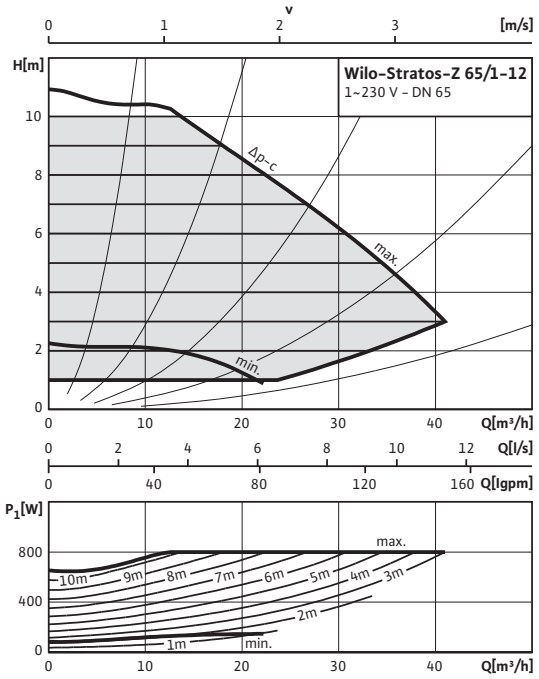


Δp-v (variable)

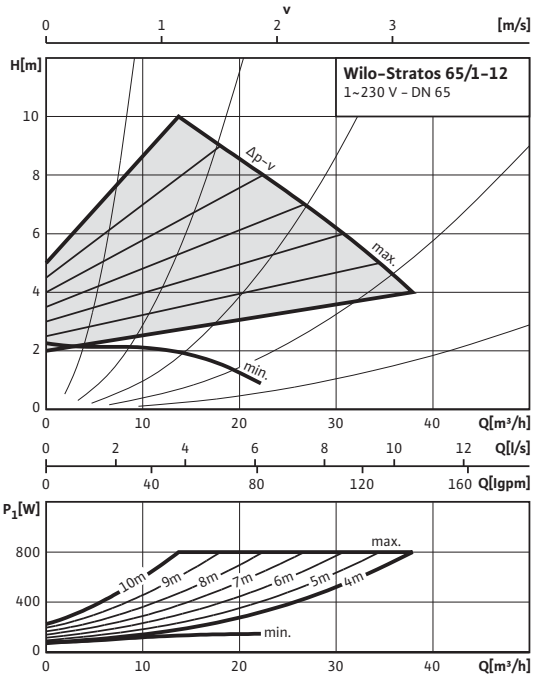


Wilo-Stratos-Z 65/1-12

Δp-c (constant)



Δp-v (variable)

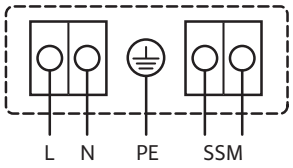


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Terminal Diagram, Motor Data Wilo-Stratos-Z

Terminal diagram

Standard



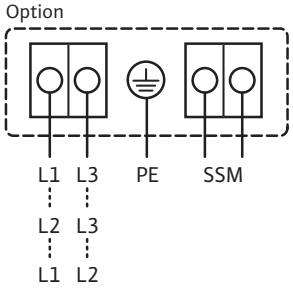
1~ 230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: "Wilo-Control pump management systems"

Terminal diagram

Option



3~230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: "Wilo-Control pump management systems

Motor data

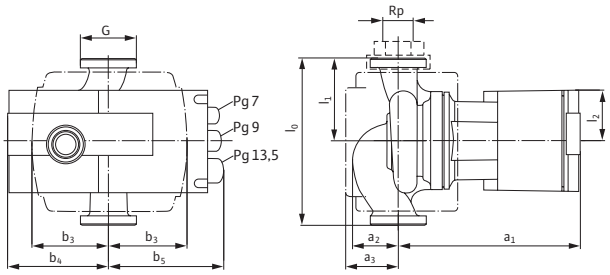
Wilo-Stratos-Z ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection
	P_2	n	P_1	I			–	PG
	[W]	[rpm]	[W]	[A]			–	[PG]
25/1-8	100	1400 - 3700	9 - 130	0.13 - 1.20	0.13 - 1.20	-	integrated	1x7/1x9/1x13.5
30/1-8	100	1400 - 3700	9 - 130	0.13 - 1.20	0.13 - 1.20	-	integrated	1x7/1x9/1x13.5
30/1-12	200	1600 - 4800	16 - 310	0.16 - 1.37	0.16 - 1.37	-	integrated	1x7/1x9/1x13.5
40/1-8	200	1800 - 4800	18 - 310	0.17 - 1.37	0.17 - 1.37	-	integrated	1x7/1x9/1x13.5
40/1-12	350	1400 - 4600	25 - 470	0.20 - 2.05	0.20 - 2.05	-	integrated	1x7/1x9/1x13.5
50/1-9	350	1400 - 4100	25 - 430	0.20 - 1.88	0.20 - 1.88	-	integrated	1x7/1x9/1x13.5
65/1-12	650	950 - 3300	38 - 800	0.30 - 3.50	0.30 - 3.50	-	integrated	1x7/1x9/1x13.5

Secondary hot water circulation

High-efficiency pumps (single pumps)

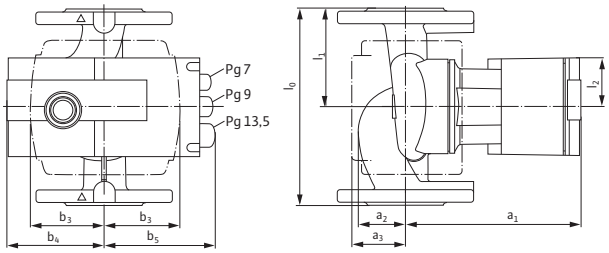
Dimensions, weights Wilo-Stratos-Z

Dimension drawing A



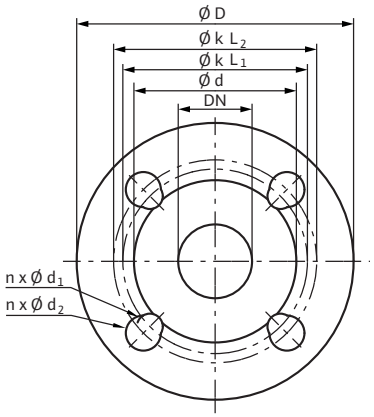
Permitted installation positions, see Planning guide
Important: With vertical module configuration, the threaded cable connection projects above the pump connection (total dimension: dimension b_5 + max. 9 mm)!

Dimension drawing B



Permitted installation positions, see Planning guide
Important: With vertical module configuration, the threaded cable connection projects above the pump connection (total dimension: dimension b_5 + max. 9 mm)!

Dimension drawing Flange A



Dimensions, weights

Wilo-Stratos-Z ...	Rated pressure	Nominal flange diameter	Pipe connection	Thread	Dimensions									Weight approx.	Dimension drawing
	PN	DN	Rp	G	l_0	l_1	l_2	a_1	a_2	a_3	b_3	b_4	b_5	M	–
	[bar]	–			[mm]									[kg]	–
25/1-8	10	–	1	1½	180	90	49	182	43	56	76	89	114	4.4	A
30/1-8	10	–	1¼	2	180	90	49	182	43	56	76	89	114	4.5	A
30/1-12	10	–	1¼	2	180	90	55	201	50	56	82	106	120	6.0	A
40/1-8	6/10	40	-	–	220	110	55	203	53	63	82	106	120	11.0	B
40/1-12	6/10	40	-	–	250	125	66	252	62	84	96	120	136	16.0	B
50/1-9	6/10	50	-	–	280	140	66	256	62	83	96	120	136	17.0	B
65/1-12	6/10	65	-	–	340	170	78	325	87	107	120	157	164	31.0	B

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Dimensions, weights Wilo-Stratos-Z

Flange dimensions

Wilo-Stratos-Z ...	Flange	Nominal flange diameter	Pump flange dimensions				Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	n x Ø $d_{L1}/Ø\ d_{L2}$	–
	–		[mm]			[pcs. x mm]	–
40/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	4 x 14 / 19	A
40/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	4 x 14 / 19	A
50/1-9	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	99	110/125	4 x 14 / 19	A
65/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	65	185	118	130/145	4 x 14 / 19	A

Secondary hot water circulation

High-efficiency pumps (double pumps)

Equipment/function Wilo-Stratos-ZD

	Wilo-Stratos-ZD
Operating modes	
Speed-stage switching	–
Manual control mode (n=constant)	•
Δp-c for constant differential pressure	•
Δp-v for variable differential pressure	•
Δp-T for temperature-controlled differential pressure	• (programmable via IR-Module, IR-Monitor, LON or CAN)
Manual functions	
Operating mode setting	•
Differential-pressure setpoint setting	•
Autopilot	•
Pump ON/OFF setting	•
Speed setting (manual control mode)	•
Setting the speed stages	–
Automatic functions	
Infinitely variable power adjustment according to the operating mode	•
Autopilot	•
Deblocking function	•
Soft start	•
Safety control	–
Full motor protection with integrated trip electronics	•
External control functions	
Overriding Off	• Possible with Stratos IF-Modules (accessories)
Overriding Min	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• Possible with Stratos IF-Modules (accessories)
Analogue In 0 ... 10 V	• Possible with Stratos IF-Modules (accessories)
Signal and display functions	
Single/collective fault signal (potential-free NC contact)	• (programmable with the IR-Monitor)
Collective fault signal (potential-free NC contact)	•
Individual run signal (potential-free NO contact)	• Possible with Stratos IF-Modules (accessories)
Thermal winding contact (WSK, potential-free NC contact)	–
Fault signal light	•

Equipment/function Wilo-Stratos-ZD

	Wilo-Stratos-ZD
Direction-of-rotation control light	–
LC display for indication of pump data and fault codes	•
Data exchange	
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	•
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	• Possible with Stratos IF-Modules (accessories)
Serial digital LON interface for connection to a LONWORKS network	• Possible with Stratos IF-Modules (accessories)
Serial digital CAN interface for connection to a CAN bus system	–
Dual pump management (double pump or 2 x single pump)	
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	• Various combinations with Stratos IF-Modules (accessories) possible
Parallel operation (efficiency-optimised peak-load cut-in and out)	• Various combinations with Stratos IF-Modules (accessories) possible
Equipment/scope of delivery	
Wrench attachment point on pump body	–
Twin switch-over valve in pump housing	•
Cable lead-in possible on both sides	–
Wilo quick connection with spring clips	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–
Plug-in position for optional extension with Wilo-IF-Modules	•
Blocking current-proof motor	–
Including seals for threaded connection (loose)	–
Including installation and operating instructions	•
Including thermal insulation	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	•
Including 1.8 m connecting cable with shock-proof plug	–
Integrated non-return valve	–
Integrated ball shut-off valve	–
Including clock timer	–
Particle filter	–

• = available, – = not available

Secondary hot water circulation

High-efficiency pumps (double pumps)

Series description Wilo-Stratos-ZD



Design
Glandless circulation double pump with flange connection, EC motor and automatic power adjustment

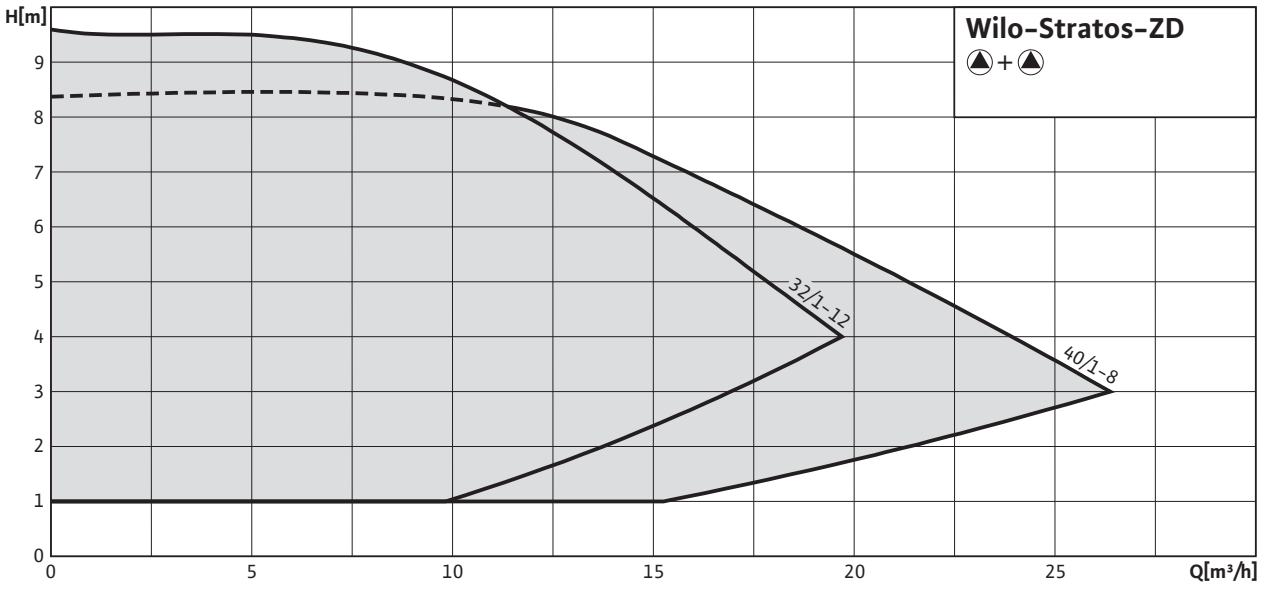
Application
Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds, air-conditioning, closed cooling circuits, industrial circulation systems

Type key

Example:	**Wilo Stratos-ZD 40/1-8**
Stratos	High-efficiency pump (flange-end pump), electronically controlled
ZD	Double pump for secondary hot water circulation
40/	Nominal connection diameter
1-8	Nominal delivery head range [m]

Options
- Special versions for operating pressure PN 16 (at additional charge)

Special features/product benefits
- Maximum efficiency due to ECM technology
- Optimum handling due to front operation and front access to the terminal room, variable installation positions, position-independent display. Combination flanges PN 6/PN 10 (for DN 32 to DN 40)
- Automatic adjustment of the pump output in secondary hot water circulation systems with variable volume flow with thermostatically controlling line shut-off valves
- Manual control mode allows the pump output to be ideally adjusted to the system for constant volume flow circulation systems
- System extension due to retrofit communication modules LON, CAN, PLR, etc.
- Integrable dual pump management due to retrofit Stratos IF-Modules for:
  - Main/standby mode with fault-dependent switchover
  - Efficiency-optimised peak-load operation
- Remote control via infrared interface (IR-Module/IR-Monitor)



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Series description Wilo-Stratos-ZD

Equipment/function

Operating modes

- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure (programmable via IR-Module, IR-Monitor, LON or CAN)

Manual functions

- Setting of operating mode
- Setting of differential-pressure setpoint
- Setting of "Autopilot" (automatic setback operation)
- Pump ON/OFF setting
- Speed setting (manual control mode)

Automatic functions

- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Full motor protection with integrated trip electronics

External control functions

- "Overriding Off" control input (possible with Stratos IF-Modules)
- "Overriding Min" control input (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote speed adjustment) (possible with Stratos IF-Modules)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment) (possible with Stratos IF-Modules)

Signal and display functions

- Collective fault signal (potential-free NC contact)
- Individual run signal (potential-free NO contact) (possible with Stratos IF-Modules)
- Fault signal light
- LC display for indication of pump data and fault codes

Data exchange

- Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)
- Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling module (possible with Stratos IF-Modules)
- Serial digital LON interface for connection to a LONWorks network (possible with Stratos IF-Modules)
- Serial digital CAN interface for connection to a CAN bus system (possible with Stratos IF-Modules)

Dual pump management (double pump or 2 x single pump)

- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): Various combinations possible with Stratos IF-Modules (accessory)
- Parallel operation (efficiency-optimised peak-load cut-in and out): Various combinations possible with Stratos IF-Modules (accessory)

Equipment

- Twin switch-over valve in pump housing
- Plug-in position for optional extension with Wilo-IF-Modules

Scope of delivery

- Pump
- Washers for flange screws (for nominal connection diameter 40)
- Installation and operating instructions

Accessories

- IR-Module
- IR-Monitor
- IF-Modules Stratos: PLR, LON, CAN, Ext. Off, Ext. Min., SBM, Ext. Off/SBM
- Analogue interface converter AnaCon
- Digital interface converter DigiCon/DigiCon-A

Secondary hot water circulation

High-efficiency pumps (double pumps)

Technical data Wilo-Stratos-ZD

	Wilo-Stratos-ZD ...	
	32/1-12	**40/1-8**
Approved fluids (other fluids on request)		
Heating water (in accordance with VDI 2035)	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	• (observe national regulations and directives)	
Output		
Delivery head max. [m]	10	8
Max. volume flow [m^3/h]	21	26
Permitted field of application		
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-	
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	0 up to +80	
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	0 up to +80	
Temperature range for applications in secondary hot water circulation systems at ambient temperature of +40 °C in short-term operation 2 h [°C]	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	20	20
Standard version for operating pressure, p_{max}	6/10	6/10
Special version for operating pressure, p_{max}	16	16
Pipe connections		
Screwed connection Rp	-	-
Nominal flange diameter DN	32	40
Flange for counter flange PN 6, standard version	–	–
Flange for counter flange PN 16, special version	•	•
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	•	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–
Electrical connection		
Mains connection 1 ~ [V], standard version	230	230
Mains connection 3 ~ [V], standard version	230	230
Mains connection 3 ~ [V], with optional switching plug	-	-
Mains frequency	50/60	50/60

Subject to change 09/2008 WILO SE

Technical data Wilo-Stratos-ZD

	Wilo-Stratos-ZD ...	
	32/1-12	**40/1-8**
Motor/electronics		
Electromagnetic compatibility	EN 61800-3	
Emitted interference	EN 61000-6-3	
Interference resistance	EN 61000-6-2	
Power electronics	Frequency converter	
Protection class	IP 44	IP 44
Insulation class	F	F
Materials		
Pump housing	Grey cast iron (EN-GJL-250)	
Impeller	Plastic (PPS - 40% GF)	
Pump shaft	Stainless steel (X39CrMo17-1)	
Bearing	Carbon, synthetic resin impregnated	
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature		
Minimum suction head at 50°C	3	3
Minimum suction head at 95°C	10	10
Minimum suction head at 110°C	16	16

• = available, - = not available

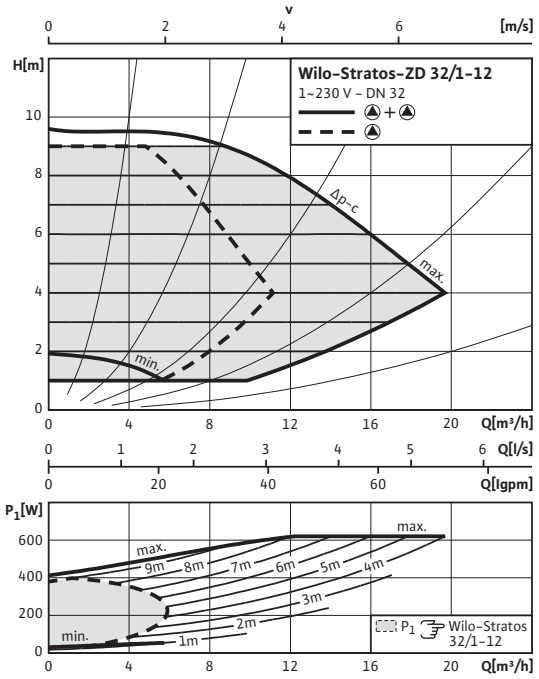
Secondary hot water circulation

High-efficiency pumps (double pumps)

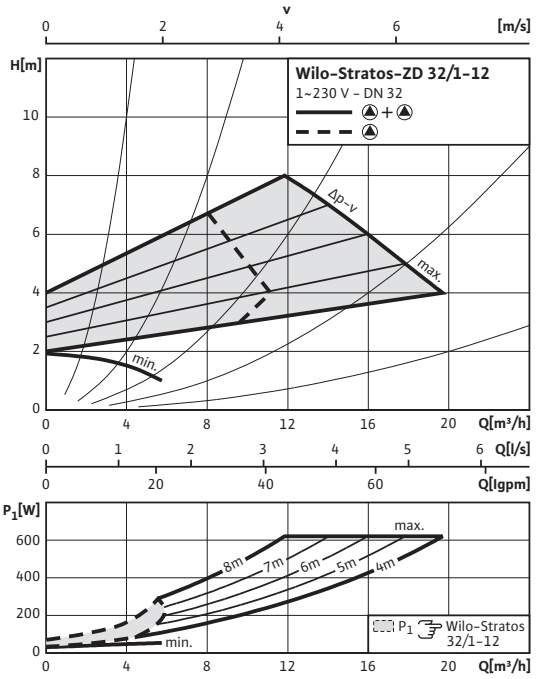
Pump curves Wilo-Stratos-ZD

Wilo-Stratos-ZD 32/1-12

Δp-c (constant)

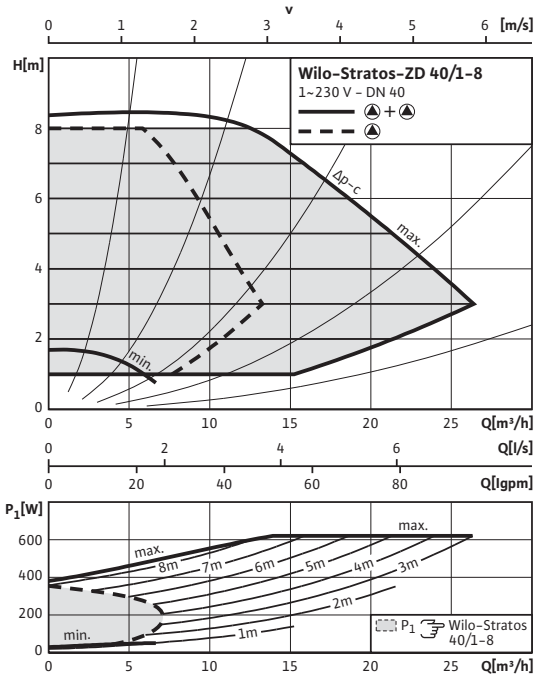


Δp-v (variable)

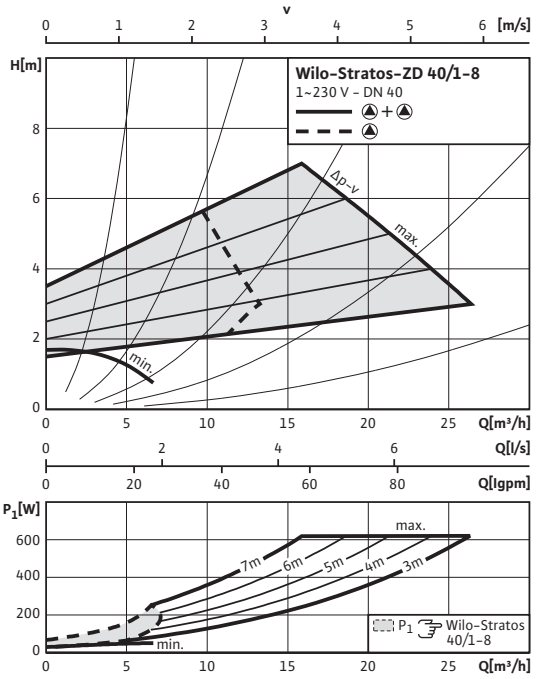


Wilo-Stratos-ZD 40/1-8

Δp-c (constant)



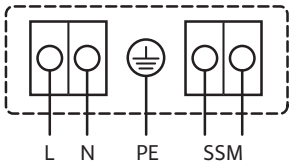
Δp-v (variable)



Terminal diagram, motor data Wilo-Stratos-ZD

Terminal diagram

Standard



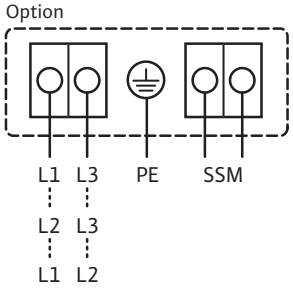
1~ 230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"

Option: Stratos IF-Modules see Chapter: "Wilo-Control pump management systems"

Terminal diagram

Option



3~230 V, 50/60 Hz

SSM: Collective fault signal
(NC contact according to VDI 3814, load capacity 1 A, 250 V ~)
Function see Chapter: "Wilo-Control pump management systems, Planning guide"

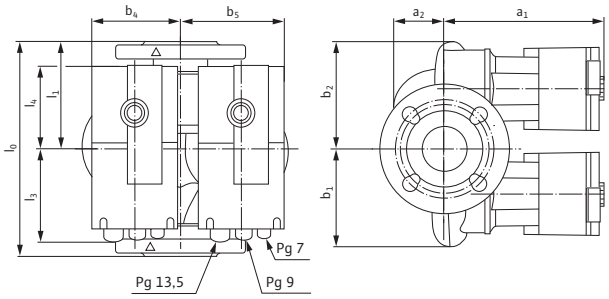
Option: Stratos IF-Modules see Chapter: "Wilo-Control pump management systems"

Motor data

Wilo-Stratos-ZD ...	Nominal motor power	Speed	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Threaded cable connection
	P_2	n	P_1	I			–	PG
	[W]	[rpm]	[W]	[A]			–	[PG]
32/1-12	200	1600 - 4800	16 - 310	0.16 - 1.37	0.16 - 1.37	-	integrated	1x7/1x9/ 1x13.5
40/1-8	200	1800 - 4800	18 - 310	0.17 - 1.37	0.17 - 1.37	-	integrated	1x7/1x9/ 1x13.5

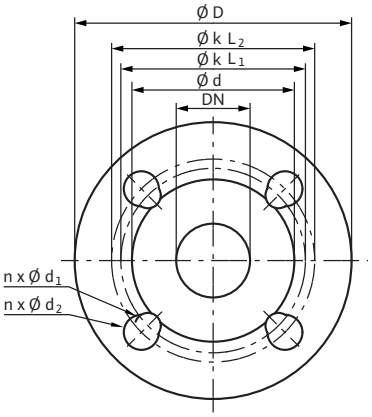
Dimensions, weights Wilo-Stratos-ZD

Dimension drawing A



Permitted installation positions, see Planning guide
Important: The threaded cable connection projects above the pump connection
(total dimension: dimension l_3 + max. 9 mm)!

Dimension drawing Flange A

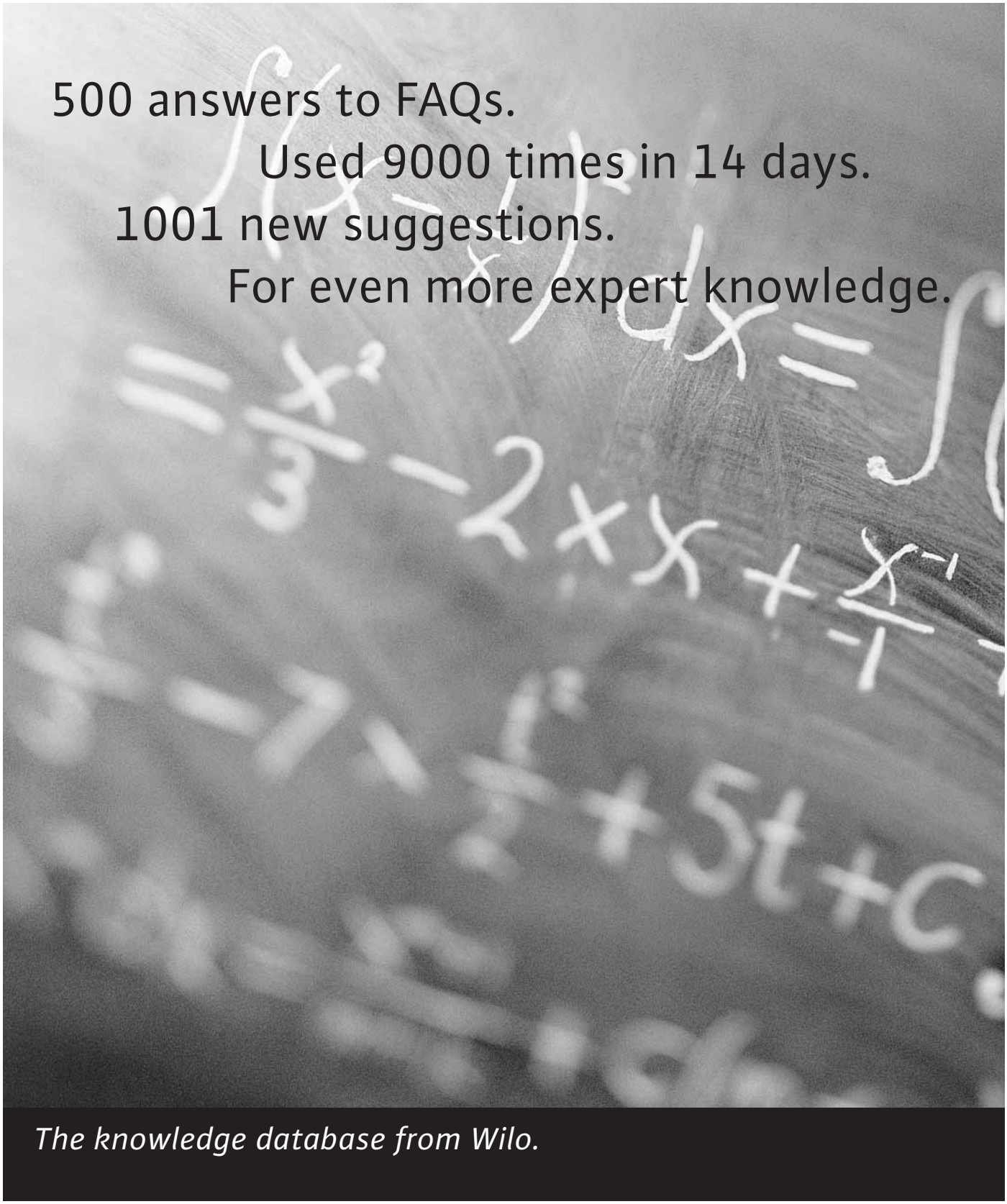


Dimensions, weights

Wilo-Stratos-ZD ...	Rated pressure	Nominal flange diameter	Dimensions										Weight approx.	Dimension drawing
	PN	DN	l_0	l_1	l_3	l_4	a_1	a_2	b_1	b_2	b_4	b_5	M	–
	[bar]	–	[mm]										[kg]	–
32/1-12	6/10	32	220	110	120	106	204	57	117	130	110	130	16.5	A
40/1-8	6/10	40	220	110	120	106	200	64	125	138	115	135	17.0	A

Flange dimensions

Wilo-Stratos-ZD ...	Flange	Nominal flange diameter	Pump flange dimensions				Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	n x Ø d_{L1}/Ø d_{L2}	–
	–		[mm]			[pcs. x mm]	–
32/1-12	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	32	140	76	90/100	4 x 14 / 19	A
40/1-8	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	84	100/110	4 x 14 / 19	A



Did you know? The knowledge database from Wilo will give you good and quick advice: with approx. 500 responses to the most frequently asked questions (FAQs) all about pumps, installations and systems. It is already being visited extensively by many skilled craftsmen.This is proven by 9000 utilisations in only 14 days, which we recently registered. The best thing: With every new question which you ask us with the contact form, we all become wiser together. Because the corresponding answer is naturally incorporated as soon as possible.
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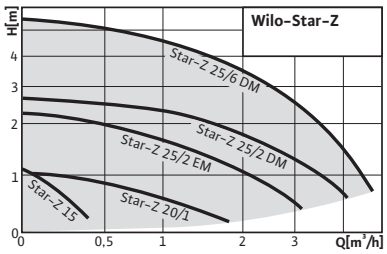
Secondary hot water circulation

Standard pumps (single pumps)

Series overview Wilo-Star-Z, TOP-Z, VeroLine-IP-Z

Series: Wilo-Star-Z



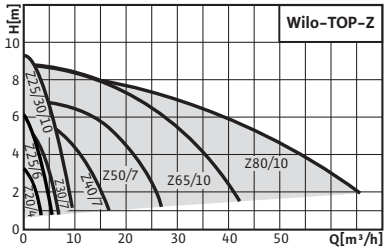


> Design
Glandless circulation pump with threaded connection

> Application
Secondary hot water circulation systems and similar systems in industrial and building services

Series: Wilo-TOP-Z



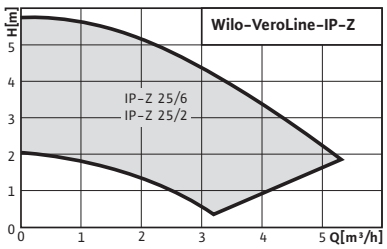


> Design
Glandless circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment

> Application
Secondary hot water circulation systems, similar systems in industrial and building services (e.g. cooling water circulation)

Series: Wilo-VeroLine-IP-Z





> Design
Glanded circulation pump in in-line design with threaded connection

> Application
For pumping potable water, cold and hot water (in accordance with VDI 2035) without abrasive substances, in heating, cold water and cooling water systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Star-Z, TOP-Z, VeroLine-IP-Z

Series: Wilo-Star-Z

> Special features/product benefits
- AC pumps with electrical quick connection
- All plastic parts that come into contact with the fluid fulfil KTW recommendations
- Thermal insulation as standard for Star-Z 15...
- Star-Z 15 TT with integrated timer and thermostat, LCD with symbolic language, red button technology and automatic detection of the thermal disinfection of the warm secondary hot water tank.

> More information **Page**

- Planning guide 8
- Equipment/function 286
- Series description 289
- Technical data 291
- Pump curves 295
- Terminal diagrams, motor data 297
- Dimensions, weights 298
- Service/accessories 351
- Switchgears and control devices 373

Series: Wilo-TOP-Z

> Special features/product benefits
- Manual power adjustment with 3 speed stages
- With thermal insulation as standard
- Simple installation due to combination flange PN 6/PN 10 (for DN 40 – DN 65)
- Cable feed into terminal box possible on both sides (from $P_2 \geq 180$ W) with integrated strain relief device
- Protection class IP 44

> More information **Page**

- Planning guide 8
- Equipment/function 286
- Series description 300
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- Pump curves 304
- Terminal diagrams, motor data 308
- Dimensions, weights 311
- Service/accessories 351
- Switchgears and control devices 373
- Wilo-Control pump management systems 437

Series: Wilo-VeroLine-IP-Z

> Special features/product benefits
- High resistance to corrosive media, due to stainless steel housing and Noryl impeller
- Wide range of applications due to suitability for water with hardness values up to 28°dH
- All plastic parts that come into contact with the fluid fulfil KTW recommendations

> More information **Page**

- Planning guide 8
- Technical data 315
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Secondary hot water circulation

Standard pumps (single pumps)

Equipment/function Wilo-Star-Z, TOP-Z, VeroLine-IP-Z

	Wilo-Star-Z ...	Wilo-TOP-Z ...	Wilo-VeroLine-IP-Z ...
Operating modes			
Speed-stage switching	• (only for Star-Z 25/6)	•	-
Manual control mode (n=constant)	–	–	-
Δp-c for constant differential pressure	–	–	-
Δp-v for variable differential pressure	–	–	-
Δp-T for temperature-controlled differential pressure	–	–	-
Manual functions			
Operating mode setting	–	–	-
Differential-pressure setpoint setting	–	–	-
Autopilot	–	–	-
Pump ON/OFF setting	–	–	-
Speed setting (manual control mode)	–	–	-
Setting the speed stages	1 (3 for Star-Z 25/6)	3	1
Automatic functions			
Infinitely variable power adjustment according to the operating mode	–	–	-
Autopilot	–	–	-
Time switching function for programming 3 switch-on or off times	• (only Z 15 TT)	-	-
Temperature control for maintaining a constant return temperature in the secondary hot water circulation system	• (only Z 15 TT)	-	-
Thermal disinfection routine (support and detection of thermal disinfection of the secondary hot water storage tank)	• (only Z 15 TT)	-	-
Deblocking function	–	–	-
Blocking protection	• (only Z 15 TT)	-	-
Soft start	–	–	-
Safety control	–	–	-
Full motor protection with integrated trip electronics	–	• (only for 3~pumps with $P_2 \geq 180W$)	-
External control functions			
Overriding Off	–	• (optional for all types with Wilo-Protect-Module C)	-
Overriding Min	–	–	-
Analogue In 0 ... 10 V	–	–	-
Analogue In 0 ... 10 V	–	–	-

Equipment/function Wilo-Star-Z, TOP-Z, VeroLine-IP-Z

	Wilo-Star-Z ...	Wilo-TOP-Z ...	Wilo-VeroLine-IP-Z ...
Signal and display functions			
Single/collective fault signal (potential-free NC contact)	–	• (optional for all types with Wilo-Protect-Module C)	-
Collective fault signal (potential-free NC contact)	–	• (standard equipment only for 3~pumps with $P_2 \geq 180W$, optional for all types with Wilo-Protect-Module C)	-
Individual run signal (potential-free NO contact)	–	• (optional for all types with Wilo-Protect-Module C)	-
Thermal winding contact (WSK, potential-free NC contact)	–	• (only for 1~ pumps with $P_2 = 180$ W)	-
Fault signal light	–	• (standard equipment only for 3~pumps with $P_2 \geq 180W$, optional for all types with Wilo-Protect-Module C)	-
Direction-of-rotation control light	–	• (only for 3~pumps)	-
LC display for indication of pump data and fault codes	• (only Z 15 TT)	–	-
Data exchange			
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	–	-
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	–	-
Serial digital LON interface for connection to a LONWORKS network	–	–	-
Serial digital CAN interface for connection to a CAN bus system	-	–	-
Dual pump management (double pump or 2 x single pump)			
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	• (optional for all types with Wilo-Protect-Module C)	-
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	–	-
Equipment/scope of delivery			
Wrench attachment point on pump body	– (only for Star-Z 25/6)	–	-
Twin switch-over valve in pump housing	–	–	-
Cable lead-in possible on both sides	– (only for Star-Z 20/25)	• (only for 1~ pumps and 3~ pumps with $P_2 \geq 180$ W)	-

Secondary hot water circulation

Standard pumps (single pumps)

Equipment/function Wilo-Star-Z, TOP-Z, VeroLine-IP-Z

	Wilo-Star-Z ...	Wilo-TOP-Z ...	Wilo-VeroLine-IP-Z ...
Wilo quick connection with spring clips	•	–	–
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	–	–
Blocking current-proof motor	•	–	–
Including seals for threaded connection (loose)	– (only for Star-Z 25/6)	•	–
Including installation and operating instructions	•	•	•
Including thermal insulation	• (only series Z 15...)	•	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	•	–
Including 1.8 m connecting cable with shock-proof plug	• (only Z 15 TT)	–	–
Integrated non-return valve	• (only Z 15 A, Z 15 TT)	–	–
Integrated ball shut-off valve	• (only Z 15 A, Z 15 TT)	–	–
Including clock timer	• (only Z 15 TT)	–	–

• = available, – = not available

Series description Wilo-Star-Z



Design
Glandless circulation pump with threaded connection

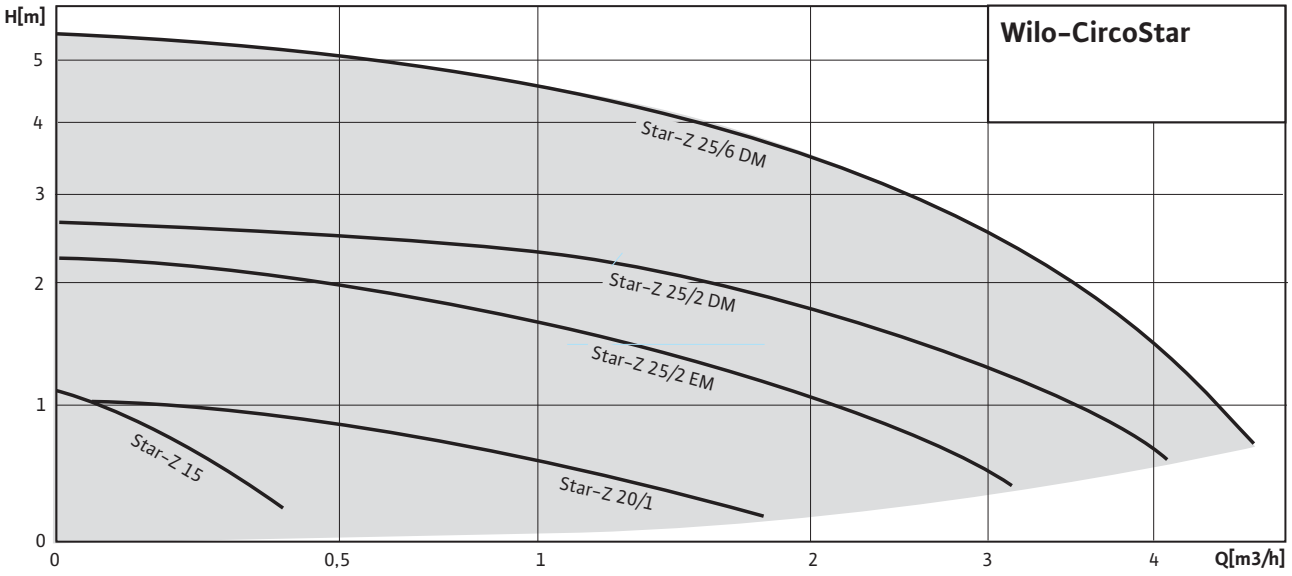
Application
Secondary hot water circulation systems and similar systems in industrial and building services

Type key

Example:	**Wilo Star-Z 20/1**
Star	Standard pump (screw-end pump or pump with press fitting)
Z	Circulation pump
20/	Nominal connection diameter
1	Nominal delivery head [m]

Options
- Wilo Star-Z 15 A with non-return valve and ball shut-off valve
- Wilo-Star-Z 15 TT as with Star-Z 15 A, with integrated clock timer, temperature control and routine for recognising and supporting thermal legionellae switching on the boiler side

Special features/product benefits
- AC pumps with electrical quick connection
- All plastic parts that come into contact with the fluid fulfil KTW recommendations
- Thermal insulation as standard for Star-Z 15...
- Star-Z 15 TT with integrated timer and thermostat, LCD with symbolic language, red button technology and automatic detection of the thermal disinfection of the warm secondary hot water tank.



Secondary hot water circulation

Standard pumps (single pumps)

Series description Wilo-Star-Z

Equipment/function

Operating modes
- Speed stage switching (only Star-Z 25/6)

Manual functions
- Setting of the speed stages (1 speed stage, 3 speed stages for Star-Z 25/6)

Automatic functions
- Time switching function for programming of 3 switch-on or off times (only Z 15 TT)
- Temperature control for maintaining a constant return temperature in the secondary hot water circulation system (only Z 15 TT)
- Thermal disinfection routine (detection and support of thermal disinfection of the warm secondary hot water tank) (only Z 15 TT)
- Blocking protection (only Z 15 TT)

Signal and display functions
- LC display for indication of pump data and fault codes (only Z 15 TT)

Equipment
- Wrench attachment point on the pump body (only Star-Z 25/6)
- Cable lead-in possible from both sides (only Star-Z 20/..., Star-Z 25/...)
- Quick connection with spring clips
- Blocking current-proof motor
- Integrated non-return valve (only Z 15 A, Z 15 TT)
- Integrated ball shut-off valve (only Z 15 A, Z 15 TT)
- Including clock timer (only Z 15 TT)

Scope of delivery
- Pump
- Including seals for threaded connection (only Star-Z 25/6)
- Including installation and operating instructions
- Including thermal insulation (only version Z 15...)
- Including 1.8 m connection cable with shock-proof plug (only Z 15 TT)

Accessories
- Screwed connections
- Thermal insulation shell for Star-Z 20/1 - Z 25/2(6)
- Brass special insert parts for screw-end pumps:
  Male thread/inner soldering connection
- Wilo-S1R-h secondary hot water plug-in module for Star-Z 20/1, Z 25/2 EM (AC current model)
- Wilo-SK 601 timer switchgear together with Wilo-SK 602 (as contactor) for Wilo-Star-Z 25/2 DM (three-phase current)
- Wilo-SK 601 switchgear for time-dependent Off/On switching for Star-Z 25/6

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Technical data Wilo-Star-Z

	Wilo-Star-Z ...				
	15	**15 A**	**15 C**	**15 TT**	**15 APress**
Approved fluids (other fluids on request)					
Heating water (in accordance with VDI 2035)	–	–	–	–	–
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	–	–	–	–	–
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	•	•	•	•	•
Output					
Delivery head max. [m]	1.25	1.25	1.25	1.1	1.25
Max. volume flow [m^3/h]	0.6	0.6	0.6	0.3	0.6
Permitted field of application					
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]			–		
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]			–		
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	+65	+65	0 to +65	+65	+65
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C in short-term operation 2 h [°C]	70	70	70	70	70
Maximum permissible total hardness in secondary hot water circulation systems [°d]	18	18	18	18	18
Standard version for operating pressure, p_{max}	10	10	10	10	10
Special version for operating pressure, p_{max}	-	-	-	-	-
Pipe connections					
Screwed connection Rp	½	½	½	½	-
Nominal connection diameters DN	–	–	–	–	• 15
Flange with nominal pressure stage PN	–	–	–	–	–
Combination flange with nominal pressure stage PN	–	–	–	–	–
Connection with press connection (Viega system) [Ø mm]	–	–	–	–	•
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–
Electrical connection					
Mains connection 1 ~ [V], standard version	230	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–
Mains frequency	50	50	50	50	50

Secondary hot water circulation

Standard pumps (single pumps)

Technical data Wilo-Star-Z

	Wilo-Star-Z ...				
	15	**15 A**	**15 C**	**15 TT**	**15 APress**
Motor/electronics					
Electromagnetic compatibility	–				
Emitted interference	EN 61000-6-3				
Interference resistance	EN 61000-6-2				
Power electronics	–	–	–	–	–
Protection class	IP 42	IP 42	IP 42	IP 42	IP 42
Insulation class	F	F	F	F	F
Materials					
Pump housing	Brass (CuZn40Pb2)				
Impeller	Plastic (PPO)				
Pump shaft	Stainless steel (X35CrMo17)				
Bearing	Carbon, synthetic resin impregnated				
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature					
Minimum suction head at 40°C	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 65°C	2	2	2	2	2

• = available, – = not available

Technical data Wilo-Star-Z

	Wilo-Star-Z ...						
	20/1	**20/4-3**	**20/5-3**	**20/7-3**	**25/2 DM**	**25/2 DM**	**25/6**
Approved fluids (other fluids on request)							
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	•	•	•	•	•	•	•
Output							
Delivery head max. [m]	1	4	5	6	2	2.9	6
Max. volume flow [m^3/h]	1.7	3.5	4.5	5.5	3.1	3.7	4.8
Permitted field of application							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	• -10 up to +110						
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• -10 up to +95						
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	+65	+65	+65	+65	+65	+65	+65
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C in short-term operation 2 h [°C]	70	70	70	70	70	70	70
Maximum permissible total hardness in secondary hot water circulation systems [°d]	18	18	18	18	18	18	18
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	-	-	-	-	-	-	-
Pipe connections							
Screwed connection Rp	½	½	½	½	1	1	1
Nominal connection diameters DN	–	-	-	-	–	–	–
Flange with nominal pressure stage PN	–	–	–	–	–	–	–
Combination flange with nominal pressure stage PN	–	–	–	–	–	–	–
Connection with press connection (Viega system) [Ø mm]	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	-	-	-	–	–	–
Electrical connection							
Mains connection 1 ~ [V], standard version	230	230	230	230	230	–	230
Mains connection 3 ~ [V], standard version	–	-	-	-	–	400	–
Mains connection 3 ~ [V], with optional switching plug	–	-	-	-	–	–	–
Mains frequency	50	50	50	50	50	50	50

Secondary hot water circulation

Standard pumps (single pumps)

Technical data Wilo-Star-Z

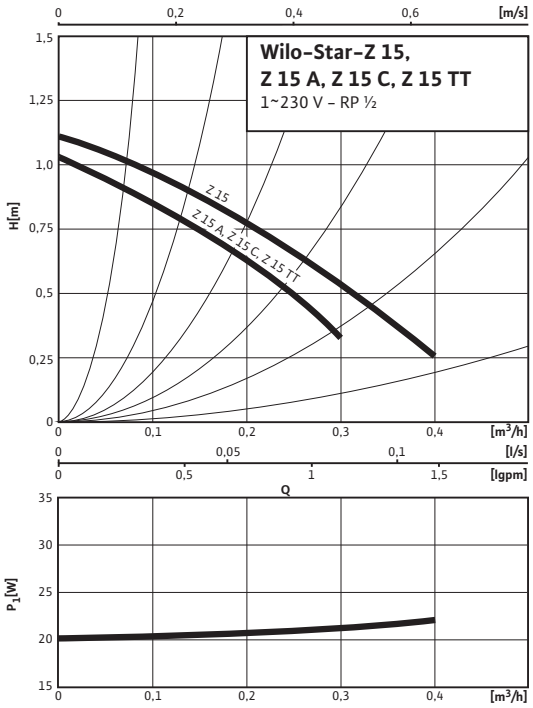
	Wilo-Star-Z ...						
	20/1	**20/4-3**	**20/5-3**	**20/7-3**	**25/2 DM**	**25/2 DM**	**25/6**
Motor/electronics							
Electromagnetic compatibility	–						
Emitted interference	EN 61000-6-3						
Interference resistance	EN 61000-6-2						
Power electronics	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F
Materials							
Pump housing	Red brass (CC 499K) according to DIN EN 1982 and according to TrinkwV2001 (drinking water ordinance)	Red brass (G-CnSn5)			Red brass (CC 499K) according to DIN EN 1982 and according to TrinkwV2001 (drinking water ordinance)		
Impeller	Plastic (PPO)						
Pump shaft	Oxide ceramic, brown (Al2O3)						
Bearing	Carbon, synthetic resin impregnated						
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature							
Minimum suction head at 40°C	0.5	–	–	–	0.5	0.5	0.5
Minimum suction head at 65°C	3	3	3	3	3	3	3
Minimum suction head at 110°C	10.0	10.0	10.0	10.0	10.0	10.0	10.0

• = available, – = not available

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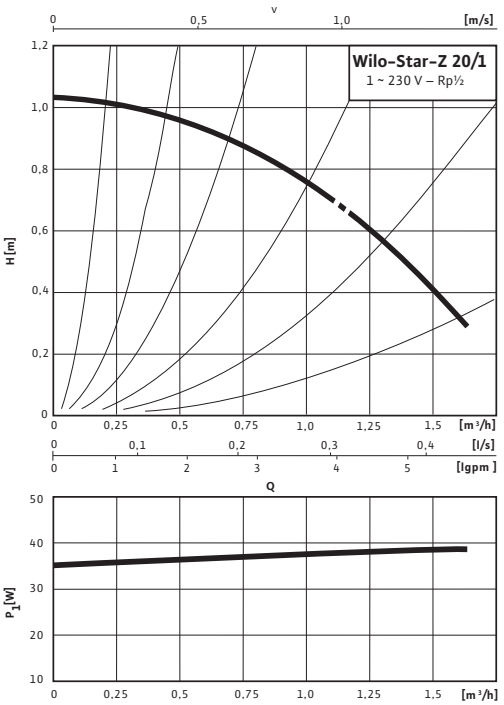
Pump curves Wilo-Star-Z

Wilo-Star-Z 15 A, Z 15 C, Z 15 TT



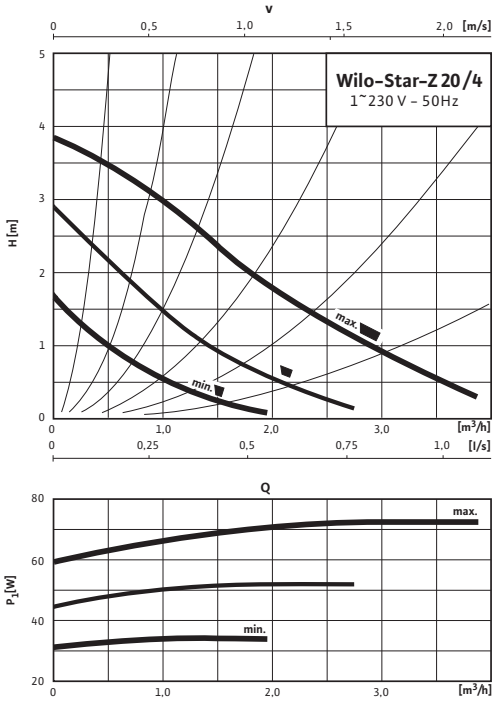
Wilo-Star-Z 20/1

Alternating current



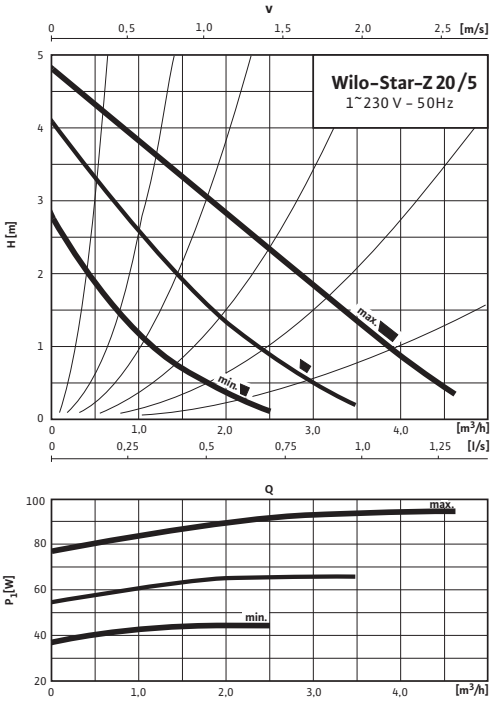
Wilo-Star-Z 20/4

Alternating current



Wilo-Star-Z 20/5

Alternating current



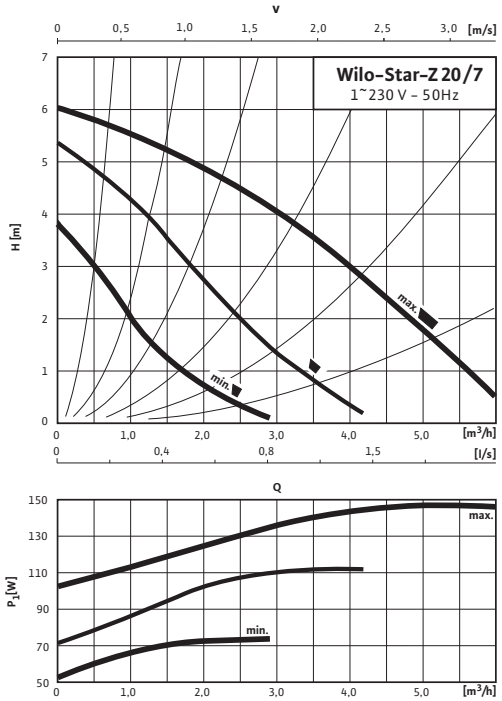
Secondary hot water circulation

Standard pumps (single pumps)

Pump curves Wilo-Star-Z

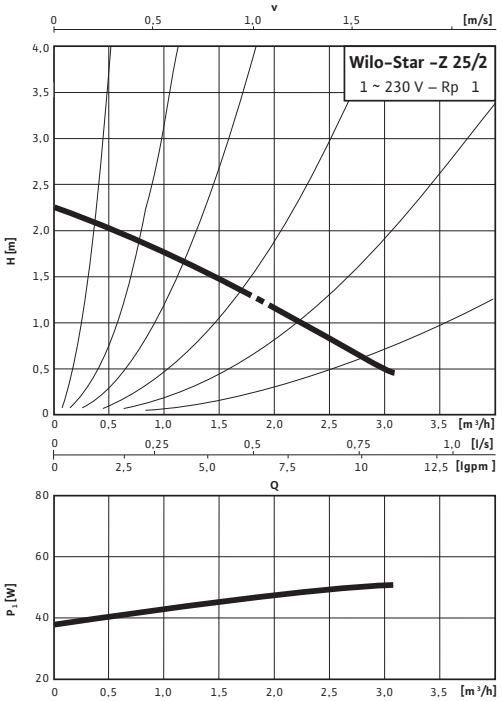
Wilo-Star-Z 20/7

Alternating current



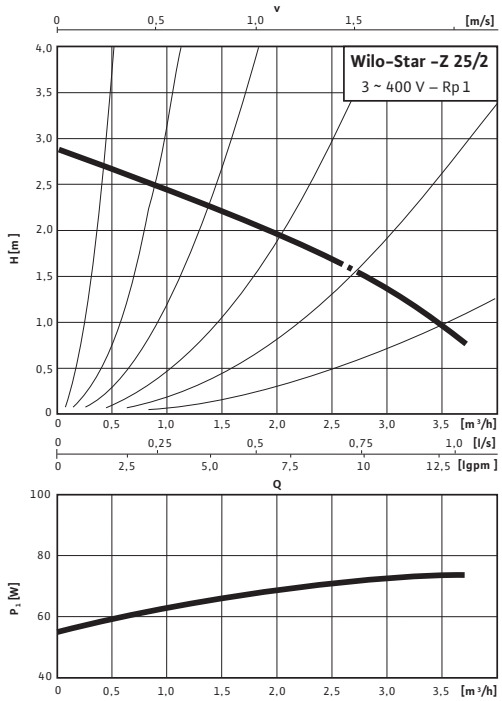
Wilo-Star-Z 25/2

Alternating current



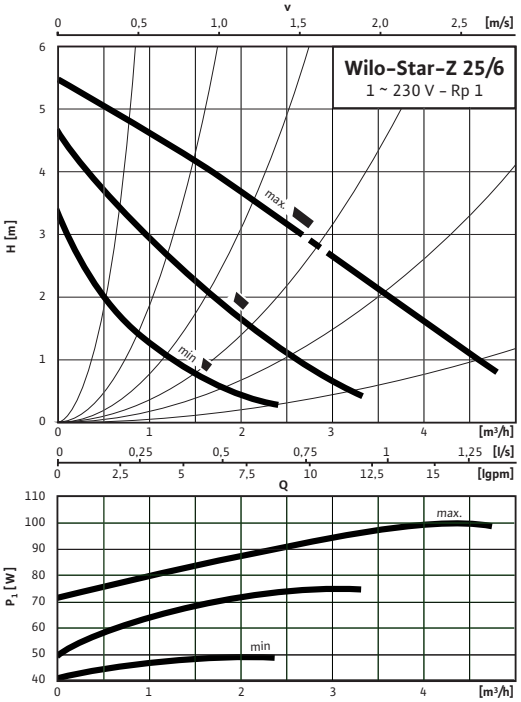
Wilo-Star-Z 25/2

Three-phase current



Wilo-Star-Z 25/6

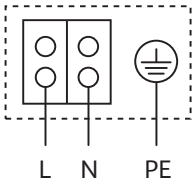
Alternating current



Subject to change 09/2008 WILO SE

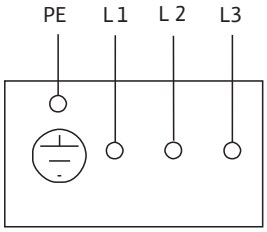
Terminal diagram, motor data Wilo-Star-Z

Terminal diagram A



Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Terminal diagram B



Three-phase motor, 2-pole 3~400 V, 50 Hz

Motor data

Wilo-Star-Z ...	Nominal motor power	Speed range	Power consumption	Current at 1~230V	Current at 3~230V	Current at 3~400V	Motor protection	Capacitor	Threaded cable connection	Wiring diagram
	P_2	–	P_1	I			–	C	PG	–
	[W]	[rpm]	[W]	[A]			–	[µF/VDB]	[PG]	–
15	–	1700-2700	22	0.25	-	-	not required (blocking current-proof)	-	1x9	A
15 A	–	1700-2700	22	0.25	-	-	not required (blocking current-proof)	-	1x9	A
15 C	–	1700-2700	22	0.25	-	-	not required (blocking current-proof)	-	1x9	A
15 TT	–	1700-2700	22	0.25	-	-	not required (blocking current-proof)	-	1x9	A
15 APress	–	1700-2700	22	0.25	-	-	not required (blocking current-proof)	-	1x9	A
20/1	4.0	1700-2700	36 - 38	0.18	-	-	not required (blocking current-proof)	1.0/400	1x11	A
20/4-3	22.5 12.5 6.5	1700-2600	57 - 71 41 - 51 29 - 33	0.3 0.2 0.1	-	-	not required (blocking current-proof)	2.0/400	1x11	A
20/5-3	38.0 21.0 11.0	2000-2600	75 - 93 66 - 51 43 - 35	0.4 0.2 0.1	-	-	not required (blocking current-proof)	2.6/400	1x11	A
20/7-3	57.0 29.5 13.5	2000-2700	102 - 146 71 - 112 52 - 73	0.6 0.4 0.3	-	-	not required (blocking current-proof)	3.5/400	1x11	A
25/2 EM	22.5 12.5 6.5	1700-2700	38 - 49	0.22	-	-	not required (blocking current-proof)	1.0/0.0	1x11	A
25/2 DM	12.0	1700-2700	55 - 72	-	-	0.16	not required (blocking current-proof)	-	1x11	B
25/6	38.0 21.0 11.0	1700-2700	72 - 99 52 - 74 39 - 49	0.43 0.32 0.22	-	-	not required (blocking current-proof)	2.6/400	1x11	A

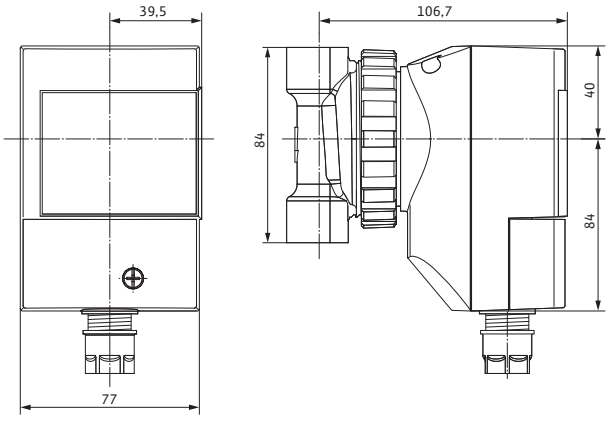
Observe name plate data!

Secondary hot water circulation

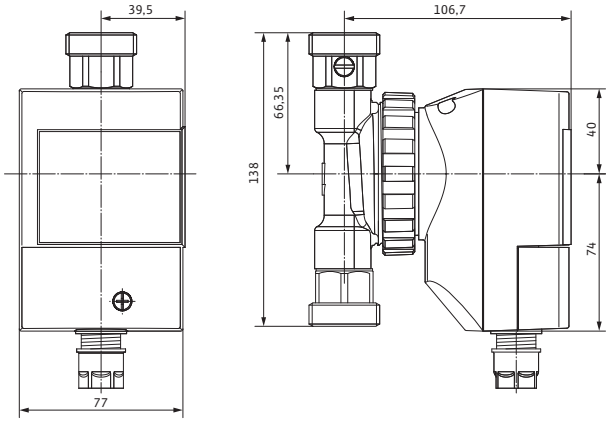
Standard pumps (single pumps)

Dimensions, weights Wilo-Star-Z

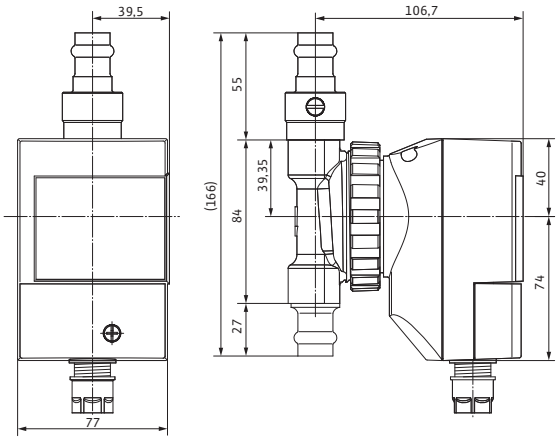
Dimension drawing A



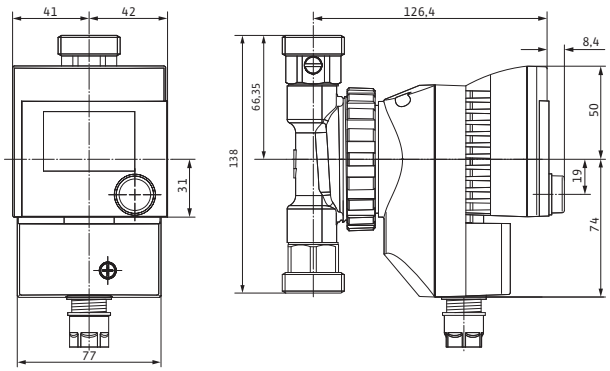
Dimension drawing B



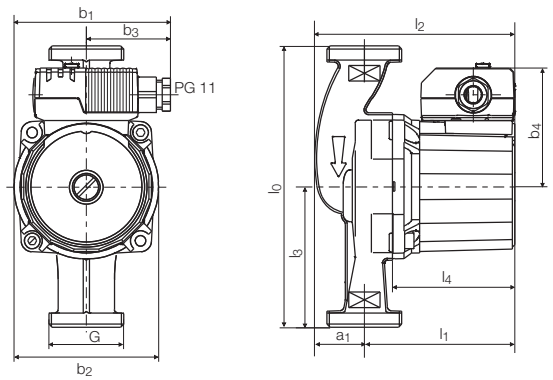
Dimension drawing C



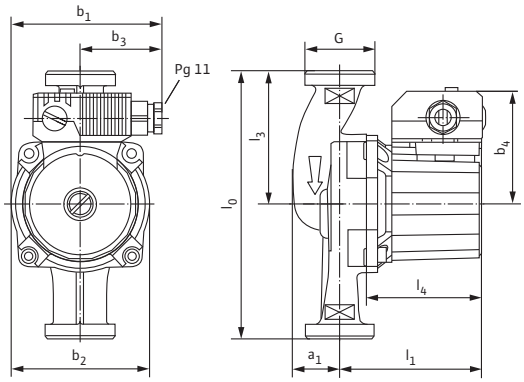
Dimension drawing D



Dimension drawing F



Dimension drawing G



Dimensions, weights Wilo-Star-Z

Dimensions, weights

Wilo-Star-Z ...	Pipe connection	Thread	Dimensions										Weight approx.	Dimension drawing
	Rp	G	l_0	l_1	l_2	l_3	l_4	a_1	b_1	b_2	b_3	b_4	M	–
	–		[mm]										[kg]	–
15	½	–	84	–	–	39.4	–	–	77	–	41.5	40	1.4	A
15 A	½	1¼	138	–	–	66.3	–	–	77	–	41.5	40	1.6	B
15 C	½	1¼	138	–	–	66.3	–	–	77	–	41.5	40	1.8	B
15 APress	-	–	166	–	–	94.3	–	–	77	–	41.5	40	1.7	C
15 TT	½	1¼	138	–	–	66.3	–	–	77	–	42.0	50	1.8	D
20/1	½	1	140	96	–	70.0	78	–	101	93.5	54.0	76	2.2	F
20/4-3	½	1¼	150	96	130	75.0	78	32	101	93.5	54.0	76	2.2	G
20/5-3	½	1¼	150	96	130	75.0	78	33	101	93.5	54.0	79	2.4	G
20/7-3	½	1¼	150	109	130	75.0	91	30	101	93.5	54.0	79	2.8	G
25/2 EM	1	1½	180	96	–	90.0	78	–	101	93.5	54.0	76	2.5	F
25/2 DM	1	1½	180	96	–	90.0	78	–	101	93.5	54.0	79	2.3	F
25/6	1	1½	180	96	–	90.0	78	–	101	93.5	54.0	79	2.5	G

Secondary hot water circulation

Standard pumps (single pumps)

Series description Wilo-TOP-Z



Design
Glandless circulation pump with screwed connection or flange connection. Preselectable speed stages for power adjustment

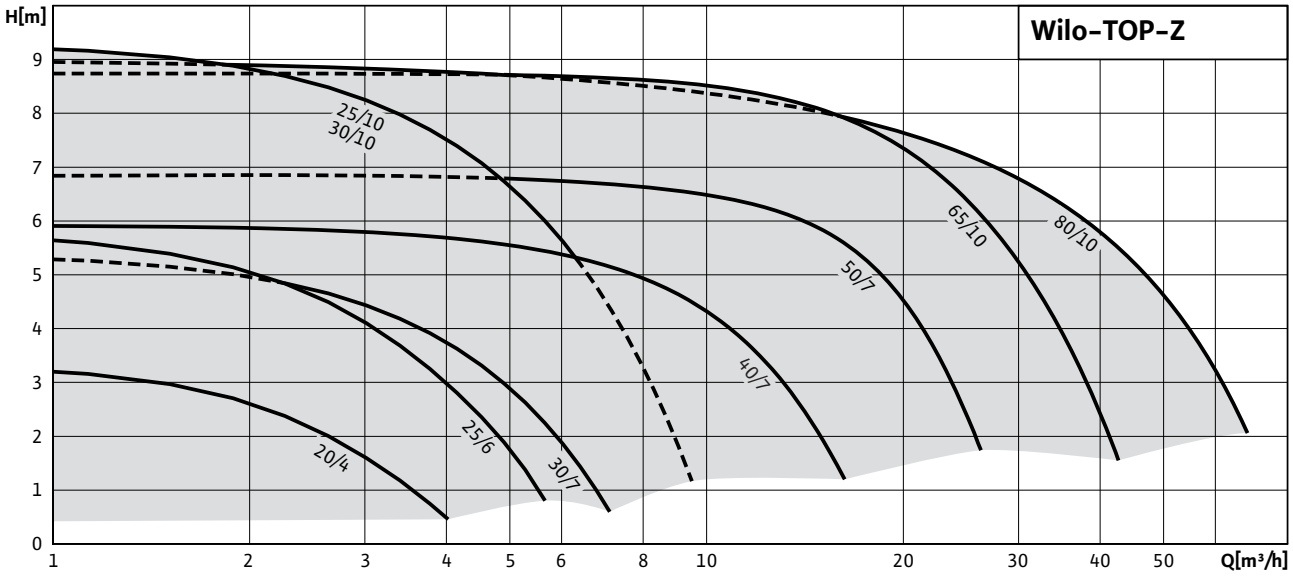
Application
Secondary hot water circulation systems, similar systems in industrial and building services (e.g. cooling water circulation)

Type key

Example:	**Wilo TOP-Z 40/7**
TOP	Standard pump (screw-end or flange-end pump)
-Z	Circulation pump
40/	Nominal connection diameter
7	Nominal delivery head range [m] at Q = 0 m^3/h

Options
- Special versions for operating pressure PN 16 (at additional charge)
- Version for special voltage on request

Special features/product benefits
- Manual power adjustment with 3 speed stages
- With thermal insulation as standard
- Simple installation due to combination flange PN 6/PN 10 (for DN 40 – DN 65)
- Cable feed into terminal box possible on both sides (from $P_2 \geq 180$ W) with integrated strain relief device
- Protection class IP 44



Subject to change 09/2008 WILO SE

Series description Wilo-TOP-Z

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting the speed stages: 3 speed stages

Automatic functions
- Full motor protection with integrated trip electronics (only for 3~pumps with P_2≥180 W)

Signal and display functions
- Individual/collective fault signal (potential-free NC contact) (optional for all types with Wilo-Protect-Module C)
- Collective fault signal (potential-free NC contact) (standard equipment only for 3~pumps with P_2≥180 W, optional for all types with Wilo-Protect-Module C)
- Individual run signal (potential-free NO contact) (optional for all types with Wilo-Protect-Module C)
- Thermal winding contact (WSK, potential-free NC contact) (only for 1~pumps with P_2=180 W)
- Fault signal light (standard equipment only for 3~pumps with P_2≥180 W, optional for all types with Wilo-Protect-Module C)
- Direction of rotation control light (only for 3~pumps)

Dual pump management (double pump or 2 x single pump)
- Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling): optional for all types with Wilo-Protect-Module C

Equipment
- Cable lead-in possible from both sides (only for 1~pumps and 3~pumps with P_2≥180 W)

Scope of delivery
- Pump
- Including seals for threaded connection
- Including installation and operating instructions
- Including thermal insulation
- Including washers for flange screws (for nominal connection diameters DN 40 – DN 65)

Accessories
- Screwed connection for threaded connection
- Wilo-SK 601 timer switchgear
- For pumps 3~400 V:
  - Switching plug 3~230 V, 50 Hz
  - Wilo-Protect-Module C, 3~400 V
- For pumps 1~230 V:
  - Wilo-SK 602/SK 622 tripping unit for full motor protection
  - Wilo-Protect-Module C, 1~230 V

Secondary hot water circulation

Standard pumps (single pumps)

Technical data Wilo-TOP-Z

	Wilo-TOP-Z ...								
	20/4	**25/6**	**25/10**	**30/7**	**30/10**	**40/7**	**50/7**	**65/10**	**80/10**
Approved fluids (other fluids on request)									
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)			•			• (with pump housing in red brass CC 499K)			
Output									
Delivery head max. [m]	3.5	6	9.5	5.5	9.5	6	7	9	9
Max. volume flow [m^3/h]	4.0	5.5	9.5	7.0	9.5	16.0	25.0	42.5	65.0
Permitted field of application									
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	-								
Temperature range for applications in heating, ventilation & air-conditioning systems at max. ambient temperature of +40 °C	-20 up to +110								
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	0 to +65 (in short-term operation 2 h: +80)		0 to +80 (in short-term operation 2 h: +110)						
Maximum permissible total hardness in secondary hot water circulation systems [°d]	18	18	20	20	20	20	20	20	20
Standard version for operating pressure, p_{max}	10	10	10	10	10	6/10	6/10	6/10	6
Special version for operating pressure, p_{max}	-	-	16	-	16	16	16	16	16
Pipe connections									
Screwed connection	¾	1	1	1¼	1¼	-	-	-	-
Nominal flange diameter	-	-	-	-	-	40	50	65	80
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–	•
Flange for counter flange PN 16, special version	–	–	–	–	–	•	•	•	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	•	•	•	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–	–
Electrical connection									
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	-	-	-
Mains connection 3 ~ [V], standard version	400	400	400	400	400	400	400	400	400
Mains connection 3 ~ [V], with optional switching plug	230	230	230	230	230	230	230	230	230
Mains frequency	50	50	50	50	50	50	50	50	50
Motor/electronics									

Technical data Wilo-TOP-Z

	Wilo-TOP-Z ...								
	20/4	**25/6**	**25/10**	**30/7**	**30/10**	**40/7**	**50/7**	**65/10**	**80/10**
Electromagnetic compatibility	–								
Emitted interference	EN 61000-6-3								
Interference resistance	EN 61000-6-2								
Power electronics	–	–	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	H	H	H	H	H	H	H	H	H
Materials									
Pump housing (standard version)	stainless steel	Red brass (CC 499K) according to DIN EN 1982, according to TrinkwV2001 Grey cast iron (EN-GJL-250)							
Impeller	Plastic (PPE), trade name: Noryl								
Pump shaft	Ceramic	Stainless steel (X39CrMo17-1)							
Bearing	Carbon, synthetic resin impregnated								
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature									
Minimum suction head at 40°C	5	5	5	5	5	5	8	8	8
Minimum suction head at 80°C	8	8	8	8	8	8	10	10	10
Minimum suction head at 110°C	20	20	20	20	20	20	30	30	30

• = available, – = not available
Note on pump housing:
Red brass material (CC 499K) according to DIN EN 1982 in accordance with TrinkwV 2001 (drinking water ordinance), alloy components according to DIN 50930-6

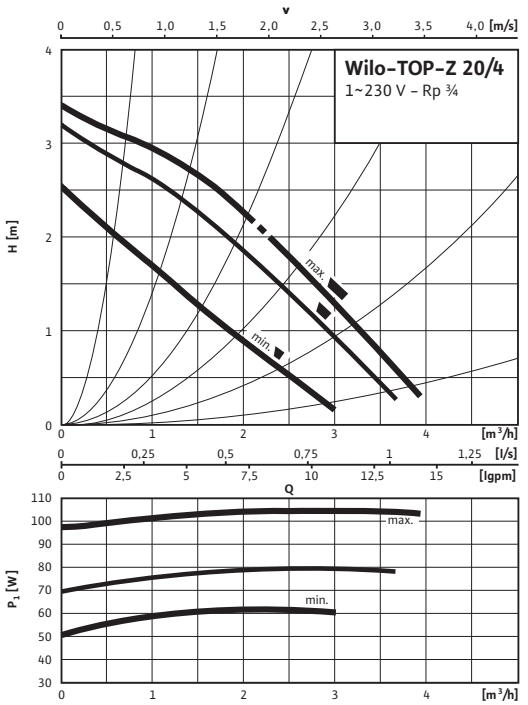
Secondary hot water circulation

Standard pumps (single pumps)

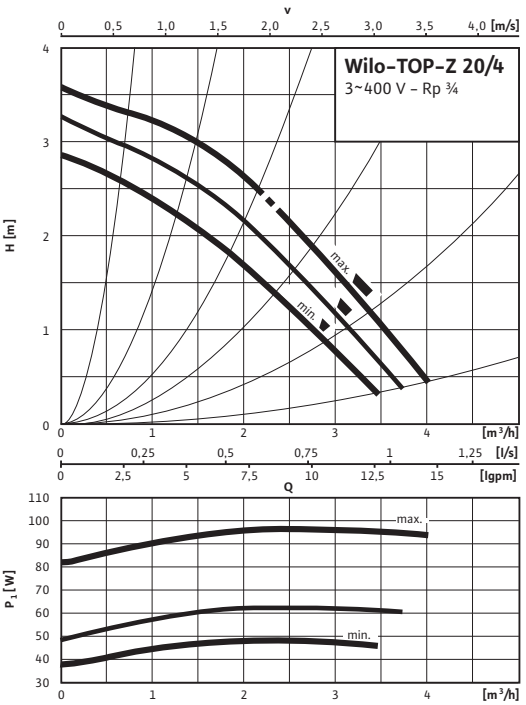
Pump curves Wilo-TOP-Z

Wilo-TOP-Z 20/4

Alternating current

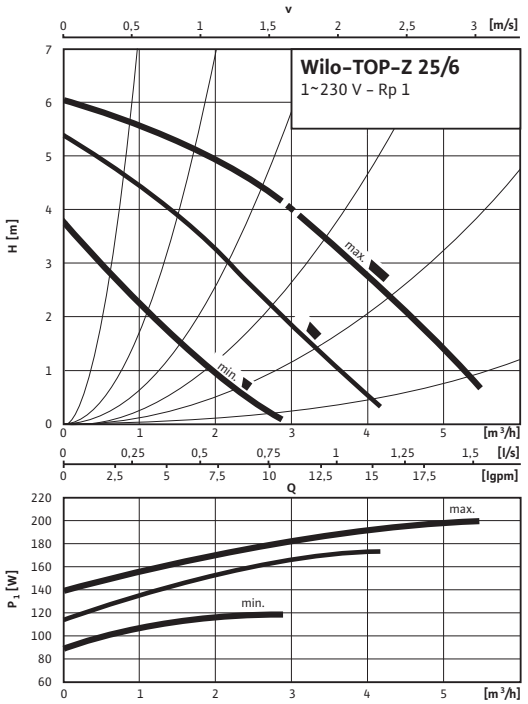


Three-phase current

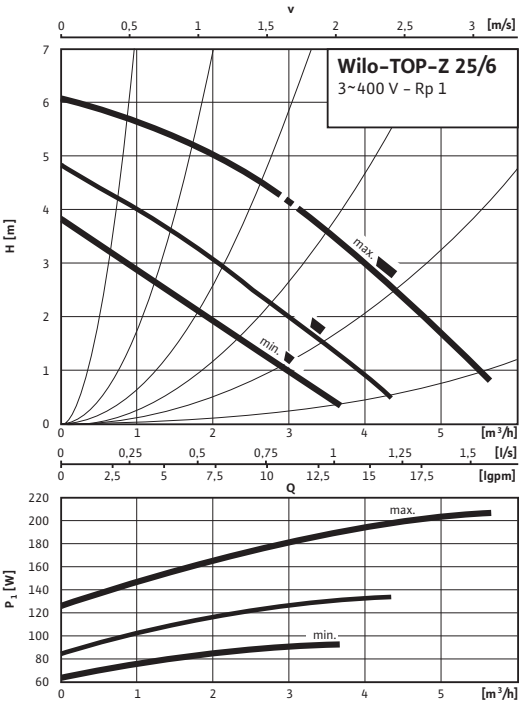


Wilo-TOP-Z 25/6

Alternating current



Three-phase current

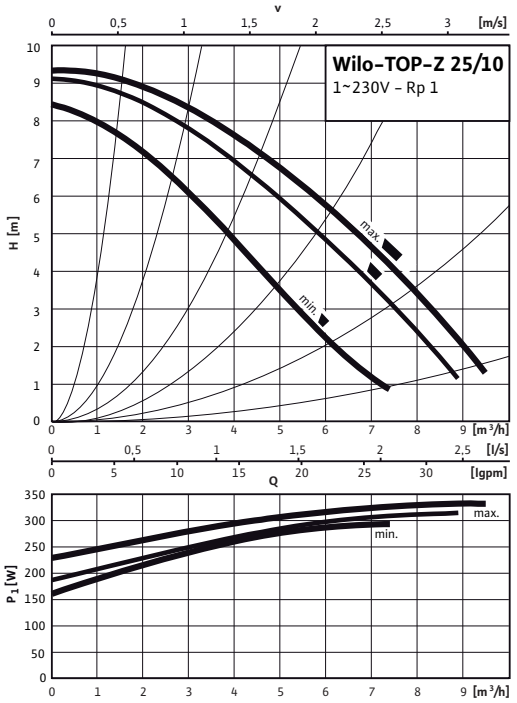


Subject to change 09/2008 WILO SE

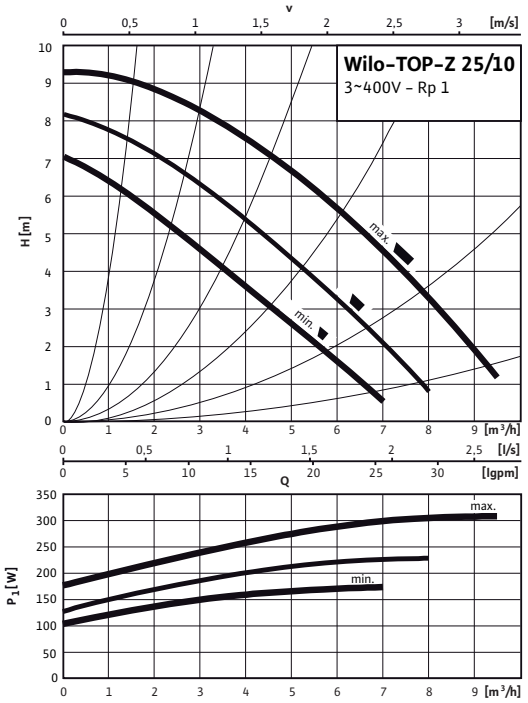
Pump curves Wilo-TOP-Z

Wilo-TOP-Z 25/10

Alternating current

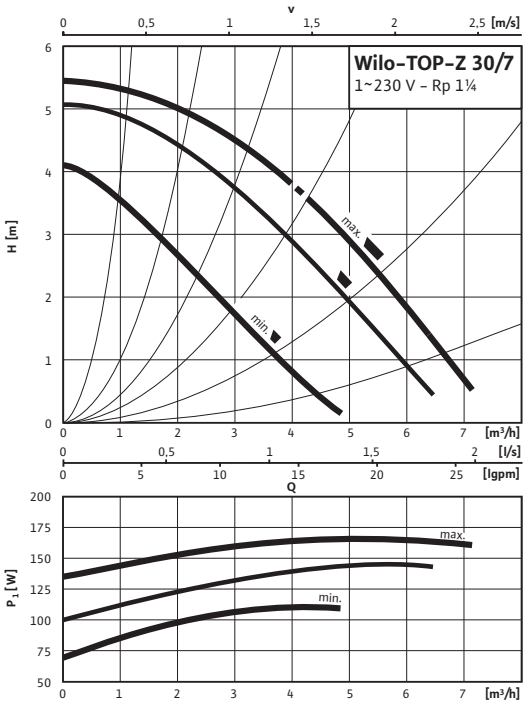


Three-phase current

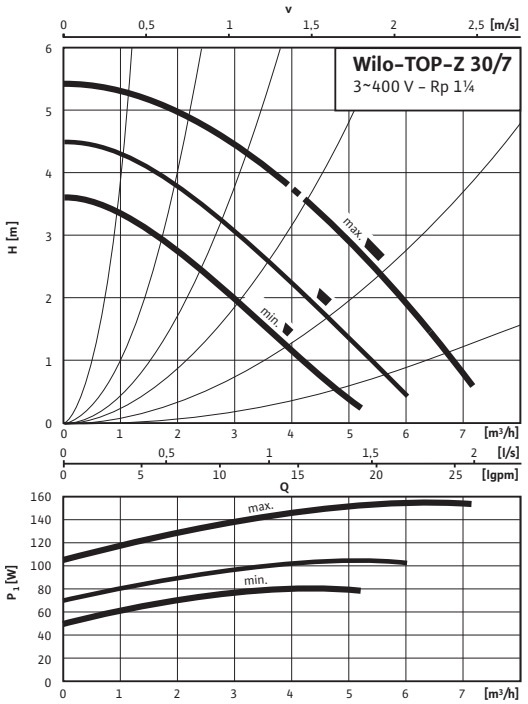


Wilo-TOP-Z 30/7

Alternating current



Three-phase current



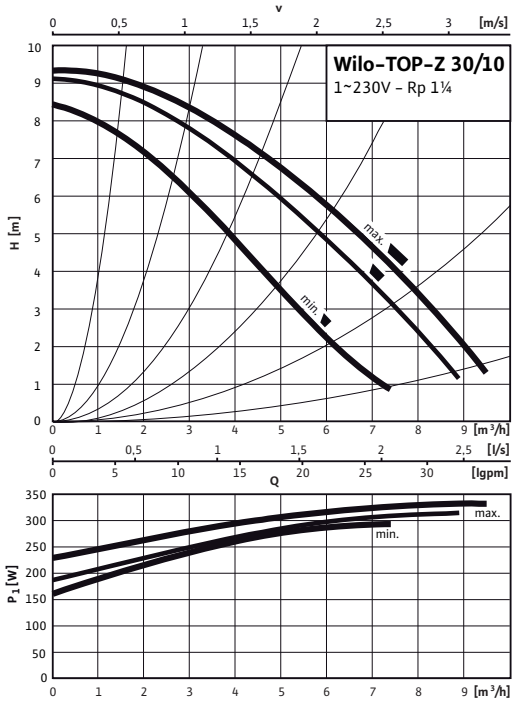
Secondary hot water circulation

Standard pumps (single pumps)

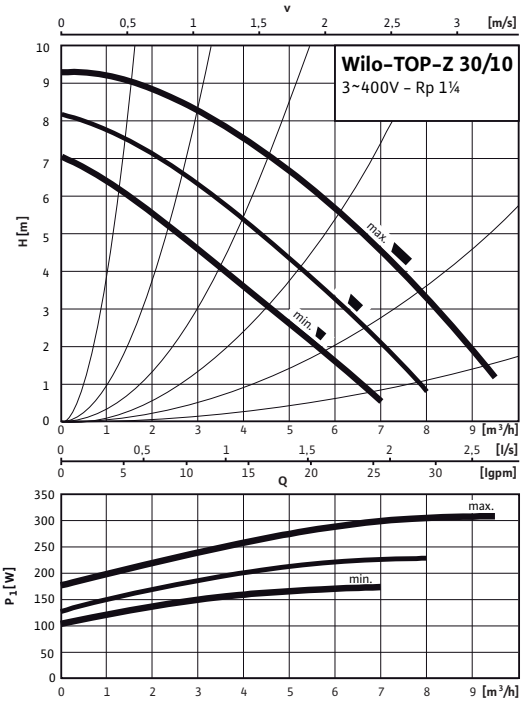
Pump curves Wilo-TOP-Z

Wilo-TOP-Z 30/10

Alternating current

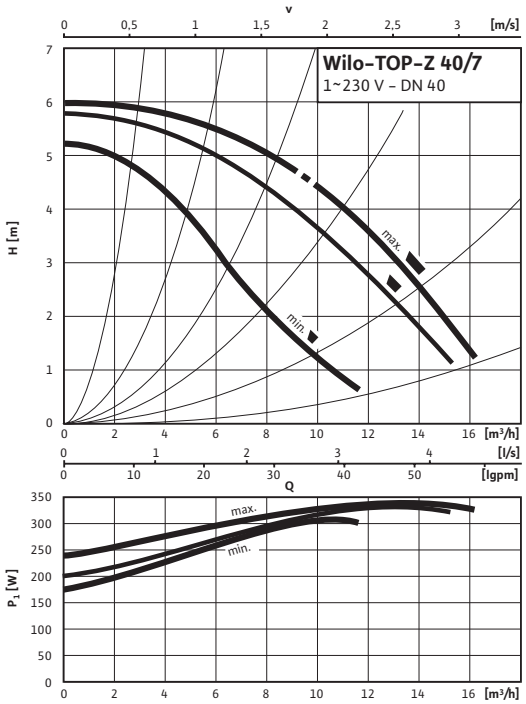


Three-phase current

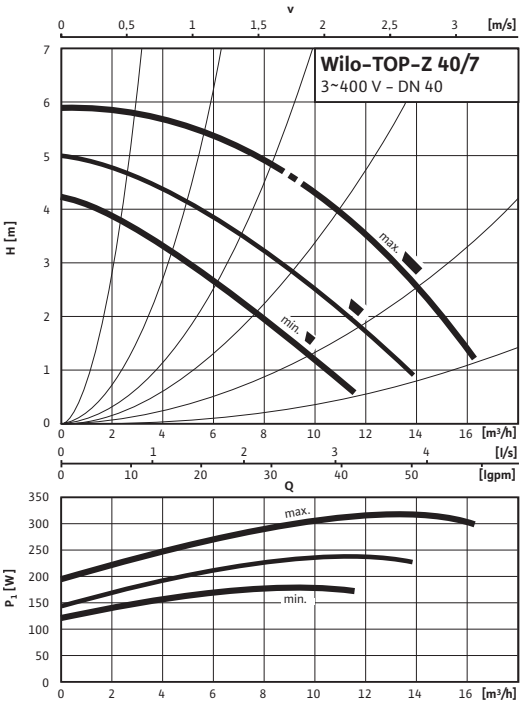


Wilo-TOP-Z 40/7

Alternating current



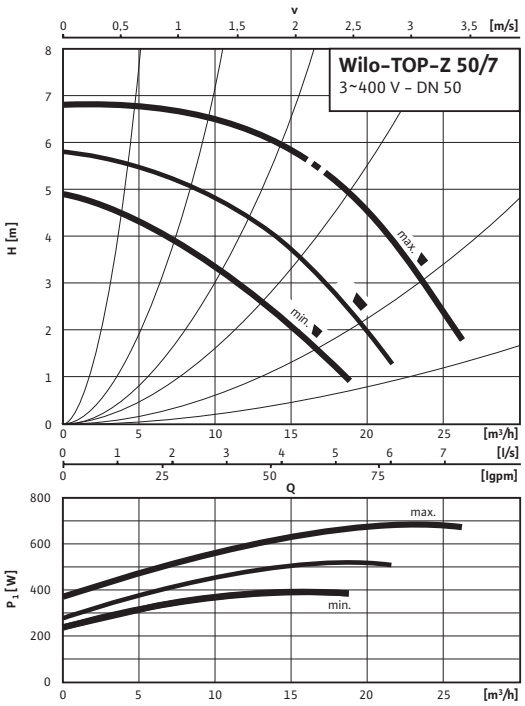
Three-phase current



Pump curves Wilo-TOP-Z

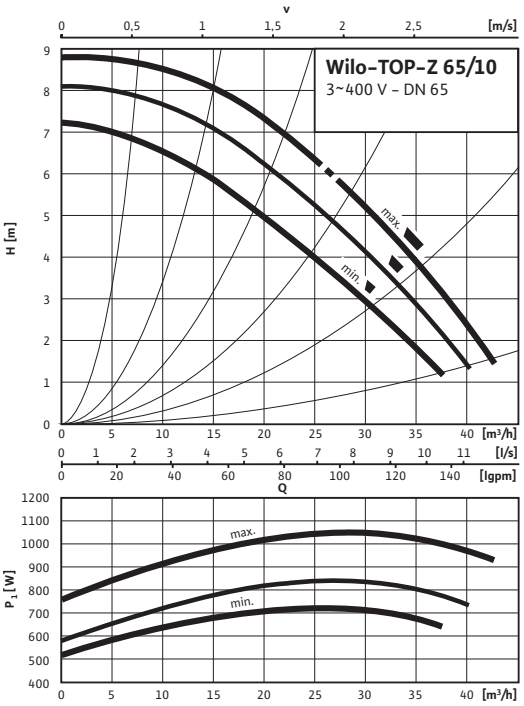
Wilo-TOP-Z 50/7

Three-phase current



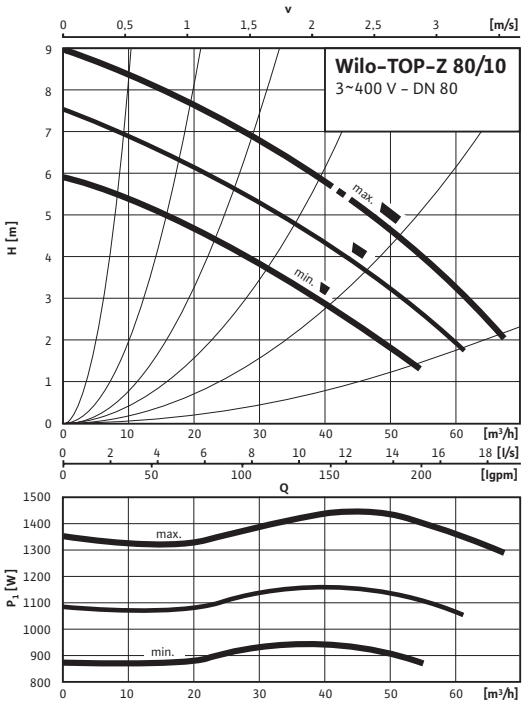
Wilo-TOP-Z 65/10

Three-phase current



Wilo-TOP-Z 80/10

Three-phase current

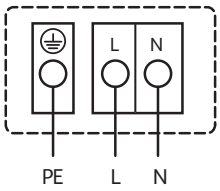


Secondary hot water circulation

Standard pumps (single pumps)

Terminal diagram, motor data Wilo-TOP-Z

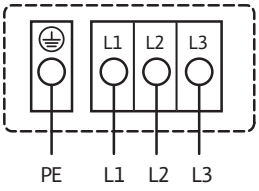
Terminal diagram A / motor protection A



Mains connection 1~230 V, 50 Hz

Internal protection against unacceptably high winding temperatures
Triggering: Internal interruption of motor voltage
Reset: Automatic after motor has cooled down

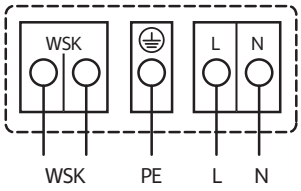
Terminal diagram B / motor protection B



Mains connection 3~400 V, 50 Hz
3~230 V, 50 Hz (with optional switching plug 3~230 V)
internal protection against unacceptably high winding temperatures

Triggering:Internal interruption of a motor phase
Reset:Disconnect mains voltage, allow motor to cool down,
switch mains voltage back on again

Terminal diagram C / motor protection C

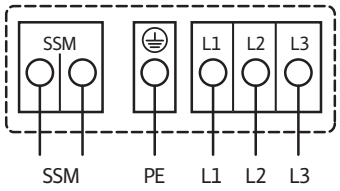


Mains connection 1~230 V, 50 Hz

WSK = thermal winding contact
Full motor protection at all speed stages with optional tripping unit
Wilo-SK 602/SK 622/Protect Module C or other switchgear/control devices with WSK connection option
Triggering: External tripping at switchgear/control device
Reset: Manual reset at switchgear/control device necessary

(Wiring diagram with SK 602/622, see "Service/Accessories")

Terminal diagram D / motor protection D



Mains connection 3~400 V, 50 Hz
3~230 V, 50 Hz (with optional switching plug 3~230 V)
Full motor protection with integrated trip electronics in terminal box for all speed stages
Resolution:All-pole shutdown of motor by integrated trip electronics
Reset: Manual reset at terminal box necessary

Load capacity of the potential-free NC contact according to VDI 3814 for the collective fault signal (SSM) 1 A, 250 V ~
Function see "Wilo-Control pump management systems, Planning guide"

Subject to change 09/2008 WILO SE

Terminal diagram, motor data Wilo-TOP-Z

Motor data

Wilo-TOP-Z ...	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Current at 1~230V	Current at 3~400V	Current at 3~230V	Capacitor	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/VDB]	–	[PG]	–
20/4 (1-phase motor)	60	max. 2790 2600 min. 2100	95 – 105 70 – 80 50 – 65	–	0.50 0.40 0.35	–	–	3.7/400	A	1x13.5	A
20/4 (3-phase motor)	60	max. 2850 2650 min. 2440	–	80 – 100 45 – 65 35 – 50	–	0.35 0.15 0.10	0.60 0.30 0.20	–	B	1x13.5	B
25/6 (1-phase motor)	100	max. 2390 1810 min. 1260	140 – 200 115 – 175 85 – 120	–	1.00 0.90 0.65	–	–	5.0/400	A	1x13.5	A
25/6 (3-phase motor)	100	max. 2450 1880 min. 1590	–	125 – 210 80 – 135 60 – 95	–	0.45 0.25 0.20	0.80 0.45 0.35	–	B	1x13.5	B
25/10 (1-phase motor)	180	max. 2800 2600 min. 2400	210 – 335 170 – 315 150 – 295	–	1.62 1.58 1.51	–	–	8.0/400	C	2x13.5	C
25/10 (3-phase motor)	180	max. – 2700 – – 2400 min. – 2000	–	175 – 310 125 – 230 100 – 175	–	0.77 0.43 0.32	1.33 0.74 0.55	–	D	2x13.5	D
30/7 (1-phase motor)	90	max. 2700 2500 min. 2100	135 – 165 100 – 145 70 – 110	–	0.80 0.72 0.56	–	–	5.0/400	A	1x13.5	A
30/7 (3-phase motor)	90	max. 2700 2350 min. 2050	–	105 – 155 70 – 105 50 – 80	–	0.42 0.21 0.15	0.72 0.37 0.26	–	B	1x13.5	B
30/10 (1-phase motor)	180	max. 2800 2600 min. 2400	210 – 335 170 – 315 150 – 295	–	1.62 1.58 1.51	–	–	8.0/400	C	2x13.5	C
30/10 (3-phase motor)	180	max. 2700 2400 min. 2000	–	175 – 310 125 – 230 100 – 175	–	0.77 0.43 0.32	1.33 0.74 0.55	–	D	2x13.5	D
40/7 (1-phase motor)	180	max. 2700 2600 min. 2400	240 – 340 200 – 330 175 – 310	–	1.62 1.60 1.54	–	–	8.0/400	C	2x13.5	C
40/7 (3-phase motor)	180	max. 2700 2600 min. 2400	–	195 – 320 145 – 240 120 – 180	–	0.70 0.44 0.32	1.22 0.76 0.55	–	D	2x13.5	D
50/7 (3-phase motor)	350	max. 2700 2300 min. 2000	–	375 – 680 280 – 520 240 – 390	–	1.38 0.92 0.69	2.38 1.60 1.19	–	D	2x13.5	D
65/10 (3-phase motor)	700	max. 2850 2700 min. 2500	–	760 – 1050 580 – 840 515 – 720	–	2.42 1.55 1.30	4.19 2.68 2.25	–	D	2x13.5	D

Secondary hot water circulation

Standard pumps (single pumps)

Terminal diagram, motor data Wilo-TOP-Z

Motor data

Wilo-TOP-Z ...	Nominal motor power	Speed	Power consumption 1~230 V	Power consumption 3~400 V	Current at 1~230V	Current at 3~400V	Current at 3~230V	Capacitor	Motor protection	Threaded cable connection	Wiring diagram
	P_2	n	P_1		I			C	–	PG	–
	[W]	[rpm]	[W]		[A]			[µF/VDB]	–	[PG]	–
80/10 (3-phase motor)	1100	max. 2800	–	1290 – 1440	–	2.92	5.06	-	D	2x13.5	D
		2500		1055 – 1155		2.06	3.56				
		min. 2200		865 – 940		1.68	2.91				
80/10 (3-phase motor)	1100	max. 2800	–	1290 – 1440	–	2.92	5.06	-	D	2x13.5	D
		2500		1055 – 1155		2.06	3.56				
		min. 2200		865 – 940		1.68	2.91				

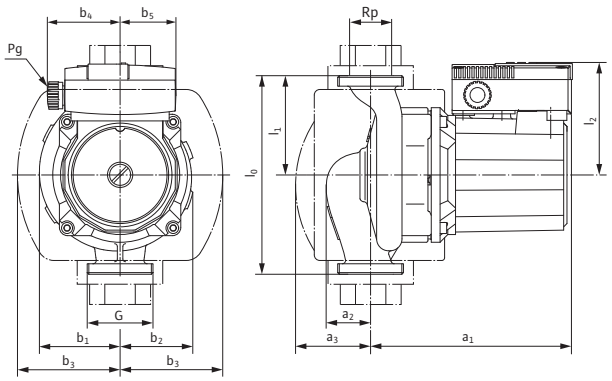
Observe name plate data!
Current I: Motor protection switch onsite setting

Note:
3~230 V only with optional switching plug (accessory)

Subject to change 09/2008 WILO SE

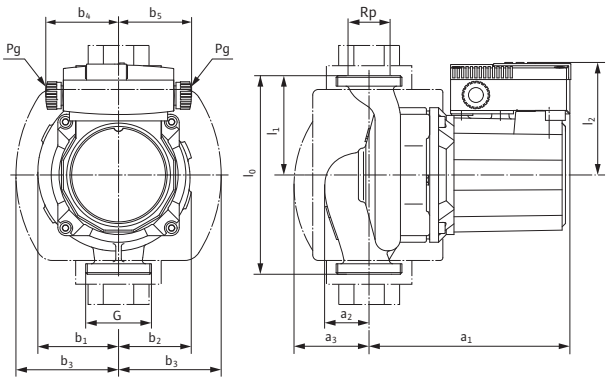
Dimensions, weights Wilo-TOP-Z

Dimension drawing A



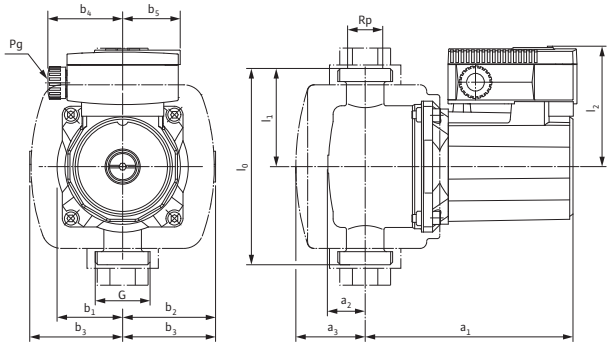
Permitted installation positions, see Planning guide

Dimension drawing B



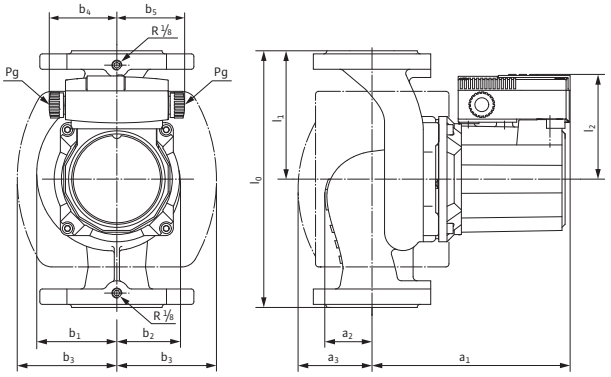
Permitted installation positions, see Planning guide

Dimension drawing C



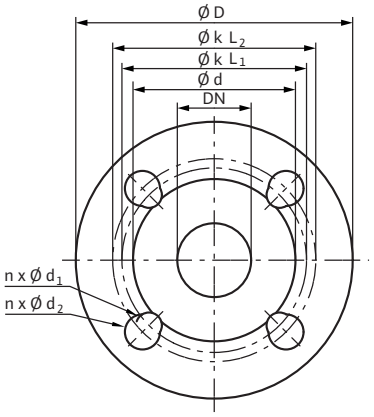
Permitted installation positions, see Planning guide

Dimension drawing D

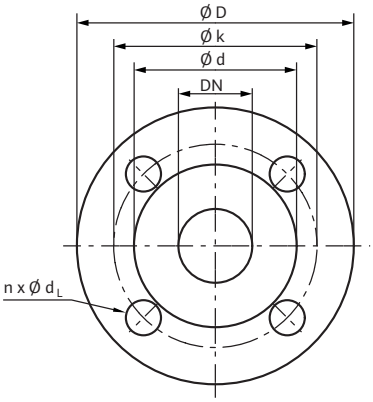


Permitted installation positions, see Planning guide

Dimension drawing Flange A



Dimension drawing Flange B



Dimensions, weights Wilo-TOP-Z

Dimensions, weights

Wilo-TOP-Z ...	Pipe connection	Nominal flange diameter	Thread	Dimensions							Weight approx.	Dimension drawing
	Rp	DN	G	l_0	a_1	a_2	l_1	b_1	b_2	b_3	M	–
	–			[mm]							[kg]	–
20/4	¾	–	1¼	150	162	30	75	50	50	–	3.0	C
25/6	1	–	1½	180	162	30	90	50	50	–	3.0	C
25/10	1	–	1½	180	172	45	90	69	68	92	6.7	B
30/7	1¼	–	2	180	172	34	90	66	57	88	5.5	A
30/10	1¼	–	2	180	171.5	52	90	68.5	61	92	6.7	B
40/7	-	40	–	250	193	46	125	78	62	97	13.0	D
50/7	-	50	–	280	224	65	140	91	77	119	16.0	D
65/10	-	65	–	340	253	80	170	118	98	136	25.5	D
80/10	-	80	–	360	258	95	180	135	108	159	28.0	D

Flange dimensions

Wilo-TOP-Z ...	Flange	Nominal flange diameter	Pump flange dimensions						Dimension drawing, flange
	–	DN	Ø D	Ø d	Ø k_{L1}/k_{L2}	Ø k	n x Ø d_{L1}/Ø d_{L2}	n x Ø d_L	–
	–		[mm]				[pcs. x mm]		–
40/7	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	40	150	88	100/110	–	4 x 14 / 19	-	A
50/7	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	50	165	102	100/125	–	4 x 14 / 19	-	A
65/10	Combination flange PN6/10 (PN 16 flange according to EN 1092-2)	65	185	122	130/145	–	4 x 14 / 19	-	A
80/10	Flange PN 6 (PN 16 design, according to EN 1092-2)	80	190	128	-	150	-	4 x 19	B
80/10	Flange PN16 (according to EN 1092-2)	80	200	138	-	160	-	8 x 19	B

n = number of drilled holes

Series description Wilo-VeroLine-IP-Z



Design
Glanded circulation pump in in-line design with threaded connection

Application
For pumping potable water, cold and hot water (in accordance with VDI 2035) without abrasive substances, in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**Wilo-Veroline-IP-Z 25/6**
IP	In-line pump (screw-end pump)
-Z	Circulation pump
25/	Nominal connection diameter R/Rp
6	Power capacity in approximation to the maximum delivery head [m]

Technical data
- Permissible temperature range
  - Potable water up to 28 °dH: max. +65 °C, In short-term operation (2 h) up to +110 °C
  - Heating water: -8 °C to +110 °C
- Mains connection 1~230 V, 50 Hz 3~400 V, 50 Hz
- Protection class IP 44 motor, IP 54 terminal box
- Nominal diameter Rp 1
- Max. operating pressure 10 bar

Special features/product benefits
- High resistance to corrosive media, due to stainless steel housing and Noryl impeller
- Wide range of applications due to suitability for water with hardness values up to 28°dH
- All plastic parts that come into contact with the fluid fulfil KTW recommendations

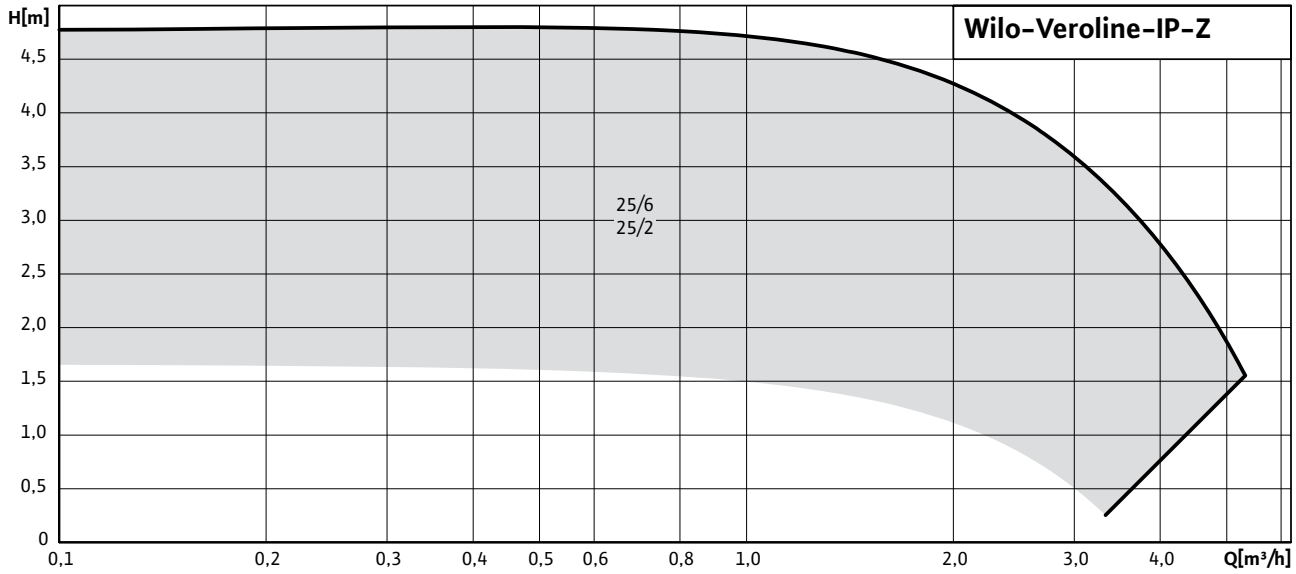
Materials
- Pump housing and lantern: 1.4306
- Impeller: Noryl
- Shaft: 1.4571
- Mechanical seal: Ceramic/graphite/EPDM

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Threaded connection
- Motor with one-piece shaft

Secondary hot water circulation

Single pumps (secondary hot water circulation)

Series description Wilo-VeroLine-IP-Z



Subject to change 09/2008 WILO SE

Technical data Wilo-VeroLine-IP-Z

	Wilo- VeroLine-IP-Z
Approved fluids (other fluids on request)	
Heating water (in accordance with VDI 2035)	•
Water-glycol mixtures (for 20-40 vol.% glycol and fluid temperature ≤ 40 °C)	•
Cooling and cold water	•
Hot water	–
Heat transfer oil	–
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	•
Permitted field of application	
Standard version for operating pressure, p_{max} [bar]	10
Temperature range [°C]	-8 to +110
Max. ambient temperature [°C]	40
Installation in closed buildings	•
Outdoor installation	Special version at additional charge
Pipe connections	
Threaded connection	G1 $^1/_2$
Flange connection (counter flanges, seals and screws included in the scope of delivery)	–
Flange version	PN10
Nominal connection diameters DN	–
Flange with pressure-measurement connections	–
Materials	
Pump housing	1.4306
Lantern	1.4306
Impeller (standard)	Noryl
Pump shaft	1.4571
Mechanical seal	Ceramic/graphite/EPDM
Other mechanical seals	on request
Electrical connection	
Mains connection	1~230 V, 50 Hz 3~400 V, 50 Hz
Speed range [rpm]	1450/2900
Motor/electronics	
Integrated full motor protection	–
Protection class	IP 44
Terminal box protection class	IP 54
Insulation class	F

Secondary hot water circulation

Standard pumps (single pumps)

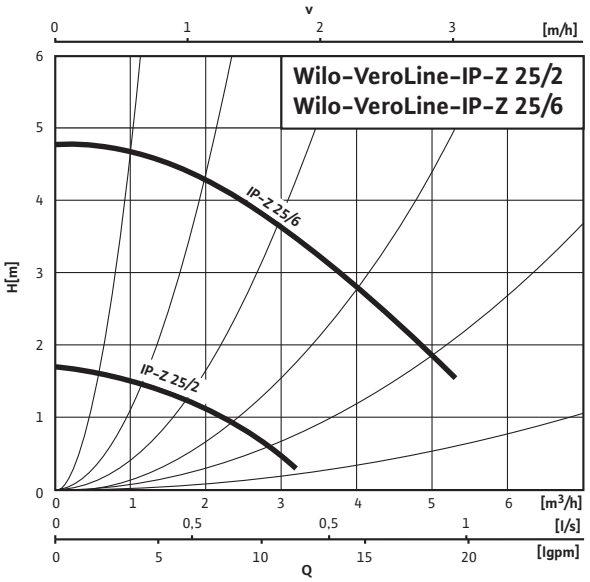
Technical data Wilo-VeroLine-IP-Z

	Wilo- VeroLine-IP-Z
Motor protection required onsite	•
Speed control	–
Motor winding up to 3 kW	230 V Δ/400 V Y, 50 Hz
Motor winding from 4 kW	–
Installation options	
Pipe installation (≤ 15 kW motor power)	•
Support-bracket mounting	–

• = available, – = not available

Pump curves Wilo-VeroLine-IP-Z

Wilo-VeroLine-IP-Z 25/2 – 25/6



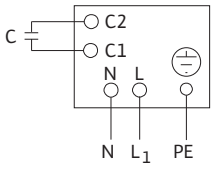
Secondary hot water circulation

Standard pumps (single pumps)

Terminal diagram, motor data Wilo-VeroLine-IP-Z

Terminal diagram A

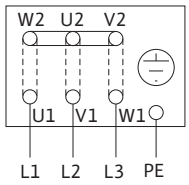
With attached capacitor



Single-phase motor 1~230 V, 50 Hz

Terminal diagram B

continuous line = Y
dashed line = Δ
3~400 V Y
3~230 V Δ



Three-phase motor 3~230/400 V, 50 Hz

Motor data

Wilo-VeroLine-IP-Z ...	Mains connection	Nominal motor power	Nominal current approx.			Capacity	Speed	Wiring diagram
	–	P_2	I_N1~230 V	I_N3~230 V	I_N3~400 V	C	V	–
	–	[kW]	[A]			[µF]	[rpm]	–
25/2	1~230 V	0.1	1.1	–	–	4.0	1450	A
25/2	3~400 V	0.09	–	0.5	0.29	–	1460	B
25/6	1~230 V	0.18	1.15	–	–	8.0	2750	A
25/6	3~400 V	0.12	–	0.66	0.38	–	2750	B

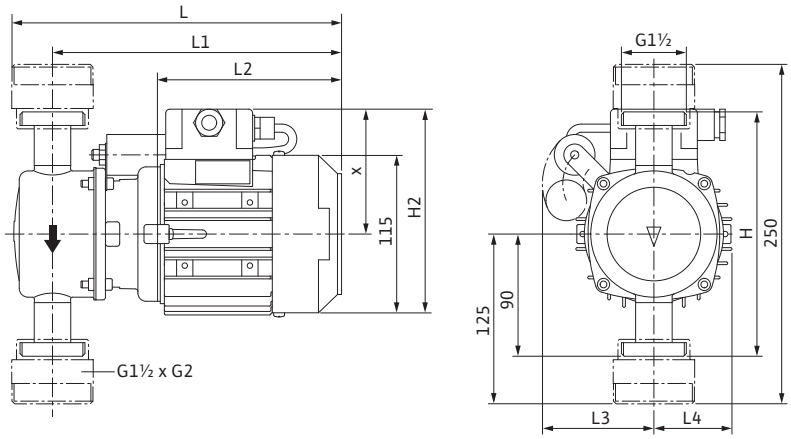
Observe motor name plate data

Subject to change 09/2008 WILO SE

Dimensions, weights Wilo-VeroLine-IP-Z

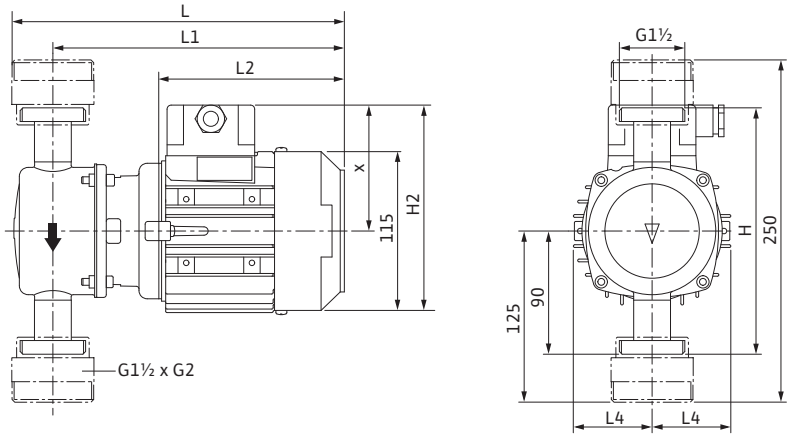
Dimension drawing A

1~230 V



Dimension drawing B

3~230/400 V



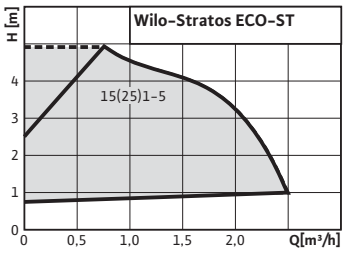
Dimensions, weights

Wilo-VeroLine-IP-Z ...	Mains connection	Nominal flange diameter	Dimensions								Weight approx.	Dimension drawing
	–	DN	H	H_2	L	L_1	L_2	L_3	L_4	X	M	–
	–		[mm]								[kg]	–
25/2	1~230 V	25	180	148	241	213	136	82	58	92	5.5	A
25/2	3~400 V	25	180	148	241	213	136	–	58	92	4.5	B
25/6	1~230 V	25	180	148	241	213	136	82	58	92	5.5	A
25/6	3~400 V	25	180	148	241	213	136	–	58	92	4.5	B

Series overview Wilo-Stratos ECO-ST

Series: Wilo-Stratos ECO-ST





> Design
Glandless circulation pump with threaded connection, EC motor and automatic output adjustment

> Application
Circulation in solar heating systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Stratos ECO-ST

Series: Wilo-Stratos ECO-ST

> Special features/product benefits
- Class A motor technology
- Up to 80% electricity savings compared to circulation pumps without speed control
- Maximum efficiency due to ECM technology
- Min. electrical power consumption: only 5.8 W
- Three times higher starting torque than conventional circulation pumps
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- BA connection: For connection to external monitoring units (e.g. building automation BA or DDC installations)

> More information **Page**

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- Equipment/function 322
- Series description 324
- Technical data 326
- Pump curves 328
- Terminal diagrams, motor data 329
- Dimensions, weights 330
- Service/accessories 351

Equipment/function Wilo-Stratos ECO-ST

	Wilo-Stratos ECO-ST
Operating modes	
Speed-stage switching	–
Manual control mode (n=constant)	•
Δp-c for constant differential pressure	•
Δp-v for variable differential pressure	•
Δp-T for temperature-controlled differential pressure	–
Manual functions	
Operating mode setting	•
Differential-pressure setpoint setting	•
Autopilot	•
Pump ON/OFF setting	–
Speed setting (manual control mode)	•
Setting the speed stages	–
Automatic functions	
Infinitely variable power adjustment according to the operating mode	•
Autopilot	•
Deblocking function	•
Soft start	•
Safety control	•
Full motor protection with integrated trip electronics	–
External control functions	
Overriding Off	•
Overriding Min	–
Analogue In 0 ... 10 V	•
Analogue In 0 ... 10 V	•
Signal and display functions	
Single/collective fault signal (potential-free NC contact)	–
Collective fault signal (potential-free NC contact)	•
Individual run signal (potential-free NO contact)	–
Thermal winding contact (WSK, potential-free NC contact)	–
Fault signal light	•
Direction-of-rotation control light	–
LC display for indication of pump data and fault codes	–

Equipment/function Wilo-Stratos ECO-ST

	Wilo-Stratos ECO-ST
Data exchange	
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–
Serial digital LON interface for connection to a LONWORKS network	–
Serial digital CAN interface for connection to a CAN bus system	-
Dual pump management (double pump or 2 x single pump)	
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–
Parallel operation (efficiency-optimised peak-load cut-in and out)	–
Equipment/scope of delivery	
Wrench attachment point on pump body	•
Twin switch-over valve in pump housing	–
Cable lead-in possible on both sides	•
Wilo quick connection with spring clips	•
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–
Plug-in position for optional extension with Wilo-IF-Modules	–
Blocking current-proof motor	•
Including seals for threaded connection (loose)	•
Including installation and operating instructions	•
Including thermal insulation	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–
Including 1.8 m connecting cable with shock-proof plug	–
Integrated non-return valve	–
Integrated ball shut-off valve	–
Including clock timer	–
Particle filter	•

• = available, - = not available

Series description Wilo-Stratos ECO-ST



Design
Glandless circulation pump with threaded connection, EC motor and automatic output adjustment

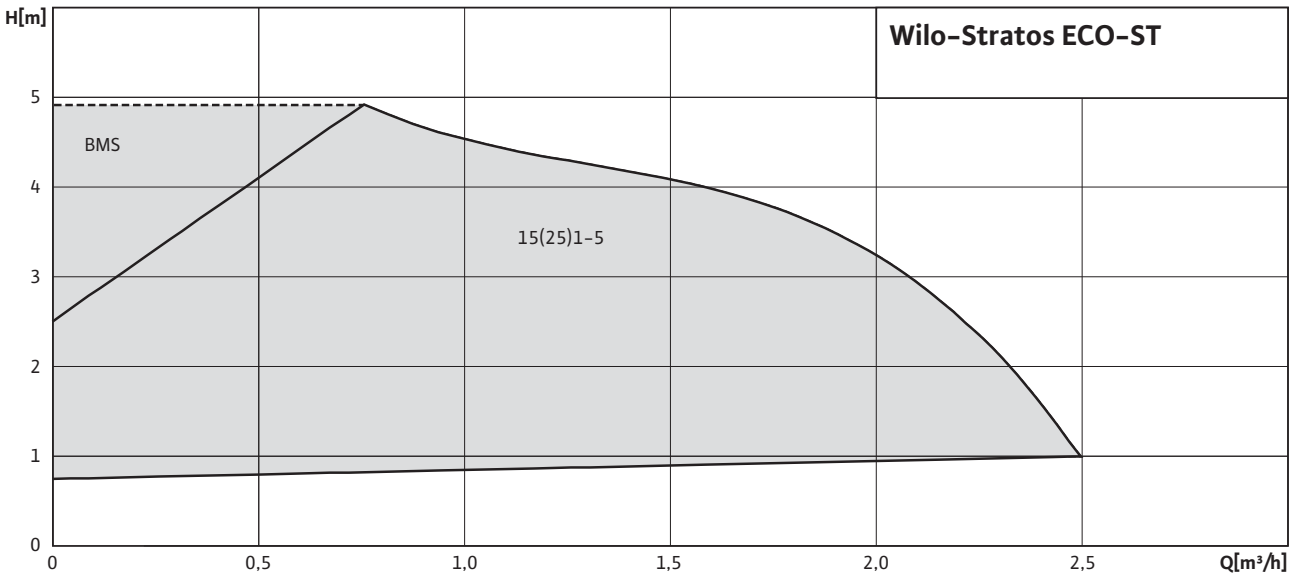
Application
Circulation in solar heating systems

Type key

Example:	**Wilo-Stratos ECO-ST 25/1-5**
Stratos ECO	High-efficiency pump
-ST	Version for solar heating applications
25/	Nominal connection diameter
1-5	Nominal delivery head range [m]

Options
- Stratos ECO-ST ...-130: Version with short over-all length of 130 mm
- Stratos ECO-ST ...-RG: Version with red brass housing

Special features/product benefits
- Class A motor technology
- Up to 80% electricity savings compared to circulation pumps without speed control
- Maximum efficiency due to ECM technology
- Min. electrical power consumption: only 5.8 W
- Three times higher starting torque than conventional circulation pumps
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation
- BA connection: For connection to external monitoring units (e.g. building automation BA or DDC installations)



Subject to change 09/2008 WILO SE

Series description Wilo-Stratos ECO-ST

Equipment/function

Operating modes
- Manual control mode (n=constant)
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure

Manual functions
- Operating mode setting
- Differential-pressure setpoint setting
- "Autopilot" (automatic setback operation) setting
- Speed setting (manual control mode)

Automatic functions
- Infinitely variable power adjustment according to the operating mode
- "Autopilot" automatic setback operation
- Deblocking function
- Soft start
- Safety control

External control functions
- "Overriding Off" control input
- "Analogue In 0 – 10 V" control input (remote speed adjustment)
- "Analogue In 0 – 10 V" control input (remote setpoint adjustment)

Signal and display functions
- Collective fault signal (potential-free NC contact)
- Fault signal light

Equipment
- Wrench attachment point on pump body
- Cable lead-in possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Pump
- Seals
- Installation and operating instructions

Accessories
- Screwed connections

Technical data Wilo-Stratos ECO-ST

	Wilo-Stratos ECO-ST ...		
	15/1-5-130	**25/1-5**	**25/1-5-RG**
Approved fluids (other fluids on request)			
Heating water (in accordance with VDI 2035)	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–
Output			
Delivery head max. [m]	5.0	5.0	5.0
Max. volume flow [m^3/h]	2.5	2.5	2.5
Permitted field of application			
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	• + 15 to + 110		
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• + 15 to + 95		
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	–		
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C in short-term operation 2 h [°C]	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-
Standard version for operating pressure, p_{max}	10	10	10
Special version for operating pressure, p_{max}	-	-	-
Pipe connections			
Screwed connection Rp	½	1	1
Nominal flange diameter DN	15	25	25
Flange for counter flange PN 6, standard version	–	–	–
Flange for counter flange PN 16, special version	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–
Electrical connection			
Mains connection 1 ~ [V], standard version	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–
Mains frequency	50	50	50

Technical data Wilo-Stratos ECO-ST

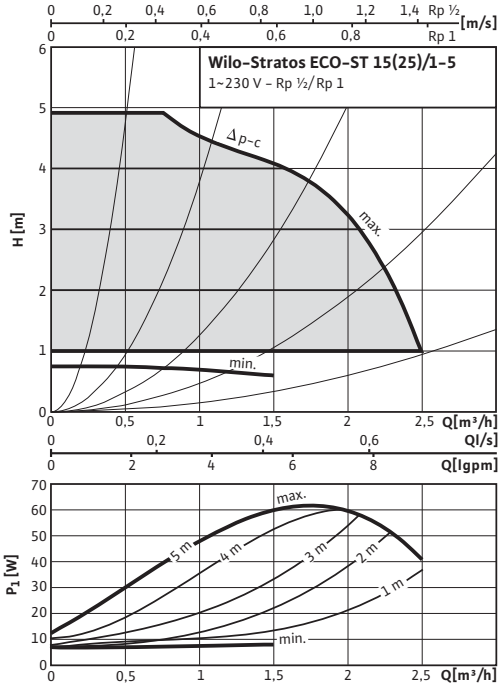
	Wilo-Stratos ECO-ST ...		
	15/1-5-130	**25/1-5**	**25/1-5-RG**
Motor/electronics			
Electromagnetic compatibility	EN 61800-3		
Emitted interference	EN 61000-6-3		
Interference resistance	EN 61000-6-2		
Power electronics	Pulse package control		
Protection class	IP 44	IP 44	IP 44
Insulation class	F	F	F
Materials			
Pump housing	Grey cast iron (EN-GJL-200)		Red brass (CC 499K) according to DIN EN 1982 and according to TrinkwV2001 (drinking water ordinance)
Impeller	Plastic (PP - 40% GF)		
Pump shaft	Stainless steel		
Bearing	Carbon, metal impregnated		
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature			
Minimum suction head at 50°C	1	1	1
Minimum suction head at 95°C	3	3	3
Minimum suction head at 110°C	10	10	10

• = available, – = not available

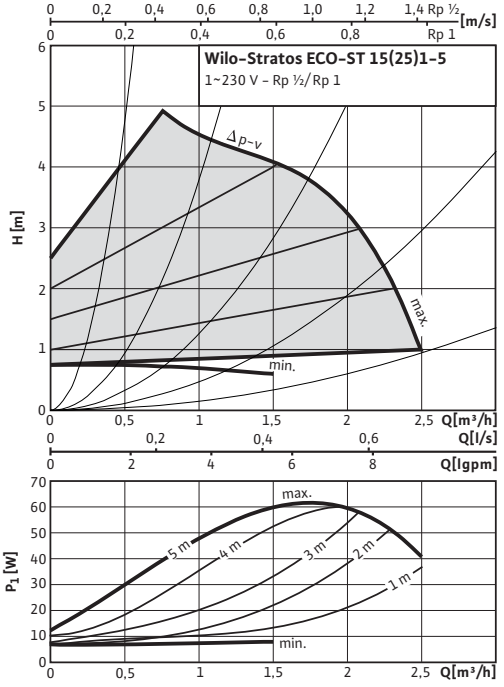
Pump curves Wilo-Stratos ECO-ST

Wilo-Stratos ECO-ST 15/1-5, 25/1-5

Δp-c (constant)

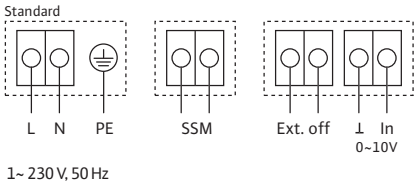


Δp-v (variable)



Terminal diagram, motor data Wilo-Stratos ECO-ST

Terminal diagram



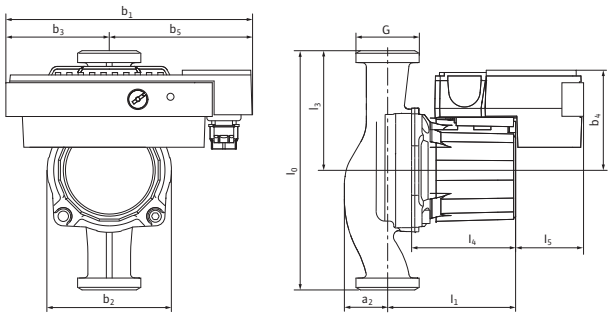
Single-phase motor, 2-pole, 1~230 V, 50 Hz

Motor data

Wilo-Stratos ECO-ST ...	Speed range	Power consumption	Max. current	Motor protection	Threaded cable connection
	–	P_1	I	–	PG
	[rpm]	[W]	[A]	–	[PG]
15/1-5-130	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x7/1x9/1x11
25/1-5	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x7/1x9/1x11
25/1-5-RG	1400 - 3500	5.8 - 59	0.46	not required (blocking current-proof)	1x7/1x9/1x11

Dimensions, weights Wilo-Stratos ECO-ST

Dimension drawing



Dimensions, weights

Wilo-Stratos ECO-ST ...	Pipe connection	Thread	Dimensions												Weight approx.
	Rp	G	l_0	l_1	l_3	l_4	l_5	A	a_2	b_1	b_2	b_3	b_4	b_5	M
	–		[mm]												[kg]
15/1-5-130	½	1	130	96	65	78	55	34	32.5	185.5	93.5	107.5	75	78.0	2.6
25/1-5	1	1½	180	96	90	78	55	34	32.5	185.5	93.5	107.5	75	78.0	2.9
25/1-5-RG	1	1½	180	96	90	78	55	34	32.5	185.5	93.5	107.5	75	78.0	3.0



The Wilo factory customer service technicians are partners who are there for you with their practical support in all of Germany 365 days a year. Your personal contact partner on site offers you all conceivable support. This local service works so well thanks to our unparalleled organisational structure. Everything comes together in our factory-owned Wilo Service Centre. Based on this, every service call is coordinated perfectly via your personal control centre, and the Wilo customer service technician will be on site to give optimum support with a lot of useful information.
Exemplary? We call this Pumpen Intelligenz.

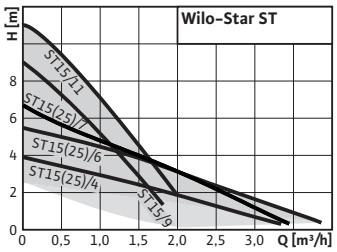
www.wilo.com

WILO
Pumpen Intelligenz.

Series overview Wilo-Star-ST, Star-RSG

Series: Wilo-Star-ST



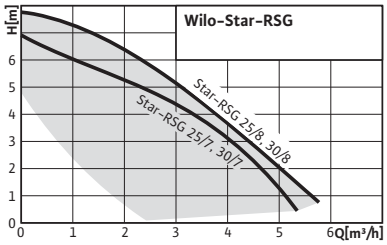


> Design
Glandless circulation pump with threaded connection. Preselectable speed stages for power adjustment

> Application
High-flow and low-flow solar thermal systems

Series: Wilo-Star-RSG





> Design
Glandless circulation pump with screwed connection. Pre-selectable speed stages for power adjustment

> Application
Geothermal systems, heating systems

Subject to change 09/2008 WILO SE

Series overview Wilo-Star-ST, Star-RSG

Series: Wilo-Star-ST

> Special features/product benefits
- Special hydraulics for applications in solar thermal systems
- Up to 30% less current consumption due to class B motor technology
- Pump housing with wrench attachment point
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation

> More information **Page**
- Planning guide 8
- Equipment/function 334
- Series description 336
- Technical data 338
- Pump curves 340
- Terminal diagrams, motor data 342
- Dimensions, weights 343

Series: Wilo-Star-RSG

> Special features/product benefits
- Special hydraulics for utilisation in geothermal systems
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion from condensation formation

> More information **Page**
- Planning guide 8
- Equipment/function 334
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- Pump curves 348
- Terminal diagrams, motor data 349
- Dimensions, weights 350

Equipment/function Wilo-Star-ST, Star-RSG

	Wilo-Star-ST ...	Wilo-Star-RSG ...
Operating modes		
Speed-stage switching	•	•
Manual control mode (n=constant)	–	–
Δp-c for constant differential pressure	–	–
Δp-v for variable differential pressure	–	–
Δp-T for temperature-controlled differential pressure	–	–
Manual functions		
Operating mode setting	–	–
Differential-pressure setpoint setting	–	–
Autopilot	–	–
Pump ON/OFF setting	–	–
Speed setting (manual control mode)	–	–
Setting the speed stages	3	3
Automatic functions		
Infinitely variable power adjustment according to the operating mode	–	–
Autopilot	–	–
Deblocking function	–	–
Soft start	–	–
Safety control	–	–
Full motor protection with integrated trip electronics	–	–
External control functions		
Overriding Off	–	–
Overriding Min	–	–
Analogue In 0 ... 10 V	–	–
Analogue In 0 ... 10 V	–	–
Signal and display functions		
Single/collective fault signal (potential-free NC contact)	–	–
Collective fault signal (potential-free NC contact)	–	–
Individual run signal (potential-free NO contact)	–	–
Thermal winding contact (WSK, potential-free NC contact)	–	–
Fault signal light	–	–
Direction-of-rotation control light	–	–
LC display for indication of pump data and fault codes	–	–

Equipment/function Wilo-Star-ST, Star-RSG

	Wilo-Star-ST ...	Wilo-Star-RSG ...
Data exchange		
Infrared interface for wireless data exchange with IR-Module/IR-Monitor (see IR-Module/IR-Monitor function table)	–	–
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	–	–
Serial digital LON interface for connection to a LONWORKS network	–	–
Serial digital CAN interface for connection to a CAN bus system		
Dual pump management (double pump or 2 x single pump)		
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	–
Parallel operation (efficiency-optimised peak-load cut-in and out)	–	–
Equipment/scope of delivery		
Wrench attachment point on pump body	• (only for nominal diameter DN 25)	• (only for nominal diameter DN 25)
Twin switch-over valve in pump housing	–	–
Cable lead-in possible on both sides	•	•
Wilo quick connection with spring clips	•	•
Built-in air extraction fitting for automatic rapid ventilation Rp $^3/_8$	–	–
Plug-in position for optional extension with Wilo-IF-Modules	–	–
Blocking current-proof motor	•	•
Including seals for threaded connection (loose)	•	•
Including installation and operating instructions	•	•
Including thermal insulation	–	–
Incl. washers for flange screws (for nominal connection diameters DN 32 – DN 65)	–	–
Including 1.8 m connecting cable with shock-proof plug	–	–
Integrated non-return valve	–	–
Integrated ball shut-off valve	–	–
Including clock timer	–	–

• = available, – = not available

Solar thermal, geothermal energy systems

Standard pumps (single pumps)

Series description Wilo-Star-ST



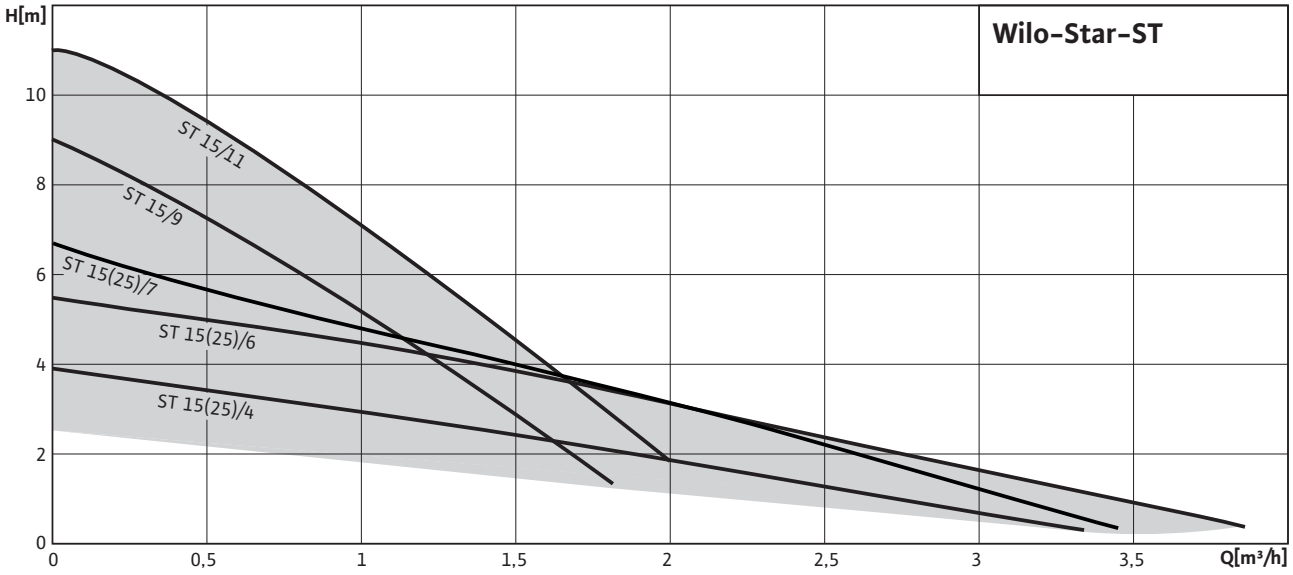
Design
Glandless circulation pump with threaded connection. Preselectable speed stages for power adjustment

Application
High-flow and low-flow solar thermal systems

Special features/product benefits
- Special hydraulics for applications in solar thermal systems
- Up to 30% less current consumption due to class B motor technology
- Pump housing with wrench attachment point
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion by condensation formation

Type key

Example:	Star-ST 25/6
Star ST	Standard pump for solar thermal systems
25	Nominal diameter R1
6	Max. delivery head in m



Subject to change 09/2008 WILO SE

Series description Wilo-Star-ST

Equipment/function

Operating modes
- Speed-stage switching

Manual functions
- Setting the speed stages: 3 speed stages

Equipment
- Wrench attachment point on pump body (only for nominal diameter DN 25)
- Cable lead-in possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Pump
- Seal
- Installation and operating instructions

Technical data Wilo-Star-ST

	Wilo-Star-ST ...							
	15/4	**15/6**	**15/7**	**15/9**	**15/11**	**25/4**	**25/6**	**25/7**
Approved fluids (other fluids on request)								
Heating water (in accordance with VDI 2035)	•	•	•	•	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–	–	–	–	–
Output								
Delivery head max. [m]	4	5.5	7	10	12	4	5.5	7
Max. volume flow [m^3/h]	3.5	4	4	2	2	3.5	4	4
Permitted field of application								
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–							
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• -10 up to +110 (in short-time operation 2 h: +120)							
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	– –	– –	– –	– –	– –	– –	– –	– –
Maximum permissible total hardness in secondary hot water circulation systems [°d]	–	–	–	–	–	–	–	–
Standard version for operating pressure, p_{max}	10	10	10	10	10	10	10	10
Special version for operating pressure, p_{max}	–	–	–	–	–	–	–	–
Pipe connections								
Screwed connection Rp	½	½	½	½	½	1	1	1
Flange for counter flange PN 6, standard version	–	–	–	–	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–	–	–	–	–
Electrical connection								
Mains connection 1 ~ [V], standard version	230	230	230	230	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–	–	–	–	–
Mains frequency	50	50	50	50	50	50	50	50

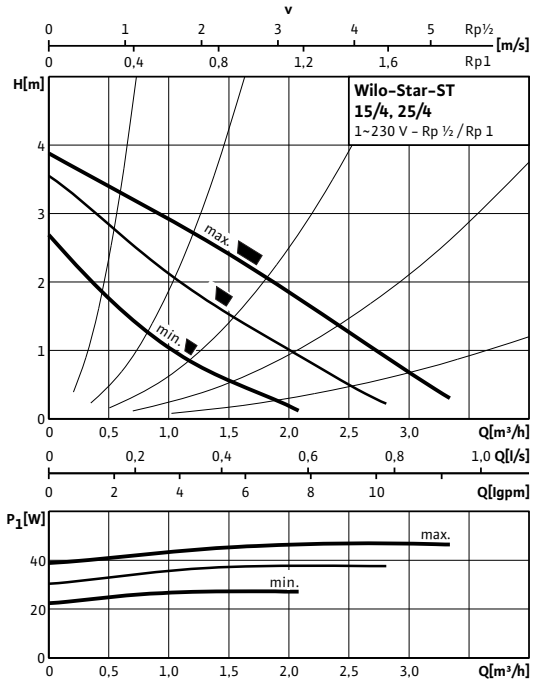
Technical data Wilo-Star-ST

	Wilo-Star-ST ...							
	15/4	**15/6**	**15/7**	**15/9**	**15/11**	**25/4**	**25/6**	**25/7**
Motor/electronics								
Electromagnetic compatibility	EN 61800-3							
Emitted interference	EN 61000-6-3							
Interference resistance	EN 61000-6-2							
Power electronics	–	–	–	–	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F	F	F	F	F
Materials								
Pump housing	Grey cast iron (EN-GJL-200)							
Impeller	Polypropylene							
Pump shaft	Stainless steel (X40Cr13)							
Bearing	Carbon							
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature								
Minimum suction head at 50°C	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	3	3	3	3	3	3	3	3
Minimum suction head at 110°C	10	10	10	10	10	10	10	10

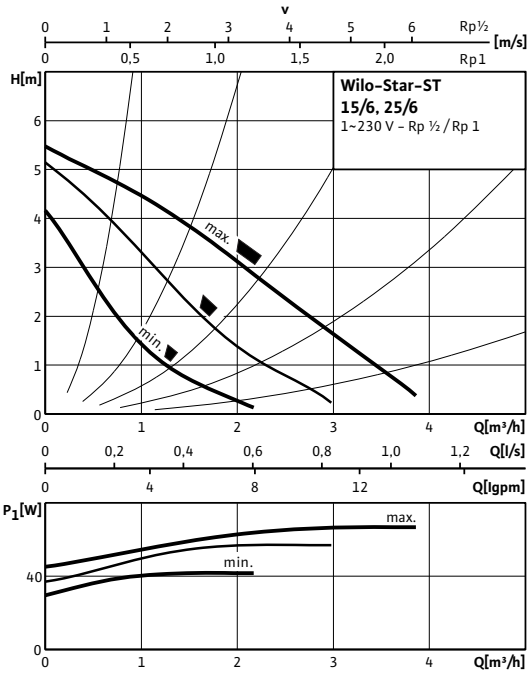
• = available, – = not available

Pump curves Wilo-Star-ST

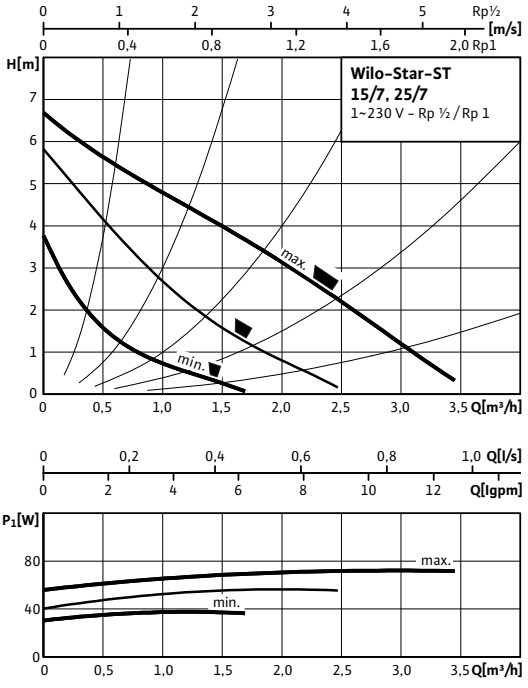
Wilo-Star-ST 15/4, 25/4



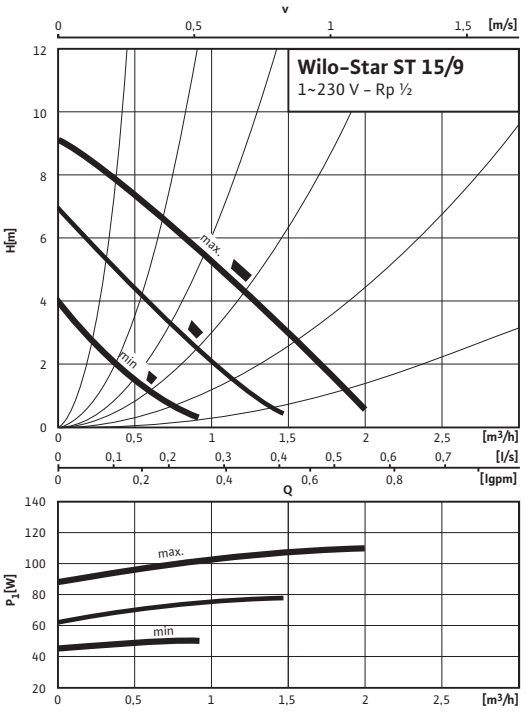
Wilo-Star-ST 15/6, 25/6



Wilo-Star-ST 15/7, 25/7

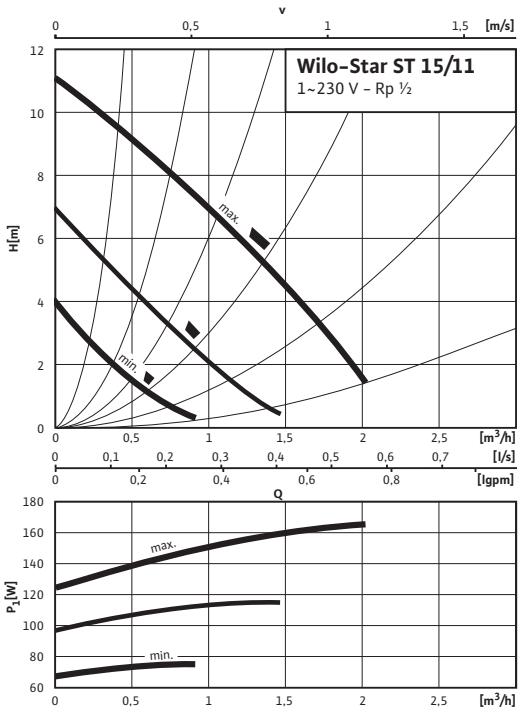


Wilo-Star-ST 15/9



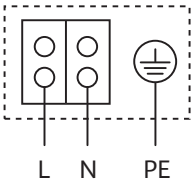
Pump curves Wilo-Star-ST

Wilo-Star-ST 15/11



Terminal diagram, motor data Wilo-Star-ST

Terminal diagram



Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

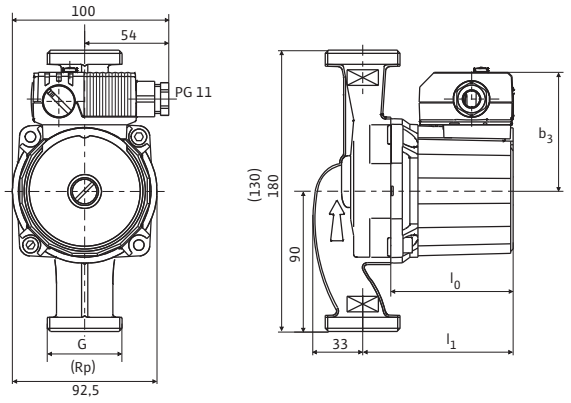
Motor data

Wilo-Star-ST ...	Nominal motor power	Speed	Power consumption	Max. current	Capacitor	Threaded cable connection	Motor protection
	P_2	n	P_1	I	C	PG	–
	[W]	[rpm]	[W]	[A]	[µF/VDB]	[PG]	–
15/4	15.5	max. 2720	48	0.21	1.7/400	1x11	not required (blocking current-proof)
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
15/6	24	max. 2750	63	0.28	2.0/400	1x11	not required (blocking current-proof)
	16.5	2650	54	0.23			
	9.5	min. 2350	41	0.18			
15/7	29	max. 2707	70	0.30	3.5/400	1x11	not required (blocking current-proof)
	16	2604	52	0.24			
	8.5	min. 2170	35	0.16			
15/9	39.5	max. 2535	110	0.50	3.0/400	1x11	not required (blocking current-proof)
	23	2122	78	0.34			
	13	min. 1564	50	0.23			
15/11	57	max. 2481	165	0.72	3.5/400	1x11	not required (blocking current-proof)
	29.5	1999	115	0.52			
	13.5	min. 1448	75	0.32			
25/4	15.5	max. 2720	48	0.21	1.7/400	1x11	not required (blocking current-proof)
	9.5	2630	38	0.17			
	5.5	min. 2350	28	0.13			
25/6	24	max. 2750	63	0.28	2.0/400	1x11	not required (blocking current-proof)
	16.5	2650	54	0.23			
	9.5	min. 2350	41	0.18			
25/7	29	max. 2707	70	0.30	3.5/400	1x11	not required (blocking current-proof)
	16	2604	52	0.24			
	8.5	min. 2170	35	0.16			

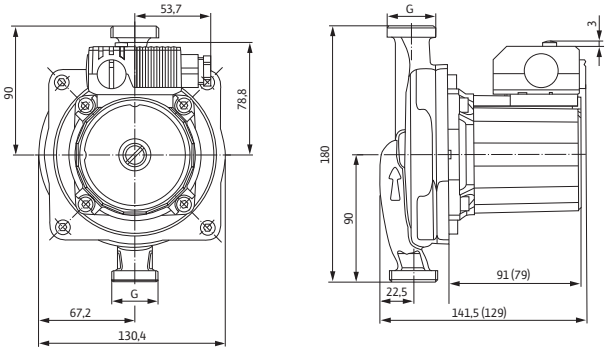
Observe name plate data!

Dimensions, weights Wilo-Star-ST

Dimension drawing A



Dimension drawing B



Dimensions, weights

Wilo-Star-ST ...	Screwed connection	Thread	Overall length	Dimensions		Weight approx.	Dimension drawing
	Rp	G	l_0	l_1	b_3	M	–
	–		[mm]			[kg]	–
15/4	½	1	130	96	58	2.3	A
15/6	½	1	130	97	54	2.5	A
15/7	½	1	130	96	54	2.9	A
15/9	½	1¼	180	105	54	3.6	B
15/11	½	1¼	180	118	54	4.0	B
25/4	1	1½	180	96	58	2.3	A
25/6	1	1½	180	96	58	2.5	A
25/7	1	1½	180	96	54	2.9	A

Series description Wilo-Star-RSG



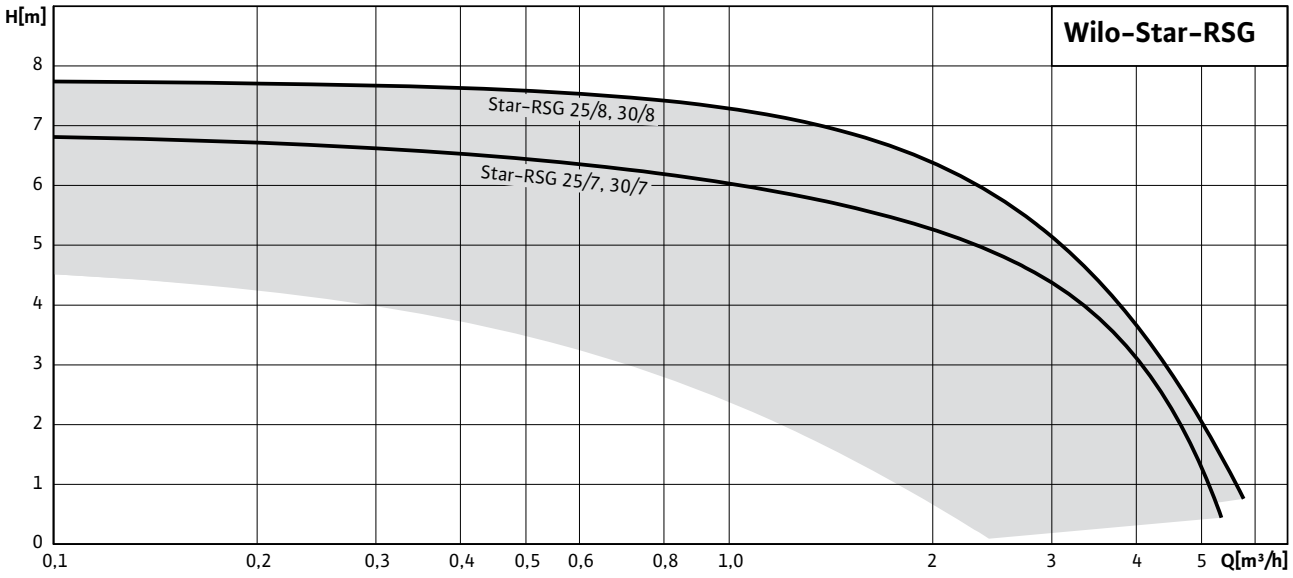
Design
Glandless circulation pump with screwed connection. Pre-selectable speed stages for power adjustment

Application
Geothermal systems, heating systems

Special features/product benefits
- Special hydraulics for utilisation in geothermal systems
- Pump housing with cataphoretic (KTL) coating for the prevention of corrosion from condensation formation

Type key

Example:	**Wilo-Star-RSG 25/7**
Star	Standard pump (screw-end pump)
-RSG	Version for geothermal systems
25 /	Nominal connection width
7	Nominal delivery head [m]



Subject to change 09/2008 WILO SE

Series description Wilo-Star-RSG

Equipment/function

Operating modes
- Speed-stage switching

Equipment
- Spanner grip on the pump body (only with nominal diameter DN 25)
- Cable entry possible on both sides
- Quick connection with spring clips
- Blocking current-proof motor

Scope of delivery
- Pump
- Seals
- Installation and operating instructions

Accessories
- Screwed connections
- Thermal insulation shells

Technical data Wilo-Star-RSG

	Wilo-Star-RSG ...			
	25/7	**25/8**	**30/7**	**30/8**
Approved fluids (other fluids on request)				
Heating water (in accordance with VDI 2035)	•	•	•	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	•	•	•	•
Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)	–	–	–	–
Output				
Delivery head max. [m]	7	8	7	8
Max. volume flow [m^3/h]	5	5.5	5	5.5
Permitted field of application				
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +25 °C [°C]	–			
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• - 10 to + 110			
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature of +40 °C [°C]	-	-	-	-
Maximum permissible total hardness in secondary hot water circulation systems [°d]	-	-	-	-
Standard version for operating pressure, p_{max}	10	10	10	10
Special version for operating pressure, p_{max}	-	-	-	-
Pipe connections				
Screwed connection Rp	1	1	1¼	1¼
Flange for counter flange PN 6, standard version	–	–	–	–
Flange for counter flange PN 16, special version	–	–	–	–
Combination flange PN 6/10 for counter flanges PN 6 and PN 16, standard version	–	–	–	–
Support-bracket mounting (with horizontal shaft only), standard version	–	–	–	–
Support-bracket mounting (with horizontal shaft only), special version	–	–	–	–
Electrical connection				
Mains connection 1 ~ [V], standard version	230	230	230	230
Mains connection 3 ~ [V], standard version	–	–	–	–
Mains connection 3 ~ [V], with optional switching plug	–	–	–	–
Mains frequency	50	50	50	50

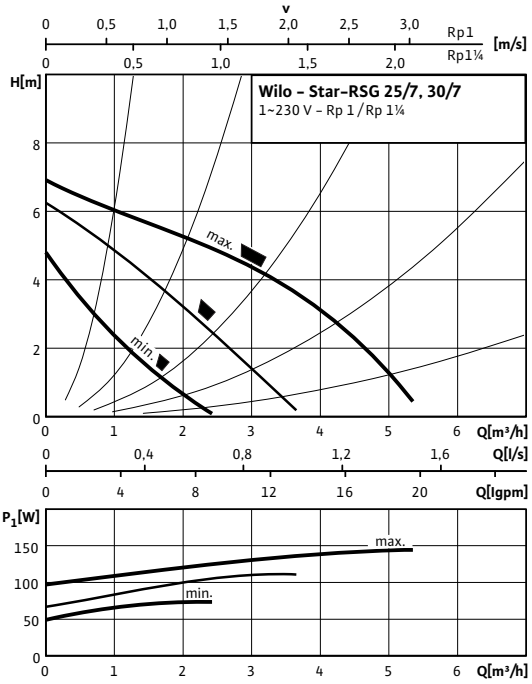
Technical data Wilo-Star-RSG

	Wilo-Star-RSG ...			
	25/7	**25/8**	**30/7**	**30/8**
Motor/electronics				
Electromagnetic compatibility	EN 61800-3			
Emitted interference	EN 61000-6-3			
Interference resistance	EN 61000-6-2			
Power electronics	–	–	–	–
Protection class	IP 44	IP 44	IP 44	IP 44
Insulation class	F	F	F	F
Materials				
Pump housing	Grey cast iron (EN-GJL-200)			
Impeller	Plastic (PP - 40% GF)			
Pump shaft	Stainless steel (X40Cr13)			
Bearing	Carbon, metal impregnated			
Minimum suction head at suction port [m] for preventing cavitation at water pumping temperature				
Minimum suction head at 50°C	0.5	0.5	0.5	0.5
Minimum suction head at 95°C	3	3	3	3
Minimum suction head at 110°C	10	10	10	10

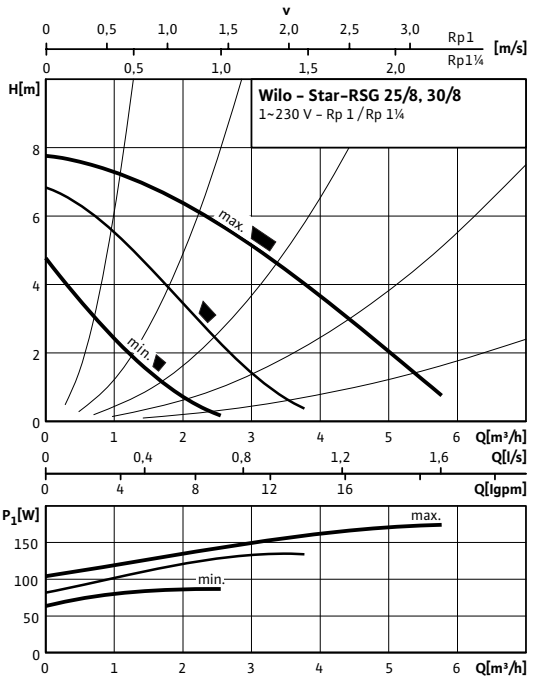
• = available, – = not available

Pump curves Wilo-Star-RSG

Wilo-Star-RSG 25/7, 30/7



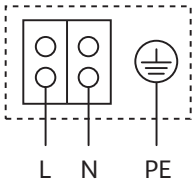
Wilo-Star-RSG 25/8, 30/8



Subject to change 09/2008 WILO SE

Terminal diagram, motor data Wilo-Star-RSG

Terminal diagram A



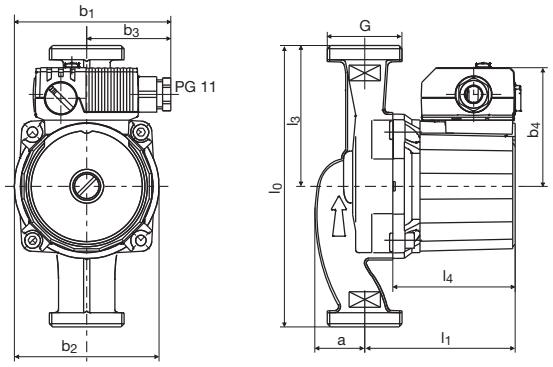
Blocking current-proof motor
Single-phase motor (EM) 2-pole - 1~230 V, 50 Hz
With built-in capacitor

Motor data

Wilo-Star-RSG ...	Nominal motor power	Speed	Power consumption	Max. current	Capacitor	Threaded cable connection	Motor protection
	P_2	n	P_1	I	C	PG	–
	[W]	[rpm]	[W]	[A]	[µF/VDB]	[PG]	–
25/7	57	max. 2800	132	0.58	3.5/400	1x11	not required (blocking current-proof)
	29.5	2650	92	0.42			
	13.5	min. 2300	62	0.30			
25/8	64	max. 2760	151	0.76	3.5/400	1x11	not required (blocking current-proof)
	35	2404	113	0.60			
	19	min. 2122	81	0.40			
30/7	57	max. 2800	132	0.58	3.5/400	1x11	not required (blocking current-proof)
	29.5	2650	92	0.42			
	13.5	min. 2300	62	0.30			
30/8	64	max. 2760	151	0.76	3.5/400	1x11	not required (blocking current-proof)
	35	2404	113	0.60			
	19	min. 2122	81	0.40			

Dimensions, weights Wilo-Star-RSG

Dimension drawing



Motor horizontal
Terminal box positions for 3, 6, 9 and 12 o'clock possible

Dimensions, weights

Wilo-Star-RSG ...	Pipe connection	Thread	Dimensions									Weight approx.
	Rp	G	A	b_1	b_2	b_3	b_4	l_0	l_1	l_3	l_4	M
	–		[mm]									[kg]
25/7	1	1½	32	101	93.5	54	79	180	109	90	91	2.7
25/8	1	1½	34	113	93.5	54	76	180	119	90	88	3.3
30/7	1¼	2	32	101	93.5	54	79	180	109	90	91	3.0
30/8	1¼	2	34	113	93.5	54	76	180	119	90	88	3.5

Motor technology

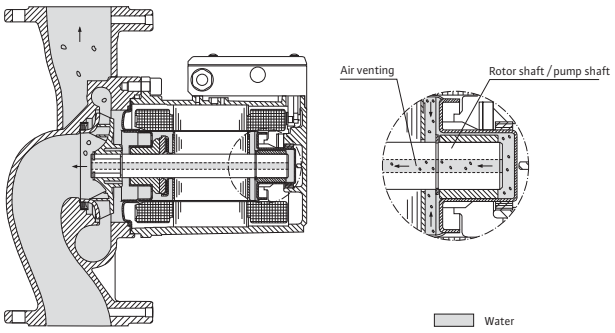
Motor technology
The motor design forms the basis for the entire Wilo-TOP series. The "Cold Motor" concept is based on optimised rotor and stator configurations in conjunction with similarly optimised motor mechanics and an electrical connecting technology with chamber block contacts. The conventional class F and H insulating materials are fully sufficient due to the minor electrical losses and the resulting reduced heat generation.

Electrical connection
Wilo-TOP-S, TOP-SD, Wilo-TOP-D, Wilo-TOP-Z, Wilo-SE, Wilo-SE-TW, Wilo-TOP-RL
The single-phase motors as well as the three-phase motors are both designed as "voltage range motors" for European voltage.
- Single-phase motor: 1~230 V, 50 Hz, tolerance in accordance with DIN IEC 60038: ± 10%. Connection to single-phase power supply also permitted, 1~220 V, 50 Hz.
- Three-phase motor: 3~400 V, 50 Hz, tolerance in accordance with DIN IEC 60038: ± 10%. Connection to three-phase power supply also permitted, 3~380 V, 50 Hz. The connection to 3~230 V power supply is also possible with Wilo-TOP-S/-SD and Wilo-TOP-Z if the switching plug, 3~230 V, as accessory is used. The connection to 3~230 V power supply is possible with TOP-D via the winding switch in the terminal box.

Important:
When operating the Wilo pumps with control devices or modular accessories, the electrical operating conditions according to VDE 0160 are to be observed (for details, see Planning guide).

Indication of direction of rotation
The integrated electronic indication of direction of rotation with the Wilo-TOP three-phase pumps indicates the correct direction of rotation when the direction of rotation control lamp lights up and the incorrect one when it goes out.

Rotor unit
The integration of all components that rotate and come into contact with water in the compact rotor unit ensures maximum smooth operation, long service life and ease of handling during service work.



Note:
No pump ventilation required during commissioning, since forced ventilation takes place through a special hole in the shaft during operation of the Wilo-TOP pumps (see figure).

Motor protection, Wilo-TOP series
Motor fuse protection in Wilo-TOP pumps is ensured as follows:

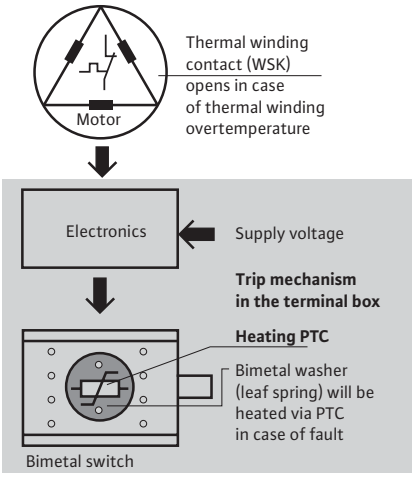
Blocking current-proof motors: No motor protection required
The motors are designed in such a way that the windings are not damaged in the event of an overload. That applies to the Wilo-TOP-D in three-phase/single-phase version with a nominal motor power P_2 = 20 W.

Pumps with internal protection against unacceptably high winding temperatures
The motors are designed in such a way that the motor voltage is switched off internally in the event of an overload and winding damage is thus prevented. This applies to the pump types
Wilo-TOP-S/-SD
Wilo-TOP-Z
Wilo-TOP-RL
Wilo-SE/SE-TW
in single-phase and in three-phase versions with a nominal motor power 50 W ≤ P_2 ≤ 100 W. An automatic restart takes place with the single-phase versions after the winding has cooled down, the three-phase versions are acknowledged by switching the mains voltage off and then back on.

Pumps with full motor protection (WSK) and Wilo tripping unit SK 602/622
Implementation of full motor protection by means of thermal winding contacts (WSK) within the stator windings. That applies to TOP-S/-SD/-D/-Z single-phase pumps with a nominal motor power P_2 = 180 W and TOP-D three-phase pumps with P_2 ≥ 60 W.

Motor technology

Pumps with integrated full motor protection including trip electronics



Full motor protection due to integrated tripping mechanism in the terminal box as standard in all Wilo-TOP-S/-SD/-Z three-phase pumps above $P_2 \geq 180$ W, and in all Wilo-S/SD single-phase pumps above $P_2 \geq 350$ W.
Permanent full motor protection due to precise motor temperature monitoring:

- TOP-S/-SD/-Z: 2 thermal winding contacts (WSK) in the winding (at $P_2 \geq 180$ W)

In the event of a fault, e.g. if there is impermissible motor heating caused by blocking, 2-phase operation etc., with WiloTOP-S/-SD/-Z there is a three-pole deactivation in the terminal box of the pump motor. They must be reset by pressing the acknowledge button on the terminal box.

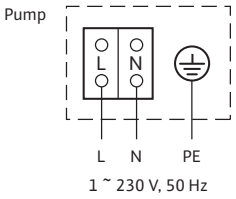
Fault indication/signal
Standard integrated signals at the terminal box with

- Fault signal light
- Collective fault signal ($P_2 \geq 180$ W) with potential-free NC contact in accordance with VDI 3814 with Wilo-TOP three-phase pumps (not TOP-D).

Connection for multi-speed Wilo-TOP motors

Motor with internal protection, P_2 up to 90 W (TOP series) – no external motor protection necessary!

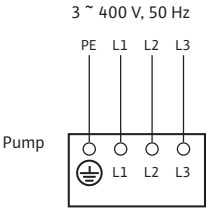
Single-phase motor 1~230 V, 50 Hz



With built-in capacitor

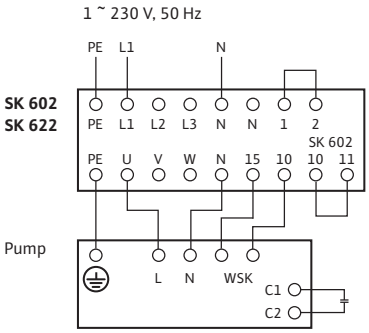
Motor with internal protection, P_2 up to 90 W (TOP series) – no external motor protection necessary!

Three-phase motor 3~400 V, 50 Hz



Motor with built-in thermal winding contacts, P_2 = 180 W (TOP series)

Single-phase motor 1~230 V, 50 Hz
With tripping unit Wilo-SK 602/SK 622



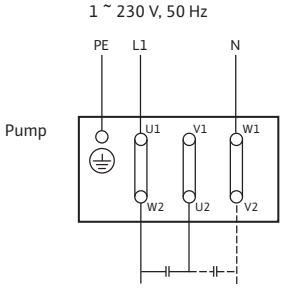
No rotation direction check required!

Important!
When using different contactor equipment: Terminals 15 and 10 "WSK" can be connected in control circuit (max. 230 V). When using a motor protection switch provided onsite, its settings must be according to the pump name plate specifications.

Connection for constant-speed three-phase motors 230 V △/400 V ⋎

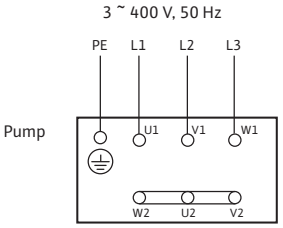
Blocking current-proof motor, P_2 up to 20 W – no motor protection necessary!

Mains connection 1~230 V, 50 Hz
Steinmetz switching:
Motor terminals in Δ connection;
attached capacitor



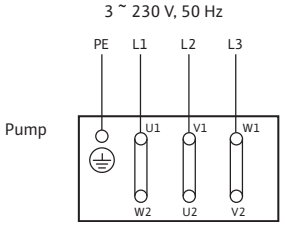
Blocking current-proof motor, P_2 up to 20 W – no motor protection necessary!

Mains connection 3~400 V, 50 Hz
Motor terminals in Y circuit



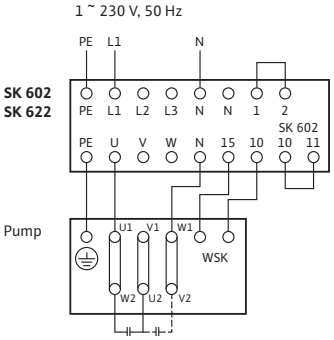
Blocking current-proof motor, P_2 up to 20 W – no motor protection necessary!

Mains connection 3~230 V, 50 Hz
Motor terminals in Δ connection



Motor with built-in thermal winding contacts, $P_2 \geq 60$ W

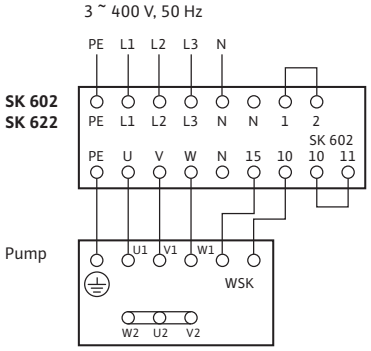
Mains connection 1~230 V, 50 Hz



Direction of rotation must be checked!
To change the direction of rotation:
Swap capacitor terminal connections W2 <-> V2 (illustrated by dashed lines)

Motor with built-in thermal winding contacts, $P_2 \geq 60$ W

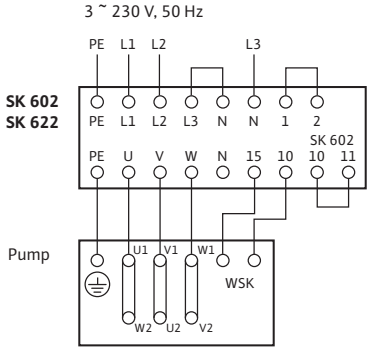
Mains connection 3~400 V, 50 Hz



Direction of rotation must be checked!
To change the direction of rotation:
Swap any two phase wires!

Motor with built-in thermal winding contacts, $P_2 \geq 60$ W

Mains connection 3~230 V, 50 Hz



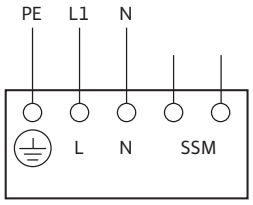
Direction of rotation must be checked!
To change direction of rotation:
Swap any two phase wires!

Connection for Wilo-TOP-E-/-ED motors

Wilo-TOP-E/-ED

Mains connection 1~230 V, 50 Hz

1~230 V, 50 Hz

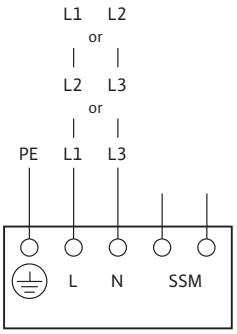


Wilo-TOP-E/-ED

Wilo-TOP-E/-ED

Mains connection 3~230 V, 50 Hz, connection between 2 phases

3~230 V, 50 Hz

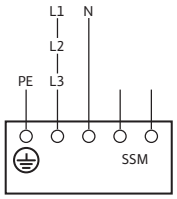


Wilo-TOP-E/-ED

Wilo-TOP-E/-ED

Mains connection 1~230 V, 50 Hz, in three-phase supply network 3~400 V, 50 Hz

1~230 V, 50 Hz



Wilo-TOP-E/-ED

Important:
The correct connection of the neutral conductor is to be observed!

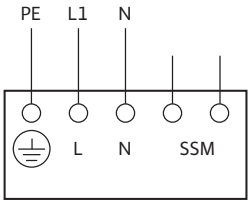
Wiring diagrams

Connection for Wilo-Stratos/-Z/-D/-ZD motors

Stratos/Stratos-Z/Stratos-D

Mains connection 1~230 V, 50/60 Hz

1~230 V, 50/60 Hz

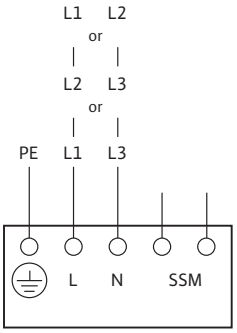


Wilo-Stratos/-Z/-D

Stratos/Stratos-Z/Stratos-D

Mains connection 3~230 V, 50/60 Hz,
Connection between two phases

3~230 V, 50/60 Hz

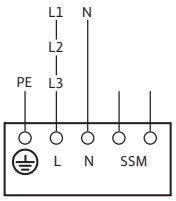


Wilo-Stratos/-Z/-D

Stratos/Stratos-Z/Stratos-D

Mains connection 1~230 V, 50/60 Hz,
in three-phase supply system 3~400 V, 50/60 Hz

1~230 V, 50/60 Hz

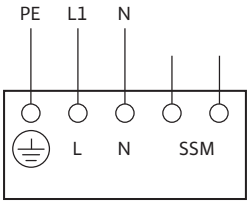


Wilo-Stratos/-Z/-D

Stratos-ZD

Mains connection 1~230 V, 50/60 Hz

1~230 V, 50/60 Hz



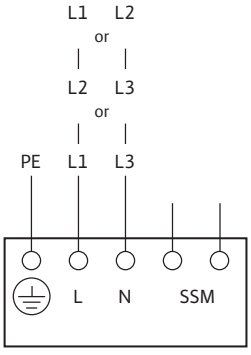
Wilo-Stratos-ZD

Important:
The correct connection of the neutral conductor is to be observed!

Stratos-ZD

Mains connection 1~230 V, 50/60 Hz,
Connection between two phases

3~230 V, 50/60 Hz

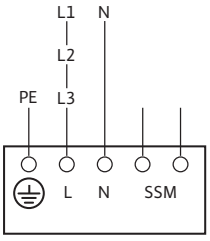


Wilo-Stratos-ZD

Stratos-ZD

Mains connection 1~230 V, 50/60 Hz,
in three-phase supply system 3~400 V, 50/60 Hz

1~230 V, 50/60 Hz

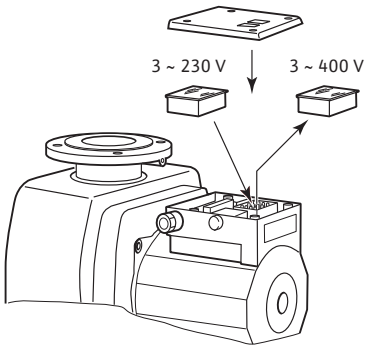


Wilo-Stratos-ZD

Important:
The correct connection of the neutral conductor is to be observed!

Switching plugs/service units

Switching plug "N"

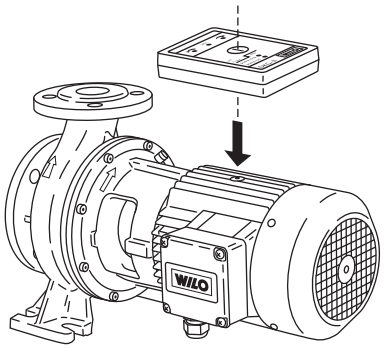


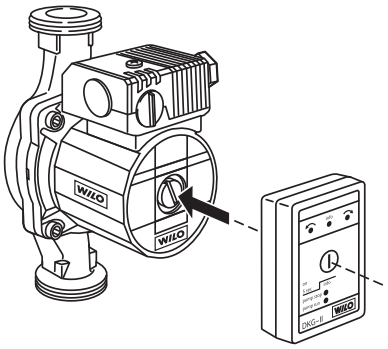
Retrofit plug for three-phase pumps Wilo-TOP-S/-SD/-Z for connecting the pump motor to the existing mains voltage 3~230 V, 50 Hz.
Weight: approx. 30 g.

> Equipment/function

The simple conversion for connecting the pump to 3~230 V is achieved by replacing the standard 400 V speed/voltage plug in the terminal box of the pump with the 230 V switching plug (accessory).
This retrofitting does not permit the connection of the pump to 1~230 V.
No further wiring work is required.
Manual variable speed switching with the plug is retained for 3 stages.

DKG-II rotational monitoring/service unit





Wilo service unit with extended function for electronic, non-contact monitoring of the exact direction of rotation (glanded and glandless pumps) as well as testing for possible pump standstill (standard glandless pumps in single-phase or three-phase design). Measuring always takes place during operation. It is no longer necessary to briefly switch the pump motor on and off.
Device Including 9 V battery (commercially available) and testing directions.
Three integrated, high-sensitivity sensors measure the stray field of the pump motor when the service unit is applied. Based on the time sequence of the sensor signals, the electronic unit determines

- the direction of rotation and
- the rotation of the pump rotor and thus the conveyance of the fluid through the pump.

Red and yellow LEDs indicate disrupted/undisrupted pump operation quickly and clearly.

Wilo direction-of-rotation indicator



Direction-of-rotation indicators (five x in the scope of delivery) for the non-contact monitoring/indication of the direction of rotation of glandless pumps.

Pipe unions

Malleable cast iron screwed connections

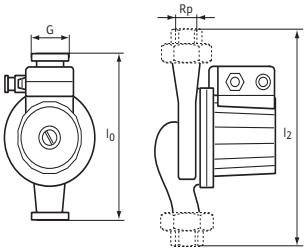


Screwed connections for circulation pumps
Union inserts with female threads for connection to steel pipes (DIN 2440) with Whitworth pipe thread in accordance with DIN 10226-1

Malleable cast iron (GTW chromated)

1 set of screwed connections consisting of: 2 union nuts, 2 flat gaskets and 2 union inserts

Installation dimensions



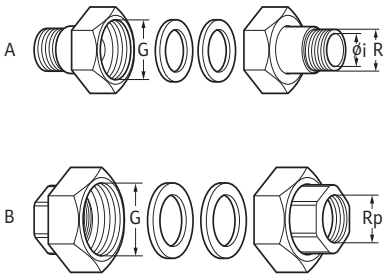
Note:
Screwed connections are not included in the pump's scope of delivery.

Screwed connections – pump configuration, dimensions and weights

	Dimensions			Overall length		Pipe connection size		Weight (set)
Variable	**Rp/R**	**G**	**Øi**	**l_0**	**l_2**	**DN, steel pipe DIN 2440**	**DN, copper pipe DIN EN 1057**	**–**
Unit	**–**		**[mm]**	**[mm]**		**–**	**–**	**[kg]**
GTW 1 For pumps with pump housing thread G 1½	Rp 1	G 1½	–	130 180	184 234	25	–	0.46
GTW 1 ¼ For pumps with pump housing thread G 2	Rp 1¼	G 2	–	180	244	32	–	0.69

Pipe unions

Brass screwed connections



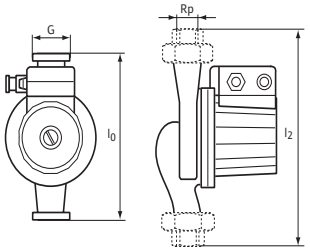
Screwed connections for secondary hot water pumps and solar heating pumps
Fig. A: Brass material (MS). Special union inserts with Whitworth male thread (DIN 10226-1) and female thread for choice between threaded connections and solder joints to copper pipe (DIN EN 1057)

Fig. B: Brass material (MS). Union inserts with female threads for connection to copper pipes (DIN EN 1057) with Whitworth pipe thread in accordance with DIN EN 10226-1.

Brass (MS), malleable cast iron (GTW, chromated)

1 set of screwed connections consisting of: 2 union nuts (GTW chromated or brass for MS 3/4 type), 2 flat gaskets and 2 union inserts, screw or soldering connection

Installation dimensions



Note:
Screwed connections are not included in the pump's scope of delivery.

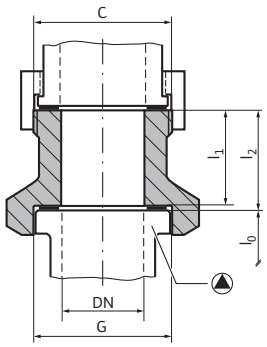
Screwed connections – pump configuration, dimensions and weights

Variable	Dimensions			Overall length		Pipe connection size		Weight (set)	Figure
	Rp/R	G	Øi	l_0	l_2	DN, steel pipe DIN 2440	DN, copper pipe DIN EN 1057	–	–
Unit	–		[mm]	[mm]		–	–	[kg]	–
MS ½ For secondary hot water circulation pumps with housing or valve male thread G 1	Rp ½	G 1	15	140	216	15	Ø 15	0.26	A
MS ¾ For secondary hot water circulation pumps with housing thread G 1¼	Rp ¾	G 1¼	–	150	195	–	R 3/4	0.34	B
MS 1 For secondary hot water circulation pumps with housing thread G 1½	Rp 1	G 1½	28	180	274	25	Ø 28	0.72	A
MS 1¼ For secondary hot water circulation pumps with housing thread G 2	Rp 1¼	G 2	35	180	280	32	Ø 35	1.20	A

Service/accessories

Adapter fittings

Wilo-R



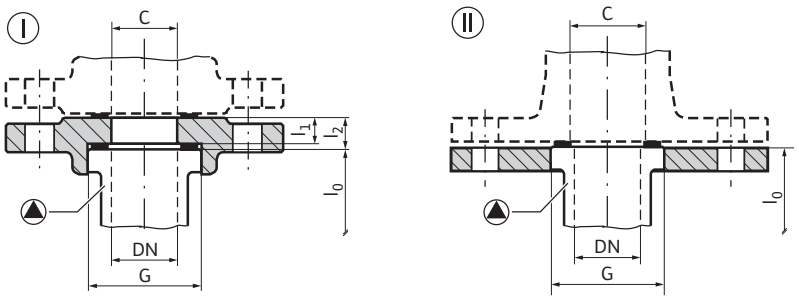
Adapters for length compensation, Wilo-R

	New pump		Pipe		Dimensions		Material	Weight approx.
	DN	G	C	DN	l_1	l_2	–	M
	–				[mm]		–	[kg]
R 24	25	G 1½	R 1½	25	18	20	GG	0.2
R 1	25	G 1½	R 1½	25	28	30	GG	0.3
R 2	25	G 1½	R 1½	25	38	40	GG	0.5
R 5	25	G 1½	R 2	32	3	5	MS	0.1
R 6	25	G 1½	R 2	32	13	15	GG	0.3
R 7	25	G 1½	R 2	32	18	20	GG	0.4
R 12	25	G 1½	R 2¼	40	3	5	MS	0.1
R 8	32	G 2	R 2	32	18	20	GG	0.3
R 9	32	G 2	R 2	32	38	40	RG	0.4
R 10	32	G 2	R 2	32	38	40	GG	0.3
R 14	32	G 2	R 2	32	28	30	GG	0.6
R 22	32	G 2	R 2	32	68	70	GG	0.8
R 11	32	G 2	R 2	32	23	25	GG	1.0

Note: Scope of delivery Including 1 adapter and 2 seals

Subject to change 09/2008 WILO SE

Wilo-RF



Flanged rings, Wilo-RF
Wilo-RF flanged rings are – with some exceptions – intended for length compensation with PN 6 flanges (RF 4, RF 5, and RF 6 also in PN 16). A pipe modification is required for length compensation with PN 10/16 flanges.

Flanged rings, Wilo-RF

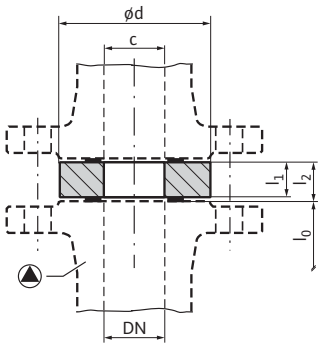
	New pump		Pipe	Version	Dimensions		Material	Standard version for operating pressure	Weight approx.
	DN	G	C	–	l_1	l_2	–	p_{max}	M
	–				[mm]		–	[bar]	[kg]
RF 7	25	G 1½	DN 25	II	–	–	GG	6	0.4
RF 10	25	G 1½	DN 25	I	25.5	30	GG	6	1.0
RF 9	25	G 1½	DN 40	I	15.5	20	GG	6	1.4
RF 13	25	G 1½	DN 50	I	25.5	30	GG	6	1.9
RF 1	32	G 2	DN 32	II	–	–	GG	6	1.0
RF 2	32	G 2	DN 32	I	2.5	7	GG	6	1.4
RF 3	32	G 2	DN 32	I	15.5	20	GG	6	1.4
RF 4	32	G 2	DN 32	I	30.5	35	GG	6	2.5
RF 4	32	G 2	DN 32	I	30.5	35	GG	10/16	2.7
RF 0	32	G 2	DN 40	II	–	–	GG	6	1.3
RF 8	32	G 2	DN 40 (square flange)	I	5.5	10	GG	6	0.9
RF 12	32	G 2	DN 40	I	5.5	10	GG	6	1.6
RF 11	32	G 2	DN 50	II	–	–	GG	6	1.7
RF 5	32	G 2	DN 50	I	15.5	20	GG	6	2.8
RF 5	32	G 2	DN 50	I	15.5	20	GG	10/16	3.1
RF 6	32	G 2	DN 50	I	30.5	35	GG	6	3.0
RF 6	32	G 2	DN 50	I	30.5	35	GG	10/16	3.3

Note: The scope of delivery Including: 1 flange ring, 2 seals and screws

Service/accessories

Adapter fittings

Wilo-F



Wilo-F flange intermediate connecting pieces
The Wilo-F flange intermediate connecting pieces - with some exceptions - are intended for length compensation with the flanges PN 6 or PN 16 . Onsite pipe modification is required if adapters are not available.
The washers included in the scope of delivery must be used for pumps that have combination flanges.
F1-MS flange pieces are made of bronze brass CW 612 N and are approved for secondary hot water circulation systems.

Intermediate flange connecting piece for length compensation, Wilo-F

	New pump	Pipe	Dimensions			Material	Standard version for operating pressure	Weight approx.
	DN	C	l_1	l_2	Ø d	–	p_{max}	M
	–		[mm]			–	[bar]	[kg]
F 0	40	DN 40	13	15	91	GG	6	0.8
F 0	40	DN 40	13	15	91	GG	10/16	1.0
F 1	40	DN 40	28	30	91	GG	6	1.4
F 1	40	DN 40	28	30	91	GG	10/16	1.6
F 1-MS	40	DN 40	28	30	91	MS	6	1.3
F 1-MS	40	DN 40	28	30	91	MS	10/16	1.8
F 26	40	DN 40	48	50	91	GG	6	2.1
F 26	40	DN 40	48	50	91	GG	10/16	2.3
F 2	50	DN 50	8	10	106	GG	6	0.7
F 2	50	DN 50	8	10	106	GG	10/16	0.8
F 3	50	DN 50	18	20	106	GG	6	1.1
F 3	50	DN 50	18	20	106	GG	10/16	1.3
F 4	50	DN 50	28	30	106	GG	6	1.7
F 4	50	DN 50	28	30	106	GG	10/16	1.9
F 5	50	DN 50	33	35	106	GG	6	1.9
F 5	50	DN 50	33	35	106	GG	10/16	2.1
F 9	65	DN 65	8	10	126	GG	6	0.8
F 9	65	DN 65	8	10	126	GG	10/16	1.0
F 10	65	DN 65	18	20	126	GG	6	1.5
F 10	65	DN 65	18	20	126	GG	10/16	1.7
F 11	65	DN 65	28	30	126	GG	6	2.2
F 11	65	DN 65	28	30	126	GG	10/16	2.4
F 28	65	DN 65	38	40	126	GG	6	2.8
F 28	65	DN 65	38	40	126	GG	10/16	3.0
F 29	65	DN 65	43	45	126	GG	6	3.1
F 29	65	DN 65	43	45	126	GG	10/16	3.3
F 16	80	DN 80	8	10	141	GG	6	0.9
F 17	80	DN 80	18	20	141	GG	6	2.1
F 30	80	DN 80	23	25	141	GG	6	2.4
F 30	80	DN 80	23	25	141	GG	10/16	3.3
F 18	80	DN 80	38	40	141	GG	6	3.7
F 34	100	DN 100	33	35	161	GG	6	3.9
F 35	100	DN 100	53	55	161	GG	6	5.7

Note: The scope of delivery Including: 2 seals and screws

Subject to change 09/2008 WILO SE

Wilo thermal insulation shells

Wilo thermal insulation shells



> User benefits
- Reduces the heat losses of the pump by up to 85 % (depending on the electrical power P_1)
- Reduces the overall energy consumption of the heating system
- Saves energy costs
- Resistant to moisture, salts, many acids, most greases and solvents
- Ensures even temperature distribution at the pump
- Protects the pump from outside moisture
- Groundwater-neutral, propellant-free, formaldehyde-free
- 100 % recyclable
- Fire resistance classification B2

> Field of application
- **Wilo screw-end pumps, 180 mm:**
  Star-RS 25/2 to …-RS 25/6,
  Star-RS 30/2 to …-RS 30/6,
  Star-ST 25/…
- **Wilo circulation pumps, 140 mm:**
  Star-Z 20/1
- **Wilo circulation pumps, 180 mm:**
  Star-Z 25/2
  Star-Z 25/6
- **Wilo energy-saving pumps, 180 mm:**
  Star-E 25/1-3 to …-E 25/1-5
  Star-E 30/1-3 to …-E 30/1-5

Service/accessories

Cold water pump insulation

Wilo-ClimaForm

Wilo-ClimaForm



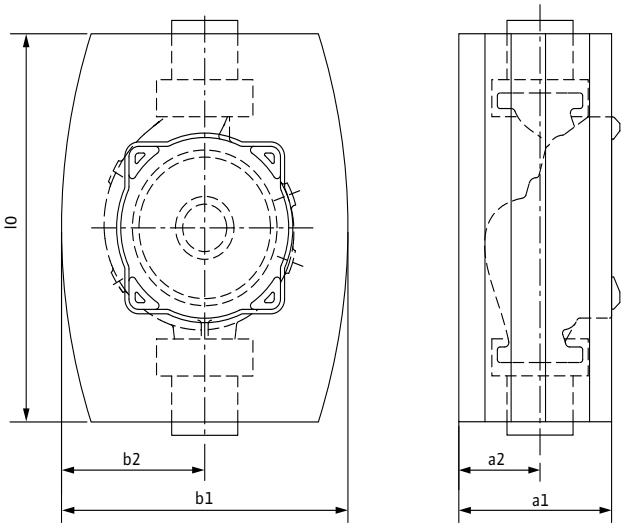
> Wilo-ClimaForm
Diffusion-proof insulation of pump housings in cold water applications (material: Armacell system).
Suitable for single pumps of the series:
- Wilo-Stratos
- Wilo-Stratos-Z
- Wilo-TOP-S
- Wilo-TOP-RL
- Wilo-SE

For avoiding condensation formation on the surface of the pump housing and consequential damage caused by drips and corrosion on the pump housing and on the rest of the system.

> Scope of delivery
Low-temperature insulation shell including Armaflex band for form-fitting sealing between insulation and motor flange, installation instructions and packaging. The processing materials required for the Armacell system (e.g. special cleaners, AF adhesive, UV protective coating) are to be provided by the customer.

> Application benefits and field of application
- Industrially prefabricated low-temperature insulation shell for the fast insulation of pump housings and secure connection with onsite diffusion-proof pipe insulation manufactured by Armacell GmbH.
- Permitted temperature range of the fluid: -10 °C to +105 °C
- Simple contours and surfaces facilitate the application of any onsite surface coatings (e.g. coat of paint for UV protection, sheet metal application for impact protection)
- Smoother transition to ongoing pipe insulation: Pipe unions/counter flanges are enclosed by the insulation
- Dimensionally precise adjustment to the housing geometry reduces the hollow space between insulation and the pump housing and thus the inclusion of air and moisture
- The flexible elastomer insulation material can be cut and re-glued in situations where access for installation is difficult

Dimension drawing



Subject to change 09/2008 WILO SE

Wilo-ClimaForm

Dimensions, weights accessories

For Wilo- ...	Dimensions				
	l_0	A	a_1	b	b_1
	[mm]				
Stratos/-Z 25/1-6, 25/1-8, 30/1-6, 30/1-8	240	137	68	150	75.0
Stratos/-Z 30/1-12	240	145	75	150	81.0
Stratos/-Z 32/1-12	350	192	97	225	112.5
Stratos/-Z 40/1-4	350	199	101	240	120.0
Stratos/-Z 40/1-4	350	205	103	240	120.0
Stratos/-Z 40/1-12	380	207	107	240	120.0
Stratos/-Z 50/1-8	380	219	112	260	130.0
Stratos/-Z 50/1-9, 50/1-12	420	225	115	270	135.0
Stratos/-Z 65/1-9	420	239	121	280	140.0
Stratos/-Z 65/1-12	490	249	132	290	145.0
Stratos/-Z 80/1-12	520	262	133	320	160.0
Stratos/-Z 100/1-12	520	280	145	350	175.0
TOP-S 30/4, 30/6, TOP-RL 30/4, 30/6.5, SE 125-N	240	133	76	170	85.0
TOP-S 25/5, 30/5, TOP-RL 25/5, 25/7.5, 30/7.5, SE 110-N	240	117	62	144	72.0
TOP-S 25/7	240	110	62	176	88.0
TOP-S 25/10[1)]	240	121	68	188	94.0
TOP-S 25/13	240	87	55	180	90.0
TOP-S 30/7	240	117	68	176	88.0
TOP-S 30/10[1)]	240	121	68	188	94.0
TOP-S 40/4	345	200	102	240	120.0
TOP-S 40/7[1)]	375	200	102	240	120.0
TOP-S 40/10	370	200	100	240	120.0
TOP-S 40/15[1)]	375	210	106	260	130.0
TOP-S 50/4[1)]	375	210	106	260	130.0
TOP-S 50/7	420	215	107	265	132.5
TOP-S 50/10	420	215	107	265	132.5
TOP-S 50/15	490	250	202	265	132.5
TOP-S 65/7	420	230	114	265	132.5
TOP-S 65/10 (450 W)	470	230	113	280	140.0
TOP-S 65/13, 65/15	490	230	112	285	142.5
TOP-S 80/7[1)]	500	260	140	320	160.0
TOP-S 80/10[1)]	500	240	120	320	160.0
TOP-S 100/10[1)]	520	270	137	345	172.5

[1)] Due to the complex geometry of the pump bodies, the insulation layer thickness specification of 19 mm may be fallen short of in certain areas with this ClimaForm. If the following extreme operating conditions occur simultaneously:

- Low fluid temperature (< 0°C)
- High ambient temperature (> 22°C)
- High humidity (> 72%)

it is possible that limited condensation formation may occur locally on the surface of the ClimaForm. This will not impair the protective function of the pump. The same applies in the event that the ClimaForm insulation layer is squeezed to a lesser thickness.

System seperation, condensate lifting unit

Series Overview Wilo-Safe-WS, Wilo-DrainLift Con

Series: Wilo-Safe

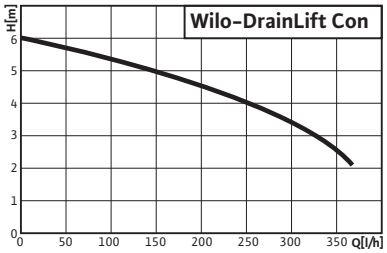


> Design
Complete system/basic device for hydraulic separation of floor heating systems

> Application
Floor heating systems of all kinds; system separation for oxygen-rich fluids

Series: Wilo-DrainLift Con





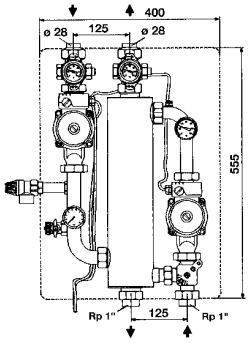
> Design
Lifting unit for condensates

> Application
For pumping condensate, can be used in
- Condensing boiler technology (an upstream neutralisation system must be used with oil-fired boilers)
- Air-conditioning and refrigeration systems (such as refrigerators and evaporators)

Subject to change 09/2008 WILO SE

Series description Wilo-Safe

Wilo-Safe WS 5-24 complete

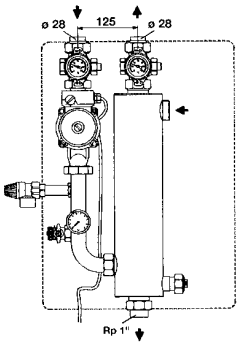


Consisting of:
WSG 5-24 Wilo-Safe basic unit, WSA 5 – 24 Wilo-Safe connector set, WSM 5 – 24 Wilo-Safe mixer

Wilo-Safe WS 5-24 E complete

Like WS 5-24, complete, but with electronically controlled pump, red brass and ceramic shaft for the floor circulation

Wilo-Safe basic unit WSG 5-24



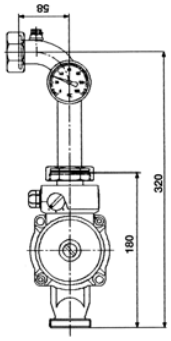
Consisting of:
Star-Z 25/6 floor-area pump with red brass housing, special heat exchanger WT 5-24 Ms/Cu, secondary pipe assembly, 2.5 bar safety valve, filling/drain cock, 2 multi-valves with blocking and built-in thermometer 0 – 120 °C including immersion wells and connection option for an expansion tank, 4-bar pressure gauge, 2 insulating shells made of environmentally safe EPP incl. wall bracket and fixation material

Output parameters for WS 5-24, complete

		Primary circuit			Secondary circuit		
	Thermal output up to max.	Volume flow	Feed temperature	Return temperature	Volume flow	Feed temperature	Return temperature
	[kW]	[m^3/h]	[°C]	[°C]	[m^3/h]	[°C]	[°C]
Conventional boiler	26	1.1	80	60	2.2	45	35
Low-temperature boiler	22	0.95	70	50	1.9	40	30
Condensing boiler	15	1.3	55	45	1.3	40	30

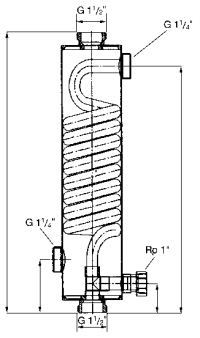
Series description Wilo-Safe

Wilo-Safe WSA 5-24 connection set



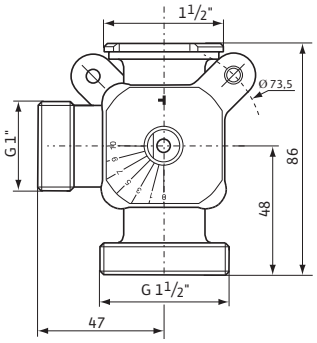
Consisting of:
Primary circuit pump Star-RS 25/6, primary elbow with ventilation valve, thermometer, 0 – 120°C and screwed connections. WSA goes with WSG 5-24

Wilo-Safe heat exchanger WT 5 – 24, Ms/Cu



Consisting of: Heat exchanger
- Jacket made of brass CuZn 36 Pb 2 As, x 10 mm
- Ribbed helical coil made of copper SF-Cu, x 22 mm
- Primary circuit (boiler side) through helical coil with G 1¼" male thread for feed and G 1½" for return and connection Rp 1" for bypassing the 3-way mixer
- Secondary circuit (floor heating system) through shell area of the heat exchanger with G 1½" or G 1¼" male thread for feed and return

Wilo-Safe mixer WSM 5-24



> Scope of delivery
Consisting of:
3-way mixer (setting angle 90°), with two-sided scaling (0-10). WSM goes with WSG 5-24

> Technical data
- Max. operating pressure: 6 bar
- Max. differential pressure: 2 bar
- Permissible temperature range: min. -30 °C, max. +110 °C
- Required torque: Nm

> Materials
- Housing, shaft, cone: Brass
- Drive sleeve: Plastic
- O-rings: EPDM elastomers

> Accessories
> Wilo-Safe servo motor
For direct connection (possible without adapter plate) to the Wilo-Safe WSM mixer
- For automatic control
- 230 V, 50 Hz; 6.5 VA, 5 Nm, setting angle 90°, 2 min
- Sticker (red/blue) enclosed for labelling the control button of the Wilo-Safe motor

> Wilo-Safe adapter plate
for the set-up of commercially available servo motors (from model year '90) on the Wilo-Safe mixer WSM.
Do not forget the attachment set or the servomotor control lever (to be provided onsite).

Technical data Wilo-Safe

	Wilo-Safe ...
Approved fluids (other fluids on request)	
Heating water (in accordance with VDI 2035)	•
Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked)	–
Output	
Delivery head max. [m]	-
Max. volume flow [m^3/h]	-
Speed range	–
Permitted field of application	
Temperature range for applications in heating/ventilation/air-conditioning systems at max. ambient temperature of +40 °C [°C]	• 20-90
Standard version for operating pressure, p_{max}	6
Connections	
Nominal flange diameter DN	see dimension drawings
Electrical connection	
Mains connection 1 ~ [V], standard version	230
Mains frequency	50
Motor/electronics	
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2
Radio shielding degree	-
Protection class	-
Insulation class	-
Materials	
Pump housing	-
Impeller	-
Pump shaft	-
Bearing	Carbon
Dimensions/weights	
Gross volume	-
Gross weight	18.0

• = available, - = not available

Series description Wilo-DrainLift Con



Design
Condensate lifting unit

Type key
Example: **Wilo-DrainLift Con**

Con Condensate

Special features/product benefits
- Low-noise operation (≤43dB[A])
- 2 inlet openings
- Standard alarm contact (NC/NO contact)
- Easy to install
- Motor unit reversible by 180°
- Variable inlets/drains
- Suitable for condensates with a pH value ≥2.4

Application
The condensate lifting unit is applied whenever the condensate cannot be discharged via the natural fall, or if the installation is located below the backflow level. It was designed for the installation in condensing boilers in which aggressive condensate according to ATV worksheet A 251 builds up. he materials used in the unit allow to pump condensate up to a pH-value of >= 2,4 pwithout any problems.An upstream neutralisaiton system must be installed with the lifting unit if it is used with oil- or gas-fired boilers which have a power of > 200 kW. Furthermore, the condensate lifting unit can be used in air-conditioning and cooling systems in which condensate builds up, e.g. for refrigerators and freezers, evaporators, refrigerated display cases.

Description/design
2 inlets in the cover (19 mm or 24 mm). NW 10 mm hose connection on the pressure side with built-in non-return valve. The system can be installed in an upright position or wall-mounted using two fixation holes. The motor unit can be reversed by 180° on the tank, enabling a variable inlet/drain.

Scope of delivery
Lifting unit, ready for connection, with standard-equipped alarm contact (NC/NO contact) for connection to condensing boiler or an alarm switchgear. Incl. hose connection with built-in non-return valve. 5 m hose for pressure side, 1 m alarm cable and 2 m mains cable with shock-proof plug and wall fixation material and installation and operating instructions.

Accessories
- Inlet adapter Ø 24 to 25 mm, Ø 24 to 30 mm, Ø 24 to 40 mm
- Pressure hose 25 m length

Subject to change 09/2008 WILO SE

Technical data Wilo-DrainLift Con

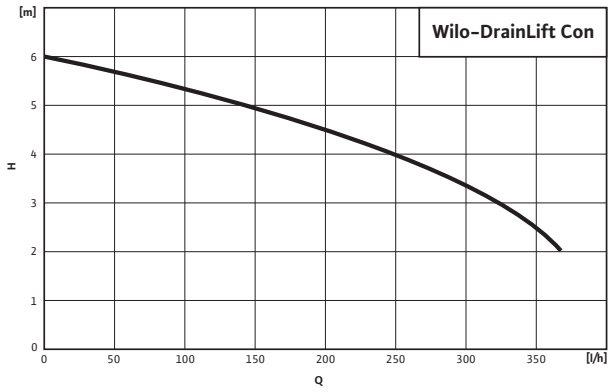
	Wilo-DrainLift Con ...
Approved fluids (other fluids on request)	
Charged condensate (pH >= 2.4)	•
Electrical connection	
Mains connection 1 ~ [V], standard version	230
Mains frequency	50
Nominal current	0.6
Power consumption	80
Length of connection cable	2
Permitted field of application	
Operating mode	S3-15%
Max. fluid temperature	80
Connections	
Inlet connection	19/24 mm
Pressure port	12
Motor/electronics	
Protection class	IP 20
Dimensions/weights	
Gross weight	2.8
Gross volume	1.5

• = available, – = not available

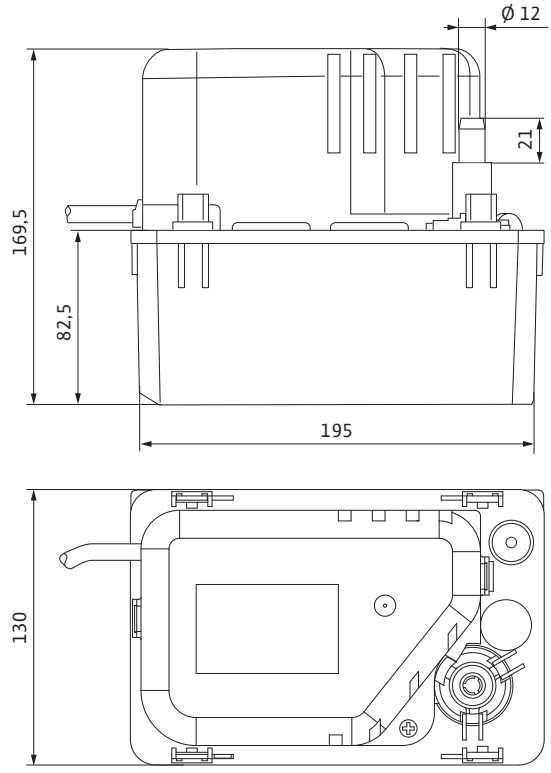
Pump curves, dimension drawing Wilo-DrainLift Con

Pump curve

2-pole, 50 Hz



Dimension drawing



Series overview

Plug-in modules: Wilo-S1R-h



> Time switching for secondary hot water circulators
- Retrofittable plug-in module for time-sensitive ON/OFF control in secondary hot water circulation systems

Switchgears: Wilo-SK 601



> Time switch unit
- Switchgear for automatic time-sensitive On/Off control
- For single pumps driven by single-phase or three-phase AC motors
- maximum switching capacity, 10 A

Switchgears: Wilo-RS-System und Wilo-SD-System



> Double pump switching
- Switchgear for dual pump management of glandless and glanded pumps
- For single-phase or three-phase AC motors
- Maximum switching capacity 10 A per pump
- Time- or fault-sensitive pump duty switchover
- Time- or load-sensitive peak-load cut-in
- Including full motor protection apparatus

Motor protection: Wilo-SK 602/SK 622



> Full motor protection relays
- Full motor protection relays for pumps with thermal winding contacts (WSK)
- Wall-mounted device for pumps with single-phase and three-phase AC motors
- Additional potential-free run and fault signals (only Wilo-SK 622)

Switchgears and control devices

Plug-in modules, switchgears, motor protection, accessories

Series overview

Control devices: Vario-control system Wilo-VR-HVAC



> Control device for glandless and glanded pumps
(electronically regulated stageless pumps and/or pumps with integrated frequency converter)
- Variable-control system for stageless performance control of pumps of the TOP-E/-ED, Stratos/-D/-Z/-ZD, IP-E/DP-E, IL-E/DL-E, IL-E...BF series
- For the control modes Δ p-c and Δ p-v in heating and air-conditioning technology
- Pump performance splitting with up to 4 units
- Nominal power up to P_2 = 22 kW
- Speed range between 100 % and 40 %
- Including full motor protection device

Control devices: Comfort-control system Wilo-CRn



> Control device for glandless and glanded pumps
(electronically regulated stageless pumps and/or pumps with integrated frequency converter)
- Comfort control system for stageless power control of pumps of the series Stratos/-D/-Z/-ZD, IP-E/DP-E, IL-E/DL-E, IL-E...BF
- For all control modes in heating and air-conditioning technology
- Pump performance splitting with up to 6 units
- Nominal power up to P_2 = 22 kW
- Speed range between 100 % and 40 %

Control devices: Wilo-CC-HVAC System



- Switchgear for glandless and glanded pumps
(Standard pumps with fixed speed)
- Comfort control system for continuous performance control of conventional circulation pumps with three-phase motor
- For all control modes in heating and air-conditioning technology
- Pump duty splitting with up to 6 units (more units on request)
- Nominal power up to P_2 = 200 kW (higher power on request)
- Speed range between 100 % and 40 %
- Incl. motor protection device

Control devices: Comfort-control system Wilo-CR



> Control device for glandless and glanded pumps
(Standard pumps with fixed speeds)
- Comfort-control system for stageless performance control of commercially available circulation pumps with a three-phase AC motor
- Suitable for all control modes used in heating, air-conditioning and pressure boosting
- Pump performance splitting with up to 6 units
- Nominal power to P_2 = 30 kW (to P_2 = 200 kW on request)
- Speed range between 100 % and 40 %
- Including full motor protection device

Subject to change 09/2008 WILO SE

Pump performance control

Pump performance control

Load-specific excess pump performance

Circulation pumps for central heating and air-conditioning as well as the hydraulic pipe system must be designed to be capable to meet the maximum climatic requirements.
These maximum load conditions, however, only exist on a few days during the heating/cooling season. A typical load curve for a central heating system is shown on the diagram. Centralised and decentralised control systems intervene continuously in the system's hydraulics in order to make adjustments to the actual load situation; in most cases, they cause a reduction of the volume flow while at the same time increasing the pump delivery head. Such operating states are not economical for pump operations, since lower delivery heads would in fact be sufficient, particularly for a low volume flow; in addition, the noise levels that would result must be avoided under all circumstances.

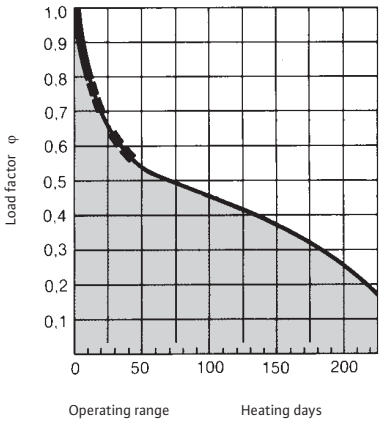


Fig.: Typical load factor of a central heating system during a heating period of roughly 5500 hours

The Wilo solution: load-sensitive power adjustment

Control mode	Pump type/ pump model	Signal/ control variable	Control system
Integrated infinitely variable differential-pressure control	Stratos/Stratos-Z Star-E Star-ZE TOP-E IP-E/IL-E	Δp	Standard equipment
Time-dependent activation/deactivation – single pumps	TOP-Z	t	SK 601
	Star-Z	t	S1R-h/SK 601
	RS	t	SK 601
Double pump control	Stratos/Stratos-Z/ Stratos-D/Stratos-ZD	Δp, t	Stratos IF-Module
	TOP-E/-ED	Δp, t	IF-Module
	IP-E/DP-E	Δp, t	–
	IL-E/DL-E	Δp, t	IF-Module
	Glandless and glanded pumps	Δp, +T, ΔT, t	3
Infinitely variable performance control – single- and multi-pump systems	Glandless and glanded pumps	Δp, ±T, ΔT, t, DDC	CR system, CC system, VR system
Motor protection	Glandless pumps	–	SK 602/SK 622
Building automation	–	–	Wilo-Control

Δp = differential pressure
±T = feed/return temperature
ΔT = differential temperature
t = time

Pump performance control

Need for control

Due to the constant further development of equipment for building services and the growing sensitivity towards energy consumption, three main factors were decisive for the use of controls for heating pumps in the past.

1. Optimisation of functions
Adjustment of the flow rate/heat volume flow to requirements, particularly to stabilise hydraulic conditions and to reduce circulation losses.

2. Economic efficiency
Reduction of the electricity consumption and operating costs, particularly during partial or low-load operation (i.e. for more than 80% of the operating time).

3. Comfort
Avoiding system noise, in particular flow noise and noise in the thermostatic valves.
In the context of reducing CO_2 emissions and environmental issues, saving electricity plays an ever more important role. It is widely known that generating power from fossil fuels produces significant levels of CO_2 emissions. In Germany, engineers use the calculation principle that one kWh of electricity generated in a power station produces about 0.56 kg of CO_2 in the form of emissions.
The decisive factor for concentrating studies on pumps in particular is their proportionally high share of power consumption in the context of the energy balance of buildings. The causes for this are the high levels of operating hours as well as the familiar phenomenon of over-dimensioning heating pumps during the planning stage, factors which considerably add to the energy balance. Over-dimensioning by a factor of 2 to 5 times is quite frequent.

Single-family house	Large building
Pumps account for 10 –15% of the overall power consumption, because...	Pumps account for 5 – 8% of the overall power consumption
- There are two to four pumps (heating/secondary hot water circulation/accumulator charging, etc.), each pump with about 1500 h to 5000 h operating time per year (depending on the application), i.e. with three pumps on average: - 3 x 65 W x approx. 3500 a/h = **approx. 700 kWh/a** - By comparison: average, statistical total power consumption for a single-family house = **approx. 5000 to 8000 kWh**	

Pump performance control by speed variation

Of the many methods developed and tried in the past to automatically adjust the heating pump output to actual load demands, among them mechanical/hydraulic processes (bypass/throttling circuits etc.), the method of speed control has established itself on a lasting basis. Particularly high efficiency and easy handling have ensured the dominance of speed control, since ideally, the performance parameters volume flow, pressure difference and output directly relate to changes of speed.

$n_1/n_2 = Q_1/Q_2 \quad (n_1/n_2)2 = H_1/H_2 \quad (n_1/n_2)3 = P_1/P_2$

For example, when the speed is doubled, the volume flow is increased by a factor of two and the delivery head by a factor of 4 while the input power must be about 7 to 8 times greater.

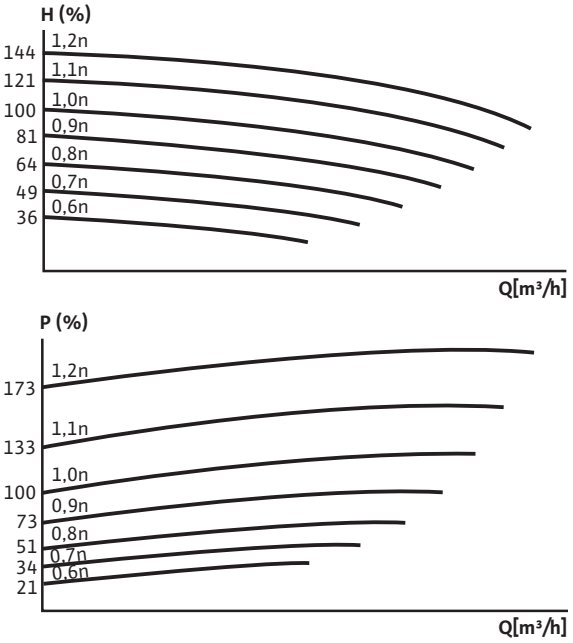


Fig.: Pump curves of a pump during operation at different speeds

Subject to change 09/2008 WILO SE

Selection guide (single pumps)

Wilo pump type	Function: ON/OFF Wilo-SR-/SK system, Time-dependent, 1~	Function: ON/OFF Wilo-SR-/SK system, Time-dependent, 3~
	WM	
TOP-S 25/5	SK 601	
TOP-S 25/7		
TOP-S 25/10	SK 601 + SK 602	
TOP-S 25/13	SK 601	
TOP-S 30/4		
TOP-S 30/5		
TOP-S 30/7		
TOP-S 30/10	SK 601 + SK 602	
TOP-S 40/4	SK 601	
TOP-S 40/7	SK 601 + SK 602	
TOP-S 40/10	SK 601 + SK 602	
TOP-S 40/15	SK 601 + SK 602	
TOP-S 50/4	SK 601 + SK 602	SK 601 + SK 602
TOP-S 50/7	SK 601 + SK 602	
TOP-S 50/10	SK 601 + SK 602	
TOP-S 50/15	–	
TOP-S 65/7	SK 601 + SK 602	
TOP-S 65/10	SK 601 + SK 602	
TOP-S 65/13	–	
TOP-S 65/15	–	
TOP-S 80/7	SK 601 + SK 602	
TOP-S 80/10	–	
TOP-S 80/15	–	
TOP-S 80/20	–	
TOP-S 100/10	–	
AXL 80/25-130	–	SK 601 + SK 602

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

SK 602/SK 622 required as contactor and/or for full motor protection

Wilo pump type	Function: ON/OFF Wilo-SR-/SK system, Time-dependent, 1~	Function: ON/OFF Wilo-SR-/SK system, Time-dependent, 3~
	WM	
TOP-RL 25/7.5	SK 601	
TOP-RL 30/4	SK 601	
TOP-RL 30/6.5	SK 601	
TOP-RL 30/7.5	SK 601	–
TOP-RL 40/4	SK 601	
SE 110-N	SK 601	
SE 125-N	SK 601	
SE 150-N	SK 601	
SE 200-N	SK 601	
Star-RS 15/4	SK 601	
Star-RS 15/6	SK 601	
Star-RS 25/2	SK 601	
Star-RS 25/4	SK 601	
Star-RS 25/6	SK 601	–
Star-RS 25/7	SK 601	
Star-RS 25/8	SK 601	
Star-RS 30/2	SK 601	
Star-RS 30/4	SK 601	
Star-RS 30/6	SK 601	
Star-RS 30/7	SK 601	
Star-RS 30/8	SK 601	
TOP-D 30/40/50	SK 601	SK 601 + SK 602
TOP-D 65/80/100/125	SK 601 + SK 602	SK 601 + SK 602
Star-Z 15	SK 601	–
Star-Z 20/1	S1R-h	

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

SK 602/SK 622 required as contactor and/or for full motor protection

Selection guide (single pumps)

	Function	
	ON/OFF Wilo-SR-/SK system	
	Time-dependent	
	1~	3~
Wilo pump type	WM	
Star-Z 25/2	S1R-h	SK 601 + SK 602
TOP-Z 20/4	SK 601	
TOP-Z 25/6	SK 601	
TOP-Z 25/10	SK 601 + SK 602	
TOP-Z 30/7	SK 601	
TOP-Z 30/10	SK 601 + SK 602	
TOP-Z 40/7	SK 601 + SK 602	
TOP-Z 50/7, 65/10, 80/10	–	

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

SK 602/SK 622 required as contactor and/or for full motor protection

Subject to change 09/2008 WILO SE

Selection guide (single pumps)

	Function				
	Infinitely variable speed control of Wilo-CR systems				
		Manual control mode	Differential pressure (Δp)		Temperature
			Δp-c		
	Basic device	DDC	Δp-v / Δp-q [1]	Signal transmitter	±T ΔT
	3~			DDG [3]	
Wilo pump type	WM or SE				
TOP-S 25/5	–	–	–	–	–
TOP-S 25/7					
TOP-S 25/10	CR 1.1-1	DDC board	Basic equipment	10	Temperature board
TOP-S 25/13	–	–	–	–	–
TOP-S 30/4	–	–	–	–	–
TOP-S 30/5					
TOP-S 30/7					
TOP-S 30/10	CR 1.1–1	DDC board	Basic equipment	10	Temperature board [2]
TOP-S 40/4	–			–	
TOP-S 40/7	CR 1.1–1			10	
TOP-S 40/10					
TOP-S 40/15	CR 2.2-1			20	
TOP-S 50/4	CR 1.1–1			10	
TOP-S 50/7					
TOP-S 50/10					
TOP-S 50/15	CR 2.2-1			20	
TOP-S 65/7	CR 1.1–1			10	
TOP-S 65/10	CR 1.1–1			10	
TOP-S 65/13	CR 2.2-1			20	
TOP-S 65/15	CR 2.2-1			20	
TOP-S 80/7	CR 1.1–1			10	
TOP-S 80/10	CR 2.2-1			10	
TOP-S 80/15	CR 2.2-1			20	
TOP-S 80/20	CR 3.0–1			20	
TOP-S 100/10	CR 2.2-1			10	
AXL 80/25-130	–	–	–	–	–

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

1) The required volume flow transmitter is to be provided by customer
2 The temperature board is to be ordered separately as required:
KTY 10 temperature board: TSG temperature sensor part of the scope of delivery
PT 100 temperature board: Temperature sensor provided by the customer
3) DDG signal transmitter to be ordered separately (specify measurement range)

Selection guide (single pumps)

	Function				
	Infinitely variable speed control of Wilo-CR systems				
		Manual control mode	Differential pressure (Δp)		Temperature
			Δp-c		
	Basic device	DDC	Δp-v / Δp-q [1]	Signal transmitter	±T ΔT
	3~			DDG [3]	
Wilo pump type	WM or SE				
TOP-RL 25/7.5	–	–	–	–	–
TOP-RL 30/4					
TOP-RL 30/6.5					
TOP-RL 30/7.5					
TOP-RL 40/4					
SE 110-N	–	–	–	–	–
SE 125-N					
SE 150-N					
SE 200-N					
Star-RS 15/4	–	–	–	–	–
Star-RS 15/6					
Star-RS 25/2					
Star-RS 25/4					
Star-RS 25/6					
Star-RS 25/7					
Star-RS 25/8					
Star-RS 30/2					
Star-RS 30/4					
Star-RS 30/6					
Star-RS 30/7					
Star-RS 30/8					
TOP-D 30/40/50	–	–	–	–	–
TOP-D 65/80/100/125					

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

1) The required volume flow transmitter is to be provided by customer
2 The temperature board is to be ordered separately as required:
KTY 10 temperature board: TSG temperature sensor part of the scope of delivery
PT 100 temperature board: Temperature sensor provided by the customer
3) DDG signal transmitter to be ordered separately (specify measurement range)

Selection guide (single pumps)

	Function				
	Infinitely variable speed control of Wilo-CR systems				
		Manual control mode	Differential pressure (Δp)		Temperature
			Δp-c		
	Basic device	DDC	Δp-v / Δp-q [1]	Signal transmitter	±T ΔT
	3~			DDG [3]	
Wilo pump type	WM or SE				
Star-Z 15	–	–	–	–	–
Star-Z 20/1					
Star-Z 25/2					
TOP-Z 20/4					
TOP-Z 25/6					
TOP-Z 25/10					
TOP-Z 30/7					
TOP-Z 30/10					
TOP-Z 40/7					
TOP-Z 50/7, 65/10, TOP-Z 80/10					

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

1) The required volume flow transmitter is to be provided by customer
2 The temperature board is to be ordered separately as required:
KTY 10 temperature board: TSG temperature sensor part of the scope of delivery
PT 100 temperature board: Temperature sensor provided by the customer
3) DDG signal transmitter to be ordered separately (specify measurement range)

Selection guide (single pumps)

	Function				
	Infinitely variable speed control, Wilo-CC system				
		Manual control mode	Differential pressure (Δp)		Temperature
			Δp-c		
	Basic device	DDC	Δp-v [1]	Signal transmitter	±T ΔT
	3~			DDG 3)	
Wilo pump type	WM				
TOP-S 25/5	–	–	–	–	–
TOP-S 25/7					
TOP-S 25/10	CC-HVAC 1x1.1 FC	Basic equipment	Basic equipment	10	Temperature module PT 100
TOP-S 30/4	–	–	–	–	–
TOP-S 30/5					
TOP-S 30/7					
TOP-S 30/10	CC-HVAC 1x1.1 FC	Basic equipment	Basic equipment	10	Temperature module PT 100 [2]
TOP-S 40/4	–			–	
TOP-S 40/7	CC-HVAC 1x1.1 FC			10	
TOP-S 40/10				10	
TOP-S 40/15	CC-HVAC 1x1.1 FC			20	
TOP-S 50/4	CC-HVAC 1x1.1 FC			10	
TOP-S 50/7				10	
TOP-S 50/10				10	
TOP-S 50/15	CC-HVAC 1x2.2 FC			20	
TOP-S 65/7	CC-HVAC 1x1.1 FC			10	
TOP-S 65/10	CC-HVAC 1x1.1 FC			10	
TOP-S 65/13	CC-HVAC 1x2.2 FC			20	
TOP-S 65/15	CC-HVAC 1x2.2 FC			20	
TOP-S 80/7	CC-HVAC 1x1.1 FC			10	
TOP-S 80/10	CC-HVAC 1x2.2 FC			10	
TOP-S 80/15	CC-HVAC 1x2.2 FC			20	
TOP-S 80/20	CC-HVAC 1x3.0 FC			20	
TOP-S 100/10	CC-HVAC 1x2.2 FC			10	

WM = wall-mounted installation
3~= three-phase motor
1~= single-phase motor

1) The required volume flow transmitter is to be provided by the customer
2) Temperature module PT 100 is to be ordered separately if required, the temperature sensor is to be provided by the customer
3) Signal transmitter DDG is to be ordered separately (specify measurement range)

Selection guide (single pumps)

	Function				
	Infinitely variable speed control, Wilo-CC system				
		Manual control mode	Differential pressure (Δp)		Temperature
			Δp-c		
	Basic device	DDC	Δp-v [1]	Signal transmitter	±T ΔT
	3~			DDG 3)	
Wilo pump type	WM				
Star-RS 25/2	–	–	–	–	–
Star-RS 25/4					
Star-RS 25/6					
Star-RS 30/2					
Star-RS 30/4					
Star-RS 30/6					
TOP-D 30/40/50	–	–	–	–	–
TOP-D 65/80/100/125					
Star-Z 15	–	–	–	–	–
Star-Z 20/1					
Star-Z 25/2					
TOP-Z 20/4					
TOP-Z 25/6					
TOP-Z 25/10					
TOP-Z 30/7					
TOP-Z 30/10					
TOP-Z 40/7					
TOP-Z 50/7, 65/10, 80/10					

WM = wall-mounted installation
3~= three-phase motor
1~= single-phase motor

1) The required volume flow transmitter is to be provided by the customer
2) Temperature module PT 100 is to be ordered separately if required, the temperature sensor is to be provided by the customer
3) Signal transmitter DDG is to be ordered separately (specify measurement range)

Selection guide (double pumps or 2 single pumps)

		Function							
		2-pump cycling or adding circuit (max./min.)							
		Wilo-SR system							
		Single-phase current (1~)				Three-phase current (3~)			
		Time-dependent	Signal transmitter			Time-dependent	Signal transmitter		
Wilo pump type		Basic device	Temperature (+T)	Differential temp. (ΔT)	Differential pressure (Δp)	Basic device	Temperature (+T)	Differential temp. (ΔT)	Differential pressure (Δp)
Double pumps	2 single pumps	1~				3~			
		WM/SE			DDM [1]	WM/SE			DDM [1]
–	2 x TOP-S 25/5	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
–	2 x TOP-S 25/7	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
–	2 x TOP-S 25/10	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	10
–	2 x TOP-S 25/13	S2R 3D	TF	DTS/SK 610	16	S2R 3D	TF	DTS/SK 610	16
–	2 x TOP-S 30/4	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 30/5	2 x TOP-S 30/5	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 32/7	2 x TOP-S 30/7	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 32/10	2 x TOP-S 30/10	S2R 3D	TF	DTS/SK 610	10	S2R 3D	TF	DTS/SK 610	10
–	2 x TOP-S 40/4	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 40/3	–	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 40/7	2 x TOP-S 40/7	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 40/10	2 x TOP-S 40/10	S2R 3D	TF	DTS/SK 610	10	S2R 3D	TF	DTS/SK 610	10
–	2 x TOP-S 50/4	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 50/7	2 x TOP-S 50/7	S2R 3D	TF	DTS/SK 610	6	S2R 3D	TF	DTS/SK 610	6
TOP-SD 50/10	2 x TOP-S 50/10	S2R 3D	TF	DTS/SK 610	10	S2R 3D	TF	DTS/SK 610	10
TOP-SD 40/15	2 x TOP-S 40/15	S2R 3D	TF	DTS/SK 610	16	S2R 3D	TF	DTS/SK 610	16
TOP-SD 50/15	2 x TOP-S 50/15	–	–	–	–	S2R 3D	TF	DTS/SK 610	16
–	2 x TOP-S 65/7	S2R 3D	TF	DTS/SK 610	10	S2R 3D	TF	DTS/SK 610	10
TOP-SD 65/10	2 x TOP-S 65/10	S2R 3D	TF	DTS/SK 610	10	S2R 3D	TF	DTS/SK 610	10
TOP-SD 65/13	2 x TOP-S 65/13	–	–	–	–	S2R 3D	TF	DTS/SK 610	16
TOP-SD 65/15	2 x TOP-S 65/15								
TOP-SD 80/7 (only 1~)	2 x TOP-S 80/7	S2R 3D	TF	DTS/SK 610	10	S2R 3D	TF	DTS/SK 610	10

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

Basic device + signal transmitter/load module as required (order separately)

1) Specify measurement range for DDM transmitter

Selection guide (double pumps or 2 single pumps)

		Function							
		2-pump cycling or adding circuit (max./min.)							
		Wilo-SR system							
		Single-phase current (1~)				Three-phase current (3~)			
		Time-dependent	Signal transmitter			Time-dependent	Signal transmitter		
Wilo pump type		Basic device	Temperature (+T)	Differential temp. (ΔT)	Differential pressure (Δp)	Basic device	Temperature (+T)	Differential temp. (ΔT)	Differential pressure (Δp)
Double pumps	2 single pumps	1~				3~			
		WM/SE			DDM [1]	WM/SE			DDM [1]
TOP-SD 80/10	2 x TOP-S 80/10	–	–	–	–	S2R 3D	TF	DTS/SK 610	10
TOP-SD 80/15	2 x TOP-S 80/15								16
TOP-SD 80/20	2 x TOP-S 80/20								25
–	2 x TOP-S 100/10								10
–	2 x AXL 80/25-130	–	–	–	–	S2R 3D	TF	DTS/SK 610	6
–	2 x TOP-RL 25/7.5	S2R 3D	TF	DTS/SK 610	10	–	–	–	–
–	2 x TOP-RL 30/4	S2R 3D	TF	DTS/SK 610	6				
–	2 x TOP-RL 30/6.5	S2R 3D	TF	DTS/SK 610	10				
–	2 x TOP-RL 30/7.5	S2R 3D	TF	DTS/SK 610	10	–	–	–	–
–	2 x TOP-RL 40/4	S2R 3D	TF	DTS/SK 610	6				
–	2 x SE 110-N	S2R 3D	TF	DTS/SK 610	6	–	–	–	–
SE 125-N-TW	2 x SE 125-N	S2R 3D	TF	DTS/SK 610	6				
SE 150-N-TW	2 x SE 150-N	S2R 3D	TF	DTS/SK 610	6				
SE 200-N-TW	2 x SE 200-N	S2R 3D	TF	DTS/SK 610	10				

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Basic device + signal transmitter/load module as required (order separately)

1) Specify measurement range for DDM transmitter

Selection guide (double pumps or 2 single pumps)

Wilo pump type		Function							
		2-pump cycling or adding circuit (max./min.)							
		Wilo-SR system							
		Single-phase current (1~)				Three-phase current (3~)			
		Time-dependent	Signal transmitter			Time-dependent	Signal transmitter		
		Basic device	Temperature (+T)	Differential temp. (ΔT)	Differential pressure (Δp)	Basic device	Temperature (+T)	Differential temp. (ΔT)	Differential pressure (Δp)
Double pumps	2 single pumps	1~				3~			
		WM/SE			DDM [1]	WM/SE			DDM [1]
–	2 x Star-RS 15/4	S2R 3D	–	–	–	–	–	–	–
–	2 x Star-RS 15/6	S2R 3D							
–	2 x Star-RS 25/2	S2R 3D							
–	2 x Star-RS 25/4	S2R 3D							
–	2 x Star-RS 25/6	S2R 3D							
–	2 x Star-RS 25/7	S2R 3D							
–	2 x Star-RS 25/8	S2R 3D							
–	2 x Star-RS 30/2	S2R 3D							
Star-RSD 30/4	2 x Star-RS 30/4	S2R 3D							
Star-RSD 30/6	2 x Star-RS 30/6	S2R 3D							
–	2 x Star-RS 30/7	S2R 3D							
–	2 x Star-RS 30/8	S2R 3D							

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~ = three-phase motor
1~ = single-phase motor

Basic device + signal transmitter/load module as required (order separately)

1) Specify measurement range for DDM transmitter

Subject to change 09/2008 WILO SE

Selection guide (double pumps or 2 single pumps)

		Function				
		Infinitely variable speed control				
		Wilo-CR system				
			Manual control mode	Differential pressure (Δp)		Temperature
				Δp-c		
Wilo pump type		Basic device	DDC	Δp-v / Δp-q [1]	Signal transmitter	±T ΔT
Double pumps	2 single pumps	3~ WM or SE			DDG [3]	
–	2 x TOP-S 25/5	–	–	–	–	–
–	2 x TOP-S 25/7	–	–	–	–	–
–	2 x TOP-S 25/10	CR 1.1 – 2	DDC board	Basic equipment	10	Temperature board [2]
–	2 x TOP-S 25/13	–	–	–	–	–
–	2 x TOP-S 30/4	–	–	–	–	–
TOP-SD 30/5	2 x TOP-S 30/5	–	–	–	–	–
TOP-SD 32/7	2 x TOP-S 30/7	–	–	–	–	–
TOP-SD 32/10	2 x TOP-S 30/10	CR 1.1 – 2	DDC board	Basic equipment	10	Temperature board [2]
–	2 x TOP-S 40/4	–	–	–	–	–

WM = wall-mounted installation
SE = switch cabinet installation
WM/SE = wall-mounted or switch cabinet installation
3~= three-phase motor
1~= single-phase motor

[1] The required volume flow transmitter is to be provided by customer
[2] The temperature board is to be ordered separately as required:
KTY 10 temperature board: TSG temperature sensor part of the scope of delivery
PT 100 temperature board: Temperature sensor provided by the customer
[3] DDG signal transmitter is to be ordered separately (specify measurement range)

Selection guide (double pumps or 2 single pumps)

		Function				
		Infinitely variable speed control				
		Wilo-CR system				
			Manual control mode	Differential pressure (Δp)		Temperature
				Δp-c		
Wilo pump type		Basic device	DDC	Δp-v / Δp-q [1]	Signal transmitter	±T ΔT
Double pumps	2 single pumps	3~ WM or SE			DDG [3]	
TOP-SD 40/3	–	CR 1.1 – 2	DDC board	Basic equipment	10	Temperature board [2]
TOP-SD 40/7	2 x TOP-S 40/7	CR 1.1 – 2			10	
TOP-SD 40/10	2 x TOP-S 40/10	CR 1.1 – 2			10	
TOP-SD 40/15	2 x TOP-S 40/15	CR 2.2 – 2			20	
–	2 x TOP-S 50/4	CR 1.1 – 2			10	
TOP-SD 50/7	2 x TOP-S 50/7	CR 1.1 – 2			10	
TOP-SD 50/10	2 x TOP-S 50/10	CR 1.1 – 2			10	
TOP-SD 50/15	2 x TOP-S 50/15	CR 2.2 – 2			20	
–	2 x TOP-S 65/7	CR 1.1 – 2			10	
TOP-SD 65/10	2 x TOP-S 65/10	CR 1.1 – 2			10	
TOP-SD 65/13	2 x TOP-S 65/13	CR 2.2 – 2			20	
TOP-SD 65/15	2 x TOP-S 65/15	CR 2.2 – 2			20	
–	2 x TOP-S 80/7	CR 1.1 – 2			10	
TOP-SD 80/10	2 x TOP-S 80/10	CR 2.2 – 2			10	
TOP-SD 80/15	2 x TOP-S 80/15	CR 2.2 – 2			20	
TOP-SD 80/20	2 x TOP-S 80/20	CR 3.0 – 2			20	
–	2 x TOP-S 100/10	CR 2.2 – 2			10	
–	2 x AXL 80/25-130	–	–	–	–	–
–	2 x TOP-RL 25/7.5	–	–	–	–	–
–	2 x TOP-RL 30/4					
–	2 x TOP-RL 30/6.5					
–	2 x TOP-RL 30/7.5					
–	2 x TOP-RL 40/4					

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PT 100 temperature board: Temperature sensor provided by the customer
[3] DDG signal transmitter is to be ordered separately (specify measurement range)

Selection guide (double pumps or 2 single pumps)

		Function				
		Infinitely variable speed control				
		Wilo-CR system				
			Manual control mode	Differential pressure (Δp)		Temperature
				Δp-c		
Wilo pump type		Basic device	DDC	Δp-v / Δp-q [1]	Signal transmitter	±T ΔT
Double pumps	2 single pumps	3~ WM or SE			DDG [3]	
–	2 x SE 110-N	–	–	–	–	–
SE 125 N-TW	2 x SE 125-N					
SE 150 N-TW	2 x SE 150-N					
SE 200 N-TW	2 x SE 200-N					
–	2 x Star-RS 15/4	–	–	–	–	–
–	2 x Star-RS 15/6					
–	2 x Star-RS 25/2					
–	2 x Star-RS 25/4					
–	2 x Star-RS 25/6					
–	2 x Star-RS 25/7					
–	2 x Star-RS 25/8					
–	2 x Star-RS 30/2					
Star-RSD 30/4	2 x Star-RS 30/4					
Star-RSD 30/6	2 x Star-RS 30/6					
–	2 x Star-RS 30/7					
–	2 x Star-RS 30/8					

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Selection guide (double pumps or 2 single pumps)

		Function				
		Infinitely variable speed control				
		Wilo-CC system				
			Manual control mode	Differential pressure (Δp)		Temperature
				Δp-c		
Wilo pump type		Basic device	DDC	Δp-v[1]	Signal transmitter	±T ΔT
Double pumps	2 single pumps	3~ WM			DDG[3]	
–	2 x TOP-S 25/5	–	–	–	–	–
–	2 x TOP-S 25/7	–	–	–	–	–
–	2 x TOP-S 25/10	CC-HVAC 2 x 1.1 FC	Basic equipment	Basic equipment	10	Temperature module, PT 100 [2]
–	2 x TOP-S 30/4	–	–	–	–	–
TOP-SD 30/5	2 x TOP-S 30/5	–	–	–	–	–
TOP-SD 32/7	2 x TOP-S 30/7	–	–	–	–	–
–	2 x TOP-S 30/10	CC-HVAC 2 x 1.1 FC	Basic equipment	Basic equipment	10	Temperature module, PT 100 [2]
–	2 x TOP-S 40/4	–	–	–	–	–
TOP-SD 40/3	2 x TOP-S 40/7	CC-HVAC 2 x 1.1 FC	Basic equipment	Basic equipment	10	Temperature module, PT 100 [2]
TOP-SD 40/7	2 x TOP-S 40/7	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 40/10	2 x TOP-S 40/10	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 40/15	2 x TOP-S 40/15	CC-HVAC 2 x 1.1 FC			20	
–	2 x TOP-S 50/4	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 50/7	2 x TOP-S 50/7	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 50/10	2 x TOP-S 50/10	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 50/15	2 x TOP-S 50/15	CC-HVAC 2 x 2.2 FC			20	
–	2 x TOP-S 65/7	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 65/10	2 x TOP-S 65/10	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 65/13	2 x TOP-S 65/13	CC-HVAC 2 x 2.2 FC			20	
TOP-SD 65/15	2 x TOP-S 65/15	CC-HVAC 2 x 2.2 FC			20	
–	2 x TOP-S 80/7	CC-HVAC 2 x 1.1 FC			10	
TOP-SD 80/10	2 x TOP-S 80/10	CC-HVAC 2 x 2.2 FC			10	
TOP-SD 80/15	2 x TOP-S 80/15	CC-HVAC 2 x 2.2 FC			20	
TOP-SD 80/20	2 x TOP-S 80/20	CC-HVAC 2 x 3.0 FC			20	
–	2 x TOP-S 100/10	CC-HVAC 2 x 2.2 FC			10	

WM = wall-mounted installation
3~ = three-phase motor
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[1] The required volume flow transmitter is to be provided by the customer
[2] Temperature module PT 100 is to be ordered separately if required, the temperature sensor is to be provided by the customer
[3] DDG signal transmitter is to be ordered separately (specify measurement range)

Selection guide (double pumps or 2 single pumps)

		Function				
		Infinitely variable speed control				
		Wilo-CC system				
			Manual control mode	Differential pressure (Δp)		Temperature
				Δp-c		
Wilo pump type		Basic device	DDC	Δp-v[1)]	Signal transmitter	±T ΔT
Double pumps	2 single pumps	3~ WM			DDG[3)]	
–	2 x Star-RS 25/2 r	–	–	–	–	–
–	2 x Star-RS 25/4 r					
–	2 x Star-RS 25/6 r					
–	2 x Star-RS 30/2 r					
Star-RSD 30/4	2 x Star-RS 30/4 r					
Star-RSD 30/6	2 x Star-RS 30/6 r					

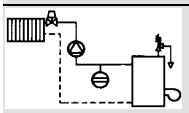
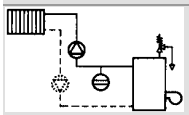
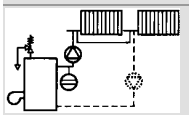
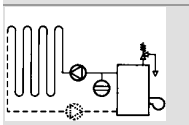
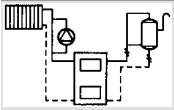
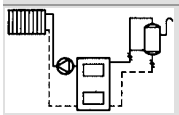
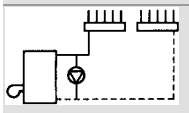
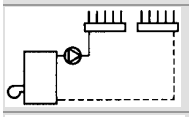
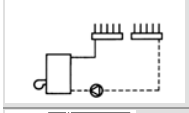
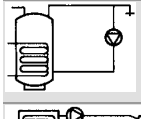
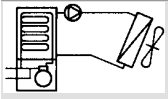
WM = wall-mounted installation
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[1)]The required volume flow transmitter is to be provided by the customer
[2)]Temperature module PT 100 is to be ordered separately if required, the temperature sensor is to be provided by the customer
[3)]DDG signal transmitter is to be ordered separately (specify measurement range)

Switchgears and control devices

Planning guide

Selection guide

Control function		Time		Temperature			Differential temperature			Differential pressure				Differential pressure with temperature control	
		h		T			ΔT			Δp				Feed	Return
Switchgear/control device type Pipe system Application/operating mode		Wilo-SK 601	Wilo-S1R-h	Wilo-S2R3D	Wilo-CC-HVAC...	Wilo-CR...	Wilo-S2R 3D	Wilo-CC-HVAC...	Wilo-CR....	Wilo-S2R 3D	Wilo-CC-HVAC...	Wilo-CR....	Wilo-VR....	Wilo-Stratos... Wilo-TOP-E...	
	2-pipe system with thermostatic valves	•	–	–	–	–	–	–	–	•	•	•	•	•	•
	2-pipe system with manual control valves	•	–	•	•	•	–	–	–	–	–	–	–	–	•
	1-pipe system with room heating areas	•	–	•	•	•	–	–	–	–	–	–	–	–	•
	1-pipe system with panel heating	•	–	•	•	•	–	–	–	–	–	–	–	–	•
	Partial gravity	•	–	–	–	–	–	–	–	–	–	–	–	–	–
	Open system	•	–	–	–	–	–	–	–	–	–	–	–	–	–
	Boiler admixture for – minimum return temperature – minimum volume flow	•	•	•	•	•	–	–	–	–	–	–	–	–	–
	Primary circuit	–	–	–	–	–	•	•	•	•	•	•	•	–	–
	Primary circuit with condensing boiler	–	–	•	•	•	–	•	•	–	–	–	–	–	•
	Secondary hot water circulation	•	•	–	–	–	–	–	–	–	–	–	–	–	–
	Ventilation/air-conditioning systems	–	–	•	•	•	•	•	•	–	–	–	–	–	–

This selection guide applies to installation systems which are designed according to the German Heating Installation Regulation (HeizAnlV) and the German Energy Savings Ordinance (EnEV).

Series description, Wilo-S1R-h



Time switching for secondary hot water circulation pumps
For the pump types Star-Z 20/1 and Star-Z 25/2 EM
- Time-dependent ON/OFF switch for secondary hot water circulation pumps
- 24h clock timer (1/4h cycle) switches the pump ON/OFF at preset operating times
- Fixed-speed version
- Special version for day/week programme and battery backup, with digital display: Type S1R-h S

Designation key:
Example: Wilo-S1R-h
S Switchgear
1 Switch
ON/OFF
R Automatic control
h Type of control time h

Installation
Safe-to-use plug-in technology enables unproblematic automation of pump performance adjustment according to requirements for both initial installation and retrofitting.
Basic plug-in module can be replaced according to the sequence displayed below.
No separate electrical connection required!

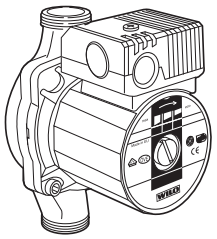


Fig.: Pump with standard module

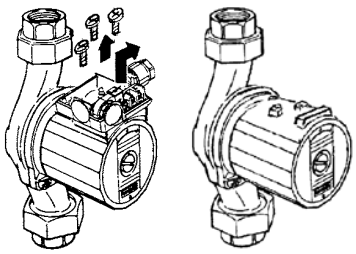


Fig.: Dismantling of the standard module

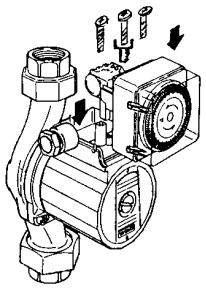


Fig.: Installation of the time module S1R-h

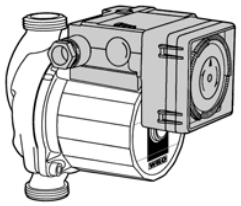


Fig.: Modules completely exchanged

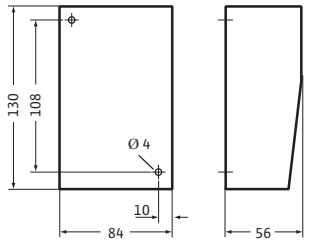
Series description, Wilo-SK 601



For wall-mounted installation for the automatic, time-dependent activation/deactivation of Wilo single pumps with single-phase or three-phase motor.

Switching function

- Automatic time-dependent activation/deactivation via clock timer at adjustable times (every ¼ hour).
- Parallel control of several pumps up to maximum rating is possible. Clock timer in special version with day/week programme and battery backup (120 hours)



Dimensions in mm
Fixation elements provided by the customer

Technical data

Operating voltage:	230 V/50 Hz
Protection class:	IP 31
Rating:	max. 10 A
Power dissipation:	1.7 W
Maximum ambient temp.:	40 °C
Weight:	0.25 kg

Direct connection for alternating current (EM) without thermal winding contacts (WSK). For three-phase or single-phase current with WSK, only in combination with SK 602 or contactor.

Connecting cable (provided by customer)

Mains –>	SK 601 –> pump EM: 3 x 1.5 mm^2 (10 A slow-blow)
Mains –>	SK 602 EM: 3 x 1.5 mm^2 (16 A slow-blow) DM: 5 x 1.5 mm^2 (16 A slow-blow)
SK 602 –>	SK 601 EM/DM: 4 x 1.5 mm^2
SK 602 –>	Pump EM with WSK: 5 x 1.5 mm^2 DM with WSK: 7 x 1.5 mm^2 DM without WSK: 4 x 1.5 mm^2

Series description Wilo-S2R 3D



For wall-mounted/switch cabinet door installation for:
- Automatic time-dependent or fault-sensitive switching (main/standby mode) of glandless or glanded double pumps or 2 single pumps with single-phase or three-phase motor up to 3 kW nominal motor power
- Automatic time-dependent or load-sensitive 2-stage control of glandless double pumps or 2 single pumps

Main switching functions

- Time-dependent or fault-dependent switchover of double pumps, optionally:
  - Switching between main and standby pumps.
  - Activation and deactivation of the peak-load pump (parallel operation), time-dependent only.
- Time-dependent control of glandless double pumps:
  - 2-stage switching from pump I to pump II with pre-selected, different speed stages including fault switchover.
  - Activation and deactivation of the peak-load pump (parallel operation) with manual pre-selection at the switchgear.
- Load-sensitive control of glandless double pumps, optionally:
  - 2-stage switching from pump I to pump II with preselected, different speed stages with time-dependent overriding switchover to the low-load pump including fault switchover.
  - Activation and deactivation of the peak-load pump (parallel operation) with manual pre-selection at the switchgear, with time-dependent overriding switchover to the base-load pump.
    Control by additional **external signal transmitter**, optionally according to:
  - The feed temperature (T), TF type.
  - The differential temperature (ΔT) between feed and return pipe, DTS/SK 610 type.
  - The differential pump pressure (Δ p), DDM type.

Additionally:

- Overriding activation and deactivation by external switch provided by the customer (e.g. mixing motor limit switch, etc.).
- Potential-free run and fault signals.
- Ext. single run and fault signals with S2R 3D signal card (additional charge).

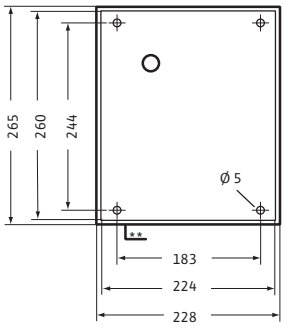
Technical data

Operating voltage:	1~230/3~400 V/ 50 Hz
Control voltage:	24 V =
Maximum connected load:	2 x 3 kW (3~400 V)
Protection class:	IP 41
Maximum ambient temp.:	40 °C
Weight:	2.2 kg

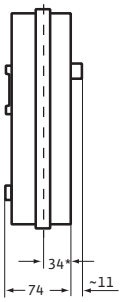
Connecting cable (provided by the customer)

Mains –>	S2R 3D (16 A slow-blow)	
	EM: 3 x 1.5 mm2	
	DM: 5 x 1.5 mm2	
S2R 3D –>	2 pumps	
	EM with WSK:	5 x 1.5 mm^2
	DM with WSK:	7 x 1.5 mm^2
	EM without WSK:	3 x 1.5 mm^2
	DM without WSK:	4 x 1.5 mm^2
S2R 3D –>	Sensor	
	TF:	3 x 1.5 mm^2
	DTS/SK 610:	Cable included in the scope of delivery of the signal transmitter
	DDM:	Cable included in the scope of delivery of the signal transmitter
S2R 3D –>	Ext. On/Off	2 x 1.5 mm^2

Dimension drawing



** Required clearance
for cable outlet: 80 mm



(Dimensions in mm)
* Projecting part
with cabinet installation

Series description Wilo-S2R 3D

Wilo-SR signal cards for remote signal	
Potential-free contacts	S2R 3D
SBM collective run signal	•
SSM collective fault signal	•
Individual run signal, pumps I + II	o
Individual fault signal, pumps I + II	o
Speed stage signal, duty pump	–

• Series (included in the switchgear)
o Signal card (functions on one card)

SR signal cards

SR signal cards for extending the device's internal potential-free connections according to the table.
Onsite wiring to the primary control unit. Fixation of the signal card in the SR device with connection via 10-pin flat-cable plug.

Technical data

Contact load: 250 V~/1 A
Connection cable: Max. 100 m length
Cable cross-section: as required up to 1.5 mm^2

Device assignment and equipment Wilo-S2R 3D

Device equipment		Device assignment				
		Single pump		Double pump optionally main/standby or peak-load activation		
		On/Off		2 stages		
		⏲	⏲	Time-dependent		
		Time-dependent for C pump	Time-dependent	Differential pressure-dependent Δp	Temperature-dependent T	Differential temperature-dependent ΔT
Switchgear		S1R-h	SK 601	S2R 3D		
Auxiliary load module (optional – required for function)		–	–	–	–	–
Auxiliary signal transmitter		–	–	DDM o	TF o	DTS o
Motor assignment	Single-phase current with built-in capacitor	•	–	–		
	Single-phase current, blocking current-proof	–	•	–		
	Single-phase current, WSK	–	•[1)]	•		
	Three-phase current, blocking current-proof	–	•[1)]	–		
	Three-phase current, WSK, SSM	–	•[1)]	•		
Installation	Wall-mounted installation, direct	–	•	•		
	Cabinet-door installation	–	–	•		
	Integrated pump installation – plug-in module	•	–	–		
Equipment						
Main switch 0 – 1		–	•	–		
Selection switch ⏲ – infinitely variable		–	•	–		
Pre-selector switch, maximum speed stage		–	–	–		
Control switch ✋ – 0 – Automatic		–	–	–		
Control switch ✋ II – ✋ I – 0 – ⏲ -Reserve I/II – ⏲ Addition I + II		–	–	•		
Clock timer with day programme On/Off (¼-hourly)		•	•	–		
Clock timer with day programme Max./Min. or Automatic/Min.		–	–	•		
Clock timer with day/week programme and battery backup (120 hours)		o	o	o		
Setpoint controller [2)] (Δp – T – ΔT) in the scope of delivery of the auxiliary module/transmitter		–	–	•	•	•
Run signal light(s)	Duty pump display.../pcs.	–	–	•2		
	Operating level display.../pcs.	–	–	–		

•Standard version
oSpecial version or auxiliary equipment (at additional charge)

[1)] + SK 602
[2)] Included in the scope of delivery of the auxiliary transmitter or the auxiliary module
[3)] Special plug, type C or E
[4)] Clock setting must be corrected in event of a power failure lasting more than 15 minutes
[5)] Protection class of the entire switch cabinet applies to switch cabinet installation

Device assignment and equipment Wilo-S2R 3D

Device equipment	Device assignment				
	Single pump		Double pump optionally main/standby or peak-load activation		
	On/Off		2 stages		
	⏲	⏲	Time-dependent		
	Time-dependent for C pump	Time-dependent	Differential pressure-dependent Δp	Temperature-dependent T	Differential temperature-dependent ΔT
Switchgear	**S1R-h**	**SK 601**	**S2R 3D**		
Fault signal light	–	–	•		
Pump connecting cable with special plug [3] 3 m.../plug type	–	–	provided by the customer		
Pump connecting cable with special plug [3] 10 m.../plug type	–	–	–		
Connected temperature sensors each with 5 m cable [2]	–	–	–	–	•2
Connected control cable 3 m/5 m [2]	–	–	•	–	•
Fault pump switchover	–	–	•		
Double pump duty switching	–	–	•		
Double pump adding circuit for peak-load operation	–	–	•		
Integrated full motor protection tripping	–	–	•		
Excess current tripping	–	–	•		
Automatic reactivation after power failure [4]	•	•	•		
Potential-free contact for external run signal	–	–	o		
Potential-free contact for external fault signal	–	–	•		
Terminals for power supply for an external signal transmitter	–	–	•		
Terminals for external activation/deactivation	–	–	•		
Signal card for external operation/speed stage indication	–	–	o		
Protection class [5]	IP 42	IP 31	IP 41		

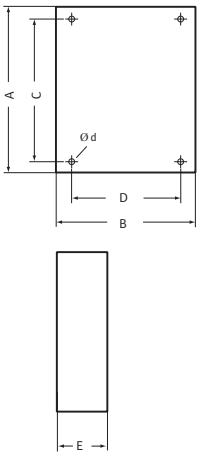
•Standard version
oSpecial version or auxiliary equipment (at additional charge)

[1] + SK 602
[2] Included in the scope of delivery of the auxiliary transmitter or the auxiliary module
[3] Special plug, type C or E
[4] Clock setting must be corrected in event of a power failure lasting more than 15 minutes
[5] Protection class of the entire switch cabinet applies to switch cabinet installation

Series description Wilo-SR system, Wilo-SD system

Switchgear series: Wilo-SD





Switchgear for wall-mounted installation for automatic control of operating and standby pumps with glanded twin units. Automatic switchover from main pump to standby pump in the event of a fault and automatically time-dependent by means of a day clock timer for regular switching of operating and standby pumps. Additional manually pre-selectable peak-load operation by time-dependent activation and deactivation of the 2nd pump. With star-delta switching for connected loads above 4 kW (for connected loads up to 3 kW, switchgear S2R 3D as described above). With motor protection switch or full thermistor protection above 11 kW.

> Main switching functions

- Switchover from glanded double pumps or 2 single pumps.
  Optionally:
  - Time-dependent duty cycling from main to standby pump.
  - Time-dependent activation and deactivation of the peak-load pump (parallel operation).

  Short-time parallel operation during duty switchover is a feature in order to avoid the flap noise normally experienced by uncontrolled pump output switchover.

- Load-sensitive control of double pumps and two single pumps
  Activation and deactivation of the peak-load pump (parallel operation) by an additional signal transmitter, optionally dependent
  - on the feed temperature (+T) signal transmitter: TF.
  - on the differential temperature (ΔT) between feed and return line, signal transmitter: DTS/SK 610.
  - on the pump differential pressure (Δp), signal transmitter: DDM.

  Time-dependent switchover to the base-load pump possible with manual switchgear pre-selection (setback operation).

> Additional switching function:
On/Off switch overriding due to onsite potential-free switch (e.g. mixing motor limit switch, etc.)

> Connection cable

S2R 3D:	–> as described above	
SD:		
SD –>	Mains 5-core (cross-section and fuse protection according to local regulations)	
SD –>	2 pumps 7-core, above 11 kW additionally 2 x 1.5 mm^2 for full motor protection (cross-section according to local regulations)	
SD –>	Sensor	
	TF:	3 x 1.5 mm^2
	DTS/SK 610:	Cable included in the scope of delivery of the signal transmitter
	DDM:	Cable included in the scope of delivery of the signal transmitter
SD –>	Ext. ON/OFF	2 x 1.5 mm^2

Series description Wilo-SR system, Wilo-SD system

Dimensions, weights

Wilo- ...	Dimensions					
	A	B	C	D	E	Ød
	[mm]					
S2R 3D	265	228	244	183	74	5
SD 5.5	750	300	722	272	175	7
SD 9	750	300	722	272	175	7
SD 18.5[1)]	900	300	872	272	175	7
SD 30[1)]	600	600	572	572	175	7
SD 37[1)]	600	600	572	572	175	7

Device assignment and equipment Wilo-S2R 3D/SD

Device equipment		Device assignment																		
		Double pump or 2 x single pumps Main/standby or peak-load switching Time-dependent ⏲ and/or																		
		Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT
Switchgear		**S2R 3D**			**SD 5.5**			**SD 9**			**SD 18.5**			**SD 30**			**SD 37**		
Auxiliary signal transmitter		DDM o	TF o	DTS o	DDM o	TF o	DTS o	DDM o	TF o	DTS o	DDM o	TF o	DTS o	DDM o	TF o	DTS o	DDM o	TF o	DTS o
Motor assignment	Three-phase current P_2 ≤ 3 kW		•			–			–			–			–			–	
	Three-phase current P_2 = 4 to 5.5 kW		–			•			–			–			–			–	
	Three-phase current P_2 = 7.5 to 9 kW		–			–			•			–			–			–	
	Three-phase current P_2 = 11 to 18.5 kW		–			–			–			•			–			–	
	Three-phase current P_2 = 22 to 30 kW		–			–			–			–			•			–	
	Three-phase current P_2 = 37 kW		–			–			–			–			–			•	
Installation	Wall-mounted installation, direct		–			•			•			•			•			•	
	Cabinet-door installation		•			–			–			–			–			–	
Equipment																				
Control switch ✋II – ✋I – 0 – ⏲ Reserve I/II – ⏲ Addition I + II			•			•			•			•			•			•	
Clock timer with day programme Max./Min. or Automatic/Min.			•			•			•			•			•			•	
Clock timer with day programme and battery backup (120 hours)			o			o			o			o			o			o	
Clock timer with week programme and battery backup (120 hours)			o			o			o			o			o			o	
Setpoint controller [3] (Δp – T – ΔT) in the scope of delivery of the auxiliary module/transmitter		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

• Standard version
o Special version or auxiliary equipment (at additional charge)

[1] Protection class of the entire switch cabinet applies to switch cabinet installation
[2] Clock setting must be corrected in event of a power failure lasting more than 15 minutes (standard version)
[3] Included in the scope of delivery of the auxiliary transmitter or the auxiliary module

Device assignment and equipment Wilo-S2R 3D/SD

Device equipment	Device assignment																	
	Double pump or 2 x single pumps Main/standby or peak-load switching Time-dependent ⏲ and/or																	
	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT
Switchgear	**S2R 3D**			**SD 5.5**			**SD 9**			**SD 18.5**			**SD 30**			**SD 37**		
Auxiliary signal transmitter	DDMo	TFo	DTSo	DDMo	TFo	DTSo	DDMo	TFo	DTSo	DDMo	TFo	DTSo	DDMo	TFo	DTSo	DDMo	TFo	DTSo
Operation run signal light(s), duty pump display.../pcs.	•2			•2			•2			•2			•2			•2		
Fault signal light	•			•			•			•			•			•		
Pump connecting cable	provided by the customer			provided by the customer			provided by the customer			provided by the customer			provided by the customer			provided by the customer		
Activation type	direct			Y/Δ			Y/Δ			Y/Δ			Y/Δ			Y/Δ		
Connected temperature sensors each with 5 m cable [3]	–	–	•2	–	–	•2	–	–	•2	–	–	•2	–	–	•2	–	–	•2
Connected control cable 3 m/5 m [3]	•	–	•	•	–	•	•	–	•	•	–	•	•	–	•	•	–	•
Fault pump switchover	•			•			•			•			•			•		
Double pump operation switchover	•			•			•			•			•			•		
Double pump adding circuit for peak-load operation	•			•			•			•			•			•		
Integrated full motor protection tripping (above 1 kW thermistor)	•			–			–			•			•			•		
Excess current tripping	–	–	•	–	–	•	–	–	•	–			–			–		
Setting range, motor protection switch	(1 - 10) A			(5.2 - 7.5) A			(9.0 - 13.0) A			–			–			–		
Automatic reactivation after power failure [2]	•			•			•			•			•			•		
Potential-free contact for external run signal	•			o			o			o			o			o		
Potential-free contact for external fault signal	•			•			•			•			•			•		
Potential-free contacts for individual run and fault signals	o			o			o			o			o			o		

• Standard version
o Special version or auxiliary equipment (at additional charge)

[1] Protection class of the entire switch cabinet applies to switch cabinet installation
[2] Clock setting must be corrected in event of a power failure lasting more than 15 minutes (standard version)
[3] Included in the scope of delivery of the auxiliary transmitter or the auxiliary module

Device assignment and equipment Wilo-S2R 3D/SD

Device equipment	Device assignment: Double pump or 2 x single pumps, Main/standby or peak-load switching, Time-dependent ⏲ and/or																			
	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT	Differential pressure-dependent Δp	Temperature-dependent +T	Differential temperature-dependent ΔT
Switchgear	**S2R 3D**			**SD 5.5**			**SD 9**			**SD 18.5**			**SD 30**			**SD 37**		
Auxiliary signal transmitter	DD Mo	TF o	DT So	DD Mo	TF o	DT So	DD Mo	TF o	DT So	DD Mo	TF o	DT So	DD Mo	TF o	DT So	DD Mo	TF o	DT So
Terminals for power supply for an external signal transmitter	•			•			•			•			•			•		
Terminals for external activation/deactivation	•			•			•			•			•			•		
Protection class [1]	IP 41			IP 54			IP 54			IP 54			IP 54			IP 54		

• Standard version
o Special version or auxiliary equipment (at additional charge)

[1] Protection class of the entire switch cabinet applies to switch cabinet installation
[2] Clock setting must be corrected in event of a power failure lasting more than 15 minutes (standard version)
[3] Included in the scope of delivery of the auxiliary transmitter or the auxiliary module

Wilo-TF, Wilo-DTS/SK 610, Wilo-DDM signal transmitter

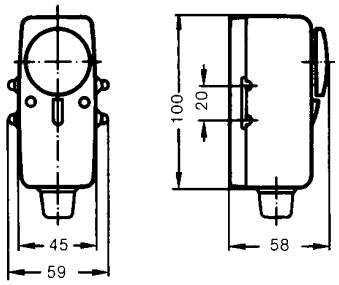
Wilo-TF signal transmitter

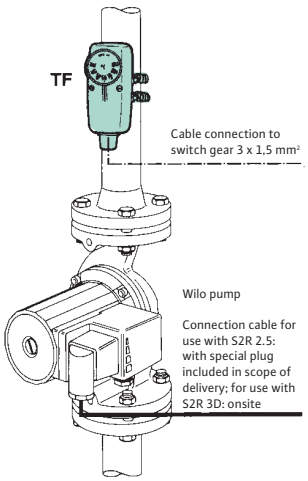


Pipe contact temperature sensor with temperature-dependent changeover contact for automatic switchover of maximum/minimum speed stages for Wilo single or double pumps with multi-speed motors in combination with the corresponding switchgears. Temperature switch with selection button including 1 spring fastener for attachment to tubes up to DN 50

Maximum operating voltage:	250 V
Contact:	Potential-free changeover contact
Maximum switching capacity:	3 A
Protection class:	IP 30
Switching range:	+30°C to +90°C
Switching difference:	5 K
Weight:	0.2 kg

Dimension drawing





Wilo-DTS/SK 610 signal transmitter

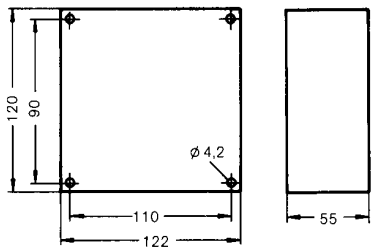


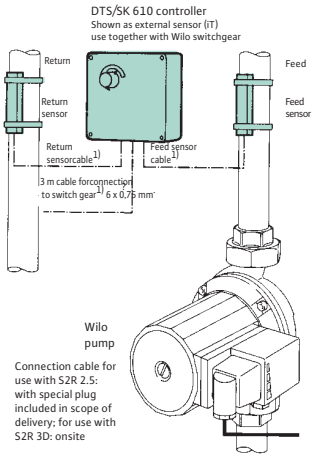
Electronic differential thermostat for the differential temperature-specific switching of max./min. speed stages for Wilo single or double pumps with multi-speed motors in combination with the corresponding Wilo switchgears.
Switchgear with selection button for differential temperature, 3 m connection cable to the main switchgear, 2 completely wired pipe contact sensors, each with 5 m cable and FEED or RETURN designation and 4 fastening straps for fixation to pipes up to DN 100.

Operating voltage:	230 V/50 Hz
Maximum connected load:	0.1 kW
Protection class:	IP 54
Protection class-differential temperature range:	+4 °C to +90 °C
Weight:	1.4 kg

Wilo-TF, Wilo-DTS/SK 610, Wilo-DDM signal transmitter

Dimension drawing





1)Included in scope of delivery of the signal transmitter

Signal transmitter, Wilo-DDM

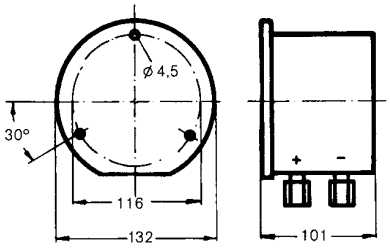


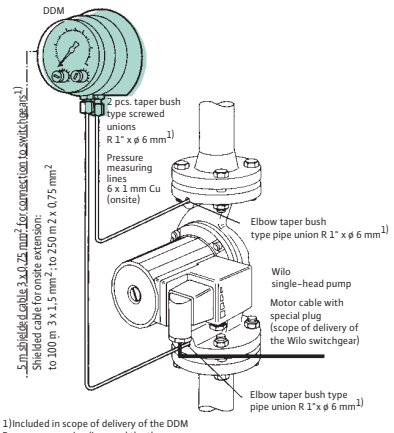
For wall-mounted installation as differential pressure contact pressure gauge. With adjustable switchpoints for automatic switchover of maximum/minimum speed stages or of the maximum to minimum speed stages with Wilo single or double pumps with multi-speed motors.
Only in conjunction with the corresponding switchgears.
Differential pressure switch with differential pressure display, adjustable maximum/minimum contacts, installed pressure surge throttling, including 5 m shielded connection cable to the switchgear, 2 cutting ring threads DIN 3862, diameter 6 mm and 2 cutting ring unions R 1/8 x 6 mm (pressure measuring lines and 3-way pressure-gauge cocks to be provided by the customer).

Maximum operating voltage:	250 V
Maximum switching capacity:	1 A
Protection class:	IP 54
Maximum pressure rating:	up to 16 bar
Weight:	1.7 kg

> Pressure measurement ranges
DDM 6: 0 to 0.6 bar
DDM 10: 0 to 1.0 bar
DDM 16: 0 to 1.6 bar
DDM 25: 0 to 2.5 bar

Dimension drawing





1)Included in scope of delivery of the DDM
Pressure measuring lines and the three-way-

Series description Wilo-SK 602, Wilo-SK 622



Wall-mounted unit for electrical connection of **single-phase and three-phase pumps with built-in thermal winding contacts (WSK)** for monitoring the winding temperature (full motor protection). Automatic reactivation of pump after power failure. After being tripped by full motor protection, the motor remains deactivated until it is unlocked manually.

Device version SK 602
Including the contactor for full motor protection tripping, ON/OFF switch, an operation run signal light, terminals for external potential-free activation/shutdown and terminal rail.

Device version SK 622
As with SK 602, but also with potential-free contacts for external run and fault messages and fault signal light.

Technical data

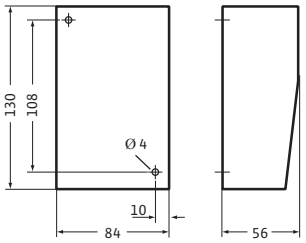
Operating voltage:	
SK 602/SK 622	1~230 V, 3~400 V
Frequency:	50 Hz
Max. motor power P_2:	3 kW
Power dissipation:	4 W
Protection class:	IP 31
Maximum ambient temp.:	+40°C
Weight:	0.25 kg

SK 622	
2 potential-free contacts	
Max. contact load:	250 V/1 A/150 VA each
Run signal:	NO contact
Fault signal:	NO contact

Connecting cable (provided by customer)

Connecting cable between SK and pump	
Alternating current (1~):	5 x 1.5 mm^2
Three-phase current (3~):	7 x 1.5 mm^2

Dimension drawing



Dimensions in mm
Fixation elements provided by the customer

Motor protection
Service life and operational reliability of a circulation pump depend to a great extent on the choice of the correct motor protection. The selection of the correct motor protection is a decisive factor for the service life and operational reliability of a circulation pump. Motor protection switches are no longer suitable for pumps with selectable speeds, since their motors have deviating nominal currents in the different stages, which require fuses for each of these stages.

Motor fuse protection in Wilo pumps can be ensured as follows:
Blocking current-proof motors: No motor protection required
The pump motors are designed in such a way that current flowing through the winding cannot cause any damage in the event of overloading or blocking. This applies in the same way to single-phase and three-phase motors depending on the nominal motor power of the following pump series:

Series	1~	3~
Star-RS/-RSD	$P_2 \leq 40$ W	–
TOP-S/-SD TOP-Z	$P_2 \leq 90$ W[1)]	
TOP-D	$P_2 \leq 20$ W	–

[1)] Internal protection against unacceptably high winding temperatures

Pumps with full motor protection and Wilo-SK 602/622 tripping unit or Wilo switchgear/control device
Implementation of full motor protection by means of thermal winding contacts (WSK) within the stator windings. This applies in the same way to single-phase and three-phase motors depending on the nominal motor power of the following pump series:

Series	1~	3~
TOP-S/-SD TOP-Z	$P_2 \leq 180$ W	–
TOP-D	$60 \text{ W} \leq P_2 \leq 320$ W	

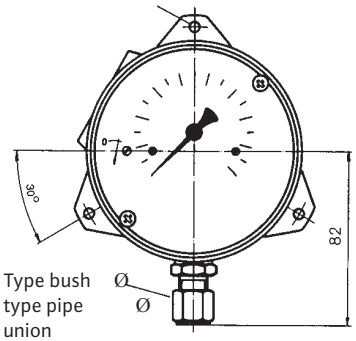
Series description Wilo-SK 602, Wilo-SK 622

Overview table of Wilo full motor protection tripping units		
Tripping unit	**Wilo-SK 602**	**Wilo-SK 622**
Equipment		
On/Off switch	•	•
Terminals for external activation/shutdown	•	•
Run signal light	•	•
Fault signal light	–	•
Potential-free contacts for external run signal	–	•
Potential-free contacts for external fault signal	–	•
Power contactor	•	•
Set-up		
Separate wall-mounted installation	•	•
Alternative switch cabinet installation [1]	–	•
Terminal box plug-in module	–	–
Operating voltage		
1~230 V	•	•
3~400 V plus neutral conductor	•	•
3~400 V without neutral conductor	–	–

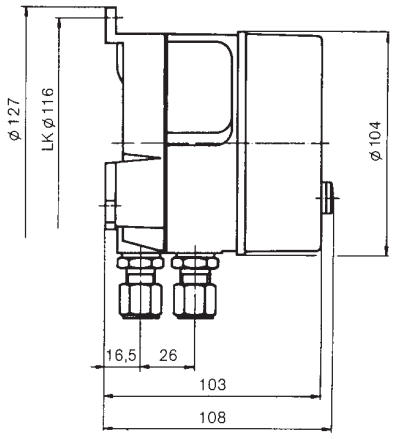
[1)] Onsite wiring to signal lamps in switch cabinet door.

Differential pressure indicator

Differential pressure indicator Wilo-DDA



Type bush
type pipe
union
dia. 6 mm



Gauge for wall-mounted installation. Universal applications for visual operation monitoring and pressure/differential pressure monitoring in installations:

- Differential pressure measurement between feed and return lines in heating systems
- Operation monitoring of heating circulation pumps
- Monitoring of filters, compressors, fans, etc.
- Monitoring of transmission line: measuring point – monitoring station – actuator – pump drive

> Pressure measurement ranges:
DDA 6: 0 to 0.6 bar
DDA 16: 0 to 1.6 bar
DDA 40: 0 to 4.0 bar

Max. pressure charge:	up to 25 bar
Measuring accuracy:	± 2.5% of upper limit
Ambient temp.:	-10 °C to +80 °C
Fluid temp.:	0 °C to +85 °C
Installation position:	as desired
Weight:	approx. 1.2 kg

Performance features

	Wilo-Control device...			
	VR-HVAC	**CRn**	**CC-HVAC**	**CR**
Applications				
Pump versions	Glandless/glanded pumps	Glandless/ glanded pumps	Glandless/ glanded pumps	Glandless/ glanded pumps
Pump types	Electronically controlled pumps	Standard/ electronically controlled pumps	Standard pumps	Standard pumps
Number of pumps	1–4	1–6	1–6[1)]	1–6
Technical data				
Complete device	•	Power supply for pumps required onsite	•	•
Modular design	•	•	•	•
Nominal power range P_2	0.37–22.0 kW	1.1–200 kW	1.1–200 kW[2)]	1.1–200 kW
Activation types:	Infinitely variable, analogue	Infinitely variable, analogue/star-delta opt.	direct/star-delta	direct/star-delta
Electrical connection standard model	3~400 V, 50 Hz or 1~230 V, 50 Hz	1~230V, 50 Hz Power connection of the pumps onsite	3~400 V, 50 Hz	3~400 V, 50 Hz
Protection class	IP 54	IP 00 + IP 42 standard / IP 54 optional	IP 54	IP 00 + IP 42 standard/ IP 54 optional
Permitted ambient temperature:	0 °C to +40°C	0 °C to +40 °C	0 °C to +40 °C	0 °C to +40 °C
Speed range	Infinitely variable, analogue, 2–10 V, 3–10 V, 4–10 V pre-selectable, Min. pump speed acc. to name plate up to 100 %	Between 40 % and 100 % of the nominal motor speed	Between 40 % and 100 % of the nominal motor speed	Between 40 % and 100 % of the nominal motor speed
Control modes (description on the following pages)				
Δp-c	•	•	•	•
Δp-c (TA)	–	•	o	•
Δp-q (m^2/h)	–	•	o	•
Δp-v	•	•	•	•
T_A (outside temperature), controller	–	•	o	•
T-abs (process temp.), controller	–	•	o	•
T_F (feed temperature), controller	–	•	o	•
T_R (return temperature), controller	–	•	o	•
ΔT-c	–	•	o	•
ΔT-v	–	•	o	•
Manual control mode (DDC)	–	•	•	•
Q-c	–	•	o	•

• = available, – = not available, o = optional on request
1) Larger number of pumps on request
2) Higher nominal motor power values on request

Switchgears and control devices

Wilo-Vario and Comfort control systems VR, CRn, CR, CC

Performance features

	Wilo-Control device...			
	VR-HVAC	**CRn**	**CC-HVAC**	**CR**
Control and signalling functions				
Remote speed adjustment (control input)	–	0/4 – 20 mA 0/2 – 10 V	0/4 – 20 mA (standard) 0/2 – 10 V (opt. on request)	0/4 – 20 mA 0/2 – 10 V
Remote setpoint adjustment	–	0/4 – 20 mA 0/2 – 10 V	0/4 – 20 mA (standard) 0/2 – 10 V (opt. on request)	0/4 – 20 mA 0/2 – 10 V
Run and fault signal visualisation	•	•	•	•
Control input "Setpoint switchover"	–	•	•	•
"Overriding Off" control input	•	•	•	•
SBM	•	•	•	•
SSM	•	•	•	•
Fault-actuated switchover from frequency converter to mains operation	–	–	•	•
Fault-actuated switchover from duty pump to standby pump	•	•	•	•
Status display for pumps and frequency converters	–	•	•	•
Equipment features				
Motor protection	Integrated in pump	WSK / SSM, integrated in pump	WSK / TS (PTC)/ TSA	ETA / TS (PTC) / WSK
Graphic display	Menu navigation/ symbol display	Menu navigation/plain text display	Menu navigation / plain text display/ symbol display	Menu navigation/ plain text display
User-oriented menu navigation with multilingual plain text display	–	•	•	•
Manual control panel	Manual /0 /Auto	Manual /0 /Auto	Manual /0 /Auto	Manual /0 /Auto
Fault memory	9 messages	35 messages	35 messages	35 messages
Fault-actuated switchover	•	•	•	•
Pump kick	•	•	•	•
Run-time optimisation / pump cycling	Only time-dependent pump cycling	•	•	•
Pump duty splitting	up to 4 pumps	up to 6 pumps	up to 6 pumps[1)]	up to 6 pumps
PID controller	•	•	•	•
Integrated real time clock with summer/winter time change	–	•	•	•
Integrated individual/total operating hours counter	•	•	•	•
Service life optimisation for multi-pump systems	–	•	•	•
Conductivity testing of the actual value section	•	•	•	•

• = available, – = not available, o = optional on request
1) Larger number of pumps on request
2) Higher nominal motor power values on request

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Performance features

	Wilo-Control device...			
	VR-HVAC	**CRn**	**CC-HVAC**	**CR**
"Mains - Emergency - Operation" service selector switch for maintenance purposes	–	•	•	•
Night reduction to minimum speed and/or second controlled level via internal clock timer	–	•	•	•
Remote acknowledgement of collective fault signal	–	• (with DDC board)	o	• (with DDC board)
Pilot pump function	–	•	•	•
Clock timer	–	•	•	•
Switchover to second setpoint level	–	• (with DDC board)	• (max. 3)	• (with DDC board)
Individual run and fault signals for pumps and converters	• (with options board)	• (with signal board)	o	• (with signal board)
Manual / automatic switchover with external switch	–	• (with control board)	o	• (with control board)
Connection option for a repair switch (potential-free contact)	–	• (with control board)	o	• (with control board)
Accessories				
Differential-pressure sensor, DDG	•	•	•	•
Temperature boards, KTY / PT 100	–	•	–	•
Temperature module, PT 100	–	–	o	–
Temperature sensor, TSG	–	•	–	•
Outdoor temperature sensor, KTY	–	•	–	•
Outdoor temperature sensor, PT 100	–	• (to be provided by the customer)	o	• (to be provided by the customer)
PTC thermistor triggering relay	–	• (to be taken into account during the selection of the pump)	o (to be taken into account during the selection of the pump)	• (to be taken into account during the selection of the pump)
Control board	–	•	–	•
Signal board	• (with options board)	•	–	•
DDC board	–	•	–	•
volume flow transmitter	– (to be provided by the customer)	• (to be provided by the customer)	– (to be provided by the customer)	• (to be provided by the customer)
Special features				
DPM (dual pump management)	not required for DPM with: Stratos/-D /-Z/-ZD, TOP-E /-ED, VeroLine IP-E, VeroTwin DP-E, CronoLine IL-E, CronoTwin DL-E	not required for DPM with: Stratos/-D /-Z/-ZD, TOP-E /-ED, VeroLine IP-E, VeroTwin DP-E, CronoLine IL-E, CronoTwin DL-E	not required for DPM with the following series: Stratos/-D /-Z/-ZD, TOP-E /-ED, VeroLine IP-E, VeroTwin DP-E, CronoLine IL-E, CronoTwin DL-E	not required for DPM with: Stratos/-D /-Z/-ZD, TOP-E /-ED, VeroLine IP-E, VeroTwin DP-E, CronoLine IL-E, CronoTwin DL-E

• = available, – = not available, o = optional on request
1) Larger number of pumps on request
2) Higher nominal motor power values on request

Control mode

Differential pressure – constant (Δp – c)

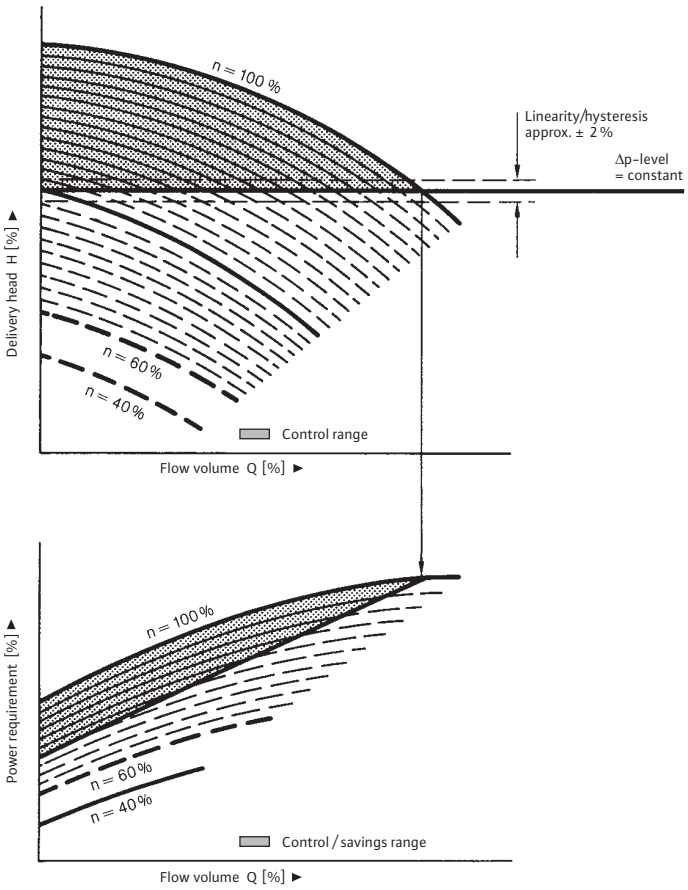


Fig.: Pump curve behaviour for infinitely variable constant differential pressure control (Δp – c)

The differential pressure setpoint to be adjusted at the control devices is kept constant across the entire volume flow range. That means that any reduction of the volume flow (Q) caused by the throttling of the hydraulic control units will in turn adjust the pump output to actual system requirements by reducing the speed of the pump. Along with the change in speed, the power consumption is reduced to below 50% of the nominal power. The application of the differential pressure control requires a variable volume flow in the system. Peak-load operation, e.g. in conjunction with a double pump, is performed automatically and according to the load by the control system. If the controlled base-load pump is no longer able to supply the required load, the second pump is automatically cut in. The variable speed pump is then run down until the preset differential pressure setpoint value is reached.

Required accessories:

- Differential pressure sensor, DDG
  (see also "Performance features" table)

Control mode

Differential pressure – variable (Δp – v)

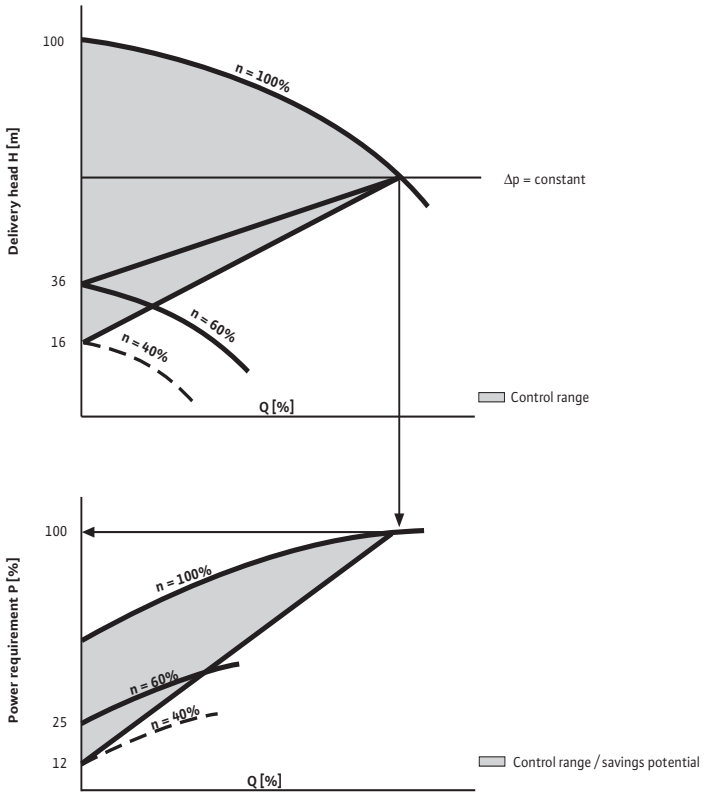


Fig.: Pump curve behaviour with infinitely variable differential pressure control (Δp – v)

When upgrading existing systems it is not always possible to evaluate the index circuit evaluation. Original installations have been completed years ago and now, after installing thermostatic valves, noise problems have developed. The index circuit of the system is not known or it is not possible to integrate the new sensor lines that are required. An extension of the control range is nevertheless possible using the Δp-v control mode (recommended for single-pump systems). A processor unit of the control system adapts the differential pressure setpoint value to a preset variable differential-pressure curve by means of a comparison of the setpoint /actual value. In parallel operation, the differential pressure is kept constant at the design level after the first peak-load pump has been cut in.

Required accessories:
- Differential pressure sensor, DDG
(also see "Performance features" table)

Control mode

Differential pressure - delivery-superimposed (Δp - q)

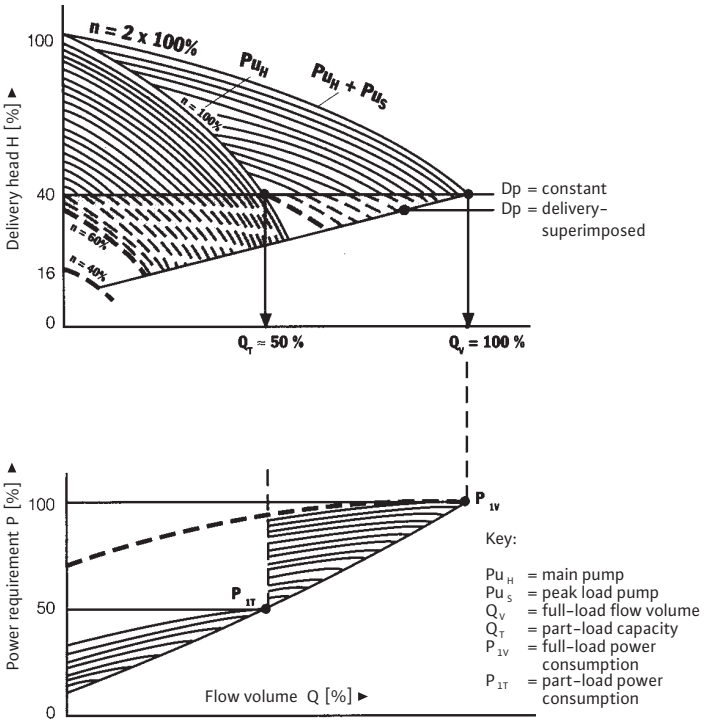


Fig.: Pump curve behaviour of a multi-pump system with infinitely variable delivery-superimposed differential pressure control (Δp - q)

In order to avoid the time and expenses associated with index circuit evaluation (extensive and expensive cable routing, amplifiers, etc.), it is possible to override the differential pressure setpoint value directly with a signal proportional to delivery. Using this method, it is possible, even with multi-pump systems, to achieve a control-range extension in spite of central measured-value acquisition (differential pressure sensor at the pump).
This method requires, in addition to the differential pressure sensor which is to be fitted directly on the pump system, the heating-circuit output or the input of the consumer rail, the provision by the customer of a volume-flow transmitter (0/4– 20 mA) to be installed in the system's main feed pipe.
The use of the Δp-q control is recommended for such systems whose index circuit or system performance are not known or in such cases where long signal distances cannot be bridged, particularly for such systems where volume flow transmitters are already available.

Required accessories:
- Differential pressure sensor, DDG
- Volume flow transmitter (provided by the customer)
  (also see "Performance features" table)

Control mode

Differential pressure – temperature superimposed (Δp – T)

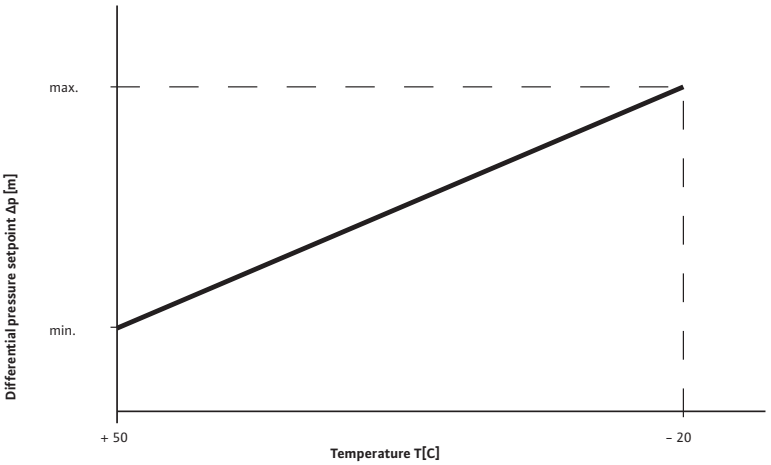


Fig.: Differential pressure setpoint variation according to a temperature

The operational performance of the hydraulic system can be further optimised by adapting the differential pressure setpoint value for pump output control according to a superimposed reference variable (e.g. outdoor temperature). The differential pressure setpoint value and thus the pump output is reduced with rising outdoor temperatures, it is increased with falling outdoor temperatures.

Required accessories:
- Differential-pressure sensor, DDG
- Temperature board, KTY 10
  or
- Temperature board, PT 100
- CC temperature module, PT 100
  (also see "Performance features" table)
- Process temperature sensor or outdoor temperature sensor, PT 100 or KTY

Control mode

Differential temperature control (ΔT)

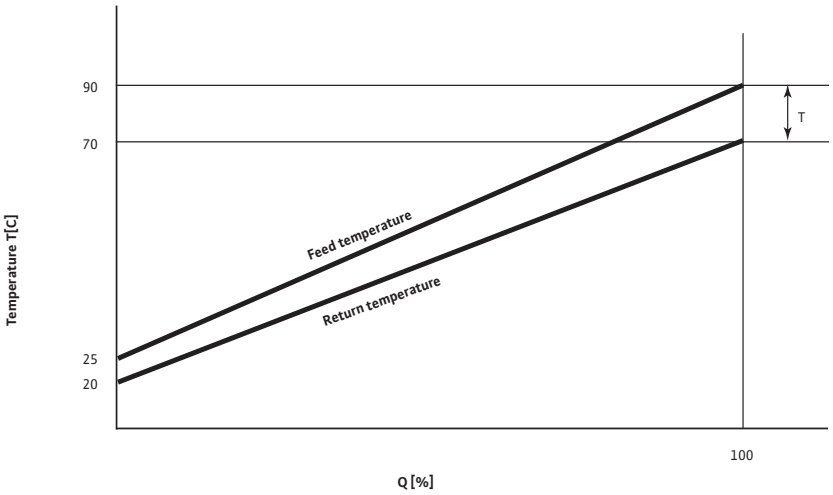


Fig.: Volume flow variation according to the temperature spread

Heating/air-conditioning systems vary in terms of their cooling/heating requirements according to outdoor temperature fluctuations. A number of installations are installed without actuating units or the option of controlling the volume flow (single-pipe heating systems, primary circuits, etc.). Moreover, pure throttling or bypass controls are highly uneconomical. The secondary power consumption (electricity) for the pump drive is also unnecessarily high during the transition period.
The differential-temperature control ΔT is one option for maintaining a constant difference between feed and return temperatures as a result of weather- and usage-dependent temperature spread. The heat flow becomes variable due to the changes in flow rates and the transferred heating/cooling capacity can be controlled independently of feed or return temperatures. Differential-temperature controls should therefore only be used with individual consumers or with systems with a known control time constant to be able to use them in a straightforward manner.

Required accessories:
- Temperature board, KTY 10
  or
- Temperature board, PT 100
- CC temperature module, PT 100
  (also see "Performance features" table)
- Temperature sensor, TSG or PT 100(provided by the customer)

Control mode

Temperature control (±T)

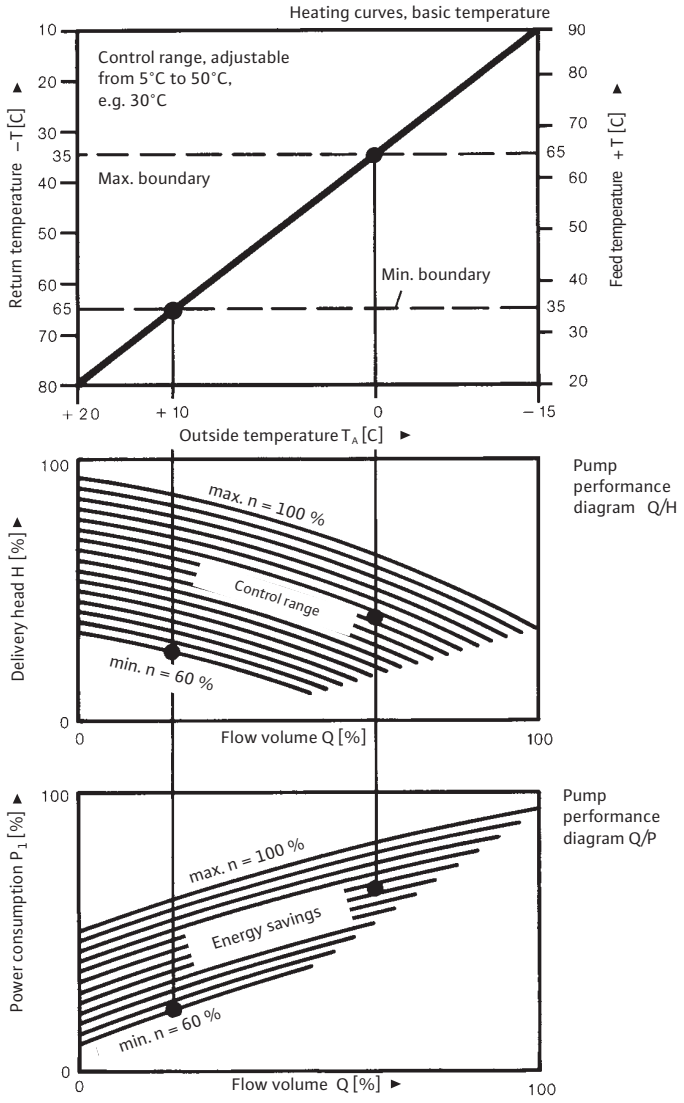


Fig.: System diagram of the infinitely variable temperature control

With the case of pump control according to the temperature, the control signal (±T) results in a variation of pump output, but there is no adjustment of the variation or its results by means of feedback of the comparison of the setpoint/actual value.
Fixed motor speeds have been assigned to the pump for specific feed/return temperatures according to an empirically predetermined pump curve.
A falling feed temperature (+T) or a rising return temperature (–T) will result in automatic speed reduction and thus the reduction of the pump performance input.
Temperature control ±T can only be applied to single pump operation. Feed or return temperature-sensitive peak-load operation is technically not feasible.

Required accessories
- Temperature board, KTY 10
  or
- Temperature board, PT 100
- CC temperature module, PT 100
  (also see "Performance features" table)
- Temperature sensor, TSG or PT 100(provided by the customer)

Control mode

Variable differential temperature (ΔT – v)

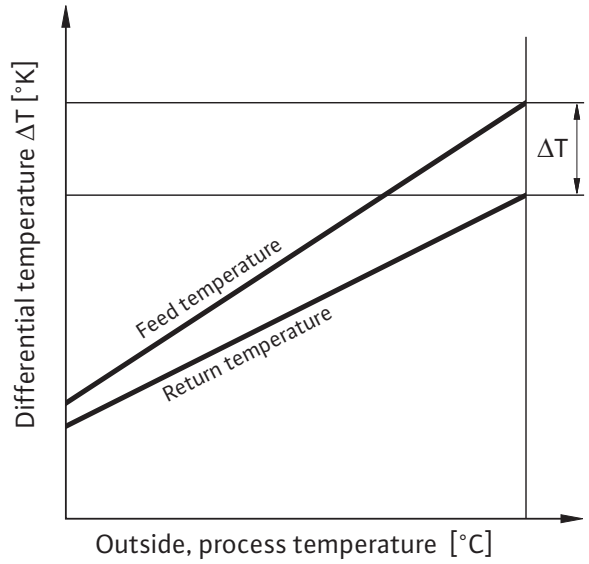


Fig.: Differential temperature according to the process or outdoor temperature

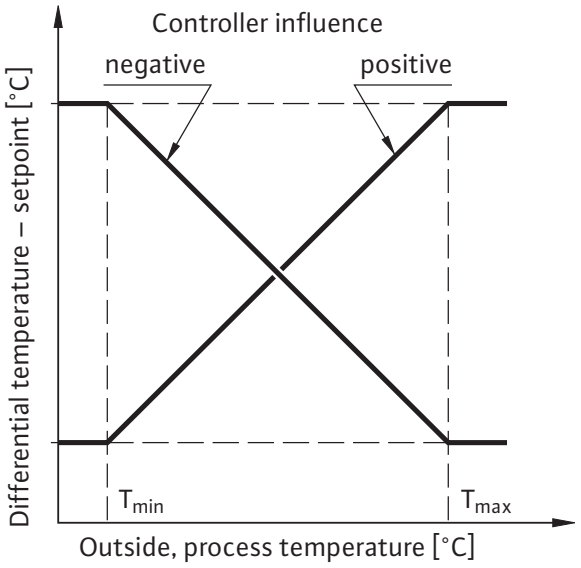


Fig.: Effect on the differential temperature

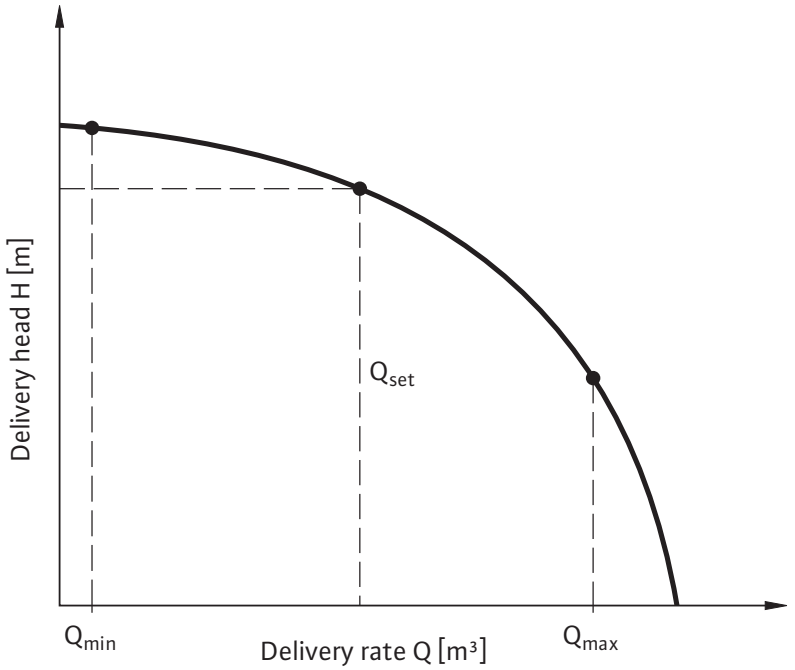
The ΔT-v control function is particularly suitable for pump output control in single-pipe heating systems, district heatings, systems with condensing boiler technology and cooling systems.
The ΔT-v control mode ensures that the differential temperature is spread variably according to another temperature, e.g. the outdoor temperature. This means that only the water quantity required for heat transfer is circulated. This leads to significant energy savings on the drive side. Furthermore, the return temperature can also be drastically reduced. The large temperature spread improves the efficiency of boilers or heat exchangers, and limits the return temperature, as required e.g. in most district heating networks.

Required accessories:
- Temperature board, KTY 10
  or
- Temperature board, PT 100
- CC temperature module, PT 100
  (also see "Performance features" table)
- Temperature sensor, TSG or PT 100
  (provided by the customer)
- Process temperature sensor or
  outdoor temperature sensor, PT 100
  or KTY

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Control mode

Constant volume flow control (Q – c)



The volume flow which is set at the CR device is kept constant. If the volume flow Q decreases, the speed of the pump system is increased until the set volume flow is reached again. If the volume flow increases, the speed is reduced so that only the required rate is pumped.

Fig.: Principle of the constant volume flow control

The Q-c control function is applied practically in such cases where a constant, adjustable volume flow is to be pumped. Such cases are for example cooling systems, cooling towers, test stands or systems for water supply, water treatment and sewage disposal. Flow rates of 2 – 2000 m^3/h can be controlled.

Examples of the application of flow rate controls:
- Mixing of chemically different well waters in an elevated tank for establishing a consistent water quality
- Delivery of cold and cooling water according to the connected cooling towers or consumers
- Mixing sewage (municipal and industrial applications) for achieving a defined untreated sewage composition, adapted to the sewage treatment in a sewage treatment plant
- Dosing of chemicals in chemical and environmental engineering
- Agricultural irrigation

Required accessories:
- Flow rate meter provided by the customer
- Monitoring of limit values is to be implemented onsite (system protection)

Pressure – constant (p – c)

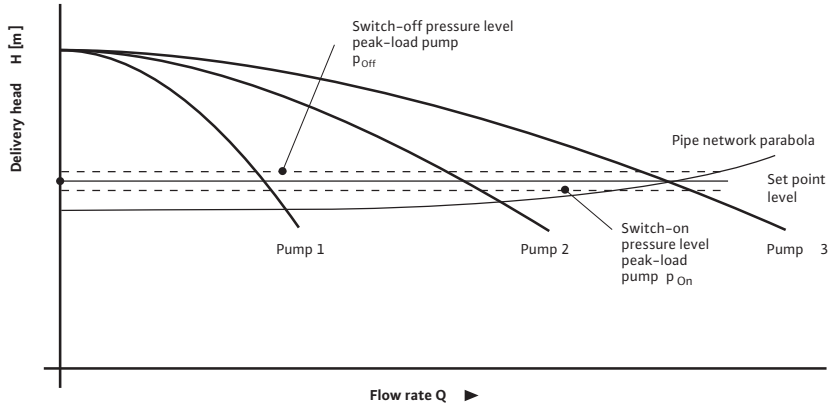


Fig.: Constant pressure control (p – c) using a 3-pump system as an example

The constant pressure control mode (p – c) is suitable for use in conjunction with open pipe systems, e.g. water supply and pressure boosting applications.
The pump output is adapted according to water requirements (pressure-dependent) along a setpoint level. Multi-pump systems require the activation and deactivation of base-load and peak-load pumps according to requirements. Fluid hammers caused by premature deactivation and immediate reactivation are thus fully eliminated.
In a pressure boosting system, the base-load pump is deactivated via the control system at Q = 0
(also see "Performance features" table)

Series description Wilo-VR-HVAC system

VR-HVAC system

Digitally-controlled, infinitely variable Vario control system for electronically controlled glandless and glanded pumps of the Stratos, TOP-E, VeroLine-IP-E and CronoLine-IL-E series, for mounting single-pump and multiple-pump systems.



Typical field of application of the Wilo-VR-HVAC system is water circulation in heating, ventilation, cooling and air-conditioning systems of large buildings such as hospitals, hotels, schools, department stores, industrial systems, residential, commercial and public buildings. Latest pump technology and digital control electronics fulfil all requirements of the Wilo-VR-HVAC system for new installations and retrofitting:
- For all glandless and glanded pumps with integrated power electronics up to P2 = 22 kW nominal power.
- For pump duty splitting with up to 4 units (to make best use of the low-power split units in low-load operation).
- Prevention of flow or cavitation noise.
- Reduction of operating costs due to energy savings.

Operating principle

The control device is for controlling and regulating circulation pumps with electronic control or integrated pump output electronics. The differential pressure of a system is controlled according to the load with appropriate signal transmitters. The controller affects the frequency converter which has an effect on the pump speed. A modification of the speed changes the delivery head and thus the power output of the single pumps. According to load requirements, pumps are activated or deactivated. The control device can control up to 4 pumps.

Equipment features
- PID controller
- Lockable main switch
- Graphical LC display for the indication of all values and operating states
- Red-button technology (one-button operation)
- LEDs for indicating operation standby, pump(s) in operation, faulty pump(s)
- Circuit breakers and output terminals for the power supply of pump(s)
- Integrated signal board (option)
- Automatic pump cycling
- Emergency operation as an option
- Selection of a standby pump

Infinitely variable speed control

An electronic Wilo-DDG differential pressure sensor delivers the actual differential pressure value as 4 - 20 mA current signal. Then the controller maintains the differential pressure at a constant level by means of the comparison of the setpoint/actual values. If there is no "External Off" signal and no fault, at least one pump is running. The pump speed depends on the load. If the required output cannot be covered by this pump (base-load pump), another pump is cut in, the speed of which is then controlled according to the reduction to the setpoint. Pumps, which are already running, keep operating at maximum speed (peak-load pumps). If the demand decreases to such an extent that the controlling pump runs at its lowest output range and is not needed to cover the demand, this pump is deactivated and the control function is assigned to another pump which has previously been running at maximum speed.
Control modes Δp-c and Δp-v can be preselected in the menu. Only the first pump is controlled in Δp-v mode. If more pumps are cut in, these are adjusted according to the Δp-c curve.

Control modes

The following control modes can be preselected on the Wilo-VR-HVAC system for electronic performance control:
- For variable-delivery systems (e.g. heating systems with thermostatic valves):
- Constant differential pressure control (Δp-c)
- Variable differential pressure control (Δp-v)

Control and signalling functions

The standard Wilo-VR-HVAC system has an extensive range of control inputs/outputs for integration into external monitoring units to be provided by the customer:
- Analogue output, Δp_{out} (0 - 10 VDC), for indicating the actual value of the differential pressure sensor
- Activation/deactivation via external potential-free contact
- SSM collective fault signal as potential-free changeover contact
- SBM collective run signal as potential-free changeover contact
- IFS individual fault signal for each pump as potential-free changeover contact (optional)
- IRS individual run signal as potential-free changeover contact (optional)

Dimensions, weights Wilo-VR-HVAC system

Dimensions, weights Wilo-VR-HVAC system

Switchbox	Dimensions	Weight approx.
	Width x height x depth	M
	[mm]	[kg]
VR-HVAC 1x0.37WM	400 x 300 x 120	8.5
VR-HVAC 2x0.37WM	400 x 300 x 120	9.0
VR-HVAC 3x0.37WM	400 x 300 x 120	9.5
VR-HVAC 4x0.37WM	400 x 300 x 120	10.0
VR-HVAC 1x0.55WM	400 x 300 x 120	8.5
VR-HVAC 2x0.55WM	400 x 300 x 120	9.0
VR-HVAC 3x0.55WM	400 x 300 x 120	9.5
VR-HVAC 4x0.55WM	400 x 300 x 120	10.0
VR-HVAC 1x0.75WM	400 x 300 x 120	8.5
VR-HVAC 2x0.75WM	400 x 300 x 120	9.0
VR-HVAC 3x0.75WM	400 x 300 x 120	9.5
VR-HVAC 4x0.75WM	400 x 300 x 120	10.0
VR-HVAC 1x1.1WM	400 x 300 x 120	8.5
VR-HVAC 2x1.1WM	400 x 300 x 120	9.0
VR-HVAC 3x1.1WM	400 x 300 x 120	9.5
VR-HVAC 4x1.1WM	400 x 300 x 120	10.0
VR-HVAC 1x1.5WM	400 x 300 x 120	8.5
VR-HVAC 2x1.5WM	400 x 300 x 120	9.0
VR-HVAC 3x1.5WM	400 x 300 x 120	9.5
VR-HVAC 4x1.5WM	400 x 300 x 120	10.0
VR-HVAC 1x2.2WM	400 x 300 x 120	8.5
VR-HVAC 2x2.2WM	400 x 300 x 120	9.0
VR-HVAC 3x3.3WM	400 x 300 x 120	9.5
VR-HVAC 4x2.2WM	400 x 300 x 120	10.0
VR-HVAC 1x3.0WM	400 x 300 x 120	8.5
VR-HVAC 2x3.0WM	400 x 300 x 120	9.0
VR-HVAC 3x3.3WM	400 x 300 x 120	9.5
VR-HVAC 4x3.0WM	400 x 300 x 120	10.0
VR-HVAC 1x4.0WM	400 x 300 x 120	8.5
VR-HVAC 2x4.0WM	400 x 300 x 120	9.0
VR-HVAC 3x4.0WM	400 x 300 x 120	9.5
VR-HVAC 4x4.0WM	400 x 300 x 120	10.0
VR-HVAC 1x5.5WM	400 x 300 x 120	8.5
VR-HVAC 2x5.5WM	400 x 300 x 120	9.0
VR-HVAC 3x5.5WM	400 x 300 x 120	9.5
VR-HVAC 4x5.5WM	400 x 300 x 120	10.0
VR-HVAC 1x7.5WM	400 x 300 x 120	8.5
VR-HVAC 2x7.5WM	400 x 300 x 120	9.0
VR-HVAC 3x7.5WM	400 x 400 x 120	11.5
VR-HVAC 4x7.5WM	400 x 400 x 120	12.0
VR-HVAC 1x11WM	400 x 400 x 120	10.5
VR-HVAC 2x11WM	400 x 400 x 120	11.0
VR-HVAC 3x11WM	600 x 600 x 250	34.5
VR-HVAC 4X11WM	600 x 600 x 250	35.0

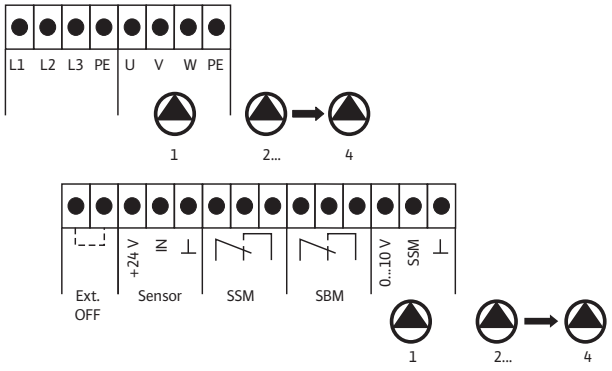
Dimensions, weights Wilo-VR-HVAC system

Dimensions, weights Wilo-VR-HVAC system

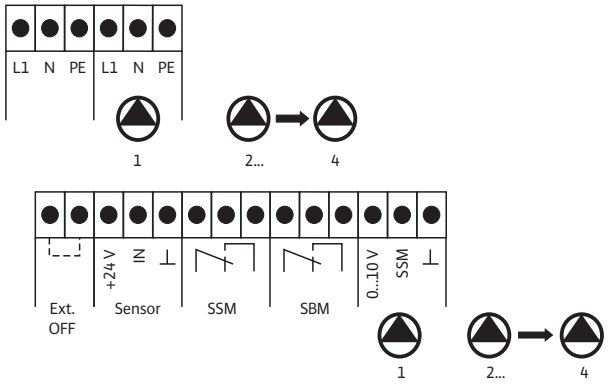
Switchbox	Dimensions	Weight approx.
	Width x height x depth	M
	[mm]	[kg]
VR-HVAC 1x15WM	400 x 400 x 120	10.5
VR-HVAC 2x15WM	400 x 400 x 120	11.0
VR-HVAC 3x15WM	600 x 600 x 250	35.0
VR-HVAC 4x15WM	600 x 600 x 250	35.5
VR-HVAC 1x18.5WM	400 x 300 x 120	10.5
VR-HVAC 2x18.5WM	400 x 300 x 120	11.0
VR-HVAC 3x18.5WM	600 x 600 x 250	35.0
VR-HVAC 4x18.5WM	600 x 600 x 250	35.5
VR-HVAC 1x22WM	400 x 300 x 120	10.5
VR-HVAC 2x22WM	400 x 300 x 120	11.0
VR-HVAC 3x22WM	600 x 600 x 250	35.5
VR-HVAC 4x22WM	600 x 600 x 250	36.0

Terminal diagrams Wilo-VR-HVAC system

Terminal diagram VR-HVAC 3~400 V



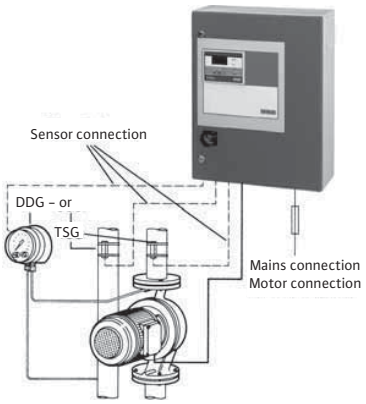
Terminal diagram VR-HVAC 1~230 V

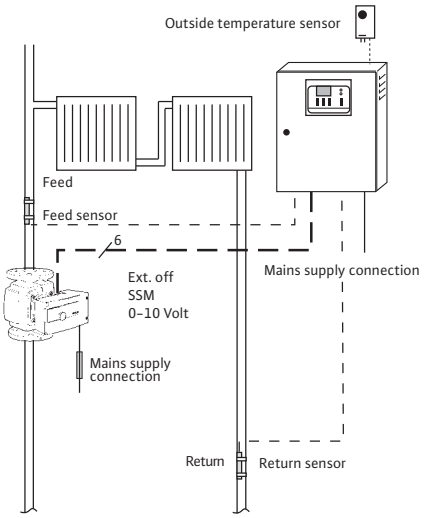


Series description Wilo-CR, Wilo-CRn, Wilo-CC

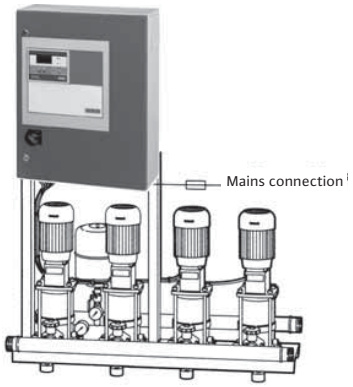
Wilo-Comfort control systems CR, CRn and CC

Digitally controlled, infinitely variable Comfort control systems for glandless and glanded pumps of all makes, single-pump and multi-pump systems.
CR version for conventional pumps with fixed speed.
CRn version for infinitely variable, electronically controlled pumps or pumps with integrated frequency converter.
CC version for conventional pumps with fixed speed.





Typical fields of application of the Wilo-Comfort control devices CR, CRn and CRn are water circulation and water supply (e.g. pressure boosting)
- In residential, commercial and public buildings, hotels, hospitals, department stores and for industrial buildings. Most up-to-date digital control electronics fulfil all requirements of the Wilo-Comfort control systems for new installations and retrofitting:
- For CR version for all glandless and glanded pumps with three-phase motors with a nominal power up to P_2 = 30 kW (higher output values and other voltages on request)
- For CRn version independent of the power via analogue control signals 0 / 2 – 10 V or 0 / 4 – 20 mA
- For CC version for all glandless and glanded pumps with three-phase motors with a nominal power up to P_2 = 200 kW (higher output values and other voltages on request)
- For pump duty splitting with up to 6 units (to make best use of the low-power individual units in low-load operation)
- Prevention of flow or cavitation noise
- Lower operating costs due to energy savings
- Speed control range between 100% and 40% of the nominal power.



Operating principle
The Wilo-Comfort control systems allow the infinitely variable electronic adjustment of the pump output to meet the continuously varying operating conditions in the hydraulic system according to the control variables: pressure (p), volume flow (Q), temperature (T).

Equipment features
- PID controller
- Integrated real-time clock with summertime/wintertime change
- Integrated individual/total operating hours counter
- Service life optimisation for multi-pump systems
- Motor protection due to connection of WSK, PTC TS and TSA (for CR version)
- Motor protection due to connection of WSK and SSM (for CRn version)
- Motor protection due to connection of WSK, PTC TS and TSA (for CC version)
- Touch display with multi-colour backlight for CC version
- Alphanumerical LCD display for the CR and CRn versions (4-line) with backlight
- Status display for drives (e.g. pumps and frequency converters)
- User-oriented menu navigation with multi-language plain text display and/or symbol navigation
- Storage and display of extensive operating data
- Defined display of fault signals and storage in the history memory
- Conductivity test of the transmitter paths

Infinitely variable speed control
Infinitely variable speed control must be regarded as the ideal solution to the problem of achieving 100% harmonious adjustment of the pump output to the actual operating states of the system. Unfortunately, its particular inherent capability of reducing the speed right down to a very low level – about 10–20% of the residual speed – cannot be implemented in practice in heating applications. Speed reductions in the range below 60% residual speed and the resulting drop in delivery head (delivery head as a quadratic function of speed) may result in malfunctions and sometimes to a breakdown in water distribution. In this case, the Δp measuring point must be installed on what is called the index circuit of the system, i.e. the line or consumer with the greatest pressure losses. Extremely low speeds below 40% of the nominal speed can also lead to thermal and mechanical overloading of the electric motors.

Control modes
The following control modes can be preselected for electronic pump output control with Wilo-Comfort control systems (also see "Performance features" table
- For variable-delivery systems (e.g. heating systems with thermostatic valves):
- Constant differential pressure control (Δp-c)
- Variable differential pressure control (Δp-v)
- Variable-delivery differential pressure control (Δp-q)

Series description Wilo-CR, Wilo-CRn, Wilo-CC

- Temperature-superimposed differential pressure control (Δp-T)
- Constant pressure control (p-c) for pressure boosting systems
- Constant flow rate control (Q-c)
- For constant-volume systems (e.g. cooling systems with heat exchangers):
- Differential temperature control (ΔT)
- Process temperature control (±T)
- Variable temperature control (ΔT-v)

Control and signalling functions
The Wilo-Comfort control systems provide extensive control inputs and outputs as standard equipment for integration in external monitoring units provided by the customer (see also "Performance features" table)
- Remote setpoint adjustment (0 – 10 V/10 – 20 mA) preselectable (with CR and CRn)
- Remote setpoint adjustment (4 – 20 mA) preselectable (with CC)
- Activation/deactivation via external potential-free contact
- Activation of frost protection via external potential-free contact (only for heating/air-conditioning) via digital input
- Low water cut-out switch via external potential-free contact (only for pressure boosting) via digital input
- Collective fault signal/collective run signal as potential-free changeover contact
- "Mains – Emergency – Operation" service selector switch for maintenance personnel
- Switchover to second setpoint level (with CR and CRn)
- Switchover to second/third setpoint level (with CC)

The following optional control inputs and outputs are available:
- Remote acknowledgement of the collective fault signal
- Switchover to manual control mode
- Individual run and fault signals for pumps and converters
- Manual/automatic switchover
- Signalling contact connection of repair switches

Type key, CR control device (example: CR 1.1-2 WM)	
CR	Comfort control technology
1.1	Maximum nominal motor power P_2 of pump to be controlled in kW
2	Number of pumps to be controlled (1 – 6 pumps)
WM	Device version
	WM = wall-mounted installation IP 42 (IP 54 on request)
	FM = floor model IP 42 (IP 54 on request)
	SE = control-panel installation

Type key, CRn control system (example: CRn 1-2 TP WM)	
CRn	Comfort control technology, new
1-2	Number of pumps that can be connected: 1 – 2 3 – 4 5 – 6
TP, TK	Control mode: T = temperature P = PT 100 sensor K = KTY sensor

Type key, CRn control system (example: CRn 1-2 TP WM)	
WM	Device version
	WM = wall-mounted installation IP 42 (IP 54 on request)
	SE = control-panel installation

Type key, CC control device (example: CC 2x1.1 FC WM)	
CC	Comfort Controller
2	Number of pumps to be controlled (1 – 6 pumps)
1.1	Maximum nominal motor power P_2 of pump to be controlled in kW
FC	Installation with frequency converter and sine filter
WM	Device version
	WM = wall-mounted installation, IP 54
	BM = floor model, IP 54

Technical data Wilo-CR, Wilo-CRn, Wilo-CC

Wilo-Comfort control system CR

- Automatic, load-sensitive, infinitely variable speed control of glanded and glandless pumps with three-phase motor.
- For heating/air-conditioning according to the differential pressure Δp, feed/return temperature (±T) or differential temperature (ΔT) including free adjustment of the duty point by means of the advance correction of the full-load pump output. For pressure boosting according to the pressure (p).
- Device version
  - Wall-mounted installation (WM) available only up to 4 kW
  - Floor models (FM) available above 5.5 kW
  - Control-panel installation (SE)

Connection data, Wilo-CR										
Device grading: Max. nominal motor power P_2 [kW] 3~400 V/50 Hz/60 Hz	1.1	2.2	3.0	4.0	5.5	7.5	11.0	15.0	22.0	30.0
Maximum output current I [A]	2.8	5.6	7.6	9.7	13.0	16.0	24.0	32.0	44.0	61.0
Power factor cos ˆ	> 0.90									
Efficiency:- for P_{max} - within the permitted partial load range	> 0.93 > 0.85									
Electrical connection	3~400 V/N/50 Hz/60 Hz									
Output voltage [V]	3 x 130 V – 400 V									
Output frequency [Hz]	(10 Hz) 12 Hz – 50 Hz/60 Hz									
Control range (% nominal motor speed)	40 % – 100 %									
Permitted ambient temperature	0 °C to +40 °C									

Wilo-Comfort control system CRn

- Automatic load-sensitive, infinitely variable speed control of glandless and glandless pumps with integrated or external frequency converter.
- For heating/air-conditioning according to the differential pressure Δp, feed/return temperature (±T) or differential temperature (ΔT) including free adjustment of the duty point by means of the advance correction of the full-load pump output.
- Device version
  - Wall-mounted installation
  - Control-panel installation

Connection data, Wilo-CRn	
Electrical connection	1~230 V (shock-proof plug)/N/PE/50 Hz/60 Hz power connection of the pumps onsite
Output signals	0/2 – 10 V 0/4 – 20 mA
Permitted ambient temperature	0 °C to +40 °C

Wilo-Comfort control system CC

- Automatic, load-sensitive, infinitely variable speed control of glanded and glandless pumps with three-phase motor.
- For heating/air-conditioning according to the differential pressure Δp, feed/return temperature (±T) or differential temperature (ΔT) including free adjustment of the duty point by means of the advance correction of the full-load pump output. For pressure boosting according to the pressure (p).
- Device version
  - Wall-mounted installation
  - Control-panel installation

Connection data, Wilo-CC															
Device grading: Max. nominal motor power P_2 [kW] 3~400 V/50 Hz/60 Hz	1.1	1.5	2.2	3.0	4.0	5.5	7.5	11.0	15.0	18.5	22.0	30.0	37.5	45.0	55.0
Max. permissible nominal pump current I [A]	3.0	3.7	5.2	7.0	9.0	13.0	16.0	24.0	32.0	37.5	43.1	61.0	72.4	89.6	106.0
Power factor cos ˆ	> 0.90														
Efficiency: - for P_{max} - within the permitted partial load range	> 0.93 > 0.85														
Electrical connection	3~400 V/PE Hz/50 Hz														

Technical data Wilo-CR, Wilo-CRn, Wilo-CC

Connection data, Wilo-CC	
Output voltage [V]	3 x 130 V – 400 V
Output frequency [Hz]	(10 Hz) 12 Hz – 50 Hz / 60 Hz
Control range (% nominal motor speed)	40 % – 100 %
Permitted ambient temperature	0 °C to +40 °C

Accessories for Wilo-Comfort control systems CR, CRn and CC

Accessories		
Sensors	Differential pressure sensor, DDG (4 – 20 mA) (observe the measurement range)	Terminal diagram: base board, CC / CRn system
	Outdoor temperature sensor, KTY or PT 100	
	Temperature signal transmitter, TSG (included in the scope of delivery of the temperature board)	Terminal diagram: temperature board, KTY 10
Temperature board Automatic, infinitely variable speed control according to the feed or return temperature or according to the difference between feed and return temperatures	Temperature board, KTY 10: Heating system with large temperature spread (T_{max}: +140 °C, $\Delta T_{min} \geq 10$ K, ΔT_{max}: 100 K), 2 TSG temperature transmitters included in the scope of delivery	Terminal diagram: temperature board, KTY 10
	Temperature board, PT 100: Cooling/air-conditioning systems with small temperature spread (T_{max}: +140 °C, $\Delta T_{min} \geq$ K, ΔT_{max}: 100 K)	Terminal diagram: temperature board, PT 100
CC temperature module, PT 100	Temperature range -200 °C to +500 °C, connection of PT 100, PT 1000 and Ni 1000 sensors	Terminal diagram: temperature module, PT 100
CR/CRn control board	Deactivation of each pump (up to 2 pumps) by repair switch onsite and remote adjustment of operating mode (mains / automatic) for each pump (up to 2 pumps) 3 control boards are required for 6 pumps	Terminal diagram: control board
CR/CRn DDC board	Load adjustment of the pump system (comparison of setpoint-actual values) via external controller, pump activation and deactivation, pump cycling, setpoint switchover, switch-over to remote speed control and acknowledgement of the collective fault signal via external potential-free contact	Terminal diagram: DDC board
CR/CRn signal board 1 – 2	Potential-free individual operation/individual fault signal for pumps 1 – 2 and frequency converter, status signals to the digital inputs DIG2 or DIG3 (e.g. low water, antifreeze), actual speed value or actual transmitter value (can be preselected)	Terminal diagram: signal board 1-2
CR/CRn signal board 3 – 6	Potential-free individual operation/individual fault signal for pumps 3 – 6	Terminal diagram: signal board 3-6

Dimensions and weights, Wilo-CR system									
Nominal power	**Number of pumps**	**WM / FM**				**SE**			
P_2		**W**	**H**	**D**	**Weight**	**W**	**H**	**Req. installation depth**	**Weight**
[kW]		**[mm]**			**[kg]**	**[mm]**			**[kg]**
1.1 – 4.0	1-4-fold	620	770	265	50	550	730	190	30
	5-6-fold	780	770	315	70	704	730	200	45
5.5 – 7.5	1-2-fold	600	1900	415	195	499	1696	210	95
	3-4-fold	800	1900	415	205	699	1696	210	105
	5-6-fold	1000	1900	415	215	899	1696	210	115

[1] Control system consists of 2 switch rails.

Technical data Wilo-CR, Wilo-CRn, Wilo-CC

Dimensions and weights, Wilo-CR system

11.0 – 22.0	1-2-fold	800	1900	515	270	699	1696	310	140
	3-4-fold	1200	1900	515	350	1099	1696	310	160
11.0 – 15.0	5-6-fold	1200	1900	515	365	1099	1696	310	175
22	5-6-fold[1)]	1200	1900	515	–	1099	1696	310	–
		600	1900	515	520	499	1696	310	230
30	1-2-fold	1200	1900	515	390	1099	1696	310	200
	3/4-fold[1)]	1200	1900	515	–	1099	1696	310	–
		600	1900	515	560	499	1696	310	270
	5-6-fold[1)]	1200	1900	515	–	1099	1696	310	–
		1200	1900	515	640	1099	1696	310	320
Section dimension CR controller and operating unit	–	–	–	–	–	186	138	82	–

[1)] Control system consists of 2 switch rails.

Dimensions and weights, Wilo-CRn system

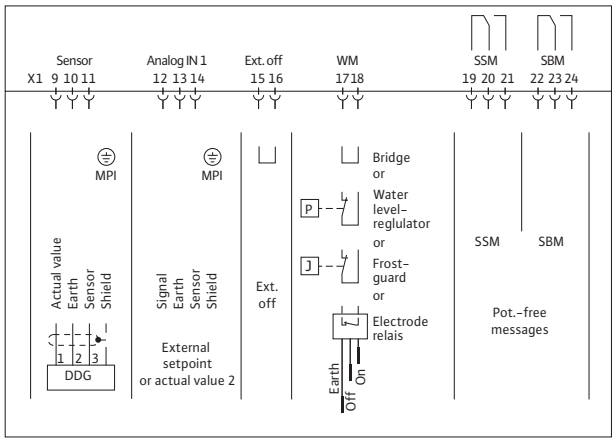
Temperature sensors	**Number of pumps**	**WM**		**SE**	
		Dimensions (W x H x D)	**Weight**	**Dimensions (W x H x D)**	**Weight**
	[pcs.]	**[mm]**	**[kg]**	**[mm]**	**[kg]**
PT 100	1 – 2	400 x 400 x 200	12.5	360 x 380 x 120	5.0
PT 100	3 – 4	400 x 400 x 200	12.5	360 x 380 x 120	5.0
KTY	1 – 2	400 x 400 x 200	13.0	360 x 380 x 120	5.5
KTY	3 – 4	400 x 400 x 200	13.0	360 x 380 x 120	5.5

Dimensions and weights, Wilo-CC system

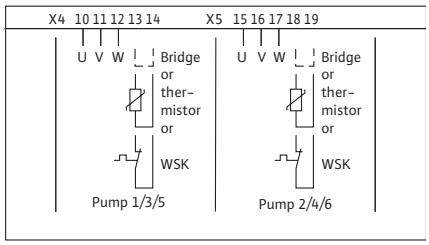
Nominal power P_2	**Number of pumps**	**Dimensions (W x H x D)**	**Weight**
[kW]	**[pcs.]**	**[mm]**	**[kg]**
0.75 – 4.0	1–4	600 x 760 x 250	50
	5–6	760 x 760 x 250	70
5.5 – 7.5	1–2	600 x 1900 x 500	175
	3–4	800 x 1900 x 500	205
	5–6	1000 x 1900 x 400	230
11.0 – 15.0	1–2	800 x 1900 x 500	220
	3–4	1000 x 1900 x 400	270
11.0	5–6	1000 x 1900 x 400	300
15.0	5–6	1200 x 1900 x 500	360
18.5 – 22.0	1–2	800 x 1900 x 500	250
	3–4	1000 x 1900 x 400	320
	5–6	1800 x 1900 x 500	500
30	1–2	800 x 1900 x 500	270
	3–4	1200 x 1900 x 500	380
	5–6	2000 x 1900 x 500	580

Terminal diagrams Wilo-CR, Wilo-CRn, Wilo-CC

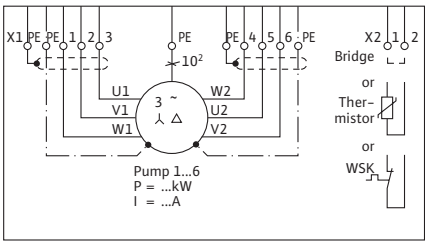
Terminal diagram, CR system base board



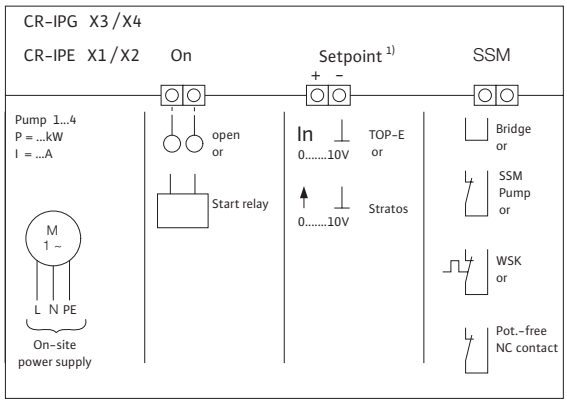
Terminal diagram drives CR system ($P_2 \leq 4$ kW)



Terminal diagram drives CR system ($P_2 \geq 5.5$ kW)



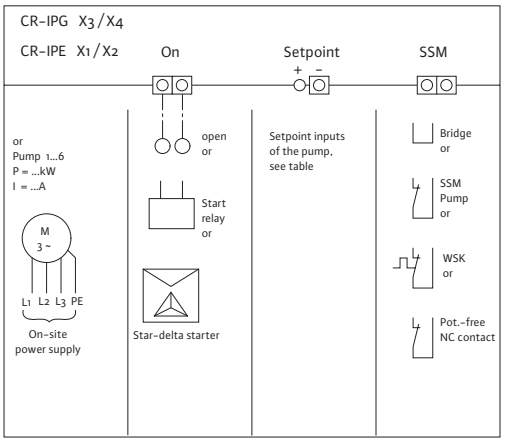
Terminal diagram base board CRn system (for pump drives 1~230 V)



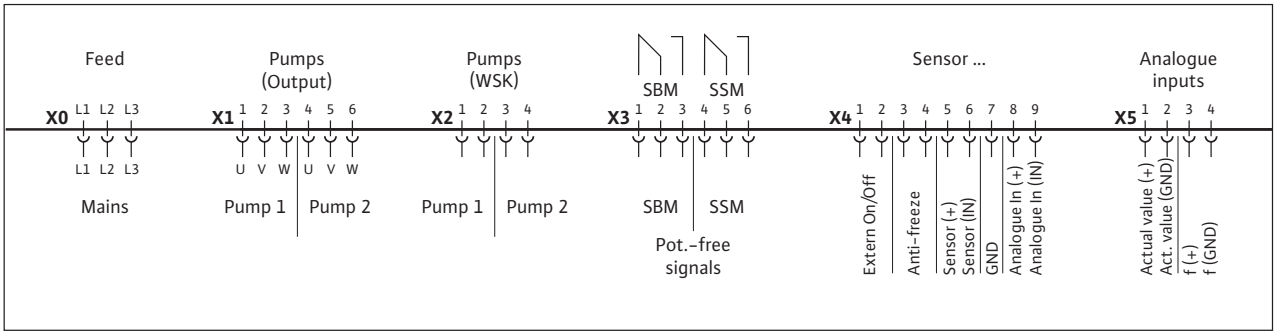
1) Required for Stratos IF-Modul with 0...10 V input
(IF-Modul Stratos SBM, Stratos Ext. Min, Stratos Ext. Aus)

Terminal diagrams Wilo-CR, Wilo-CRn, Wilo-CC

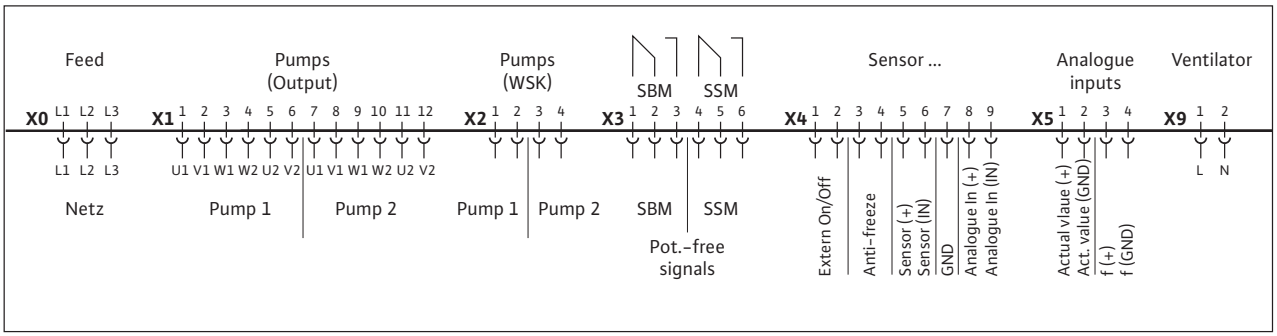
Terminal diagram expansion board CRn system (for pump drives 3~400 V)



Terminal diagram CC-HVAC, direct starting, with frequency converter



Terminal diagram CC-HVAC, Y-Δ-starting, with frequency converter



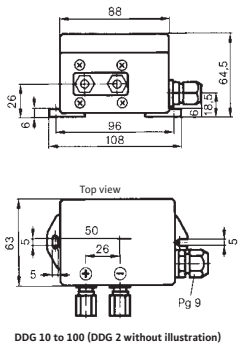
Terminal diagrams, Wilo CR, Wilo CRn, Wilo CC

Wilo-CRn system, assignment of the setpoint Wilo outputs: 1. at the CRn control device / 2. at the pump to be controlled

Pump type		Analogue control signal	1. Setpoint outputs, CRn:	
			+	–
			2. Setpoint inputs, pump:	
IL-E...BF R1	(from year of construction 08/2002 to 02/2003)	0 – 10 V	2	4 GND
IL-E...BF R1	(from year of construction 08/2002 to 02/2003)	0 – 20 mA	2	4 GND
IL-E...BF R1	(from year of construction 03/2003)	0 – 10 V	2	7 GND
IL-E...BF R1	(from year of construction 03/2003)	0 – 20 mA	2	7 GND
IL-E... R1	(from year of construction 01/2003)	0 – 10 V	1 (0 – 10 V)	2 (GND)
IL-E... R1	(from year of construction 01/2003)	0 – 20 mA	4 – 20 mA	2 (GND)
IP-E	–	0 – 10 V	1	2
IP-E	–	4 – 20 mA	1	2

Signal transmitters and accessories

Wilo-DDG signal transmitter



DDG 10 to 100 (DDG 2 without illustration)

(Dimensions in mm), fastening elements onsite

Signal transmitter for wall-mounted installation for infinitely variable speed control according to the differential pressure.
With built-in pressure-surge throttles, 2 DIN 3862, Ø 6 mm cutting-ring unions, 5 m connection cable to the switchgear[1] (3 x 0.75 mm^2), 2 angle cutting-ring unions R $^1/_8$ x ø 6 mm.
1) Longer distances to be extended by customer
up to 25 m: x 0.75 mm^2, shielded, up to 250 m: 3 x 1.5 mm^2, shielded

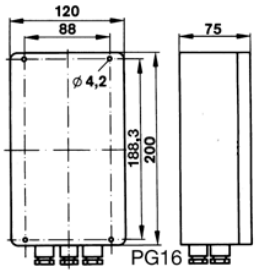
Maximum operating voltage: 15 – 30 VDC
Current output: 4 – 20 mA
Maximum load resistance: 500 Ω
Pressure measurement ranges:[2] [3])

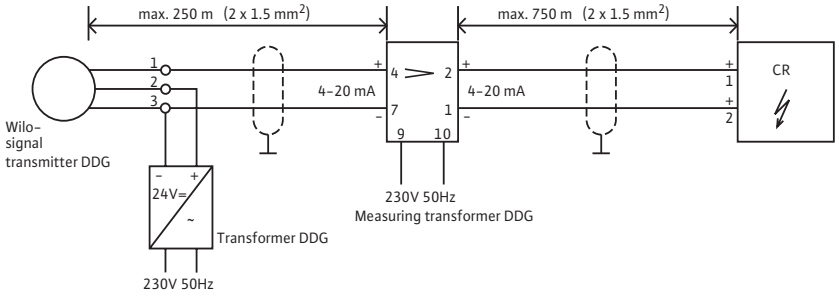
DDG	2:	0	to	0.2 bar*
DDG	10:	0	to	1.0 bar
DDG	20:	0	to	2.0 bar
DDG	40:	0	to	4.0 bar
DDG	60:	0	to	6.0 bar
DDG	100:	0	to	10.0 bar*

2) Other pressure measurement ranges on request
3) Selection of pressure measurement range according to the pump duty point
* not with VR-HVAC

Power consumption:	1.5 W
Protection class:	IP 54
Maximum pressure rating:	25 bar
Fluid temperature:	0 °C to +70 °C
Ambient temp.:	0 °C to +40 °C

DDG transducer





Transducer for wall-mounted installation for amplifying signals from the Wilo DDG signal transmitter for cable lengths in excess of 250 m.
Delivery incl. DDG power supply unit.

Operating voltage:	230 V/50 Hz
Current input/output:	0 – 20 mA
Max. back-up fuse:	10 A
Maximum input resistance:	50 Ω
Maximum load resistance:	≤ 600 Ω

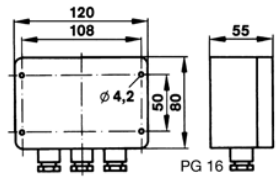
Maximum power consumption:	5 VA
Protection class:	IP 54
Ambient temperature:	0°C to + 40°C

Signal cable

Input:	2 x 1.5 mm^2, 250 m max. length, shielded
Output:	2 x 1.5 mm^2, 750 m maximum length, shielded

Signal transmitters and accessories

DDG power supply unit



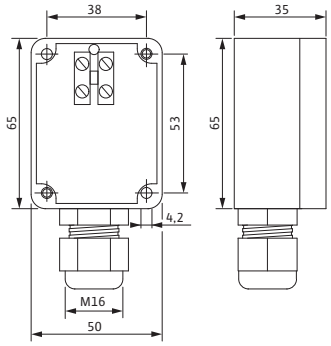
Fastening elements onsite

Power supply unit for wall-mounted installation for power supply of the DDG signal transmitter.

Operating voltage:	230 V/50 Hz
Output voltage:	24 V DC
Output current:	0 – 20 mA

Protection class:	IP 54
Ambient temperature:	0 °C to +40 °C

Outdoor temperature sensor KTY/PT 100

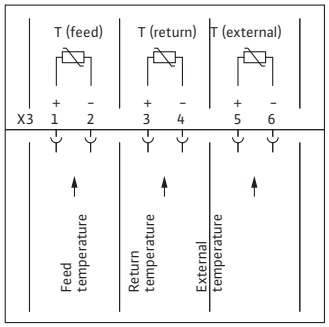


Signal transmitter for wall-mounted installation for outdoor temperature measurement.

Required: connection line (provided by the customer)
up to 25 m: 3 x 0.75 mm^2, shielded
up to 100 m: 3 x 1.50 mm^2, shielded
up to 250 m: 3 x 2.50 mm^2, shielded

Protection class:	IP 65
Temperature range:	–25 °C to +80 °C

KTY 10 temperature board



Terminal diagram, KTY 10 temperature board

Additional board for upgrading Wilo-CR/CRn system switchgear series for use of the control modes
- Differential temperature control (△T)
- Feed/return temperature control (±T)
- Differential pressure – temperature-superimposed (△p-T)

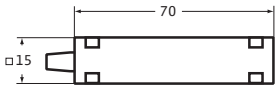
3 analogue inputs for TSG temperature sensors:
- Feed temperature (+T)
- Return temperature (–T)
- Temperature setpoint (T)

Fixation material, CAN bus cable and 2 TSG temperature signal transmitters are included in the scope of delivery.

Measurement range:	±T: – 20 ... +150°C △T: ≥ 10 K
Resolution:	10 bits
Accuracy:	0.2% of upper limit + transmitter tolerance
Ambient temperature:	0 °C to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approx. 0.5 kg

Signal transmitters and accessories

TSG signal transmitter



Signal transmitter for pipe attachment for temperature measurement included in the scope of delivery of the KTY 10 temperature board. With 2 spring fasteners for attachment to pipes up to DN 100, 1 tube of thermal conducting glue, 5 m connecting cable for switchgear [1] (2 x 0.75 mm^2, shielded)

1) Longer distances to be extended by customer

up to 25 m: 3 x 0.75 mm^2, shielded,
up to 100 m: 3 x 1.50 mm^2, shielded,
up to 250 m: 3 x 2.50 mm^2, shielded

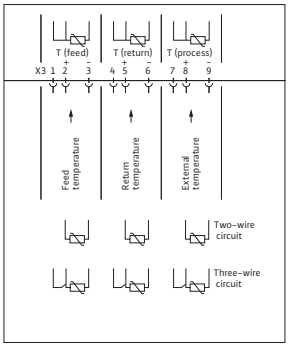
KTY 10 PTC thermistor

– at +25 °C:	2 kΩ
– at +90 °C:	3.09 kΩ
Max. current:	2 mA

> Technical data

Protection class:	IP 43
Temperature range:	0 °C to +150 °C

Temperature board PT 100



Terminal diagram, PT 100 temperature board

Additional board for upgrading switchgears of the Wilo-CR/CRn system series for use of the control modes
- Differential temperature control (△T)
- Feed/return temperature control (±T)
- Differential pressure – temperature-superimposed (△p-T)

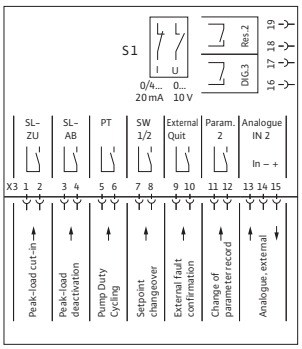
3 analogue inputs for PT 100 temperature sensors in 2-/3- and 4-conductor technology to be provided by the customer:
- Feed temperature (+T)
- Return temperature (–T)
- Temperature setpoint (T)

Fixation material and CAN bus cable are included in the scope of delivery.

> Technical data

Measurement range:	±T: – 20 ... +150 °C △T: ≥ 5 K
Accuracy:	± 2 K (in relation to standard values in accordance with DIN IEC 751) + transmitter tolerance
Ambient temperature:	0 °C to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approx. 0.5 kg

DDC board



Terminal diagram, DDC board

Additional board for upgrading switchgears of the Wilo-CR/CRn system series for remote control by external monitoring units (e.g. BA or DDC substation).

1 analogue input for external correcting variable (speed adjustment for DDC operation)
8 digital inputs for connection of an external potential-free button for
- Peak-load cut-in
- Peak-load deactivation
- Pump cycling
- Setpoint changeover
- Acknowledgement of the collective fault signal
- Parameter record switching
- Control input, 0/2 -10 V or 0/4 - 20 mA
- Signal input DIG 3

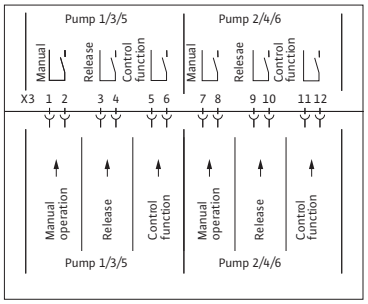
Fixation material and CAN bus cable are included in the scope of delivery.

> Technical data

Analogue input:	Correcting variable: 0 – 10 V, 0/4 – 20 mA
Measurement range:	(= min.- max. speed)
Input resistance:	10kŸ or 50 Ÿ
Resolution:	10 bits
Accuracy:	0.2% of upper limit + transmitter tolerance
Digital inputs:	
Input level:	24 VDC/1 mA
Dielectric strength:	250 VAC
Maximum cable length:	100 m
Terminal cross-sections:	1.5 mm^2
Ambient temp.:	0 °C to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approx. 0.5 kg

Signal transmitters and accessories

Control board



Terminal diagram, control board

Additional board for upgrading switchgears of the Wilo-CR/CRn system series for Manual – 0 – Automatic operating mode selection for a maximum of 2 pumps (e.g.: 5-pump system requires 3 control boards). Switchover for each pump via potential-free control switches provided by the customer.

Manual – 0 – Automatic switchover via potential-free two-way NO contacts provided by the customer with "Off" middle position for each pump.
Operating mode:

– Manual:	Pump in mains operation
– 0:	Pump Off
– Automatic:	Pump enabled for control mode

Connection for repair switches provided by the customer with auxiliary contact:

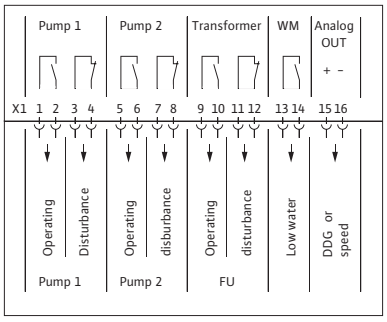
– closed:	Pump enabled
– open:	Pump disabled

Fixation material and CAN bus cable are included in the scope of delivery.

> Technical data

Selector switch:	P1/P2, P3/P4, P5/P6
Control inputs:	2 x repair switches (On/Off for each pump) 2 x control switches (Manual – 0 – Automatic for each pump)
Input level:	24 VDC/1 mA
Dielectric strength:	250 VAC
Maximum cable length:	100 m
Terminal cross-sections:	1.5 mm^2
Ambient temp.:	0 °C to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approx. 0.5 kg

Signalling board 1 – 2



Terminal diagram, signal board 1 – 2

Additional board for upgrading switchgears of the Wilo-CR/CRn system series for individual run and single fault signals for single and double pump systems.

- Potential-free signalling contacts for operation (NO contact) and fault (NC contact) of: pump 1, pump 2, frequency converter
- Signals for the digital inputs DIG2 or DIG3, e.g. frost (heating) or low water (pressure boosting)
- Analogue output for actual speed value or actual value transmitter (can be preselected)

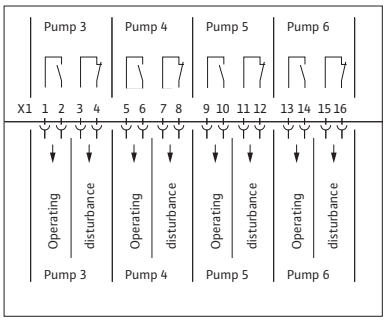
Fixation material and CAN bus cable are included in the scope of delivery.

> Technical data

Analogue output:	Actual value
Measurement range:	0 – 10 V, 0/4 – 20 mA (speed or transmitter)
Input resistance:	10kΩ or 50Ω
Resolution:	10 bits
Accuracy:	0.2% of upper limit + transmitter tolerance
Signalling contacts	
Rating:	max. 250 VAC/2 A min. 12 VDC/10 mA
Maximum cable length:	100 m
Terminal cross-sections:	1.5 mm^2
Ambient temp.:	0 °C to +40 °C
Dimensions:	120 mm x 120 mm
Weight:	approx. 0.5 kg

Signal transmitters and accessories

Signalling board 3 – 6



Terminal diagram, signal board 3 – 6

Additional board for upgrading switchgears of the Wilo-CR/CRn series for individual run/single fault signals for three- to six-pump systems (signal board 1 – 2 pump also required).

- Potential-free signalling contacts for operation (NO contact) and fault (NC contact) of: pump 3, pump 4, pump 5, pump 6
  Fixation material and CAN bus cable are included in the scope of delivery.

> Technical data

Signalling contacts	
Rating:	max. 250 VAC/2 A min. 12 VDC/10 mA
Terminal cross-sections:	1.5 mm^2
Ambient temp.:	0 °C to +40 °C
Dimensions:	120 mm x 120 mm
Weight:	approx. 0.5 kg

Series overview Wilo-Stratos interface modules

Wilo-IF-Module Stratos, PLR



- Retrofit plug-in module for pump types Wilo Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Serial digital PLR interface for connection to BA building automation via
  - Wilo interface converter or
  - Company-specific coupling modules
- Communication-capable dual pump management (according to time, load and fault)

Wilo-IF-Module Stratos, LON



- Retrofit plug-in module for pump types Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Serial digital LON interface for connection to BA building automation via LONWorks networks:
  - LONTalk protocol
  - LONMark conformity
- Communication-capable dual pump management (according to time, load and fault)

Wilo-IF-Module Stratos, CAN



- Retrofit plug-in module for pump types Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Serial, digital CAN interface for connection to BA building automation via CAN bus system
- Protocol in accordance with the CANopen standard (EN50325-4)
- Communication-capable dual pump management (according to time, load and fault)

Wilo-IF-Module Stratos, Ext. Off



- Retrofit plug-in module for pump types Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Overriding Off control input
- Control input, 0 - 10 V (remote speed or setpoint adjustment) for connection to BA building automation
- Communication-capable dual pump management (according to time, load and fault)

Series overview Wilo-Stratos interface modules

Wilo-IF-Module Stratos, Ext. Min



- Retrofit plug-in module for pump types Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Overriding Min control input (setback operation without Autopilot)
- 0 – 10 V control input (remote speed or setpoint adjustment) for connection to BA building automation
- Communication-capable dual pump management (according to time, load and fault)

Wilo-IF-Module Stratos, SBM



- Retrofit plug-in module for pump types Wilo-Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Collective run signal
- Control input, 0 – 10 V (remote speed or setpoint adjustment) for connection to BA building automation
- Communication-capable dual pump management (according to time, load and fault)

Wilo-IF-Module Stratos, Ext. Off/SBM



- Retrofit plug-in module for pump types Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- Overriding Off control input
- Collective run signal
- Communication-capable dual pump management (according to time, load and fault)

Series overview Wilo interface modules

Wilo-IF-Modul PLR



- Retrofit plug-in module for pump types with IR interface
  - Wilo-TOP-E/ED
  - Wilo-VeroLine-IP-E
  - Wilo-VeroTwin-DP-E
  - Wilo-CronoLine-IL-E
  - Wilo-CronoTwin-DL-E
- Serial digital PLR interface for connection to BA building automation via:
  - Wilo interface converter or
  - Company-specific coupling modules
- Communication-capable dual pump management (according to time, load and fault, only TOP-E/-ED and IL-E/DL-E)

Wilo-IF-Modul LON



- Retrofit plug-in module for LON-compatible pump types with infrared interface
  - Wilo-TOP-E/ED
  - Wilo-VeroLine-IP-E
  - Wilo-VeroTwin-DP-E
  - Wilo-CronoLine-IL-E
  - Wilo-CronoTwin-DL-E
- Serial digital LON interface for connection to BA building automation via LONWorks networks:
  - LONTalk protocol
  - LONMark conformity
- Communication-capable dual pump management (according to time, load and fault, only TOP-E/-ED and IL-E/DL-E)

Wilo-Control pump management systems

Pump control

Series overview operating and service units

Wilo-IR-Module



- Remote control with infrared interface for electronically controlled Wilo pumps
- Commissioning and diagnostic instrument/tool
- Adaptable into the SDIO slot of a Pocket PC (PDA)
- Wilo software is compatible with Microsoft Windows mobile operating system
- Extension of pump functions
- Enables the export, storage and printout of pump data records

Wilo-Dia-Log



- The complete package for commissioning, service, maintenance and documentation of electronically controlled Wilo pumps with infrared interface, consisting of:
  - Wilo-IR-Module, complete
  - Pocket PC, preconfigured with the Microsoft Windows Mobile™ Version 5.0 operating system and "IR-Module" user software, including power supply unit
  - Data transfer cable from the Pocket PC to a computer (USB interface)
  - Portable printer, including power supply unit and paper roll (for roll width of 58 mm)
  - Documentation and software

Wilo-IR Monitor



- Remote control with infrared interface for electronically controlled Wilo pumps
- Commissioning and diagnostic instrument/tool
- Extension of pump functions
- Rotation test unit for all pump motors and standard motors

Series overview Wilo-Protect-Modules

Wilo-Protect-Module C (single pumps)



- Plug-in module for single pumps of the Wilo-TOP-S/-Z and Wilo-TOP-RL series and Wilo-SE with mains connection 1~230 V, 50 Hz or 3~400 V, 50 Hz
  Not suitable for controlled power supply (e.g. Wilo-CR system).
- Plug-in module for double pumps of the Wilo-TOP-SD series (2 x Wilo-Protect-Modules C) with mains connection 1~230 V, 50 Hz or 3~400 V, 50 Hz
  Not suitable for controlled power supply (e.g. Wilo-CR system).

Wilo-Protect-Module C (double pumps)



- Plug-in module for double pumps of the Wilo-TOP-SD (2 x Wilo-Protect-Module C) and Wilo-SE-TW (2 x Wilo-Protect-Module C) series with mains connection 1~230 V, 50 Hz or 3~400 V, 50 Hz
  Not suitable for controlled power supply (e.g. Wilo-CR system).

Series overview building automation (BA)

Wilo-Control AnaCon



- Analogue interface converter for the universal connection of communication-capable Wilo pumps with serial, digital PLR interface to onsite monitoring units in accordance with VDI 3814.

Wilo-Control DigiCon



- Digital interface converter for the connection of communication-capable Wilo pumps with serial digital PLR interface to onsite monitoring units with digital RS 485 interface.

Wilo-Control DigiCon-A (Manual control level)



- Manual control panel for Wilo-Control DigiCon for the extended connection communication-capable Wilo pumps with serial digital PLR interface to operating levels onsite in accordance with VDI 3814.
  The Wilo-Control DigiCon-A manual control panel allows the overriding control of pumps connected to the Wilo-Control DigiCon interface converter.

Wilo-Control bus Box



- Junction box or distribution box for setting up a CAN bus system with connection of the nodes via short spur lines.

Subject to change 09/2008 WILO SE

Building automation planning guide

Building automation (BA)

Automatically controlled processes have become essential in modern buildings. This particularly applies to all building and technical systems in the fields of:

- Heating systems
- Cooling systems
- Ventilation systems
- Heating pumps
- Combined heat and power plants
- Water supply
- Sewage disposal etc.

The BA is responsible for controlling the dependencies between the various sections involved in the technical building equipment (TGA). It is in particular facility management that requires the intersectional exchange of information and data in order to run the building or estates with optimum efficiency and economy. As field devices, pumps are to be seen as components with high power consumption that are indispensable for operations in the TGA. The operational reliability and economic efficiency of pumps and pump systems are ensured by their central availability and monitoring.
Due to technical progress in the fields of electrical engineering/electronics, potential-free contacts and analogue unit signals are being successively replaced by bus systems.

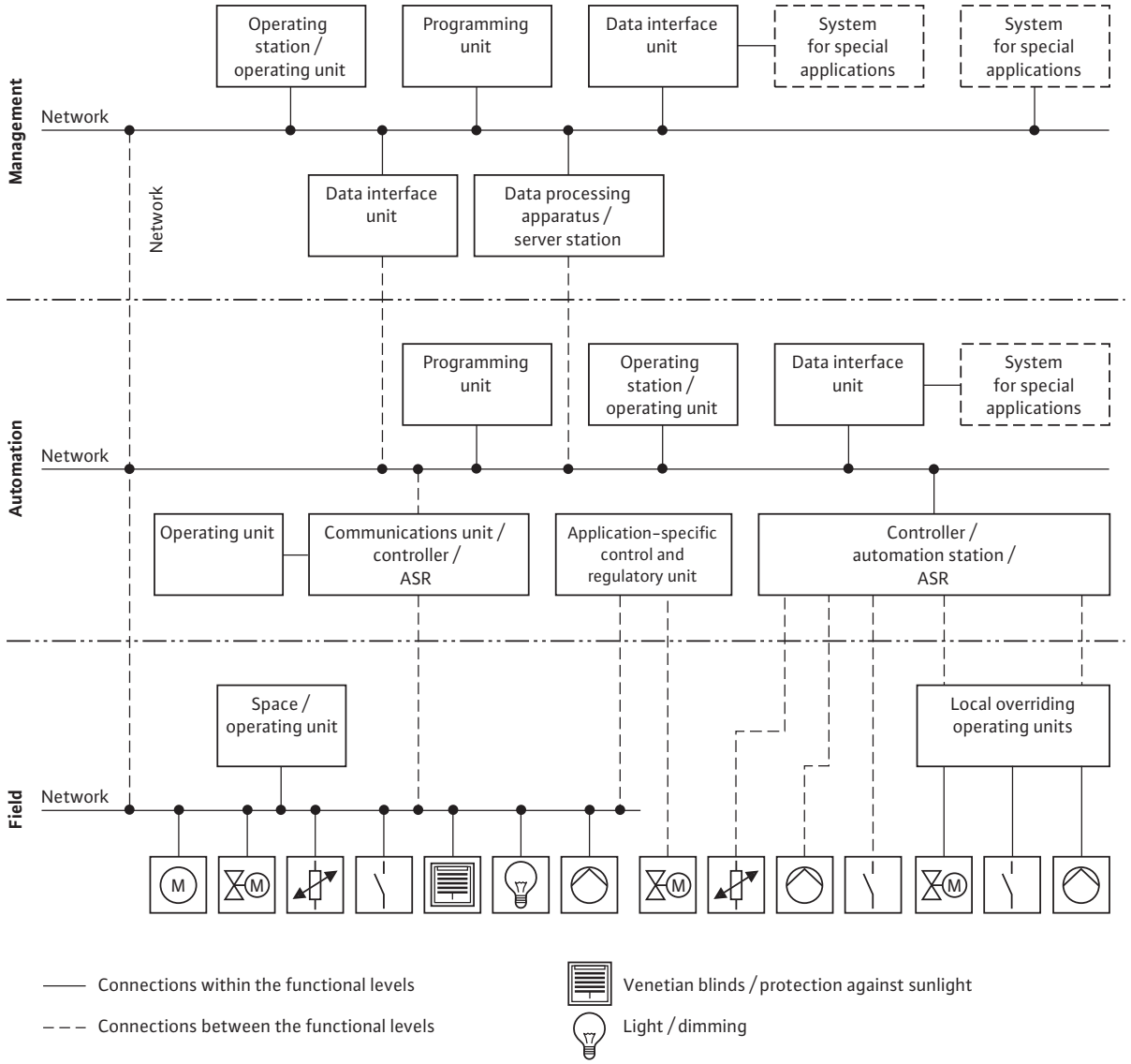


Fig.: Building automation - diagram

Building automation planning guide

Integration into the building automation

Depending on the nature and extent of a BA system, different communications connections are required to transfer the signals, control commands and data to the pump system to be monitored.
The design and functions of BA a system are defined precisely in VDI 3814. The scope of communication is decisive for determining whether potential-free contacts or analogue signals (2 control cables are required for each piece of information) or bus systems (all data via one bus line) are used for data transmission.
Wilo pumps as well as their optional accessories are equipped with control terminals at which internal relay signals are available in accordance with VDI 3814 requirements.

Functional principle of a collective fault/collective run signal*:

Input	NO contact	SPDT contact
		
Fault signal in compliance with VDI 3814	Run signal in compliance with VDI 3814	Connection optional
Illustration: De-energised idle state (relay not active)		

Mains voltage	Collective fault signal SSM		Collective run signal SBM	
	Relay	Contact	Relay	Contact
Off[1)]	0	closed	0	open
On	0	closed	1	closed
On, pump faulty	1	open	0	open

Mains voltage	Control input "Ext. Off"	Collective fault signal SSM		Collective run signal SBM	
		Relay	Contact	Relay	Contact
Off[1)]	closed open	0 0	closed closed	0 0	open open
On	closed open	0 0	closed closed	1 0	closed open
On, pump faulty	closed open	1 1	open	0 0	open open

0 = relay not active (without current)
1 = relay active
SBM = collective run signal
SSM = collective fault signal
[1)] Failure of the control electronics is equivalent to the "Mains off" state

* Functional principle according to factory setting

It is also possible to implement external control functions such as Overriding Off and Overriding Min. via potential-free contacts provided by the customer.

For this, there are the following combination options:
- Overriding Off:
  - Stratos/Stratos-Z/Stratos-D/Stratos-ZD with IF-Modules
  - TOP-E/-ED ($P_2 \geq 350$ W)
  - CronoLine-IL-E/CronoTwin-DL-E
  - VeroLine-IP-E/VeroTwin-DP-E
- Overriding Min.:
  - Stratos/Stratos-Z/Stratos-D/Stratos-ZD with IF-Modules
- Overriding Off, Overriding Max and Overriding Min:
  - Stratos/Stratos-Z/Stratos-D/Stratos-ZD with Stratos IF-Modules PLR and analogue interface converter
  - TOP-E/-ED with PLR IF-Modules and Wilo-Control AnaCon
  - VeroLine-IP-E/Vero-Twin-DP-E with PLR IF-Module and Wilo-Control AnaCon
  - CronoLine-IL-E/CronoTwin-DL-E with IF-Modules PLR and Wilo-Control AnaCon

In addition to these functions, the new pumps with communication capabilities feature the option of specifying an extensive number of actual physical values. The latest sensor technology records hydraulic and electrical pump data and provides it via a PLR or LON serial digital interface of the BA. This entire information can be exchanged between a pump with communication capability (accessory modules required) and another BA unit via a 2-wire cable.
Pumps with communication capability are:
- Stratos/Stratos-Z/Stratos-D with IF-Modules
- TOP-E/-ED with IF-Modules
- CronoLine-IL-E/CronoTwin-DL-E with IF-Modules
- VeroLine-IP-E/VeroTwin-DP-E with IF-Modules

System integration

The demands in terms of communication capabilities and functions are guided through ever more complex hierarchies of building automation as a result of the rising demands for technical building equipment (TGA) in large building projects. This leads to a situation where components at the field level are becoming increasingly technically sophisticated, because - among other things - they also fulfil functional requirements at the automation level. In order to reduce installation costs and thus investment costs of technical building equipment, and thus also those associated with pump systems while at the same time increasing their economic efficiency and reliability, it is necessary to use systems with "open communication" and "distributed intelligence".

The Wilo-Control automation and control system offers:
- Monitoring and control in accordance with VDI 3814 with
  - Potential-free contacts
  - Analogue signals

- Serial digital **PLR interface** (Wilo-specific hardware and protocol) of pumps with communication capability is connected in a star shape via a 2-wire cable to a Wilo interface converter or a company-specific coupling module (I/O module). This connection permits transmission lines of up to 1000 m. Additional advantages are:
  - Twisting protection
  - Resistance to interference
  - Small cross-sections (0.75 mm^2)
  - EMC protection at both ends
  - Galvanic isolation
  - Interference voltage resistance up to 250 VAC

- Serial bus-capable **RS 485 interface** (standard hardware, Wilo-specific protocol) with digital interface converter for communication with digital monitoring units. The data protocol is to be coordinated with the respective BA manufacturer.

- Serial bus-capable **LON interface** with LONTalk protocol and FTT10A transceiver type for connecting electronically controlled LON-capa-

Building automation planning guide

ble Wilo pumps with infrared interfaces to LONWorks networks. The LONWorks technology offers installation advantages such as:
- Twisting protection
- Resistance to interference
- Small cross-sections (0.75 mm^2)
- EMC protection at both ends
- Galvanic isolation
- Interference voltage resistance up to 250 VAC
- Freely selectable topology.

LON is an open, non-manufacturer-specific system which enables open, intersectional communication between different components and systems. It thus offers advantages to planning engineers, installers and operators, such as:
- Intersectional integration
- Is non-manufacturer-specific
- Creation of functional added values
- Avoidance of installation and planning errors due to standardised data interface (prerequisite: no varying transmission media)
- Reduction of installation expenses compared to stand-alone systems
- Reduced investment costs due to multiple use of sensors
- No expensive gateway solutions are required for data exchange between stand-alone systems
- Flexibility in the event of modifications and retrofitting
- Reduced operating costs due to intelligent energy management
- Efficiency and operational reliability due to hydraulic load management in heating/ventilation/air-conditioning installations
- Overall transparency due to centralised displays, interventions and monitoring
- Standardised and transparent operation of equipment and technical systems
- LONWorks enables 2 directions of communication:
  - Vertical communication between components at the field level and automation stations at the automation level
  - Horizontal communication between components of the field level.

    Horizontal communication in particular allows decentralised structures to be set up, which operate without higher-level automation station. It has thus become possible to implement previously expensive control tasks with significantly lower installation expenses, e.g. a controlled pump with communication capability can exchange data directly via LON with a valve, a differential-pressure sensor or a boiler control system and conduct control tasks. At the same time, the pump is able to send electrical and hydraulic operating data, for statistical evaluation, and, if necessary, any fault and run signals to the higher-level primary control unit or receive overriding commands from this primary control unit.
    Communication takes place according to the standardised LONTalk protocol and uses the defined network variables of the LONMark functional profile "Pump Controller Object for HVAC Applications" (8120_10.pdf).

- Serial bus-capable **CAN interface** as the new Wilo standard for connection to a CAN bus system. The protocol meets the CANopen standard (EN 50325-4). Compared to the data items of the LONTalk protocol, the CAN protocol uses newly defined data items, such as e.g.
  - Times for pump kick, pump cycling, fault shutdown delay
  - Adjustment of the SSM/SBM performance, pump management for up to 127 pumps
  - Histogram (statistics), and much more:
    The complete list of parameters can be downloaded from the WILO website.

- The data items of these two bus protocols are nevertheless comparable at the functional level (selection of control mode, setpoint specification, etc.). With its high transmission speed (125 kBit/s), however, CAN does offer a few advantages compared to the LON field bus system:
  - Integration into any CAN bus system, since the protocol complies with the CANopen standard (EN 50325-4).
  - Communication options with CAN-capable third-party products
  - Communication options with Wilo I/O modules and Wilo gateways; due to the line structure of the CAN bus system, the amount of cables required is reduced to a minimum.

- The following aspects are to be observed when planning and installing a CAN bus line:
  - A maximum of 127 consumers can be connected to and addressed on a CAN bus line.
  - With 64 pumps and 32 I/O modules, simplified addressing and connection options are possible.
  - When there are more than 64 pumps on a CAN bus line, the pumps must be configured with a commercially available CANopen configuration program.
  - A special, shielded CAN bus cable is used for cabling. This shield is to be placed carefully on both sides in order to avoid communication disruptions on the bus. This is done at the pumps with EMC cable connections which are enclosed with the Stratos CAN IF-Module. Cable clips that enclose the braided shield are to be used in the switch cabinet.
  - For the configuration of the various bus topologies, the maximum line lengths are to be taken into account (cf. fig. 1, fig. 2, fig. 3):

Maximum line lengths with different bus topologies

Max. overall line length L_t	Max. line length of an individual spur line L_d	Max. cumulative length of all spur lines
[m]	[m]	[m]
200	10	50

- Nodes may be structural elements and components (including ones from third-party sources) such as:
  - Single pumps, double pumps, pump systems with CAN interface
  - Pressure sensors, differential pressure sensors, temperature sensors
  - External controllers
  - Routers, repeaters, gateways
  - I/O modules
- The bus must be sealed off at the last node of the bus line with appropriate resistances. The Stratos CAN IF-Module with two DIP switches is possible with the pumps.
- The use of CAN bridges with interface in accordance with ISO 11898-2 is recommended for extending the bus length. The use of repeaters is not recommended.

Building automation planning guide

Operating data management by BA
Operating data management by the BA system allows the recording and storage of cyclic and event-specific data, e.g.:
- Maximum output data for Δp and Q
- Minimum output data for Δp and Q
- Current power consumption P_1
- Operating hours
- Cumulative power consumption
- Status signals
- Fault signals with specification of date, time and cause.

The multitude of listed information and functions enables specific energy and maintenance management and thus contributes to reducing costs. Overall efficiency values and performance figures can thus be determined, e.g. by performance and work values in relation to the heating load to be measured.

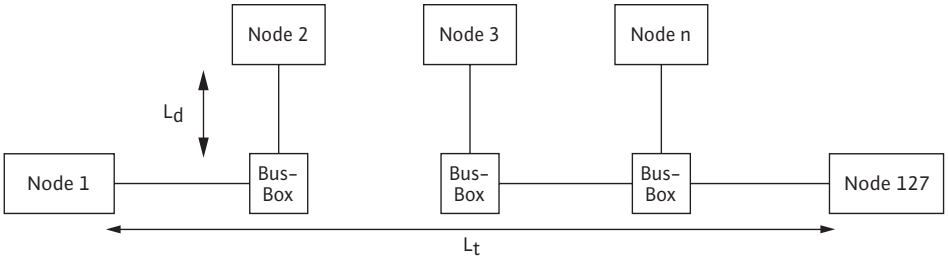


Fig. 1: Line structure with connection of all nodes via short spur lines

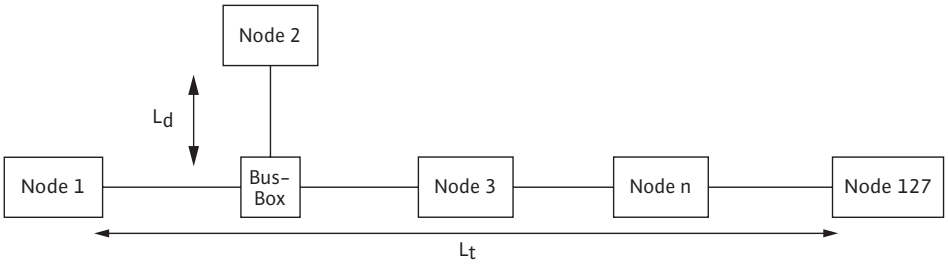


Fig. 2: Line structure with connection of individual nodes via short spur lines

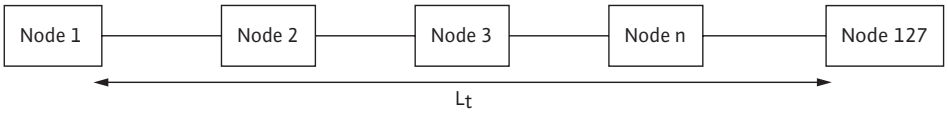


Fig. 3: Pure line structure

Series description, Wilo-IR-Module

Wilo-IR-Module



Fig.: Wilo-IR-Module: Operating and service unit for pump monitoring

Application

The Wilo-IR-Module is, in conjunction with a commercially available PDA or Pocket-PC, a modern operating and service unit for wireless, convenient remote control of the electronically controlled Wilo pumps with infrared interface of the series Wilo ...

- Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- TOP-E/-ED
- VeroLine-IP-E
- VeroTwin-DP-E
- CronoLine-IL-E
- CronoTwin-DL-E

The extensive pump functions can be adjusted via the IR-Module by wireless remote control using the PDA/Pocket-PC. The pumps send back detailed operation and status data which are displayed in a readily comprehensible and clearly legible fashion on the monitor of the PDA/Pocket-PC. A program created by Wilo guarantees a clear structure for all operation functions. Pump-specific data sets can be saved and archived as text (file format .rtf) or as tables (file format .xls), together with information regarding installation site, date and time.

The user continues to have access to all of the functions and programmes that a PDA/Pocket-PC offers. The analysis and adjustment possibilities of the IR-Module are guaranteed to installers, planners and operators that electronically controlled pumps of the above-named series can be adjusted in optimum fashion in heating, ventilation and air-conditioning systems and that they can be documented throughout their entire life cycles.

Version

A PDA or Pocket PC is required to operate the IR-Module that must meet certain requirements:

- SDIO-capable cart slot
- Windows Mobile version 5.0 operating system or higher
- 5 MB free memory (minimum)
- Bluetooth interface for printer (optional)
- CPU with 300 MHz pulse frequency
- 64 MB ROM
- 32 MB RAM
- Display: 240 x 320 pixels

Updating the program

The current software for the IR-Module and the PDA/Pocket PC is available for download at the website: www.wilo.com.

Technical data	
	Wilo IR-Module
Protection class	IP 43
Vibration resistance	DIN EN 60068-2-6
Operating temperature	-10 °C to +40 °C
Storage temperature	-20 °C to +70 °C
Transmission and reception range	max. 8 m, 15 °C
Display	50 x 50 mm, with backlight that can be switched on
Power supply	provided via PDA/Pocket PC
Service life	depends on the selected PDA/Pocket PC
Data buffer	EEPROM
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2

Automatic connection setup

Information is exchanged between IR-Module and pump(s) in wireless fashion via an infrared interface with 33 kHz or 455 kHz. The slow transmission with 33 kHz guarantees the compatibility of all existing electronically controlled pumps with infrared interfaces. In the event of installation conditions in narrow spaces (e.g. a number of pumps installed closely side-by-side), an automatic connection set-up prevents the simultaneous activation of different pumps and thus initiates the correct data exchange between the desired pump and the IR-Monitor. No manual addressing of the individual pumps is required for IR communication.

Data storage

Operating data recorded immediately prior to a fault is stored in the pump and can be further used for diagnostic purposes with the IR-Module and the PDA/Pocket PC.

Statistical functions

The hydraulic duty point of the relevant pump can be viewed with the IR-Module in a statistical histogram. The hydraulic load of the pump can thus be monitored during a definable operating period.

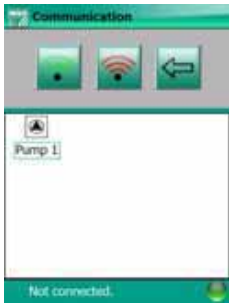
Series description, Wilo-IR-Module

Main menu
The main menu of the IR-Module provides access to ten function menus.



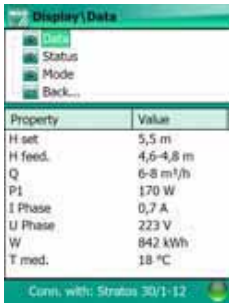
Function menu 1: "Communication"
This function menu automatically establishes a connection between the IR-Module and the pump. All of the pumps detected in a single group (e.g. distributor) can be activated selectively here.







Function menu 2: "Display/Operating data"
Hydraulic and electrical operating data is displayed in this function menu. Status signals and information on the pump mode can be accessed.

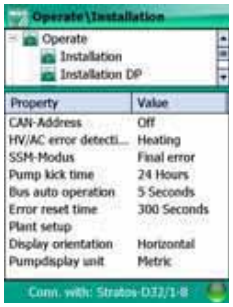


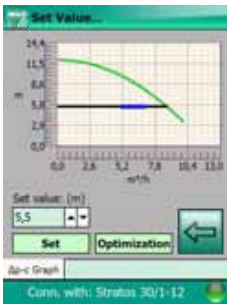




Function menu 3: "Operation"
Operating data and status information are displayed in this function menu. Settings such as the selection of the control mode and setpoint changes can be defined at the same time.







Function menu 4: "Statistics"
Statistical data is displayed in this function menu, which can also be reset here. A histogram shows the distribution in percent of the volume flow throughout the operating time. This makes the hydraulic load of the pump transparent.





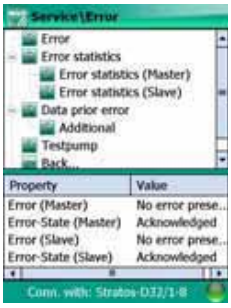


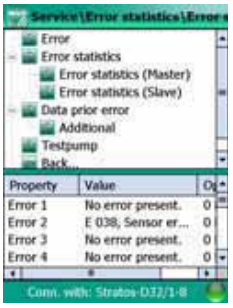
Series description, Wilo-IR-Module

Function menu 5: "Service"

This function menu enables detailed fault diagnostics with the stored operating data that was available prior to the last fault that occurred. The fault memory (FIFO principle) of the pump is read out and various self-tests can be carried out at the pump.







Function menu 6: "Settings"

This function menu allows you to select a specific language and international or US units for displaying operating data. In addition, the IR-Module software version can be updated.







Function menu 7: "Print"

Data records of pumps can be printed out in this function menu. Data transfer to a mobile printer is implemented by means of a Bluetooth interface. The printer must be configured separately.



Function menu 8: "Open"

Saved data records for pumps are opened in this function menu.



Function menu 9: "Save"

Pump data records are saved using this function menu along with details concerning installation-specific designations. The date and time are automatically recorded in file names, so that multiple storage of a data record results in a chronological order.
The files are saved to the PDA and can be transferred to the PC.



Series description, Wilo-IR-Module

Function menu 10: "Snap shot"
Important data of the pump (from the CAN version) or the pump system can be displayed in summarised form here.





Wilo-Dia-Log



Fig.: Wilo-Dia-Log

- The complete package for commissioning, service, maintenance and documentation of electronically controlled Wilo pumps with infrared interface, consisting of:
  - Wilo-IR-Module, complete
  - Pocket PC, preconfigured with the Microsoft Windows Mobile™ Version 5.0 operating system and "IR-Module" user software, including power supply unit
  - Data transfer cable from the Pocket PC to a computer (USB interface)
  - Portable printer, including power supply unit and paper roll (for roll width of 58 mm)
  - Documentation and software

Series description, Wilo-IR-Monitor

Wilo-IR-Monitor



Fig.: Wilo-IR-Monitor; operating and service unit for pump monitoring

Application

Modern operating and servicing equipment for user-friendly remote control of the electronically controlled Wilo pumps with infrared interface of the following Wilo series:

- Stratos/Stratos-Z/Stratos-D/Stratos-ZD
- TOP-E/-ED
- VeroLine-IP-E
- VeroTwin-DP-E
- CronoLine-IL-E
- CronoTwin-DL-E

The IR-Monitor can be used in conjunction with all conventional glandless and glanded pumps without IR interfaces. It is capable of checking the direction of rotation, the rotating-field frequency and the current operating status of each pump and standard motor with the IR-Monitor.
The extensive pump functions can be remotely monitored by wireless control with the IR-monitor. All operating steps and status reports are clearly graphically displayed by a LC display.
The functionality of the IR monitor is closely linked with the properties of the high-efficiency and/or energy-saving pumps. The operation of the IR-monitor is similar to operating the pump; that is, changes and confirmations of newly set values is done by turning and pressing the red operating knob (single knob operation).
The functional capacity has mainly been tailored for the use by contractors and service personnel.

Version

Industrial standard due to its sturdy and robust plastic casing and the scratch-resistant monitor screen. A carrying case for additional protection is also included in the scope of delivery.

Technical data	
	Wilo-IR-Monitor
Protection class	IP 43
Vibration resistance	DIN EN 60068-2-6
Operating temperature	-10 °C to +40 °C
Storage temperature	-20 °C to +70 °C
Transmission and reception range	max. 8 m
Display	50 x 50 mm, with backlight that can be switched on

Technical data	
Power supply	2 Mignon alkaline battery cells 1.5 V size AA (included in the scope of delivery)
Service life	approx. 24 o'clock. when on and illuminated
Data buffer	EEPROM
Emitted interference	EN 61000-6-3
Interference resistance	EN 61000-6-2

Automatic connection setup

The information exchange between the IR-Monitor and the pump is wireless via infrared light. In the event of installation conditions in narrow spaces (e.g. a number of pumps installed closely side-by-side), an automatic connection setup prevents the simultaneous activation of different pumps and thus initiates the correct data exchange between the desired pump and the IR-Monitor. Manual coding of the individual pumps is not required.

Data storage

Any operating data recorded immediately prior to a fault is saved in the pump and can be made further use of for data diagnostic purposes with the IR-Monitor.

Statistical functions

The hydraulic output (volume flow) of the relevant pump can be viewed with the IR-Monitor in a statistical histogram.
The load profile of the hydraulic system is thus perceivable during the course of a defined operating period.
A non-fading data storage medium (EEPROM) is available for buffering preset values.

Battery monitoring

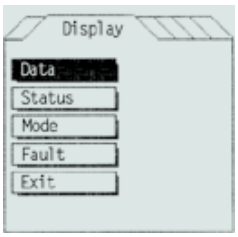
The state of the (rechargeable) batteries is monitored on a continuous basis. A warning is displayed on the monitor when the capacity fades.

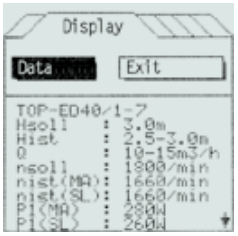
Series description, Wilo-IR-Monitor

Main menu
The main menu of the IR-Monitor is divided into 6 function menus:

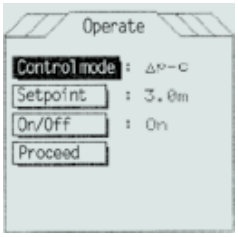
Menu 1: "Communication"
This menu initiates the automatic setup of a connection between the IR-Monitor and the pump. The selective activation of individual pumps within a group of pumps ≤ 1000 W is also possible here.

Menu 2: "Display"
System data can be read here, e.g. actual electrical and hydraulic values, operating status, operating mode, fault messages.
The display always distinguishes clearly between "Single pump" and "Double pump".

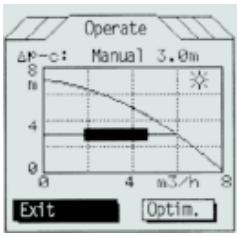




Menu 3: "Operation"
Data can be both displayed (current setpoint) and changed in this menu, e.g. control mode, setpoint, pump ON/OFF, disabling the manual control panel at the pump (pump ON/OFF, Ext. Off and SSM are still active).

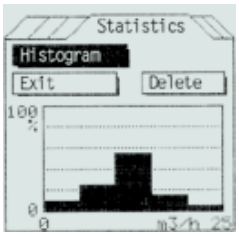




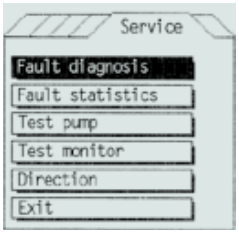


Menu 4: "Statistics"
The Statistics menu provides a clear histogram of the hydraulic output (volume flow Q) for the analysis of operating periods. This makes the load conditions of the hydraulic system visible over a definable operating period. This menu also has an operating hours and operating data counter.





Menu 5: "Service"
The service menu gives the user the option of fault diagnostics, fault statistics, function tests of the pump, the IR-Monitor and the serial digital interface, as well as monitoring the direction of rotation and measuring the frequency of the rotating field.
These two measurements can also be conducted with all conventional pumps without IR interface.





Menu 6: "Adjust"
Language selection, contrast and time-out settings, changing and activating the personal password are available to adjust the IR-Monitor to suit individual requirements.





Technical data, Wilo-IF-Modules Stratos/Wilo-IF-Modules PLR, LON, CAN

	IF-Module Stratos PLR IF-Module PLR	**IF-Module Stratos LON IF-Module LON**	**IF-Module Stratos CAN**
Terminal cross-section	2.5 mm^2	2.5 mm^2	1.5 mm^2
Max. cable length	1000 m	– 1000 m for bus topology with spur lines with a max. length of 3 m – 500 m for free topology, no more than 400 m between two communicating nodes	– max. bus length: 200 m – max. length of a spur line: 10 m – max. cumulative length of all spur lines: 50 m
Bus cable	Shielded cable	min. 2 x 0.34 mm^2, twisted (10 t/m), shielded cable, (e.g. J-Y(st)Y 2 x 2 x 0.8 mm^2)	e.g. CAN bus cable 1 x 2 x 0.5 min. 2 x 0.5 mm^2, shielded cable, shaft resistance 120 Ÿ
Transceiver	–	FTT 10 A	–
Power supply	–	5 V=/15 V= via the pump	5 V=/15 V= via the pump
Current consumption	–	30 mA	30 mA
Neuron ID/address	–	2-part sticker with barcode of Neuron ID	2-part sticker with blank field for address
Protocol	–	LONTalk	according to CANopen
Contact load	–	–	–
External dielectric strength	–	–	–
Control input, 0 - 10 V			
Terminal cross-section	–	–	–
Max. cable length	–	–	–
Dielectric strength	–	–	–
Input resistance of voltage input	–	–	–
Accuracy	–	–	–

Technical data, Wilo-IF-Modules Stratos Ext. Off, Ext. Min., Ext. Off/SBM

	Stratos IF-Module Ext. Off	Stratos IF-Module Ext. Min	Stratos IF-Module SBM	Stratos IF-Module Ext. Off/SBM	
				Function: Ext. Off	Function: SBM
Terminal cross-section	1.5 mm^2	1.5 mm^2	1.5 mm^2	1.5 mm^2	1.5 mm^2
Max. cable length	100 m	100 m	100 m	100 m	100 m
Bus cable	Shielded cable	Shielded cable	–	Shielded cable	–
Transceiver	–	–	–	–	–
Power supply	–	–	–	–	–
Current consumption	–	–	–	–	–
Neuron ID	–	–	–	–	–
Protocol	–	–	–	–	–
Contact load	24 V DC, 1 mA	24 V DC, 10 A	max.: 30 V AC/DC 1 A AC1/DC1 min.: 5 V/100 mA	24 V DC, 10 mA/	max.: 30 V AC/DC 1 A AC1/DC1 min.: 5 V /100 mA
External dielectric strength	250 V AC	250 V AC	–	250 V AC	–
Control input, 0 – 10 V					
Terminal cross-section	1.5 mm^2	1.5 mm^2	1.5 mm^2	–	–
Max. cable length	25 m (shielded cable)	25 m (shielded cable)	25 m (shielded cable)	–	–
Dielectric strength	24 V =	24 V =	24 V =	–	–
Input resistance of voltage input	> 100 Ÿ	> 100 Ÿ	> 100 Ÿ	–	–
Accuracy	± 5 %	± 5 %	± 5 %	–	–

Subject to change 09/2008 WILO SE

Function overview, Wilo-Stratos pumps with Wilo Stratos IF-Modules

Wilo-Stratos/Stratos-Z with Stratos IF-Module



- Integrated electronic performance control for operation at constant/ variable differential pressure
  - Simplifies pump configuration
  - Can be adjusted to the duty point
  - Reduces noise and saves electricity
- Integrated full motor protection
- Thermal insulation as standard
- Retrofit Stratos IF-Modules for functional extension

Wilo-Stratos-D/Stratos-ZD with 2 x Stratos IF-Modules



- Integrated electronic performance control for operation at constant/ variable differential pressure
  - Simplifies pump configuration
  - Can be adjusted to the duty point
  - Reduces noise and saves electricity
- Integrated full motor protection
- Double pump switchover valve
- Retrofit Stratos IF-Modules for functional extension

Function table, Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD

Function	Single pumps Wilo-Stratos	Single pumps Wilo-Stratos-Z	Double pumps Wilo-Stratos-D	Double pumps Wilo-Stratos-ZD
Electrical connection				
1~230 V, 50/60 Hz	•	•	•	•
Manual function				
Pump On/Off	•	•	•	•
Control mode setting (Δp-c, Δp-v, Δp-T[*)], controller)	•	•	•	•
Differential pressure setpoint setting	•	•	•	•
Speed setting (manual control mode)	•	•	•	•
Automatic function				
Infinitely variable performance control Δp-c	•	•	•	•
Infinitely variable performance control Δp-v	•	•	•	•
Infinitely variable performance control Δp-T	•	•	•	•
Automatic setback during low-load periods (e.g. at night)	•	•	•	•
Full motor protection with fault trip	•	•	•	•

• = available, - = not available
*) programmable via IR-Module, IR-Monitor, LON or CAN
1) Stratos IF-Module, Ext. Off
2) Stratos IF-Module, Ext. Min
3) Stratos IF-Module, SBM
4) Stratos IF-Module, PLR
5) Stratos IF-Module, LON
6) Stratos IF-Module, Ext. Off/SBM
7) Stratos IF-Module, CAN
8) Various combinations possible with Stratos IF-Modules, see "Wilo-Control pump management systems"
9) Dual pump management with 2 single pumps is only possible if the equivalent double pump is also listed in the Wilo catalogue.
10) Functions, see Function table, Wilo-IR-Module/IR Monitor

Function overview, Wilo-Stratos pumps with Wilo Stratos IF-Modules

Function table, Wilo-Stratos/Stratos-Z/Stratos-D/Stratos-ZD

Function	Single pumps Wilo-Stratos	Single pumps Wilo-Stratos-Z	Double pumps Wilo-Stratos-D	Double pumps Wilo-Stratos-ZD
External control function				
Overriding Off control input	•1) 6)	•1) 6)	•1) 6)	•1) 6)
Overriding Min control input	•2)	•2)	•2)	•2)
Control input, 0 – 10 V (remote speed adjustment)	•1) 2) 3)	•1) 2) 3)	•1) 2) 3)	•1) 2) 3)
Control input, 0 – 10 V (remote setpoint adjustment)	•1) 2) 3)	•1) 2) 3)	•1) 2) 3)	•1) 2) 3)
Signal and display function				
Collective fault signal (potential-free NC contact) Function, see Wilo-Control	•	•	•	•
Run signal (potential-free NO contact) Function, see Wilo-Control	•3) 6)	•3) 6)	•3) 6)	•3) 6)
Fault signal light	•	•	•	•
IR communication run signal light	•	•	•	•
Fault code	•	•	•	•
LC display for indicating pump data	•	•	•	•
Data exchange				
Infrared interface for wireless data exchange with the operating and service unit Wilo-IR-Module/IR-Monitor	•10)	•10)	•10)	•10)
Serial digital PLR interface for connection to BA via Wilo-interface converter or company-specific coupling modules	•4)	•4)	•4)	•4)
Serial digital LON interface for connection to a LONWorks network	•5)	•5)	•5)	•5)
Serial digital CAN interface for connection to a CAN bus system	•7)	•7)	•7)	•7)
Dual pump management (2 x single pumps or 1 x double pump)				
Main/standby mode (automatic. fault-actuated switchover/time-dependent pump cycling)	•8)	•8)	•8)	•8)
Parallel operation (efficiency-optimised peak-load activation and deactivation)	•8)9)	•8)9)	•8)	•8)

• = available, – = not available
*) programmable via IR-Module, IR-Monitor, LON or CAN
1) Stratos IF-Module, Ext. Off
2) Stratos IF-Module, Ext. Min
3) Stratos IF-Module, SBM
4) Stratos IF-Module, PLR
5) Stratos IF-Module, LON
6) Stratos IF-Module, Ext. Off/SBM
7) Stratos IF-Module, CAN
8) Various combinations possible with Stratos IF-Modules, see "Wilo-Control pump management systems"
9) Dual pump management with 2 single pumps is only possible if the equivalent double pump is also listed in the Wilo catalogue.
10) Functions, see Function table, Wilo-IR-Module/IR Monitor

Function overview, Wilo-Stratos pumps with Wilo-Stratos IF-Modules

Dual pump management that can be integrated for 1 x Wilo Stratos-D/Stratos-ZD or 2 x Wilo Stratos/Stratos-Z

Functions of the dual pump management system that can be integrated:
- Main/standby mode
- Parallel operation (efficiency-optimised peak-load activation and deactivation)
- Base-load pump cycling after 24 hours of cumulative operating time
- Automatic fault-actuated switchover

Combination options of the Stratos IF-Modules for integrated dual pump management[1)]

Function[2)]	**Stratos IF-Module PLR**	**Stratos IF-Module LON**	**Stratos IF-Module CAN**	**Stratos IF-Module Ext. Off**	**Stratos IF-Module Ext. Min**	**Stratos IF-Module SBM**	**Stratos IF-Module Ext. Off/SBM**
Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling modules	1 x MA 1 x SL	–	–	–	–	–	–
Serial digital LON interface for connection to LONWorks networks, FTT 10 A transceiver	1 x SL	1 x MA	–	–	–	–	–
Serial digital CAN interface for connection to a CAN bus system	1 x SL	–	1 x MA	–	–	–	–
Input for potential-free NC contact with the **Ext. Off** function [3)] **0 – 10 V control input** for remote speed adjustment or remote setpoint adjustment [4)]	1 x SL	–	–	1 x MA	–	–	–
Input for potential-free NC contact with **Ext. Min** function [5)] **0 – 10 V control input** for remote speed adjustment or remote setpoint adjustment[4)]	1 x SL	–	–	–	1 x MA	–	–
SBM run signal as potential-free NO contact[6)] **0 – 10 V control input** for remote speed adjustment or remote setpoint adjustment [4)]	–	–	–	–	–	1 x MA 1 xSL	–
Input for potential-free NC contact with **Ext. Off function[3)]** and **SBM run signal** as potential-free NO contact [6)]	–	–	–	–	–	–	1 x MA 1 xSL
SSM fault signal as potential-free NC contact integrated in the pump[7)]	–	–	–	–	–	–	–

MA = master, SL = slave

1) All Stratos IF-Modules can be combined as desired for integrated dual pump management.
The table shows the most economic combinations without the omission of any functional properties.
2) The control function is applied to the MA of the double pump; it is effective for the entire double pump.
The SL of the double pump receives the relevant command from the MA via the DP interface of the IF-Modules (2-wire connection cable).
The control functions (inputs) on the SL are not active.
The PLR interface on the SL is not active.
The IR interface on the SL is not active.
The signal outputs (SSM, SBM) on the SL are active.
3) Both drives are stationary.
4) The 0 – 10 V control input has various additional functions, see "Function of the analogue input, 0 – 10 V, in the integrated dual pump management" table and "High-efficiency pumps planning guide".
5) The base-load pump runs at minimum speed, the other drive is stationary.
6) The run signal indicates the rotation of the respective drive (separate individual run signals for MA and SL).
7) The SSM on the MA can be set as individual fault signal (for the MA) or collective fault signal (for MA and SL) with the IR-Module/IR-Monitor.

Function overview, Wilo-Stratos pumps with Wilo-Stratos IF-Modules

Function of the 0 – 10 V analogue input in the integrated dual pump management system

Function 0 – 10 V	Double pump operating mode	
	Main/standby mode /	Parallel operation +
Remote speed adjustment (DDC) **0 – 1 V: Off** [1] **1 – 3 V: Min speed** [1] **3 – 10 :n_{min}...n_{max}**	Speed of base-load pump follows the voltage signal Base-load pump cycling after 24 operating hours	Both pumps follow the voltage signal at the same speed
Remote setpoint adjustment [2] **0 – 1 V: Off** [1] **1 – 3 V: H_{min}** **3 – 10 V: H_{min}...H_{max}**	Base-load pump controls the differential pressure Base-load pump cycling after 24 operating hours	Efficiency-optimised activation and deactivation of the peak-load pump Base-load pump cycling after 24 operating hours

[1] Observe On/Off switching hysteresis, see "High-efficiency pumps planning guide"
[2] If the Ext. Off and Ext. Min functions are also simultaneously required for via potential-free contacts, a Wilo-Control AnaCon and 2 x Stratos PLR IF-Modules are required. All functions are then available at the Wilo-Control AnaCon.

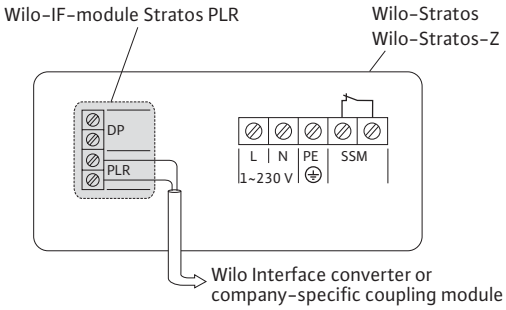
Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos IF-Module PLR

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series







Additional functions

- Serial digital **PLR interface** for connection to BA building automation via
  - Wilo interface converter or
  - Company-specific coupling modules
- Transfer of the following data items as control commands to the pump:
  - Control mode
  - Delivery head/speed setpoint
  - Pump ON/OFF
  - Setback operation
- Transfer of the following data items as signals from the pump:
  - Actual delivery head value
  - Actual volume flow value
  - Actual consumption value
  - Actual output value
  - Actual motor current value
  - Operating hours
  - Actual speed value
  - Detailed fault signals
  - Status signals
- **Double pump DP interface** for integrated dual pump management of 2 x single pumps or 1 x double pump (see Wilo-Stratos IF-Modules for double pumps)

Documentation

We provide you with the following documentation on our homepage **www.wilo.com** (/Products/Wilo building automation):

- PLR specification for Wilo-DigCon

Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos IF-Module LON

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series





Additional functions

- Serial digital **LON interface** for connection to LONWorks networks.
- Transfer of the following data items as control commands to the pump:
  - Operating mode
  - Setpoint
  - Data from external sensors
- Transfer of the following data items as signals from the pump:
  - Hydraulic operating data
  - Electrical operating data
  - Status signals
  - Fault signals
- **Double pump DP interface** for optional integration of a dual pump management system of 2 x single pumps or 1 x double pump (see Wilo-Stratos IF-Modules for double pumps)

Standards

- LONMark Application Layer Interoperability Guidelines Version 3.2
- LONMark Layers 1-6 Interoperability Guidelines 3.0
- LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

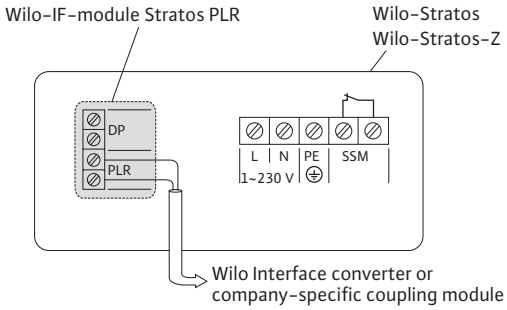
Delivery status

The LON IF-Module is supplied as "Application unconfigured" in accordance with the LONMark Application Layer Interoperability Guidelines.

Documentation

We provide you with the following documentation on our homepage **www.wilo.com** (/Products/Wilo building automation):

- LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)
- Download application via network: *.NXE / *.APB
- External interface files: *.XIF / *.XFB
- Device resource files: *.ENU /*.FMT / *.FPT / *.TYP



Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos CAN IF-Module

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series





Additional functions

- Serial, digital **CAN interface** for connection to a CAN bus system.
- Transfer of following data items to the pump:
  - Operating mode
  - Setpoints for the selected operating mode
  - Configuration parameters
- Transmission of the following data items as signals from the pump:
  - Hydraulic operating data
  - Electrical operating data
  - Statistical values
  - Status signals
  - Warning/fault/service signals
  - Type-specific parameters
- **Double pump DP interface** for the optional integration of a dual pump management system of 2 x single pumps or 1 x double pump (see Wilo-Stratos IF-Modules for double pumps)

Standards

- The interface CAN fulfils ISO 11898-2
- The CAN interface fulfils the CANopen standard **CiA DS 301 Version 4.0.2**

Scope of delivery

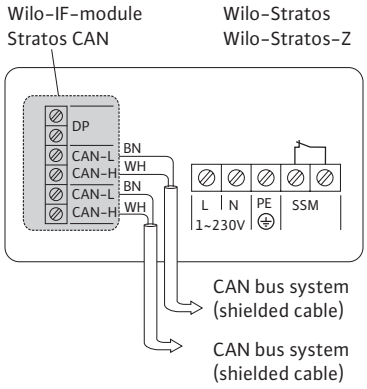
- Stratos CAN IF-Module
- EMC threaded cable connection PG7
- EMC threaded cable connection PG9

Accessories

- BusBox for cabling with short spur lines
- CAN bus line in various lengths

Documentation

The protocol documentation is available to you on our homepage**www.wilo.com**. (/automation).



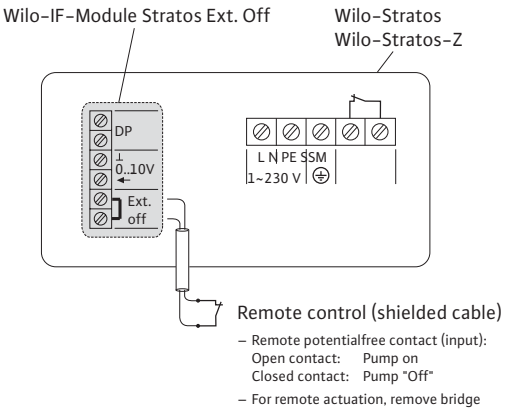
Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos IF-Module Ext. Off

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series







Remote control (shielded cable)

– Remote potentialfree contact (input):
  Open contact: Pump on
  Closed contact: Pump "Off"
– For remote actuation, remove bridge

Additional functions

- Input for potential-free NC contact with the **Ext. Off function**
  - Contact closed: Pump is running in auto control mode
  - Contact open: Pump is not running
- **Control input, 0 – 10 V** for remote setpoint adjustment or remote speed adjustment (shielded cable)
  - Remote setpoint adjustment:
    The setpoint for the integrated differential pressure control is preset for the pump via an analogue signal, 0 – 10 V
    (see "High-efficiency pumps planning guide").
  - Remote speed adjustment:
    An external controller provides an actuating signal for remote speed adjustment (DDC operation)
    (see "High-efficiency pumps planning guide").
    The desired function must be activated at the pump.
- **Double pump DP interface** for optional integration of a dual pump management system of 2 x single pumps or 1 x double pump
  (see Wilo-Stratos IF-Modules for double pumps)

Delivery status

The terminals of the Ext. Off control input are bridged.

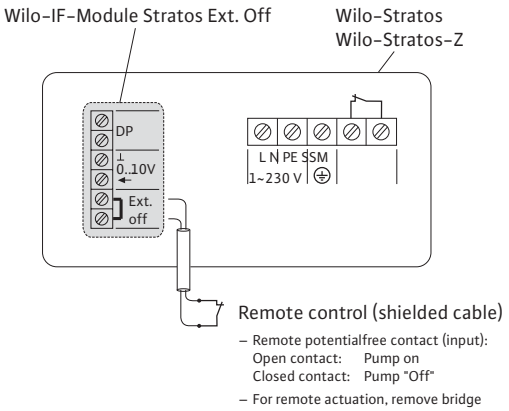
Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos IF-Module Ext. Min

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series







Additional functions

- Input for potential-free NC contact with **Ext. Min function** (setback operation without Autopilot)
  - Contact closed: Pump is running in auto control mode
  - Contact open: Pump is running at a fixed minimum speed
- **Control input, 0 – 10 V** for remote setpoint adjustment or remote speed adjustment (shielded cable)
  - Remote setpoint adjustment:
    The setpoint for the integrated differential pressure control is preset for the pump via an analogue signal 0 – 10 V
    (see "High-efficiency pumps planning guide").
  - Remote speed adjustment:
    An external controller provides an actuating signal for remote speed adjustment (DDC operation)
    (see "High-efficiency pumps planning guide").
    The desired function must be activated at the pump.
- **Double pump DP interface** for optional integration of a dual pump management system of 2 x single pumps or 1 x double pump
  (see Wilo-Stratos IF-Modules for double pumps)

Delivery status

The terminals of the Ext. Min control input are bridged.

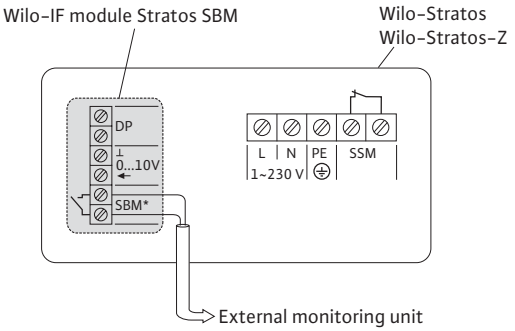
Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos IF-Module SBM

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series







* SBM: Collective run signal, normally open contact according to VDI 3814 (load capacity of the potential-free NO contact: 0.2 A, 24 V~), see Wilo Control for function

Additional functions

- Collective run signal **SBM** as potential-free NO contact
  - Contact closed: Pump is running in the specified operating mode
  - Contact open: Pump is not running
- **Control input, 0 – 10 V** for remote setpoint adjustment or remote speed adjustment (shielded cable)
  - Remote setpoint adjustment:
    The setpoint for the integrated differential pressure control is preset for the pump via an analogue signal, 0 – 10 V
    (see "High-efficiency pumps planning guide").
  - Remote speed adjustment:
    An external controller provides an actuating signal for remote speed adjustment (DDC operation)
    (see "High-efficiency pumps planning guide").
    The desired function must be activated at the pump.
- **Double pump DP interface** for optional integration of a dual pump management system of 2 x single pumps or 1 x double pump
  (see Wilo-Stratos IF-Modules for double pumps)

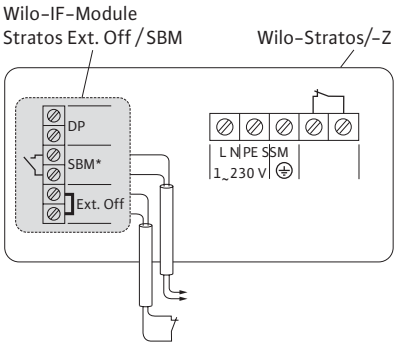
Wilo-Stratos IF-Modules for single pumps

1 x Wilo-Stratos IF-Module Ext. Off/SBM

Plug-in module for single pumps of the Wilo-Stratos and Wilo-Stratos-Z series







Remote control (shielded cable)
* Remote potentialfree contact
Open contact: Pump on
Closed contact: Pump "Off"
* For remote actuation, remove bridge

* SBM: Collective run signal, normally open contact according to VDI 3814 (load capacity of the potential-free NO contact: 0.2 A, 24 V~), see Wilo Control for function

Additional functions

- Input for potential-free NC contact with the **Ext. Off function**
  - Contact closed: Pump running in auto control mode
  - Contact open: Pump is not running
- Collective run signal **SBM** as potential-free NO contact
  - Contact closed: Pump is running in the specified operating mode
  - Contact open: Pump is not running
- **Double pump DP interface** for integrated dual pump management of 2 x single pumps or 1 x double pump
  (see Wilo-Stratos IF-Modules for double pumps)

Wilo-Stratos IF-Module for double pumps

2 x Wilo-Stratos IF-Modules PLR

Plug-in modules for double pumps of the Wilo-Stratos-D/Stratos-ZD and Wilo-Stratos/Stratos-Z series (2 x).





Additional functions

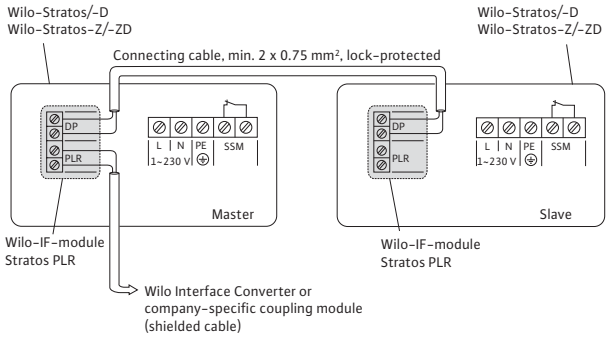
- Serial digital **PLR interface** for connection to BA building automation via
  - Wilo interface converter or
  - company-specific coupling modules
- Transfer of the following data items as control commands to the pump:
  - Control mode
  - Delivery head/speed setpoint
  - Pump On/Off
  - Setback operation
- Transfer of the following data items as signals from the pump:
  - Actual delivery head value
  - Actual volume flow value
  - Actual consumption value
  - Actual output value
  - Actual motor current value
  - Operating hours
  - Actual speed value
  - Detailed fault signals
  - Status signals
- **Double pump DP interface** for the optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation for the efficiency-optimised activation/deactivation of the peak-load pump and automatic fault-actuated switchover to standby pump

(included in the scope of delivery of the Stratos IF-Module PLR: 2-core connecting cable, 670 mm long; a longer connecting cable is to be provided by customer: min. 2 x 0.75 mm^2)

Documentation

The following documentation is available to you on our homepage www.wilo.com (/Products/Wilo building automation):

- PLR specification for Wilo-DigCon



Wilo-Stratos IF-Module for double pumps

Wilo-Stratos IF-Module 1 x LON and 1 x PLR

Plug-in modules for double pumps of the Wilo-Stratos-D/Stratos-ZD and Wilo-Stratos/Stratos-Z series (2 x).
For dual pump management, a PLR module is required in addition to the LON function module.
The functions of the LON module apply to the entire double pump.





Additional functions

- Serial, digital **LON interface** with connection to LONWorks networks. In the LONWorks network, data items are transmitted for the double pump as a complete unit; there is no differentiation between master and slave.
- Transfer of the following data items as control commands to the pump:
  - Operating mode
  - Setpoint
  - Data from external sensors
- Transfer of the following data items as signals from the pump:
  - Hydraulic operating data
  - Electrical operating data
  - Status signals
  - Fault signals
- **Double pump DP interface** for optional integration of dual pump management of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation for efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to the standby pump

  (in the scope of delivery of the Stratos IF-Module PLR: 2-core connecting cable, 670 mm long; a longer connecting cable is to be provided by customer: min. 2 x 0.75 mm^2)

Standards

- LONMark Application Layer Interoperability Guidelines Version 3.2
- LONMark Layers 1-6 Interoperability Guidelines 3.0
- LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

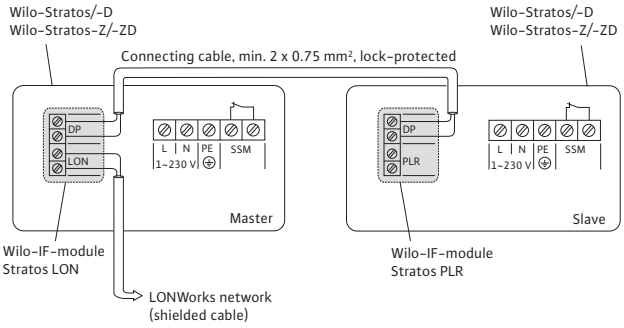
Delivery status

The LON IF-Module is supplied as "Application unconfigured" in accordance with the LONMark Application Layer Interoperability Guidelines.

Documentation

We provide you with the following documentation on our homepage **www.wilo.com** (/Products/Wilo building automation):
LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

- Download application via network: *.NXE /*.APB
- External interface files: *.XIF/*.XFB
- Device resource files: *.ENU /*.FMT /*.FPT /*.TYP



Wilo-Control pump management systems

Pump control

Wilo-Stratos IF-Module for double pumps

Wilo-Stratos IF-Module 1 x CAN and 1 x PLR

Plug-in modules for double pumps of the Wilo-Stratos-D/Stratos-ZD and Wilo-Stratos/Stratos-Z series (2 x).





Additional functions

- Serial, digital **CAN interface** for connection to a CAN bus system.
- Transfer of following data items to the pump:
  - Operating mode
  - Setpoints for the selected operating mode
  - Configuration parameters
- Transmission of the following data items as signals from the pump:
  - Hydraulic operating data
  - Electrical operating data
  - Statistical values
  - Status signals
  - Warning/fault/service signals
  - Type-specific parameters
- **Double pump DP interface** for the optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation for efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to the standby pump

  (in the Stratos IF-Module PLR scope of delivery: 2-wire connecting cable, 670 mm long; a longer connecting cable is to be provided by customer: Min. 2 x 0.75 mm^2)

Standards

- The interface CAN fulfils ISO 11898-2
- The CAN interface fulfils the CANopen standard **CiA DS 301 Version 4.0.2**

Scope of delivery

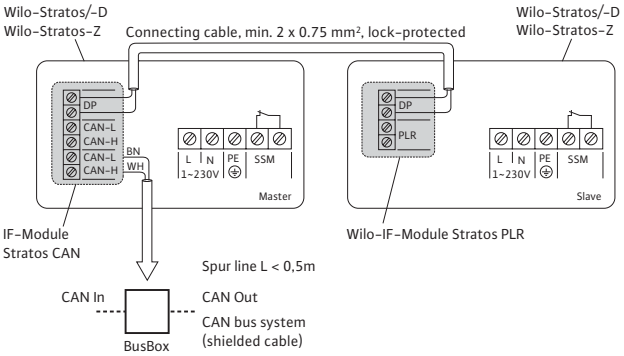
- Stratos CAN IF-Module
- EMC threaded cable connection PG7
- EMC threaded cable connection PG9

Accessories

- BusBox for cabling with short spur lines
- CAN bus line in various lengths

Documentation

The protocol documentation is available to you on our homepage**www.wilo.com**.



Subject to change 09/2008 WILO SE

Wilo-Stratos IF-Module for double pumps

Wilo-Stratos IF-Module 1 x Ext. Off and 1 x PLR

Plug-in modules for double pumps of the Wilo-Stratos-D/Stratos-ZD and Wilo-Stratos/Stratos-Z series (2 x).
For dual pump management, a PLR module is required in addition to the Ext. Off function module.
The functions of the Ext. Off module apply to the entire double pump.





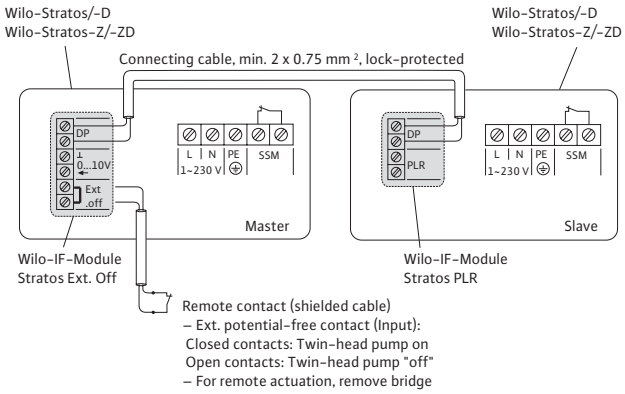
Additional functions

- Input for potential-free NC contact with the **Ext. Off function**
  - Contact closed: Pump is running in auto control mode
  - Contact open: Pump is not running
- **Control input, 0 – 10 V** for remote setpoint adjustment or remote speed adjustment (shielded cable)
  - Remote setpoint adjustment:
    The setpoint for the integrated differential pressure control is preset for the pump via an analogue signal, 0 – 10 V
    (see "High-efficiency pumps planning guide").
  - Remote speed adjustment:
    An external controller issues an actuating signal for the remote speed adjustment (DDC operation) . This actuating signal acts in:
    -Main/standby mode on the active pump
    -Parallel operation on both pumps at the same time (synchronous)
    (also see "High-efficiency pumps planning guide").
    The desired form must be activated at the pump.
- **Double pump DP interface** for optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation for efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to the standby pump

    (in the Stratos IF-Module PLR scope of delivery: 2-wire connecting cable, 670 mm long; a longer connecting cable is to be provided by customer: min. 2 x 0.75 mm^2)

Delivery status

The terminals of the Ext. Off control input are bridged.



Wilo-Stratos IF-Module for double pumps

Wilo-Stratos IF-Module 1 x Ext. Min and 1 x PLR

Plug-in modules for double pumps of the Wilo-Stratos-D/Stratos-ZD and Wilo-Stratos/Stratos-Z series (2 x).
For dual pump management, a PLR module is required in addition to the Ext. Min function module.
The functions of the Ext. Min module apply to the entire double pump.





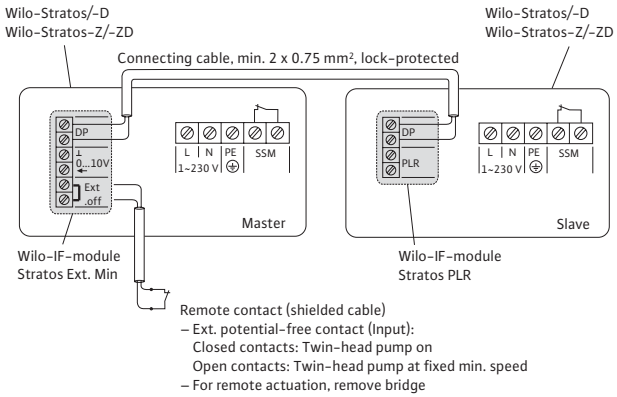
Additional functions

- Input for potential-free NC contact with **Ext. Min function** (setback operation without Autopilot)
  - Contact closed: Pump operates in auto control mode
  - Contact open: Pump runs at fixed minimum speed
- **Control input, 0 – 10 V** for remote setpoint adjustment or remote speed adjustment (cable shielded)
  - Remote setpoint adjustment:
    The setpoint for the integrated differential pressure control is preset for the pump via an analogue signal 0 – 10 V
    (see "High-efficiency pumps planning guide").
  - Remote speed adjustment:
    An external controller issues an actuating signal for the remote speed adjustment (DDC operation) . The actuating signal is effective in:
    -Main/standby mode on the active pump
    -Parallel operation on both pumps simultaneously (synchronous)
    (also see "High-efficiency pumps planning guide").
    The desired function must be activated at the pump.
- **Double pump DP interface** for optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock Operating time
  - Parallel operation for efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to the standby pump

  (in the scope of delivery of the Stratos IF-Module PLR: 2-core connecting cable, 670 mm long; a longer connecting cable is to be provided by customer: min. 2 x 0.75 mm^2)

Delivery status

The terminals of the Ext. Min control input are bridged.



Wilo-Stratos IF-Module for double pumps

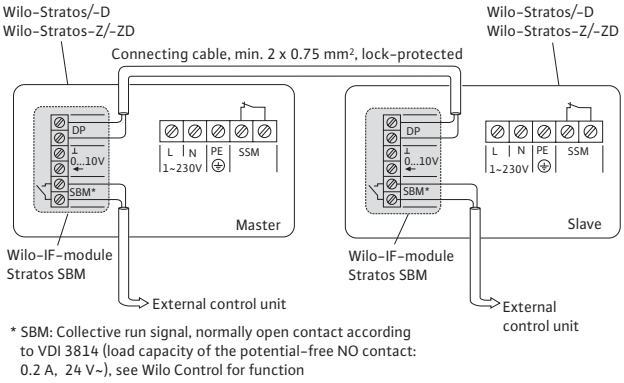
2 x Wilo-Stratos IF-Modules SBM

Plug-in modules for double pumps of the Wilo-Stratos-D/Stratos-ZD and Wilo-Stratos/Stratos-Z series (2 x).
For dual pump management, an additional SBM function module is required in addition to the SBM function module.





A connection cable is to be provided by the customer:
Min. 2 x 0.75 mm^2)



* SBM: Collective run signal, normally open contact according to VDI 3814 (load capacity of the potential-free NO contact: 0.2 A, 24 V~), see Wilo Control for function

Additional functions

- Collective run signal **SBM** as potential-free NO contact
  - Contact closed: Pump is running in the specified operating mode
  - Contact open: Pump is not running
  - Dual pump operation:
    The SBM contact operates as an individual run signal for the corresponding drive.
- **Control input, 0 - 10 V** for remote setpoint adjustment or remote speed adjustment (shielded cable)
  - Remote setpoint adjustment:
    The setpoint for the integrated differential pressure control is preset for the pump via an analogue signal, 0 - 10 V
    (see "High-efficiency pumps planning guide").
  - Remote speed adjustment:
    An external controller issues an actuating signal for remote speed adjustment (DDC operation) . This actuating signal acts in:
    -Main/standby mode on the active pump
    -Parallel operation on both pumps at the same time (synchronous)
    (also see "High-efficiency pumps planning guide").
    The desired function must be activated at the pump.
- **Double pump DP interface** for optional integration of dual pump management of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation for efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to the standby pump

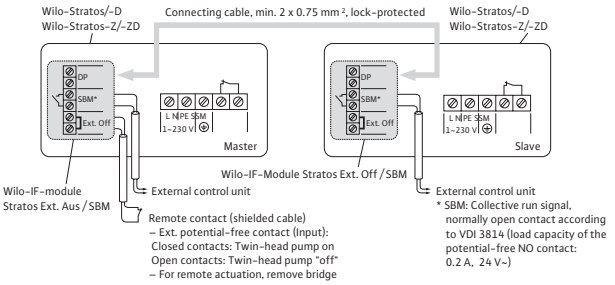
Wilo-Stratos IF-Module for double pumps

2 x Wilo-Stratos IF-Modules Ext. Off/SBM

Plug-in modules for double pumps of the Wilo Stratos-D/Stratos-ZD and Wilo Stratos/Stratos-Z series (2 x).
An additional Ext. Off/SBM function module is required for dual pump management.







Additional functions

- Input for potential-free NC contact with the **Ext. Off/SBM** function
  - Contact closed: Pump is running in auto control mode
  - Contact open: Pump is not running
- Collective run signal **SBM** as potential-free NO contact
  - Contact closed: Pump is running in the specified operating mode
  - Contact open: Pump is not running
  - Dual pump operation:
    The SBM contact operates as an individual run signal for the corresponding drive.
- **Double pump DP interface** for the optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation for efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to the standby pump

  A connection cable is to be provided by the customer:
  Min. 2 x 0.75 mm^2)

Delivery status

The terminals of the Ext. Off control input are bridged.

Function overview, Wilo-TOP-E/-ED with Wilo-IF-Modules

Wilo-TOP-E with IF-Module





> Integrated electronic performance control for constant/variable differential pressure:
- Simplifies pump configuration
- Can be adjusted to the duty point
- Reduces noise and saves electricity

> Integrated full motor protection
> Thermal insulation as standard
> Retrofit IF-Modules for functional extension

Wilo-TOP-ED with 2 x IF-Modules







> Integrated electronic performance control for constant/variable differential pressure:
- Simplifies pump configuration
- Can be adjusted to the duty point
- Reduces noise and saves electricity

> Integrated full motor protection
> Double pump switchover valve
> Retrofit IF-Modules for functional extension

Function table, Wilo-TOP-E and TOP-ED

Function	Wilo-TOP-E... single pumps		Wilo-TOP-ED...	
	25/1-7 30/1-10 40/1-4 50/1-6	40/1-10 50/1-7 50/1-10 65/1-10 80/1-10 100/1-10	32/1-7 40/1-7 50/1-6	40/1-10 50/1-7 50/1-10 65/1-10 80/1-10
Electrical connection				
1~230 V / 50 Hz	•	•	•	•
Manual function				
Pump On/Off	•	•	•	•
Control mode setting (Δp - c, Δp-v, Δp-T, controller)	•	•	•	•
Differential pressure setpoint setting	•	•	•	•
Speed setting (manual control mode)	•	•	•	•
Automatic function				

• = available, - = not available
[1] with 1 x IF-Module, PLR
[2] with 2 x IF-Modules, PLR/PLR
[3] with 1 x IF-Module, LON
[4] with 2 x IF-Modules, LON/PLR
[5] For the function, see "Wilo-Control pump management systems planning guide"
[6] Dual pump management with 2 single pumps is only possible if the equivalent double pump is also listed in the Wilo catalogue.

Function overview, Wilo-TOP-E/-ED with Wilo-IF-Modules

Function table, Wilo-TOP-E and TOP-ED				
Function	**Wilo-TOP-E... single pumps**		**Wilo-TOP-ED...**	
	25/1-7 30/1-10 40/1-4 50/1-6	**40/1-10 50/1-7 50/1-10 65/1-10 80/1-10 100/1-10**	**32/1-7 40/1-7 50/1-6**	**40/1-10 50/1-7 50/1-10 65/1-10 80/1-10**
Infinitely variable performance control Δp-c	•	•	•	•
Infinitely variable performance control Δp-v	•	•	•	•
Infinitely variable performance control Δp-T	•	•	•	•
Automatic setback during low-load periods (e.g. at night)	•	•	•	•
Full motor protection with fault trip	•	•	•	•
External control function				
Overriding Off control input	–	•	–	•
Control input, 0 – 10 V (remote speed adjustment)	–	•	–	•
Signal and display function				
Collective fault signal (potential-free NC contact) [5]	•	•	•	•
Operation and fault signal lights	•	•	•	•
Fault code	•	•	•	•
LC display for indicating pump data	•	•	•	•
Data exchange				
Infrared interface for wireless data exchange with the Wilo-IR-Monitor operating and service unit	•	•	•	•
Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling modules	•[1]	•[1]	•[2]	•[2]
Serial digital LON interface for connection to a LON-Works network	•[3]	•[3]	•[4]	•[4]
Dual pump management (2 x single pumps or 1 x double pump)				
Main/standby mode (automatic. fault-actuated switchover/time-dependent pump cycling)	•[2] [4] [6]	•[2] [4] [6]	•[2] [4]	•[2] [4]
Parallel operation (efficiency-optimised peak-load cut-in and deactivation)	•[2] [4] [6]	•[2] [4] [6]	•[2] [4]	•[2] [4]

• = available, – = not available
[1] with 1 x IF-Module, PLR
[2] with 2 x IF-Modules, PLR/PLR
[3] with 1 x IF-Module, LON
[4] with 2 x IF-Modules, LON/PLR
[5] For the function, see "Wilo-Control pump management systems planning guide"
[6] Dual pump management with 2 single pumps is only possible if the equivalent double pump is also listed in the Wilo catalogue.

Wilo-IF-Modules for single pumps

1 x Wilo-IF-Module PLR

Plug-in module for single pumps of the Wilo-TOP-E and Wilo-Vero-Line-IP-E/CronoLine-IL-E series with infrared interface



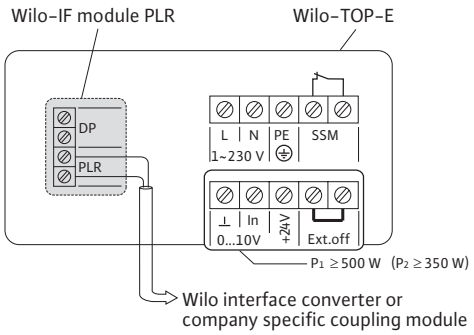


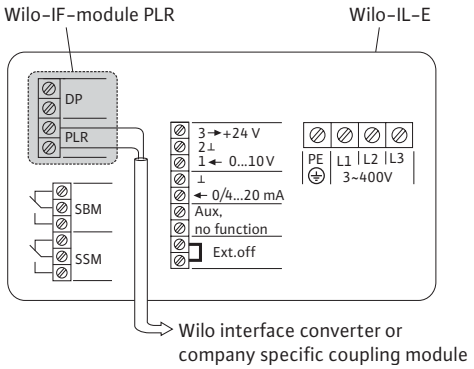


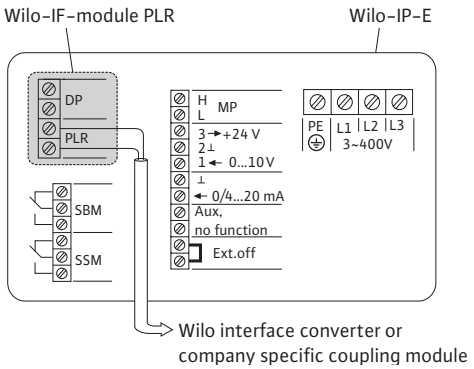
Additional functions

- Serial digital **PLR interface** for connection to BA building automation via
  - Wilo interface converter or
  - company-specific coupling modules
- Transfer of the following data items as control commands to the pump:
  - Control mode Δp-c
  - Delivery head/speed setpoint
  - Pump On/Off
  - Setback operation
- Transfer of the following data items as signals from the pump:
  - Actual delivery head value
  - Actual volume flow value
  - Actual consumption value
  - Actual output value
  - Actual motor current value
  - Operating hours
  - Actual speed value
  - Detailed fault signals
  - Status signals

- **Double pump DP interface** for integrated dual pump management of 2 x single pumps or 1 x double pump
  (see Wilo-IF-Modules for double pumps)







Wilo-IF-Modules for single pumps

1 x Wilo-IF-Module LON

Plug-in module for LON-capable single pumps of the Wilo-TOP-E and Wilo-VeroLine-IP-E/CronoLine-IL-E series with infrared interface







Additional functions

- Serial digital **LON interface** for connection to LONWorks networks
- Transfer of the following data items as control commands to the pump:
  - Operating mode
  - Setpoint
  - Data from external sensors
- Transfer of the following data items as signals from the pump:
  - Hydraulic operating data
  - Electrical operating data
  - Status signals
  - Fault signals
- **Double pump DP interface** for integrated dual pump management of 2 x single pumps or 1 x double pump (see Wilo-IF-Modules for double pumps)

Standards

- LONMark Application Layer Interoperability Guidelines Version 3.2
- LONMark Layers 1-6 Interoperability Guidelines 3.0
- LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

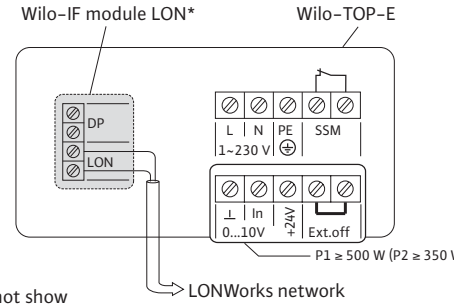
Delivery status

The LON IF-Module is supplied as "Application unconfigured" in accordance with the LONMark Application Layer Interoperability Guidelines.

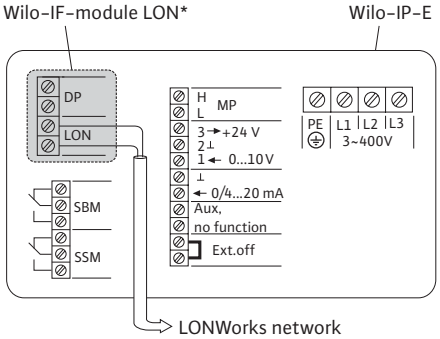
Documentation

The following documentation is available to you on our homepage **www.wilo.com** (/Products/Wilo building automation):
LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

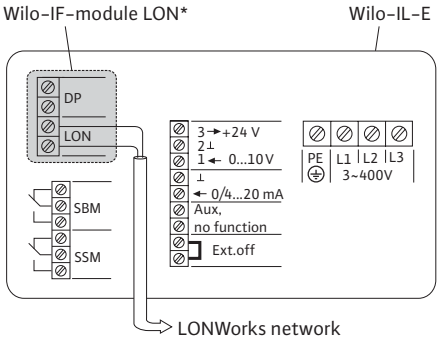
- Download application via network: *.NXE / *.APB
- External interface files: *.XIF / *.XFB
- Device resource files: *.ENU / *.FMT / *.FPT / *.TYP



* The picture does not show the actual position of the terminals



* The picture does not show the actual position of the terminals



* The picture does not show the actual position of the terminals

Wilo-IF-Modules for double pumps

2 x Wilo-IF-Modules PLR

Plug-in modules for double pumps of the Wilo-TOP-ED and Wilo-TOP-E series (2 pc.) and Wilo-CronoTwin-DL-E and CronoLine-IL-E (2 x) with infrared interface



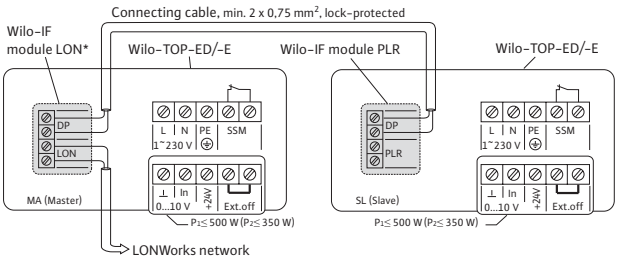




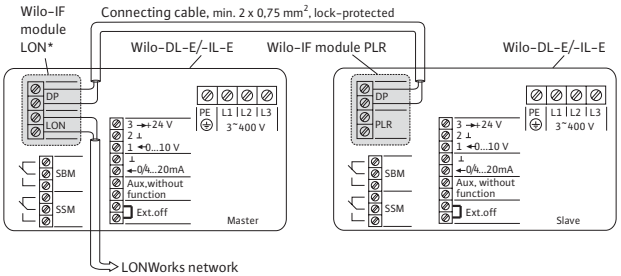
Additional functions

- Serial digital **PLR interface** for connection to BA building automation via
  - Wilo interface converter or
  - company-specific coupling modules
- Transfer of the following data items as control commands to the pump:
  - Control mode
  - Delivery head/speed setpoint
  - Pump ON/OFF
  - Setback operation
- Transfer of the following data items as signals from the pump:
  - Actual delivery head value
  - Actual volume flow value
  - Actual consumption value
  - Actual output value
  - Actual motor current value
  - Operating hours
  - Actual speed value
  - Detailed fault signals
  - Status signals
- **Double pump DP interface** for optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode
    for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock Operating time
  - Parallel operation for efficiency-optimised (TOP-ED) and/or (DL-E) activation and deactivation of the peak-load pump according to requirements and automatic fault-actuated switchover to standby pump

- Included in the IF-Module PLR scope of delivery for TOP-ED/-E: 2-core connecting cable, 670 mm long
- Included in the IF-Module PLR scope of delivery for DL-E/-IL-E: 2-core connecting cable, 1800 mm long



* Illustration does not reflect the actual position of the terminals



* Illustration does not reflect the actual position of the terminals

Wilo-IF-Modules for double pumps

Wilo-IF-Modules 1 x LON and 1 x PLR

Plug-in modules for LON-capable double pumps of the Wilo-TOP-ED and Wilo-TOP-E series (2 x) and Wilo-CronoTwin-DL-E and Crono-Line-IL-E (2 x) with infrared interface.
For dual pump management, a PLR module is required in addition to the LON function module.
The functions of the LON module apply to the entire double pump.







Additional functions

- Serial digital **LON interface** for connection to LONWorks networks. In the LONWorks network, data items are transmitted for the double pump as a complete unit; there is no differentiation between master and slave.
- Transfer of the following data items as control commands to the pump:
  - Operating mode
  - Setpoint
  - Data from external sensors
- Transfer of the following data items as signals from the pump:
  - Hydraulic operating data
  - Electrical operating data
  - Status signals
  - Fault signals
- **Double pump DP interface** for the optional integration of a dual pump management system of 1 x double pump or 2 x single pumps, optionally with the following functions:
  - Main/standby mode
    for automatic fault-actuated switchover to the standby pump and automatic pump cycling after 24 o'clock operating time
  - Parallel operation
    for the efficiency-optimised activation and deactivation of the peak-load pump and automatic fault-actuated switchover to standby pump

- Included in the IF-Module PLR scope of delivery for TOP-ED/-E: 2-core connecting cable, 670 mm long;
- Included in the IF-Module PLR scope of delivery for DL-E/-IL-E: 2-core connecting cable, 1800 mm long

Standards

- LONMark Application Layer Interoperability Guidelines Version 3.2
- LONMark Layers 1-6 Interoperability Guidelines 3.0
- LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

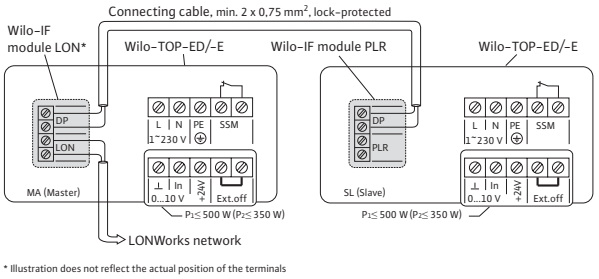
Delivery status

The LON IF-Module is supplied as "Application unconfigured" in accordance with the LONMark Application Layer Interoperability Guidelines.

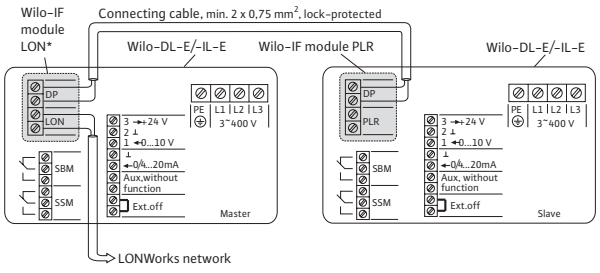
Documentation

We provide you with the following documentation on our homepage **www.wilo.com** (/Products/Wilo building automation):
LONMark Functional Profile "Pump Controller Object for HVAC Applications" (8120_10.pdf)

- Download application via network: *.NXE /*.APB
- External interface files: *.XIF / *.XFB
- Device resource files: *.ENU /*.FMT /*.FPT /*.TYP



* Illustration does not reflect the actual position of the terminals



* Illustration does not reflect the actual position of the terminals

Function overview, Wilo-Protect module

Standard single pumps:
Wilo-TOP-S/-TOP-Z/-TOP-RL/-SE series
- 3 speed stages
- 2 speed stages for TOP-S series, 1~230 V, $P_2 \geq 350$ W
- Blocking-current proof or **with full motor protection**
- Thermal insulation as standard
- Retrofit Protect module for standard pump for extending functions
- For secondary hot water circulation systems with TOP-Z

Standard double pumps:
Wilo-TOP-SD/-SE-TW series
- 3 speed stages
- 2 speed stages with TOP-SD series, 1~230 V, $P_2 \geq 350$ W
- Blocking-current proof or **with full motor protection**
- Double pump switchover valve with delay
- Retrofit Protect modules for standard pumps for extending functions

Function table, TOP-S /-Z/-SD/-RL/-SE/-SE-TW

Function	Single pump Wilo-TOP-S/-TOP-Z Wilo-TOP-RL/-SE				Double pump Wilo-TOP-SD/-SE-TW			
	1~		3~		1~		3~	
	Pump	Pump with Protect Module C	Pump	Pump with Protect Module C	Pump	Pump with 2 x Protect-Modules C	Pump	Pump with 2 x Protect-Modules C
Electrical connection								
1~230 V / 50 Hz	•	•	–	–	•	•	–	–
3~400 V/50 Hz	–	–	•	•	–	–	•	•
3~230 V/50 Hz	–	–	•	–	–	–	•	–
Manual function								
3-stage speed control	• [1]	•	•	•	• [1]	•	•	•
Reset button	• [2]	•	•	•	• [2]	•	•	•
Automatic function								
Motor protection	• [3]	•	• [3]	•	• [3]	•	• [3]	•
Full motor protection with fault trip	• [2]	•	•	•	• [2]	•	•	•
Blockage detection with fault trip	–	•	–	•	–	•	–	•
External control function								
External activation/deactivation via potential-free NC contact provided by the customer	–	•	–	•	–	•	–	•
Signal and display function								
Individual/collective fault signal, potential-free	–	•	• [1]	•	–	•	• [1]	•
Individual/collective fault signal, potential-free	–	•	–	•	–	•	–	•
Run signal light	–	•	–	•	–	•	–	•
Motor protection fault light	–	•	•	•	–	•	•	•
Blockage fault light	–	•	–	•	–	•	–	•
Rotation direction monitoring	–	–	•	•	–	–	•	•
Dual pump management (2 x single pumps)								
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	–	•	–	•	–	•	–	•

• = available, – = not available
[1] Pumps with $P_2 \geq 350$ W: 2-stage speed control
[2] Only pumps with $P_2 \geq 350$ W
[3] $P_2 \leq 100$ W: Pumps with internal protection against unacceptably high winding temperatures
$P_2 = 180$ W: WSK, motor protection only in conjunction with tripping units

Wilo-Protect-Module C for single pumps

Wilo-Protect-Modul C (single pumps)



Wilo-Protect-Module C for single pumps
Plug-in module for glandless single pumps with mains connection 1~230 V, 50 Hz or 3~400 V, 50 Hz. Not suitable for controlled power supply (e.g. Wilo-CR system).

> Additional functions
- Collective fault signal as potential-free NC contact, adjustable as single or collective fault signal
- Collective run signal as potential-free NC contact, adjustable as single or collective run signal
- Overriding Off control input by means of external potential-free contact (NC contact)
- Pump blocking is detected and indicated as fault
- Full motor protection with integrated fault trip
- Fault acknowledgement

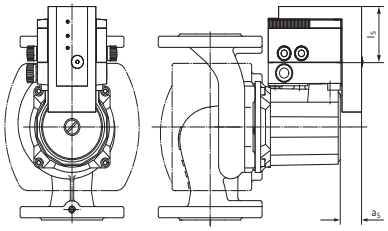
Assignment of Wilo-Protect-Module C/pump, dimensions

Wilo-Protect module C	Mains connection	Wilo-TOP-S...	Wilo-TOP-Z...	Wilo-TOP-RL...	Wilo-SE...	Dimensions	
	–					a_5	l_5
	–					[mm]	
Type 22 EM	1~230 V	25/5, 25/7, 25/13, 30/4, 30/5, 30/7, 40/4	20/4, 25/6, 30/7	25/7.5, 30/4, 30/6.5, 30/7.5, 40/4	110-N, 125-N, 150-N, 200-N	27	61
Type 22 DM	3~400 V	25/5, 25/7, 25/13, 30/4, 30/5, 30/7, 40/4	20/4, 25/6, 30/7	–	–	27	61
Type 32-52 EM	1~230 V	25/10, 30/10, 40/7, 40/10, 40/15, 50/4, 50/7, 50/10, 65/7, 65/10, 80/7	25/10, 30/10, 40/7	–	–	28	63
Type 32-52 DM	3~400 V	25/10, 30/10, 40/7, 40/10, 40/15, 50/4, 50/7, 50/10, 50/15, 65/7, 65/10, 65/13, 65/15, 80/7, 80/10, 80/15, 80/20, 100/10	25/10, 30/10, 40/7, 50/7, 65/10, 80/10	–	–	28	63

Subject to change 09/2008 WILO SE

Wilo-Protect-Module C for single pumps

Dimension drawing

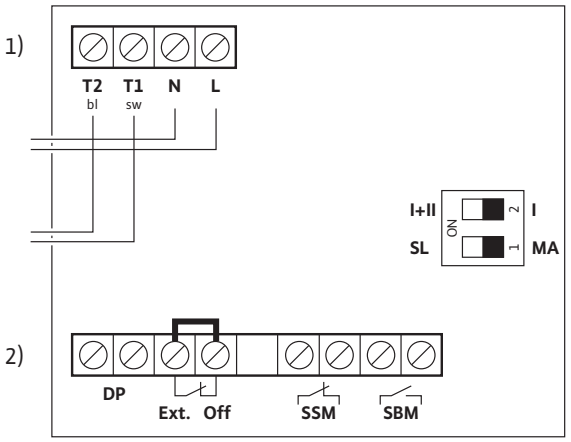


> Technical data
Ambient temperature: max. +40°C
Fluid temperature: -20°C to +110°C
Weight: approx. 0.6 kg
Protection class: IP 44
Degree of radio shielding: N
Insulation material class: F
4 cable lead-ins PG9 (control cable max. 6-core)
No separate power supply required

Mains terminals
Terminal cross-section: max. 2.5 mm^2
Signal terminals
Max. rating: 250 V/1 A
Terminal cross-section: max. 2.5 mm^2
Control terminal Ext. Off
Contact rating: 24 VDC, 10 mA
Terminal cross-section: min. 0.75 mm^2, max. 2.5 mm^2

Wilo-Protect-Module C, type 22

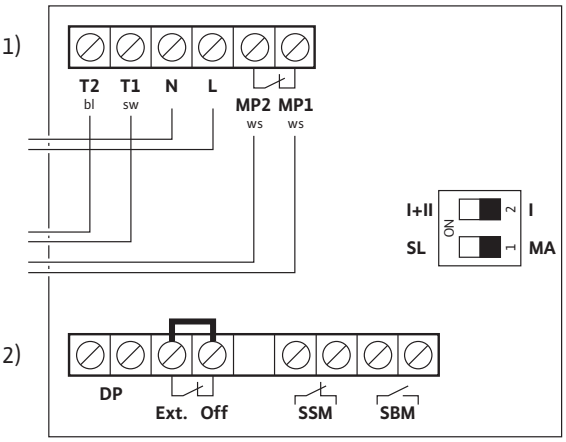
1~230 V (EM)



1) Mains terminals
2) Control terminals

Wilo-Protect-Module C, type 32-52

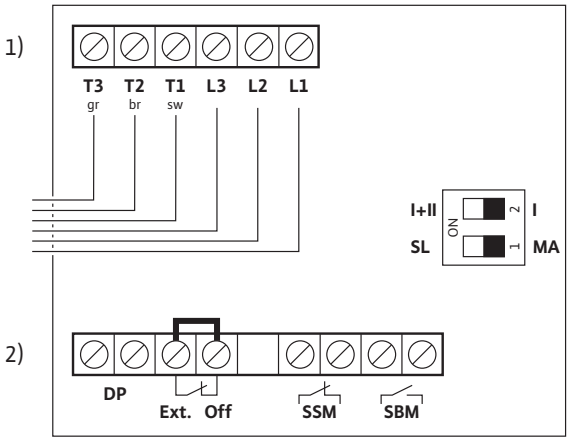
1~230 V (EM)



1) Mains terminals
2) Control terminals

Wilo-Protect-Module C, type 22

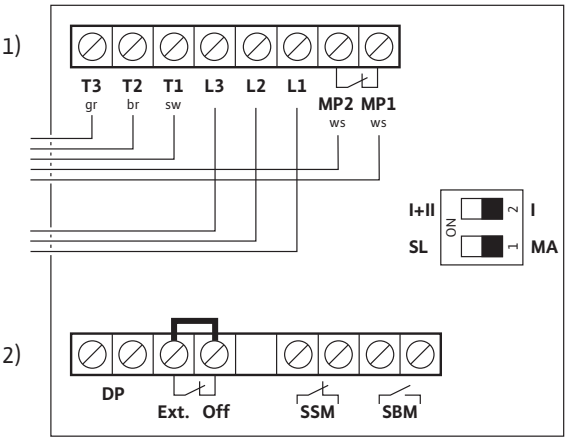
3~400 V (DM)



1) Mains terminals
2) Control terminals

Wilo-Protect-Module C, type 32-52

3~400 V (DM)



1) Mains terminals
2) Control terminals

Wilo-Protect-Module-C for double pumps

Wilo-Protect-Modul C (double pumps)



> Wilo-Protect-Module-C for double pumps
Plug-in module for glandless double pumps or two glandless single pumps of the series with mains connections 1~230 V, 50 Hz or 3~400 V, 50 Hz. Not suitable for controlled power supply (e.g. Wilo-CR system).

- SSM collective fault signal as potential-free NC contact, adjustable as single or collective fault signal
- SBM collective run signal as potential-free NC contact, adjustable as single or collective run signal
- Overriding Off control input via external potential-free contact (NC contact)
- Pump blocking is detected and indicated as a fault
- Full motor protection with integrated fault trip
- Fault acknowledgement
- Integrated dual pump management with the functions:
- Main/standby mode with runtime-dependent (24 h) switching from main to standby pump
- Fault-sensitive switchover to operational standby pump

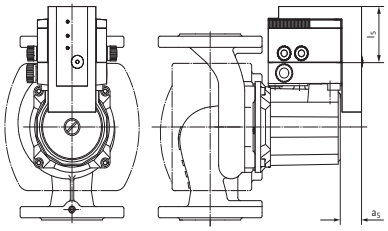
Assignment of Wilo-Protect-Module C/pump, dimensions

Wilo-Protect module C	Mains connection	Wilo-TOP-SD...	Wilo-SE-TW...	Dimensions	
	–			a_5	l_5
	–			[mm]	
Type 22 EM	1~230 V	30/5, 32/7, 40/3	125-N-TW, 150-N-TW, 200-N-TW	27	61
Type 22 DM	3~400 V	30/5, 32/7, 40/3	–	27	61
Type 32-52 EM	1~230 V	32/10, 40/7, 40/10, 40/15, 50/7, 50/10, 65/10, 80/7	–	28	63
Type 32-52 DM	3~400 V	32/10, 40/7, 40/10, 40/15, 50/7, 50/10, 50/15, 65/10, 65/13, 65/15, 80/10, 80/15, 80/20	–	28	63

Subject to change 09/2008 WILO SE

Wilo-Protect-Module-C for double pumps

Dimension drawing

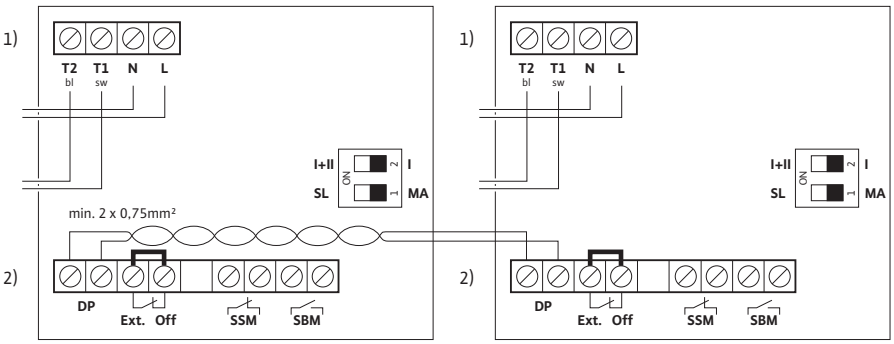


> Technical data
Ambient temperature: max. +40°C
Fluid temperature: -20°C to +110°C
Weight: approx. 0.6 kg
Protection class: IP 44
Degree of radio shielding: N
Insulation material class: F
4 cable lead-ins PG9 (control cable max. 6-core)
No separate power supply required

Mains terminals
Terminal cross-section: max. 2.5 mm^2
Signal terminals
Max. rating: 250 V/1 A
Terminal cross-section: max. 2.5 mm^2
Control terminal Ext. Off
Contact rating: 24 VDC, 10 mA
Terminal cross-section: min. 0.75 mm^2, max. 2.5 mm^2

Wilo-Protect-Module C, type 22 - double pump

1~230 V (EM)

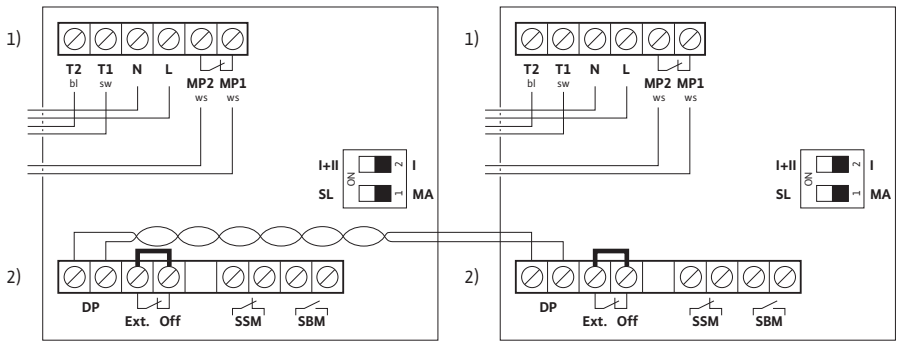


To be provided onsite:
2-core connecting cable,
min. 2 x 0.75 mm^2,
connections cannot be confused

1) Mains terminals
2) Control terminals

Wilo-Protect-Module C, type 32-52 - double pump

1~230 V (EM)



To be provided onsite:
2-core connecting cable,
min. 2 x 0.75 mm^2,
connections cannot be confused

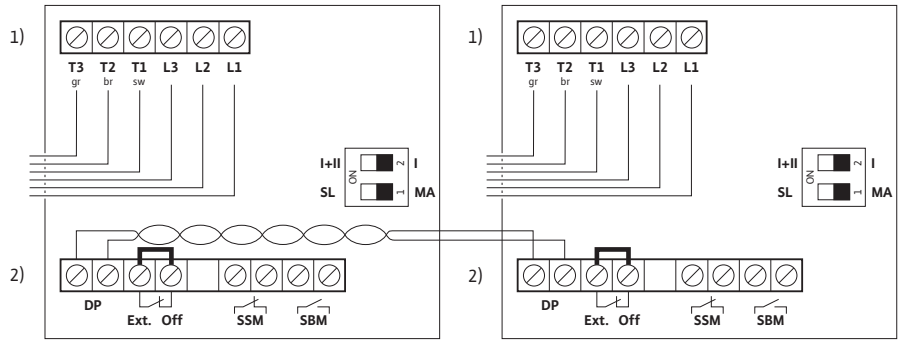
1) Mains terminals
2) Control terminals

Wilo-Protect-Module-C for double pumps

Wilo-Protect-Module C, type 22 – double pump

3~400 V (DM)

To be provided onsite:
2-core connecting cable,
min. 2 x 0.75 mm^2,
connections cannot be confused

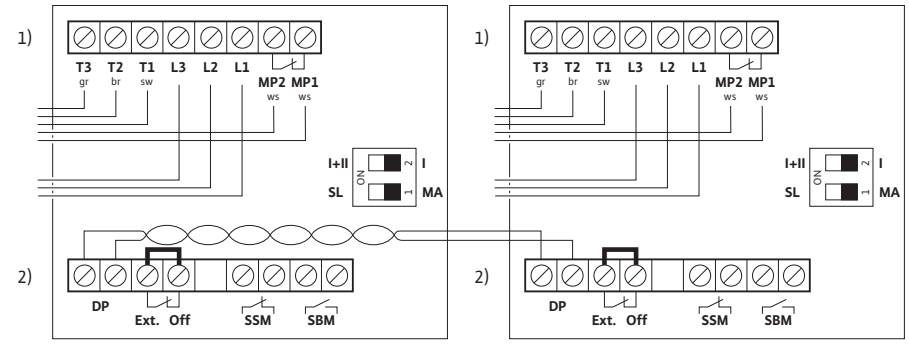


1) Mains terminals
2) Control terminals

Wilo-Protect-Module C, type 32-52 – double pump

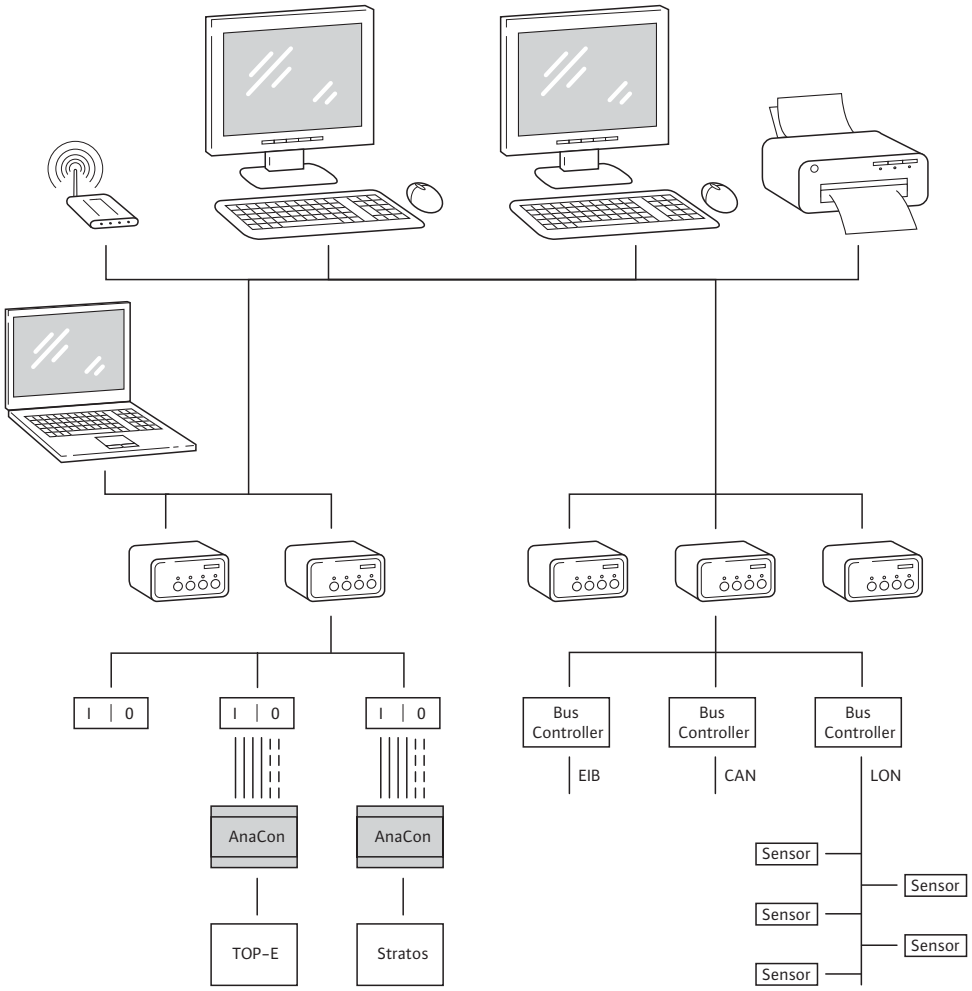
3~400 V (DM)

To be provided onsite:
2-core connecting cable,
min. 2 x 0.75 mm^2,
connections cannot be confused

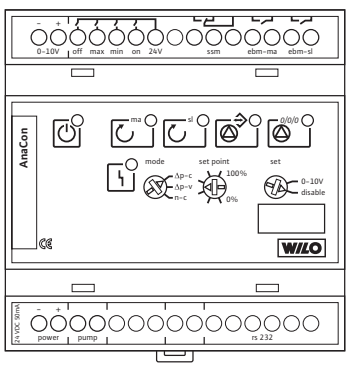


1) Mains terminals
2) Control terminals

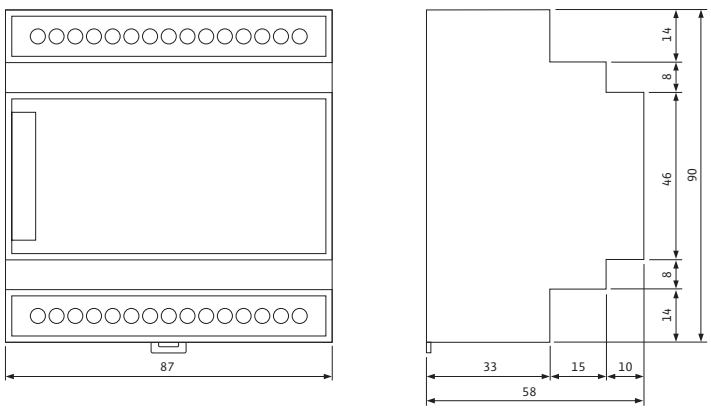
Wilo-Control AnaCon



Front view



Dimension drawing



Wilo-Control AnaCon

Wilo-Control AnaCon

The Wilo-Control AnaCon interface converter is suitable for the universal connection of communications-capable pumps with the PLR interface to onsite control and monitoring units with conventional input/output channels. It is installed on a top-hat rail (DIN EN 50 02235) in a switch cabinet in the immediate vicinity of the monitoring unit. The Wilo-Control AnaCon interface converter converts the two-wire connection of the serial digital PLR interface into a parallel interface with analogue signals and potential-free contacts.

1 single or double pump of the following Wilo series is connected to the BA via the Wilo-Control AnaCon interface converter:
- TOP-E/-ED (with IF-Module PLR)
- Stratos/-D/-Z series (with Stratos IF-Module PLR)
- VeroLine-IP-E/-DP-E (with IF-Module PLR)
- CronoLine-IL-E/-DL-E (with IF-Module PLR)

Bidirectional communication between the pumps and the monitoring unit (BA) enables the remote control of:
- Pump OFF
- Pump ON in control mode
- Max. speed
- Min. speed (setback operation)
- Setpoint for differential pressure or speed (analogue In 0 – 10 V control input)

Bidirectional communication between the pumps and the monitoring unit (BA) enables the remote querying of:
- Collective fault signal
- MA individual run signal or single pump
- SL individual run signal (double pump only)

In addition to remote control and remote querying, the Wilo-Control AnaCon interface converter also enables the local adjustment of:
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- n-c for constant speed
- Setpoint for differential pressure or speed
- Enabling of the analogue In 0 – 10 V control input

The Wilo-Control AnaCon interface converter is equipped with LEDs for:
- AnaCon operational standby
- Communication with the pump
- Communication with RS 485 interface
- Collective fault signal
- MA individual run signal or single pump
- SL individual run signal (double pump only)

Technical data
- Contact load
  - Collective fault signal (potential-free changeover contact: max. 250 VAC, 1 A
  - MA individual run signal (potential-free NO contact) max. 250 VAC, 1 A
  - SL individual run signal (potential-free NO contact) max. 250 VAC, 1 A
  - Potential-free NO contact for "Pump Off" function: 24 VDC, 2.4 mA
  - Potential-free NO contact for "Control On" function: 24 VDC, 2.4 mA
  - Potential-free NO contact for "Maximum speed" function: 24 DC, 2.4 mA
  - Potential-free NO contact for "Min. speed" function: 24 VDC, 2.4 mA

- Supply voltage
  - Operating voltage: 24 VDC ± 25 %
  - Current consumption: 40 mA

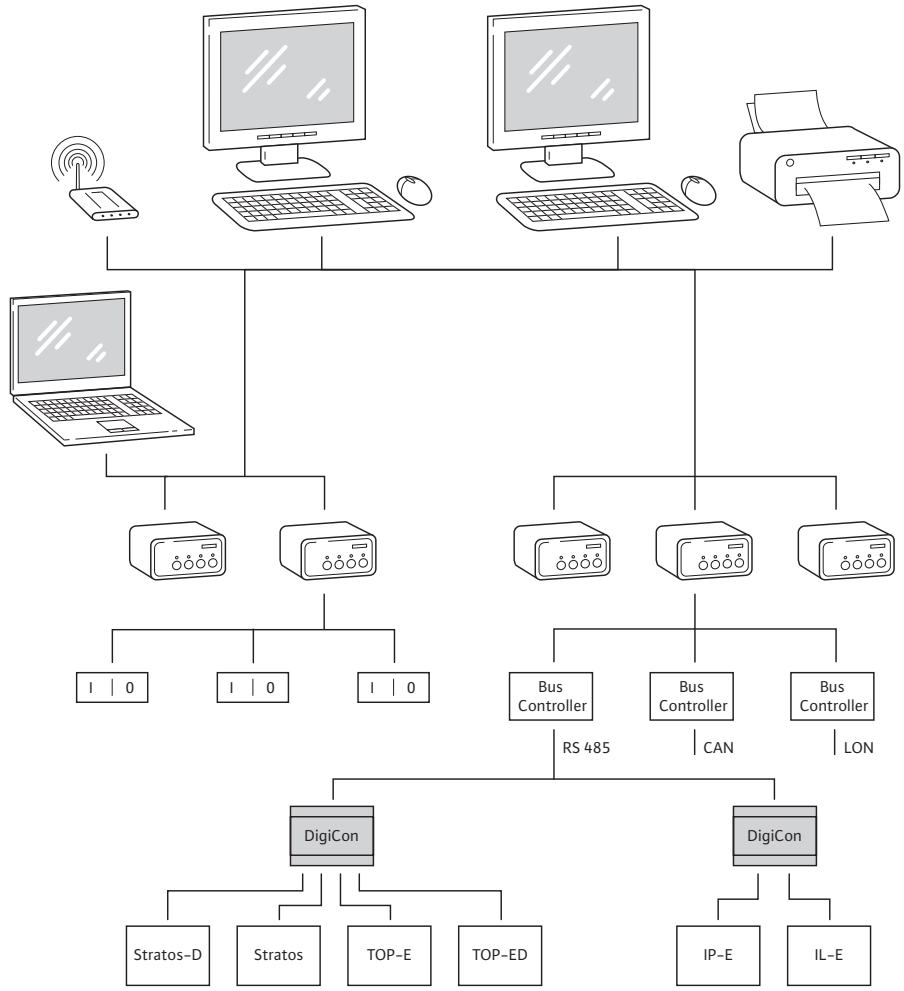
- Electromagnetic compatibility
  - Emitted interference: DIN EN 61000-6-3
  - Interference resistance: DIN EN 61000-6-2

- Analogue In 0 – 10 V control input
  - Input resistance: > 200 kW
  - Input protection: max. +/- 48 VDC

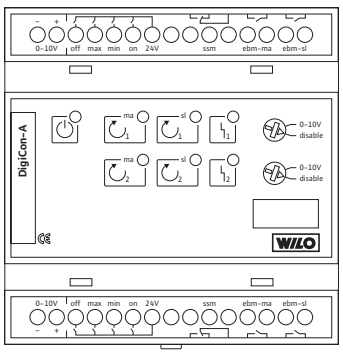
- PLR interface
  - Point-to-point interface with Wilo-specific hardware and Wilo-specific protocol
  - Two-core connection with interchangeable wires (no shielded cable necessary)
  - Maximum cable length: 1000 m

Manual operation of the pump by means of the red button is not possible if the pump is connected to the AnaCon.
A temporary disruption of the interface connection to electronically controlled pumps with IR interface is possible with the IR-Monitor. Operation can then be controlled with the IR-Monitor. Interface communication is automatically restored after the IR connection is disconnected.

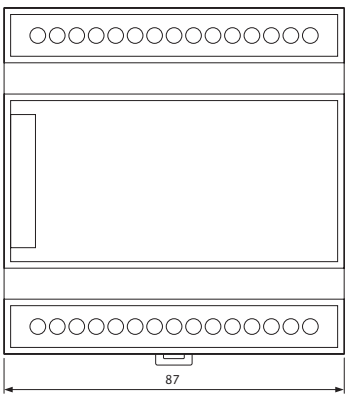
Wilo-Control DigiCon

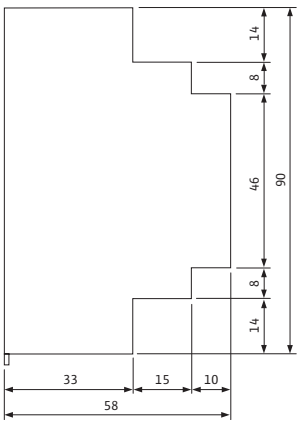


Front view



Dimension drawing





Wilo-Control DigiCon

Wilo-Control DigiCon

The Wilo-Control DigiCon interface converter is suitable for the universal connection of communication-capable pumps with the PLR interface on the onsite control and monitoring units with RS 485 digital serial interface. It is installed on a top-hat rail (DIN EN 50 02235) in a switch cabinet in the immediate vicinity of the monitoring unit. The Wilo-Control DigiCon interface converter transforms the two-wire connection of the serial digital PLR interface into a bus-compatible RS 485 serial digital interface.

A maximum of 4 single or double pumps of the following Wilo series can be connected to the BA by means of the Wilo-Control DigiCon interface converter:
- TOP-E/-ED (with IF-Module PLR)
- Stratos/-D/-Z series (with Stratos IF-Module PLR)
- VeroLine-IP-E (with IF-Module PLR)
- VeroTwin-DP-E (with IF-Module PLR)
- CronoLine-IL-E (with IF-Module PLR) CronoTwin-DL-E (with IF-Module PLR)

Bidirectional communication between the pumps and the monitoring unit (BA) makes it possible to select between the following types of regulation and control modes:
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-controlled differential pressure
- n-c for constant speed

Bidirectional communication between the pumps and the monitoring unit (BA) allows the remote control of:
- Pump OFF
- Pump ON in control mode
- Max. speed
- Min. speed (setback operation)
- Setpoint for the preselected regulation or control mode

Bidirectional communication between the pumps and the monitoring unit (BA) enables the remote query of:
- Current operating mode
- Collective fault signal
- Detailed fault signal
- Individual run signal MA or single pump
- Individual run signal SL (only double pump)

as well as the following pump operating parameters:
- Actual delivery head and current volume flow
- Motor current
- Power consumption
- Operating hours
- Cumulative power consumption
- Speed
- Fluid temperature (only Stratos/-D/-Z/-ZD)

In addition to remote control and remote querying, the Wilo-Control DigiCon interface converter also enables the local adjustment of:
- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- n-c for constant speed
- Setpoint for differential pressure or speed

The Wilo-Control DigiCon interface converter is equipped with LEDs for:
- DigiCon operation standby
- Communication with the pump
- Communication with RS 485 interface

A maximum of 64 Wilo-Control DigiCon interface converters can be switched in series via the RS 485 interface.

Technical data
- Supply voltage
  - Operating voltage: 24 VDC ± 25 %
  - Current consumption: 70 mA
  - Terminal cross-section: 1.5 mm^2
- Electromagnetic compatibility
  - Emitted interference: DIN EN 61000-6-3
  - Interference resistance: DIN EN 61000-6-2
- PLR interface
  - Point-to-point interface with Wilo-specific hardware and Wilo-specific protocol
  - Two-wire connection with interchangeable cores (no shielded cable necessary)
  - Maximum cable length: 1000 m
  - Cable type: e.g. J-Y(St)Y 2x2x0.8
  - Terminal cross-section: 1.5 mm^2
- Interface RS 485

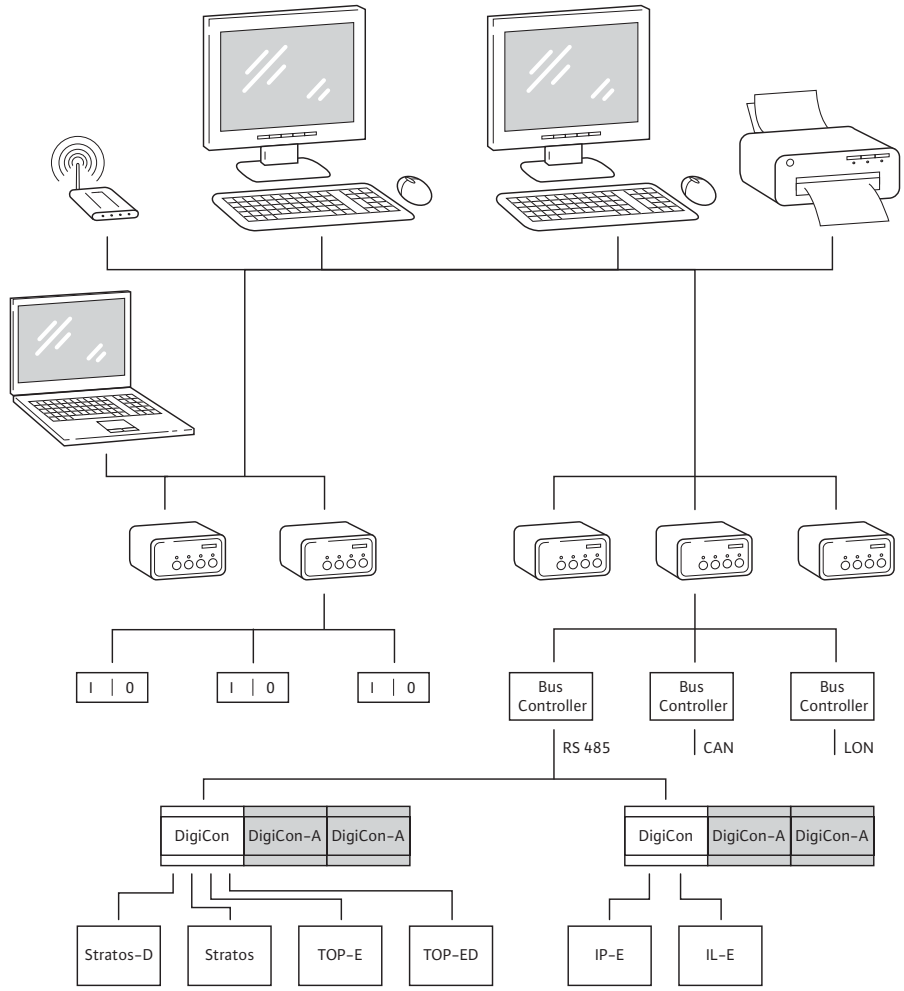
  Bus-capable interface with hardware in accordance with the RS 485 standard and the Wilo-specific protocol. The protocol is to be coordinated with the respective BA manufacturer.
  - Addressing of a maximum of 64 DigiCons (maximum of 256 pumps)
  - Maximum total length of the bus line: 1000 m
  - Cable type: e.g. J-Y(St)Y 2x2x0.8, shielded
  - Terminal cross-section: 1.5 mm^2

  Documentation of the Wilo-specific protocol is stored on the CD included in the scope of delivery. The software provided on this CD also enables communication between the pumps and a conventional PC. Manual operation of the pump by means of the red button is not possible if the pump is connected to the Wilo-Control DigiCon. A temporary disruption of the interface connection to electronically controlled pumps with IR interface is possible with the IR-Monitor. Operation can then be controlled with the IR-Monitor. Interface communication is automatically restored after the IR connection is disconnected.

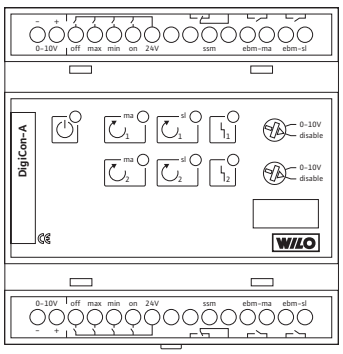
Accessories

Manual control panel Wilo-Control DigiCon-A for a maximum of 2 pumps

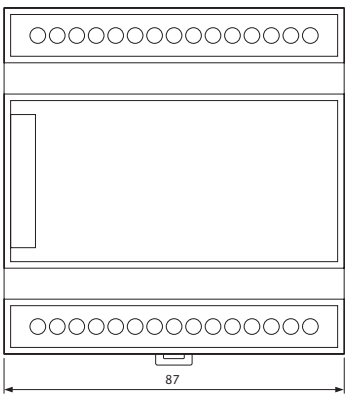
Wilo-Control DigiCon-A

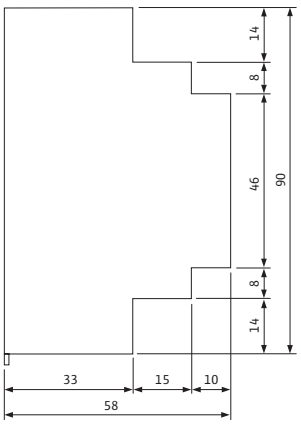


Front view



Dimension drawing





Wilo-Control DigiCon-A

Wilo-Control DigiCon-A

The Wilo-Control DigiCon-A manual control panel allows the overriding control of pumps connected to the Wilo-Control DigiCon interface converter.
The manual control panel is installed on a top-hat rail (DIN EN 50 02235) and is contacted via a lateral plug system to the Wilo-Control DigiCon interface converter. 2 manual control panels for the higher-level control of no more than one single or double pump can be connected to a Wilo-Control DigiCon.

The Wilo-Control DigiCon-A manual control panel enables overriding remote control via potential-free control contacts and an analogue signal for simultaneous bus communication of:
- Pump OFF
- Pump ON in control mode
- Max. speed
- Min. speed (setback operation)
- Setpoint for differential pressure or speed (analogue In 0 - 10 V control input)

The Wilo-Control DigiCon-A manual control panel enables remote querying via potential-free signalling contacts for simultaneous bus communication of:
- Collective fault signal
- MA individual run signal or single pump
- SL individual run signal (double pump only)

In addition to remote control and remote querying, the Wilo-Control DigiCon-A manual control panel also allows:
- Enabling of the analogue In 0 - 10 V control input

The Wilo-Control DigiCon-A manual control panel is equipped with LEDs for:
- DigiCon-A operational standby
- Collective fault signal (for each pump)
- MA individual run signal or single pump (for each pump)
- SL individual run signal (double pump only) (for each pump)

Technical data
- Contact load
  - Collective fault signal (potential-free changeover contact): max. 250 VAC, 1 A
  - MA individual run signal (potential-free NO contact) max. 250 VAC, 1 A
  - SL individual run signal (potential-free NO contact) max. 250 VAC, 1 A
  - Potential-free NO contact for "Pump Off" function: 24 VDC, 2.4 mA
  - Potential-free NO contact for "Control On" function: 24 VDC, 2.4 mA
  - Potential-free NO contact for "Maximum speed" function: 24 VDC, 2.4 mA
  - Potential-free NO contact for "Min. speed" function: 24 VDC, 2.4 mA
- Supply voltage
  - Operating voltage: The DigiCon-A manual control panel is powered via the lateral DigiCon plug system.
  - Current consumption: 40 mA
- Electromagnetic compatibility
  - Emitted interference: DIN EN 61000-6-3
  - Interference resistance: DIN EN 61000-6-2
- Analogue In 0 - 10 V control input
  - Input resistance: > 200 kW
  - Input protection: max. +/- 48 VDC
- PLR interface
  - Point-to-point interface with Wilo-specific hardware and Wilo-specific protocol
  - Two-core connection with interchangeable wires (no shielded cable necessary)
  - Maximum cable length: 1000 m

Manual operation of the pump by means of the red button is not possible if the pump is connected to the Wilo-Control DigiCon.
A temporary disruption of the interface connection to electronically controlled pumps with IR interface is possible with the IR-Monitor. Operation can then be controlled with the IR-Monitor. Interface communication is automatically restored after the IR connection is disconnected.

Accessories



Wilo-Control bus box
Junction box or distribution box for setting up a CAN bus system with connection of the nodes via short spur lines. The Wilo-Control bus box does not require any external power supply.

- Threaded cable connection (3x): M16x1.5
- Dimensions (without threaded cable connection); 95x95x60 mm
- Fixation elements: to be provided by the customer

Technical data
Protection class: IP 44

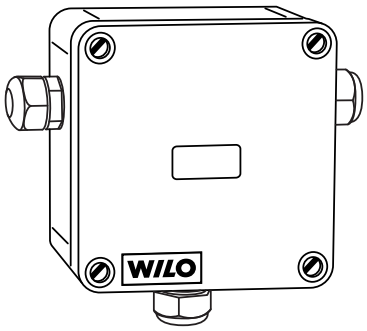


Fig.: Wilo-Control bus box

Wilo-Control CAN bus cable
- Shielded CAN bus cable 1x2x0.5; available in the lengths:
  - 10 m
  - 100 m
- The cable is suitable for permanent installation inside buildings.

Technical data
- Number of wires: 2
- Nominal cross-section: 0.5 mm^2
- Characteristic impedance 120 W
  Loop resistance: max. 37 Ω/km
- Operating capacity: 50 pF/m

Wilo Catalogue Edition 2009

Heating, air-conditioning, cooling
Circulation pumps
Glandless pumps and accessories, package heat exchanger assembly

Catalogue A1



Heating, air-conditioning, cooling
Glanded pumps
Pumps with in-line design and accessories

Catalogue A2



Heating, air-conditioning, cooling, water supply
Monobloc and norm pumps, axial split case pumps
Pumps and accessories

Catalogue A3



Water supply
Domestic water supply, rainwater utilisation
Pumps, systems and accessories

Catalogue B1



Water supply
Borehole pumps, 3" to 24"
Pumps and systems for building services, domestic, municipal and industrial water supply

EMU Technologie

Catalogue B2



Water supply
High-pressure multistage centrifugal pumps
Pumps and accessories

Catalogue B3



Water supply
Pressure boosting systems
Single-pump and multi-pump systems in dry well installations

Catalogue B4



Water supply
Sprinkler pumps with VdS approval
Borehole pumps and accessories

EMU Technologie

Catalogue B5



Drainage and sewage
Drainage pumps
Submersible pumps, self-priming pumps and accessories

EMU Technologie

Catalogue C1



Drainage and sewage
Sewage pumps, DN 32 to DN 600
Submersible pumps and accessories for building services, municipal and industrial applications

EMU Technologie

Catalogue C2



Drainage and sewage
Wastewater and sewage lifting units, pumps stations
Pump systems and accessories

Catalogue C3



Drainage and sewage
Submersible mixers
Mixers, re-circulation pumps, jet cleaners, grit collector pumps and accessories for municipal application in water treatment systems

EMU Technologie

Catalogue C4



Heating, air-conditioning, cooling

Water supply

Drainage and sewage

WILO

Pumpen Intelligenz.

WILO SE
Nortkirchenstraße 100
44263 Dortmund
Germany
T +49 231 4102-0
F +49 231 4102-7363
wilo@wilo.com
www.wilo.com

Wilo – International (Subsidiaries)

Argentina
WILO SALMSON
Argentina S.A.
C1295ABI Ciudad
Autónoma de Buenos Aires
T+ 54 11 4361 5929
info@salmson.com.ar

Austria
WILO Pumpen
Österreich GmbH
1230 Wien
T +43 507 507-0
office@wilo.at

Azerbaijan
WILO Caspian LLC
1065 Baku
T +994 12 5962372
info@wilo.az

Belarus
WILO Bel OOO
220035 Minsk
T +375 17 2503393
wilobel@wilo.by

Belgium
WILO SA/NV
1083 Ganshoren
T +32 2 4823333
info@wilo.be

Bulgaria
WILO Bulgaria Ltd.
1125 Sofia
T +359 2 9701970
info@wilo.bg

Canada
WILO Canada Inc.
Calgary, Alberta T2A 5L4
T +1 403 2769456
bill.lowe@wilo-na.com

China
WILO China Ltd.
101300 Beijing
T +86 10 80493900
wilobj@wilo.com.cn

Croatia
WILO Hrvatska d.o.o.
10090 Zagreb
T +38 51 3430914
wilo-hrvatska@wilo.hr

Czech Republic
WILO Praha s.r.o.
25101 Cestlice
T +420 234 098711
info@wilo.cz

Denmark
WILO Danmark A/S
2690 Karlslunde
T +45 70 253312
wilo@wilo.dk

Estonia
WILO Eesti OÜ
12618 Tallinn
T +372 6509780
info@wilo.ee

Finland
WILO Finland OY
02330 Espoo
T +358 207401540
wilo@wilo.fi

France
WILO S.A.S.
78390 Bois d'Arcy
T +33 1 30050930
info@wilo.fr

Great Britain
WILO (U.K.) Ltd.
DE14 2WJ Burton-
Upon-Trent
T +44 1283 523000
sales@wilo.co.uk

Greece
WILO Hellas AG
14569 Anixi (Attika)
T +302 10 6248300
wilo.info@wilo.gr

Hungary
WILO Magyarország Kft
2045 Törökbálint
(Budapest)
T +36 23 889500
wilo@wilo.hu

Ireland
WILO Engineering Ltd.
Limerick
T +353 61 227566
sales@wilo.ie

Italy
WILO Italia s.r.l.
20068 Peschiera
Borromeo (Milano)
T +39 25538351
wilo.italia@wilo.it

Kazakhstan
WILO Central Asia
050002 Almaty
T +7 727 2785961
in.pak@wilo.kz

Korea
WILO Pumps Ltd.
621-807 Gimhae
Gyeongnam
T +82 55 3405800
wilo@wilo.co.kr

Latvia
WILO Baltic SIA
1019 Riga
T +371 67 145229
mail@wilo.lv

Lebanon
WILO SALMSON
Lebanon
12022030 El Metn
T +961 4 722280
wsl@cyberia.net.lb

Lithuania
WILO Lietuva UAB
03202 Vilnius
T +370 5 2136495
mail@wilo.lt

The Netherlands
WILO Nederland b.v.
1551 NA Westzaan
T +31 88 9456 000
info@wilo.nl

Norway
WILO Norge AS
0975 Oslo
T +47 22 804570
wilo@wilo.no

Poland
WILO Polska Sp. z.o.o.
05-090 Raszyn
T +48 22 7026161
wilo@wilo.pl

Portugal
Bombas Wilo-Salmson
Portugal Lda.
4050-040 Porto
T +351 22 2080350
bombas@wilo.pt

Romania
WILO Romania s.r.l.
077040 Com. Chiajna
Jud. Ilfov
T +40 21 3170164
wilo@wilo.ro

Russia
WILO Rus ooo
123592 Moscow
T +7 495 7810690
wilo@orc.ru

Saudi Arabia
WILO ME - Riyadh
Riyadh 11465
T +966 1 4624430
wshoula@wataniaind.com

Serbia and Montenegro
WILO Beograd d.o.o.
11000 Beograd
T +381 11 2851278
office@wilo.co.yu

Slovakia
WILO Slovakia s.r.o.
82008 Bratislava 28
T +421 2 45520122
wilo@wilo.sk

Slovenia
WILO Adriatic d.o.o.
1000 Ljubljana
T +386 1 5838130
wilo.adriatic@wilo.si

South Africa
Salmson South Africa
1610 Edenvale
T +27 11 6082780
errol.cornelius@
salmson.co.za

Spain
WILO Ibérica S.A.
28806 Alcalá de Henares
(Madrid)
T +34 91 8797100
wilo.iberica@wilo.es

Sweden
WILO Sverige AB
35246 Växjö
T +46 470 727600
wilo@wilo.se

Switzerland
EMB Pumpen AG
4310 Rheinfelden
T +41 61 83680-20
info@emb-pumpen.ch

Taiwan
WILO-EMU Taiwan Co. Ltd.
110 Taipeh
T +886 227 391655
nelson.wu@
wiloemutaiwan.com.tw

Turkey
WILO Pompa Sistemleri
San. ve Tic. A.Ş.
34530 Istanbul
T +90 216 6610211
wilo@wilo.com.tr

Ukraina
WILO Ukraina t.o.w.
01033 Kiew
T +38 044 2011870
wilo@wilo.ua

Vietnam
Pompes Salmson Vietnam
Ho Chi Minh-Ville Vietnam
T +84 8 8109975
nkm@salmson.com.vn

United Arab Emirates
WILO ME - Dubai
Dubai
T +971 4 3453633
info@wilo.com.sa

USA
WILO-EMU USA LLC
Thomasville,
Georgia 31792
T +1 229 5840097
info@wilo-emu.com

USA
WILO USA LLC
Melrose Park, Illinois 60160
T +1 708 3389456
mike.easterley@
wilo-na.com

Wilo – International (Representation offices)

Algeria
Bad Ezzouar, Dar El Beida
T +213 21 247979
chabane.hamdad@salmson.fr

Armenia
375001 Yerevan
T +374 10 544336
info@wilo.am

Bosnia and Herzegovina
71000 Sarajevo
T +387 33 714510
zeljko.cvjetkovic@wilo.ba

Georgia
0179 Tbilisi
T +995 32 306375
info@wilo.ge

Macedonia
1000 Skopje
T +389 2 3122058
valerij.vojneski@wilo.com.mk

Mexico
07300 Mexico
T +52 55 55863209
roberto.valenzuela@wilo.com.mx

Moldova
2012 Chisinau
T +373 2 223501
sergiu.zagurean@wilo.md

Rep. Mongolia
Ulaanbaatar
T +976 11 314843
wilo@magicnet.mn

Tajikistan
734025 Dushanbe
T +992 37 2232908
farhod.rahimov@wilo.tj

Turkmenistan
744000 Ashgabad
T +993 12 345838
wilo@wilo-tm.info

Uzbekistan
100015 Tashkent
T +998 71 1206774
info@wilo.uz

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