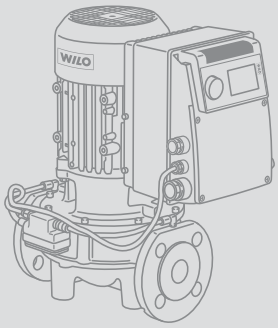
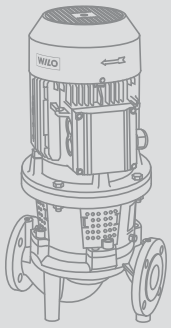
WILO
Pumpen Intelligenz.

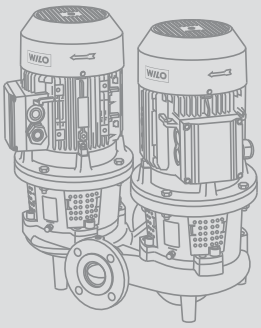
Catalogue Heating, Air-conditioning Cooling

Glanded Pumps

Pumps in In-line Design
and Accessories







Catalogue A2 - 50 Hz - 2009

A2

Programme overview and fields of applications

Glanded pumps

	Pump type	Main field of application				Page
Energy-saving pumps						
Single pumps	Wilo-VeroLine-IP-E	•	•	•	o	28
	Wilo CronoLine-IL-E	•	•	•	o	43
	Wilo-CronoLine-IL-E...BF	•	•	•	o	49
Double pumps	Wilo VeroTwin-DP-E	•	•	•	o	61
	Wilo CronoTwin-DL-E	•	•	•	o	85
☞	**Wilo-CronoTwin-DL-E...BF**	•	•	•	o	93
Standard pumps						
Single pumps	Wilo VeroLine-IPL	•	•	•	o	108
	Wilo-CronoLine-IL	•	•	•	o	123
Double pumps	Wilo VeroTwin-DPL	•	•	•	o	147
	Wilo CronoTwin-DL	•	•	•	o	166
Special in-line pumps						
Single pumps	Wilo VeroLine-IPS	•	•	•	–	200
	Wilo-VeroLine-IPH-O/-W	•	•	•	–	204
	Wilo-VeroLine-IP-Z	•	•	•	•	211
Monobloc pumps						
Single pumps	Wilo BAC	–	•	•	–	1)
	Wilo-CronoBloc-BL	•	•	•	–	

Key:

- • Applicable
- – Cannot be used
- o can be used in special version
- 1) See catalogue A3 – Monobloc and norm pumps, axially split case pumps

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

Fields of application:

- Heating
- Industrial applications
- Air-conditioning/cooling
- Secondary hot water circulation

Contents

Glanded pumps

Contents

Energy-saving pumps

Standard pumps

Special in-line pumps

Switchgears and control devices

Wilo-Control pump management systems

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 dampproom 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

General notes and abbreviations

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

Note on range of application

This planning guide applies to:
- Electronically controlled in-line pumps of the series: IP-E, DP-E, IL-E, DL-E, IL-E .. BF, DL-E .. BF
- Uncontrolled in-line pumps of the series: IPL, DPL, IL, DL, IPs, IPH-O/-W, IP-Z
- Monobloc pumps of the BL series

Pump selection

Glanded pumps are ideally suited for use in conjunction with large plant systems covering a wide range of applications in the field of hot water and air conditioning/cooling. The technically correct selection of a pump involves a number of factors:
- The correct pump size to achieve the required duty point
- The correct pump series to fulfil the process parameters (e.g. pressure and temperature)
- The right materials to fulfil endurance requirements.

The overview duty charts in the **Program overviews** section of the catalogue allow you to roughly select the pump series you need, helping you to select the most suitable size of pump within the respective series more quickly. Frequently, pumps of various series are found to be hydraulically suitable in the border area of the duty charts. Accurate selection of the required pump size is possible only with the aid of the individual pump curve. These are provided in this catalogue and in the Wilo planning software (available on CD-ROM and online at www.wilo-select.com).

The **Technical data** section of the catalogue provides information on the application limits with respect to pressure, temperature and material options. In addition, this section of the catalogue provides information on the pump equipment.

Pump curve

An ideally dimensioned pump has its duty point in the region of maximum efficiency. At the duty point, there is a balance between the performance capacity of the pump (figure 1, curve P) and the power consumption required to overcome the resistance of the pipe system (figure 1, curve A1). Tolerances in accordance with ISO 9906, Appendix 1, are to be taken into account for all of the pump curves illustrated.

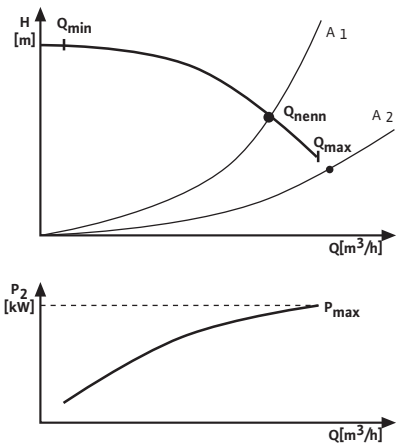


Figure 1

The point of highest efficiency is approximately in the upper third of the pump curve, or is indicated on the performance diagram. The planning engineer must find a duty point to match the maximum requirements of the pump.
In the case of a heating pump, this is the capacity to meet the calculated standard heating load of the building. All other duty points that occur in practice lie on the pump curve to the left of the duty point $Q_{nominal}$. The pump thus operates within its highest efficiency range.
If the actual resistance of the pipe system is lower than that on which the pump selection has been based, then the duty point may lie outside the pump curve (figure 1, curve A_2). This may lead to an unacceptably high power consumption and hence to an overload of the selected motor. In this case it is necessary to redetermine the duty point and, if necessary, use a more powerful pump. The minimum volume flow Q_{min} of a glanded pump is 10% of Q_{max} (figure 1).
The incremental pump curves provided for pumps and, in particular, for power selection, are intended for use when there is reliable knowledge of the duty point. If reliable knowledge of the duty point is not available, our basic recommendation is to select the pump with the maximum electrical power.

Cavitation

The selection of the right pump also includes the prevention of cavitation. This is particularly the case in open systems (e.g. cooling tower systems) and at very high temperatures and low system pressures. The pressure drop in a flowing fluid, e.g. due to frictional resistance in the pipe, a change in absolute velocity or the geodetic head, leads to the local formation of vapour bubbles when the static pressure falls to the vapour pressure of the fluid (Fig. 2).
The vapour bubbles are carried along by the flow, collapsing suddenly if the static pressure increases again above the vapour pressure (Fig. 3).

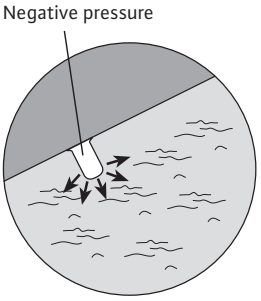


Fig. 2

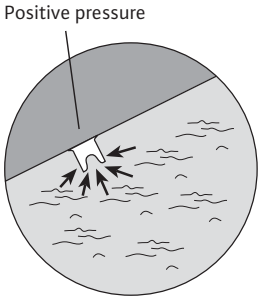


Fig. 3

This process is called cavitation. The collapse of the vapour bubbles causes micro-jets which, on hitting the surface of a wall, cause destruction of the wall material.
To avoid cavitation, special attention must therefore be given to the maintenance of the correct pressure. If the available intake pressure (or static pressure) in the pipe system is not high enough to meet the static head required for the pump (net positive suction head or NPSH), appropriate measures must be taken to increase the static head to at least achieve a balance. This can be done by:
- Increasing the static pressure (pump positioning).
- Reducing the fluid temperature (reduced vapour pressure pD)
- Selecting a pump with a lower net positive suction head (NPSH) (as a rule a larger pump)

Net positive suction head NPSH

The net positive suction head (NPSH) is pump-specific and is displayed in the performance diagram for the pump (Fig.4). The NPSH values are based on the respective maximum impeller diameter. In order to allow for any uncertainty in the specification of the duty point, when selecting the pump, the values should be increased by a **margin of safety of 0.5 m**.

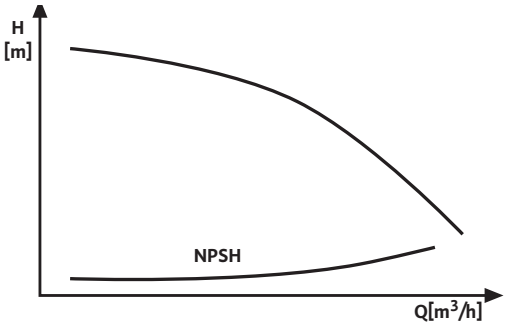


Fig. 4

Series

A hydraulically suitable pump must also meet the required operating conditions. For this, it is necessary to check the maximum permissible operating temperature and pressure first.

Design

In-line pumps

Wilo in-line pumps are single-stage, low-pressure centrifugal pumps in in-line design with suction and pressure ports of the same nominal diameter and with air-cooled IEC standard motors. PN 16 flanges with pressure measuring connections R $^1/_8$. The pump housing is standard-equipped with feet.

Monobloc pumps

Wilo monobloc pumps are single-stage, low-pressure centrifugal pumps in block design in accordance with EN 733 with air-cooled IEC standard motors. Spiral housing made of cast iron with axial suction port and radially arranged pressure port, PN 16 flanges with pressure measuring connections R $^1/_8$. The pumps are standard-equipped with angled or motor feet.

Materials

The selection of materials for all parts that come in contact with the fluid is of importance for the chemical resistance of the pump.

The material selection table provides an overview of the most important components. In addition to the resistance of glanded pumps, particular significance is attached to the functional capability of the mechanical seal.

Materials

Fluids	Application limits	Materials Housing/ impeller		Shaft seal Mechanical seal			Housing seal		
	(The maximum permissible operating temperatures and pressures of the pump series must be adhered to)	Grey cast iron/grey cast iron	Grey cast iron/bronze or plastic [1]	Standard: AQ1EGG	S1: Q1Q1X4GG	S2: AQ1X4GG	EPDM	Viton	HNBR
Heating water (in accordance with VDI 2035) (Conductivity <300 µs, silicates <10 mg/l, solid matter content <10 mg/l)	up to 140°C	•	–	•	–	–	•	–	–
Cooling and cold water	up to -20 °C	•	–	•	–	–	•	–	–
Cooling brine, inorganic, pH > 7.5, inhibited	up to 30°C	•	–	•	–	–	•	–	–
Water-glycol mixtures, 20-40 vol.% glycol	-20 °C to 40 °C	•	–	•	–	–	•	–	–
Water-glycol mixtures, 20-40 vol.% glycol	40°C to 90°C	•	–	–	o	–	–	–	o
Water-glycol mixtures, 40-50 vol.% glycol	-20 °C to 90 °C	•	–	–	o	–	–	–	o
Water-glycol mixtures, 20-50 vol.% glycol	90°C to 120°C	•	–	–	o	–	–	–	o
Water with oil in suspension	0 °C to 90 °C	•	–	–	–	o	–	o	–
Mineral oil (Observe operating regulations with regard to explosion protection)	-20 °C to 140 °C	•	–	–	–	o	–	o	–

• = standard, o = special equipment
[1] for IPL, DPL, IP-E, DP-E standard plastic impellers, IPL and DPL in parts with grey cast iron impeller

Materials									
Swimming-pool water (Chloride <250 mg/l, install pump upstream of filter)	up to 35°C	–	o	–	–	–	–	–	o
Fire water	up to 30°C	–	o	–	–	–	–	–	o

• = standard, o = special equipment
[1)] for IPL, DPL, IP-E, DP-E standard plastic impellers, IPL and DPL in parts with grey cast iron impeller

Mechanical seal

A **mechanical seal** is fitted as standard on all Wilo glanded pumps (except IPs) (Fig. 5). Mechanical seals are dynamic seals and are used to seal rotating shafts at medium to high pressures. The dynamic sealing area of the mechanical seal consists of two surface-ground, low-wearing faces (e.g. silicon carbide or carbon rings), which are pressed together by axial forces. The slip ring rotates with the shaft, while the counter ring remains stationary in the housing. The rings are pressed together by a spring and the fluid pressure.

Fig. 5

As a rule, there is little or no drip leakage during operation, and no maintenance work is necessary. The average service life, under average operating and water conditions, is between 2 and 4 years. However, extreme conditions (soiling, admixtures and overheating) may drastically reduce the service life.

Important:
Mechanical seals are wearing parts. Dry running is not permissible as it will lead to the destruction of the sealing faces.
The mechanical seal fitted as standard by Wilo can be used for water-glycol mixtures with 20 - 40 vol.% glycol and a fluid temperature of ≤ 40°C.

Outside the limits of these parameters, silicate precipitation may occur, which could damage the standard seals. Special versions are available on request for use outside these limits. When additives such as glycol are used, or if oil-polluted water is encountered, then in addition to the suitability of the mechanical seal, **it may also be necessary to check the performance of the pump (in the case of glycol admixtures exceeding 20% volume proportion).**
The following formula can be applied to determine the **power requirement P_2** of a pump:

$$P_2 = \frac{\rho \times Q \times H}{367 \times \eta}$$

P_2	Power requirement [kW]
ρ	Density [kg/dm^3]
Q	Volume flow [m^3/h]
H	Delivery head [m]
η	Pump efficiency (e.g. 0.8 at 80%)

Mechanical seals – material identification code

The materials of a mechanical seal are identified by means of a 5-part code. The "Technical data" tables for the glanded pumps contain the code for each series. The code characters relate to the following seal components:

1:	Slip ring
2:	Counter ring
2:	Secondary seals
4:	Spring
5:	Other components

Typical materials:

1:	**A**	Carbon-graphite (antimony impregnated)
	B	Carbon-graphite (synthetic resin impregnated), approved for use with foods
	Q1	Silicon carbide
2:	**Q1**	Silicon carbide
3:	**E**	EPDM
	E3	EPDM, approved for use with foods
	V	Viton
	X4	HNBR
4:	**G**	Stainless steel
5:	**G**	Stainless steel

The standard seal on Wilo glanded pumps is **AQ1EGG**.

Cataphoretic coating

Wilo glanded pumps are provided as standard with a cataphoretic coating (exceptions: IL 250, IPS, IPH-O, IPH-W, IP-Z series). External components which are susceptible to corrosion such as hexagon head bolts, couplings etc., are chromated. The advantages of these coatings lie in their resistance to corrosion caused by aggressive atmospheres, such as humid air, condensation and an environment containing salt and chemicals. To prevent rust, pumps with cast components with a cataphoretic coating and chromated components are suitable for heating and air conditioning/cooling applications both indoors and outdoors (a special motor is required for outside applications). These pumps also offer the advantage of low maintenance costs and a longer service life.

Thermal insulation of pumps
In systems, which are heat-insulated, only the pump housing should be insulated, not the lantern or the motor.

Installation location/position of the pumps
The standard pumps must be protected from the weather and installed in a frost/dust-free, well-ventilated and non-explosive environment. Pipes and pumps are to be installed in a stress-free condition. The pipes must be mounted in such a way that the pump does not bear the weight of the pipe.

In-line pumps are designed for direct horizontal and vertical installation in a pipe. Installation with the motor and the terminal box facing downwards is not permitted. Sufficient space must be provided for the removal of motor, lantern and impeller. With a motor power in excess of 18.5 kW, it is not permitted to install the pump with the pump shaft in a horizontal position. With a vertically mounted pump, the pipe must be stress-free and the pump must be supported on the pump feet.

The installation of monobloc pumps with the motor and terminal box facing downwards is not permitted. All other installation positions are possible. Monobloc pumps are to be mounted on a sufficiently strong base or brackets.

Anticipated noise levels for in-line and monobloc pumps (guideline values)

Motor power P_N [kW]	Sound-pressure level pA (dB) [1] Pump with motor	
	1450 rpm	2900 rpm
< 0.55	52	55
0.75	53	58
1.1	54	58
1.5	54	61
2.2	57	62
3.0	58	64
4.0	58	67
5.5	63	70
7.5	64	71
11.0	67	74
15.0	68	75
18.5	67	76
22.0	67	77
30.0	69	78
37.0	68	74
45.0	68	74
55.0	68	78
75.0	70	80
90.0	70	80
110.0	72	82
132.0	72	82
160.0	72	82

[1] Spatial mean value of sound pressure levels on a square measuring surface at a distance of 1 m from the surface of the motor

Electrical drive
The **rated output values** and operating values for the electrical drives specified in this catalogue for glanded pumps (in-line and monobloc) apply to a rated frequency of 50 Hz, a rated voltage of 230/400 V up to 3 kW or 400/690 V above 4 kW, a maximum coolant temperature (CT) of 40°C and an installation altitude of up to 1000 m above mean sea level.
For cases outside these parameters a reduction of the rated output must be applied or a larger motor type or a higher insulation class must be selected.
All Wilo glanded pumps are standard-equipped with electric motors, which meet the IEC standard in terms of output and design. A restriction only applies where, due to the design of the pump, coupling to a standard motor is not possible. In this case, motors with an extended shaft are used. The customary speed categories/operating speeds are as follows:

Number of poles	50 Hz	60 Hz
2	2900 rpm	3500 rpm
4	1450 rpm	1750 rpm
6	950 rpm	1150 rpm

High-efficiency motor

EFF1
Wilo glanded pumps are available with EFF1 high-efficiency motors on, for a motor power in excess of 1.1 kW.

Use of explosion-protected pumps according to Directive 94/9/EG (ATEX100a)
Potentially explosive areas are zones where an explosive atmosphere (gas/dust) can occur in sufficient measure to pose a risk.
These areas are divided into zones. Decisions on the assignment of zones lie with the operator and the respective regulation authority.
The testing of pumps (machines) and hence the approval for use in hazardous areas is governed in the EU on the basis of the relevant explosion protection specification 94/9/EG (ATEX100a) by appropriate authorised institutes. Approval is granted by means of a prototype test certificate. Wilo glanded pumps of the IL, DL, BL, IPL (only version –N), DPL (only version -N), IPS and IPH series can be supplied according to the specifications for use in potentially explosive areas.
These pumps have a prototype test certificate in accordance with Directive 94/9/EG (ATEX100a), which permits the following designations to be applied:

II 2 G c b II A T3, T4 / II 2 G c b II C T3, T4

CE	**CE marking**
II	Device group

G	Explosive atmosphere due to gases, vapours and mist
C	Design safety (protection due to safe design)
b	Ignition source monitoring with T4

T1 – T4	**Temperature class with maximum surface temperature**
T1	450 °C
T2	300 °C
T3	200 °C
T4	135 °C

E/D	**Motor ignition protection category**
e	Increased safety
d	Pressure-proof enclosure

Particular attention must be paid to ensure that for applications in the T4 temperature range, the pumps and mechanical seals are additionally protected against dry running.
This can take the form, for example, of monitoring the differential pressure or the nominal motor power.

The motors have their own specific designations, e.g. EEX eII T3 which stands for:

E	Motor according to European standard
Ex	Explosion protection
e	Ignition protection category "Increased safety"
II	Motor for potentially explosive areas
T3	Temperature class

and must also be approved in accordance with Directive 94/9/EG (ATEX100a).
The approved operating conditions are listed in the following matrix:

Important:
Attention must also be paid in each application case to the special features relating to the dependency on temperature, pressure, fluid and mechanical seal. The pumps may only be used for the permitted fluids listed in the following matrix (II B). However, outside the pump, the presence of gases according to the EX groups and temperature classes is permitted (II C).

Matrix of permissible operating conditions

Fluid II A	Mechanical seal	Number of motor poles	IL/DL/BL Maximum permissible fluid temperature T4[1] P = 10 bar	IL/DL/BL T4[1] P = 16 bar	IL/DL/BL T3 P = 10 bar	IL/DL/BL T3 P = 16 bar	IPL/DPL Maximum permissible fluid temperature T4[1] P = 10 bar	IPL/DPL T3 P = 10 bar
Heating water in accordance with VDI 2035	Standard	2-pole	100 °C	90 °C	140 °C	120 °C	120 °C	120 °C
		4-pole	115 °C	110 °C	140 °C	120 °C	120 °C	120 °C
Partially desalinated water with: conductivity > 80 µs, silicates < 10 mg/l, pH value > 9	Standard	2-pole	100 °C	90 °C	140 °C	120 °C	120 °C	120 °C
		4-pole	115 °C	110 °C	140 °C	120 °C	120 °C	120 °C
Mineral oil	G2 / S2	2-pole	75 °C	50 °C	140 °C	115 °C	105 °C	120 °C
		4-pole	95 °C	80 °C	140 °C	120 °C	115 °C	120 °C
Heating water with: conductivity < 850 µs, silicates < 10 mg/l, solid matter content < 10 mg/l	Standard	2-pole	100 °C	90 °C	120 °C	120 °C	120 °C	120 °C
		4-pole	115 °C	110 °C	120 °C	120 °C	120 °C	120 °C
Condensate	Standard	2-pole	100 °C	90 °C	100 °C	100 °C	100 °C	100 °C
		4-pole	100 °C	100 °C	100 °C	100 °C	100 °C	100 °C
Cooling brine, inorganic; pH value > 7.5, inhibited	Standard		20 °C	20 °C	20 °C	20 °C	20 °C	20 °C
Water with oil contamination	G2 / S2		90 °C	90 °C	90 °C	90 °C	90 °C	90 °C
Cooling water with antifreeze (pH value: 7.5–10; no galvanised components)	Standard		40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Water-glycol mixture (20% – 40% glycol)	Standard		40 °C	40 °C	40 °C	40 °C	40 °C	40 °C

[1] Pumps and mechanical seals must be additionally protected against dry running in the T4 temperature range.
This can be achieved by monitoring the differential pressure or the nominal power of the motor.

The use of solvents is not permitted, since they could corrode the elastomers in the seals. In turn, this can lead to uncontrolled leakage!

Scope of delivery

Pump, including packaging, installation and operating instructions

Accessories

Electronically controlled in-line pumps:

- IF-Module: PLR or LON for the IP-E, DP-E, IL-E, DL-E series (also see catalogue section: "Switchgears and control systems").
- IR-Monitor for the IP-E, DP-E, IL-E, DL-E series. Interface converter along the same lines (also see catalogue section: "Switchgears and control systems").
- Digital interface converter (also see catalogue section: "Switchgears and control systems").
- Brackets for installation on a base
- Blind flanges for double pumps

Uncontrolled in-line and monobloc pumps:

- Wilo control system for infinitely variable speed control for pump operation according to requirements.
- Switchgears for the automatic control of duty pumps and standby pumps (also see catalogue section: "Switchgears and control systems").
- Brackets for installation on a base
- Blind flanges for double pumps

Pump duty splitting

In the context of infinitely variable output control, the "split solution" is available for optimisation, starting with the medium pump output range (1–1.5 kW), i.e. instead of using a large pump, the maximum output is split up between two smaller pump units or a double pump. In the normal case, i.e. for more than 85% of the heating season, one pump is adequate as the basic load unit. The second pump is available to fulfil peak-load requirements.

Important:

The extra costs for the pumps are more than compensated for by power savings by the control device.

Advantages of pump duty splitting:

- Electricity savings of between 50% and 70%
- A second pump is always available on standby.

With the so-called "split solutions", one pump is operated for basic load requirements, while the other pumps are cut in for parallel peak-load operation.

This ensures that the design requirement is in accordance with DIN 4701. In conjunction with controlled units, continuous adjustment to the load demand can be achieved over the entire performance range.

Important:

Wilo control systems for double-pump or multi-pump installations feature the peak-load cut-in option.

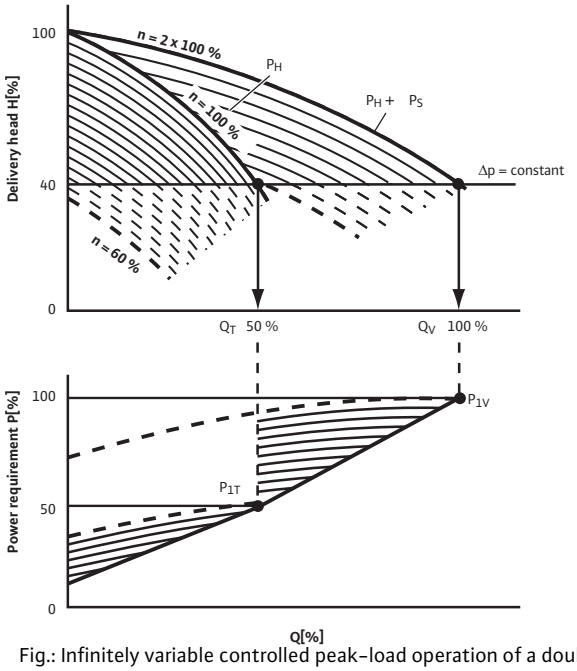


Fig.: Infinitely variable controlled peak-load operation of a double pump with two motor impeller units of equal power.

Key:

P_H	Main pump
P_S	Peak-load pump
Q_V	Full load volume flow
Q_T	Partial load volume flow
P_{1V}	Full load power consumption
P_{1T}	Partial load power consumption

Investment costs

The total investment costs in heating systems can be reduced by almost $^1/_4$ using "split solutions". Particularly when use is made of double pumps instead of single pumps, with their very high installation costs (Y-pipes, etc.)

Important:

Due to their low outlet velocities, Wilo double pumps are particularly suitable for parallel operation.

Operating costs

Considerable reductions in the operating costs also ensured as a result of the significant savings in current of the low-output "split units", due to the improved utilisation in the partial load range and, in particular, in the low-load range.

Standby

From an operating point of view, there are other advantages, since in the event of a fault in the partial load range or the low-load range, a 100% standby option is available and in the peak-load range, on the few extremely cold days, there is a so-called emergency standby (75%).

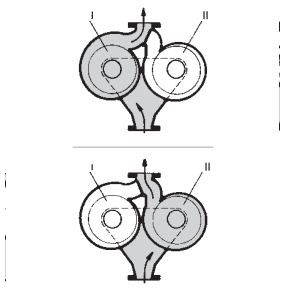
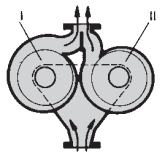
Principle of operation

The duty pump and base-load pump are speed-controlled. With the full stabilisation of this unit, i.e. with the nominal pump speed reached and at the start of the peak-load requirement, the peak-load unit is switched on at a fixed speed (nominal speed), while the power of the controlled base-load pump is directly reduced and adjusted to the load point. Resulting pressure fluctuations are relatively minor and in practice have no appreciable effect. During parallel operation, the output of the constant-speed peak-load unit and the controlled base-load unit are added according to the volume flow, which in this operating situation readjusts to the respective peak-load requirement.
The switch-point for cutting in the peak-load pump is determined by means of an internal electronic assessment logic.

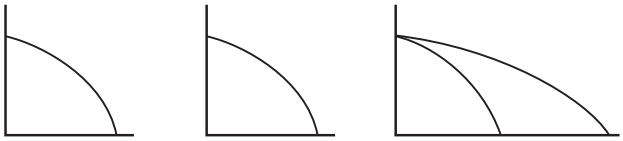
Important:
Peak-load switching of Wilo control systems is only possible with control modes according to the differential pressure or differential temperature.
More information on pump controls is available in the catalogue section: "Switchgears and control systems".

Double pump switching
There are two different operating modes for the operation of double pumps:
- **Standby switching** for the individual operation of the duty pump.
- **Peak-load switching** for the parallel operation of both pumps, which are also overridden by a control option on the respective duty pump.

Operating modes

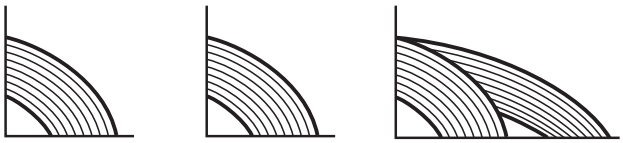
Standby mode	Peak-load operation
	
Pump I or Pump II in operation	Both pumps in operation

Duty pump uncontrolled



	Pump I	Pump II	Pumps I + II
Investment costs:		Lower	Higher
Operating costs:		High	Low

Duty pump controlled via Wilo control system



	Pump I	Pump II	Pumps I + II
Investment costs (including control):		Higher	Lower
Operating costs:		Higher	Low

Operating functions
Wilo switchgears feature the following operating functions:
A Standby switching, fault-dependent or time-dependent operation switchover pump I <-> pump II.
B Peak-load operation for load-dependent or time-dependent automatic power adjustment by activation or deactivation of the second pump.
C Infinitely variable speed control of the duty pump for load-dependent or time-dependent automatic power adjustment when the second pump is cut in for infinitely variably controlled peak-load operation.

Switchgear		Switching function A	B	C
SD series	(standby/cut-in)	•	•	•
S2R 3D	(standby/cut-in)	•	•	•
CR system	(infinitely variable)	•	•	•

S2R 3D/SD series
Switchgears for the automatic control of duty and standby pumps of double units. Automatic fault-actuated switchover from duty to standby pump. With clock timer for regular duty pump and standby pump cycling. **Additional peak-load switching by standard cut-in option for the 2nd pump.**
Short-term parallel operation is integrated into the changeover sequence to avoid the occurrence of valve noise during uncontrolled switchover.
Version in ISO housing, protection class: IP 41. Potential-free contact for collective fault signal.
Connection options to three-phase current 400 V, 50 Hz, or three-phase current 230 V, 50 Hz.
Other voltages and frequencies available as special version on request.

Technical data	
Switchgear type	**Motor power [kW]**
S2R 3D	0.37 – 3
SD 5.5	4 – 5.5
SD 9	7.5 – 9
SD 18.5	11 – 18.5
SD 30	22 – 30
SD 37	37

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 P2 ≤ 1.3 kW and glanded pumps with P2 ≤ 1.1 kW

- Rate of voltage rise du/dt < 500 V/µs
- Voltage peaks û < 650 V

For the noise reduction of glandless pump motors, it is recommended that sine filters (LC filters) be used rather than du/dt filters (RC filters).

Glanded pumps with P2 > 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 at one power supply source. The output filters must be selected as recommended by the converter manufacturer or filter supplier.

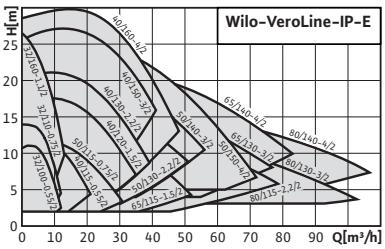
The pumps must be operated at a maximum of 95% of their nominal speed if the frequency converter causes motor losses. The following limit values at the pump connection terminals must not be fallen short of if glandless pumps of the TOP-S/-SD, TOP-D and TOP-Z series are operated with a frequency converter: Umin = 150 Vfmin = 30 Hz.

Energy-saving pumps

Single in-line pumps, double in-line pumps

Series overview

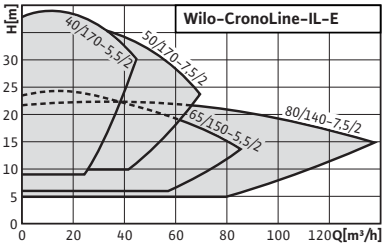
Series: Wilo-VeroLine-IP-E



> **Design**
Electronically controlled glanded single pump in in-line design with flange connection and automatic power adjustment

> **Application**
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

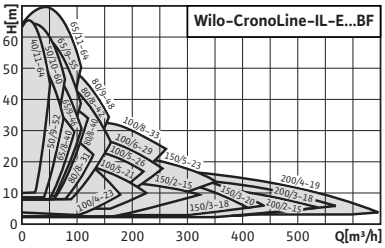
Series: Wilo-CronoLine-IL-E



> **Design**
Electronically controlled glanded single pump in in-line design with flange connection and automatic power adjustment

> **Application**
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series: Wilo-CronoLine-IL-E...BF



> **Design**
Electronically controlled glanded single pump in in-line design with flange connection and automatic power adjustment

> **Application**
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series overview

Series: Wilo-VeroLine-IP-E

> Special features/product benefits
- Improved functionality
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Volume flow tendency indication
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Simple operation due to red-button technology, display and infrared interface (IR-Monitoring)
- Optional interfaces due to retrofit IF-Modules for bus communication (LON or PLR)
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating

Series: Wilo-CronoLine-IL-E

> Special features/product benefits
- Reduced life cycle costs due to optimised efficiency
- Improved functionality
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Volume flow tendency indication
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Simple operation due to red-button technology, display and infrared interface (IR-Monitoring)
- Optional interfaces due to retrofit LON or PLR IF-Modules for bus communication
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating
- Can be used flexibly in air-conditioning and cooling systems with application benefits due to the direct draining of condensate via optimised lantern design

Series: Wilo-CronoLine-IL-E...BF

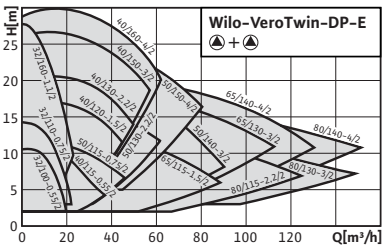
> Special features/product benefits
- Powerful, up to 22 kW
- Control mode Δp-c for constant differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA)
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- High corrosion protection due to cataphoretic coating

Energy-saving pumps

Single in-line pumps, double in-line pumps

Series overview

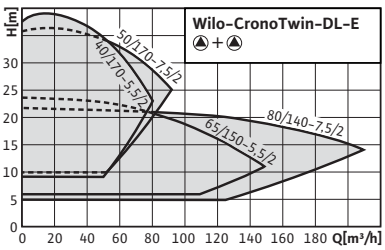
Series: Wilo-VeroTwin-DP-E



> **Design**
Electronically controlled glanded double pump in in-line design with flange connection and automatic power adjustment

> **Application**
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

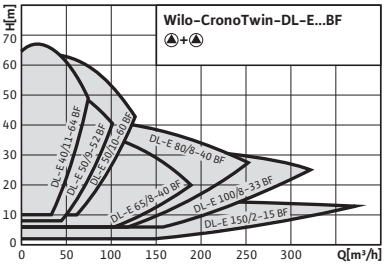
Series: Wilo-CronoTwin-DL-E



> **Design**
Electronically controlled glanded double pump in in-line design with flange connection and automatic power adjustment

> **Application**
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series: Wilo-CronoTwin-DL-E...BF



> **Design**
Electronically controlled glanded double pump in in-line design with flange connection and automatic power adjustment

> **Application**
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series overview

Series: Wilo-VeroTwin-DP-E

> Special features/product benefits
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Simple operation due to red-button technology, display and infrared interface (IR-Monitoring)
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Optional interfaces due to retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating

Series: Wilo-CronoTwin-DL-E

> Special features/product benefits
- Reduced life cycle costs due to optimised of efficiency
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Red-button technology for simplest operation
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Simple operation due to infrared interface (IR-Monitoring)
- Optional interfaces due to retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating
- Bidirectional mechanical seal with forced flushing
- Easy to install due to pump housing with feet and threaded holes

Series: Wilo-CronoTwin-DL-E...BF

> Special features/product benefits
- Control mode Δp-c for constant differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA)
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Powerful, up to 22 kW

Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Equipment/function

	Wilo- VeroLine-IP-E	Wilo- CronoLine-IL-E	Wilo- CronoLine-IL-E...BF	Wilo- CronoLine-IL-E...BF R1
Operating modes				
Δp-c for constant differential pressure	•	•	•	• (Differential pressure sensor required onsite)
Δp-v for variable differential pressure	•	•	–	–
Manual control mode (0 - 10 V) for connection to external control unit (DDC)	•	•	–	•
Manual control mode (2 - 10 V) for connection to external control unit (DDC)	•	•	–	–
Manual control mode (0 - 20 mA) for connection to external control unit (DDC)	•	•	–	•
Manual control mode (4 - 20 m) for connection to external control unit (DDC)	•	•	–	–
Manual functions				
Differential-pressure setpoint setting	•	•	• (Pressure gauge required onsite)	–
Pump ON/OFF setting	•	•	–	–
Speed setting (manual control mode)	•	•	–	–
Manual control panel	•	•	•	–
Automatic functions				
Infinitely variable performance control Δp-c	•	•	•	•
Infinitely variable performance control Δp-v	•	•	–	–
Full motor protection with integrated trip electronics	•	•	•	•
External control functions				
Overriding Off	•	•	•	•
Analogue In 0 ... 10 V	•	•	–	•
Analogue In 0 ... 20 mA	•	•	–	•
Signal and display functions				
Collective fault signal (potential-free NC contact)	•	•	•	•
Collective run signal	•	•	•	•
Fault signal light	•	•	•	•
Fault acknowledgement button	•	•	•	•
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)	•	•	–	–

Equipment/function

	Wilo- VeroLine-IP-E	Wilo- CronoLine-IL-E	Wilo- CronoLine-IL-E...BF	Wilo- CronoLine-IL-E...BF R1
PLR serial digital interface for connection to BA via Wilo interface converter or company-specific coupling modules	• with 1 x IF-Module (accessory)		–	
Serial digital LON interface for connection to a LONWORKS network	• with 1 x IF-Module (accessory)		–	
Dual pump management (double pump or 2 x single pump)				
Main/standby mode (automatic fault-actuated switchover)	•	•	–	–
Main/standby mode pump cycling after 24 hours	•	•	–	–
Parallel operation	•	•	–	–
Parallel operation (efficiency-optimised peak-load cut-in and out)	•	•	–	–

• = available, – = not available

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Equipment/function

	Wilo- VeroTwin-DP-E	Wilo- CronoTwin-DL-E	Wilo- CronoTwin-DL-E...BF	Wilo- CronoTwin-DL-E...BF R1
Operating modes				
Δp-c for constant differential pressure	•	•	•	• (Differential pressure sensor required onsite)
Δp-v for variable differential pressure	•	•	–	–
Manual control mode (0 - 10 V) for connection to external control unit (DDC)	•	•	–	•
Manual control mode (2 - 10 V) for connection to external control unit (DDC)	•	•	–	–
Manual control mode (0 - 20 mA) for connection to external control unit (DDC)	•	•	–	•
Manual control mode (4 - 20 m) for connection to external control unit (DDC)	•	•	–	–
Manual functions				
Differential-pressure setpoint setting	•	•	• (Pressure gauge required onsite)	–
Pump ON/OFF setting	•	•	–	–
Speed setting (manual control mode)	•	•	–	–
Manual control panel	•	•	•	–
Automatic functions				
Infinitely variable performance control Δp-c	•	•	•	•
Infinitely variable performance control Δp-v	•	•	–	–
Full motor protection with integrated trip electronics	•	•	•	•
External control functions				
Overriding Off	• (only on master pump)	• (only on master pump)	•	•
Analogue In 0 ... 10 V	•	•	–	•
Analogue In 0 ... 20 mA	•	•	–	•
Signal and display functions				
Collective fault signal (potential-free NC contact)	•	•	•	•
Collective run signal	•	•	•	•
Fault signal light	•	•	•	•
Fault acknowledgement button	•	•	•	•
LC display for indication of pump data and fault codes	•	•	–	–

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Equipment/function

	Wilo- VeroTwin-DP-E	Wilo- CronoTwin-DL-E	Wilo- CronoTwin-DL-E...BF	Wilo- CronoTwin-DL-E...BF R1
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	• with 1 x IF-Module (accessory)		–	
Serial digital LON interface for connection to a LONWORKS network	• with 1 x IF-Module (accessory)		–	
Dual pump management (double pump or 2 x single pump)				
Main/standby mode (automatic fault-actuated switchover)	•	•	•	•
Main/standby mode pump cycling after 24 hours	•	•	–	–
Parallel operation	•	•	•	•
Parallel operation (efficiency-optimised peak-load cut-in and out)	•	•	–	–

• = available, – = not available

Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Technical data

	Wilo- VeroLine-IP-E	Wilo- CronoLine-IL-E	Wilo- CronoLine-IL-E...BF	Wilo- CronoLine-IL-E...BF R1
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	•	•	•	•
Heat transfer oil	Special version at additional charge			
Permitted field of application				
Standard version for operating pressure, p_{max} [bar]	10	13 (up to +140°C) 16 (up to +120°C)		
Special version for operating pressure, p_{max} [bar]	16	-	-	-
Temperature range [°C]	- 10 to + 120	- 20 to + 140	- 20 to + 140	- 20 to + 140
Max. ambient temperature [°C]	40 (50 on request)	40	40	40
Installation in closed buildings	•	•	•	•
Outdoor installation	–	–	–	–
Pipe connections				
Nominal connection diameters DN	32 - 80	40 - 80	40 - 200	40 - 200
Flanges (according to EN 1092-2)	PN 16 (only flange fixing holes in accordance with EN 1092-2)	PN 16	PN 16	PN 16
Materials				
Pump housing	EN-GJL-250	EN-GJL-250 (EN-GJS-400 on request)		
Lantern	EN-GJL-250	EN-GJL-250 (EN-GJS-400 on request)		
Impeller (standard)	PP, fibreglass-reinforced	EN-GJL-200		
Impeller (special version)	-	G-CuSn10		
Pump shaft	1.4021	1.4122		
Mechanical seal	AQEGG			
Other mechanical seals	On request (at additional charge)			
Electrical connection				
Mains connection	3~400 V, 50 Hz 3~380 V, 60 Hz			
Speed range [rpm]	1100 - 2900	750-2900	750-2900 375-1450	
Motor/electronics				
Integrated full motor protection	Standard PTC thermistor sensor (TRS)			
Protection class	IP 55	IP 55	IP 54	IP 54
Insulation class	F	F	F	F
Emitted interference	EN 61800-3			

Technical data

	Wilo- VeroLine-IP-E	Wilo- CronoLine-IL-E	Wilo- CronoLine-IL-E...BF	Wilo- CronoLine-IL-E...BF R1
Interference resistance	EN 61800-3			
Residual-current protection device (RCD)	•	•	•	•
Installation options				
Pipe installation (≤ 15 kW motor power)	•	•	•	•
Support-bracket mounting	•	•	•	•

• = available, - = not available

Note on emitted interference and interference resistance for IL-E...BF and IL-E...BF R1:
The standard version complies with the limit values for the first environment with limited availability.
EMC radio interference suppression filter for mains-side interference EN 61800-3 Class B/1 - available as an accessory for switch cabinet installation

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Technical data

	Wilo- VeroTwin-DP-E	Wilo- CronoTwin-DL-E	Wilo- CronoTwin-DL-E...BF	Wilo- CronoTwin-DL-E...BF R1
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	•	•	•	•
Heat transfer oil	Special version at additional charge			
Permitted field of application				
Standard version for operating pressure, p_{max} [bar]	10	13 (up to +140°C) 16 (up to +120°C)		
Special version for operating pressure, p_{max} [bar]	16	-	-	-
Temperature range [°C]	- 10 to + 120	- 20 to + 140	- 20 to + 140	- 20 to + 140
Max. ambient temperature [°C]	40 (50 on request)	40	40	40
Installation in closed buildings	•	•	•	•
Outdoor installation	–	–	–	–
Pipe connections				
Nominal connection diameters DN	32 - 80	40 - 80	40 - 200	40 - 200
Flanges (according to EN 1092-2)	PN 16 (only flange fixing holes in accordance with EN 1092-2)	PN 16	PN 16	PN 16
Materials				
Pump housing	EN-GJL-250	EN-GJL-250 (EN-GJS-400 on request)		
Lantern	EN-GJL-250	EN-GJL-250 (EN-GJS-400 on request)		
Impeller (standard)	PP, fibreglass-reinforced	EN-GJL-200		
Impeller (special version)	-	G-CuSn10		
Pump shaft	1.4021	1.4122		
Mechanical seal	AQEGG			
Other mechanical seals	On request (at additional charge)			
Electrical connection				
Mains connection	3~400 V, 50 Hz 3~380 V, 60 Hz			
Speed range [rpm]	1100 - 2900	750-2900	750-2900 375-1450	
Motor/electronics				
Integrated full motor protection	Standard PTC thermistor sensor (TRS)			
Protection class	IP 55	IP 55	IP 54	IP 54
Insulation class	F	F	F	F
Emitted interference	EN 61800-3			

Technical data

	Wilo- VeroTwin-DP-E	Wilo- CronoTwin-DL-E	Wilo- CronoTwin-DL-E...BF	Wilo- CronoTwin-DL-E...BF R1
Interference resistance	EN 61800-3			
Residual-current protection device (RCD)	•	•	•	•
Installation options				
Pipe installation (≤ 15 kW motor power)	•	•	•	•
Support-bracket mounting	•	•	•	•

• = available, - = not available

Note on emitted interference and interference resistance for DL-E...BF and DL-E...BF R1:
The standard version complies with the limit values for the first environment with limited availability.
EMC radio interference suppression filter for mains-side interference EN 61800-3 Class B/1 - available as an accessory for switch cabinet installation

Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-VeroLine-IP-E

Design
Electronically controlled glanded single pump in in-line design with flange connection and automatic power adjustment

Application
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**IP-E 40/160-4/2**
IP-E	In-line pump with electronic control
40	Nominal diameter DN of the pipe connection
160	Nominal impeller diameter
4	Nominal motor power P_2 in kW
2	Number of poles
R1	Version without pressure sensor

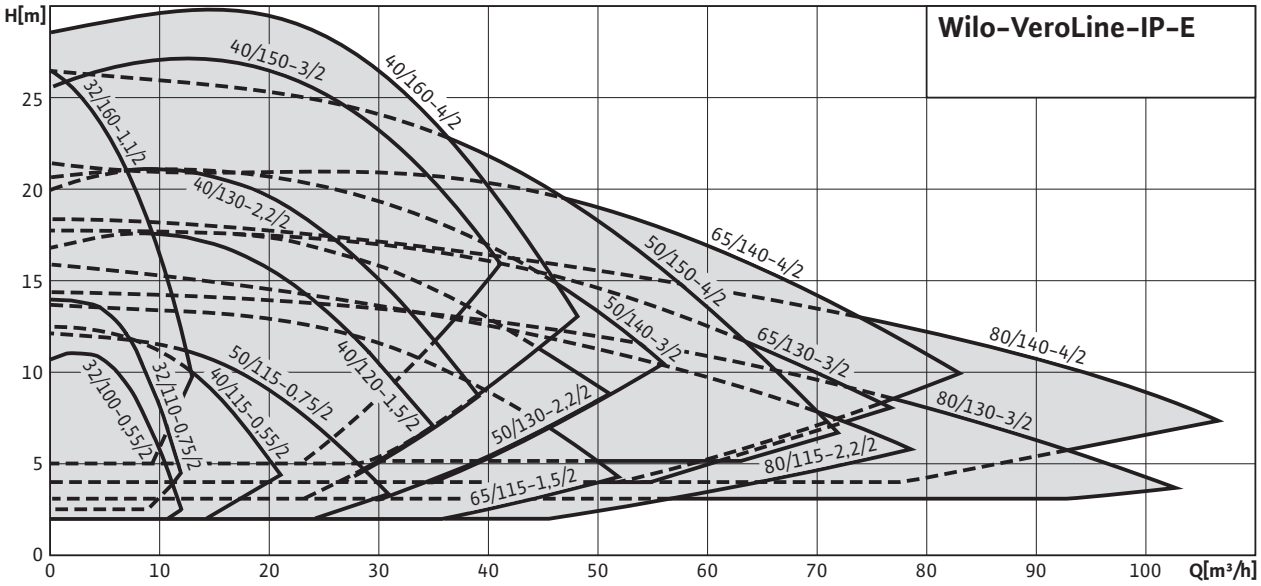
Technical data
- Permissible temperature range -10°C to +120°C
- Mains connection 3~400 V, 50 Hz; 3~380 V, 60 Hz
- Protection class IP 55
- Nominal diameter DN 32 to DN 80
- Max. operating pressure 10 bar (special version: 16 bar)

Special features/product benefits
- Improved functionality
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Volume flow tendency indication
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Simple operation due to red-button technology, display and infrared interface (IR-Monitoring)
- Optional interfaces due to retrofit IF-Modules for bus communication (LON or PLR)
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating

Materials
- Pump housing and lantern: EN-GJL-250
- Impeller: PP, fibreglass-reinforced
- Shaft: 1.4021
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection
- Drive with integrated electronic speed control

Series description Wilo-VeroLine-IP-E



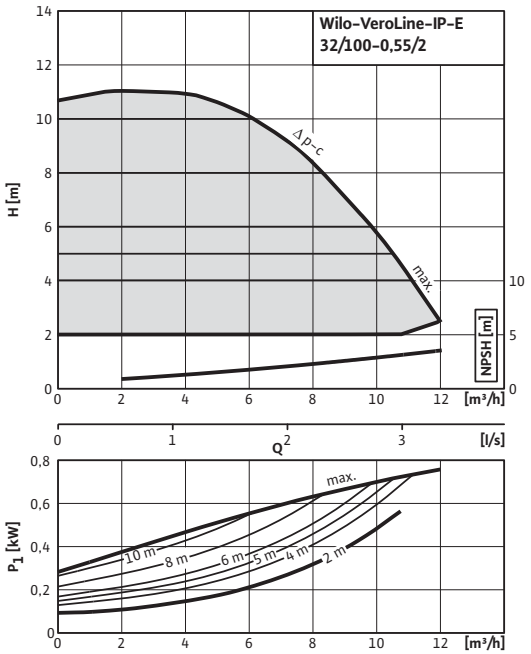
Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IP-E

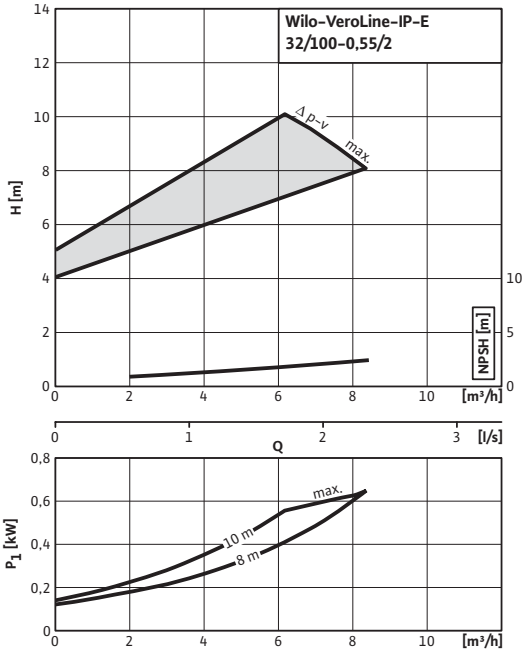
Wilo-VeroLine-IP-E 32/100-0,55/2

Δp-c (constant)



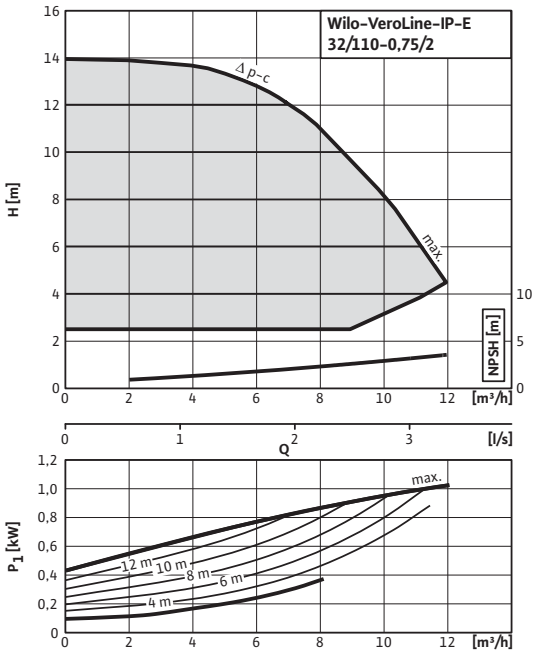
Wilo-VeroLine-IP-E 32/100-0,55/2

Δp-v (variable)



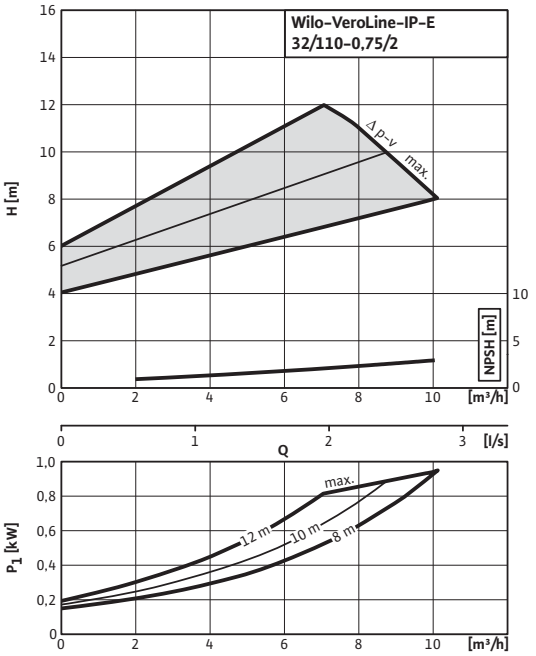
Wilo-VeroLine-IP-E 32/110-0,75/2

Δp-c (constant)



Wilo-VeroLine-IP-E 32/110-0,75/2

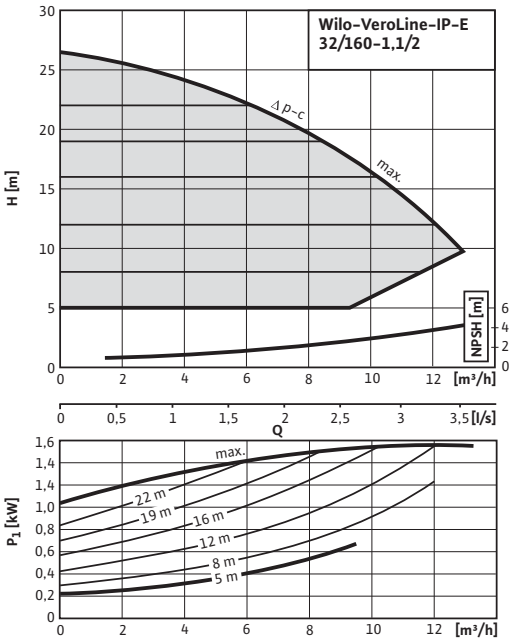
Δp-v (variable)



Pump curves Wilo-VeroLine-IP-E

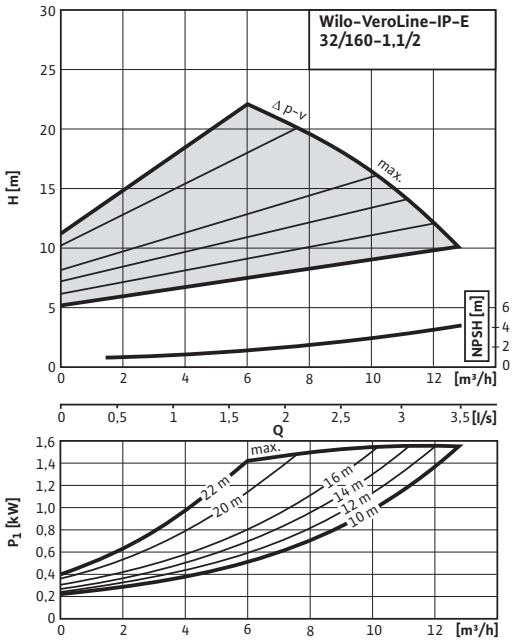
Wilo-VeroLine-IP-E 32/160-1,1/2

Δp-c (constant)



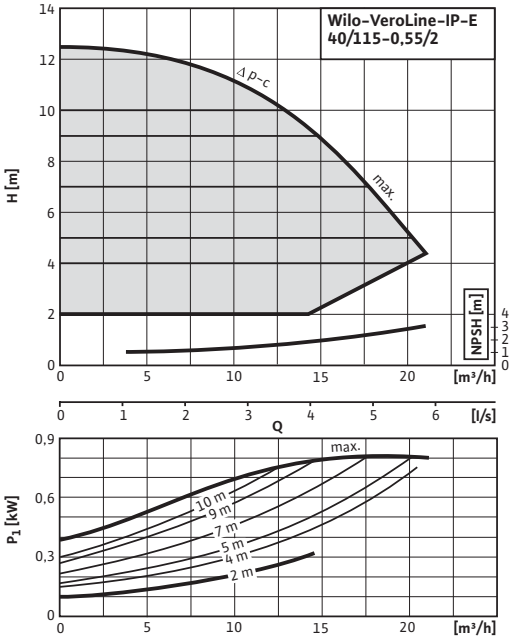
Wilo-VeroLine-IP-E 32/160-1,1/2

Δp-v (variable)



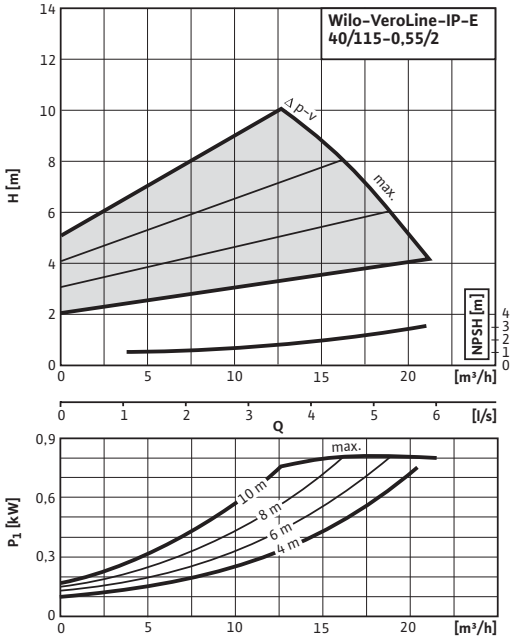
Wilo-VeroLine-IP-E 40/115-0,55/2

Δp-c (constant)



Wilo-VeroLine-IP-E 40/115-0,55/2

Δp-v (variable)



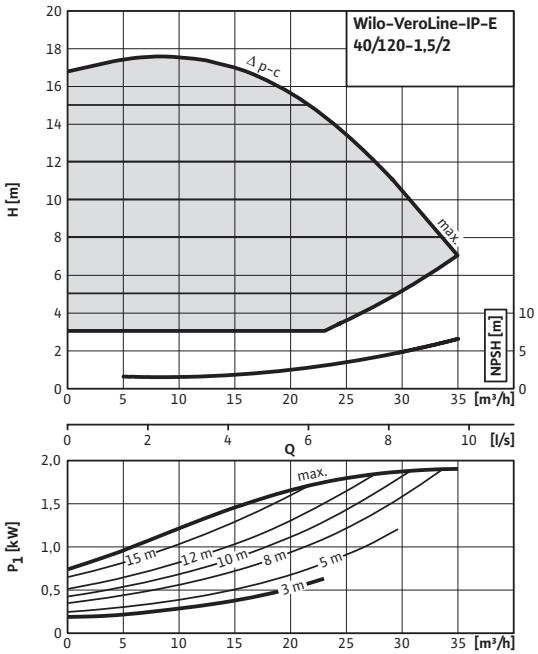
Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IP-E

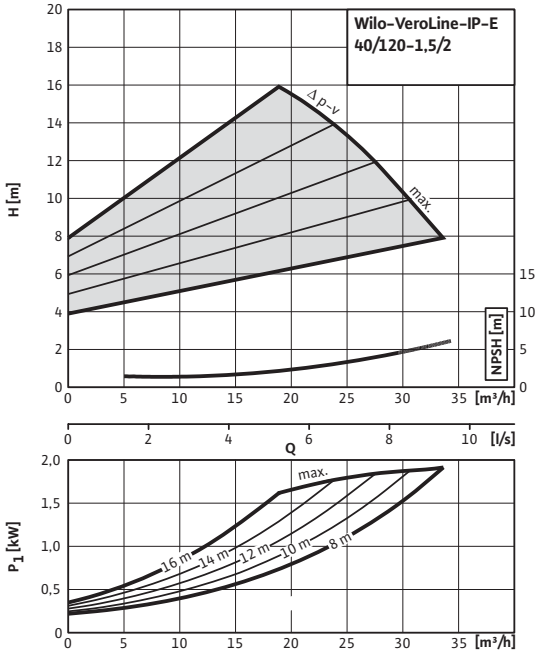
Wilo-VeroLine-IP-E 40/120-1,5/2

Δp-c (constant)



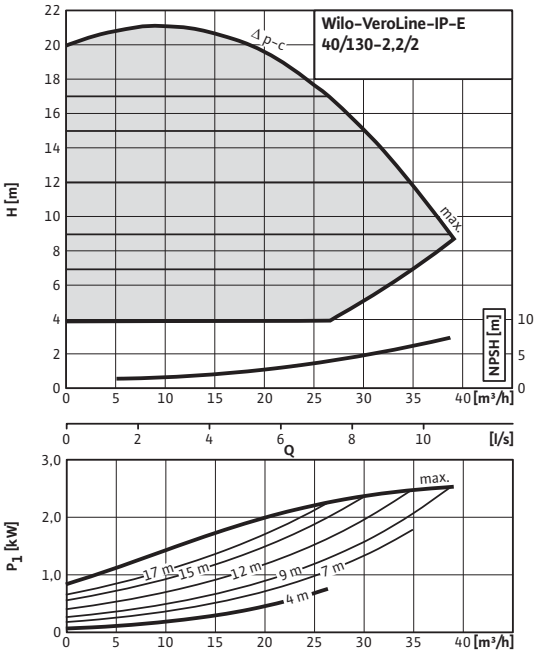
Wilo-VeroLine-IP-E 40/120-1,5/2

Δp-v (variable)



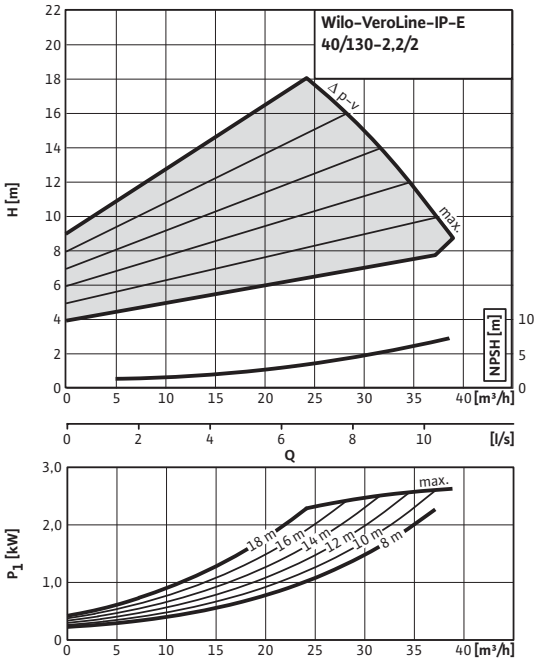
Wilo-VeroLine-IP-E 40/130-2,2/2

Δp-c (constant)



Wilo-VeroLine-IP-E 40/130-2,2/2

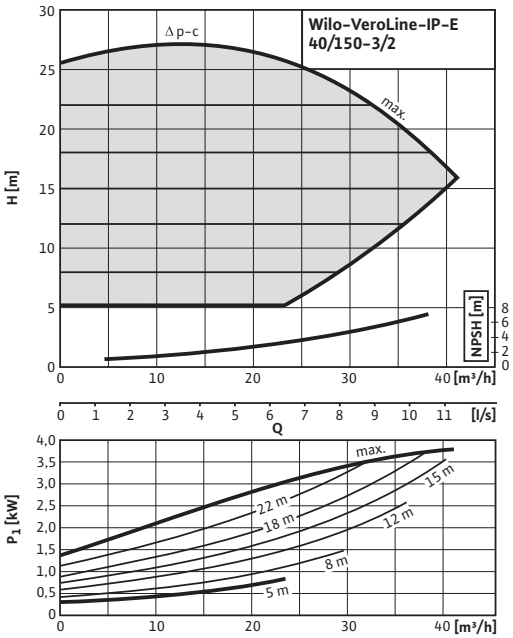
Δp-v (variable)



Pump curves Wilo-VeroLine-IP-E

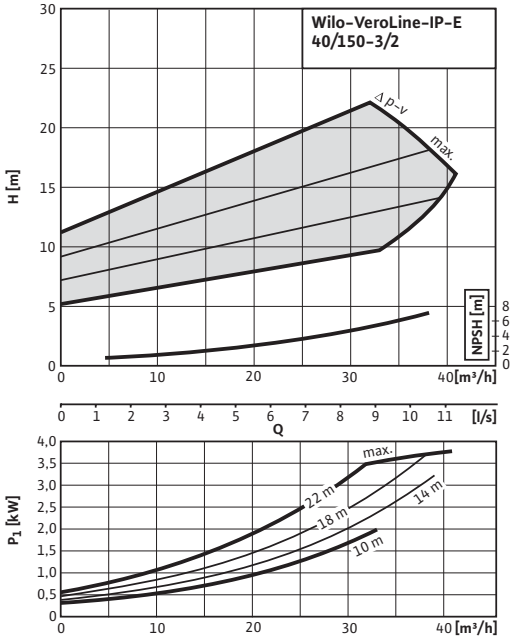
Wilo-VeroLine-IP-E 40/150-3/2

Δp-c (constant)



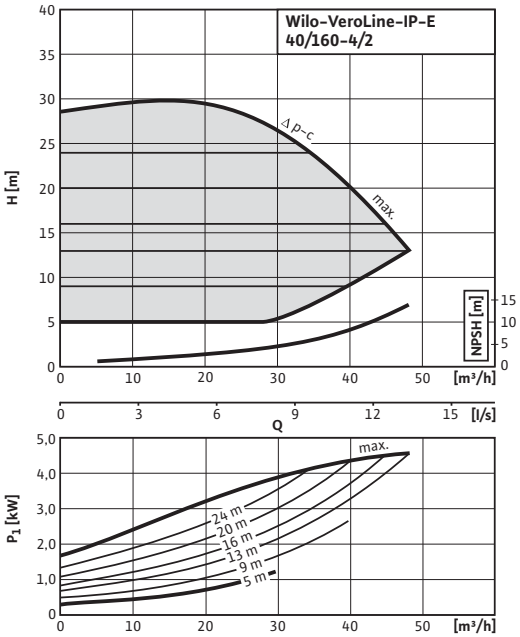
Wilo-VeroLine-IP-E 40/150-3/2

Δp-v (variable)



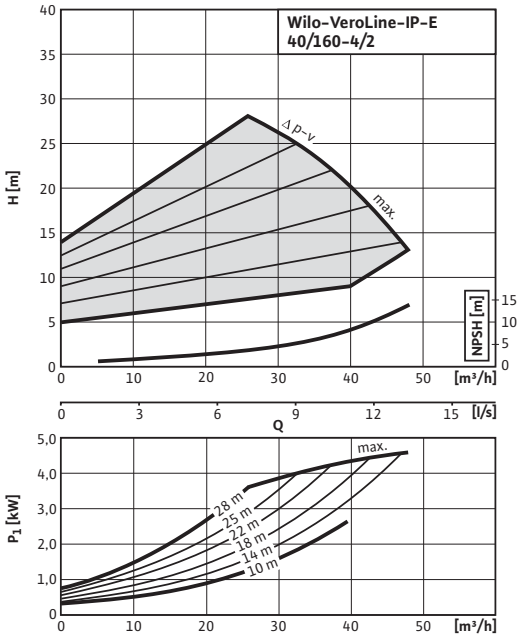
Wilo-VeroLine-IP-E 40/160-4/2

Δp-c (constant)



Wilo-VeroLine-IP-E 40/160-4/2

Δp-v (variable)



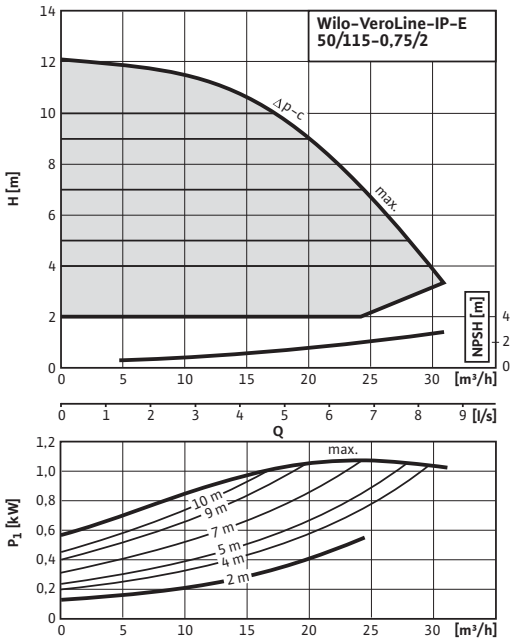
Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IP-E

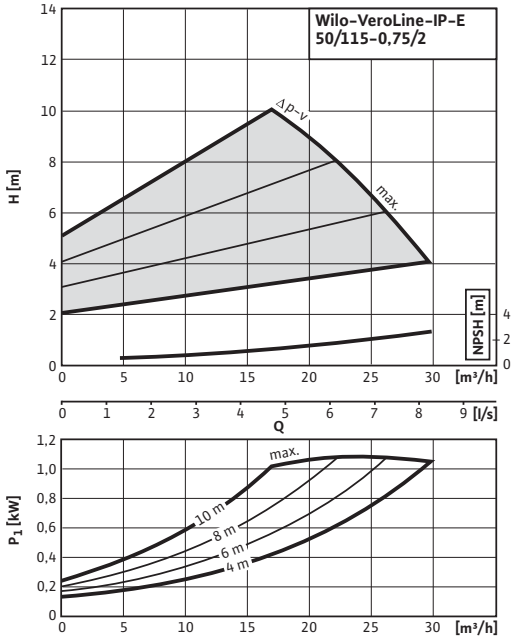
Wilo-VeroLine-IP-E 50/115-0,75/2

Δp-c (constant)



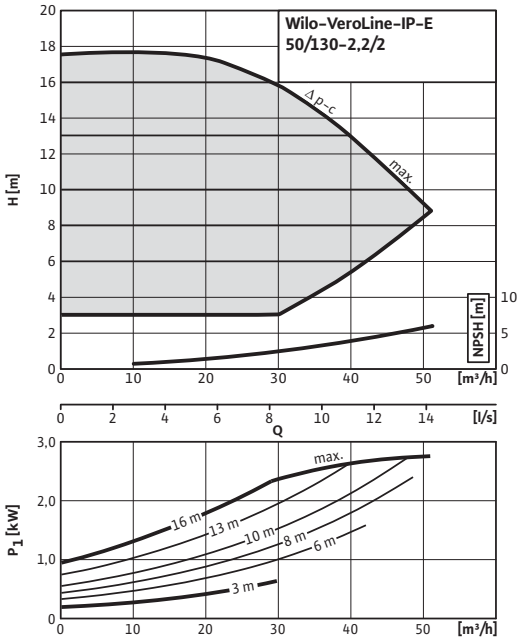
Wilo-VeroLine-IP-E 50/115-0,75/2

Δp-v (variable)



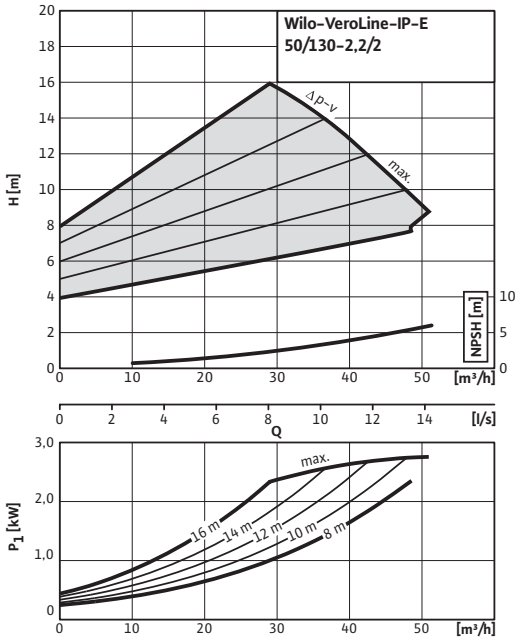
Wilo-VeroLine-IP-E 50/130-2,2/2

Δp-c (constant)



Wilo-VeroLine-IP-E 50/130-2,2/2

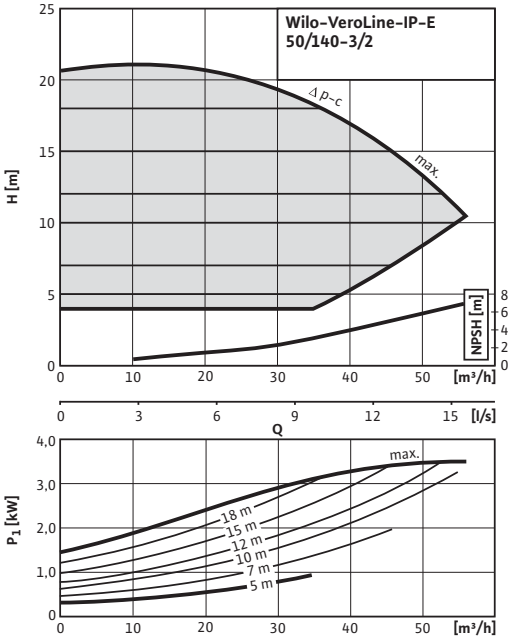
Δp-v (variable)



Pump curves Wilo-VeroLine-IP-E

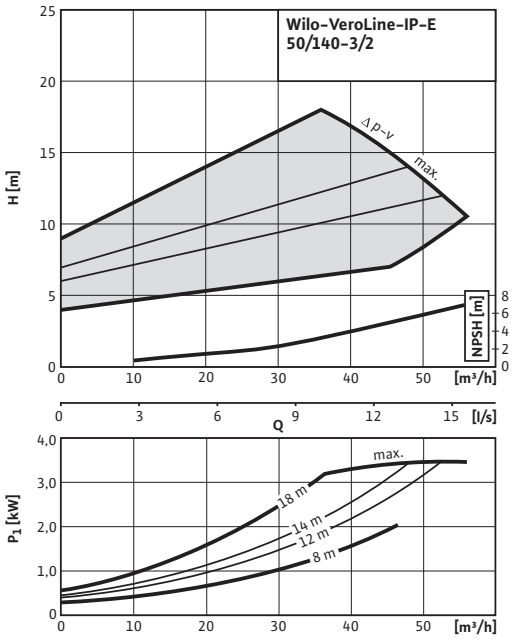
Wilo-VeroLine-IP-E 50/140-3/2

Δp-c (constant)



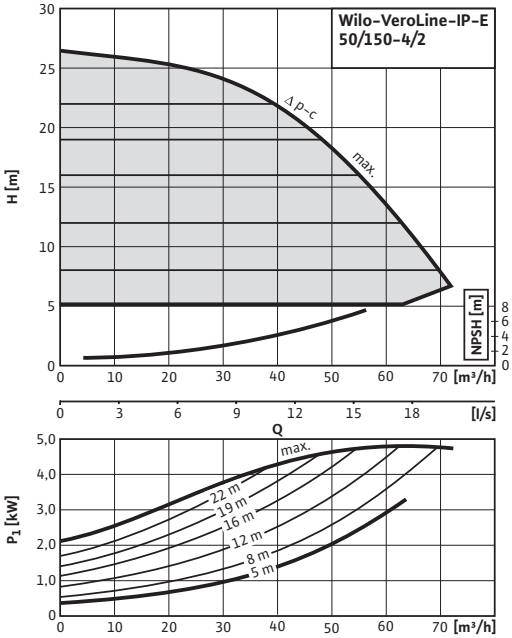
Wilo-VeroLine-IP-E 50/140-3/2

Δp-v (variable)



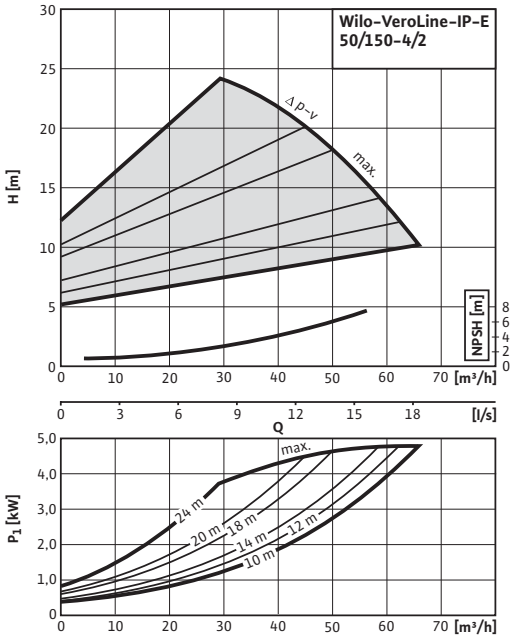
Wilo-VeroLine-IP-E 50/150-4/2

Δp-c (constant)



Wilo-VeroLine-IP-E 50/150-4/2

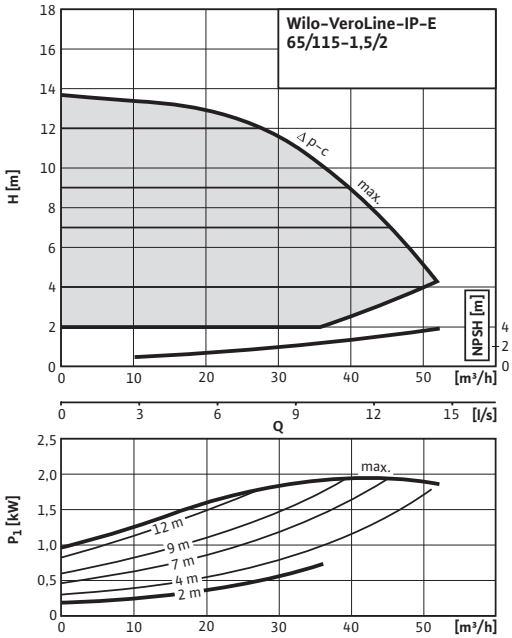
Δp-v (variable)



Pump curves Wilo-VeroLine-IP-E

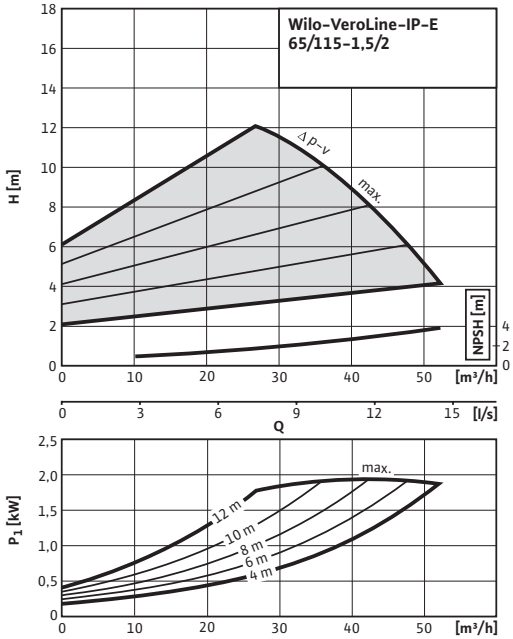
Wilo-VeroLine-IP-E 65/115-1,5/2

Δp-c (constant)



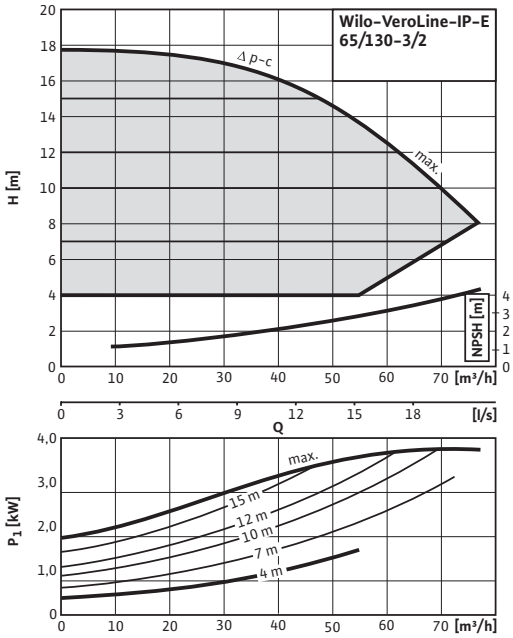
Wilo-VeroLine-IP-E 65/115-1,5/2

Δp-v (variable)



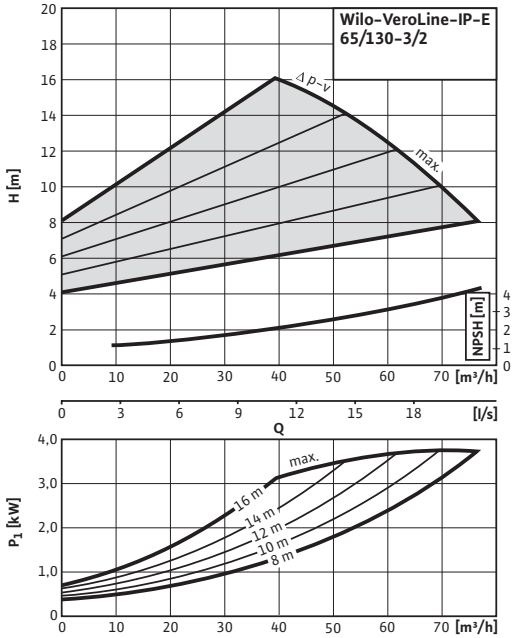
Wilo-VeroLine-IP-E 65/130-3/2

Δp-c (constant)



Wilo-VeroLine-IP-E 65/130-3/2

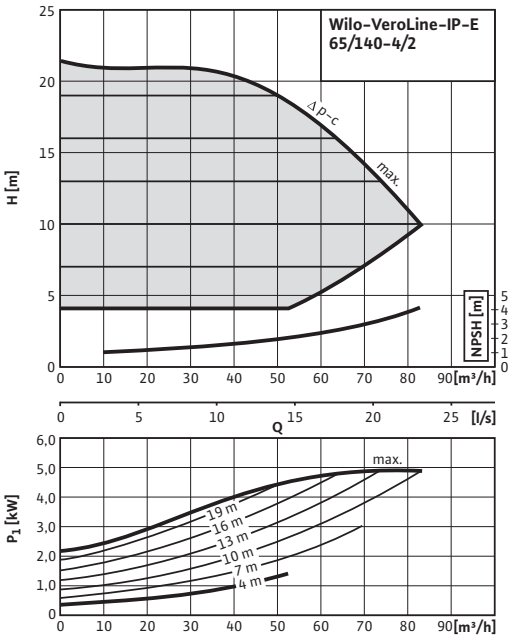
Δp-v (variable)



Pump curves Wilo-VeroLine-IP-E

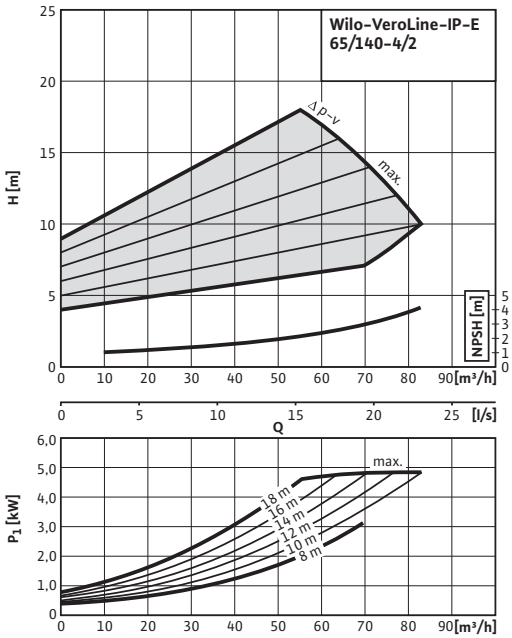
Wilo-VeroLine-IP-E 65/140-4/2

Δp-c (constant)



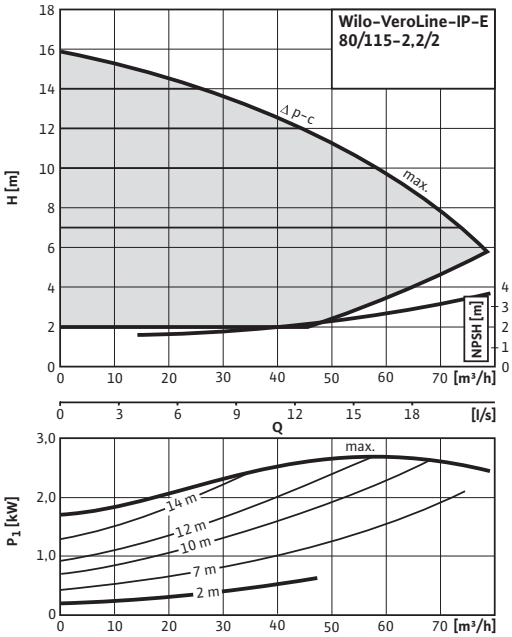
Wilo-VeroLine-IP-E 65/140-4/2

Δp-v (variable)



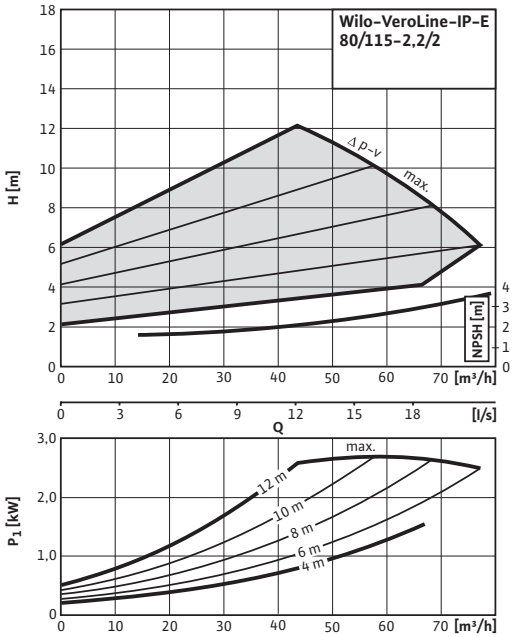
Wilo-VeroLine-IP-E 80/115-2.2/2

Δp-c (constant)



Wilo-VeroLine-IP-E 80/115-2,2/2

Δp-v (variable)



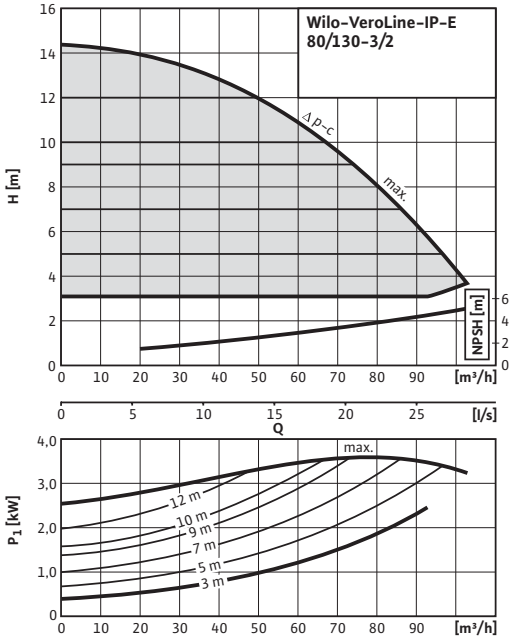
Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IP-E

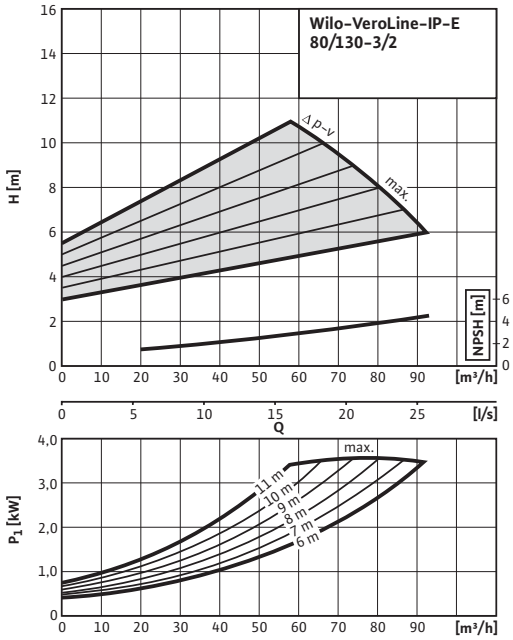
Wilo-VeroLine-IP-E 80/130-3/2

Δp-c (constant)



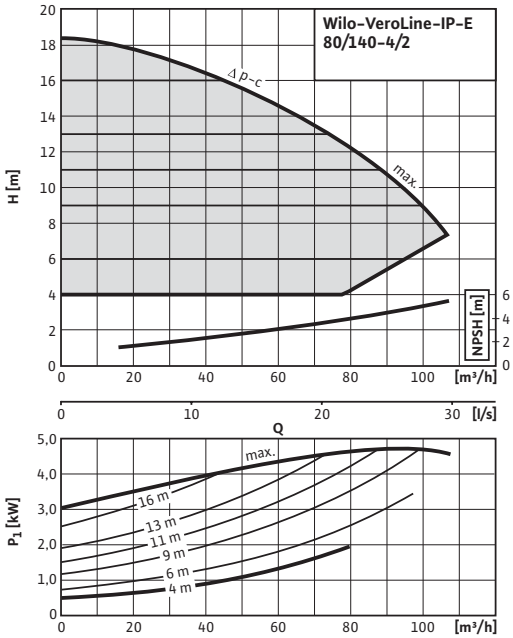
Wilo-VeroLine-IP-E 80/130-3/2

Δp-v (variable)



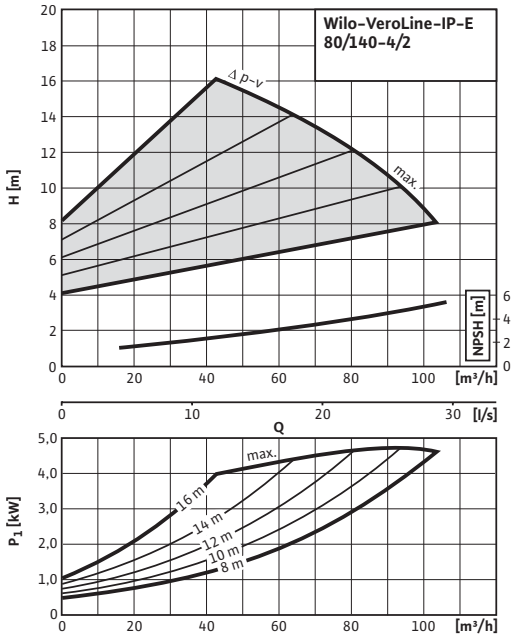
Wilo-VeroLine-IP-E 80/140-4/2

Δp-c (constant)



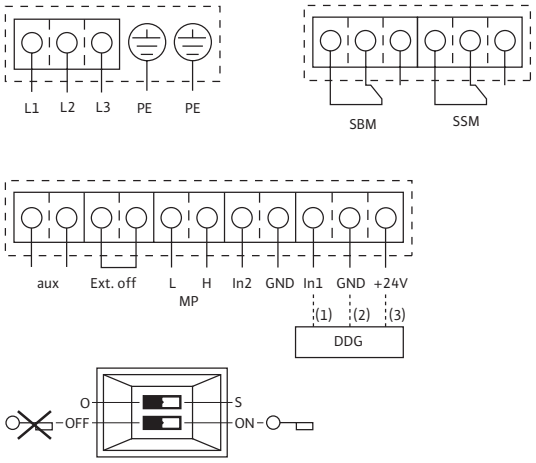
Wilo-VeroLine-IP-E 80/140-4/2

Δp-v (variable)



Terminal diagram, motor data Wilo-VeroLine-IP-E

Terminal diagram



L1, L2, L3:	Mains connection: 3~400 V AC/50 Hz; 3~380 V AC/60 Hz
PE:	Protective conductor connection
DDG:	Connection for differential pressure sensor
In1 (1):	Actual value input 0-10 V/0-20 mA; 2-10 V/4-20 mA
GND (2):	Ground connection for In1 and In2
+ 24 V (3):	DC voltage output for an external consumer/sensor. Max load 60 mA
In2:	Setpoint input 0-10 V/0-20 mA; 2-10 V/4-20 mA
MP:	Multi-pump, interface for dual pump management
Ext. off:	"Overriding Off" control input The pump can be switched on or off via an external, potential-free contact (24 V DC/10 mA).
SBM:*	Potential-free collective run signal (changeover contact according to VDI 3814)
SSM:*	Potential-free collective fault signal (changeover contact according to VDI 3814)
aux:	no function
DIP switch:	1: Switchover between operation (O) and service mode (S) 2: Activation/deactivation of menu access disable
Option:	IF-Module (PLR/LON) for connection to building automation

* Load capacity of contacts for SBM and SSM:
min.: 12 V DC/10 mA
max.: 250 V AC/1 A

Motor data

Wilo-VeroLine-IP-E ...	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
32/100-0.55/2	0.55	1100 - 2900	0.8	1.8
32/110-0.75/2	0.75	1100 - 2900	1.1	2.9
32/160-1.1/2	1.1	1100 - 2900	1.3	3.6
40/115-0.55/2	0.55	1100 - 2900	0.8	1.8
40/120-1.5/2	1.5	1100 - 2900	1.9	4.8
40/130-2.2/2	2.2	1100 - 2900	2.6	6.8
40/150-3/2	3	1100 - 2900	3.6	7.5
40/160-4/2	4	1100 - 2900	4.7	9.6
50/115-0.75/2	0.75	1100 - 2900	1.1	2.9
50/130-2.2/2	2.2	1100 - 2900	2.6	6.8
50/140-3/2	3	1100 - 2900	3.5	7.8
50/150-4/2	4	1100 - 2900	4.9	10.1
65/115-1.5/2	1.5	1100 - 2900	1.9	4.8
65/130-3/2	3	1100 - 2900	3.7	7.9
65/140-4/2	4	1100 - 2900	5.0	10.1
80/115-2.2/2	2.2	1100 - 2900	2.6	6.8
80/130-3/2	3	1100 - 2900	3.5	7.7

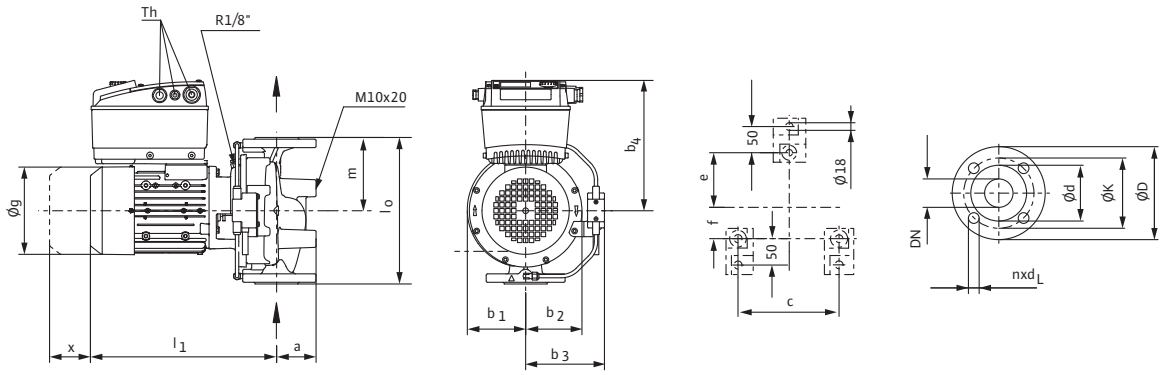
Terminal diagram, motor data Wilo-VeroLine-IP-E

Motor data				
Wilo-VeroLine-IP-E ...	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
80/140-4/2	4	1100 - 2900	4.9	10.2

Three-phase motor (three-phase current), 2-pole - 3~400V, 50 Hz / 3~380V, 60 Hz

Dimensions, weights Wilo-VeroLine-IP-E

Dimension drawing



Note:
Housing with feet for installation on a base and drilled holes M10, brackets on request.

Dimensions, weights

Wilo-VeroLine-IP-E ...	Nominal flange diameter	Overall length	Dimensions												Threaded cable connection	Weight approx.
	DN	l_0	A	b_1	b_2	b_3	b_4	c	e	f	Ø g	l_1	m	x	Th	M
	–	[mm]													–	[kg]
32/100-0.55/2	32	260	70	101	106	135	221	90	40	50	145	308	130	150		24
32/110-0.75/2	32	260	70	101	106	142	228	90	40	50	163	331	130	150		25
32/160-1.1/2	32	260	70	101	106	142	237	90	40	50	163	348	130	150		36
40/115-0.55/2	40	250	90	80	90	114	228	90	40	50	145	310	125	150		21
40/120-1.5/2	40	320	75	113	121	142	245	90	40	50	180	357	160	150		33
40/130-2.2/2	40	320	75	113	121	142	247	90	40	50	203	356	160	150		35
40/150-3/2	40	320	75	113	121	142	267	90	40	50	203	390	160	150		39
40/160-4/2	40	320	75	113	121	142	279	90	40	50	227	390	160	150	2xM12	45
50/115-0.75/2	50	280	83	91	101	126	237	90	40	50	163	353	140	150	1xM16	26
50/130-2.2/2	50	340	86	116	131	143	247	104	40	50	203	360	170	150	1xM20	38
50/140-3/2	50	340	86	116	131	143	267	104	40	50	203	425	170	150	1xM25	42
50/150-4/2	50	340	86	116	131	143	279	104	40	50	227	425	170	150		42
65/115-1.5/2	65	340	93	100	118	137	255	104	40	50	180	389	170	150		35
65/130-3/2	65	340	93	119	138	163	267	135	40	55	203	409	170	150		44
65/140-4/2	65	340	93	119	138	163	279	135	40	55	227	409	170	150		50
80/115-2.2/2	80	360	100	110	135	137	255	135	40	55	203	391	180	150		43
80/130-3/2	80	360	105	125	153	143	267	135	40	55	203	425	180	150		54
80/140-4/2	80	360	105	125	153	143	279	135	40	55	227	425	180	150		54

Dimensions, weights Wilo-VeroLine-IP-E

Flange dimensions					
Wilo-VeroLine-IP-E ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19

Pump flange dimensions – drilled according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-CronoLine-IL-E

Design
Electronically controlled glanded single pump in in-line design with flange connection and automatic power adjustment

Application
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**IL-E 50/170-7.5/2 R1**
IL-E	In-line pump with electronic control
50	Nominal diameter DN of the pipe connection
170	Nominal impeller diameter
7.5	Nominal motor power P_2 in kW
2	Number of poles
R1	Version without pressure sensor

Technical data
- Permissible temperature range -20°C to +140°C
- Mains connection 3~400 V, 50 Hz; 3~380 V, 60 Hz
- Protection class IP 55
- Nominal diameter DN 40 to DN 80
- Max. operating pressure 16 bar

Special features/product benefits
- Improved functionality
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Volume flow tendency indication
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Simple operation due to red-button technology, display and infrared interface (IR-Monitoring)
- Optional interfaces due to retrofit LON or PLR IF-Modules for bus communication
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating
- Can be used flexibly in air-conditioning and cooling systems with application benefits due to the direct draining of condensate via optimised lantern design
- Long motor life due to standard condensate drainage holes in the motor housings

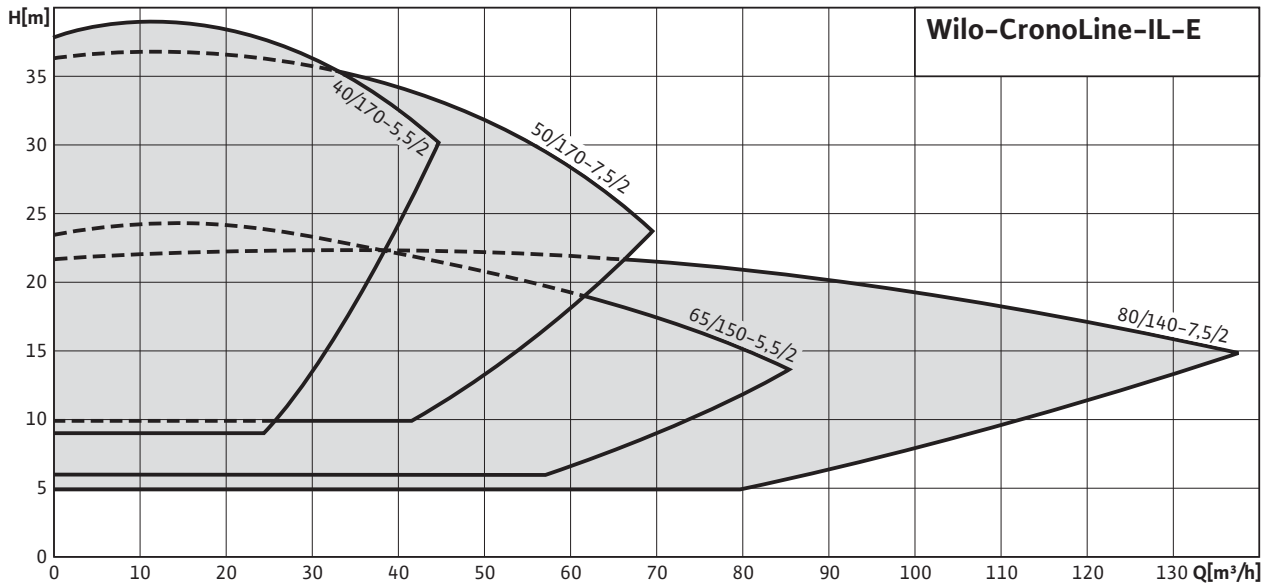
Materials
- Pump housing and lantern: EN-GJL-250
- Impeller
  - Standard version: EN-GJL-200
  - Special version: G-CuSn 10
- Shaft: 1.4122
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection
- Lantern
- Coupling
- Drive with integrated electronic speed control

Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

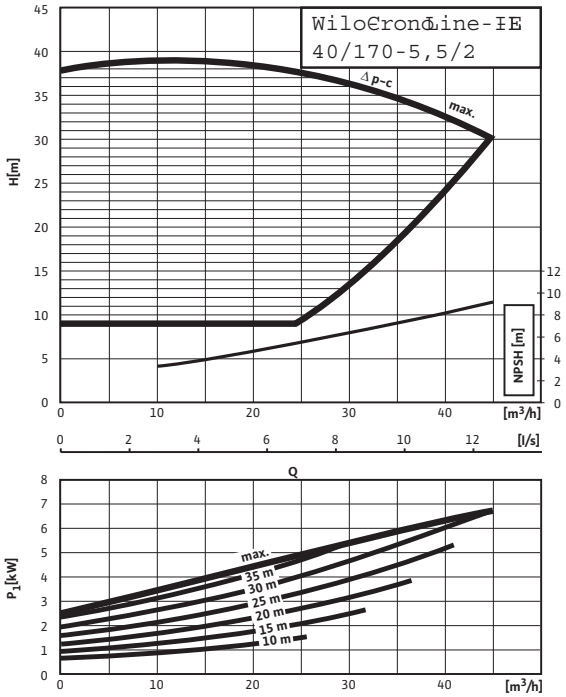
Series description Wilo-CronoLine-IL-E



Pump curves Wilo-CronoLine-IL-E

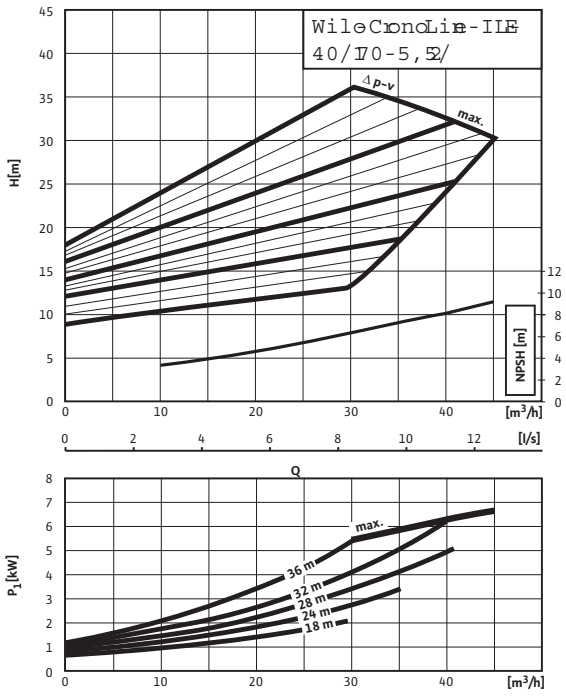
Wilo-CronoLine-IL-E 40/170-5,5/2

Δp-c (constant)



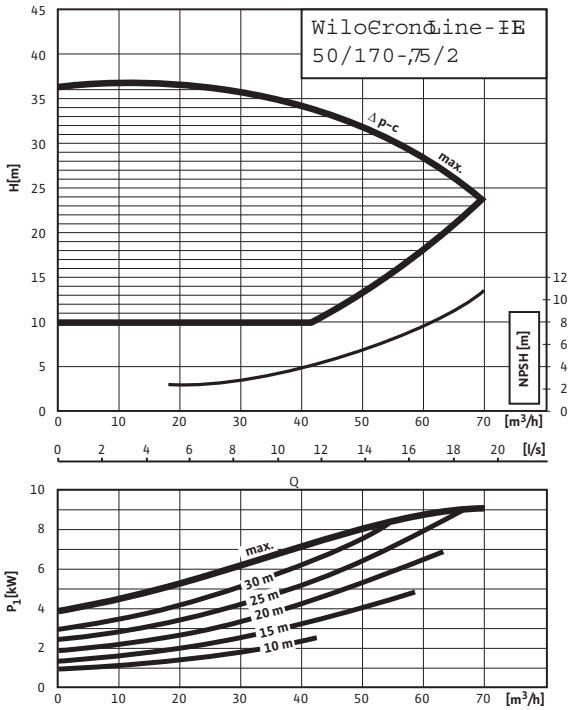
Wilo-CronoLine-IL-E 40/170-5,5/2

Δp-v (variable)



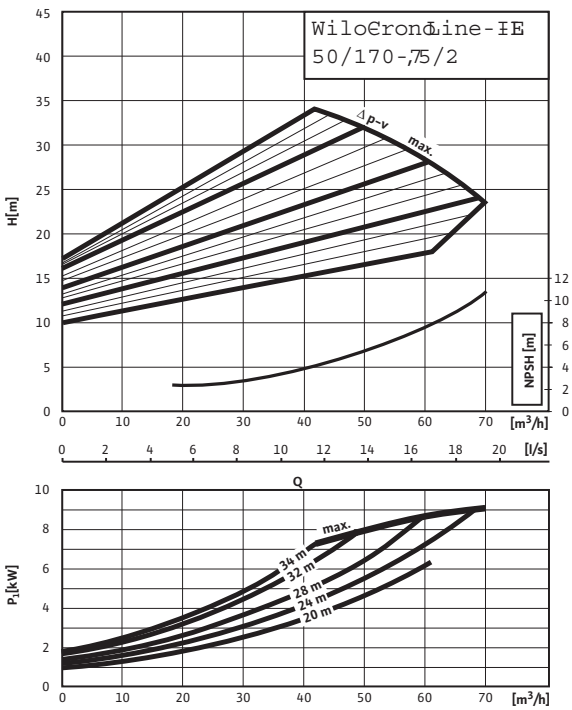
Wilo-CronoLine-IL-E 50/170-7,5/2

Δp-c (constant)



Wilo-CronoLine-IL-E 50/170-7,5/2

Δp-v (variable)



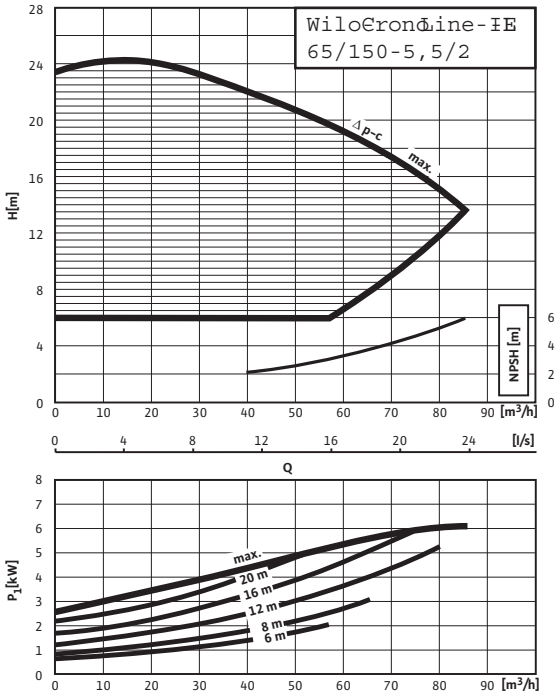
Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL-E

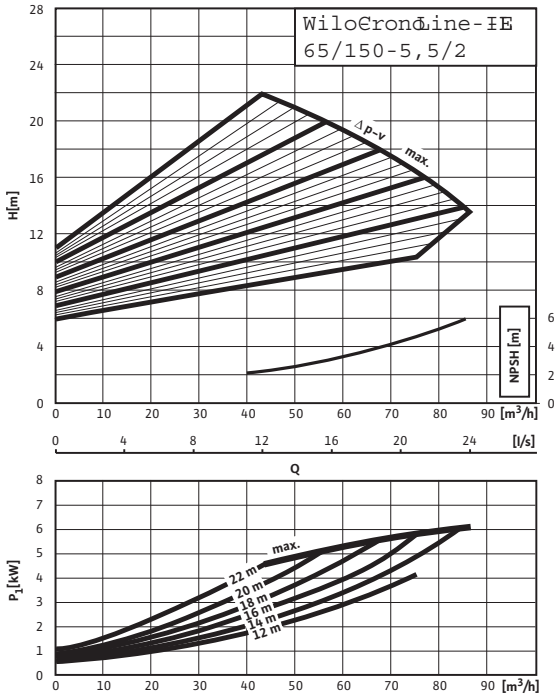
Wilo-CronoLine-IL-E 65/150-5,5/2

Δp-c (constant)



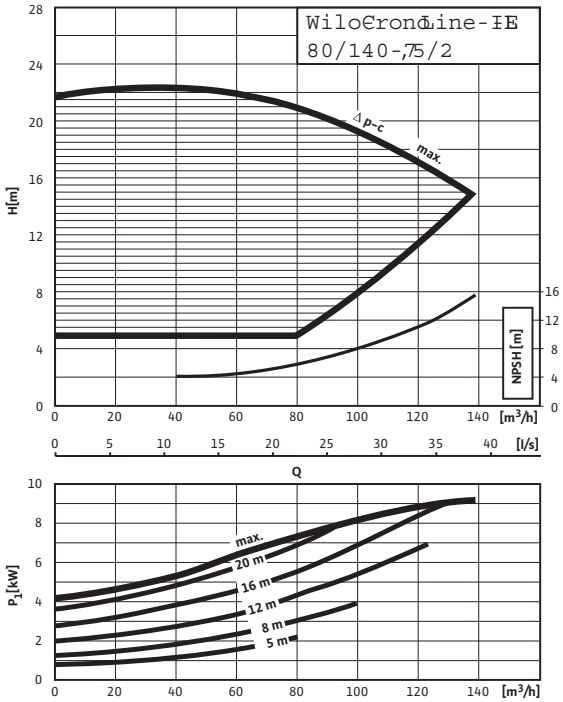
Wilo-CronoLine-IL-E 65/150-5,5/2

Δp-v (variable)



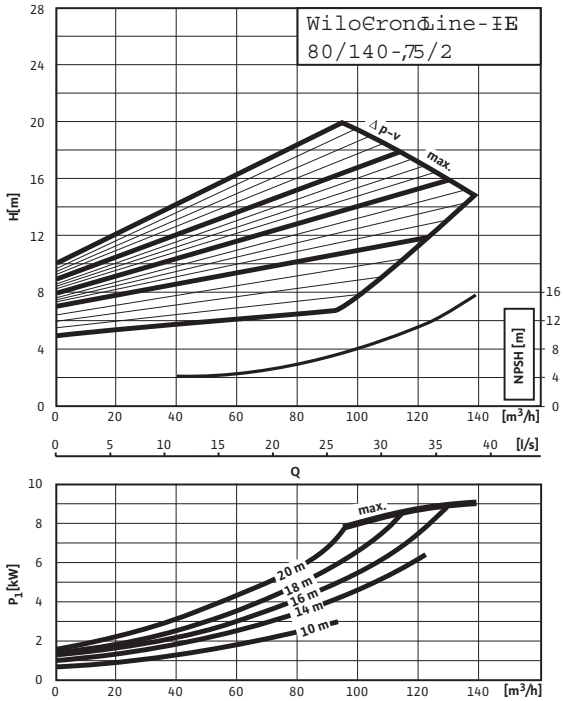
Wilo-CronoLine-IL-E 80/140-7,5/2

Δp-c (constant)



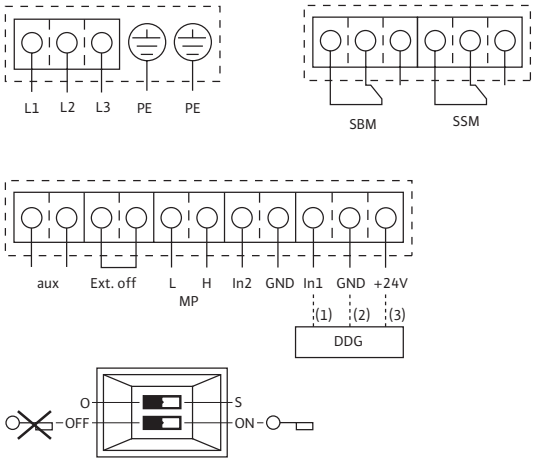
Wilo-CronoLine-IL-E 80/140-7,5/2

Δp-v (variable)



Terminal diagram, motor data Wilo-CronoLine-IL-E

Terminal diagram



L1, L2, L3: Mains connection: 3~400 V AC/50 Hz; 3~380 V AC/60 Hz

PE: Protective conductor connection

DDG: Connection for differential pressure sensor

In1 (1): Actual value input 0-10 V/0-20 mA; 2-10 V/4-20 mA

GND (2): Ground connection for In1 and In2

+ 24 V (3): DC voltage output for an external consumer/sensor. Max load 60 mA

In2: Setpoint input 0-10 V/0-20 mA; 2-10 V/4-20 mA

MP: Multi-pump, interface for dual pump management

Ext. off: "Overriding Off" control input
The pump can be switched on or off via an external, potential-free contact (24 V DC/10 mA).

SBM:* Potential-free collective run signal (changeover contact according to VDI 3814)

SSM:* Potential-free collective fault signal (changeover contact according to VDI 3814)

aux: no function

DIP switch: 1: Switchover between operation (O) and service mode (S)
2: Activation/deactivation of menu access disable

Option: IF-Module (PLR/LON) for connection to building automation

* Load capacity of contacts for SBM and SSM:
min.: 12 V DC/10 mA
max.: 250 V AC/1 A

Motor data

Wilo-CronoLine-IL-E ...	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
40/170-5.5/2	5.5	750 - 2900	7.2	11.5
50/170-7.5/2	7.5	750 - 2900	9.3	14.5
65/150-5.5/2	5.5	750 - 2900	7.2	11.5
80/140-7.5/2	7.5	750 - 2900	9.3	14.5

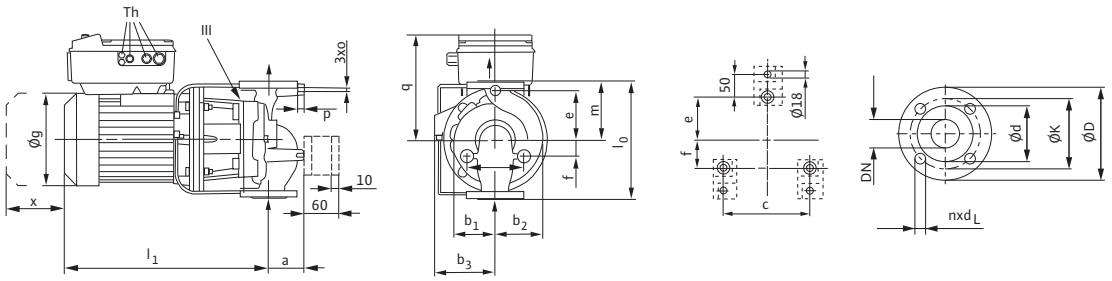
Three-phase motor (three-phase current), 2-pole - 3~400V, 50 Hz / 3~380V, 60 Hz
Observe motor name plate data

Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoLine-IL-E

Dimension drawing



Dimensions, weights																		
Wilo-CronoLine-IL-E ...	Nominal flange diameter	Overall length	Dimensions														Threaded cable connection	Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_1	m	o	p	q	x	Th	M
	–	[mm]											–	[mm]			–	[kg]
40/170-5.5/2	40	340	82	113	129	180	130	149	58	266	659	170	M10	20	303	95	1xM12	89
50/170-7.5/2	50	340	103	120	138	180	164	143	48	266	666	170	M10	20	303	100	2xM16	101
65/150-5.5/2	65	430	110	126	146	180	180	195	60	266	672	215	M12	20	303	120	1xM20	97
80/140-7.5/2	80	400	105	123	151	180	180	173	57	266	686	200	M12	20	303	120	1xM25	106

Flange dimensions					
Wilo-CronoLine-IL-E ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19

Pump flange dimensions – according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-CronoLine-IL-E...BF

Design
Electronically controlled glanded single pump in in-line design with flange connection and automatic power adjustment

Application
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**IL-E 100/5-21 BF R1**
IL-E	In-line pump with electronic control
100	Nominal diameter DN of the pipe connection
5-21	Adjustable delivery head range in m
BF	Basic Function version with Δp-c control
R1	Version without pressure sensor

Technical data
- Permissible temperature range -20°C to +140°C
- Mains connection 3~400 V, 50 Hz; 3~380 V, 60 Hz
- Protection class 54
- Nominal diameter DN 40 to DN 200
- Max. operating pressure 16 bar

Special features/product benefits
- Powerful, up to 22 kW
- Control mode Δp-c for constant differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA)
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- High corrosion protection due to cataphoretic coating

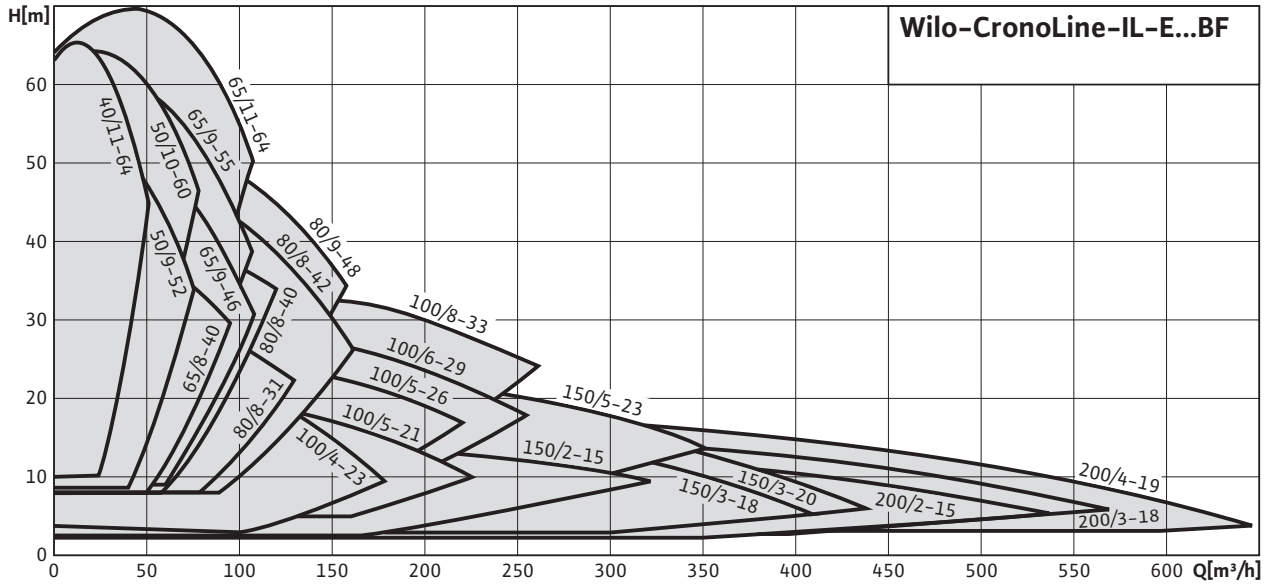
Materials
- Pump housing and lantern: EN-GJL-250
- Impeller:
  - Standard version: EN-GJL-200
  - Special version: G-CuSn 10
- Shaft: 1.4122
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection
- Lantern
- Coupling
- Drive with integrated electronic speed control

Energy-saving pumps

Single pumps (heating, air-conditioning, cooling and industry)

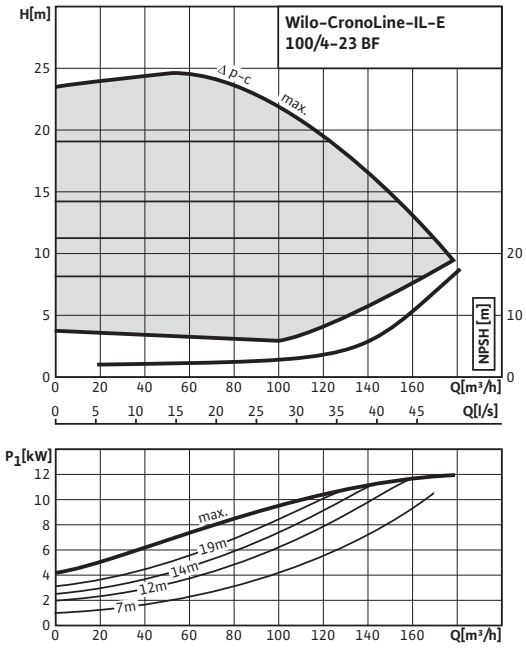
Series description Wilo-CronoLine-IL-E...BF



Pump curves Wilo-CronoLine-IL-E...BF

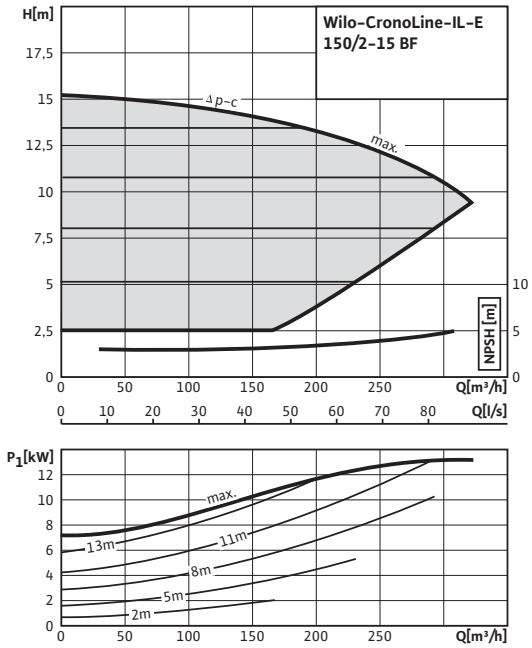
Wilo-IL-E 100/4-23 BF

4-pole, Δp-c (constant)



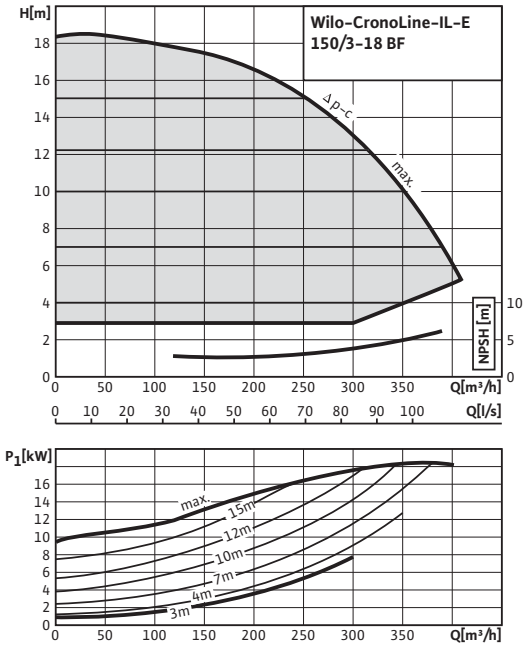
Wilo-IL-E 150/2-15 BF

4-pole, Δp-c (constant)



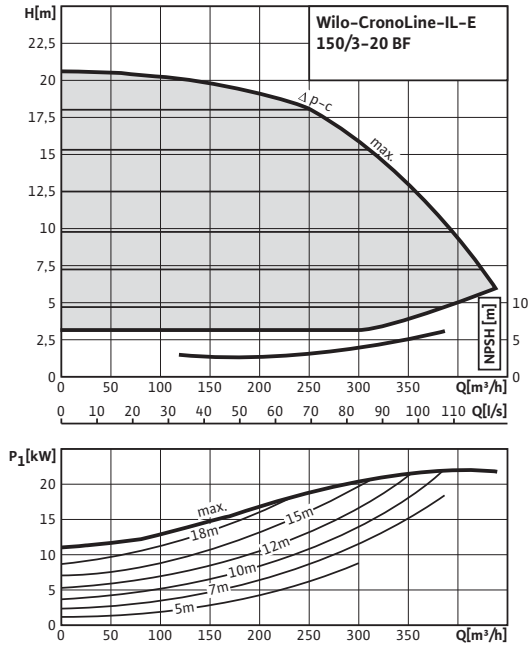
Wilo-IL-E 150/3-18 BF

4-pole, Δp-c (constant)



Wilo-IL-E 150/3-20 BF

4-pole, Δp-c (constant)



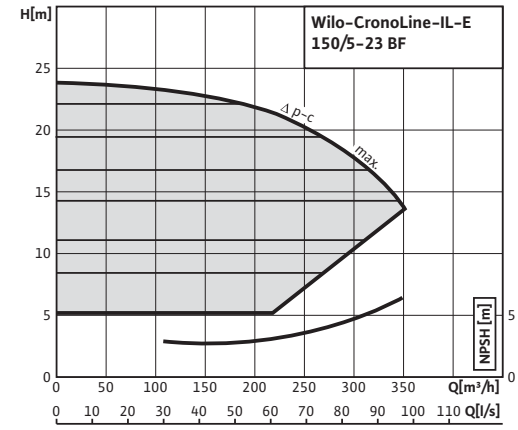
Energy-saving pumps

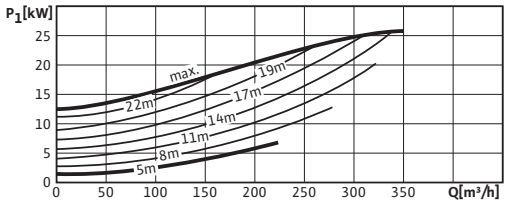
Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL-E...BF

Wilo-IL-E 150/5-23 BF

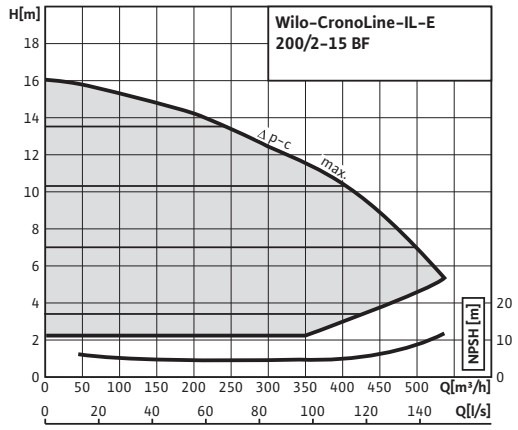
4-pole, Δp-c (constant)

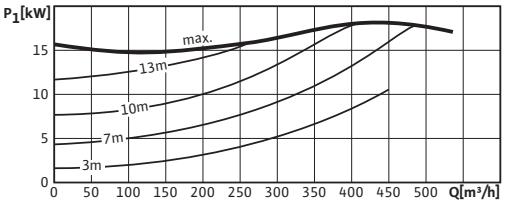




Wilo-IL-E 200/2-15 BF

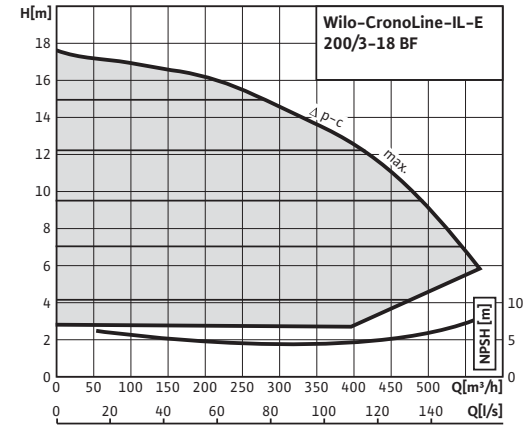
4-pole, Δp-c (constant)

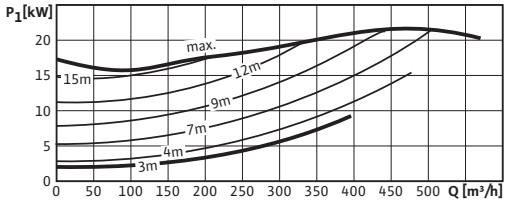




Wilo-IL-E 200/3-18 BF

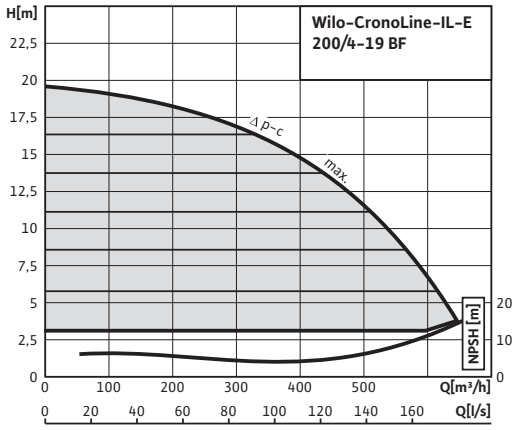
4-pole, Δp-c (constant)

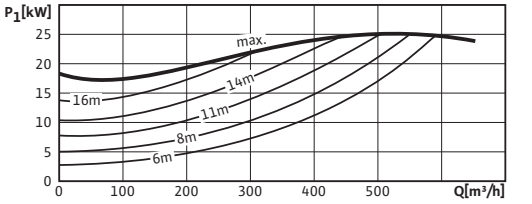




Wilo-IL-E 200/4-19 BF

4-pole, Δp-c (constant)

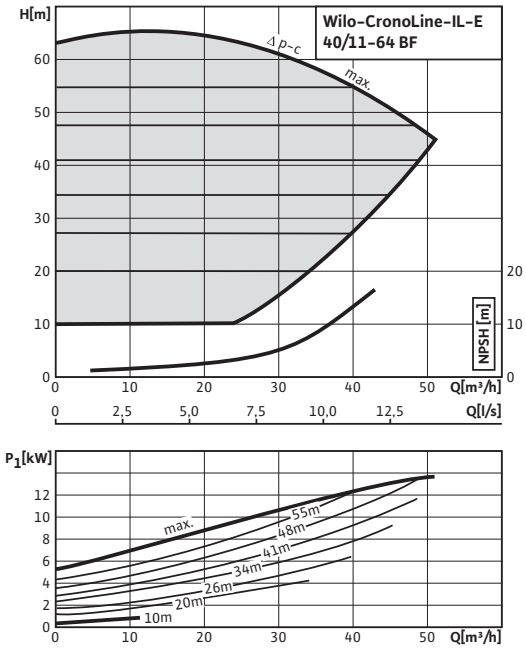




Pump curves Wilo-CronoLine-IL-E...BF

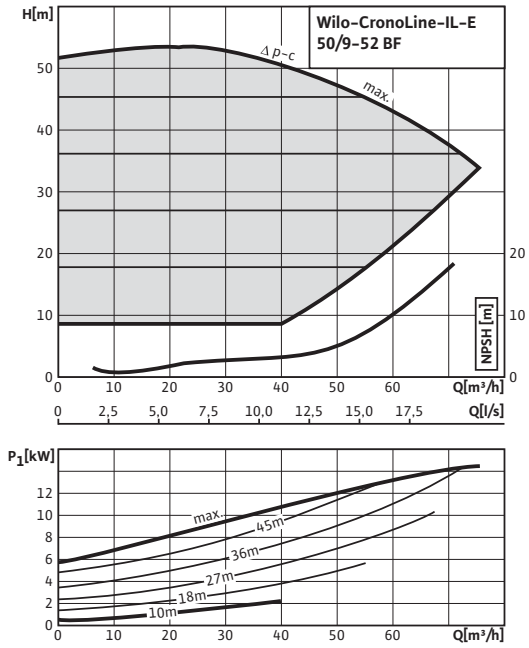
Wilo-IL-E 40/11-64 BF

2-pole, Δp-c (constant)



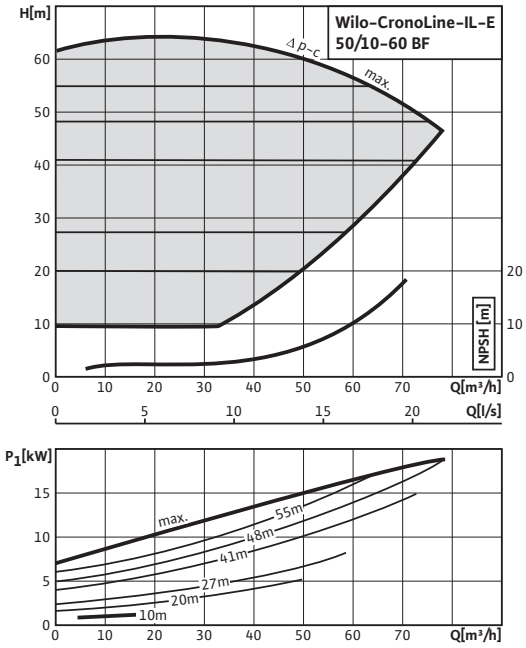
Wilo-IL-E 50/9-52 BF

2-pole, Δp-c (constant)



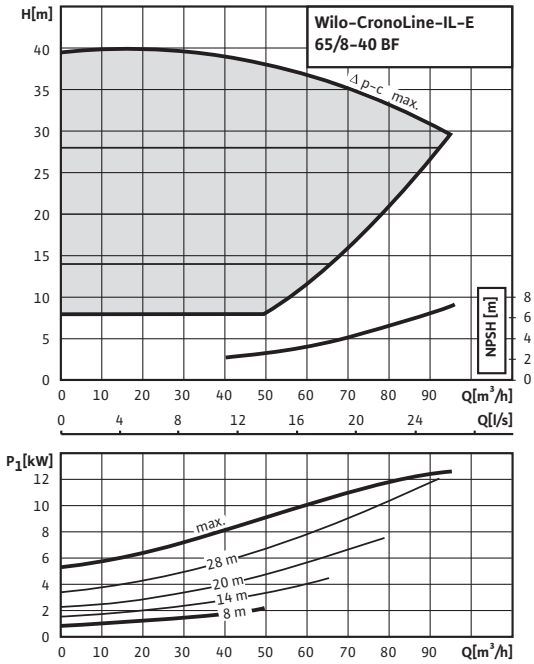
Wilo-IL-E 50/10-60 BF

2-pole, Δp-c (constant)



Wilo-IL-E 65/8-40 BF

2-pole, Δp-c (constant)



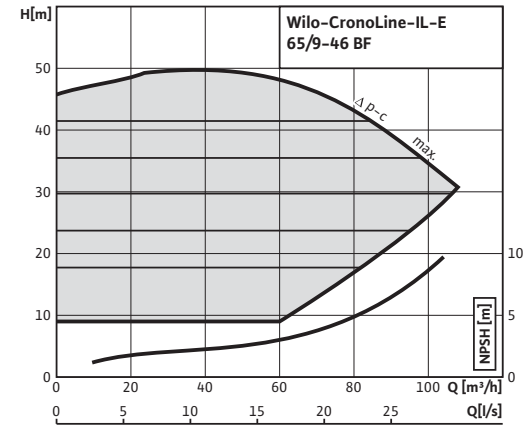
Energy-saving pumps

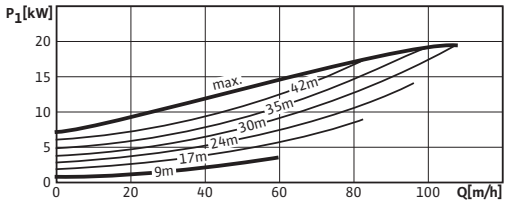
Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL-E...BF

Wilo-IL-E 65/9-46 BF

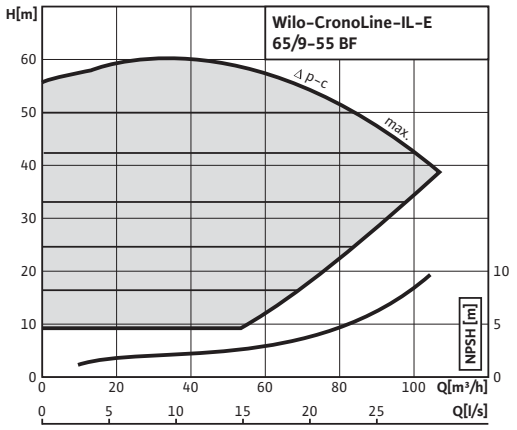
2-pole, Δp-c (constant)

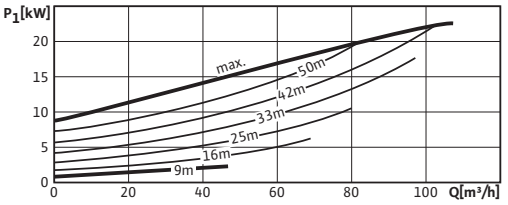




Wilo-IL-E 65/9-55 BF

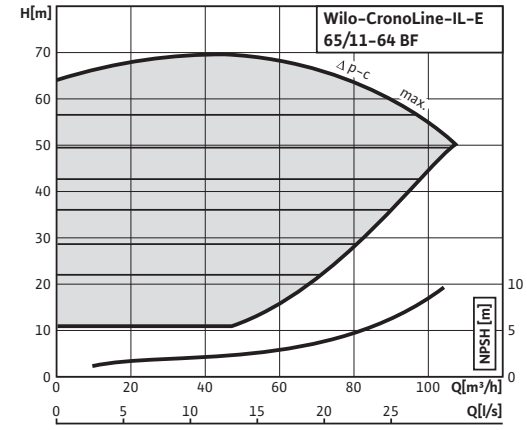
2-pole, Δp-c (constant)

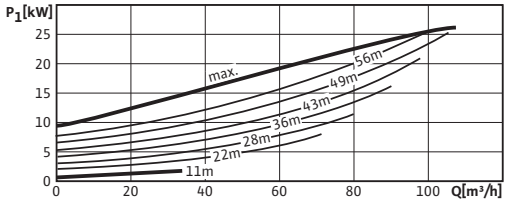




Wilo-IL-E 65/11-64 BF

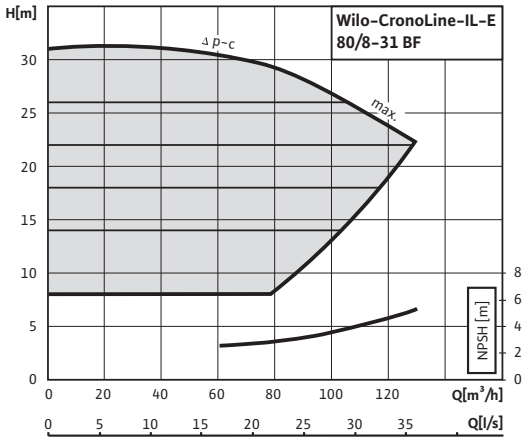
2-pole, Δp-c (constant)

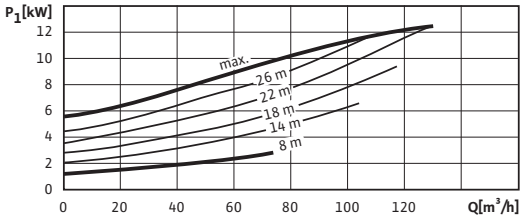




Wilo-IL-E 80/8-31 BF

2-pole, Δp-c (constant)

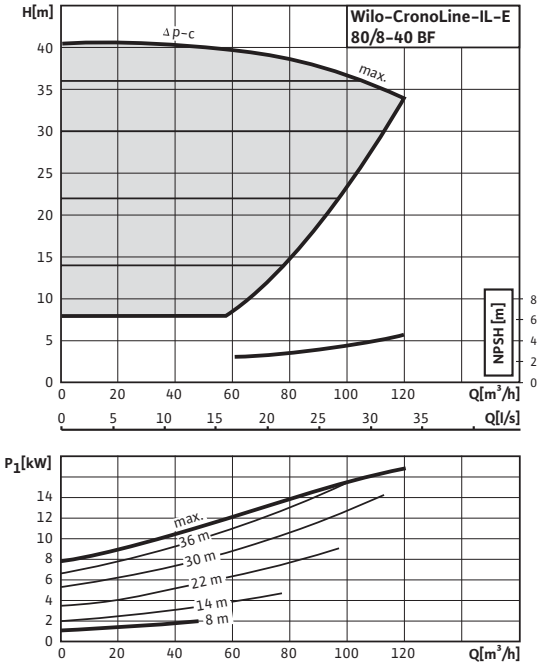




Pump curves Wilo-CronoLine-IL-E...BF

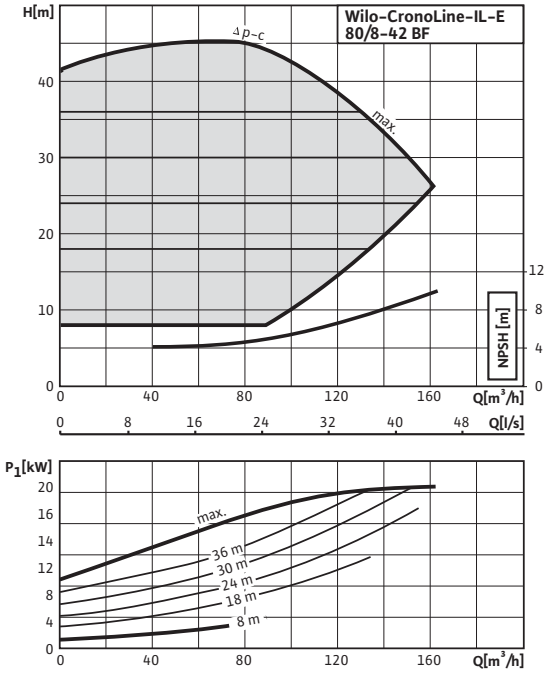
Wilo-IL-E 80/8-40 BF

2-pole, Δp-c (constant)



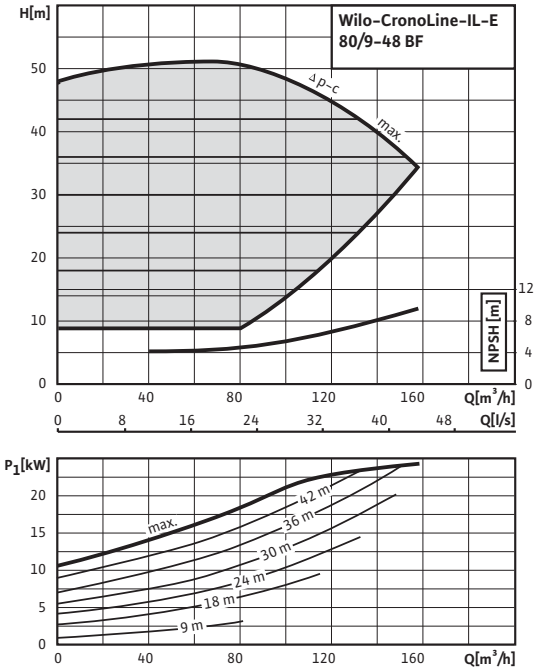
Wilo-IL-E 80/8-42 BF

2-pole, Δp-c (constant)



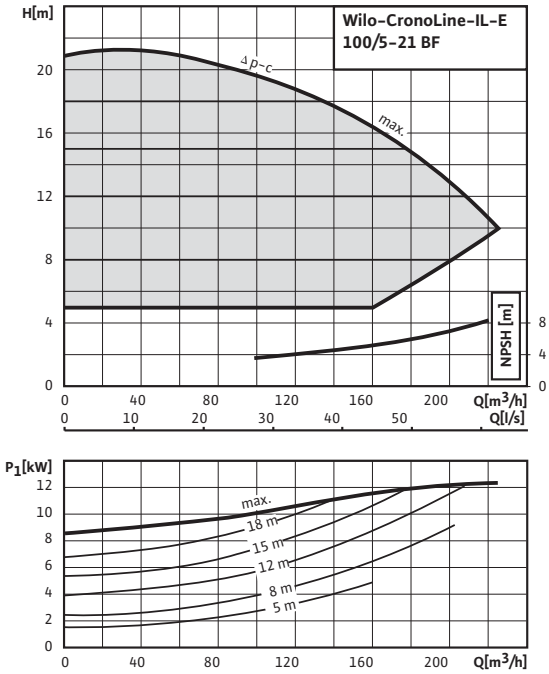
Wilo-IL-E 80/9-48 BF

2-pole, Δp-c (constant)



Wilo-IL-E 100/5-21 BF

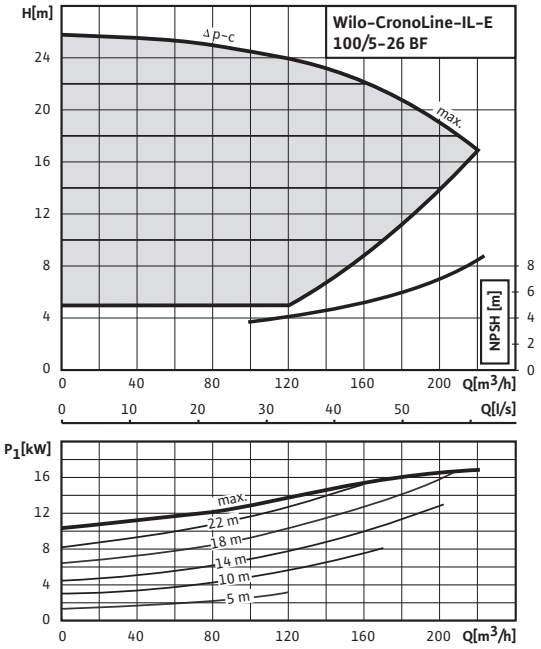
2-pole, Δp-c (constant)



Pump curves Wilo-CronoLine-IL-E...BF

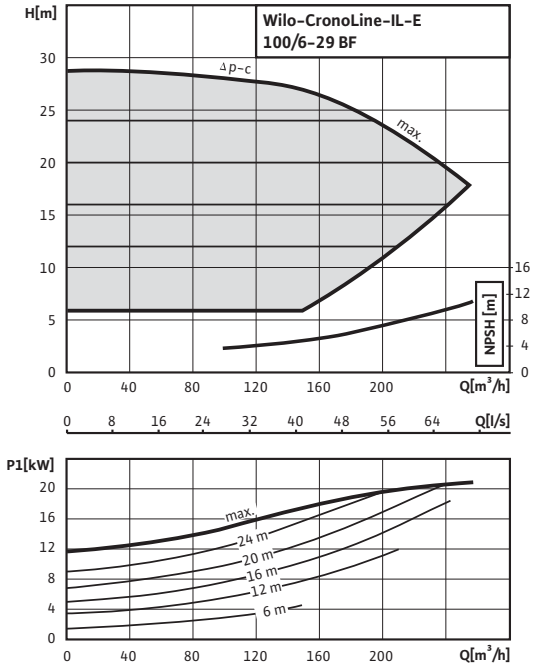
Wilo-IL-E 100/5-26 BF

2-pole, Δp-c (constant)



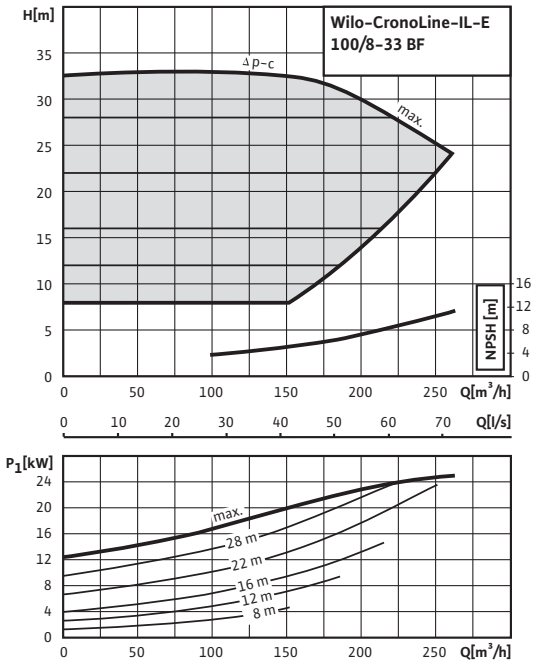
Wilo-IL-E 100/6-29 BF

2-pole, Δp-c (constant)



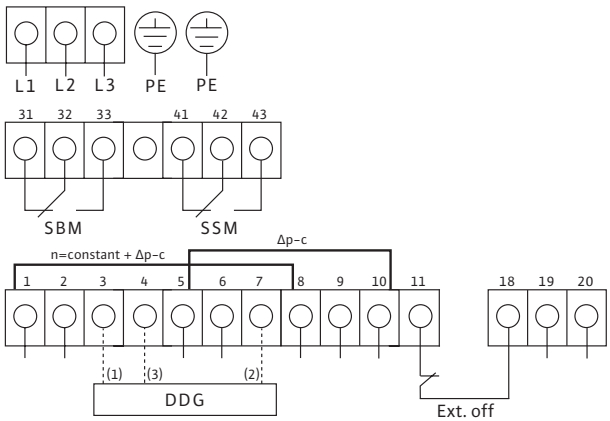
Wilo-IL-E 100/8-33 BF

2-pole, Δp-c (constant)



Terminal diagram, motor data Wilo-CronoLine-IL-E...BF

Terminal diagram



L1, L2, L3:	Mains connection: 3~400 V AC/50 Hz; 3~380 V AC/60 Hz
PE:	Protective conductor connection
DDG:	Connection for differential pressure sensor
Ext. off:	"Overriding Off" control input The pump can be switched on or off via an external, potential-free contact (24 V DC/10 mA).
SBM:*	Potential-free collective run signal (changeover contact according to VDI 3814)
SSM:*	Potential-free collective fault signal (changeover contact according to VDI 3814)
n=constant:	Control mode with fixed motor speed
Δp-c:	Control mode with constant differential pressure

* Load capacity of contacts for SBM and SSM:
42 V DC or 250 V AC/0.1-2 A
Note for DL-E...BF: Detailed information on the controls for the double pumps are to be found in the installation and operating instructions.

Motor data (4-pole)

Wilo-CronoLine-IL-E...BF	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
100/4-23	11	375 - 1450	12.0	22.6
150/2-15	11	375 - 1450	13.0	22.6
150/3-18	15	375 - 1450	18.5	29.0
150/3-20	18.5	375 - 1450	22.0	34.9
150/5-23	22	375 - 1450	26.0	41.2
200/2-15	15	375 - 1450	18.0	29.0
200/3-18	18.5	375 - 1450	22.0	34.9
200/4-19	22	375 - 1450	26.0	41.2
150/2-15	11	375 - 1450	13.0	22.6

Three-phase motor (three-phase current), 4-pole - 3~400V, 50 Hz / 3~380V, 60 Hz
Observe motor name plate data

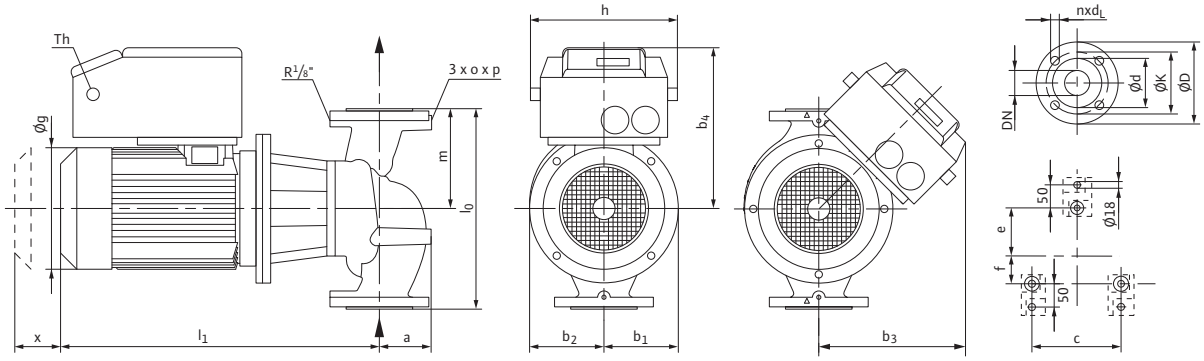
Terminal diagram, motor data Wilo-CronoLine-IL-E...BF

Motor data (2-pole)				
Wilo-CronoLine-IL-E...BF	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
40/11-64	11	750 - 2900	13.0	22.6
50/9-52	11	750 - 2900	13.0	22.6
50/10-60	15	750 - 2900	18.5	29.0
65/8-40	11	750 - 2900	13.0	22.6
65/9-46	15	750 - 2900	18.3	29.0
65/9-55	18.5	750 - 2900	21.5	34.9
65/11-64	22	750 - 2900	25.1	41.2
80/8-31	11	750 - 2900	13.0	22.6
80/8-40	15	750 - 2900	18.5	29.0
80/8-42	18.5	750 - 2900	21.5	34.9
80/9-48	22	750 - 2900	25.1	41.2
100/5-21	11	750 - 2900	13.0	22.6
100/5-26	15	750 - 2900	18.5	29.0
100/6-29	18.5	750 - 2900	21.5	34.9
100/8-33	22	750 - 2900	25.1	41.2

Three-phase motor (three-phase current), 4-pole - 3~400V, 50 Hz / 3~380V, 60 Hz
Observe motor name plate data

Dimensions, weights Wilo-CronoLine-IL-E...BF

Dimension drawing



Dimensions, weights (4-pole)																			
Wilo-CronoLine-IL-E...BF	Nominal flange diameter	Overall length	Dimensions															Threaded cable connection	Weight approx.
	DN	l_0	A	b_1	b_2	b_3	b_4	c	e	f	Ø g	h	l_1	m	o	p	x	Th	M
	–	[mm]													–	[mm]		–	[kg]
100/4-23	100	550	180	188	214	–	391	240	236	114	258	368	732	260	M12	20	120	2xM25 1xM40	204
150/2-15	150	700	200	202	249	–	391	260	284	116	258	368	757	310	M16	25	130		237
150/3-18	150	700	230	278	320	–	419	288	304	146	313	368	826	330	M16	25	135		339
150/3-20	150	700	230	278	320	–	419	288	304	146	313	400	826	330	M16	25	135		372
150/5-23	150	700	230	278	320	–	439	288	304	146	351	400	897	330	M16	25	135		379
200/2-15	200	800	245	281	362	–	419	330	270	165	313	368	851	370	M16	25	140		400
200/3-18	200	800	245	281	362	–	419	330	270	165	313	400	851	370	M16	25	140		434
200/4-19	200	800	245	281	362	–	439	330	270	165	351	400	922	370	M16	25	140		441
150/2-15	–	700	200	202	249	–	391	260	284	116	258	368	757	310	M16	25	130		237

Dimensions, weights Wilo-CronoLine-IL-E...BF

Dimensions, weights (2-pole)

Wilo-CronoLine-IL-E...BF	Nominal flange diameter	Overall length	Dimensions															Threaded cable connection	Weight approx.
	DN	l_0	A	b_1	b_2	b_3	b_4	c	e	f	Ø g	h	l_1	m	o	p	x	Th	M
	–	[mm]													–	[mm]		–	[kg]
40/11-64	40	440	110	145	149	–	391	180	172	78	258	368	704	190	M10	20	100	2xM25 1xM40	181
50/9-52	50	440	120	145	150	–	391	160	170	70	258	368	705	190	M10	20	100		201
50/10-60	50	440	120	145	150	–	419	160	170	70	313	368	717	190	M10	20	100		213
65/8-40	65	430	110	126	146	370	–	180	195	60	258	368	723	215	M12	20	120		158
65/9-46	65	475	130	150	168	–	419	200	225	50	313	368	726	245	M12	20	110		218
65/9-55	65	475	130	150	168	–	419	200	225	50	313	400	764	245	M12	20	110		251
65/11-64	65	475	130	150	168	–	439	200	225	50	351	400	790	245	M12	20	110		283
80/8-31	80	440	120	136	162	370	–	180	173	72	258	368	721	200	M12	20	120		167
80/8-40	80	440	120	136	162	390	–	180	173	72	313	368	735	200	M12	20	120		184
80/8-42	80	500	145	157	182	–	419	220	208	62	313	400	772	230	M12	20	120		261
80/9-48	80	500	145	157	182	–	439	220	208	62	351	400	798	230	M12	20	120		292
100/5-21	100	500	120	159	197	370	–	200	226	60	258	368	756	250	M12	20	135		181
100/5-26	100	500	120	159	197	390	–	200	226	60	313	368	770	250	M12	20	135		218
100/6-29	100	500	120	159	197	410	–	200	226	60	313	400	803	250	M12	20	135		261
100/8-33	100	500	120	159	197	426	–	200	226	60	351	400	829	250	M12	20	135		292

Flange dimensions

Wilo-CronoLine-IL-E...BF	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19
100...	100	220	156	180	8 x 19
150...	150	285	211	240	8 x 23
200...	200	340	266	295	12 x 23

Pump flange dimensions – according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-VeroTwin-DP-E

Design
Electronically controlled glanded double pump in in-line design with flange connection and automatic power adjustment

Application
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**DP-E 40/160-4/2**
DP-E	In-line double pump with electronic control
40	Nominal diameter DN of the pipe connection
160	Nominal impeller diameter
4	Nominal motor power P_2 in kW
2	Number of poles
R1	Version without sensor

Technical data
- Permissible temperature range -10°C to +120°C
- Mains connection 3~400 V, 50 Hz; 3~380 V, 60 Hz
- Protection class IP 55
- Nominal diameter DN 32 to DN 80
- Max. operating pressure 10 bar (special version: 16 bar)

Special features/product benefits
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Simple operation due to red-button technology, display and infrared interface (IR-Monitoring)
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Optional interfaces due to retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating

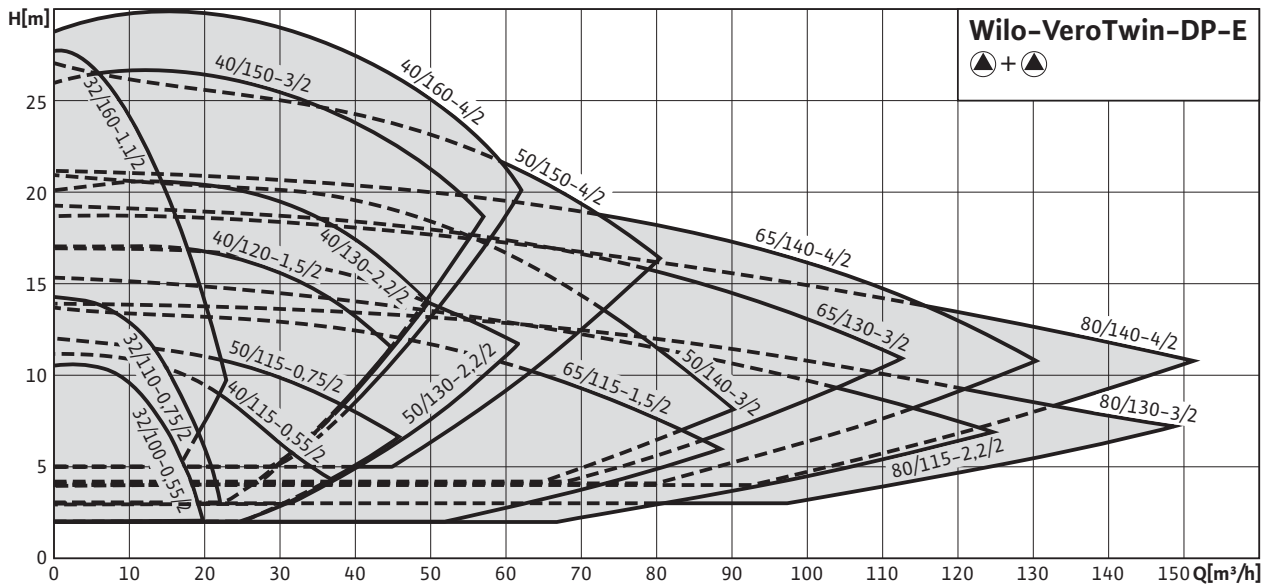
Materials
- Pump housing and lantern: EN-GJL-250
- Impeller: PP, fibreglass-reinforced
- Shaft: 1.4021
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure double pump in in-line design with
- Switchover valve
- Mechanical seal
- Flange connection
- Drive with integrated electronic speed control

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

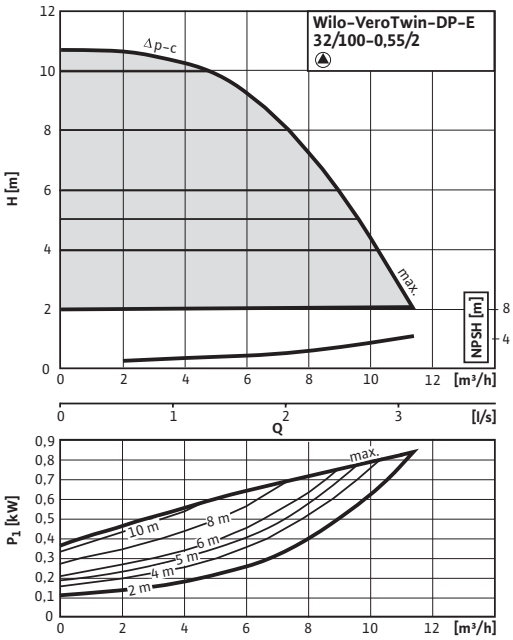
Series description Wilo-VeroTwin-DP-E



Pump curves Wilo-VeroTwin-DP-E

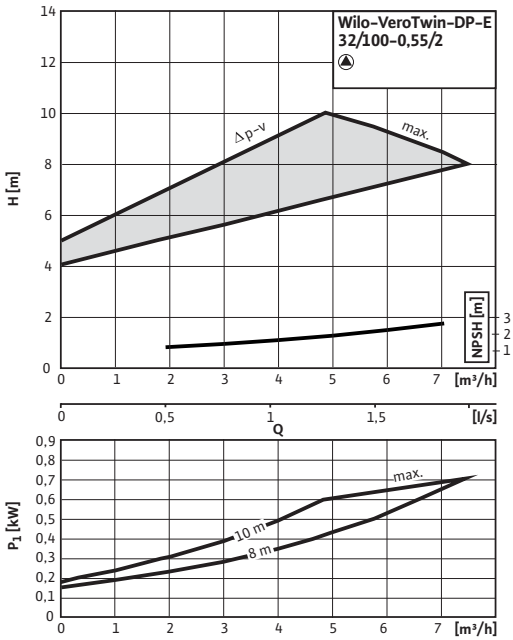
Wilo-VeroTwin-DP-E 32/100-0,55/2

Δp-c (constant) individual operation



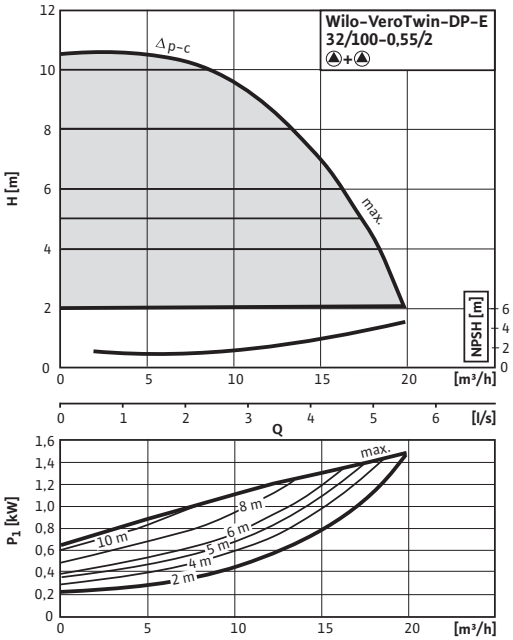
Wilo-VeroTwin-DP-E 32/100-0,55/2

Δp-v (variable) individual operation



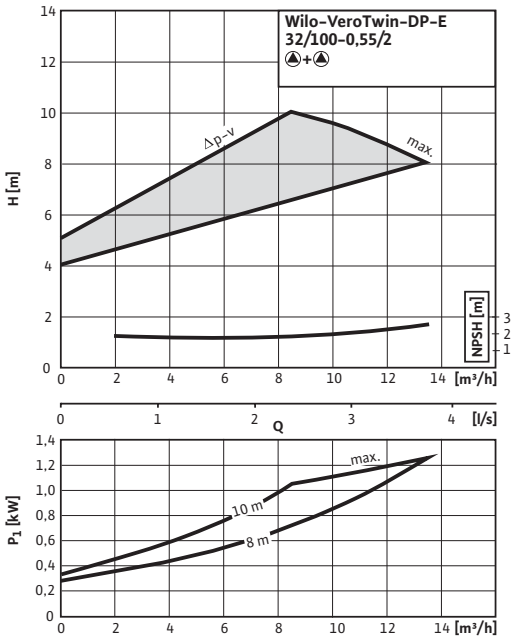
Wilo-VeroTwin-DP-E 32/100-0,55/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 32/100-0,55/2

Δp-v (variable) parallel operation



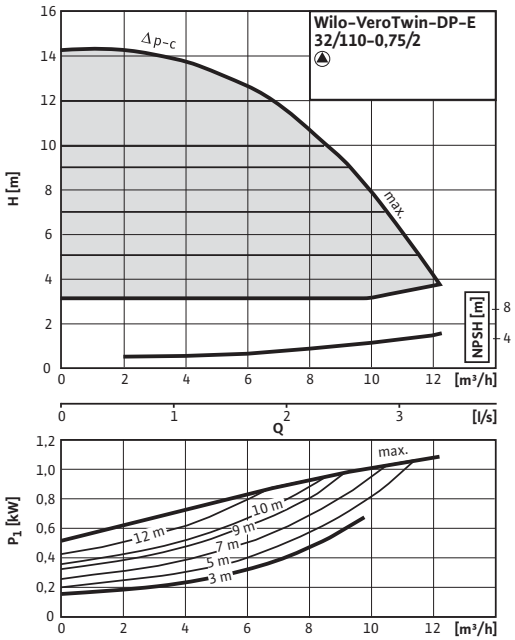
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

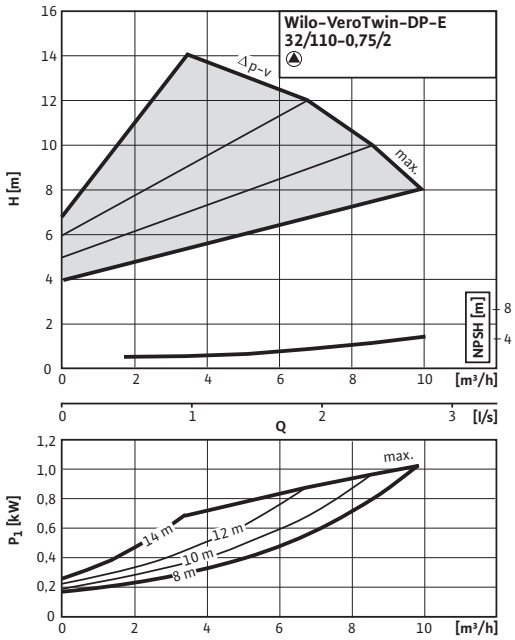
Wilo-VeroTwin-DP-E 32/110-0,75/2

Δp-c (constant) individual operation



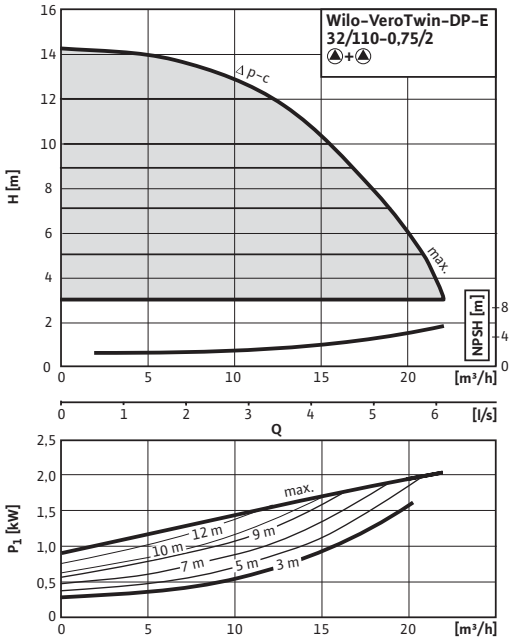
Wilo-VeroTwin-DP-E 32/110-0,75/2

Δp-v (variable) individual operation



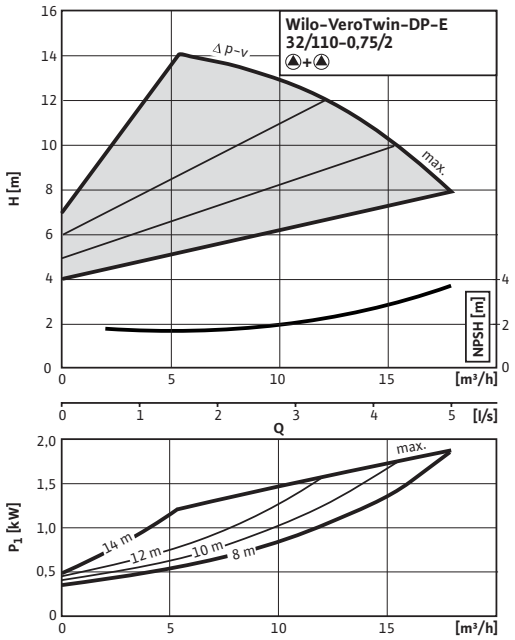
Wilo-VeroTwin-DP-E 32/110-0,75/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 32/110-0,75/2

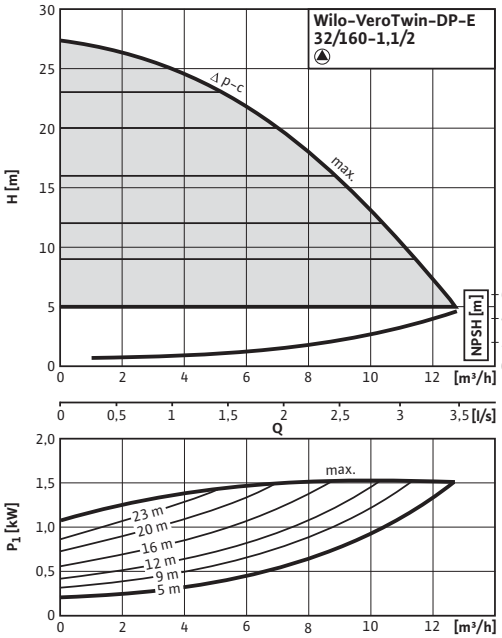
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

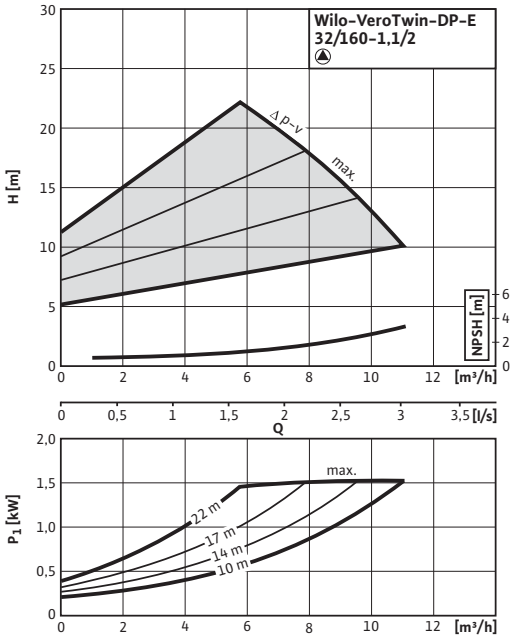
Wilo-VeroTwin-DP-E 32/160-1,1/2

Δp-c (constant) individual operation



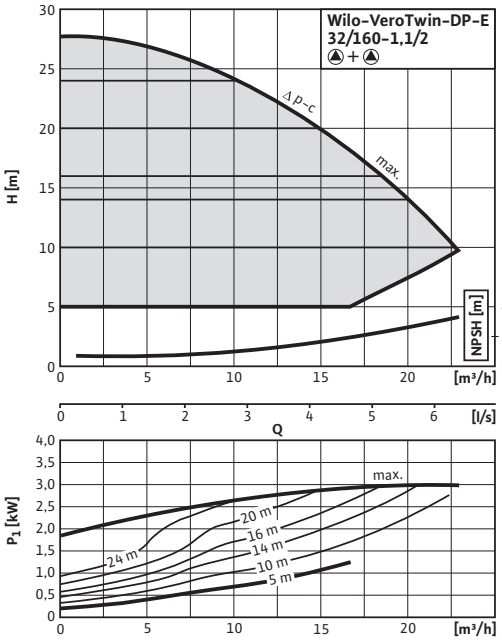
Wilo-VeroTwin-DP-E 32/160-1,1/2

Δp-v (variable) individual operation



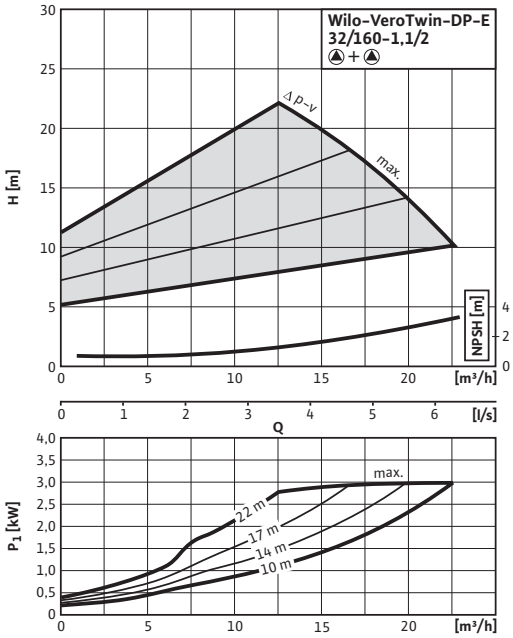
Wilo-VeroTwin-DP-E 32/160-1,1/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 32/160-1,1/2

Δp-v (variable) parallel operation



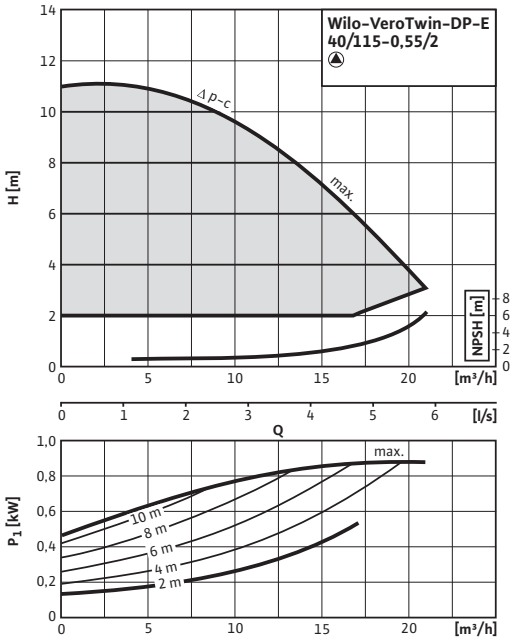
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

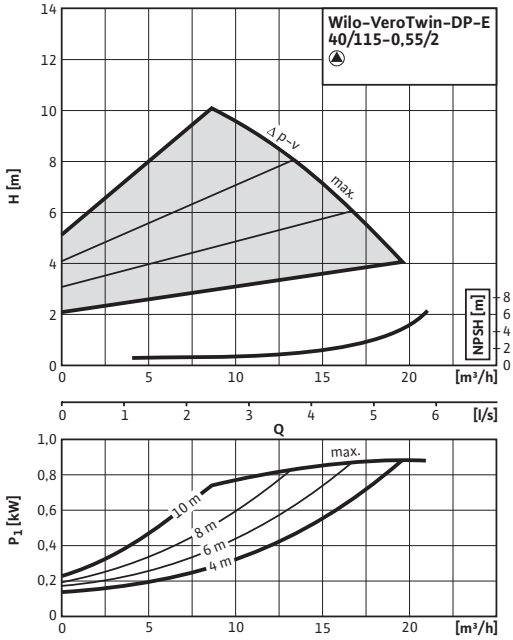
Wilo-VeroTwin-DP-E 40/115-0,55/2

Δp-c (constant) individual operation



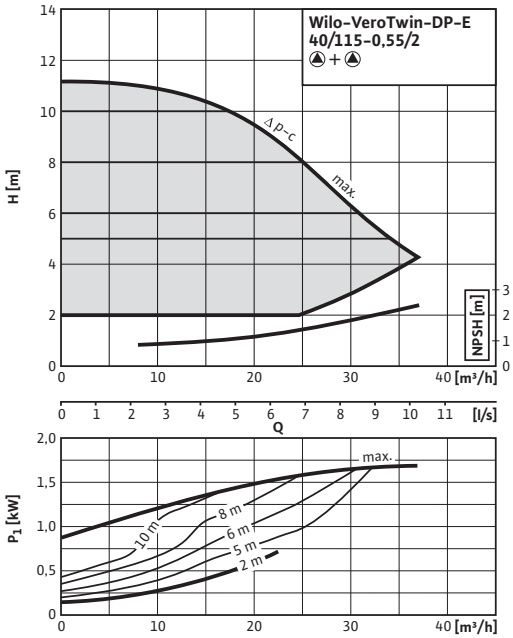
Wilo-VeroTwin-DP-E 40/115-0,55/2

Δp-v (variable) individual operation



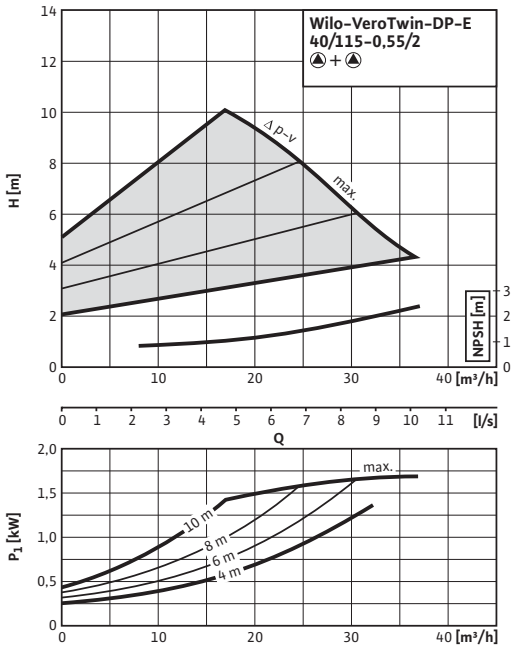
Wilo-VeroTwin-DP-E 40/115-0,55/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 40/115-0,55/2

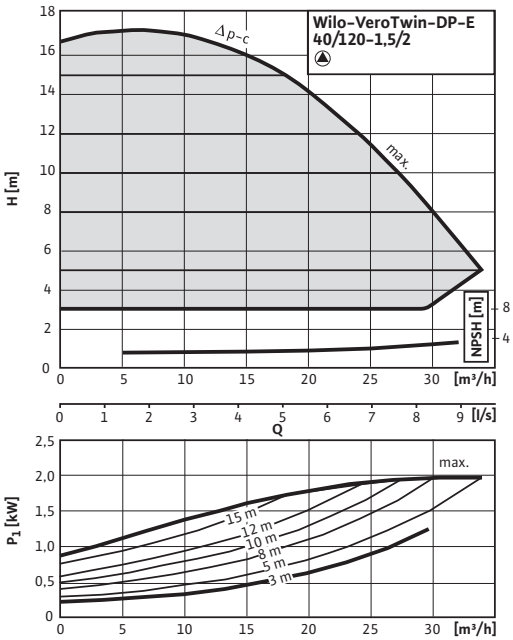
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

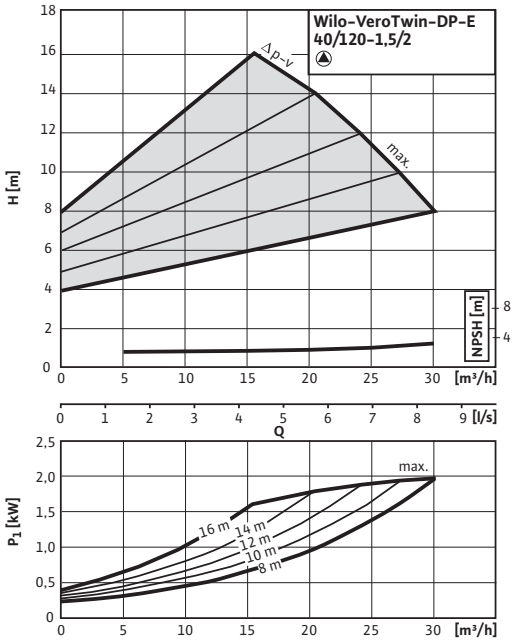
Wilo-VeroTwin-DP-E 40/120-1,5/2

Δp-c (constant) individual operation



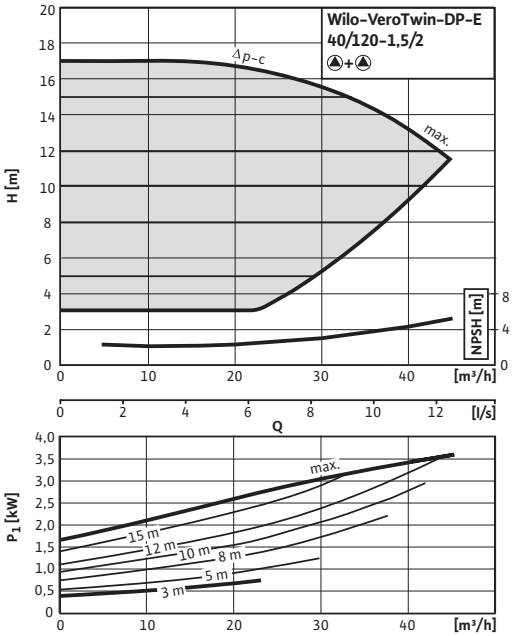
Wilo-VeroTwin-DP-E 40/120-1,5/2

Δp-v (variable) individual operation



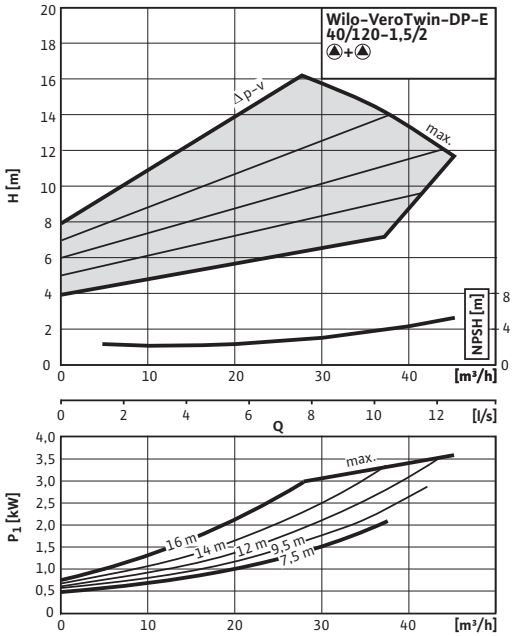
Wilo-VeroTwin-DP-E 40/120-1,5/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 40/120-1,5/2

Δp-v (variable) parallel operation



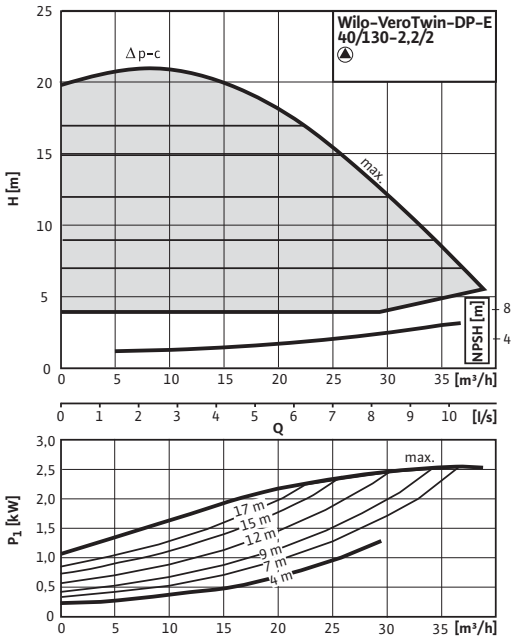
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

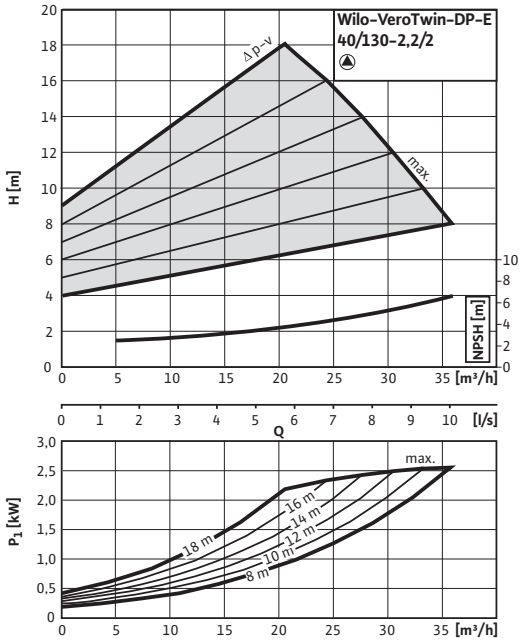
Wilo-VeroTwin-DP-E 40/130-2,2/2

Δp-c (constant) individual operation



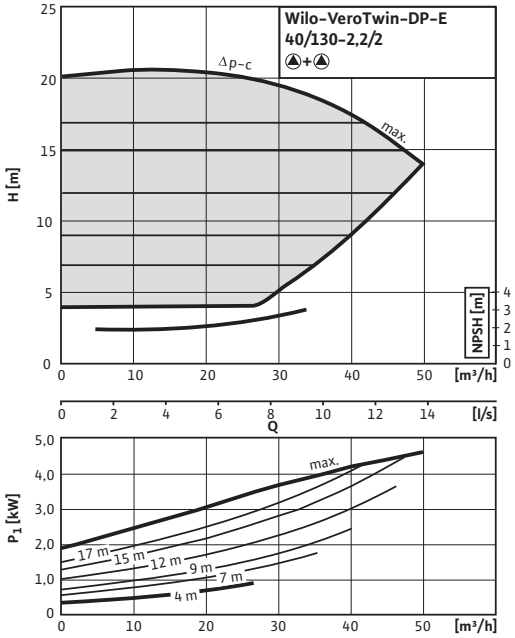
Wilo-VeroTwin-DP-E 40/130-2,2/2

Δp-v (variable) individual operation



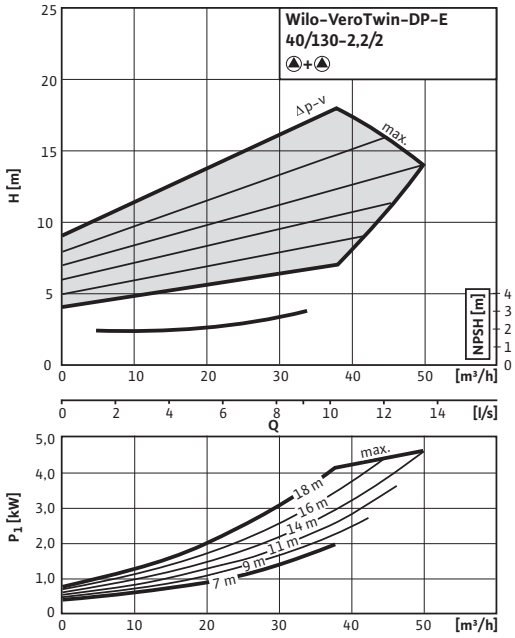
Wilo-VeroTwin-DP-E 40/130-2,2/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 40/130-2,2/2

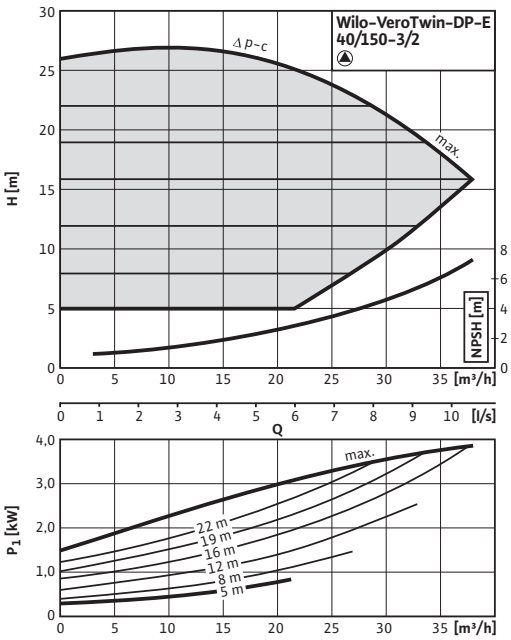
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

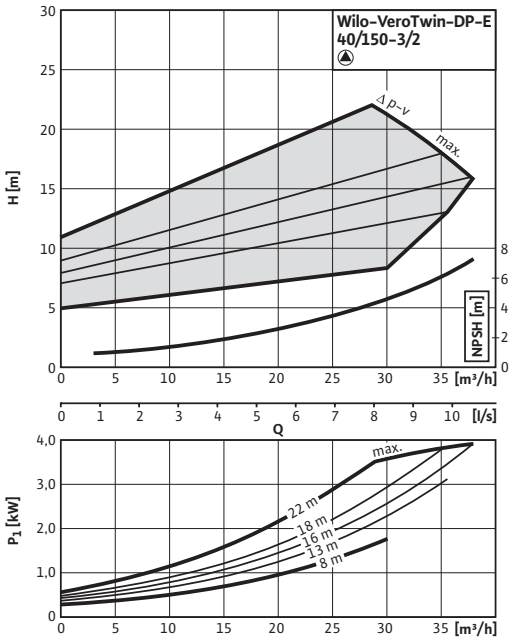
Wilo-VeroTwin-DP-E 40/150-3/2

Δp-c (constant) individual operation



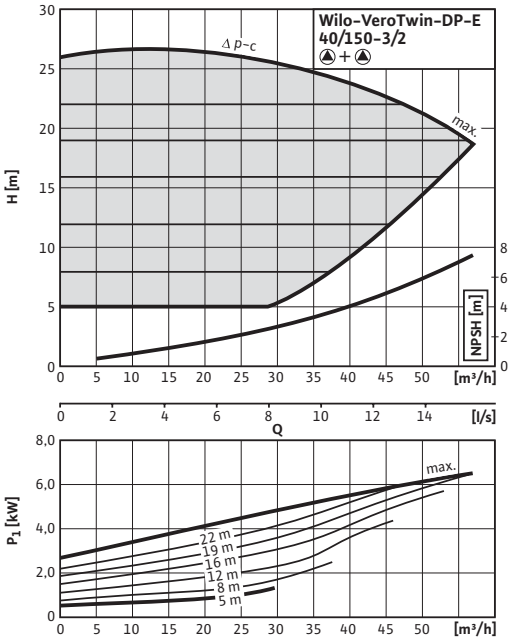
Wilo-VeroTwin-DP-E 40/150-3/2

Δp-v (variable) individual operation



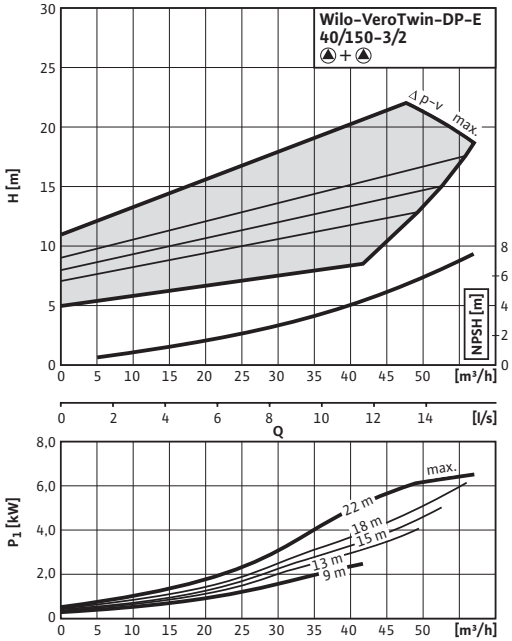
Wilo-VeroTwin-DP-E 40/150-3/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 40/150-3/2

Δp-v (variable) parallel operation



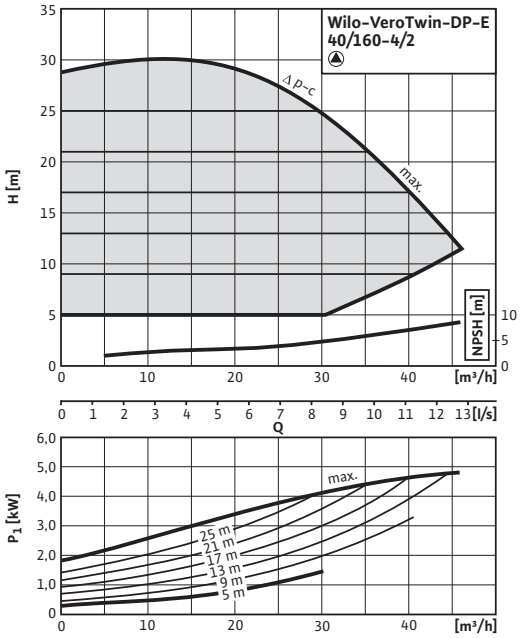
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

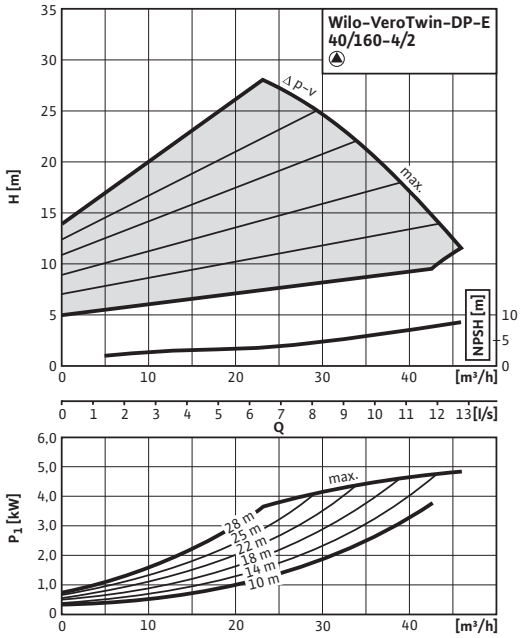
Wilo-VeroTwin-DP-E 40/160-4/2

Δp-c (constant) individual operation



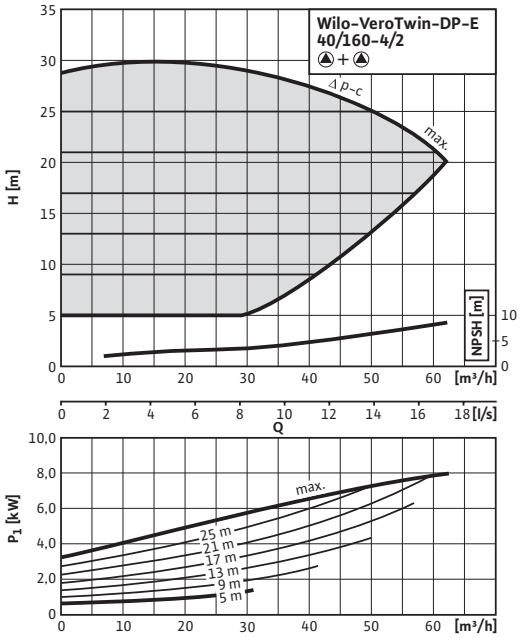
Wilo-VeroTwin-DP-E 40/160-4/2

Δp-v (variable) individual operation



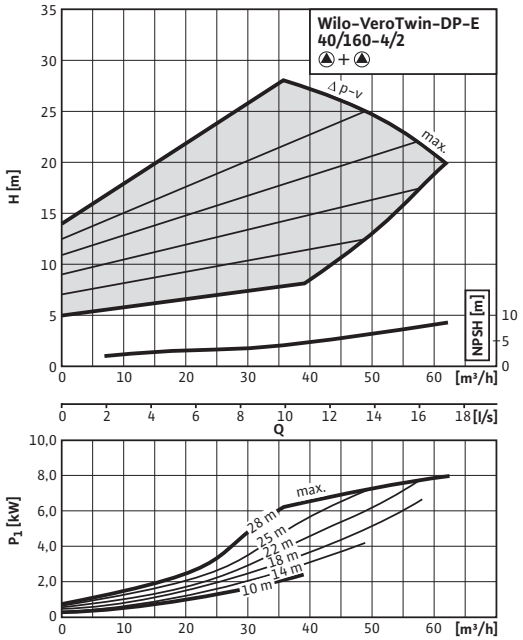
Wilo-VeroTwin-DP-E 40/160-4/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 40/160-4/2

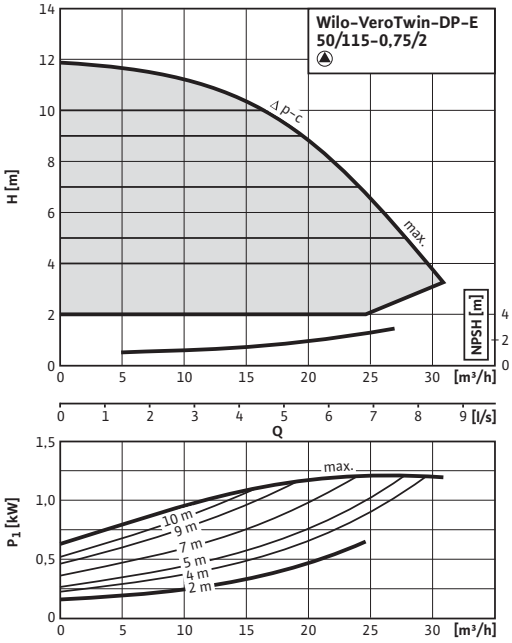
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

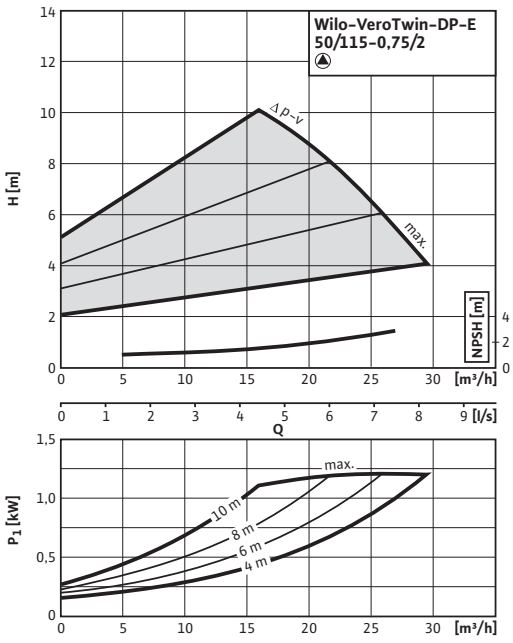
Wilo-VeroTwin-DP-E 50/115-0,75/2

Δp-c (constant) individual operation



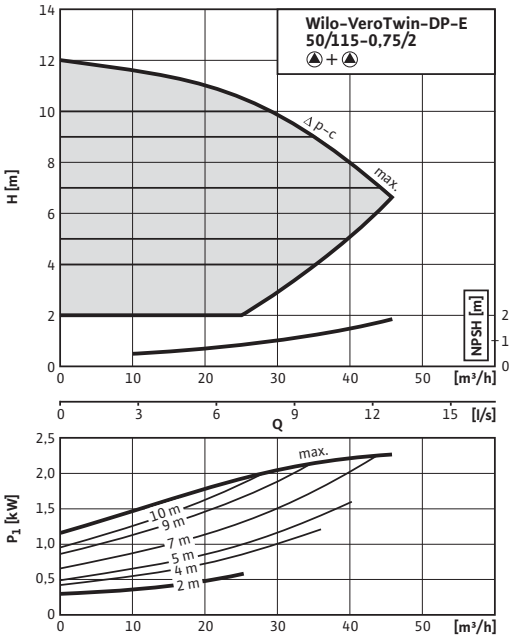
Wilo-VeroTwin-DP-E 50/115-0,75/2

Δp-v (variable) individual operation



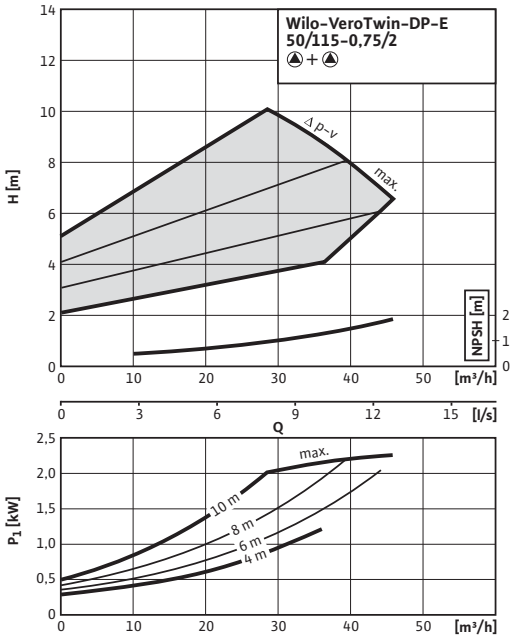
Wilo-VeroTwin-DP-E 50/115-0,75/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 50/115-0,75/2

Δp-v (variable) parallel operation



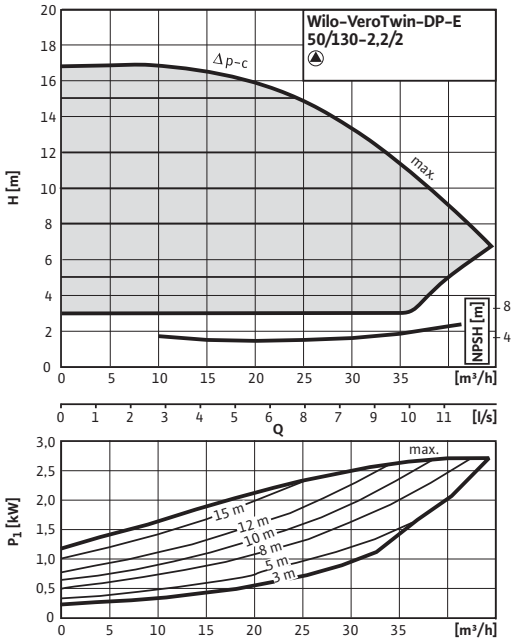
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

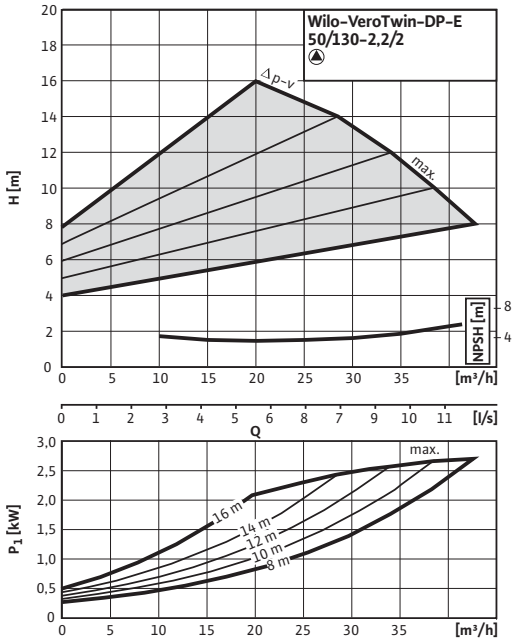
Wilo-VeroTwin-DP-E 50/130-2,2/2

Δp-c (constant) individual operation



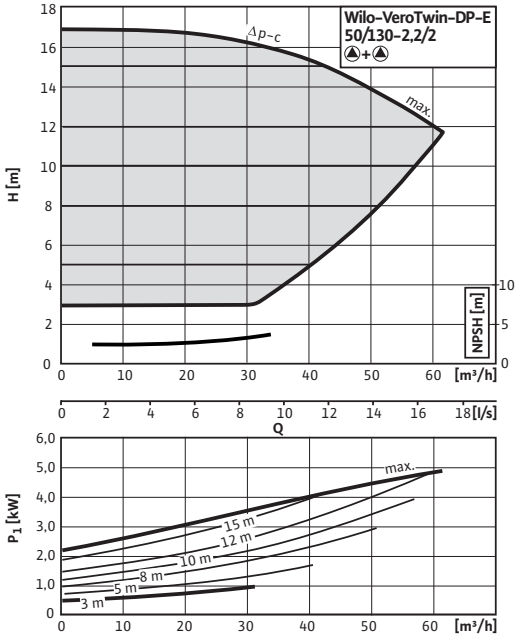
Wilo-VeroTwin-DP-E 50/130-2,2/2

Δp-v (variable) individual operation



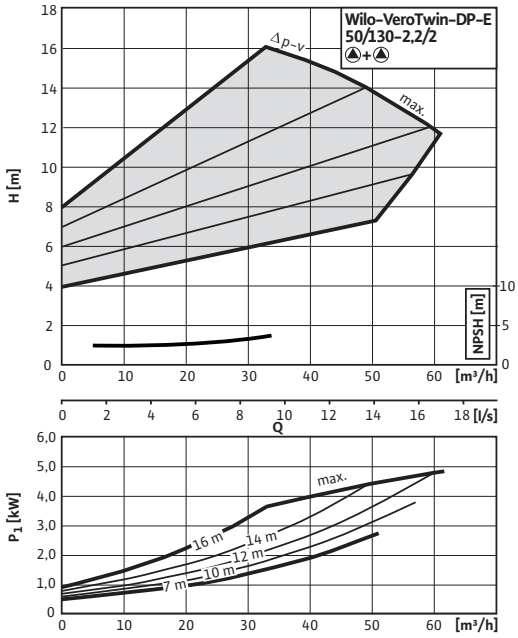
Wilo-VeroTwin-DP-E 50/130-2,2/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 50/130-2,2/2

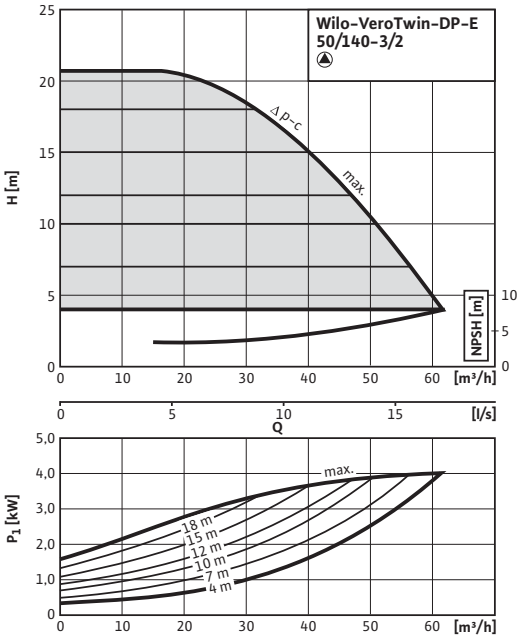
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

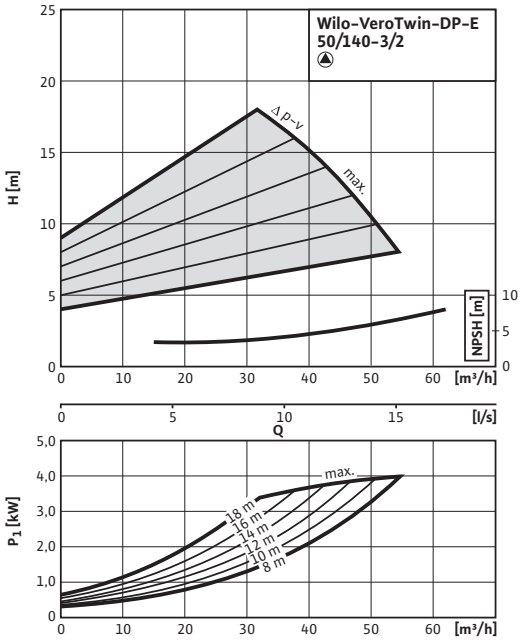
Wilo-VeroTwin-DP-E 50/140-3/2

Δp-c (constant) individual operation



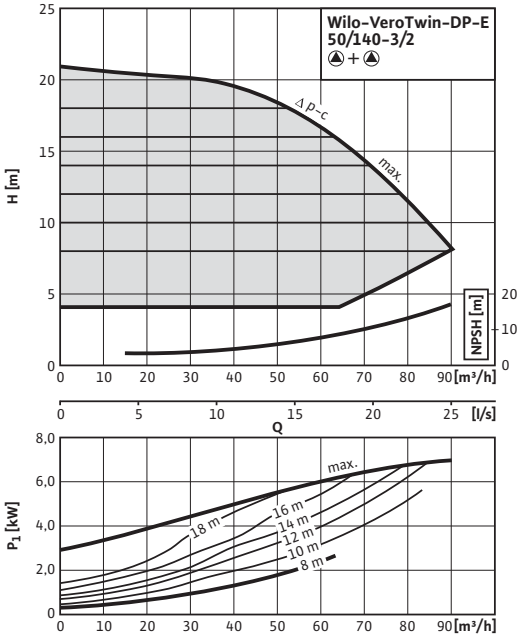
Wilo-VeroTwin-DP-E 50/140-3/2

Δp-v (variable) individual operation



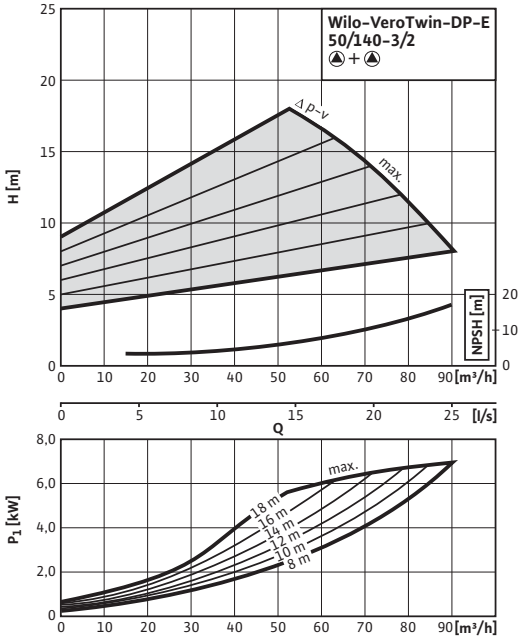
Wilo-VeroTwin-DP-E 50/140-3/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 50/140-3/2

Δp-v (variable) parallel operation



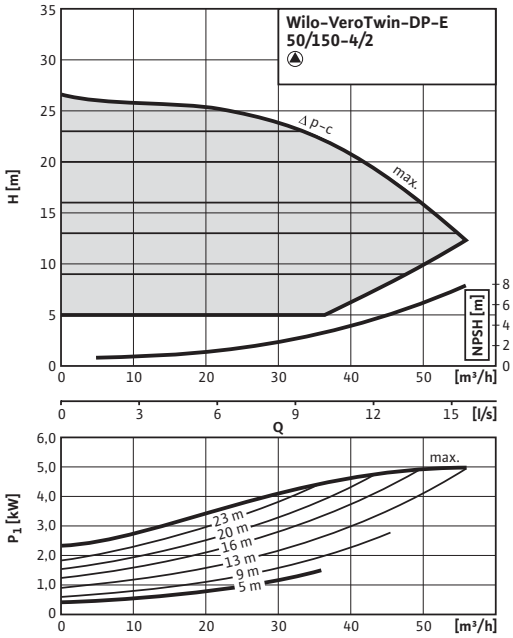
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

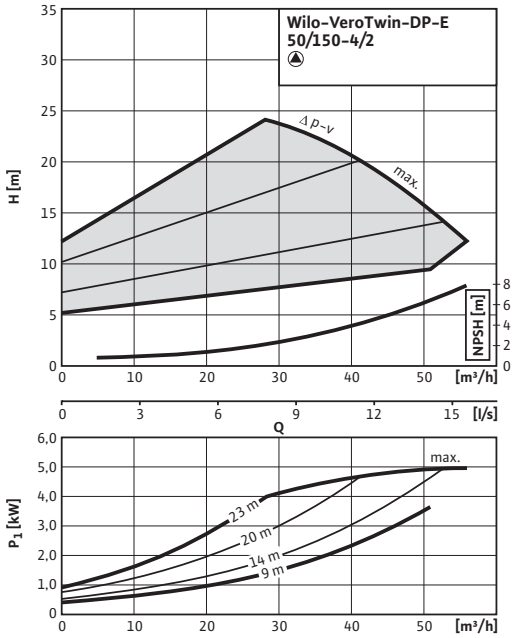
Wilo-VeroTwin-DP-E 50/150-4/2

Δp-c (constant) individual operation



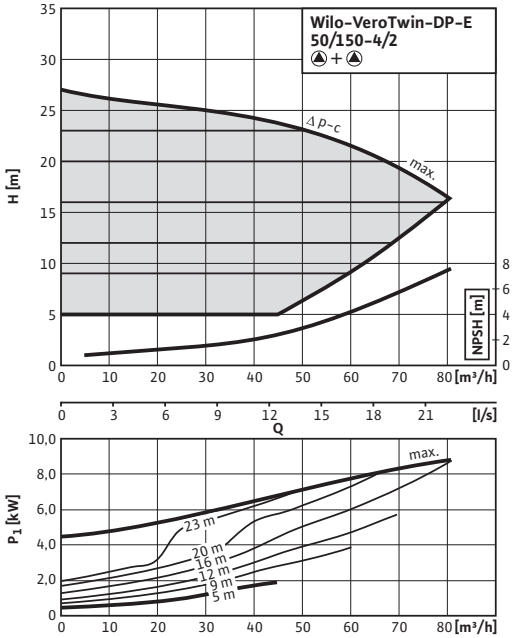
Wilo-VeroTwin-DP-E 50/150-4/2

Δp-v (variable) individual operation



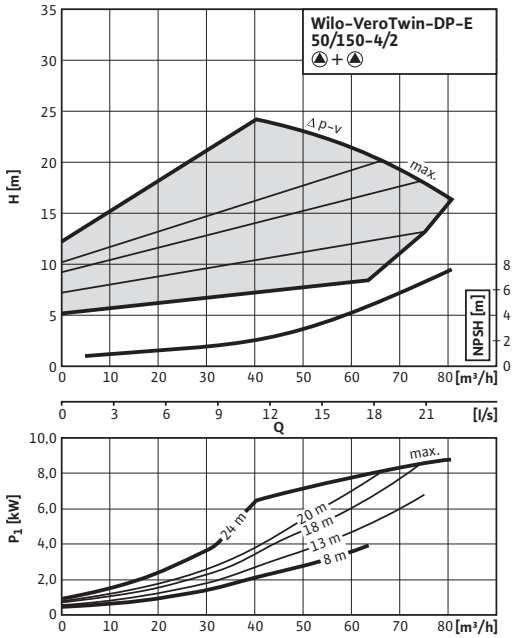
Wilo-VeroTwin-DP-E 50/150-4/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 50/150-4/2

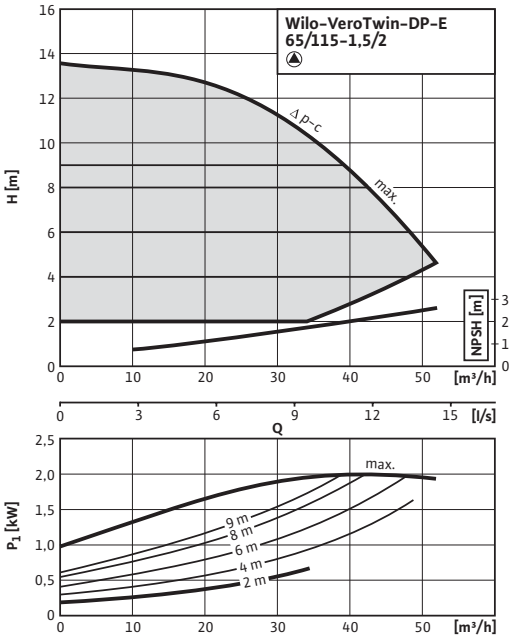
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

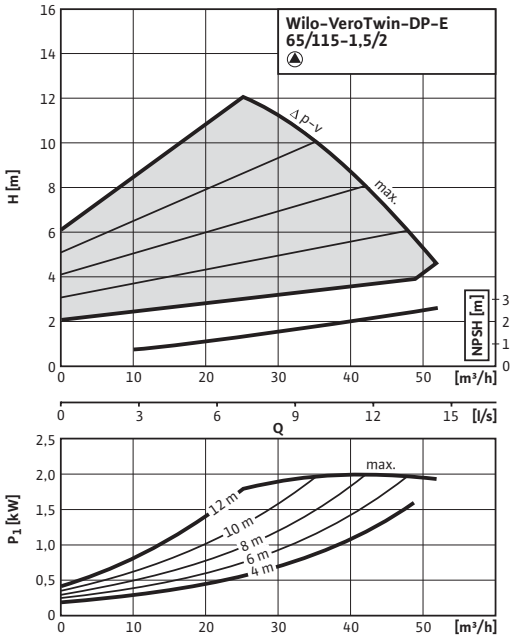
Wilo-VeroTwin-DP-E 65/115-1,5/2

Δp-c (constant) individual operation



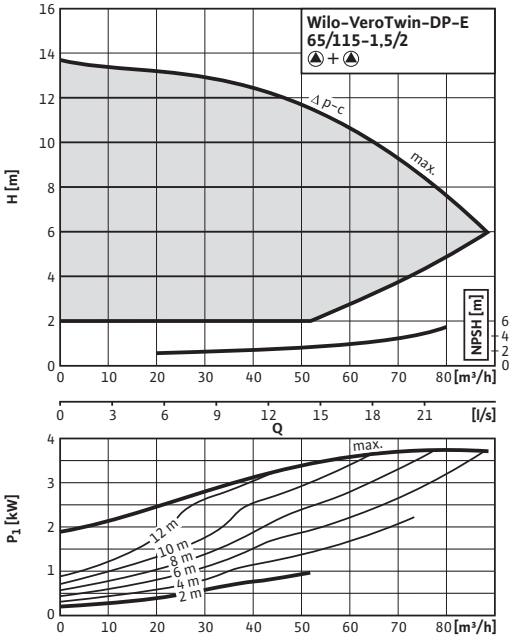
Wilo-VeroTwin-DP-E 65/115-1,5/2

Δp-v (variable) individual operation



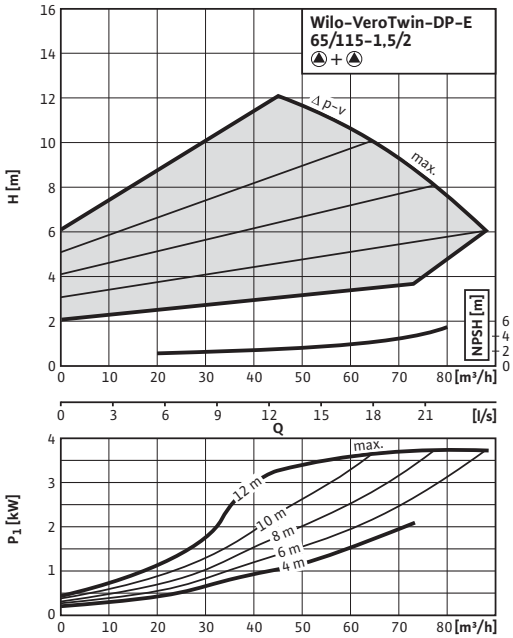
Wilo-VeroTwin-DP-E 65/115-1,5/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 65/115-1,5/2

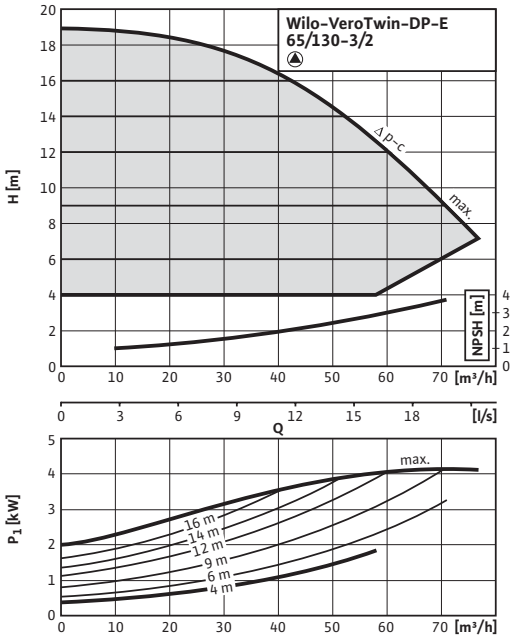
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

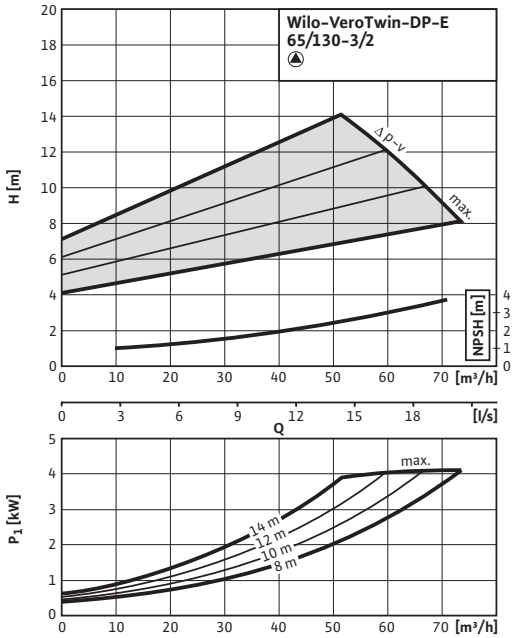
Wilo-VeroTwin-DP-E 65/130-3/2

Δp-c (constant) individual operation



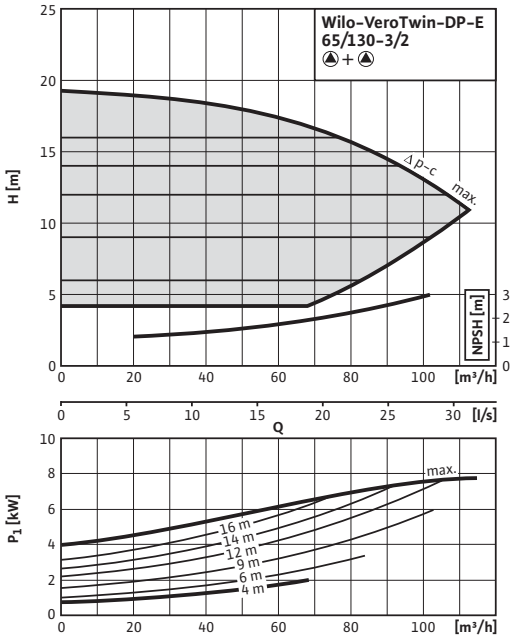
Wilo-VeroTwin-DP-E 65/130-3/2

Δp-v (variable) individual operation



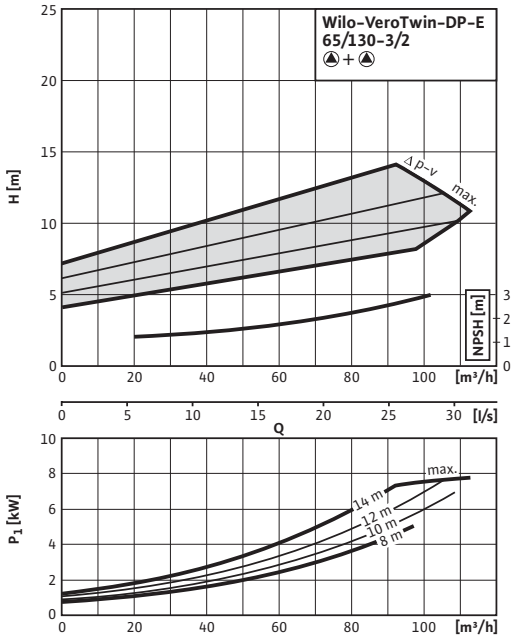
Wilo-VeroTwin-DP-E 65/130-3/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 65/130-3/2

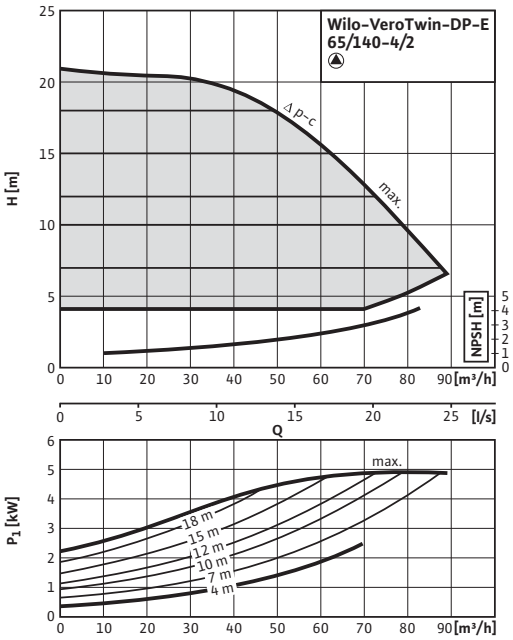
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

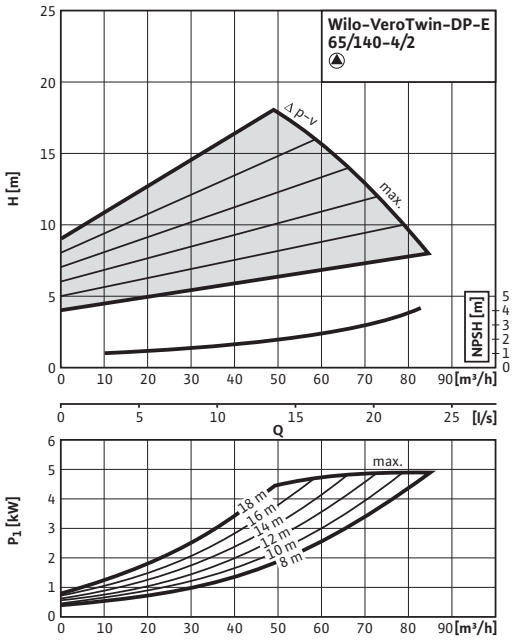
Wilo-VeroTwin-DP-E 65/140-4/2

Δp-c (constant) individual operation



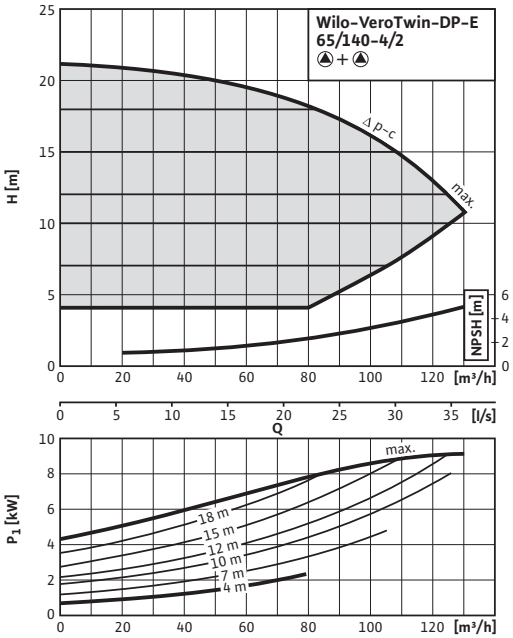
Wilo-VeroTwin-DP-E 65/140-4/2

Δp-v (variable) individual operation



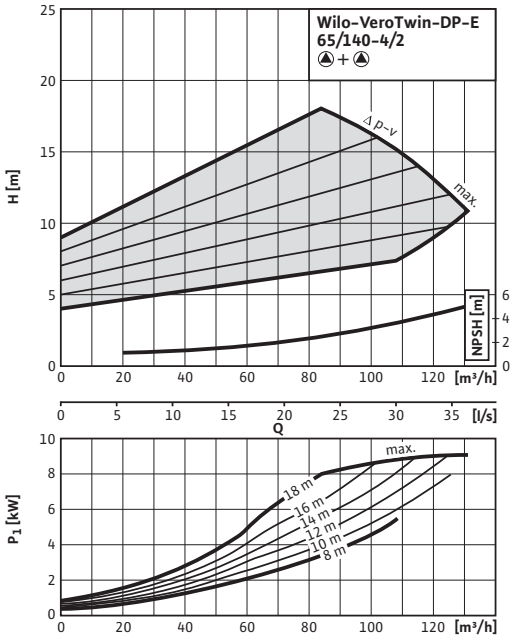
Wilo-VeroTwin-DP-E 65/140-4/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 65/140-4/2

Δp-v (variable) parallel operation



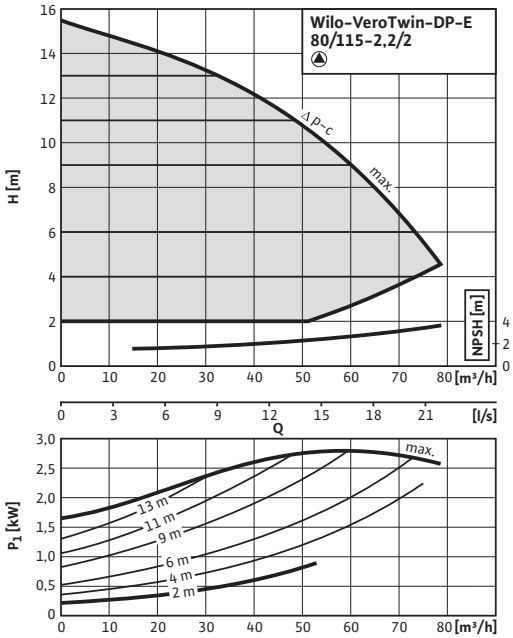
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DP-E

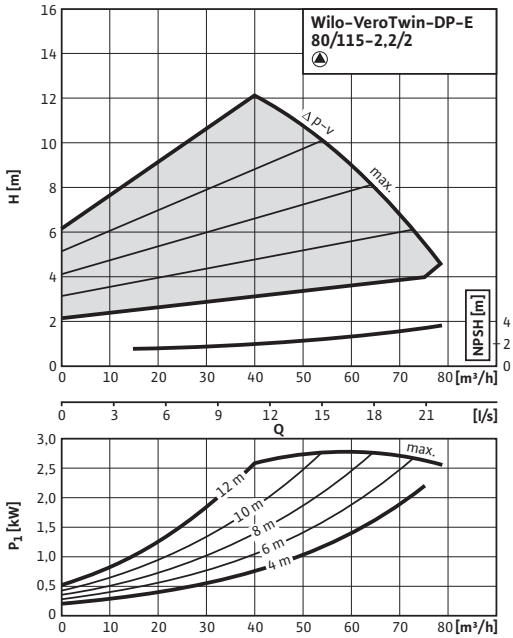
Wilo-VeroTwin-DP-E 80/115-2,2/2

Δp-c (constant) individual operation



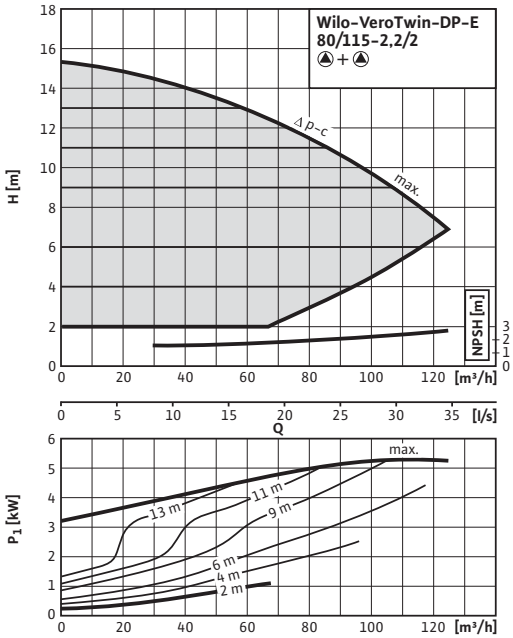
Wilo-VeroTwin-DP-E 80/115-2,2/2

Δp-v (variable) individual operation



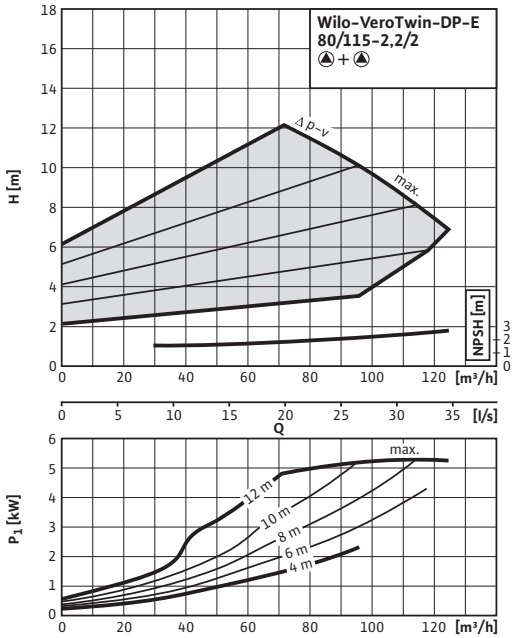
Wilo-VeroTwin-DP-E 80/115-2,2/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 80/115-2,2/2

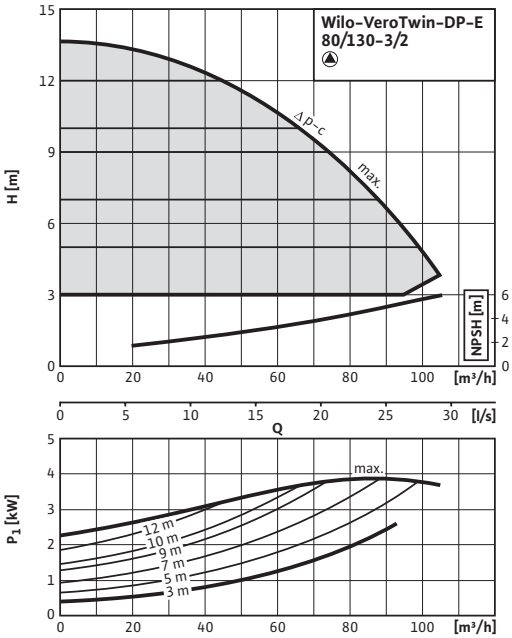
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

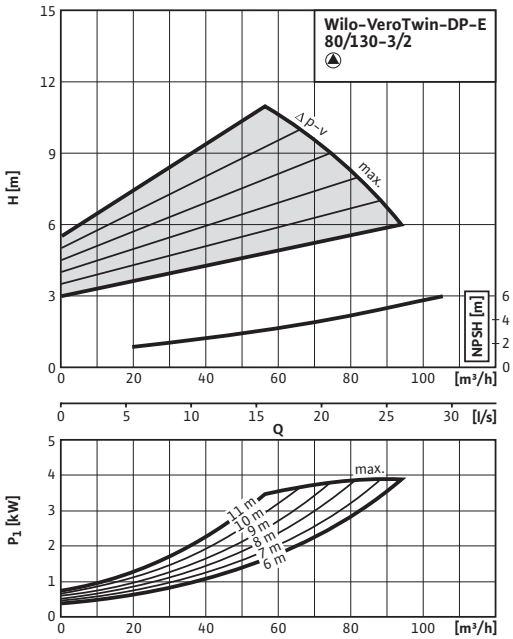
Wilo-VeroTwin-DP-E 80/130-3/2

Δp-c (constant) individual operation



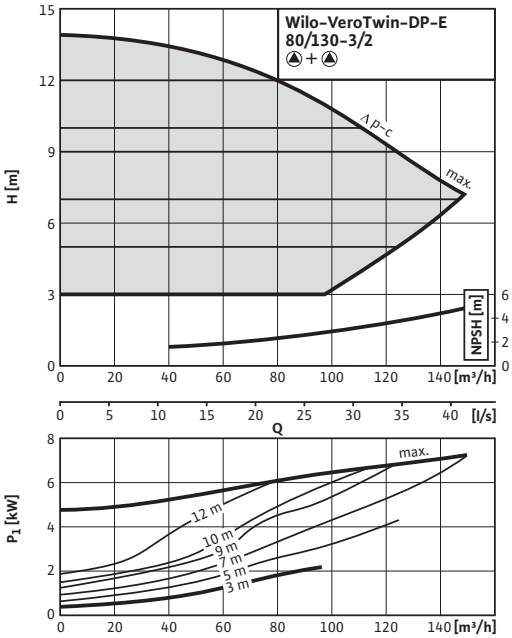
Wilo-VeroTwin-DP-E 80/130-3/2

Δp-v (variable) individual operation



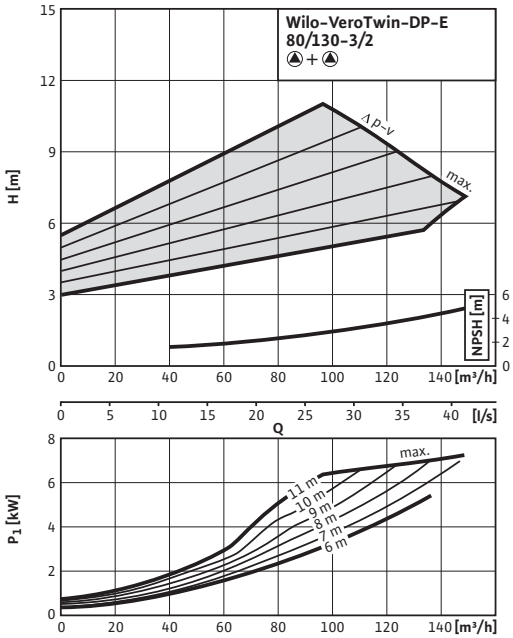
Wilo-VeroTwin-DP-E 80/130-3/2

Δp-c (constant) parallel operation



Wilo-VeroTwin-DP-E 80/130-3/2

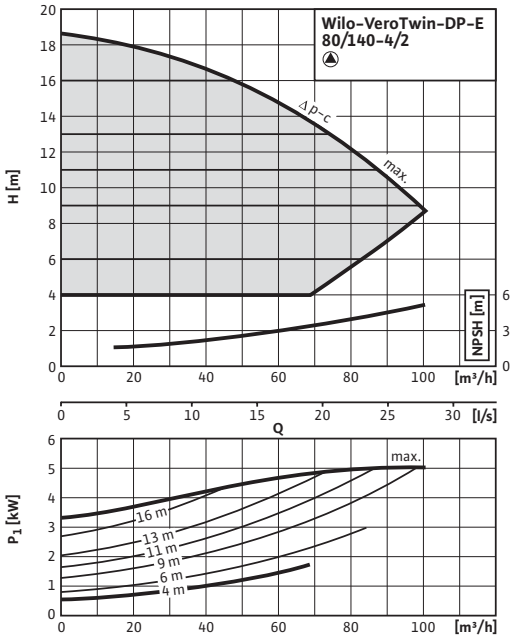
Δp-v (variable) parallel operation



Pump curves Wilo-VeroTwin-DP-E

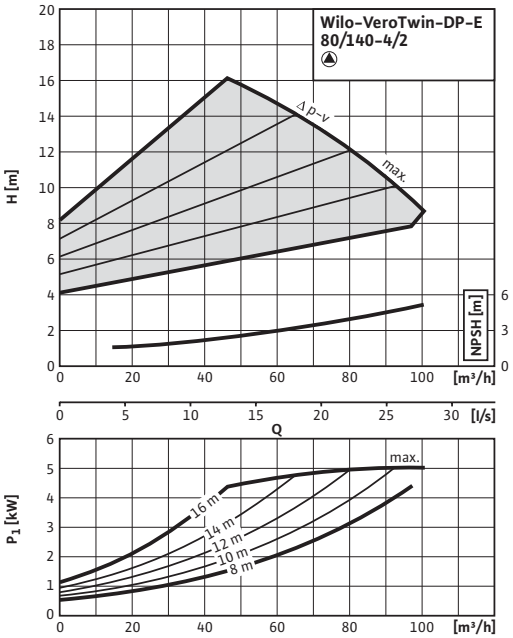
Wilo-VeroTwin-DP-E 80/140-4/2

Δp-c (constant) individual operation



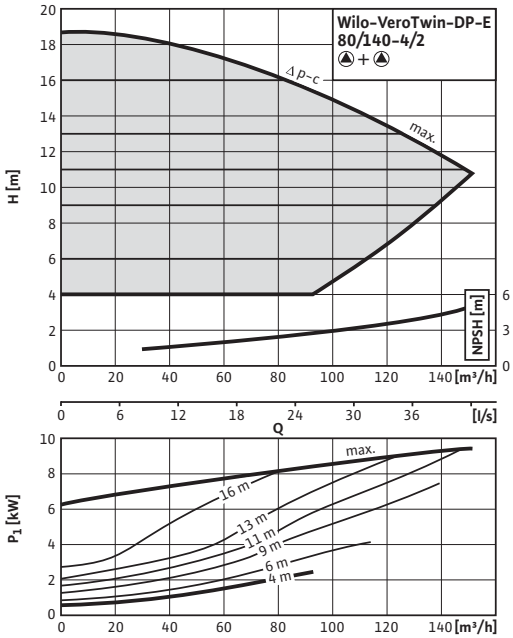
Wilo-VeroTwin-DP-E 80/140-4/2

Δp-v (variable) individual operation



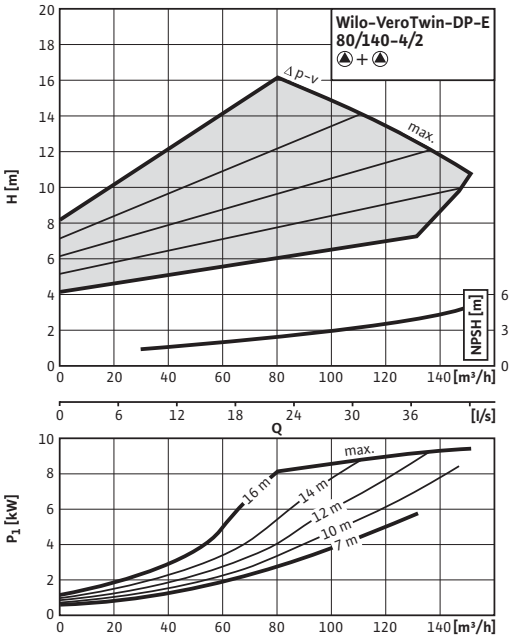
Wilo-VeroTwin-DP-E 80/140-4/2

Δp-c (constant) parallel operation



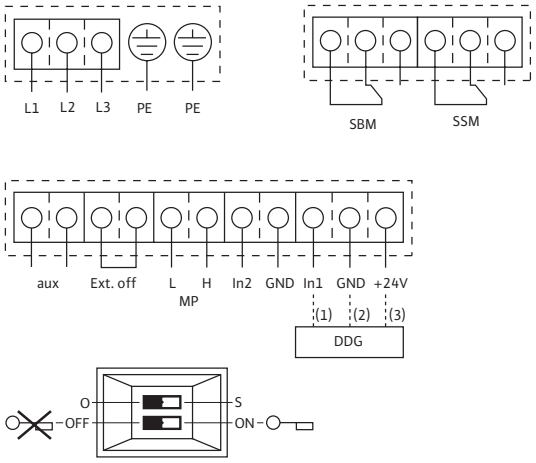
Wilo-VeroTwin-DP-E 80/140-4/2

Δp-v (variable) parallel operation



Terminal diagram, motor data Wilo-VeroTwin-DP-E

Terminal diagram



L1, L2, L3:	Mains connection: 3~400 V AC/50 Hz; 3~380 V AC/60 Hz
PE:	Protective conductor connection
DDG:	Connection for differential pressure sensor
In1 (1):	Actual value input 0-10 V/0-20 mA; 2-10 V/4-20 mA
GND (2):	Ground connection for In1 and In2
+ 24 V (3):	DC voltage output for an external consumer/sensor. Max load 60 mA
In2:	Setpoint input 0-10 V/0-20 mA; 2-10 V/4-20 mA
MP:	Multi-pump, interface for dual pump management
Ext. off:	"Overriding Off" control input The pump can be switched on or off via an external, potential-free contact (24 V DC/10 mA).
SBM:*	Potential-free collective run signal (changeover contact according to VDI 3814)
SSM:*	Potential-free collective fault signal (changeover contact according to VDI 3814)
aux:	no function
DIP switch:	1: Switchover between operation (O) and service mode (S) 2: Activation/deactivation of menu access disable
Option:	IF-Module (PLR/LON) for connection to building automation

* Load capacity of contacts for SBM and SSM:
min.: 12 V DC/10 mA
max.: 250 V AC/1 A

Motor data

Wilo-VeroTwin-DP-E ...	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
32/100-0.55/2	0.55	1150 - 2800	0.8	2.4
32/110-0.75/2	0.75	1160 - 2850	1.2	3.2
32/160-1.1/2	1.1	1100 - 2900	1.5	3.5
40/115-0.55/2	0.55	1100 - 2900	0.9	1.8
40/120-1.5/2	1.5	1200 - 2860	2.2	5.4
40/130-2.2/2	2.2	1200 - 2880	2.8	6.4
40/150-3/2	3	1100 - 2900	3.9	8.4
40/160-4/2	4	1200 - 2900	4.5	9.5
50/115-0.75/2	0.75	1200 - 2900	1.2	2.4
50/130-2.2/2	2.2	1160 - 2880	2.9	6.7
50/140-3/2	3	1100 - 2890	4.0	8.5
50/150-4/2	4	1100 - 2900	5.5	11.0
65/115-1.5/2	1.5	1100 - 2900	2.1	4.7
65/130-3/2	3	1200 - 2900	4.0	8.7
65/140-4/2	4	1200 - 2890	5.0	10.2
80/115-2.2/2	2.2	1200 - 2900	2.9	6.7
80/130-3/2	3	1200 - 2890	3.8	8.4

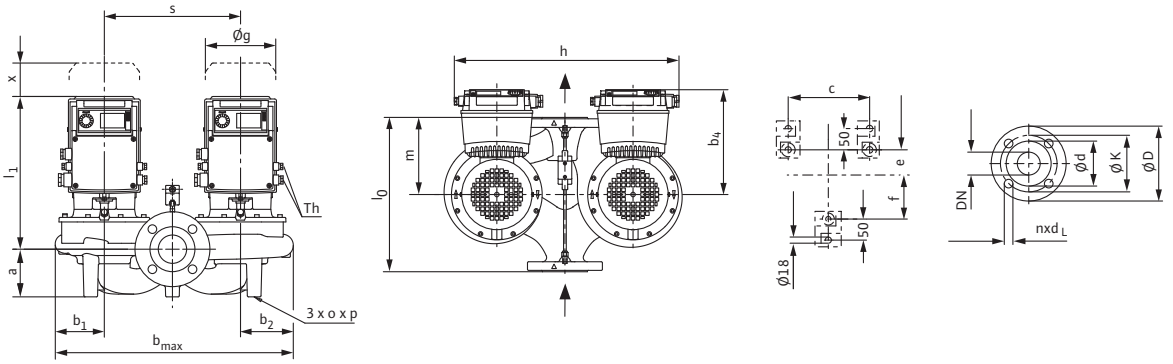
Terminal diagram, motor data Wilo-VeroTwin-DP-E

Motor data				
Wilo-VeroTwin-DP-E ...	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
80/140-4/2	4	1100 - 2900	5.3	10.6

Three-phase motor (three-phase current), 2-pole - 3~400V, 50 Hz / 3~380V, 60 Hz

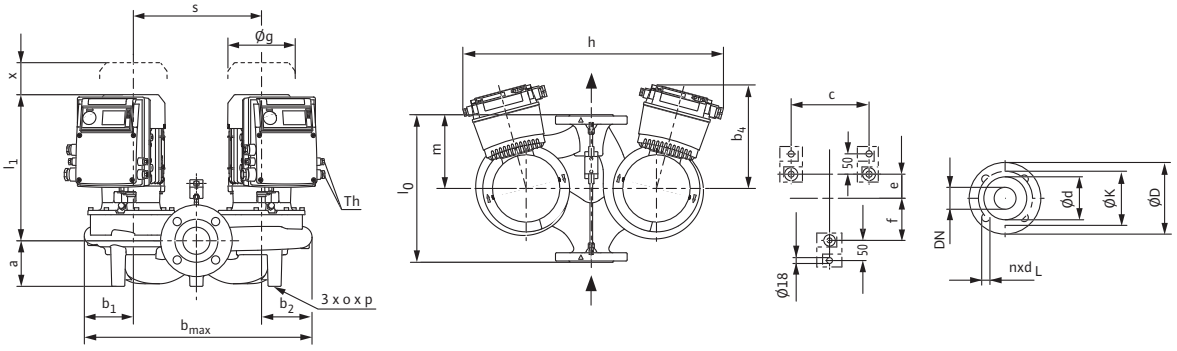
Dimensions, weights Wilo-VeroTwin-DP-E

Dimension drawing A



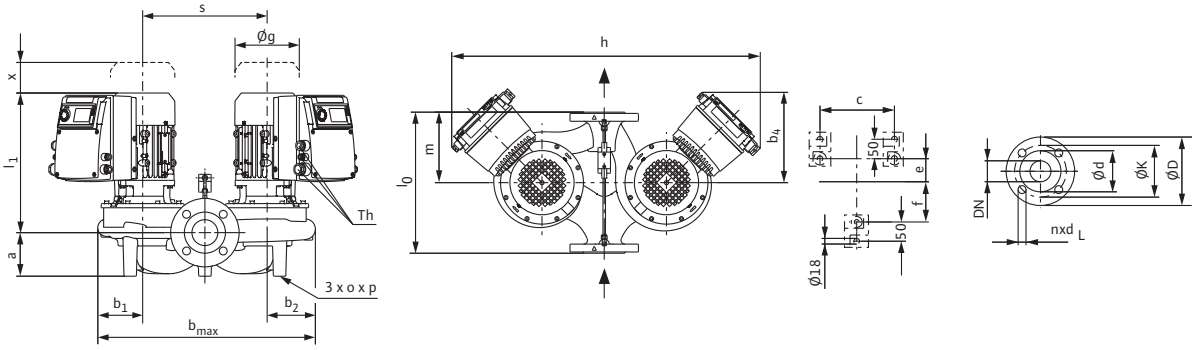
Note:
Housing with feet for installation on a base and drilled holes M10, brackets on request.

Dimension drawing B



Note:
Housing with feet for installation on a base and drilled holes M10, brackets on request.

Dimension drawing C



Note:
Housing with feet for installation on a base and drilled holes M10, brackets on request.

Dimensions, weights Wilo-VeroTwin-DP-E

Dimensions, weights

Wilo-VeroTwin-DP-E ...	Nominal flange diameter	Overall length	Dimensions																Weight approx.	Threaded cable connection	Dimension drawing
	DN	l_0	A	b_1	b_2	b_4	b_{max}	c	e	f	Øg	h	l_1	m	o	p	s	x	M	Th	–
	–	[mm]													–	[mm]			[kg]	–	
32/100-0.55/2	32	260	70	101	105	233	410	225	56	106	145	671	308	136	M10	20	205	150	42		C
32/110-0.75/2	32	260	70	101	105	240	410	225	56	106	163	685	332	136	M10	20	205	150	45		C
32/160-1.1/2	32	260	70	101	105	276	410	225	56	106	163	757	332	136	M10	20	205	150	58		C
40/115-0.55/2	40	250	75	85	91	275	350	225	35	97	145	478	303	135	M10	20	174	150	43		B
40/120-1.5/2	40	320	75	113	119	245	456	240	45	135	180	714	358	167	M10	20	224	150	53		C
40/130-2.2/2	40	320	75	113	119	245	456	240	45	135	180	714	358	167	M10	20	224	150	58		C
40/150-3/2	40	320	75	113	119	312	456	240	45	135	103	848	391	167	M10	20	224	150	79		C
40/160-4/2	40	320	75	113	119	272	456	240	45	135	203	768	411	167	M10	20	224	150	89	2xM12	C
50/115-0.75/2	50	280	83	95	101	225	390	228	50	107	163	506	333	155	M10	20	194	150	48	1xM16	B
50/130-2.2/2	50	340	86	120	130	250	500	240	48	132	180	750	360	190	M10	20	250	150	64	1xM20	C
50/140-3/2	50	340	86	120	130	270	500	240	48	132	227	460	393	190	M10	20	250	150	79	1xM25	A
50/150-4/2	50	340	86	120	130	279	500	240	48	132	227	460	413	190	M10	20	250	150	91		A
65/115-1.5/2	65	340	93	103	117	272	432	225	25	137	180	528	371	185	M10	20	212	150	67		B
65/130-3/2	65	340	93	125	135	255	550	240	43	137	203	500	399	185	M10	20	290	150	89		A
65/140-4/2	65	340	93	125	135	272	550	240	43	137	203	500	419	185	M10	20	290	150	98		A
80/115-2.2/2	80	360	100	113	132	255	480	240	43	137	180	551	373	205	M10	20	235	150	82		B
80/130-3/2	80	360	103	134	147	267	601	240	30	150	227	440	405	192	M10	20	320	150	89		A
80/140-4/2	80	360	103	134	147	279	601	240	30	150	227	530	425	192	M10	20	320	150	101		A

Flange dimensions

Wilo-VeroTwin-DP-E ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
32...	32	140	76	100	4 x 19
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19

Pump flange dimensions – drilled according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-CronoTwin-DL-E

Design
Electronically controlled glanded double pump in in-line design with flange connection and automatic power adjustment

Application
For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**DL-E 50/170-7.5/2 R1**
DL-E	In-line double pump with electronic control
50	Nominal diameter DN of the pipe connection
170	Nominal impeller diameter
7.5	Nominal motor power P_2 in kW
2	Number of poles
R1	Version without pressure sensor

Technical data
- Permissible temperature range -20°C to +140°C
- Mains connection 3~400 V, 50 Hz; 3~380 V, 60 Hz
- Protection class IP 55
- Nominal diameter DN 40 to DN 80
- Max. operating pressure 16 bar

Special features/product benefits
- Energy savings due to integrated electronic performance control
- Control mode Δp-c for constant and Δp-v for variable differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA; 2–10 V/4–20 mA)
- Red-button technology for simplest operation
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Simple operation due to infrared interface (IR-Monitoring)
- Optional interfaces due to retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management
- High corrosion protection due to cataphoretic coating
- Bidirectional mechanical seal with forced flushing
- Easy to install due to pump housing with feet and threaded holes

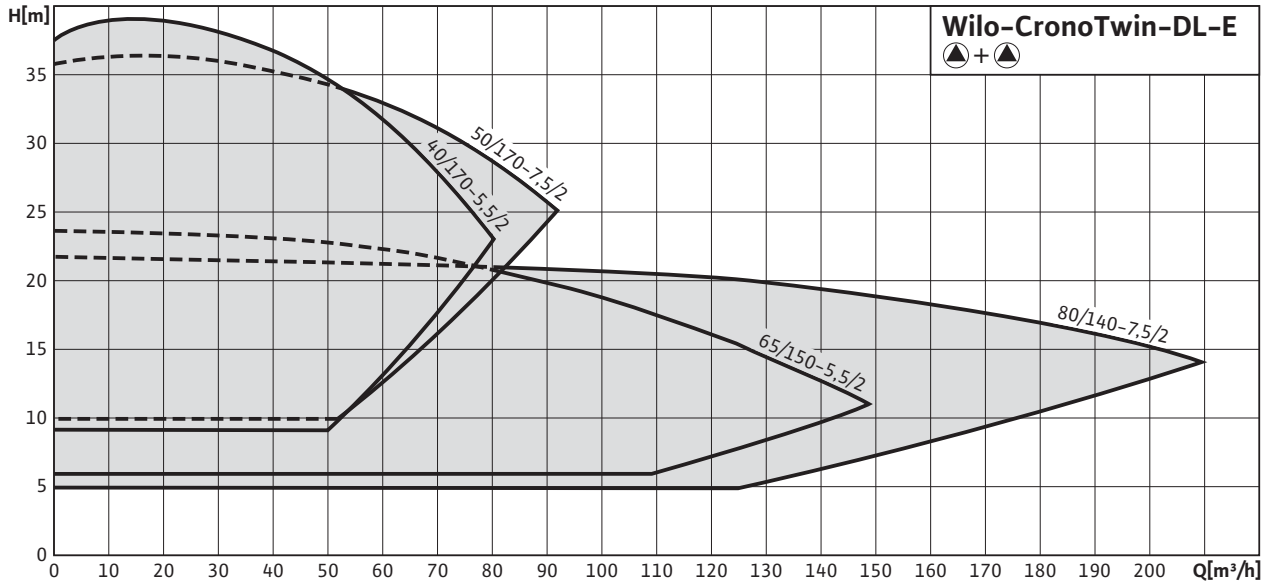
Materials
- Pump housing and lantern: EN-GJL-250
- Impeller:
  - Standard version: EN-GJL-200
  - Special version: G-CuSn 10
- Shaft: 1.4122
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure double pump in in-line design with
- Switchover valve
- Mechanical seal
- Flange connection
- Lantern
- Coupling
- Drive with integrated electronic speed control

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

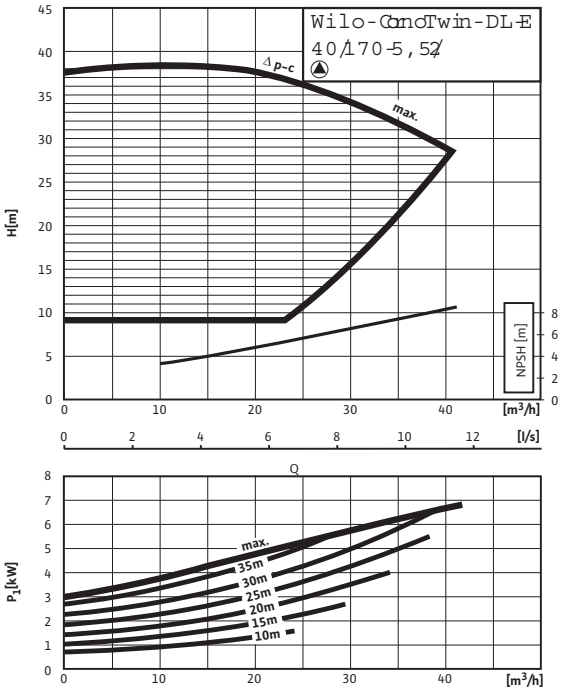
Series description Wilo-CronoTwin-DL-E



Pump curves Wilo-CronoTwin-DL-E

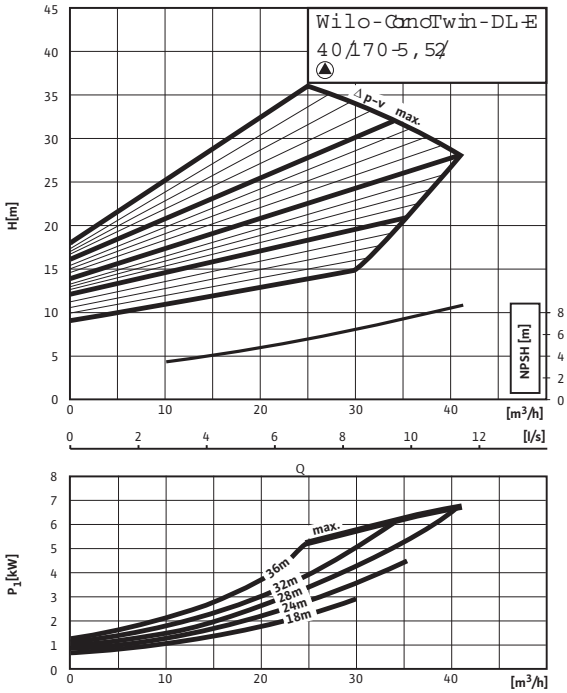
Wilo-CronoTwin-DL-E 40/170-5,5/2

Δp-c (constant) individual operation



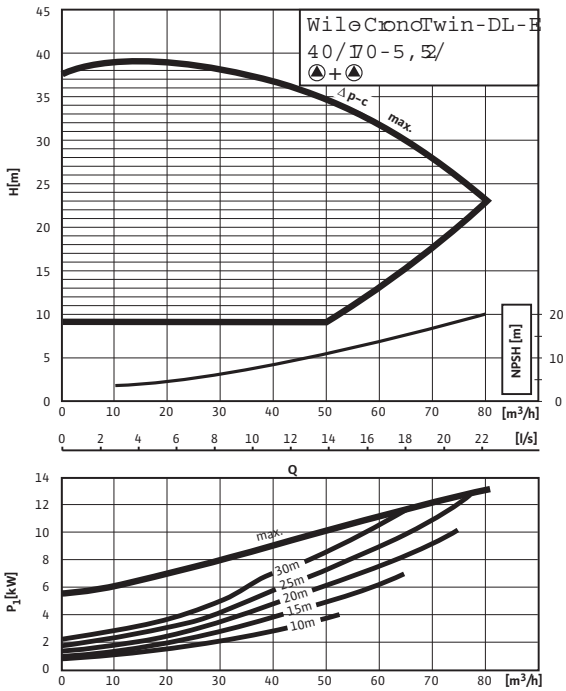
Wilo-CronoTwin-DL-E 40/170-5,5/2

Δp-v (variable) individual operation



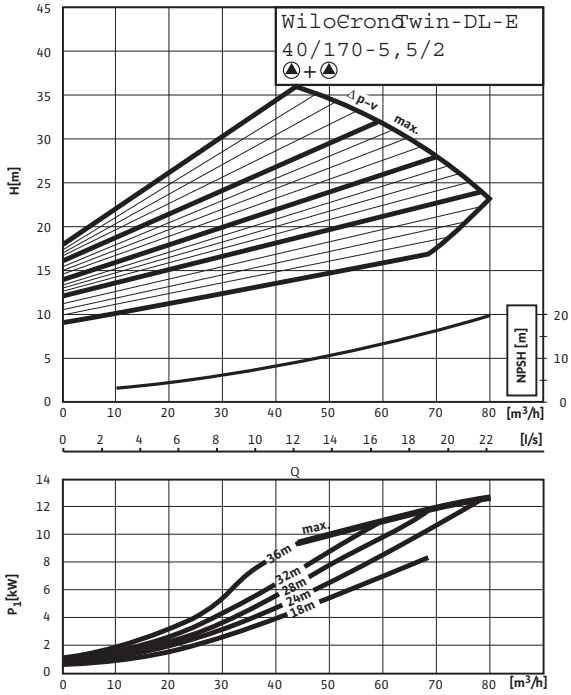
Wilo-CronoTwin-DL-E 40/170-5,5/2

Δp-c (constant) parallel operation



Wilo-CronoTwin-DL-E 40/170-5,5/2

Δp-v (variable) parallel operation



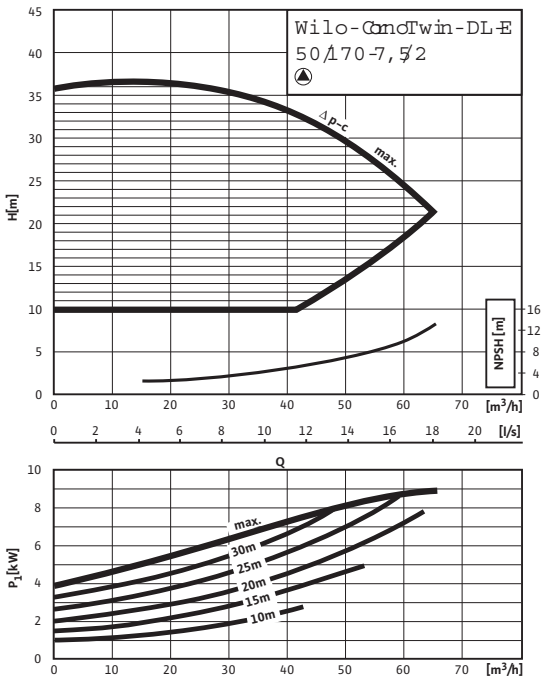
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL-E

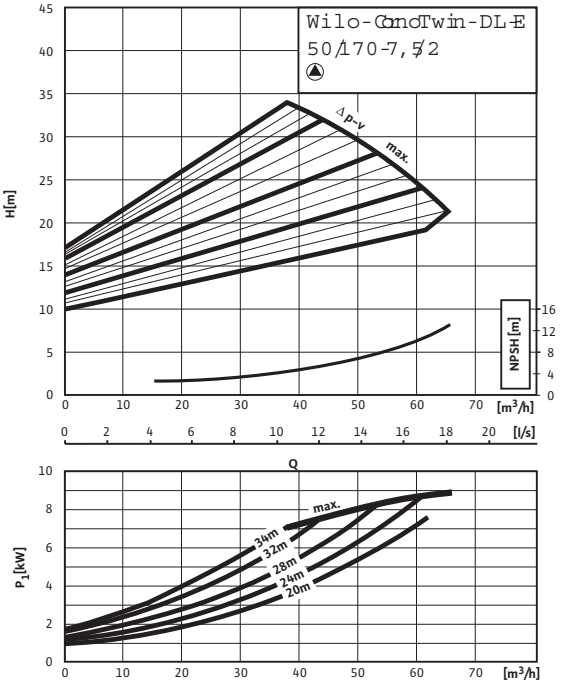
Wilo-CronoTwin-DL-E 50/170-7,5/2

Δp-c (constant) individual operation



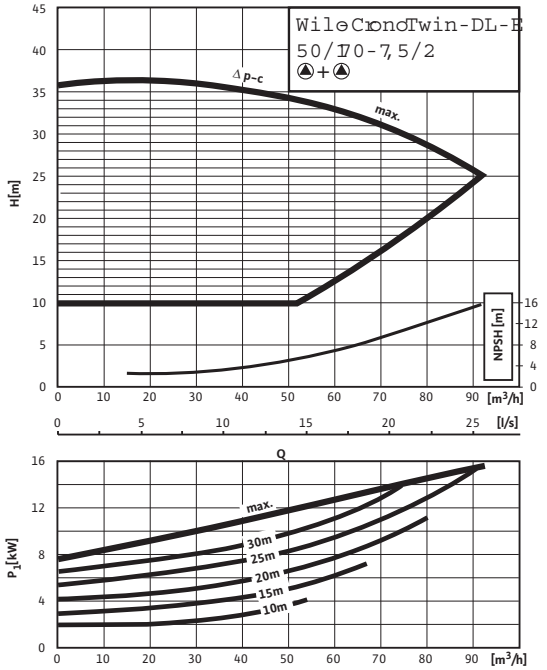
Wilo-CronoTwin-DL-E 50/170-7,5/2

Δp-v (variable) individual operation



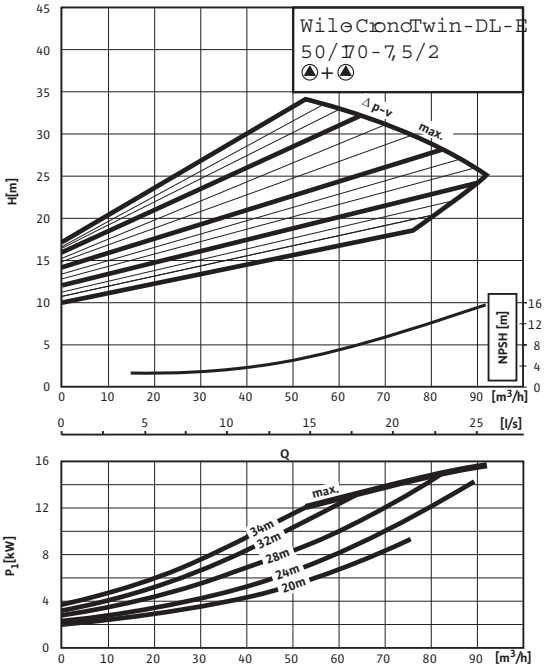
Wilo-CronoTwin-DL-E 50/170-7,5/2

Δp-c (constant) parallel operation



Wilo-CronoTwin-DL-E 50/170-7,5/2

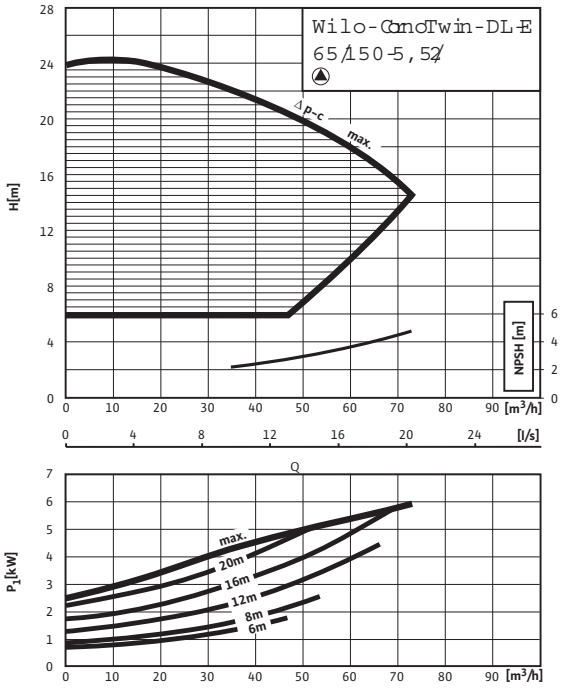
Δp-v (variable) parallel operation



Pump curves Wilo-CronoTwin-DL-E

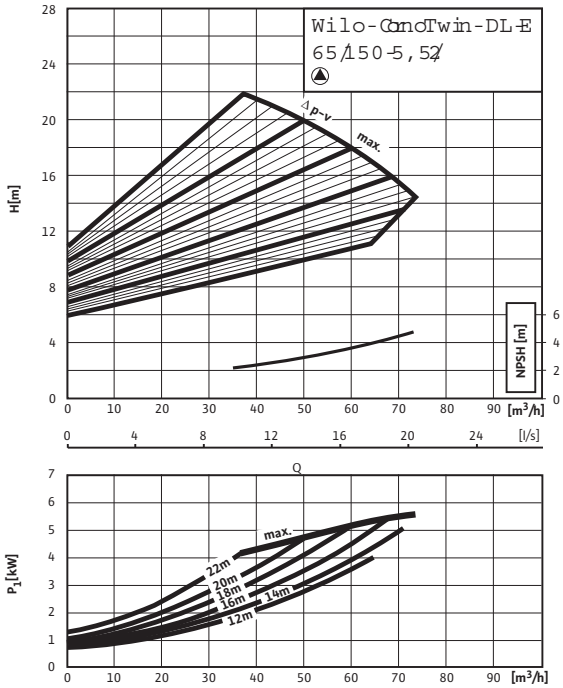
Wilo-CronoTwin-DL-E 65/150-5,5/2

Δp-c (constant) individual operation



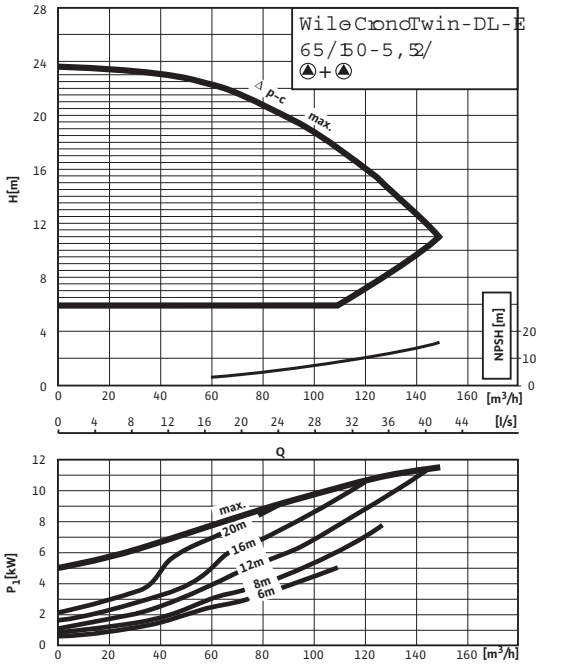
Wilo-CronoTwin-DL-E 65/150-5,5/2

Δp-v (variable) individual operation



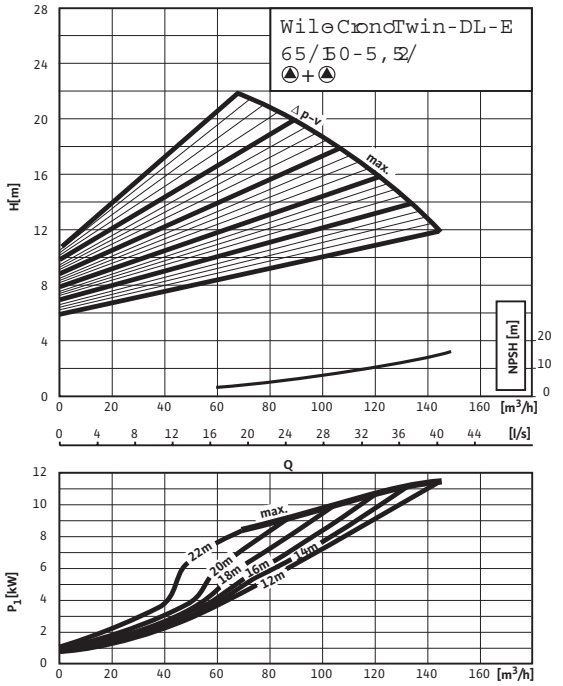
Wilo-CronoTwin-DL-E 65/150-5,5/2

Δp-c (constant) parallel operation



Wilo-CronoTwin-DL-E 65/150-5,5/2

Δp-v (variable) parallel operation



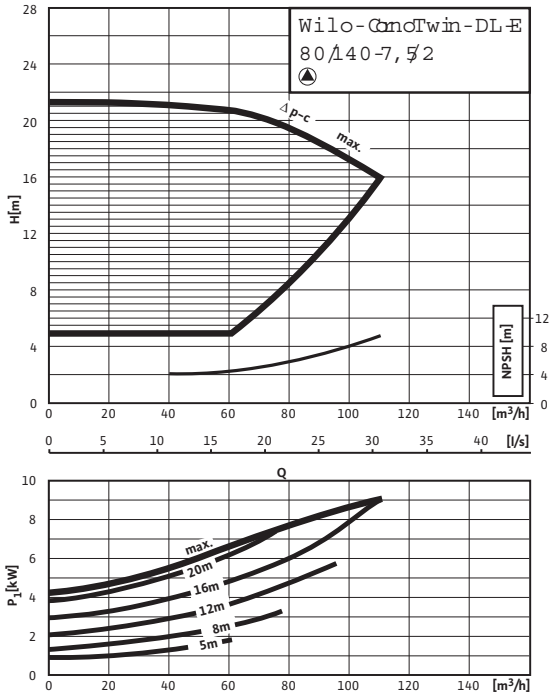
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL-E

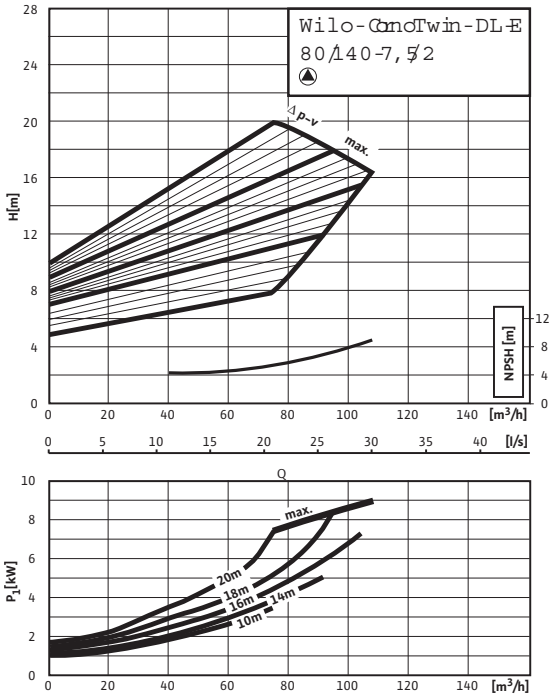
Wilo-CronoTwin-DL-E 80/140-7,5/2

Δp-c (constant) individual operation



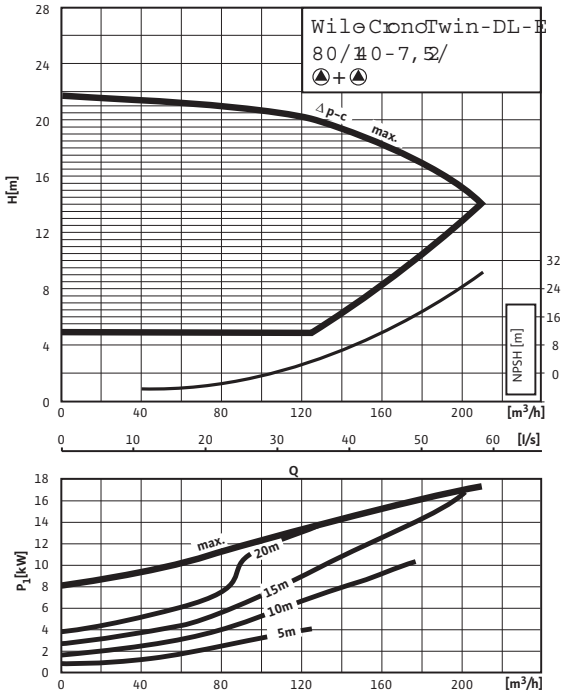
Wilo-CronoTwin-DL-E 80/140-7,5/2

Δp-v (variable) individual operation



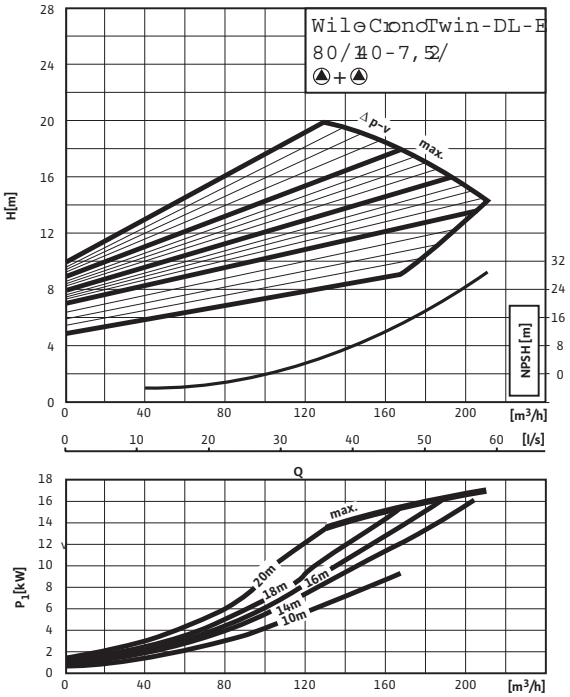
Wilo-CronoTwin-DL-E 80/140-7,5/2

Δp-c (constant) parallel operation



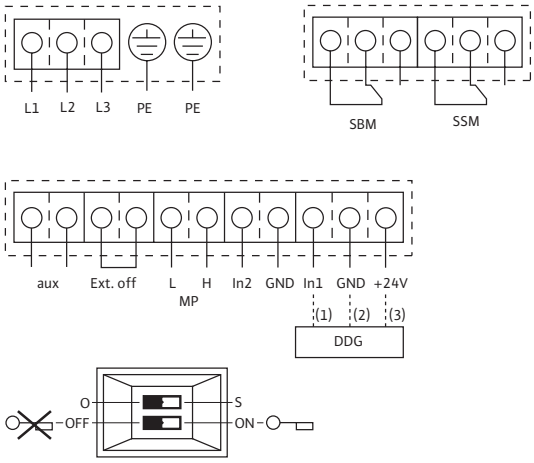
Wilo-CronoTwin-DL-E 80/140-7,5/2

Δp-v (variable) parallel operation



Terminal diagram, motor data Wilo-CronoTwin-DL-E

Terminal diagram



L1, L2, L3:	Mains connection: 3~400 V AC/50 Hz; 3~380 V AC/60 Hz
PE:	Protective conductor connection
DDG:	Connection for differential pressure sensor
In1 (1):	Actual value input 0-10 V/0-20 mA; 2-10 V/4-20 mA
GND (2):	Ground connection for In1 and In2
+ 24 V (3):	DC voltage output for an external consumer/sensor. Max load 60 mA
In2:	Setpoint input 0-10 V/0-20 mA; 2-10 V/4-20 mA
MP:	Multi-pump, interface for dual pump management
Ext. off:	"Overriding Off" control input The pump can be switched on or off via an external, potential-free contact (24 V DC/10 mA).
SBM:*	Potential-free collective run signal (changeover contact according to VDI 3814)
SSM:*	Potential-free collective fault signal (changeover contact according to VDI 3814)
aux:	no function
DIP switch:	1: Switchover between operation (O) and service mode (S) 2: Activation/deactivation of menu access disable
Option:	IF-Module (PLR/LON) for connection to building automation

* Load capacity of contacts for SBM and SSM:
min.: 12 V DC/10 mA
max.: 250 V AC/1 A

Motor data

Wilo-CronoTwin-DL-E ...	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
40/170-5.5/2	5.5	750 - 2900	7.2	11.5
50/170-7.5/2	7.5	750 - 2900	9.3	14.5
65/150-5.5/2	5.5	750 - 2900	7.2	11.5
80/140-7.5/2	7.5	750 - 2900	9.3	14.5

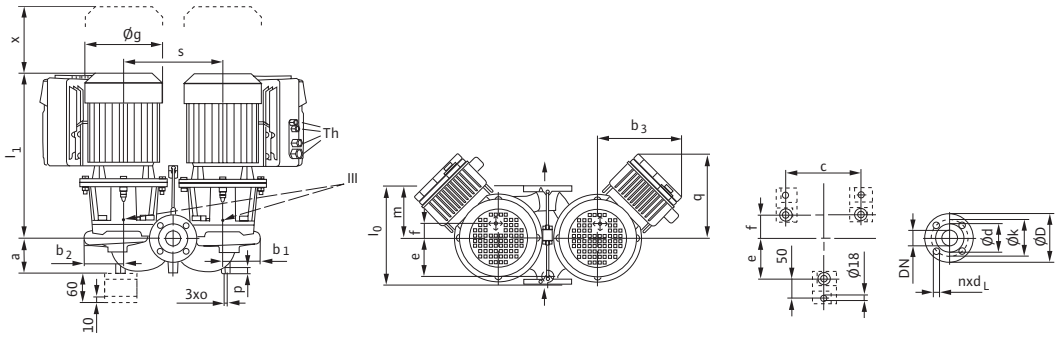
Three-phase motor (three-phase current), 2-pole - 3~400V, 50 Hz / 3~380V, 60 Hz
Observe motor name plate data

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoTwin-DL-E

Dimension drawing



Dimensions, weights																			
Wilo-CronoTwin-DL-E ...	Nominal flange diameter	Overall length	Dimensions															Threaded cable connection	Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_1	m	o	p	q	s	x	Th	M
	–	[mm]											–	[mm]				–	[kg]
40/170-5.5/2	40	340	100	120	127	288	400	52	145	266	646	170	M10	20	303	340	95	1xM12	173
50/170-7.5/2	50	340	120	126	136	288	360	50	130	266	643	180	M10	20	303	340	100	2xM16	203
65/150-5.5/2	65	430	153	134	144	288	440	55	185	266	662	215	M12	20	303	400	120	1xM20	202
80/140-7.5/2	80	400	155	134	146	288	400	62	178	266	667	200	M12	20	303	350	120	1xM25	210

Flange dimensions					
Wilo-CronoTwin-DL-E ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19

Pump flange dimensions – according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-CronoTwin-DL-E...BF

Description/design

Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection
- Lantern
- Coupling
- Drive with integrated electronic speed control

Design

Electronically controlled glanded double pump in in-line design with flange connection and automatic power adjustment

Application

For pumping heating water (in accordance with VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery

- Pump
- Installation and operating instructions

Type key

Example	**DL-E 100/5-21 BF R1**
IL-E	In-line double pump with electronic control
100	Nominal diameter DN of the pipe connection
5-21	Adjustable delivery head range in m
BF	Basic Function version with Δp-c control
R1	Version without pressure sensor

Technical data

- Permissible temperature range -20°C to +140°C
- Mains connection 3~400 V, 50 Hz; 3~380 V, 60 Hz
- Protection class 54
- Nominal diameter DN 40 to DN 150
- Max. operating pressure 16 bar

Special features/product benefits

- Control mode Δp-c for constant differential pressure at the pump
- Manual control mode (0–10 V/0–20 mA)
- Integrated full motor protection (PTC thermistor sensor) with trip electronics
- Powerful, up to 22 kW

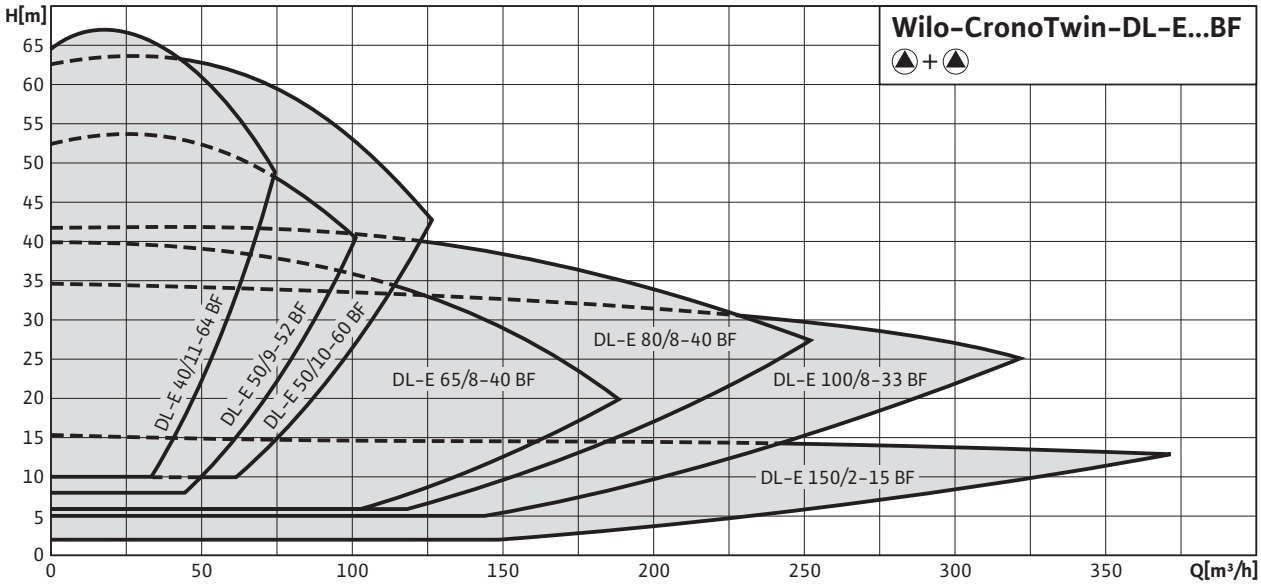
Materials

- Pump housing and lantern: EN-GJL-250
- Impeller:
  - Standard version: EN-GJL-200
  - Special version: G-CuSn 10
- Shaft: 1.4122
- Mechanical seal: AQ1EGG; other mechanical seals on request

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

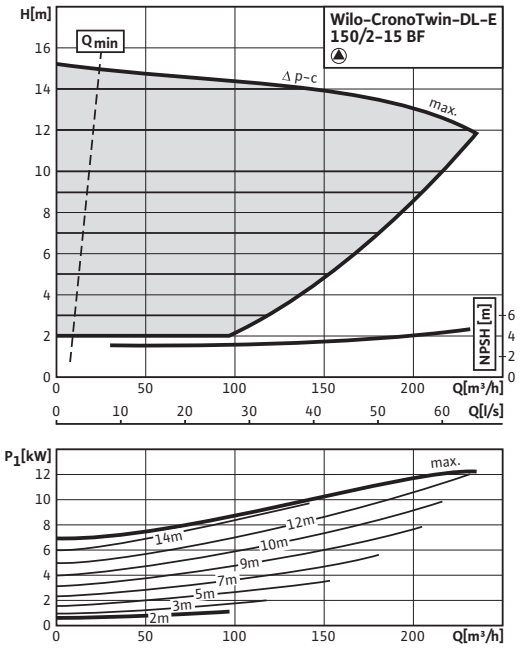
Series description Wilo-CronoTwin-DL-E...BF



Pump curves Wilo-CronoTwin-DL-E...BF

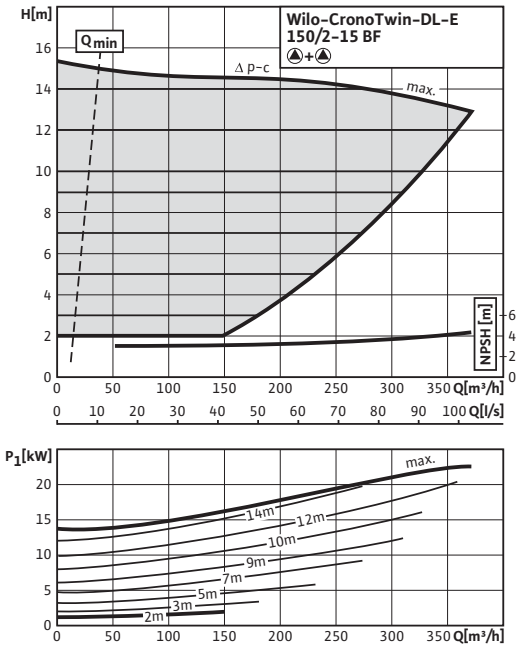
Wilo-DL-E 150/2-15 BF

4-pole, Δp-c (constant) – individual operation



Wilo-DL-E 150/2-15 BF

4-pole, Δp-c (constant) – parallel operation



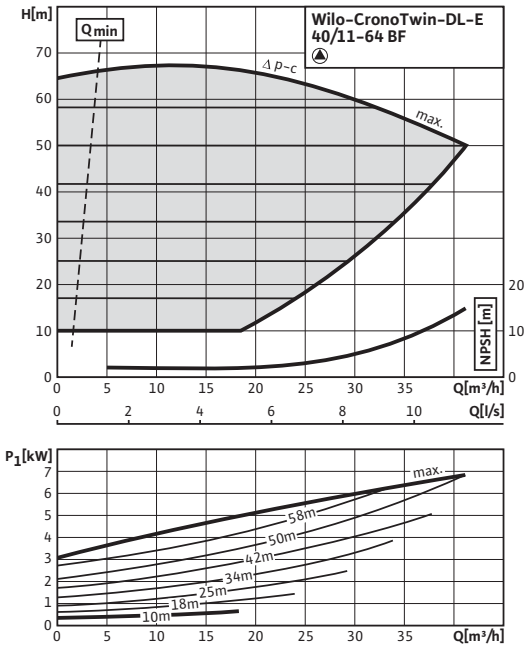
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL-E...BF

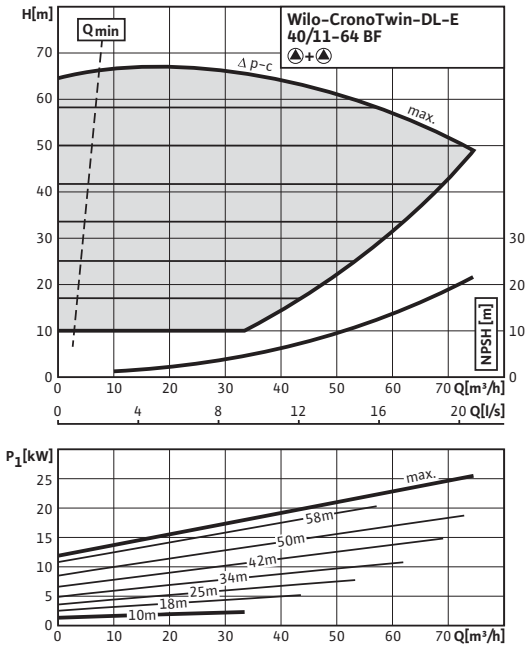
Wilo-DL-E 40/11-64 BF

2-pole, Δp-c (constant) - individual operation



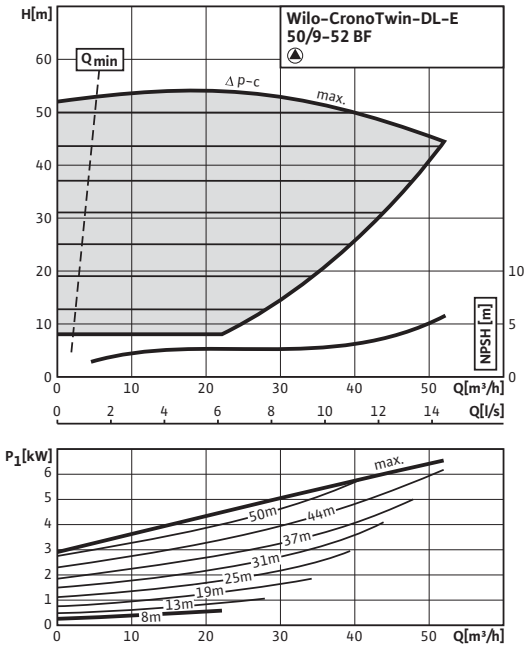
Wilo-DL-E 40/11-64 BF

2-pole, Δp-c (constant) - parallel operation



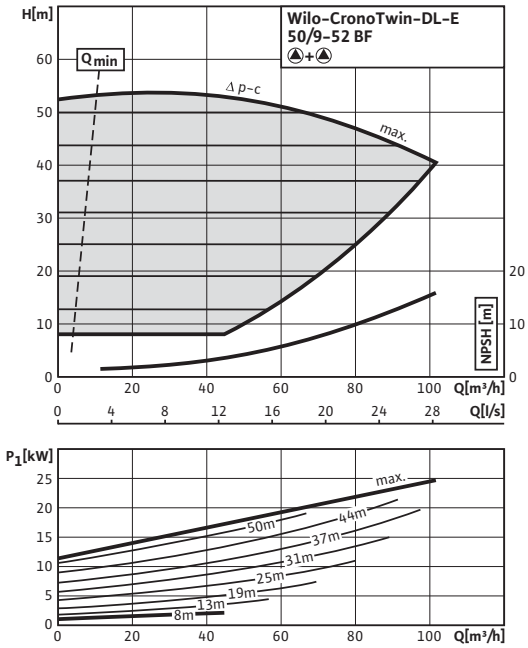
Wilo-DL-E 50/9-52 BF

2-pole, Δp-c (constant) - individual operation



Wilo-DL-E 50/9-52 BF

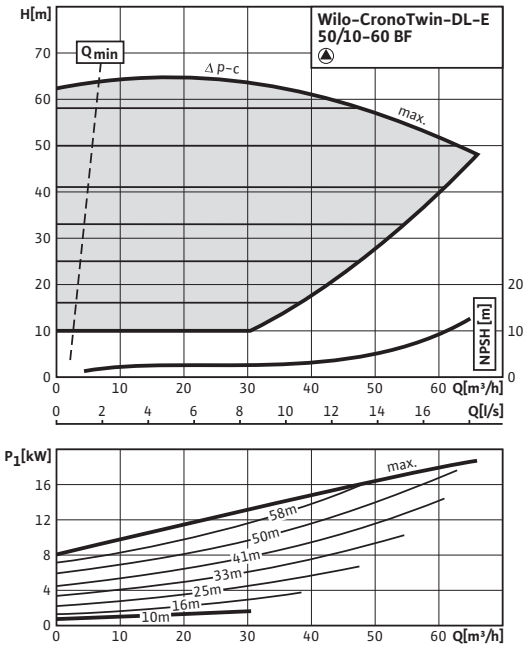
2-pole, Δp-c (constant) - parallel operation



Pump curves Wilo-CronoTwin-DL-E...BF

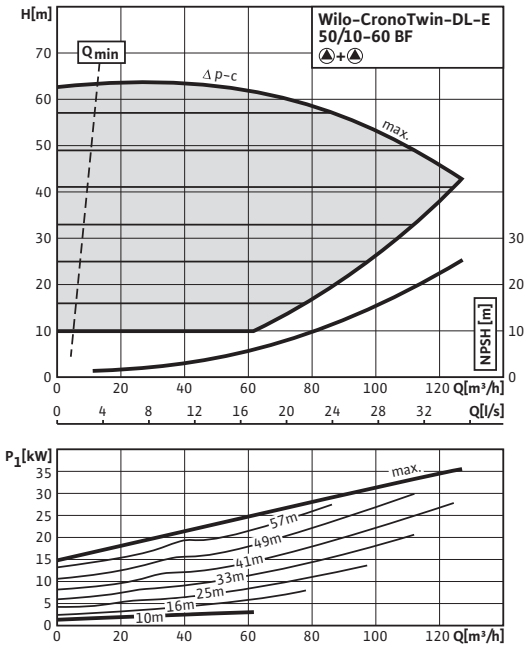
Wilo-DL-E 50/10-60 BF

2-pole, Δp-c (constant) - individual operation



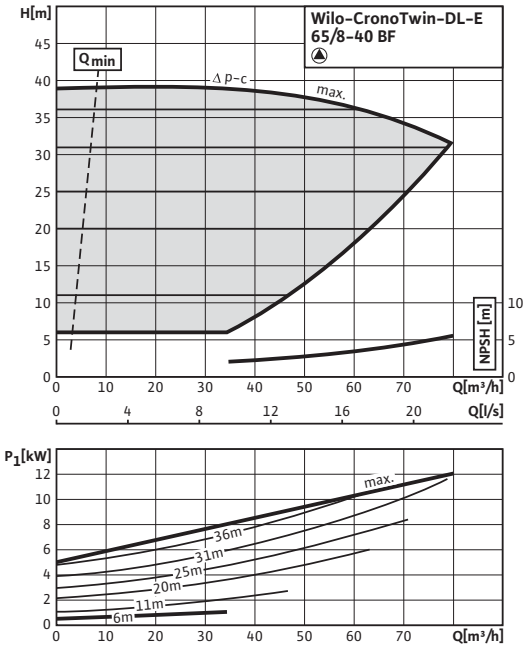
Wilo-DL-E 50/10-60 BF

2-pole, Δp-c (constant) - parallel operation



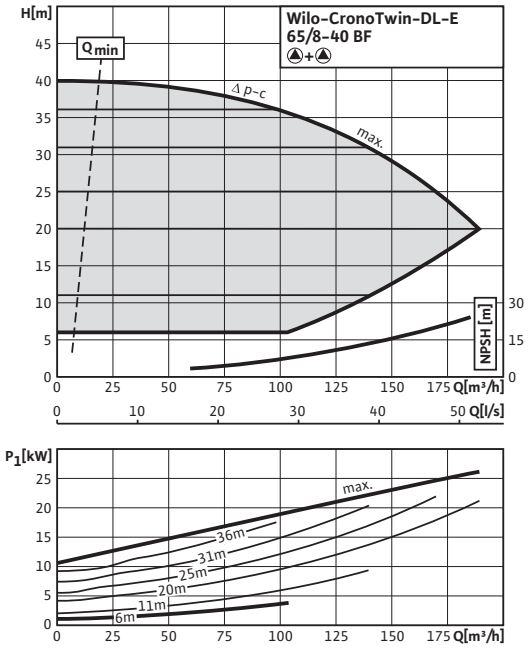
Wilo-DL-E 65/8-40 BF

2-pole, Δp-c (constant) - individual operation



Wilo-DL-E 65/8-40 BF

2-pole, Δp-c (constant) - parallel operation



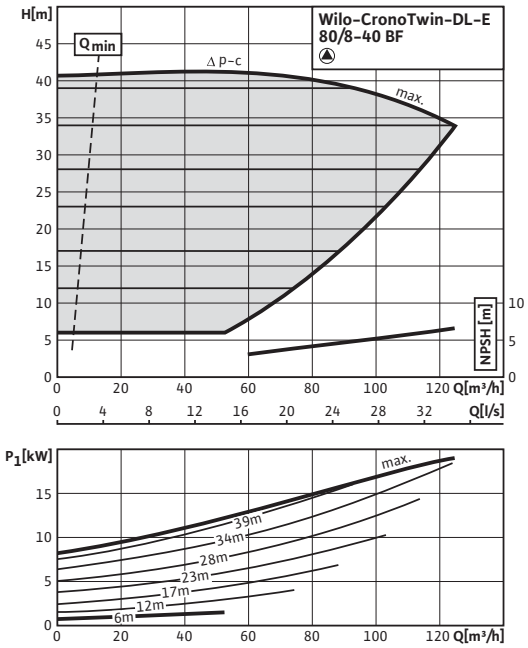
Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL-E...BF

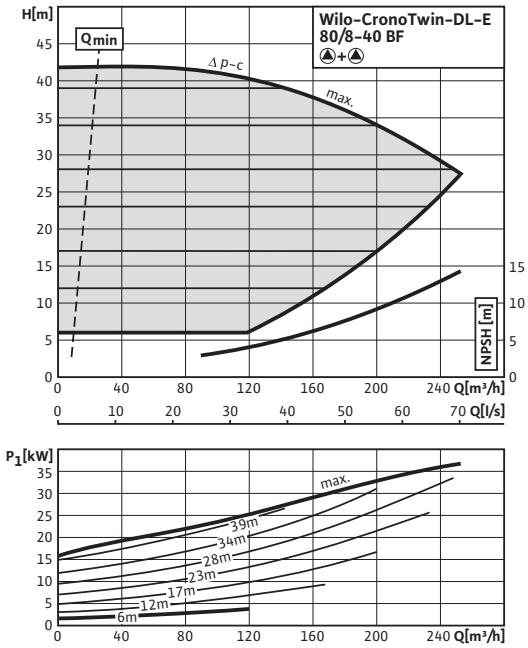
Wilo-DL-E 80/8-40 BF

2-pole, Δp-c (constant) - individual operation



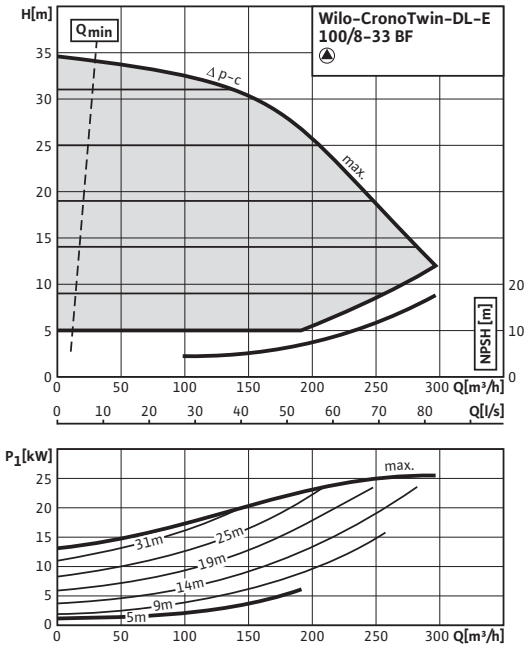
Wilo-DL-E 80/8-40 BF

2-pole, Δp-c (constant) - parallel operation



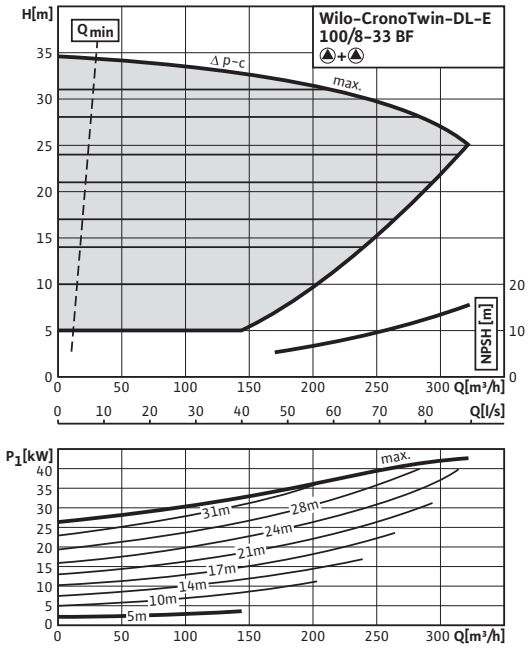
Wilo-DL-E 100/8-33 BF

2-pole, Δp-c (constant) - individual operation



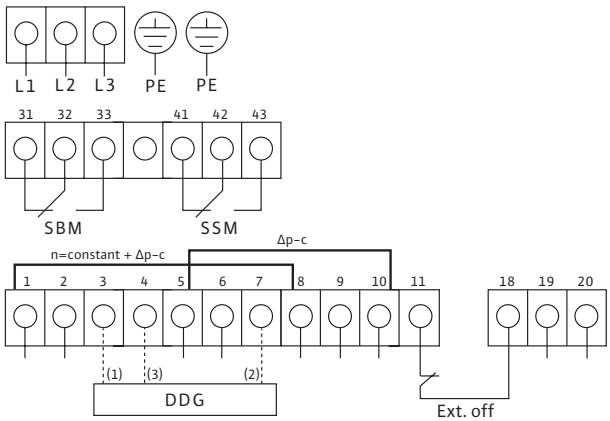
Wilo-DL-E 100/8-33 BF

2-pole, Δp-c (constant) - parallel operation



Terminal diagram, motor data Wilo-CronoTwin-DL-E...BF

Terminal diagram



L1, L2, L3:	Mains connection: 3~400 V AC/50 Hz; 3~380 V AC/60 Hz
PE:	Protective conductor connection
DDG:	Connection for differential pressure sensor
Ext. off:	"Overriding Off" control input The pump can be switched on or off via an external, potential-free contact (24 V DC/10 mA).
SBM:*	Potential-free collective run signal (changeover contact according to VDI 3814)
SSM:*	Potential-free collective fault signal (changeover contact according to VDI 3814)
n=constant:	Control mode with fixed motor speed
Δp-c:	Control mode with constant differential pressure

* Load capacity of contacts for SBM and SSM:
42 V DC or 250 V AC/0.1-2 A
Note for DL-E...BF: Detailed information on the controls for the double pumps are to be found in the installation and operating instructions.

Motor data (4-pole)

Wilo-CronoTwin-DL-E...BF	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
150/2-15	11	375 - 1450	13.0	22.6

Three-phase motor (three-phase current), 4-pole - 3~400V, 50 Hz / 3~380V, 60 Hz
Observe motor name plate data

Motor data (2-pole)

Wilo-CronoTwin-DL-E...BF	Nominal motor power	Speed	Power consumption	Nominal current (approx.)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[kW]	[A]
40/11-64	11	750 - 2900	13.0	22.6
50/9-52	11	750 - 2900	13.0	22.6
50/10-60	15	750 - 2900	18.5	29.0
65/8-40	11	750 - 2900	13.0	22.6
80/8-40	15	750 - 2900	18.5	29.0
100/8-33	22	750 - 2900	25.1	41.2

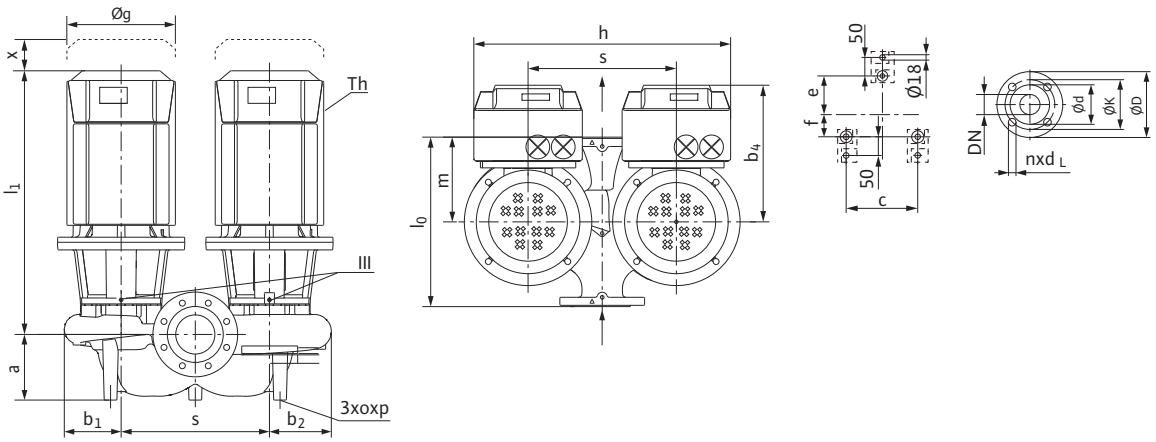
Three-phase motor (three-phase current), 4-pole - 3~400V, 50 Hz / 3~380V, 60 Hz
Observe motor name plate data

Energy-saving pumps

Double pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoTwin-DL-E...BF

Dimension drawing A



Dimensions, weights (4-pole)

Wilo-CronoTwin-DL-E...BF	Nominal flange diameter	Overall length	Dimensions																Threaded cable connection	Weight approx.	Dimension drawing
	DN	l_0	A	b_1	b_2	b_4	c	e	f	Ø g	h	l_1	m	o	p	q	s	x	Th	M	–
	–	[mm]												–	[mm]				–	[kg]	–
150/2-15	150	700	210	215	241	391	640	91	309	258	918	818	365	M16	25	–	550	130	2x M25 1x M40	474	A

Dimensions, weights (2-pole)

Wilo-CronoTwin-DL-E...BF	Nominal flange diameter	Overall length	Dimensions																Threaded cable connection	Weight approx.	Dimension drawing
	DN	l_0	A	b_1	b_2	b_4	c	e	f	Ø g	h	l_1	m	o	p	q	s	x	Th	M	–
	–	[mm]												–	[mm]				–	[kg]	–
40/11-64	40	440	110	145	147	391	500	38	192	258	768	699	220	M10	20	–	400	100		364	A
50/9-52	50	440	120	145	148	391	500	50	200	258	768	705	220	M10	20	–	400	100		362	A
50/10-60	50	440	120	145	148	419	500	50	200	313	768	717	220	M10	20	–	400	100	2xM25	421	A
65/8-40	65	430	153	134	144	–	440	55	185	258	1140	710	215	M12	20	370	400	120	1xM40	355	B
80/8-40	80	440	155	144	160	–	440	62	188	313	1180	727	220	M12	20	390	400	120		423	B
100/8-33	100	500	180	173	188	–	580	80	250	351	1292	804	226	M12	20	426	440	135		570	B

Dimensions, weights Wilo-CronoTwin-DL-E...BF

Flange dimensions					
Wilo-CronoTwin-DL-E...BF	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19
100...	100	220	156	180	8 x 19
150...	150	285	211	240	8 x 23

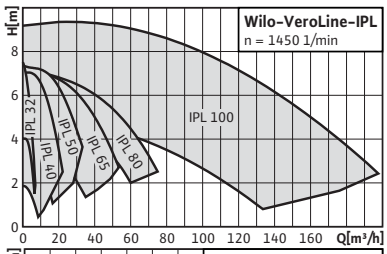
Pump flange dimensions - according to EN 1092-2 PN 16, n = number of drilled holes

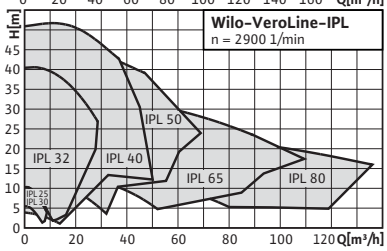
Standard pumps

Single in-line pumps, double in-line pumps

Series overview

Series: Wilo-VeroLine-IPL

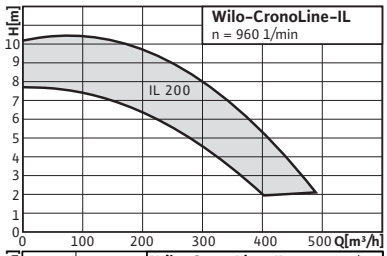


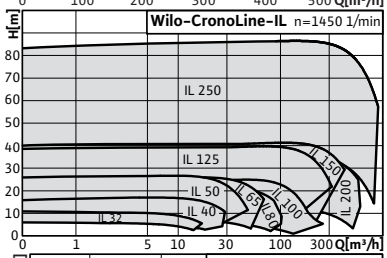


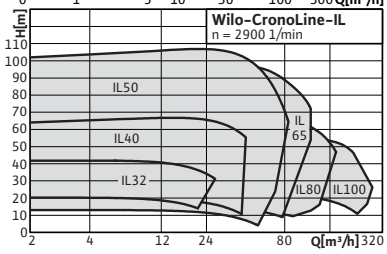
> **Design**
Glanded pump in in-line design with screwed connection or flange connection

> **Application**
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series: Wilo-CronoLine-IL







Series overview

Series: Wilo-VeroLine-IPL

> Special features/product benefits
- High corrosion protection due to cataphoretic coating
- Standard condensate drainage holes in the motor housings and lanterns
- Series version: Motor with one-piece shaft
- Version N: Standard motor B5 or V1 with stainless steel plug shaft
- Bidirectional mechanical seal with forced flushing
- Easy to install due to feet with threaded holes on pump housing

Series: Wilo-CronoLine-IL

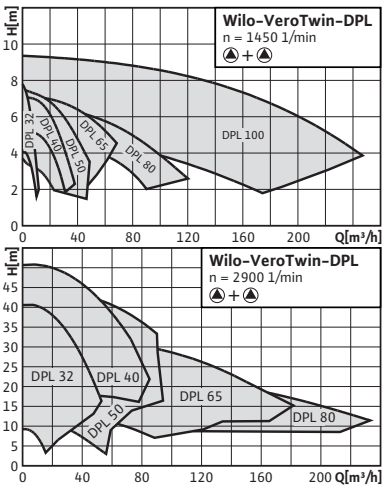
> Special features/product benefits
- Reduced life cycle costs due to optimised efficiency
- Standard condensate drainage holes in the motor housings
- Can be used flexibly in air-conditioning and cooling systems, with application benefits due direct draining of condensate via optimised lantern design (patented)
- High corrosion protection due to cataphoretic coating
- Easy to install due to feet with threaded holes on pump housing
- Bidirectional mechanical seal with forced flushing
- High degree of availability due to worldwide obtainability of standard motors (in accordance with Wilo specifications) and mechanical seals

Standard pumps

Single in-line pumps, double in-line pumps

Series overview

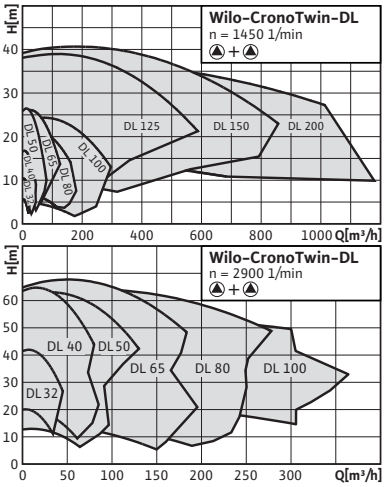
Series: Wilo-VeroTwin-DPL



> **Design**
Glanded double pump in in-line design with flange connection

> **Application**
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series: Wilo-CronoTwin-DL



> **Design**
Glanded double pump in in-line design with flange connection

> **Application**
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Series overview

Series: Wilo-VeroTwin-DPL

> Special features/product benefits
- Reduction of space required and installation costs due to double pump design
- Main/standby mode or peak-load operation (by means of auxiliary external device)
- Standard condensate drainage holes in the motor housings and lanterns
- High corrosion protection due to cataphoretic coating
- Series version: Motor with one-piece shaft
- Version N: Standard motor B5 or V1 with stainless steel plug shaft
- Bidirectional mechanical seal with forced flushing

> More information **Page**

Series: Wilo-CronoTwin-DL

> Special features/product benefits
- Reduced life cycle costs due to optimised efficiency
- Reduction of space required and installation costs due to double pump design
- Main/standby mode or peak-load operation (by means of external auxiliary device)
- Peak-load operation (by means of external auxiliary device)
- Standard condensate drainage holes in the motor housings
- Can be used flexibly in air-conditioning and cooling systems, with application benefits due to direct draining of condensate via optimised lantern design (patented)
- High corrosion protection due to cataphoretic coating
- Bidirectional mechanical seal with forced flushing
- High worldwide availability of standard motors (according to Wilo specifications) and standard mechanical seals

> More information **Page**

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Technical data

	Wilo- VeroLine-IPL		Wilo- Crono-Line-IL	Wilo- VeroTwin-DPL	Wilo-CronoTwin-DL
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	•	•	•	•	•
Heat transfer oil	Special version at additional charge				
Permitted field of application					
Standard version for operating pressure, p_{max} [bar]	10		13 (up to +140°C) 16 (up to +120°C)	10	13 (up to +140°C) 16 (up to +120°C)
Special version for operating pressure, p_{max} [bar]	16		25 (on request)	16	25 (on request)
Temperature range [°C]	- 10 to + 120	- 10 to + 120	- 20 to + 140	- 10 to + 120	- 20 to + 140
Max. ambient temperature [°C]	40	40	40	40	40
Installation in closed buildings	•	•	•	•	•
Outdoor installation	Special version at additional charge				
Pipe connections					
Threaded connection	RP 1 - RP $1^1/_4$	–	–	–	–
Nominal connection diameters DN		32 -100	32 - 250	32 -100	32 - 200
Flanges (according to EN 1092-2)	–	PN 16 (in accordance with EN 1092-2)	PN 16	PN 16 (in accordance with EN 1092-2)	PN 16 (in accordance with EN 1092-2)
Flange with pressure-measurement connections	–	R $^1/_8$	R $^1/_8$	R $^1/_8$	R $^1/_8$
Materials					
Pump housing	EN-GJL-250		EN-GJL-250 (EN-GJS-400 on request)	EN-GJL-250	EN-GJL-250 (EN-GJS-400 on request)
Lantern	EN-GJL-250		EN-GJL-250 (EN-GJS-400 on request)	EN-GJL-250	EN-GJL-250 (EN-GJS-400 on request)
Impeller (standard)	PP, fibreglass-reinforced/ EN-GJL-200 (depending on type)		EN-GJL-200	PP, fibreglass-reinforced/ EN-GJL-200 (depending on type)	EN-GJL-200
Impeller (special version)	-		G-CuSn10	-	G-CuSn10
Pump shaft	1.4021		1.4122	1.4021	1.4122
Mechanical seal	AQEGG				
Other mechanical seals	On request (at additional charge)				
Electrical connection					
Mains connection	3~400 V, 50 Hz		3~400 V, 50 Hz (others on re-quest)	3~400 V, 50 Hz	3~400 V, 50 Hz (others on re-quest)

Technical data

	Wilo- VeroLine-IPL		Wilo- Crono-Line-IL	Wilo- VeroTwin-DPL	Wilo-CronoTwin-DL
Speed range [rpm]	1450/2900		960/1450/2900 1450-2900	1450/2900	1450/2900 1450-2900
Motor/electronics					
Integrated full motor protection	Special version with PTC thermistor sensor (TRS) at additional charge				
Protection class	IP 55	IP 55	IP 55	IP 55	IP 55
Insulation class	F	F	F	F	F
Speed control	Wilo control system				
Motor winding up to 3 kW	230 V Δ/400 V Y, 50 Hz				
Motor winding from 4 kW	400 V Δ/690 V Y, 50 Hz				
Installation options					
Pipe installation (≤ 15 kW motor power)	•	•	•	•	•
Support-bracket mounting	•	•	•	•	•

• = available, - = not available

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-VeroLine-IPL

Design
Glanded pump in in-line design with screwed connection or flange connection

Application
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**IPL 40/160-4/2**
IPL	In-line pump
40	Nominal diameter DN of the pipe connection
160	Nominal impeller diameter
4	Nominal motor power P_2 in kW
2	Number of poles

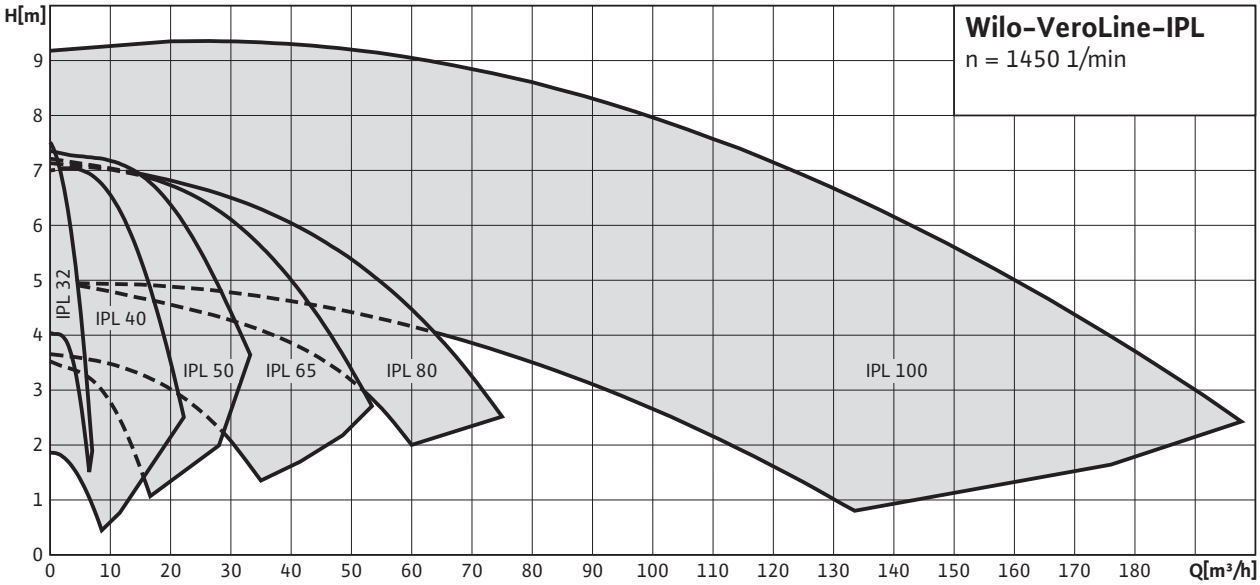
Technical data
- Permissible temperature range -10°C to +120°C
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter Rp 1 to DN 100
- Max. operating pressure 10 bar (special version: 16 bar)

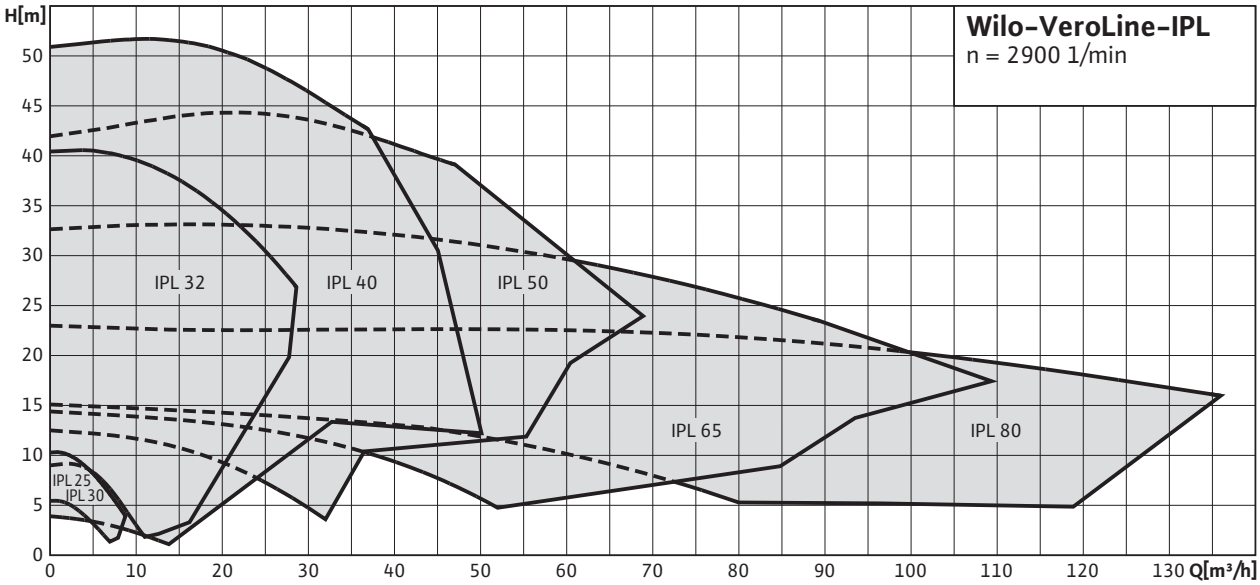
Special features/product benefits
- High corrosion protection due to cataphoretic coating
- Standard condensate drainage holes in the motor housings and lanterns
- Series version: Motor with one-piece shaft
- Version N: Standard motor B5 or V1 with stainless steel plug shaft
- Bidirectional mechanical seal with forced flushing
- Easy to install due to feet with threaded holes on pump housing

Materials
- Pump housing and lantern: EN-GJL-250
- Impeller: PP fibreglass-reinforced / EN-GJL-200 (depending on pump type)
- Shaft: 1.4021 (version N: 1.4404)
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection with pressure measuring connection R $^1/_8$
- Motor with one-piece shaft

Series description Wilo-VeroLine-IPL





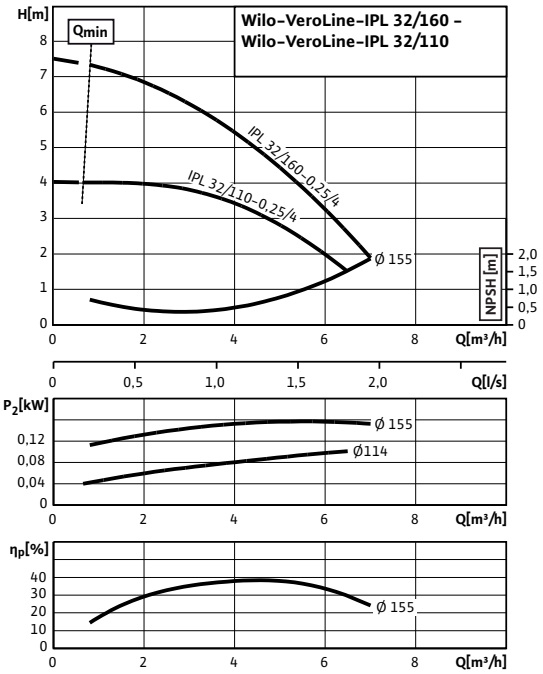
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IPL

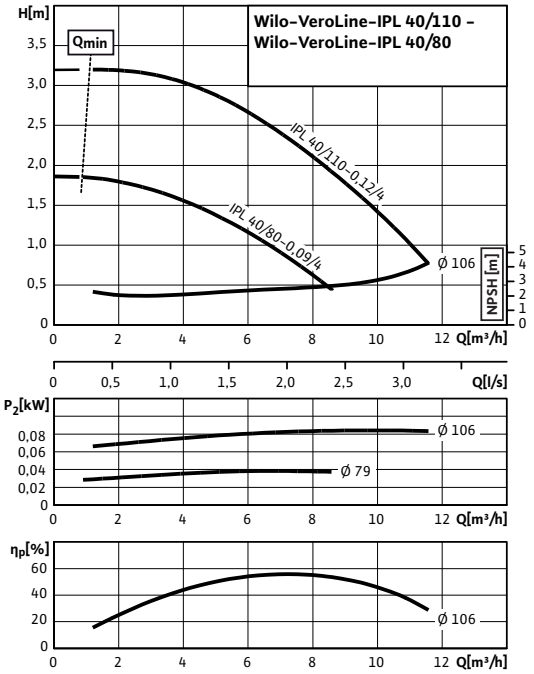
Wilo-VeroLine-IPL 32/110-0,25/4 - 32/160-0,25/4

Speed 1450 rpm



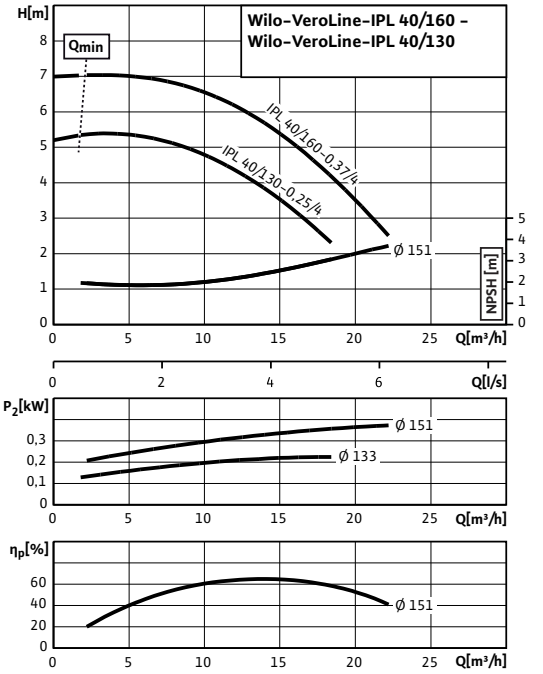
Wilo-VeroLine-IPL 40/80-0,09/4 - 40/110-0,12/4

Speed 1450 rpm



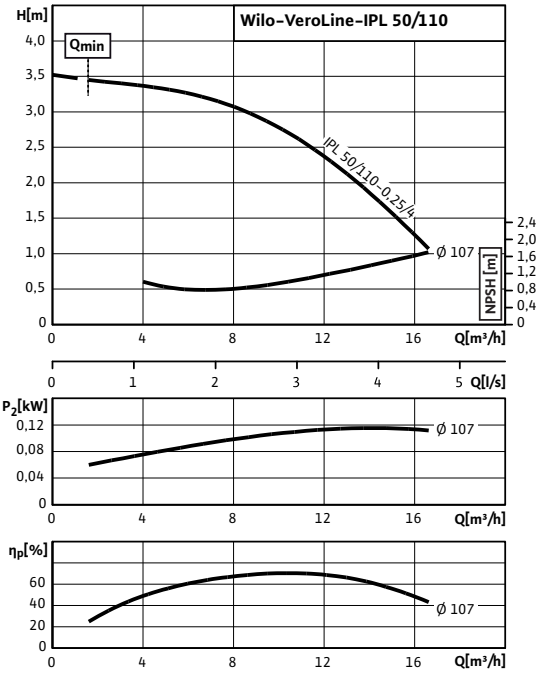
Wilo-VeroLine-IPL 40/130-0,25/4 - 40/160-0,37/4

Speed 1450 rpm



Wilo-VeroLine-IPL 50/110-0,25/4

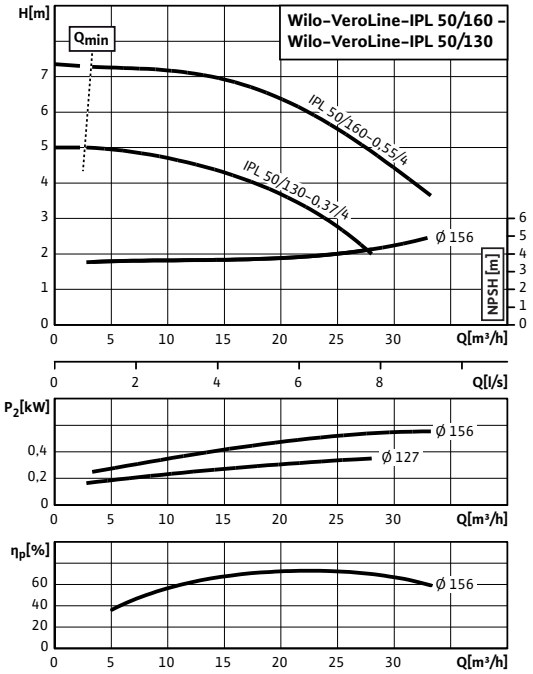
Speed 1450 rpm



Pump curves Wilo-VeroLine-IPL

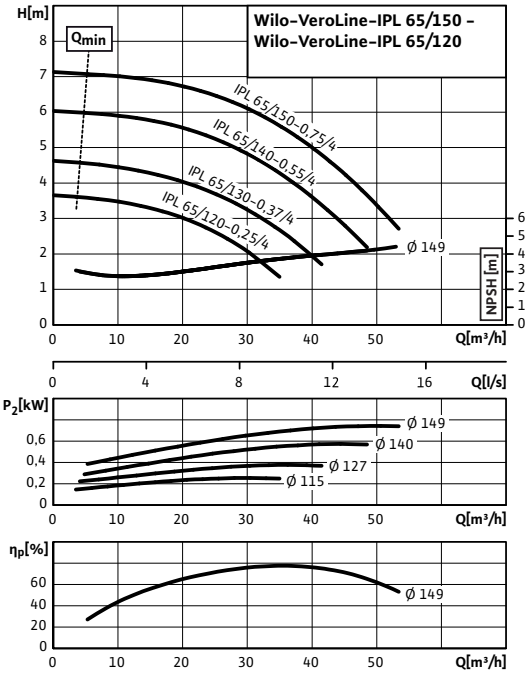
Wilo-VeroLine-IPL 50/130-0,37/4 - 50/160-0,55/4

Speed 1450 rpm



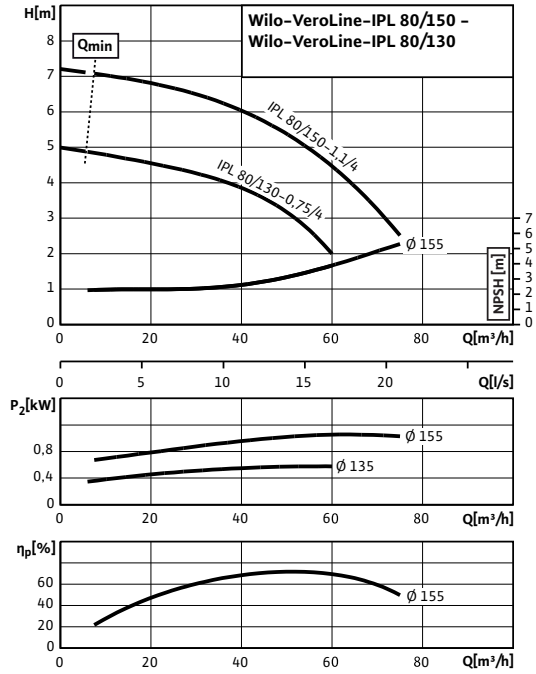
Wilo-VeroLine-IPL 65/120-0,25/4 - 65/150-0,75/4

Speed 1450 rpm



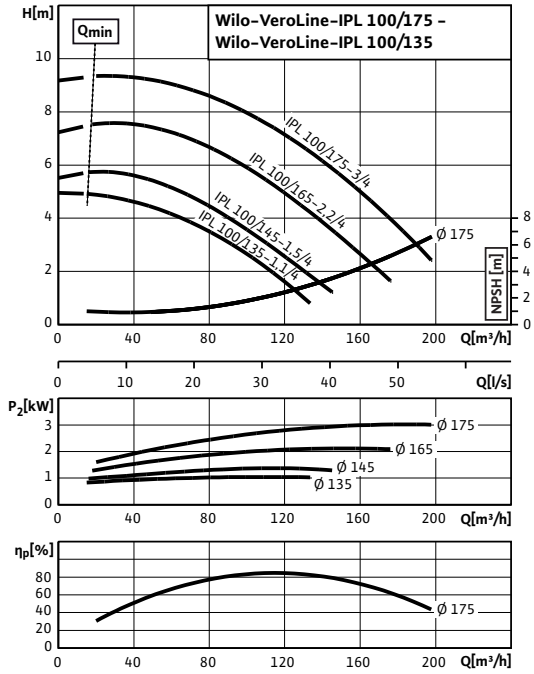
Wilo-VeroLine-IPL 80/130-0,75/4 - 80/150-1,1/4

Speed 1450 rpm



Wilo-VeroLine-IPL 100/135-1,1/4 - 100/175-3/4

Speed 1450 rpm



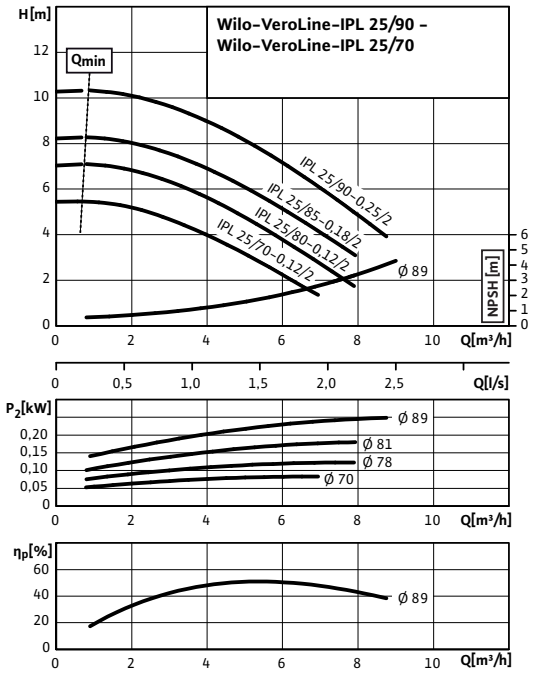
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IPL

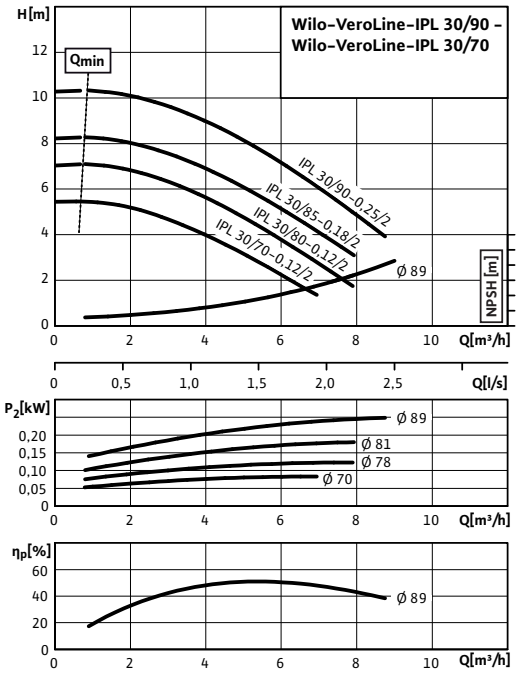
Wilo-VeroLine-IPL 25/70-0,12/2 - 25/90-0,25/2

Speed 2900 rpm



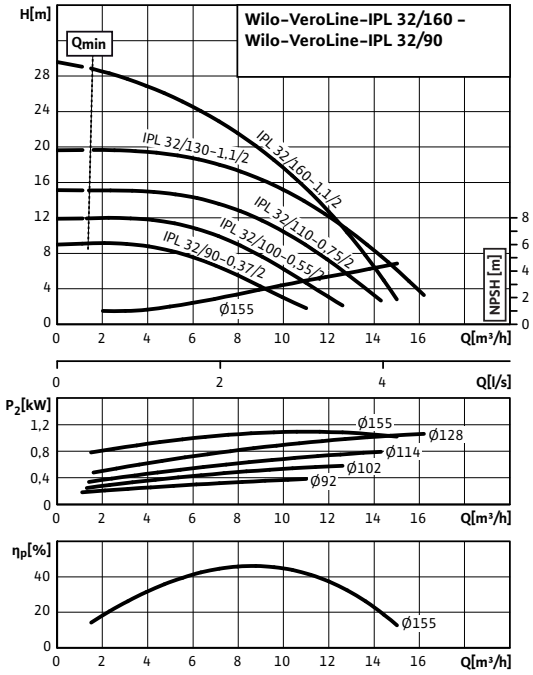
Wilo-VeroLine-IPL 30/70-0,12/2 - 30/90-0,25/2

Speed 2900 rpm



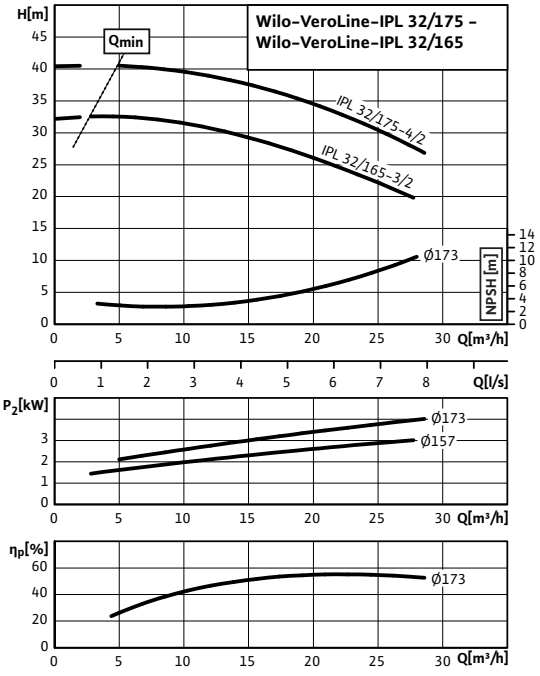
Wilo-VeroLine-IPL 32/90-0,37/2 - 32/160-1,1/2

Speed 2900 rpm



Wilo-VeroLine-IPL 32/165-3/2 - 32/175-4/2

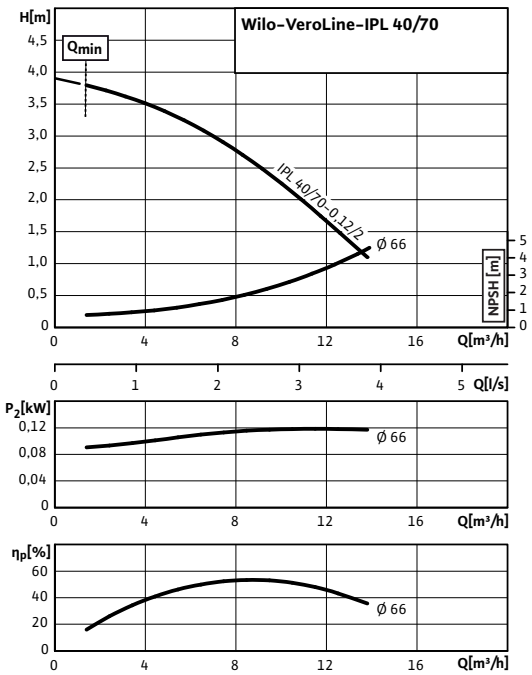
Speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

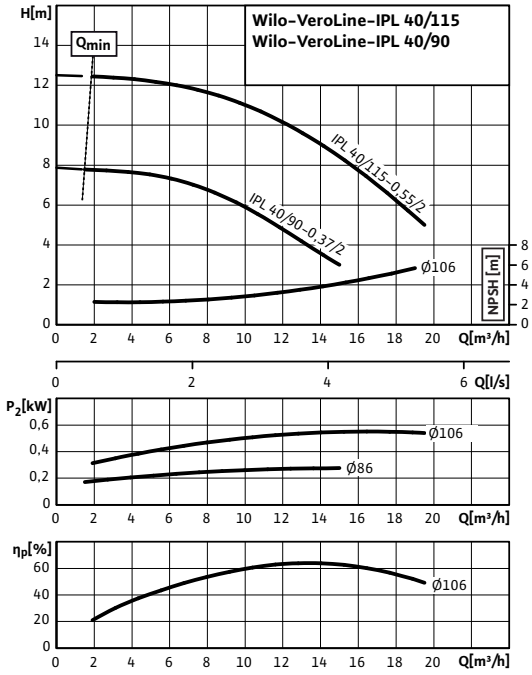
Wilo-VeroLine-IPL 40/70-0,12/2

Speed 2900 rpm



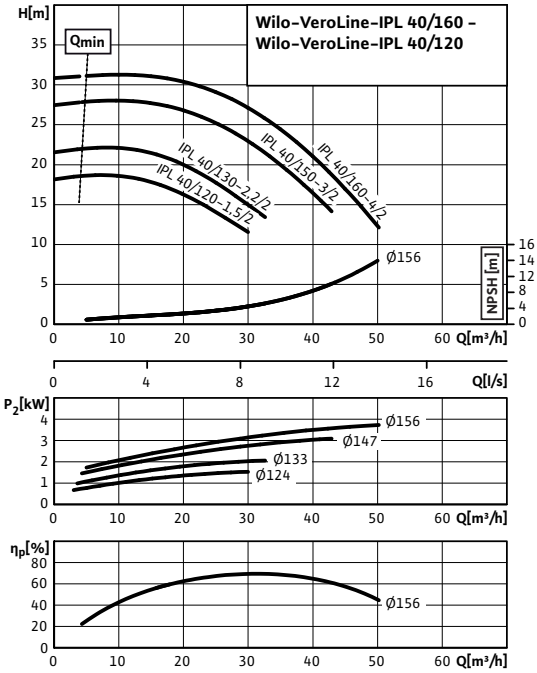
Wilo-VeroLine-IPL 40/90-0,37/2 - 40/115-0,55/2

Speed 2900 rpm



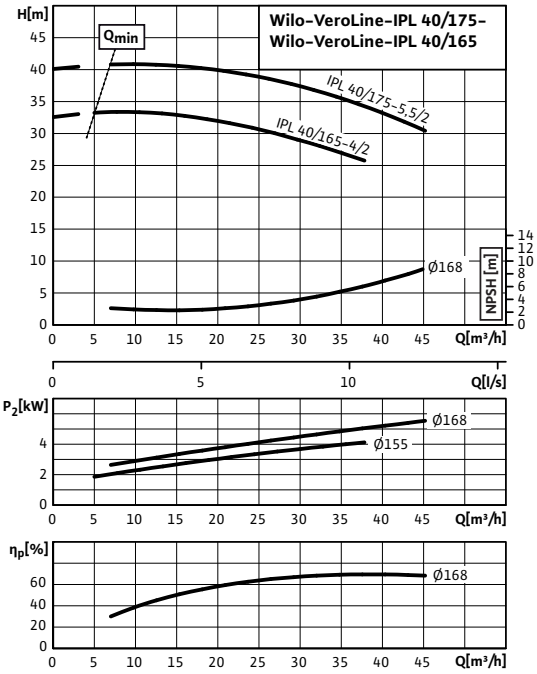
Wilo-VeroLine-IPL 40/120-1,5/2 - 40/160-4/2

Speed 2900 rpm



Wilo-VeroLine-IPL 40/165-4/2 - 40/175-5,5/2

Speed 2900 rpm



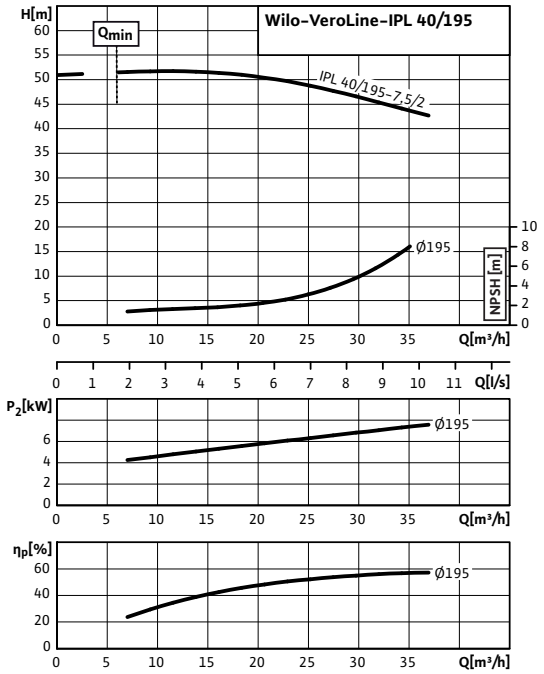
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IPL

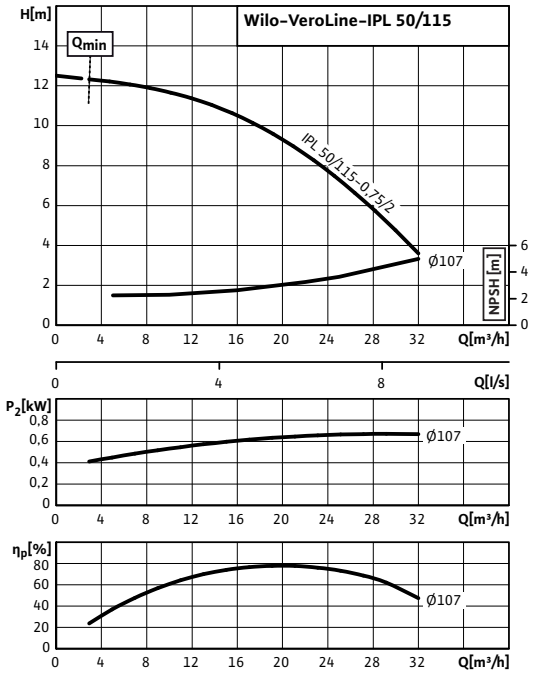
Wilo-VeroLine-IPL 40/195-7,5/2

Speed 2900 rpm



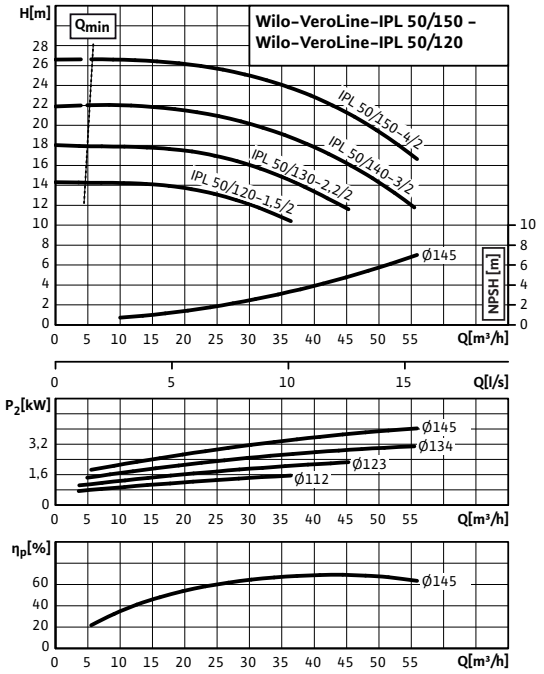
Wilo-VeroLine-IPL 50/115-0,75/2

Speed 2900 rpm



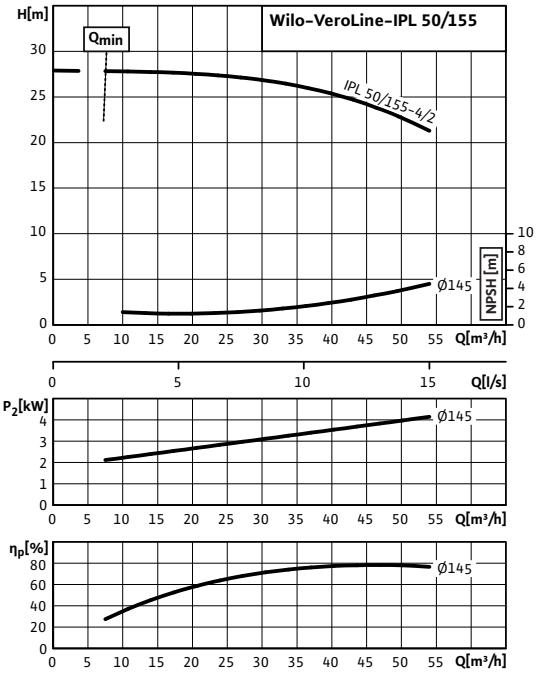
Wilo-VeroLine-IPL 50/120-1,5/2 - 50/150-4/2

Speed 2900 rpm



Wilo-VeroLine-IPL 50/155-4/2

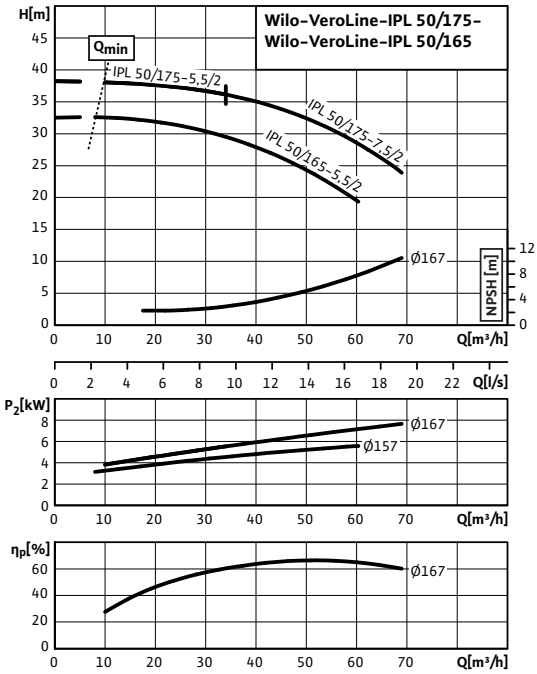
Speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

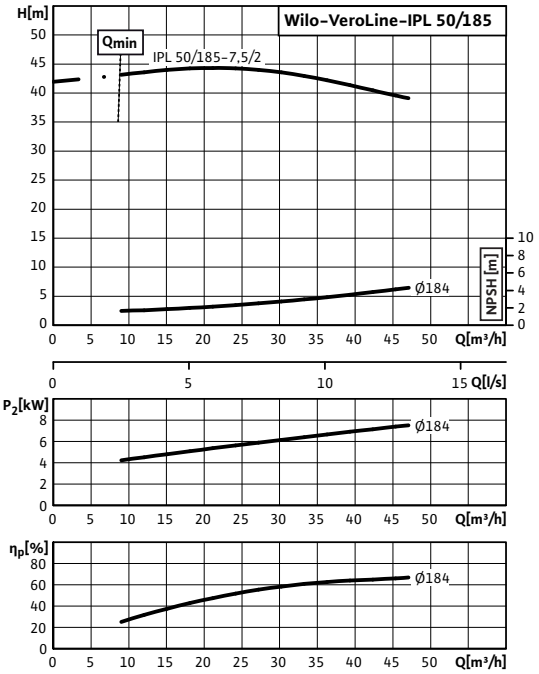
Wilo-VeroLine-IPL 50/165-5,5/2 - 50/175-7,5/2

Speed 2900 rpm



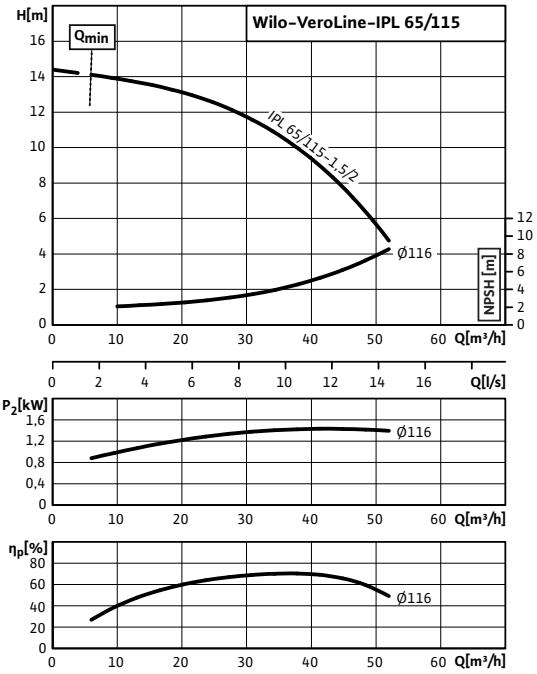
Wilo-VeroLine-IPL 50/185-7,5/2

Speed 2900 rpm



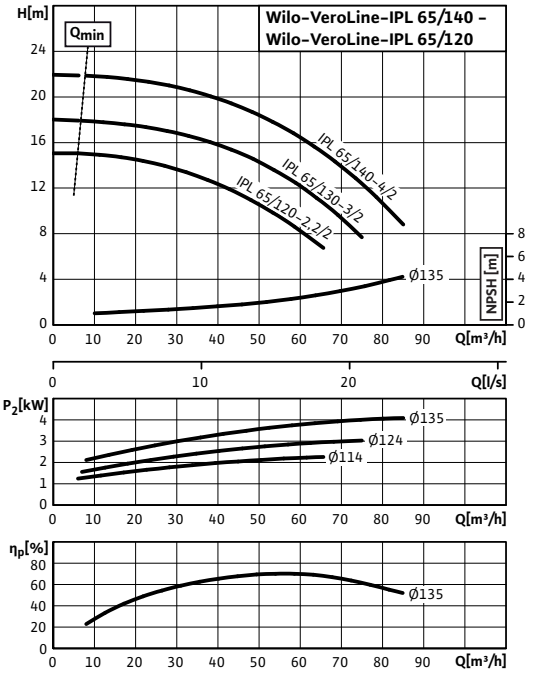
Wilo-VeroLine-IPL 65/115-1,5/2

Speed 2900 rpm



Wilo-VeroLine-IPL 65/120-2,2/2 - 65/140-4/2

Speed 2900 rpm



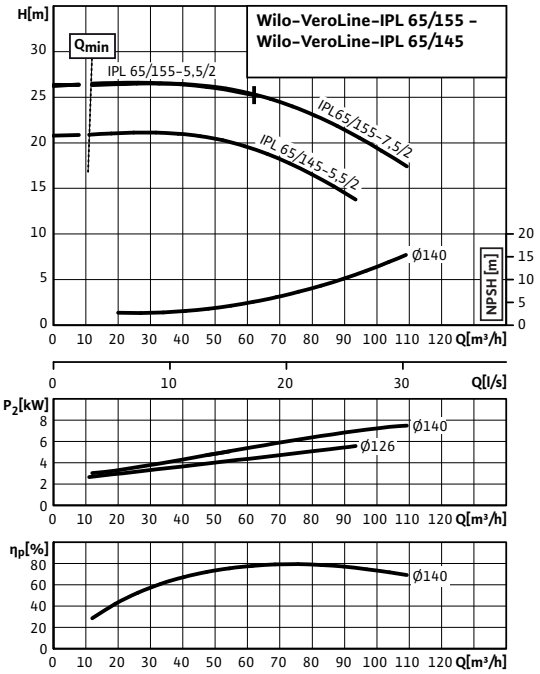
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroLine-IPL

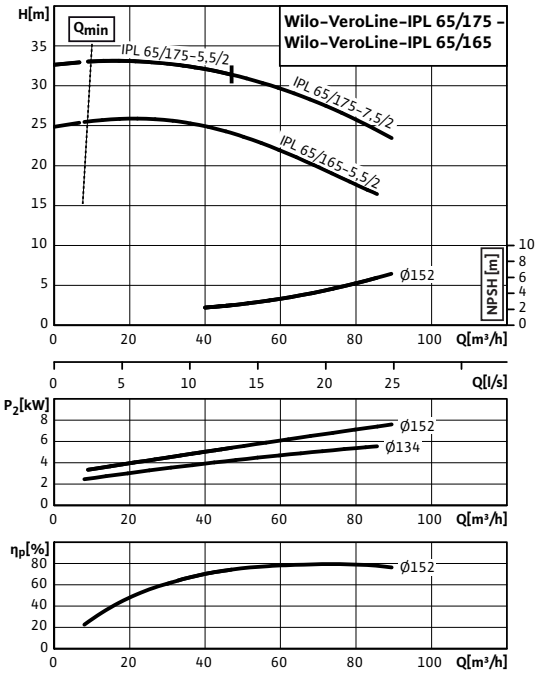
Wilo-VeroLine-IPL 65/145-5,5/2 - 65/155-7,5/2

Speed 2900 rpm



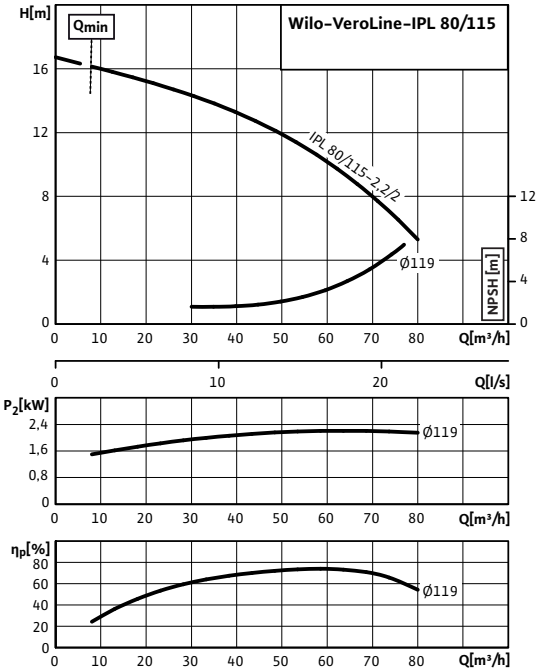
Wilo-VeroLine-IPL 65/165-5,5/2 - 65/175-7,5/2

Speed 2900 rpm



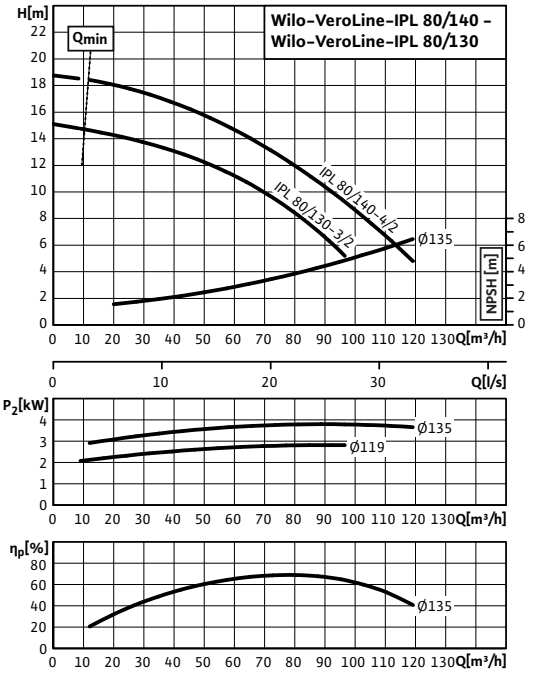
Wilo-VeroLine-IPL 80/115-2,2/2

Speed 2900 rpm



Wilo-VeroLine-IPL 80/130-3/2 - 80/140-4/2

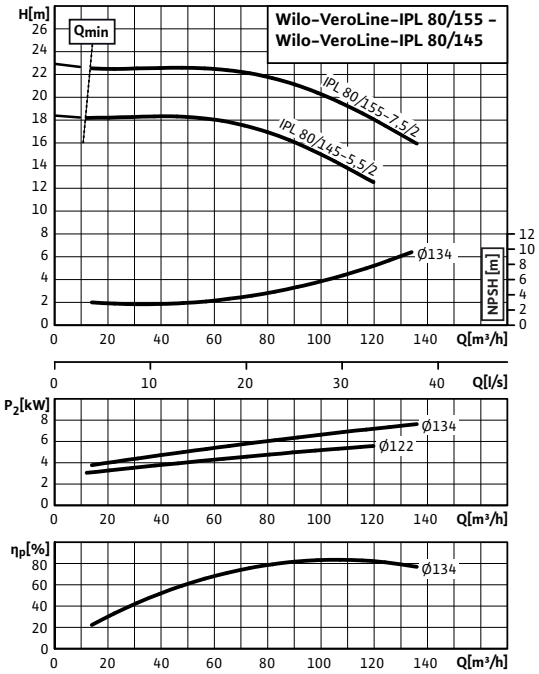
Speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

Wilo-VeroLine-IPL 80/145-5,5/2 - 80/155-7,5/2

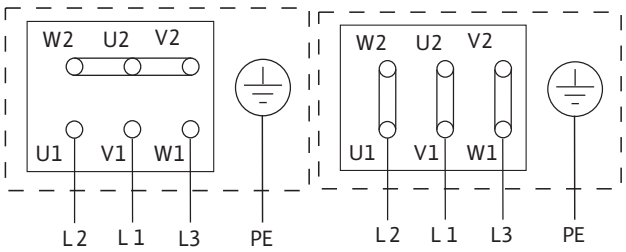
Speed 2900 rpm



Terminal diagram, motor data Wilo-VeroLine-IPL

Terminal diagrams

Star switching Y **Delta switching Δ**



Motor protection switch required onsite. Check the direction of rotation.
To change the direction of rotation, swap any two phases.

$P_2 \leq 3$ kW	3~400 V Y 3~230 V Δ
$P_2 \geq 4$ kW	3~690 V Y 3~400 V Δ

After removing the bridges, Y-Δ starting is possible.

Motor data (1450 rpm)

Wilo-VeroLine-IPL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.09 kW	0.37	0.69	0.51
0.12 kW	0.45	0.67	0.58
0.25 kW	0.86	0.74	0.61
0.37 kW	1.10	0.75	0.65
0.55 kW	1.70	0.69	0.70
0.75 kW	1.95	0.76	0.73
1.1 kW	2.90	0.78	0.74
1.5 kW	3.35	0.82	0.79
2.2 kW	4.70	0.83	0.82
3 kW	6.40	0.83	0.83

Observe motor name plate data

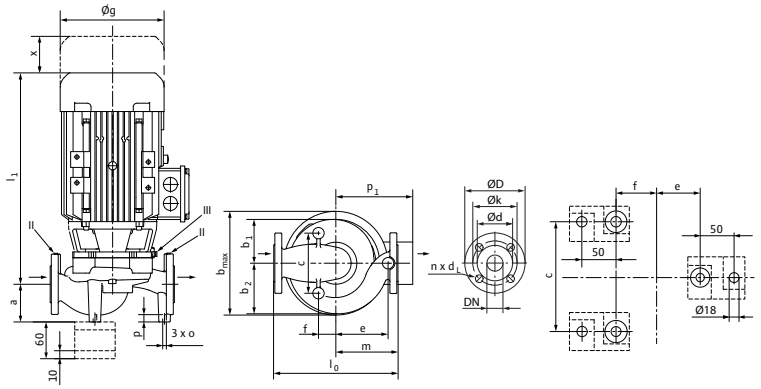
Motor data (2900 rpm)

Wilo-VeroLine-IPL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.12 kW	0.35	0.74	0.67
0.18 kW	0.53	0.77	0.68
0.25 kW	0.70	0.76	0.66
0.37 kW	1.00	0.84	0.68
0.55 kW	1.40	0.82	0.70
0.75 kW	2.00	0.86	0.68
1.1 kW	2.60	0.84	0.79
1.5 kW	3.25	0.81	0.80
2.2 kW	4.60	0.87	0.81
3 kW	6.10	0.86	0.84
4 kW	8.20	0.86	0.85
5.5 kW	10.50	0.90	0.84
7.5 kW	14.30	0.90	0.86

Observe motor name plate data

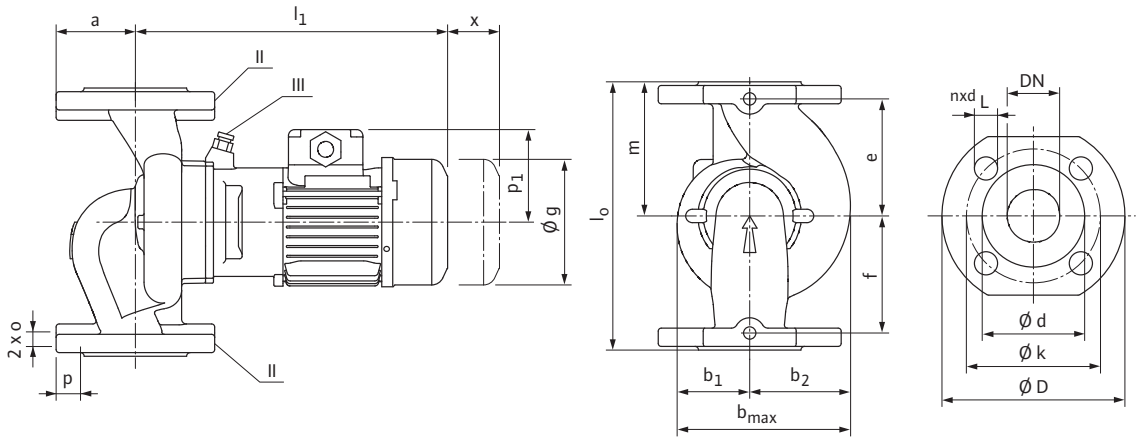
Dimensions, weights Wilo-VeroLine-IPL

Dimension drawing A



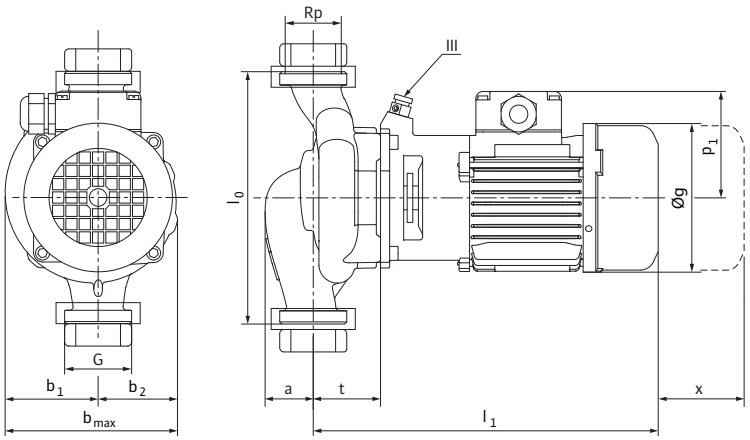
Note:
Housing with feet for installation on a base, brackets on request; II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimension drawing B



Note:
Housing with feet for installation on a base, brackets on request; II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimension drawing C



III Ventilation $R^1/_8$

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-VeroLine-IPL

Dimensions, weights (1450 rpm with flange connection)

Wilo-VeroLine-IPL ...	Nominal flange diameter	Overall length	Dimensions														Impeller*	Weight approx.	Dimension drawing
	DN	l_0	A	b_1	b_2	b_{max}	c	e	f	Ø g	l_{1max}	m	o	p	p_1	x	–	M	–
	–	[mm]											–	[mm]			–	[kg]	–
32/110-0.25/4	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	120	150	CI	20	A
32/160-0.25/4	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	120	150	CI	20	A
40/80-0.09/4	40	250	65	68	78	146	–	110	110	125	272	125	M10	20	107	150	CI	13	B
40/110-0.12/4	40	250	90	80	90	170	90	40	50	143	294	125	M10	20	120	150	CI	18	B
40/130-0.25/4	40	320	75	113	121	234	90	40	50	143	289	160	M10	20	120	150	CI	21	A
40/160-0.37/4	40	320	75	113	121	234	90	40	50	143	289	160	M10	20	120	150	CI	22	A
50/110-0.25/4	50	280	83	91	101	192	90	40	50	143	300	140	M10	20	120	150	CI	22	A
50/130-0.37/4	50	340	86	116	131	247	104	40	50	143	291	170	M10	20	120	150	CI	25	A
50/160-0.55/4	50	340	86	116	131	247	104	40	50	185	327	170	M10	20	128	150	CI	27	A
65/120-0.25/4	65	340	93	119	138	257	135	40	55	143	297	170	M10	20	120	150	CI	26	A
65/130-0.37/4	65	340	93	119	138	257	135	40	55	143	297	170	M10	20	120	150	CI	27	A
65/140-0.55/4	65	340	93	119	138	257	135	40	55	185	333	170	M10	20	128	150	CI	30	A
65/150-0.75/4	65	340	93	119	138	257	135	40	55	185	333	170	M10	20	128	150	CI	31	A
80/130-0.75/4	80	360	105	125	153	278	135	40	55	185	339	180	M10	20	128	150	CI	34	A
80/150-1.1/4	80	360	105	125	153	278	135	40	55	185	339	180	M10	20	128	150	CI	35	A
100/135-1.1/4	100	500	120	159	197	356	200	226	60	176	398	250	M12	20	148	150	CI	69	A
100/145-1.5/4	100	500	120	159	197	356	200	226	60	176	423	250	M12	20	148	150	CI	69	A
100/165-2.2/4	100	500	120	159	197	356	200	226	60	196	450	250	M12	20	155	150	CI	76	A
100/175-3/4	100	500	120	159	197	356	200	226	60	196	450	250	M12	20	155	150	CI	77	A

Note concerning l_1
For version N (standard motor), the dimensions depend on the motor version
*impeller material: CI grey cast iron; P plastic

Dimensions, weights

Wilo-VeroLine-IPL ...	Thread	Screwed connection	Overall length	Dimensions									Impeller*	Weight approx.	Dimension drawing
	G	Rp	l_0	A	b_1	b_2	b_{max}	Ø g	l_1	p_1	t	x	–	M	–
	–		[mm]										–	[kg]	–
25/70-0.12/2	1½	1	180	34	66	57	123	106	247	76	48	100	CI	6.5	C
25/80-0.12/2	1½	1	180	34	66	57	123	106	247	76	48	100	CI	6.5	C
25/85-0.18/2	1½	1	180	52	69	68	137	125	251	107	44	100	CI	8.0	C
25/90-0.25/2	1½	1	180	52	69	68	137	125	251	107	44	100	CI	8.6	C
30/70-0.12/2	2	1¼	180	34	66	57	123	106	254	76	55	100	CI	6.5	C
30/80-0.12/2	2	1¼	180	34	66	57	123	106	254	76	55	100	CI	6.5	C
30/85-0.18/2	2	1¼	180	52	69	68	137	125	251	107	44	100	CI	8.0	C
30/90-0.25/2	2	1¼	180	52	69	68	137	125	251	107	44	100	CI	8.6	C

*impeller material: CI grey cast iron; P plastic

Dimensions, weights Wilo-VeroLine-IPL

Dimensions, weights

Wilo-VeroLine-IPL ...	Nominal flange diameter	Overall length	Dimensions														Impeller*	Weight approx.	Dimension drawing
	DN	l_0	A	b_1	b_2	b_{max}	c	e	f	Ø g	l_{1max}	m	o	p	p_1	x	–	M	–
	–	[mm]											–	[mm]			–	[kg]	–
32/90-0.37/2	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	120	150	CI	20	A
32/100-0.55/2	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	120	150	CI	20	A
32/110-0.75/2	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	120	150	CI	22	A
32/130-1.1/2	32	260	70	101	106	207	90	40	50	185	331	130	M10	20	128	150	CI	24	A
32/160-1.1/2	32	260	70	101	106	207	90	40	50	185	331	130	M10	20	128	150	CI	24	A
32/165-3/2	32	320	100	112	124	236	120	132	68	217	396	155	M10	20	160	150	CI	43	A
32/175-4/2	32	320	100	112	124	236	120	132	68	220	412	155	M10	20	168	150	CI	50	A
40/70-0.12/2	40	220	65	75	84	159	–	95	95	106	259	110	M10	20	76	150	CI	11	B
40/90-0.37/2	40	250	90	80	90	170	90	40	50	143	294	125	M10	20	120	150	CI	19	A
40/115-0.55/2	40	250	90	80	90	170	90	40	50	143	294	125	M10	20	120	150	CI	19	A
40/120-1.5/2	40	320	75	113	121	234	90	40	50	185	325	160	M10	20	128	150	CI	30	A
40/130-2.2/2	40	320	75	113	121	234	90	40	50	193	353	160	M10	20	151	150	CI	32	A
40/150-3/2	40	320	75	113	121	234	90	40	50	217	388	160	M10	20	160	150	CI	37	A
40/160-4/2	40	320	75	113	121	234	90	40	50	232	421	160	M10	20	168	150	CI	44	A
40/165-4/2	40	340	82	113	129	242	130	149	58	220	426	170	M10	20	168	150	CI	54	A
40/175-5.5/2	40	340	82	113	129	242	130	149	58	232	446	170	M10	20	168	150	CI	55	A
40/195-7.5/2	40	440	110	145	149	294	180	172	78	279	520	190	M10	20	188	150	CI	84	A
50/115-0.75/2	50	280	83	91	101	192	90	40	50	143	300	140	M10	20	120	150	CI	24	A
50/120-1.5/2	50	340	86	116	131	247	104	40	50	185	327	170	M10	20	128	150	CI	33	A
50/130-2.2/2	50	340	86	116	131	247	104	40	50	193	349.5	170	M10	20	151	150	CI	35	A
50/140-3/2	50	340	86	116	131	247	104	40	50	217	390	170	M10	20	160	150	CI	40	A
50/150-4/2	50	340	86	116	131	247	104	40	50	232	423	170	M10	20	168	150	CI	47	A
50/155-4/2	50	340	105	102	119	232	140	130	40	232	463	150	M10	20	168	150	CI	60	A
50/165-5.5/2	50	340	103	120	138	279	164	143	48	279	526	170	M10	20	188	150	CI	76	A
50/175-5.5/2	50	340	103	120	138	279	164	143	48	279	526	170	M10	20	188	150	CI	76	A
50/175-7.5/2	50	340	103	120	138	279	164	143	48	279	526	170	M10	20	188	150	CI	84	A
50/185-7.5/2	50	440	120	145	150	295	160	170	70	279	521	190	M10	20	188	100	CI	86	A
65/115-1.5/2	65	340	93	100	118	218	104	40	50	193	360.5	170	M10	20	151	150	CI	34	A
65/120-2.2/2	65	340	93	119	138	257	135	40	55	193	356	170	M10	20	151	150	CI	37	A
65/130-3/2	65	340	93	119	138	257	135	40	55	217	396	170	M10	20	160	150	CI	42	A
65/140-4/2	65	340	93	119	138	257	135	40	55	232	429	170	M10	20	168	150	CI	49	A
65/145-5.5/2	65	340	120	112	134	279	140	140	60	279	531	160	M12	20	188	150	CI	78	A
65/155-5.5/2	65	340	120	112	134	279	140	140	60	279	531	160	M12	20	188	150	CI	78	A
65/155-7.5/2	65	340	120	112	134	279	140	140	60	279	531	160	M12	20	188	150	CI	86	A
65/165-5.5/2	65	430	110	126	146	279	180	195	60	279	532	215	M12	20	188	150	CI	80	A
65/175-5.5/2	65	430	110	126	146	279	180	195	60	279	532	215	M12	20	188	150	CI	81	A
65/175-7.5/2	65	430	110	126	146	279	180	195	60	279	532	215	M12	20	188	150	CI	89	A
80/115-2.2/2	80	360	100	110	135	245	135	40	55	193	378	180	M10	20	151	150	CI	40	A
80/130-3/2	80	360	105	125	153	278	135	40	55	217	402	180	M10	20	160	150	CI	46	A
80/140-4/2	80	360	105	125	153	278	135	40	55	232	435	180	M10	20	168	150	CI	53	A
80/145-5.5/2	80	400	105	123	151	279	180	173	57	279	548	200	M12	20	188	150	CI	85	A

Dimensions, weights Wilo-VeroLine-IPL

Dimensions, weights

Wilo-VeroLine-IPL ...	Nominal flange diameter	Overall length	Dimensions														Impeller*	Weight approx.	Dimension drawing
	DN	l_0	A	b_1	b_2	b_{max}	c	e	f	Ø g	l_{1max}	m	o	p	p_1	x	–	M	–
	–	[mm]											–	[mm]			–	[kg]	–
80/155-7.5/2	80	400	105	123	151	279	180	173	57	279	548	200	M12	20	188	120	CI	93	A

Note concerning l_1
For version N (standard motor), the dimensions depend on the motor version
*impeller material: CI grey cast iron; P plastic

Flange dimensions

Wilo-VeroLine-IPL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19
100...	100	220	156	180	8 x 19

Pump flange dimensions - drilled according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-CronoLine-IL

Design
Glanded pump in in-line design with flange connection

Application
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**IL 40/160-4/2**
IL	In-line pump
40	Nominal diameter DN of the pipe connection
160	Nominal impeller diameter
4	Nominal motor power P_2 in kW
2	Number of poles

Technical data
- Permissible temperature range -20°C to +140°C
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter DN 32 to DN 250
- Max. operating pressure 16 bar (25 bar on request)

Special features/product benefits
- Reduced life cycle costs due to optimised efficiency
- Standard condensate drainage holes in the motor housings
- Can be used flexibly in air-conditioning and cooling systems, with application benefits due direct draining of condensate via optimised lantern design (patented)
- High corrosion protection due to cataphoretic coating
- Easy to install due to feet with threaded holes on pump housing
- Bidirectional mechanical seal with forced flushing
- High degree of availability due to worldwide obtainability of standard motors (in accordance with Wilo specifications) and mechanical seals

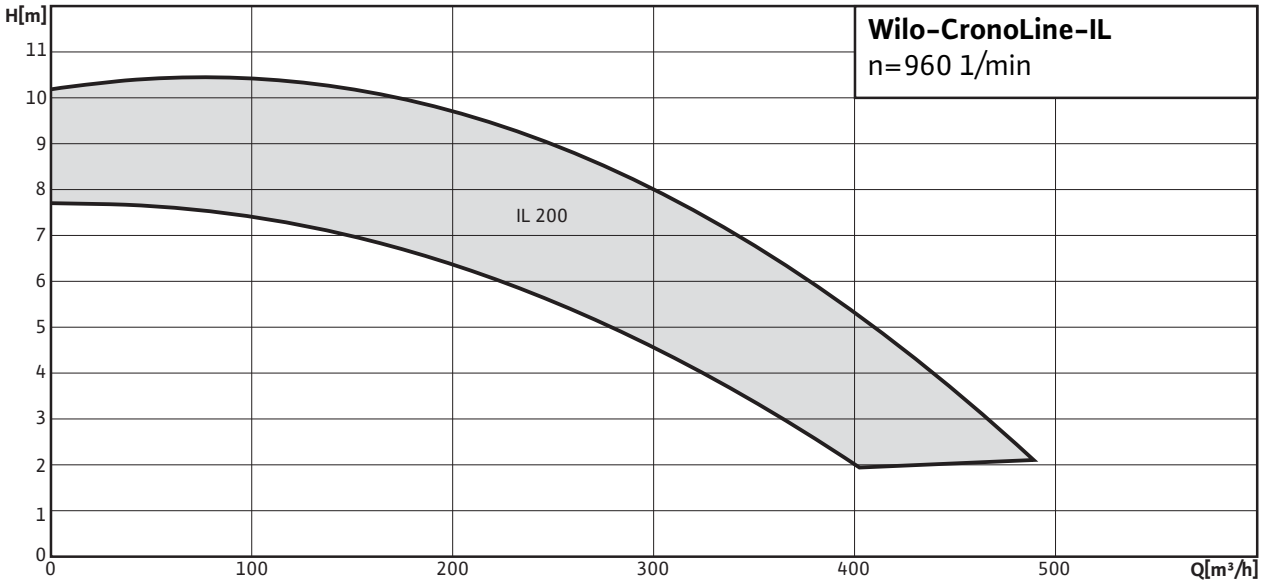
Materials
- Pump housing and lantern: Standard: EN-GJL-250; optionally spheroidal cast iron EN-GJS-400-18-LT
- Impeller: Standard: EN-GJL-200; Special version: Red brass G-CuSn10
- Shaft: 1.4122
- Mechanical seal: AQ1EGG; other mechanical seals on request

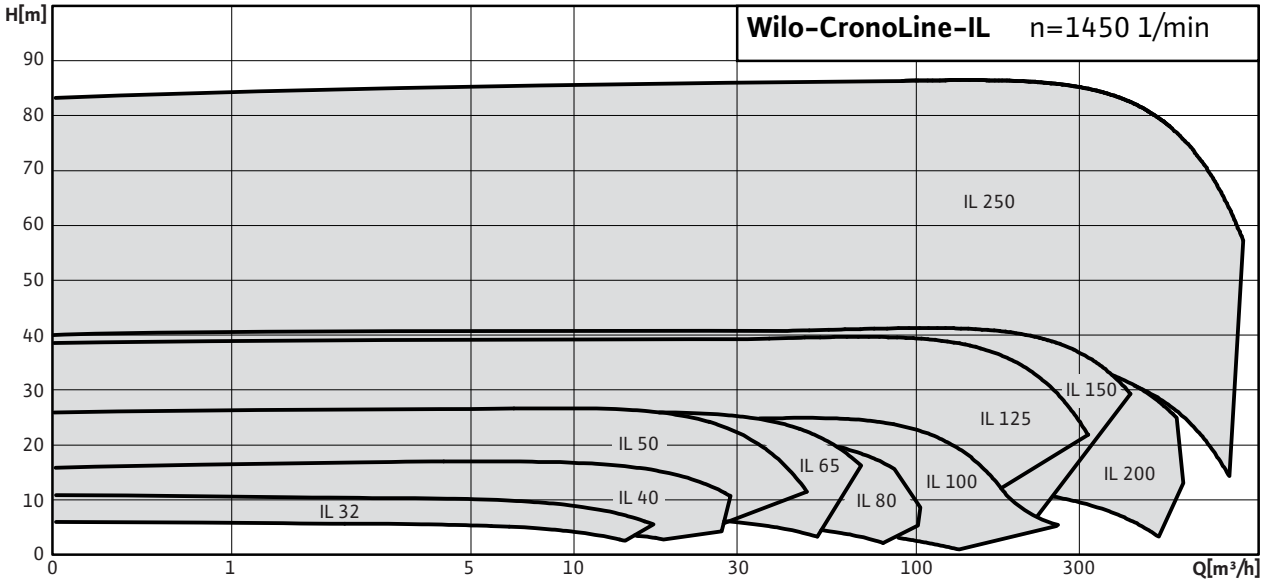
Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection with pressure measuring connection R $^1/_8$
- Lantern
- Coupling
- IEC standard motor

Standard pumps

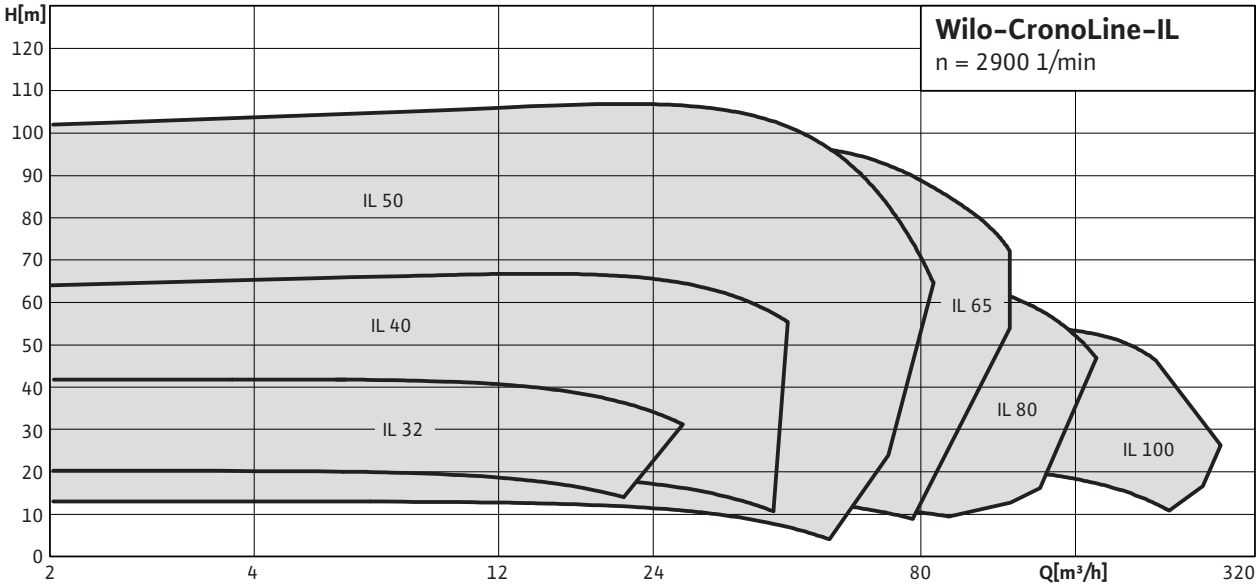
Single pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-CronoLine-IL





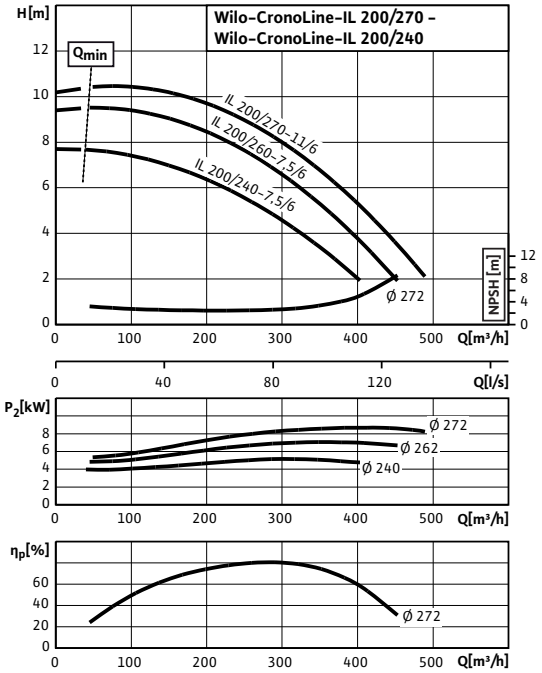
Series description Wilo-CronoLine-IL



Pump curves Wilo-CronoLine-IL

Wilo-CronoLine-IL 200/240-7,5/6 - 200/270-11/6

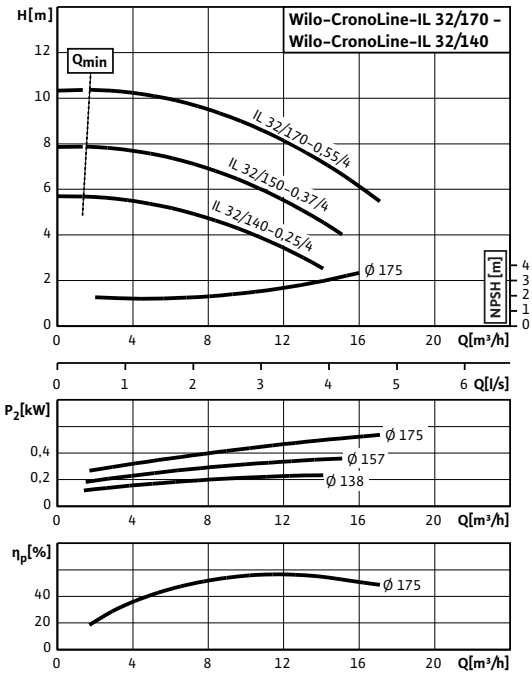
Speed 960 rpm



Pump curves Wilo-CronoLine-IL

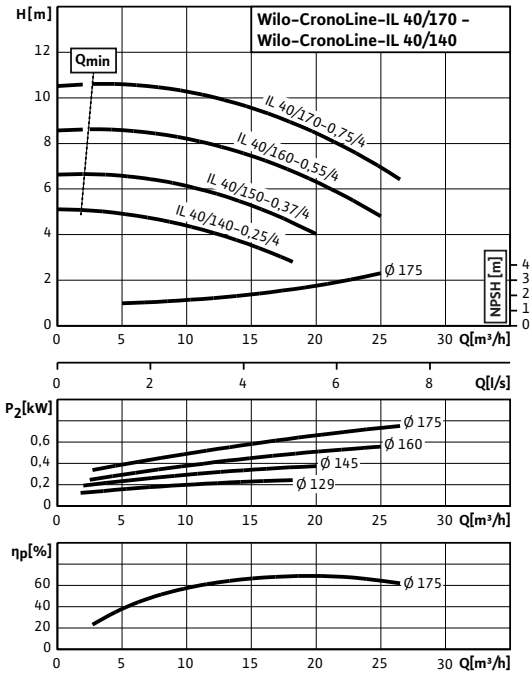
Wilo-CronoLine-IL 32/140-0,25/4 - 32/170-0,55/4

Speed 1450 rpm



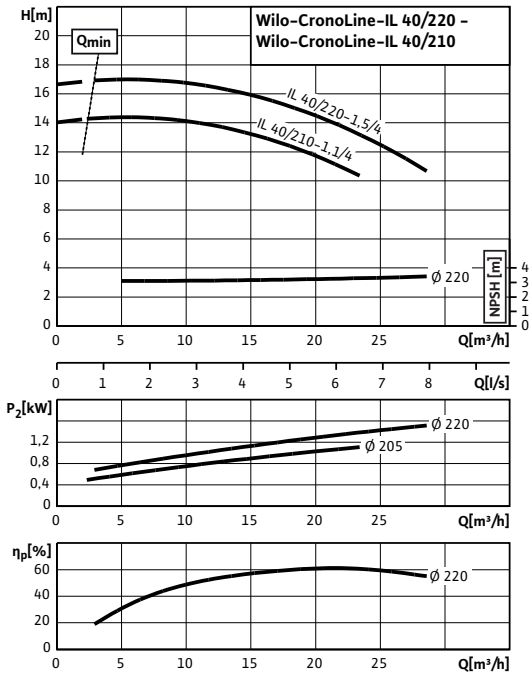
Wilo-CronoLine-IL 40/140-0,25/4 - 40/170-0,75/4

Speed 1450 rpm



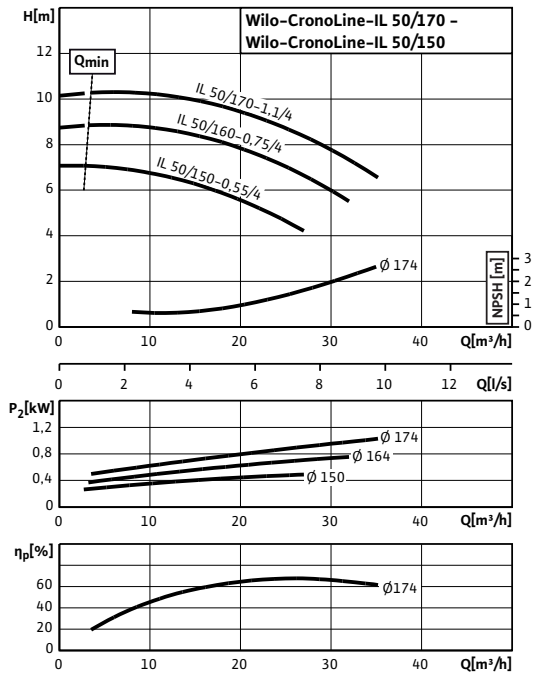
Wilo-CronoLine-IL 40/210-1,1/4 - 40/220-1,5/4

Speed 1450 rpm



Wilo-CronoLine-IL 50/150-0,55/4 - 50/170-1,1/4

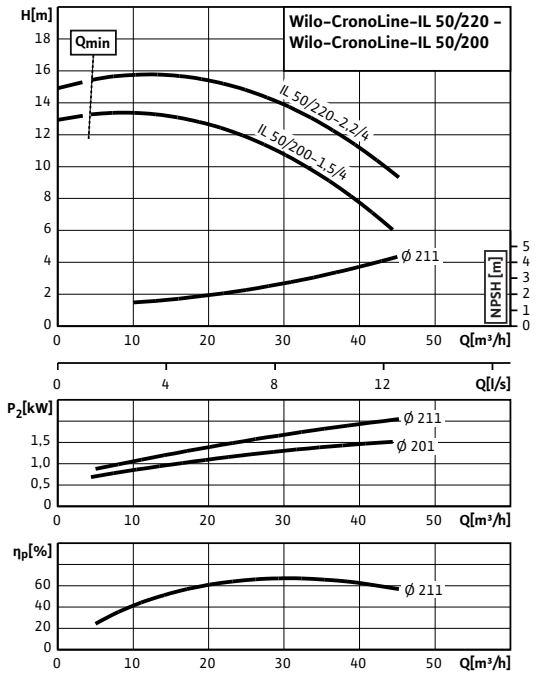
Speed 1450 rpm



Pump curves Wilo-CronoLine-IL

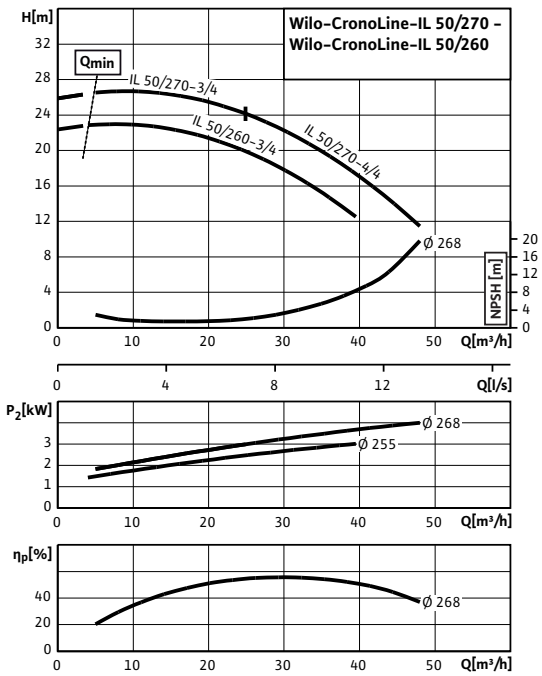
Wilo-CronoLine-IL 50/200-1,5/4 - 50/220-2,2/4

Speed 1450 rpm



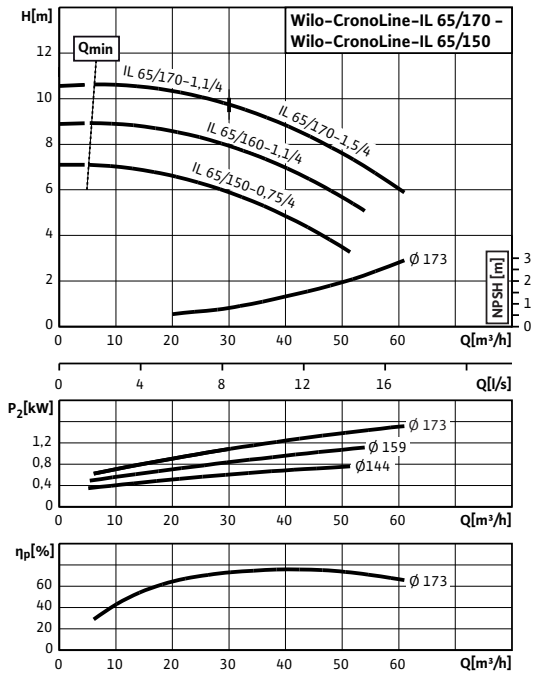
Wilo-CronoLine-IL 50/260-3/4 - 50/270-4/4

Speed 1450 rpm



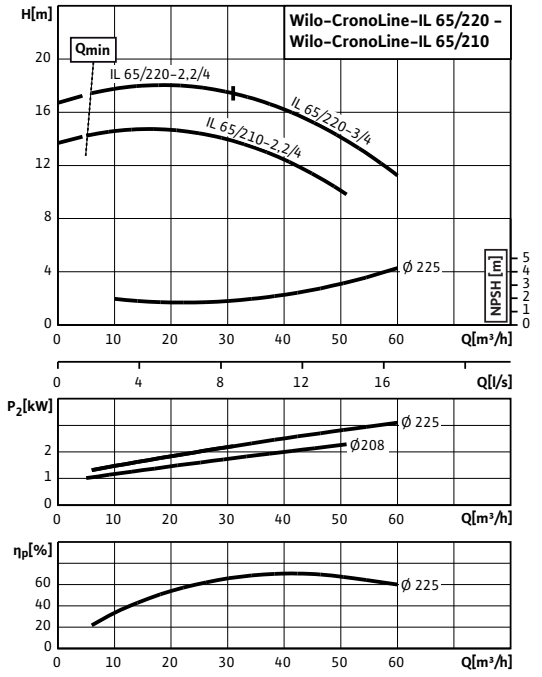
Wilo-CronoLine-IL 65/150-0,75/4 - 65/170-1,5/4

Speed 1450 rpm



Wilo-CronoLine-IL 65/210-2,2/4 - 65/220-3/4

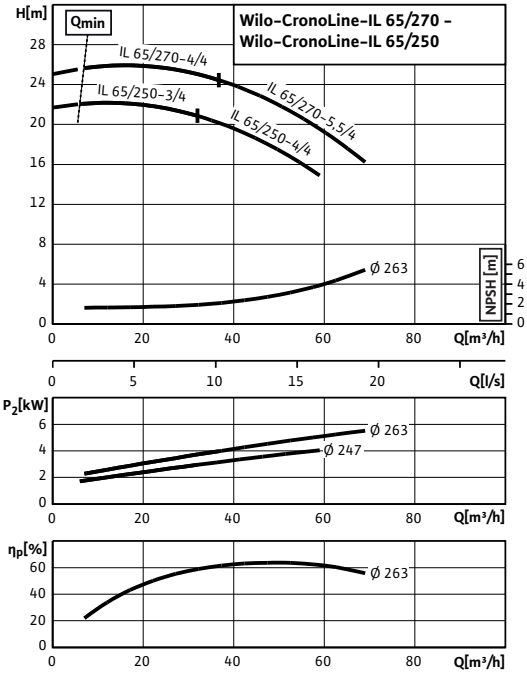
Speed 1450 rpm



Pump curves Wilo-CronoLine-IL

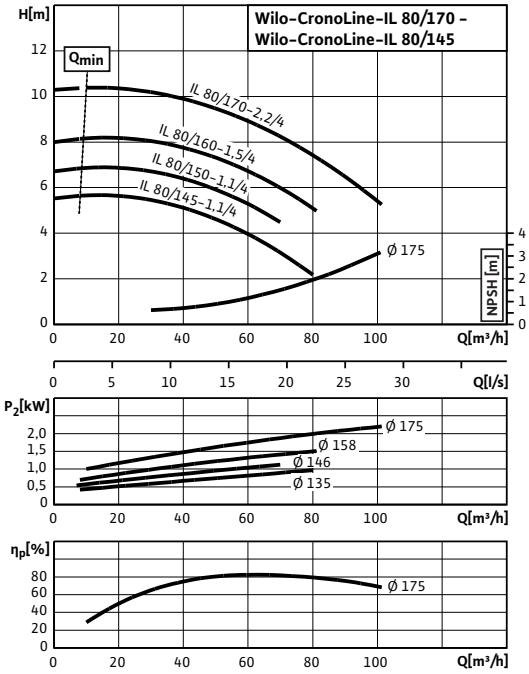
Wilo-CronoLine-IL 65/250-3/4 - 65/270-5,5/4

Speed 1450 rpm



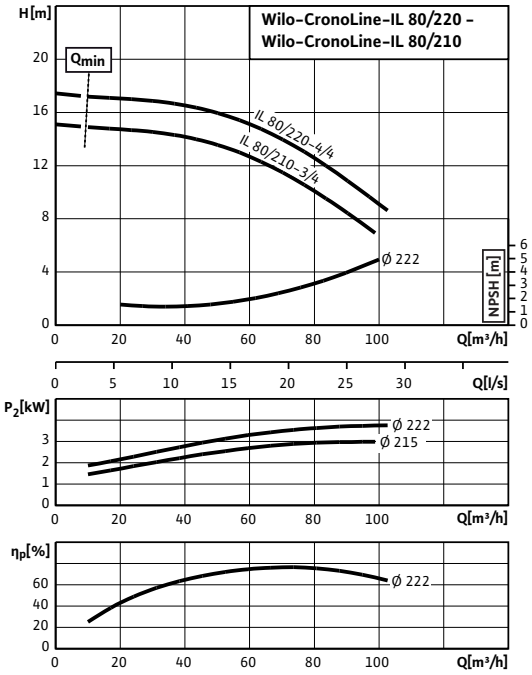
Wilo-CronoLine-IL 80/145-1,1/4 - 80/170-2,2/4

Speed 1450 rpm



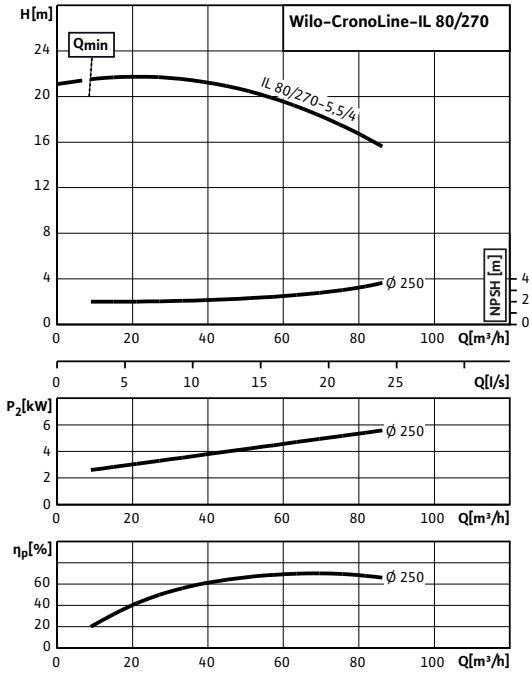
Wilo-CronoLine-IL 80/210-3/4 - 80/220-4/4

Speed 1450 rpm



Wilo-CronoLine-IL 80/270-5,5/4

Speed 1450 rpm



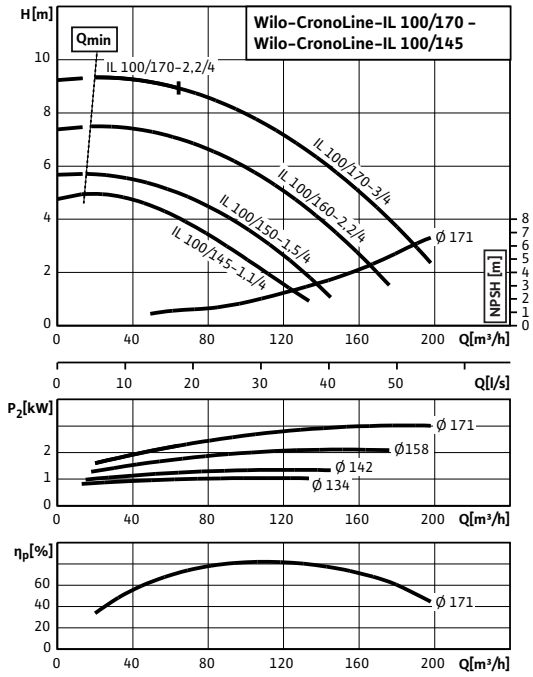
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL

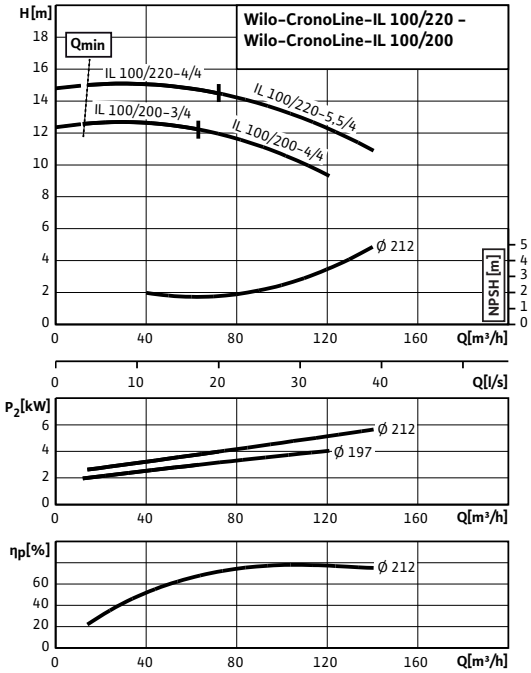
Wilo-CronoLine-IL 100/145-1,1/4 - 100/170-3/4

Speed 1450 rpm



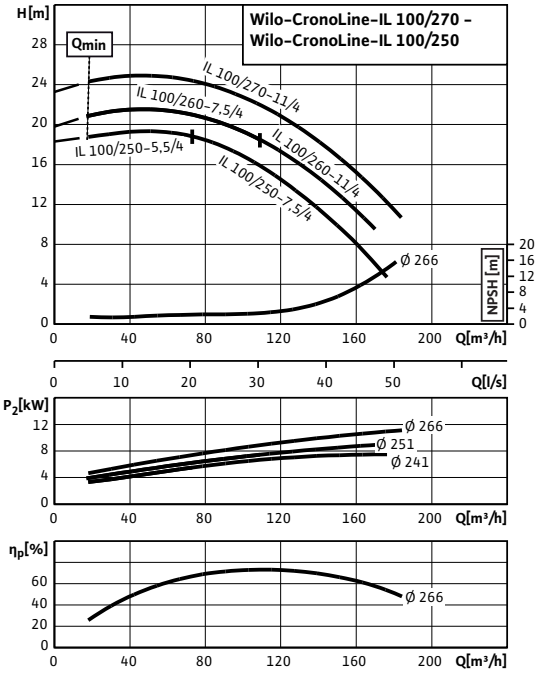
Wilo-CronoLine-IL 100/200-3/4 - 100/220-5,5/4

Speed 1450 rpm



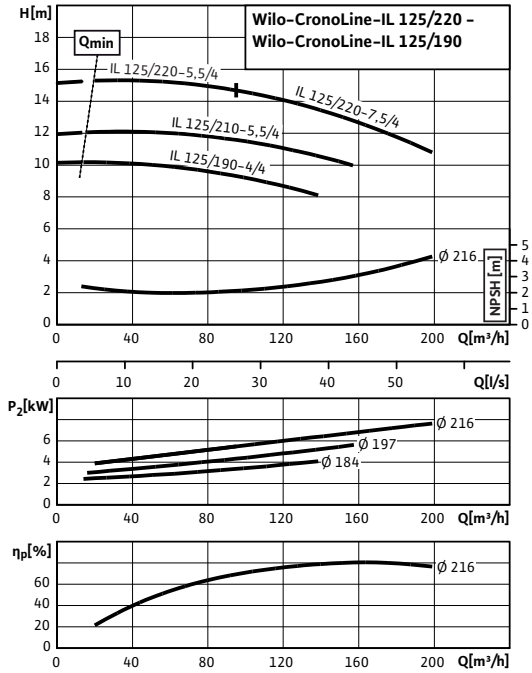
Wilo-CronoLine-IL 100/250-5,5/4 - 100/270-11/4

Speed 1450 rpm



Wilo-CronoLine-IL 125/190-4/4 - 125/220-7,5/4

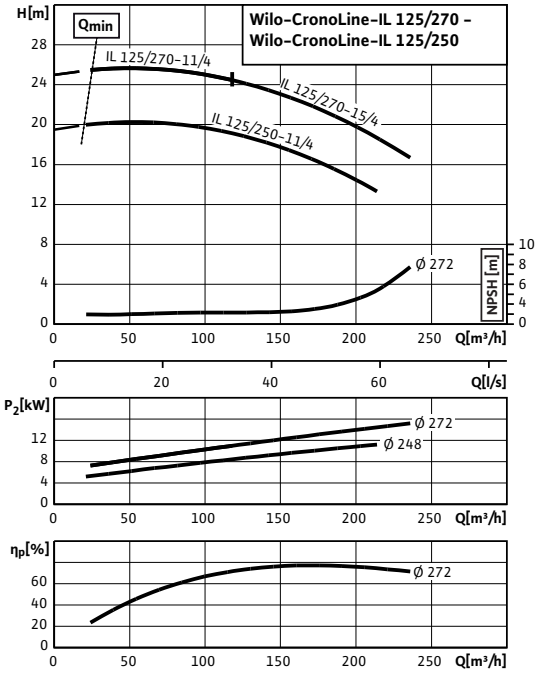
Speed 1450 rpm



Pump curves Wilo-CronoLine-IL

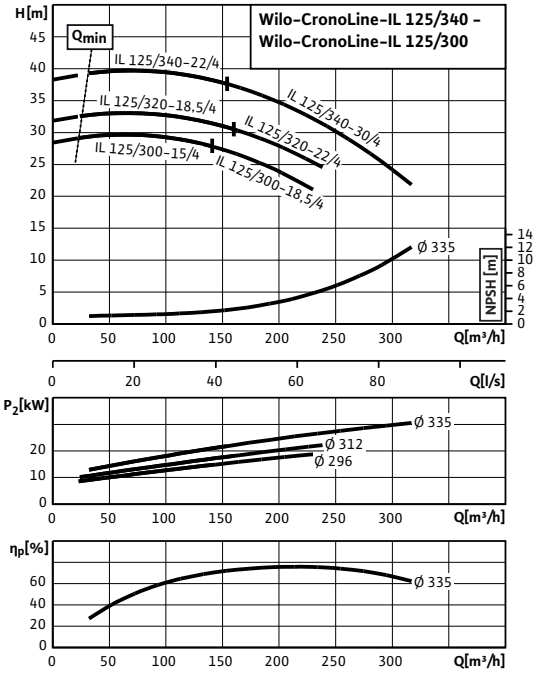
Wilo-CronoLine-IL 125/250-11/4 - 125/270-15/4

Speed 1450 rpm



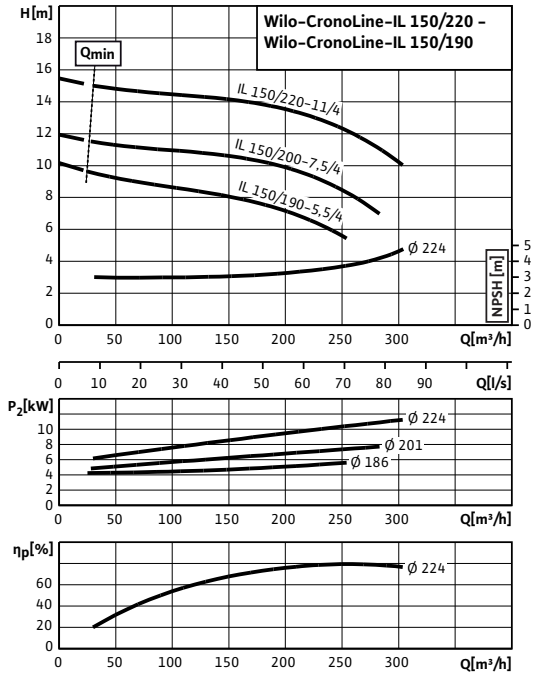
Wilo-CronoLine-IL 125/300-15/4 - 125/340-30/4

Speed 1450 rpm



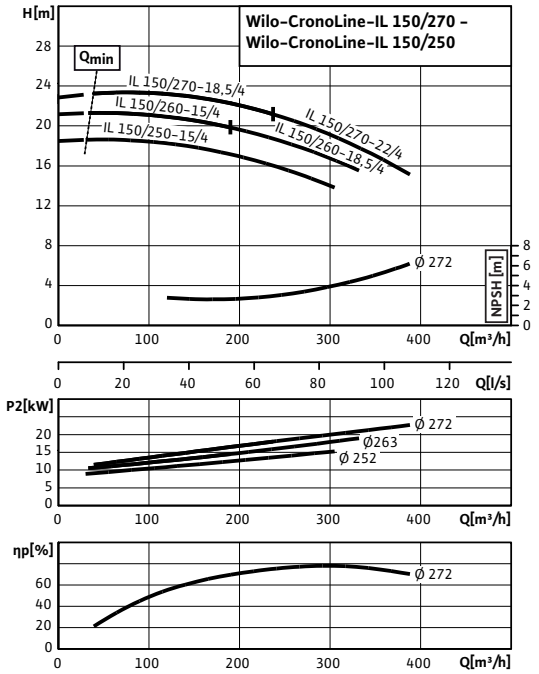
Wilo-CronoLine-IL 150/190-5,5/4 - 150/220-11/4

Speed 1450 rpm



Wilo-CronoLine-IL 150/250-15/4 - 150/270-18,5/4

Speed 1450 rpm



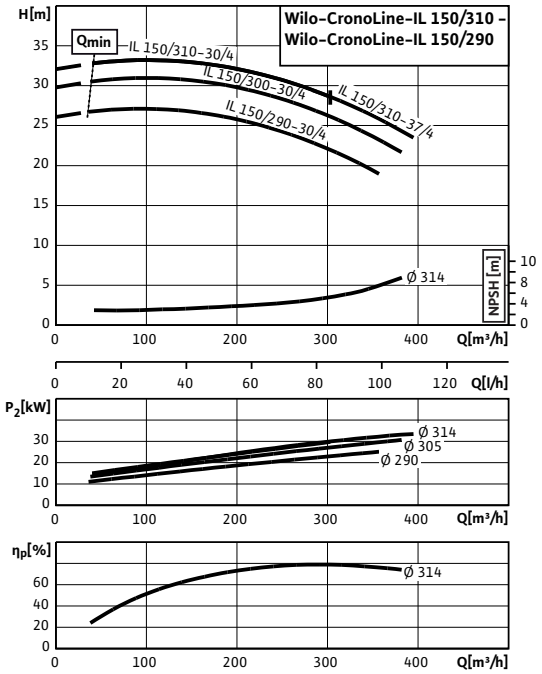
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL

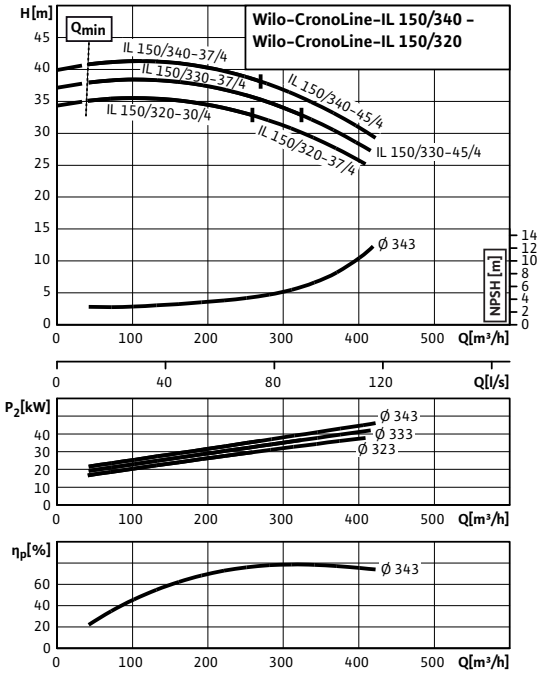
Wilo-CronoLine-IL 150/290-30/4 - 150/310-37/4

Speed 1450 rpm



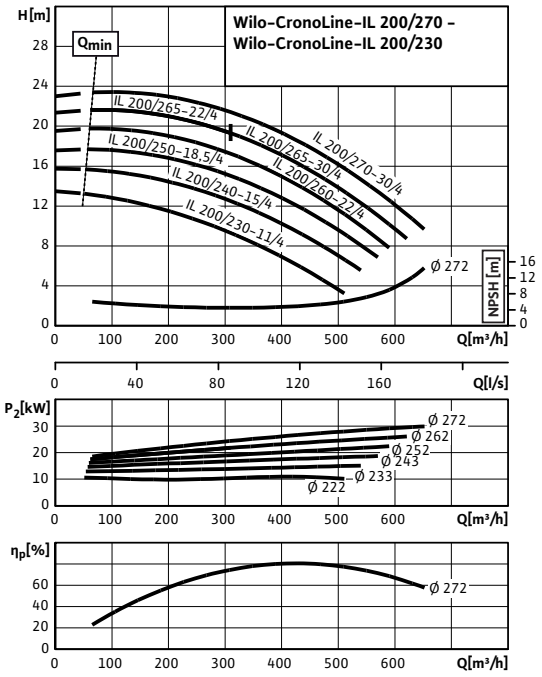
Wilo-CronoLine-IL 150/320-30/4 - 150/340-45/4

Speed 1450 rpm



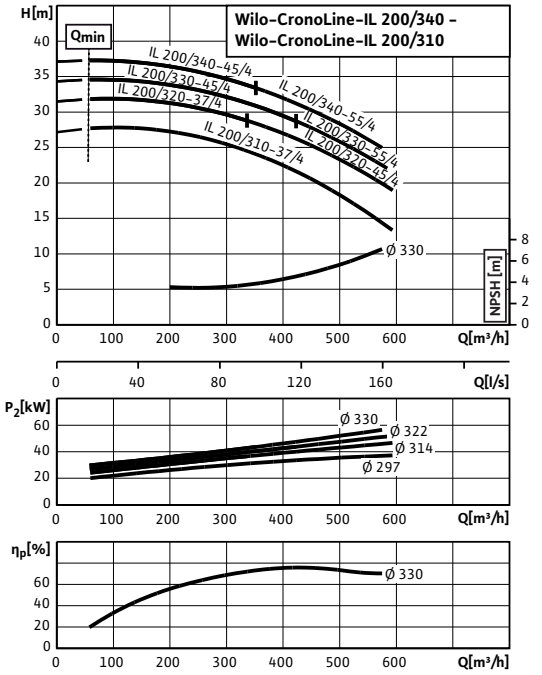
Wilo-CronoLine-IL 200/230-11/4 - 200/270-30/4

Speed 1450 rpm



Wilo-CronoLine-IL 200/310-37/4 - 200/340-55/4

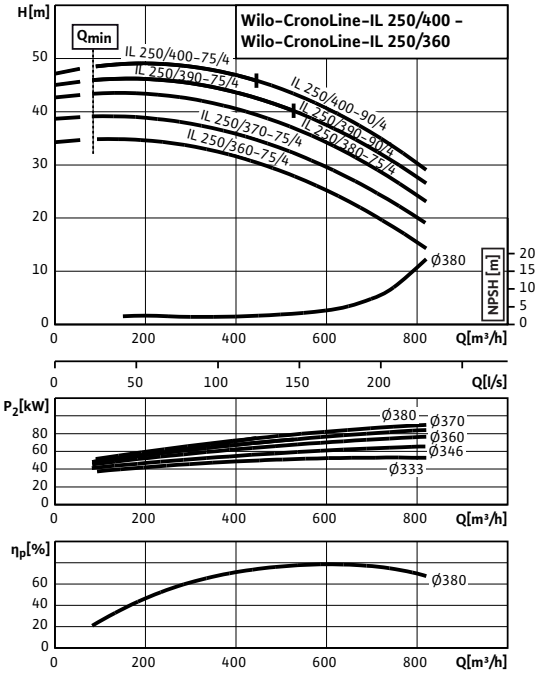
Speed 1450 rpm



Pump curves Wilo-CronoLine-IL

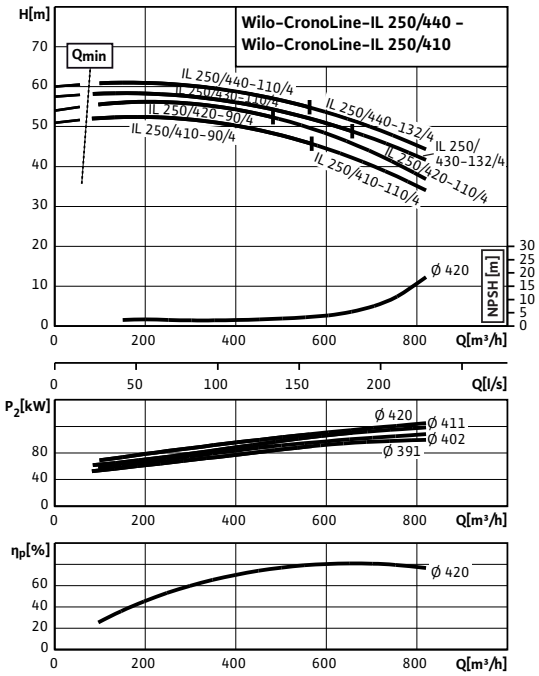
Wilo-CronoLine-IL 250/360-75/4 - 250/400-90/4

Speed 1450 rpm



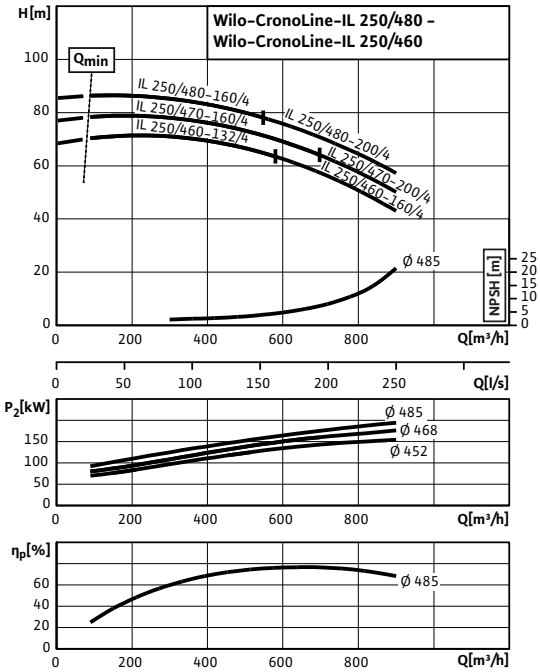
Wilo-CronoLine-IL 250/410-90/4 - 250/440-132/4

Speed 1450 rpm



Wilo-CronoLine-IL 250/460-132/4 - 250/480-200/4

Speed 1450 rpm



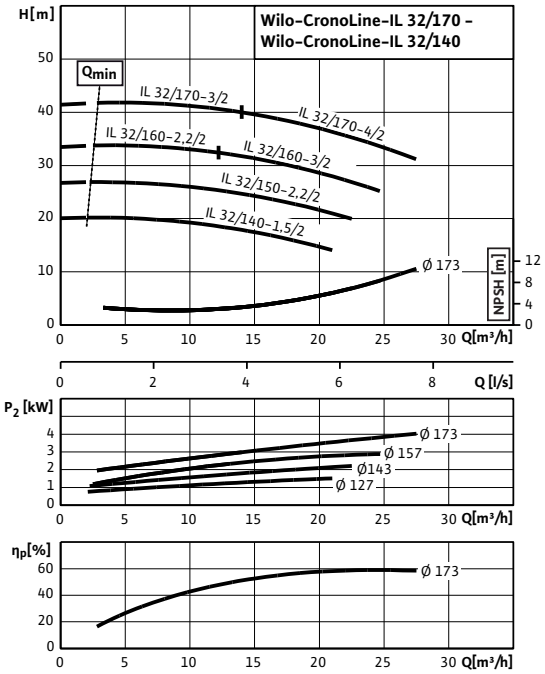
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL

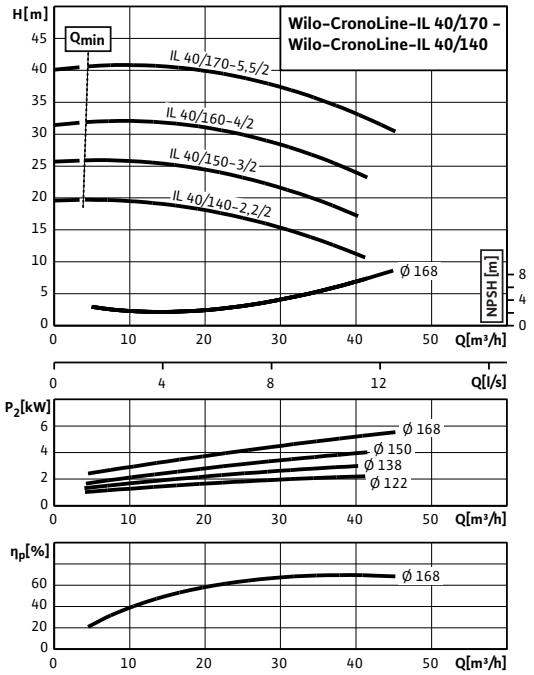
Wilo-CronoLine-IL 32/140-1,5/2 - 32/170-4/2

Speed 2900 rpm



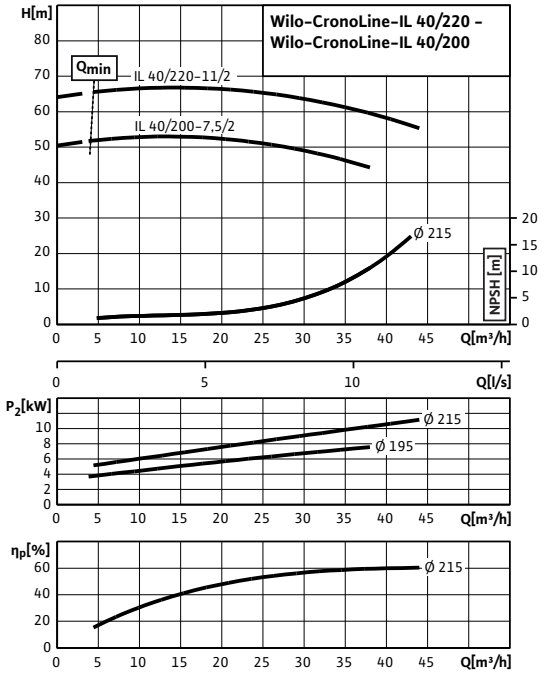
Wilo-CronoLine-IL 40/140-2,2/2 - 40/170-5,5/2

Speed 2900 rpm



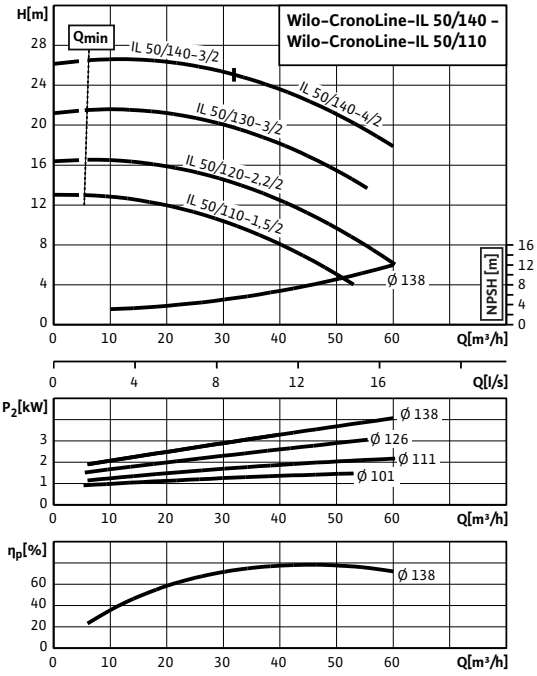
Wilo-CronoLine-IL 40/200-7,5/2 - 40/220-11/2

Speed 2900 rpm



Wilo-CronoLine-IL 50/110-1,5/2 - 50/140-4/2

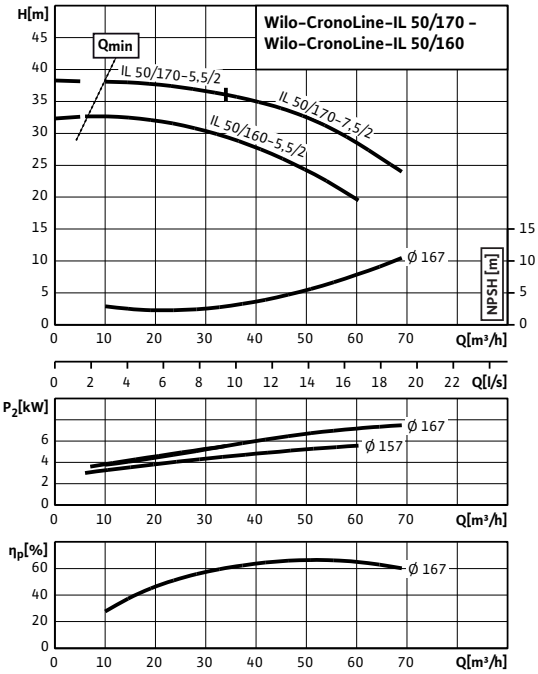
Speed 2900 rpm



Pump curves Wilo-CronoLine-IL

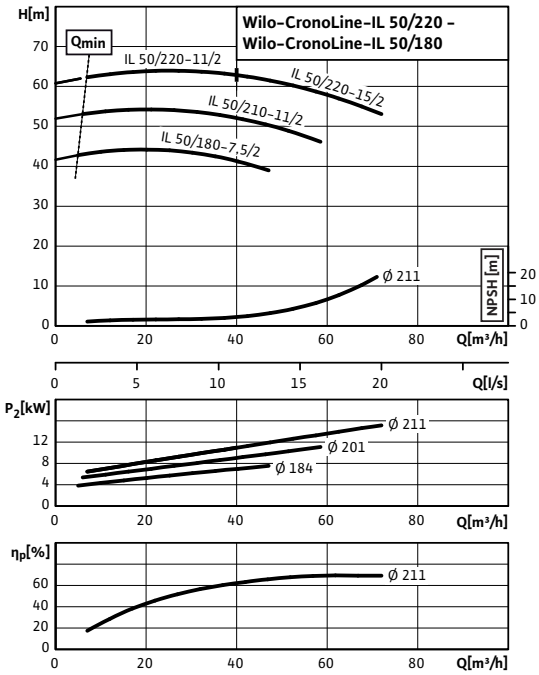
Wilo-CronoLine-IL 50/160-5,5/2 - 50/170-7,5/2

Speed 2900 rpm



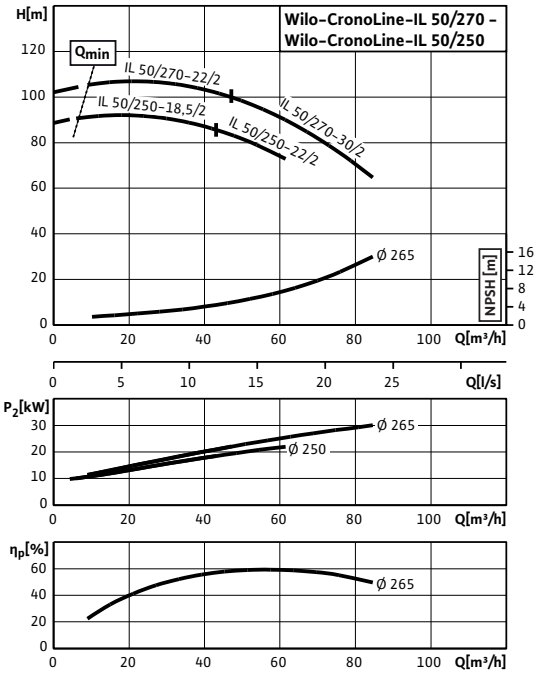
Wilo-CronoLine-IL 50/180-7,5/2 - 50/220-15/2

Speed 2900 rpm



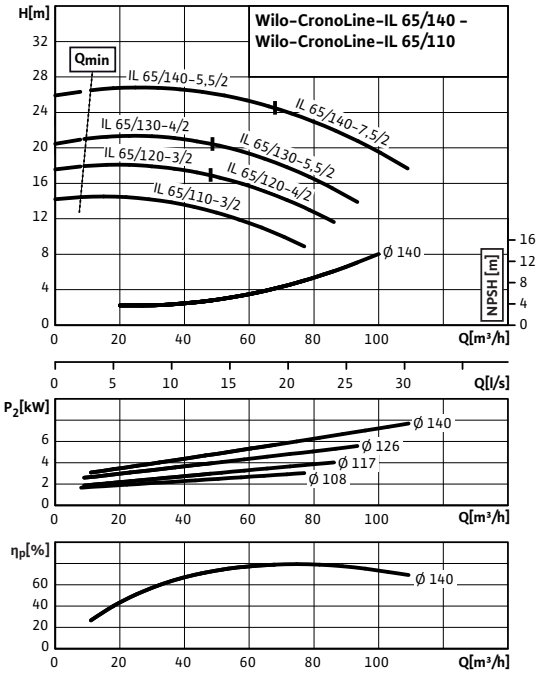
Wilo-CronoLine-IL 50/250-18,5/2 - 50/270-30/2

Speed 2900 rpm



Wilo-CronoLine-IL 65/110-3/2 - 65/140-7,5/2

Speed 2900 rpm



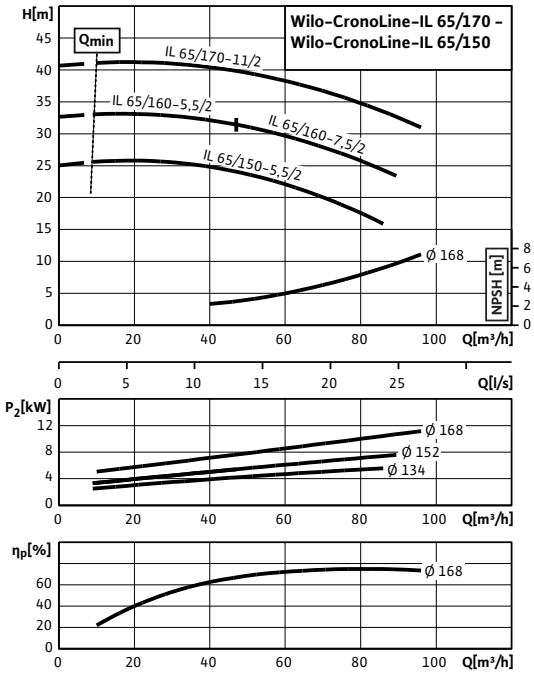
Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoLine-IL

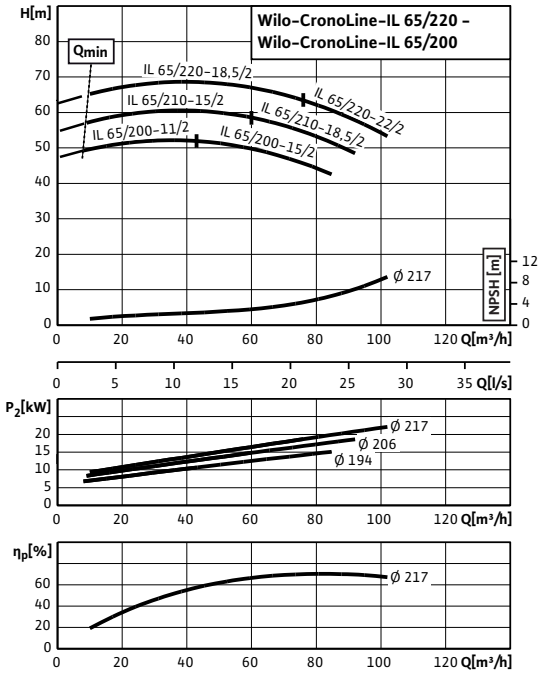
Wilo-CronoLine-IL 65/150-5,5/2 - 65/170-11/2

Speed 2900 rpm



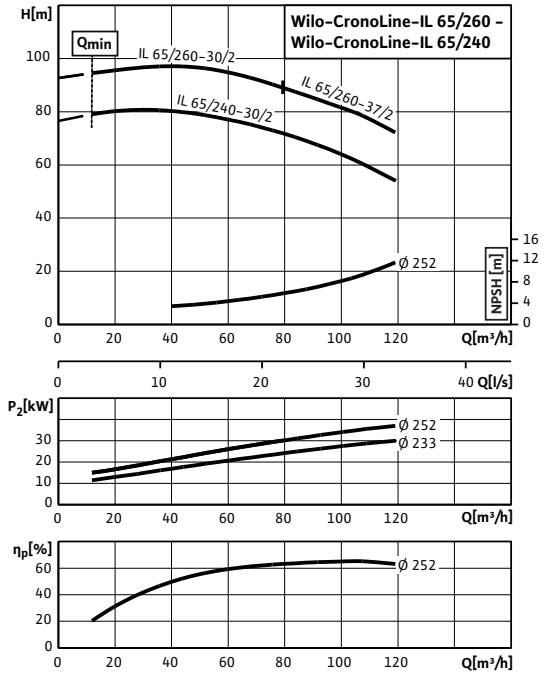
Wilo-CronoLine-IL 65/200-11/2 - 65/220-22/2

Speed 2900 rpm



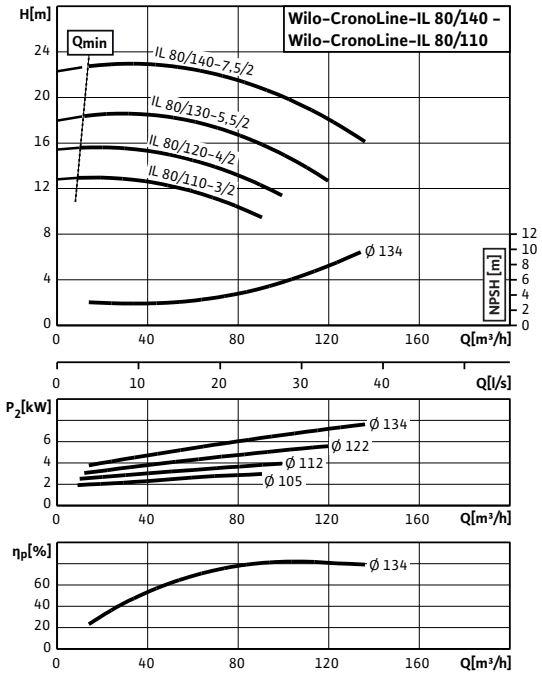
Wilo-CronoLine-IL 65/240-30/2 - 65/260-37/2

Speed 2900 rpm



Wilo-CronoLine-IL 80/120-4/2 - 80/140-7,5/2

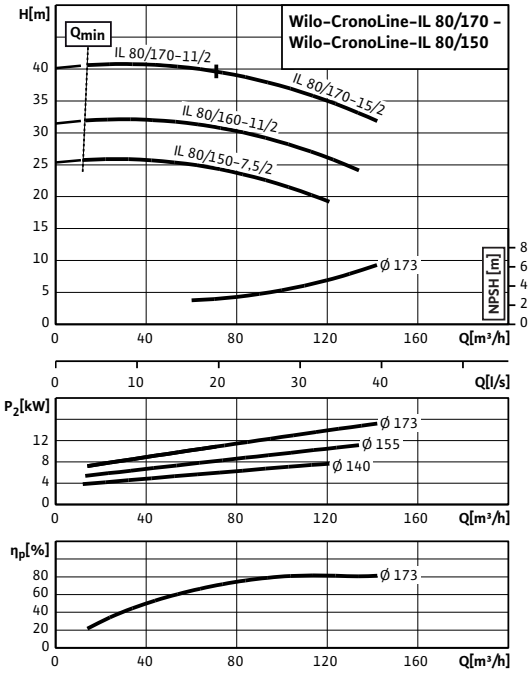
Speed 2900 rpm



Pump curves Wilo-CronoLine-IL

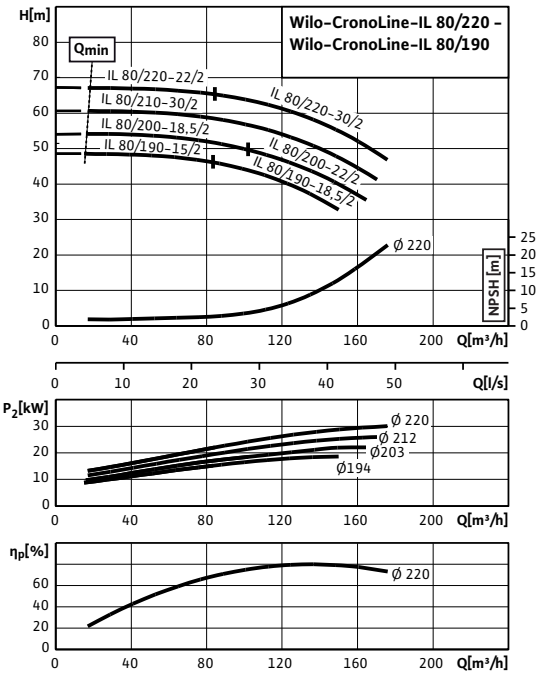
Wilo-CronoLine-IL 80/150-7,5/2 - 80/170-15/2

Speed 2900 rpm



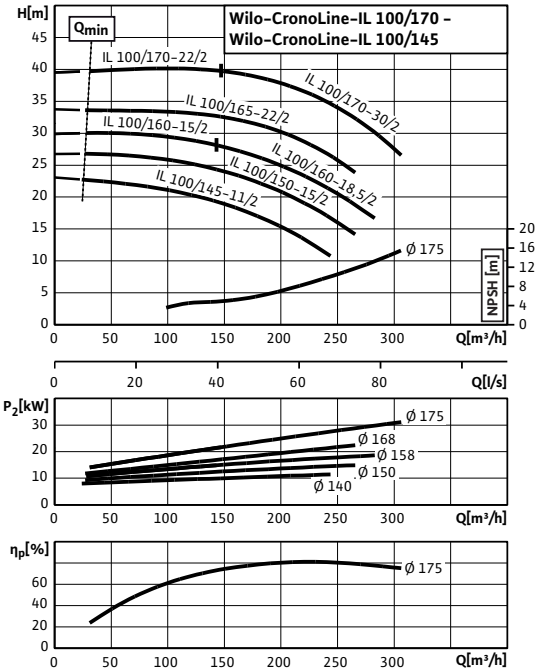
Wilo-CronoLine-IL 80/190-15/2 - 80/220-30/2

Speed 2900 rpm



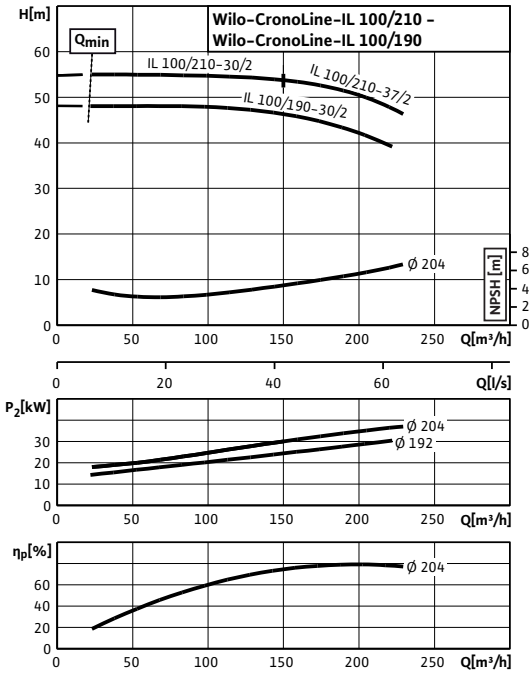
Wilo-CronoLine-IL 100/145-11/2 - 100/170-30/2

Speed 2900 rpm



Wilo-CronoLine-IL 100/190-30/2 - 100/210-37/2

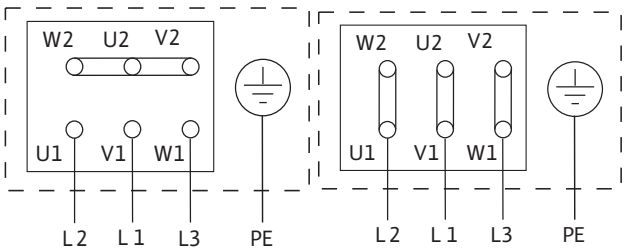
Speed 2900 rpm



Terminal diagram, motor data Wilo-CronoLine-IL

Terminal diagrams

Star switching Y **Delta switching Δ**



Motor protection switch required onsite. Check the direction of rotation.
To change the direction of rotation, swap any two phases.

$P_2 \leq 3$ kW	3~400 V Y 3~230 V Δ
$P_2 \geq 4$ kW	3~690 V Y 3~400 V Δ

After removing the bridges, Y-Δ starting is possible.

Motor data (960 rpm)

Wilo-CronoLine-IL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
7.5 kW	16.00	0.79	0.86
11 kW	24.00	0.77	0.88

Observe motor name plate data

Motor data (1450 rpm)

Wilo-CronoLine-IL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.25 kW	0.77	0.78	0.60
0.37 kW	1.06	0.78	0.65
0.55 kW	1.44	0.82	0.67
0.75 kW	1.91	0.81	0.72
1.1 kW	2.55	0.81	0.77
1.5 kW	3.40	0.81	0.79
2.2 kW	4.70	0.82	0.82
3 kW	6.40	0.82	0.83
4 kW	8.20	0.83	0.85
5.5 kW	11.40	0.81	0.86
7.5 kW	15.20	0.82	0.87
11 kW	21.50	0.84	0.89
15 kW	28.50	0.84	0.90
18.5 kW	35.50	0.83	0.91
22 kW	41.50	0.84	0.91
30 kW	55.00	0.86	0.92
37 kW	66.00	0.87	0.93
45 kW	80.00	0.87	0.93
55 kW	100.00	0.85	0.94
75 kW	136.00	0.85	0.94
90 kW	160.00	0.86	0.95
110 kW	198.00	0.85	0.95
132 kW	235.00	0.85	0.95
160 kW	280.00	0.86	0.96

Terminal diagram, motor data Wilo-CronoLine-IL

Motor data (1450 rpm)			
Wilo-CronoLine-IL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
200 kW	340.00	0.88	0.96

Observe motor name plate data

Motor data (2900 rpm)			
Wilo-CronoLine-IL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
1.5 kW	3.25	0.85	0.79
2.2 kW	4.55	0.85	0.82
3 kW	6.10	0.85	0.84
4 kW	7.80	0.86	0.86
5.5 kW	10.40	0.89	0.86
7.5 kW	13.80	0.89	0.88
11 kW	20.00	0.88	0.90
15 kW	26.50	0.90	0.90
18.5 kW	32.00	0.91	0.91
22 kW	39.50	0.88	0.92
30 kW	53.00	0.89	0.92
37 kW	65.00	0.89	0.93

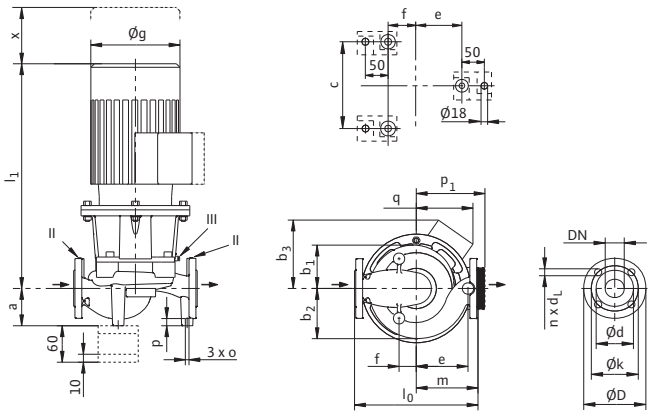
Observe motor name plate data

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoLine-IL

Dimension drawing



II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimensions, weights (960 rpm)																		
Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
200/240-7.5/6	200	800	245	281	362	–	330	270	165	323	869	370	M16	25	250	–	140	345
200/260-7.5/6	200	800	245	281	362	–	330	270	165	323	869	370	M16	25	250	–	140	345
200/270-11/6	200	800	245	281	362	–	330	270	165	370	912	370	M16	25	250	–	140	345

Dimensions, weights (1450 rpm)																		
Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
32/140-0.25/4	32	320	100	112	124	118	120	132	68	145	398	155	M10	20	–	118	150	39
32/150-0.37/4	32	320	100	112	124	118	120	132	68	145	398	155	M10	20	–	118	150	40
32/170-0.55/4	32	320	100	112	124	124	120	132	68	188	423	155	M10	20	–	124	150	43
40/140-0.25/4	40	340	82	113	129	118	130	149	58	145	412	170	M10	20	–	118	95	43
40/150-0.37/4	40	340	82	113	129	118	130	149	58	145	412	170	M10	20	–	118	95	45
40/160-0.55/4	40	340	82	113	129	124	130	149	58	188	437	170	M10	20	–	124	95	46
40/170-0.75/4	40	340	82	113	129	124	130	149	58	188	437	170	M10	20	–	124	95	48
40/210-1.1/4	40	440	110	145	149	–	180	172	78	193	471	190	M10	20	151	–	100	51
40/220-1.5/4	40	440	110	145	149	–	180	172	78	193	471	190	M10	20	151	–	100	55
50/150-0.55/4	50	340	103	120	138	124	164	143	48	188	443	170	M10	20	–	124	100	48
50/160-0.75/4	50	340	103	120	138	124	164	143	48	188	443	170	M10	20	–	124	100	50
50/170-1.1/4	50	340	103	120	138	145	164	143	48	193	483	170	M10	20	–	145	100	53
50/200-1.5/4	50	440	120	145	150	–	160	170	70	193	472	190	M10	20	151	–	100	57

Dimensions, weights Wilo-CronoLine-IL

Dimensions, weights (1450 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
50/220-2.2/4	50	440	120	145	150	–	160	170	70	217	516	190	M10	20	160	–	100	67
50/260-3/4	50	440	122	178	174	–	200	200	70	217	542	220	M10	20	160	–	120	80
50/270-3/4	50	440	122	178	174	–	200	200	70	217	542	220	M10	20	160	–	120	80
50/270-4/4	50	440	122	178	174	–	200	200	70	232	620	220	M10	20	178	–	120	87
65/150-0.75/4	65	430	110	126	146	124	180	195	60	188	449	215	M12	20	–	124	120	53
65/160-1.1/4	65	430	110	126	146	145	180	195	60	193	489	215	M12	20	–	145	120	56
65/170-1.1/4	65	430	110	126	146	145	180	195	60	193	489	215	M12	20	–	145	120	57
65/170-1.5/4	65	430	110	126	146	149	180	195	60	193	489	215	M12	20	–	149	120	60
65/210-2.2/4	65	475	130	150	168	–	200	225	50	217	525	245	M12	20	160	–	110	73
65/220-2.2/4	65	475	130	150	168	–	200	225	50	217	525	245	M12	20	160	–	110	73
65/220-3/4	65	475	130	150	168	–	200	225	50	217	525	245	M12	20	160	–	110	76
65/250-3/4	65	475	140	187	174	–	200	215	80	217	546	235	M12	20	160	–	120	85
65/250-4/4	65	475	140	187	174	–	200	215	80	232	624	235	M12	20	178	–	120	91
65/270-4/4	65	475	140	187	174	–	200	215	80	232	624	235	M12	20	178	–	120	91
65/270-5.5/4	65	475	140	187	174	–	200	215	80	279	680	235	M12	20	188	–	120	103
80/145-1.1/4	80	440	120	136	162	145	180	173	72	193	487	200	M12	20	–	145	120	63
80/150-1.1/4	80	440	120	136	162	145	180	173	72	193	487	200	M12	20	–	145	120	63
80/160-1.5/4	80	440	120	136	162	149	180	173	72	193	487	200	M12	20	–	149	120	70
80/170-2.2/4	80	440	120	136	162	156	180	173	72	217	531	200	M12	20	–	156	120	81
80/210-3/4	80	500	145	157	182	–	220	208	62	217	533	230	M12	20	160	–	120	85
80/220-4/4	80	500	145	157	182	–	220	208	62	232	611	230	M12	20	178	–	120	91
80/270-5.5/4	80	500	125	180	202	–	240	223	102	279	667	245	M12	20	188	–	115	114
100/145-1.1/4	100	500	120	159	197	145	200	226	60	193	522	250	M12	20	–	145	135	79
100/150-1.5/4	100	500	120	159	197	149	200	226	60	193	522	250	M12	20	–	149	135	82
100/160-2.2/4	100	500	120	159	197	156	200	226	60	217	565	250	M12	20	–	156	135	93
100/170-2.2/4	100	500	120	159	197	156	200	226	60	217	565	250	M12	20	–	156	135	93
100/170-3/4	100	500	120	159	197	156	200	226	60	217	565	250	M12	20	–	156	135	96
100/200-3/4	100	550	155	173	202	–	220	231	99	217	543	255	M12	20	160	–	120	98
100/200-4/4	100	550	155	173	202	–	220	231	99	232	621	255	M12	20	178	–	120	104
100/220-4/4	100	550	155	173	202	–	220	231	99	232	621	255	M12	20	178	–	120	105
100/220-5.5/4	100	550	155	173	202	–	220	231	99	279	677	255	M12	20	188	–	120	118
100/250-5.5/4	100	550	180	188	214	–	240	236	114	279	677	260	M12	20	188	–	120	132
100/250-7.5/4	100	550	180	188	214	–	240	236	114	323	718	260	M12	20	188	–	120	138
100/260-7.5/4	100	550	180	188	214	–	240	236	114	323	718	260	M12	20	188	–	120	138
100/260-11/4	100	550	180	188	214	–	240	236	114	323	800	260	M12	20	250	–	120	174
100/270-11/4	100	550	180	188	214	–	240	236	114	323	800	260	M12	20	250	–	120	174
125/190-4/4	125	620	175	177	212	–	280	266	54	232	633	280	M16	25	178	–	120	118
125/210-5.5/4	125	620	175	177	212	–	280	266	54	279	689	280	M16	25	188	–	120	134
125/220-5.5/4	125	620	175	177	212	–	280	266	54	279	689	280	M16	25	188	–	120	134
125/220-7.5/4	125	620	175	177	212	–	280	266	54	323	730	280	M16	25	188	–	120	142
125/250-11/4	125	620	200	232	264	–	250	254	125	323	813	280	M16	25	250	–	130	201

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

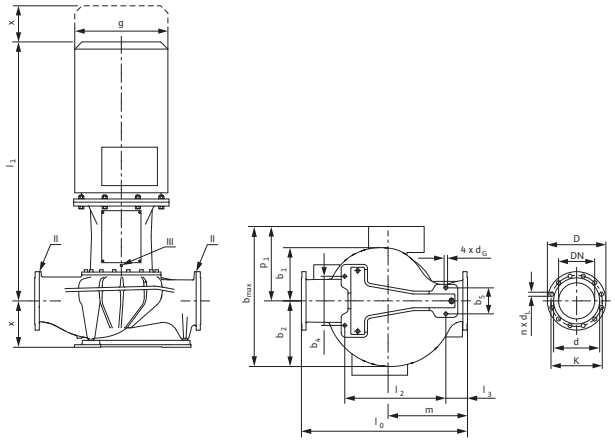
Dimensions, weights Wilo-CronoLine-IL

Dimensions, weights (1450 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
125/270-11/4	125	620	200	232	264	–	250	254	125	323	813	280	M16	25	250	–	130	201
125/270-15/4	125	620	200	232	264	–	250	254	125	370	856	280	M16	25	250	–	130	213
125/300-15/4	125	700	185	238	270	–	280	315	140	370	882	340	M16	25	250	–	140	264
125/300-18.5/4	125	700	185	238	270	–	280	315	140	370	924	340	M16	25	294	–	140	274
125/320-18.5/4	125	700	185	238	270	–	280	315	140	370	924	340	M16	25	294	–	140	274
125/320-22/4	125	700	185	238	270	–	280	315	140	370	952	340	M16	25	294	–	140	284
125/340-22/4	125	700	185	238	270	–	280	315	140	370	952	340	M16	25	294	–	140	284
125/340-30/4	125	700	185	238	270	–	280	315	140	415	1012	340	M16	25	306	–	140	330
150/190-5.5/4	150	700	200	202	249	–	260	284	116	279	702	310	M16	25	188	–	130	166
150/200-7.5/4	150	700	200	202	249	–	260	284	116	323	743	310	M16	25	188	–	130	174
150/220-11/4	150	700	200	202	249	–	260	284	116	323	825	310	M16	25	250	–	130	209
150/250-15/4	150	700	230	278	320	–	288	304	146	370	887	330	M16	25	250	–	135	281
150/260-15/4	150	700	230	278	320	–	288	304	146	370	887	330	M16	25	250	–	135	281
150/260-18.5/4	150	700	230	278	320	–	288	304	146	370	929	330	M16	25	294	–	135	309
150/270-18.5/4	150	700	230	278	320	–	288	304	146	370	929	330	M16	25	294	–	135	309
150/270-22/4	150	700	230	278	320	–	288	304	146	370	957	330	M16	25	294	–	135	319
150/290-30/4	150	770	230	300	337	–	300	344	150	415	1025	370	M16	25	306	–	145	392
150/300-30/4	150	770	230	300	337	–	300	344	150	415	1025	370	M16	25	306	–	145	392
150/310-30/4	150	770	230	300	337	–	300	344	150	415	1025	370	M16	25	306	–	145	392
150/310-37/4	150	770	230	300	337	–	300	344	150	456	1061	370	M16	25	327	–	145	446
150/320-30/4	150	770	230	300	337	–	300	344	150	415	1025	370	M16	25	306	–	145	399
150/320-37/4	150	770	230	300	337	–	300	344	150	456	1061	370	M16	25	327	–	145	446
150/330-37/4	150	770	230	300	337	–	300	344	150	456	1061	370	M16	25	327	–	145	446
150/330-45/4	150	770	230	300	337	–	300	344	150	456	1125	370	M16	25	327	–	145	472
150/340-37/4	150	770	230	300	337	–	300	344	150	456	1061	370	M16	25	327	–	145	446
150/340-45/4	150	770	230	300	337	–	300	344	150	456	1125	–	M16	–	327	–	–	472
200/230-11/4	200	800	245	281	362	–	330	270	165	323	869	370	M16	25	250	–	140	335
200/240-15/4	200	800	245	281	362	–	330	270	165	370	912	370	M16	25	250	–	140	335
200/250-18.5/4	200	800	245	281	362	–	330	270	165	370	954	370	M16	25	294	–	140	364
200/260-22/4	200	800	245	281	362	–	330	270	165	370	982	370	M16	25	294	–	140	374
200/265-22/4	200	800	245	281	362	–	330	270	165	370	982	370	M16	25	294	–	140	374
200/265-30/4	200	800	245	281	362	–	330	270	165	415	1042	370	M16	25	306	–	140	419
200/270-30/4	200	800	245	281	362	–	330	270	165	415	1042	370	M16	25	306	–	140	419
200/310-37/4	200	820	245	322	370	–	360	370	180	456	1086	400	M16	25	327	–	155	486
200/320-37/4	200	820	245	322	370	–	360	370	180	456	1086	400	M16	25	327	–	155	486
200/320-45/4	200	820	245	322	370	–	360	370	180	456	1150	400	M16	25	327	–	155	512
200/330-45/4	200	820	245	322	370	–	360	370	180	456	1150	400	M16	25	327	–	155	512
200/330-55/4	200	820	245	322	370	–	360	370	180	495	1230	400	M16	25	392	–	155	665
200/340-45/4	200	820	245	322	370	–	360	370	180	456	1150	400	M16	25	327	–	155	512
200/340-55/4	200	820	245	322	370	–	360	370	180	495	1230	400	M16	25	392	–	155	665

Dimensions, weights Wilo-CronoLine-IL

Dimension drawing



II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Maße, Gewichte (1450 rpm)

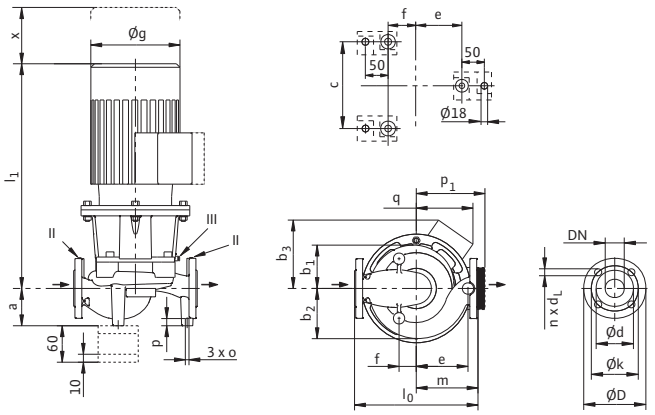
Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions													Weight approx.
	DN	l_0	A	b_1	b_2	b_4	b_5	b_{max}	Ø g	l_{1max}	l_2	l_3	m	p_1	x	M
	–	[mm]														[kg]
250/360-75/4	250	1150	321	369	454	340	180	932	764	1850	700	150	550	478	190	1137
250/370-75/4	250	1150	321	369	454	340	180	932	764	1850	700	150	550	478	190	1137
250/380-75/4	250	1150	321	369	454	340	180	932	764	1850	700	150	550	478	190	1137
250/390-75/4	250	1150	321	369	454	340	180	932	764	1850	700	150	550	478	190	1137
250/390-90/4	250	1150	321	369	454	340	180	932	764	1900	700	150	550	478	190	1182
250/400-75/4	250	1150	321	369	454	340	180	932	764	1850	700	150	550	478	190	1137
250/400-90/4	250	1150	321	369	454	340	180	932	764	1900	700	150	550	478	190	1182
250/410-90/4	250	1150	321	369	454	340	180	932	764	1900	700	150	550	478	190	1182
250/410-110/4	250	1150	321	369	454	340	180	1001	834	2150	700	150	550	547	190	1347
250/420-90/4	250	1150	321	369	454	340	180	932	764	1900	700	150	550	478	190	1182
250/420-110/4	250	1150	321	369	454	340	180	1001	834	2150	700	150	550	547	190	1347
250/430-110/4	250	1150	321	369	454	340	180	1001	834	2150	700	150	550	547	190	1347
250/430-132/4	250	1150	321	369	454	340	180	1001	834	2150	700	150	550	547	190	1427
250/440-110/4	250	1150	321	369	454	340	180	1001	834	2150	700	150	550	547	190	1347
250/440-132/4	250	1150	321	369	454	340	180	1001	834	2150	700	150	550	547	190	1427
250/460-132/4	250	1200	308	386	451	340	180	998	834	2150	700	175	575	547	190	1500
250/460-160/4	250	1200	308	386	451	340	180	998	834	2150	700	175	575	547	190	1637
250/470-160/4	250	1200	308	386	451	340	180	998	834	2150	700	175	575	547	190	1637
250/470-200/4	250	1200	308	386	451	340	180	998	834	2150	700	175	575	547	190	1742
250/480-160/4	250	1200	308	386	451	340	180	998	834	2150	700	175	575	547	190	1637
250/480-200/4	250	1200	308	386	451	340	180	998	834	2150	700	175	575	547	190	1742

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoLine-IL

Dimension drawing



II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimensions, weights (2900 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
32/140-1.5/2	32	320	100	112	124	145	120	132	68	193	463	155	M10	20	–	145	150	48
32/150-2.2/2	32	320	100	112	124	149	120	132	68	193	463	155	M10	20	–	149	150	50
32/160-2.2/2	32	320	100	112	124	149	120	132	68	193	448	155	M10	20	–	149	90	50
32/160-3/2	32	320	100	112	124	156	120	132	68	217	506	155	M10	20	–	156	150	60
32/170-3/2	32	320	100	112	124	156	120	132	68	217	506	155	M10	20	–	156	90	60
32/170-4/2	32	320	100	112	124	168	120	132	68	232	584	155	M10	20	–	168	150	67
40/140-2.2/2	40	340	82	113	129	149	130	149	58	193	477	170	M10	20	–	149	95	55
40/150-3/2	40	340	82	113	129	156	130	149	58	217	520	170	M10	20	–	156	95	64
40/160-4/2	40	340	82	113	129	168	130	149	58	232	598	170	M10	20	–	168	95	71
40/170-5.5/2	40	340	82	113	129	182	130	149	58	279	644	170	M10	20	–	182	95	82
40/200-7.5/2	40	440	110	145	149	–	180	172	78	279	649	190	M10	20	188	–	100	96
40/220-11/2	40	440	110	145	149	–	180	172	78	323	772	190	M10	20	250	–	100	125
50/110-1.5/2	50	340	105	102	119	145	140	130	40	193	463	150	M10	20	–	145	100	53
50/120-2.2/2	50	340	105	102	119	149	140	130	40	193	463	150	M10	20	–	149	100	56
50/130-3/2	50	340	105	102	119	156	140	130	40	217	510	150	M10	20	–	156	100	68
50/140-3/2	50	340	105	102	119	156	140	130	40	217	510	150	M10	20	–	156	100	68
50/140-4/2	50	340	105	102	119	168	140	130	40	232	588	150	M10	20	–	168	100	75
50/160-5.5/2	50	340	103	120	138	182	164	143	48	279	651	170	M10	20	–	182	100	86
50/170-5.5/2	50	340	103	120	138	182	164	143	48	279	651	170	M10	20	–	182	100	86
50/170-7.5/2	50	340	103	120	138	182	164	143	48	279	651	170	M10	20	–	182	100	94
50/180-7.5/2	50	440	120	145	150	–	160	170	70	279	650	190	M10	20	188	–	100	99
50/210-11/2	50	440	120	145	150	–	160	170	70	323	773	190	M10	20	250	–	100	128
50/220-11/2	50	440	120	145	150	–	160	170	70	323	773	190	M10	20	250	–	100	128
50/220-15/2	50	440	120	145	150	–	160	170	70	323	773	190	M10	20	250	–	100	139
50/250-18.5/2	50	440	122	178	174	–	200	200	70	370	824	220	M10	20	250	–	120	182

Dimensions, weights Wilo-CronoLine-IL

Dimensions, weights (2900 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
50/250-22/2	50	440	122	178	174	–	200	200	70	370	866	220	M10	20	294	–	120	213
50/270-22/2	50	440	122	178	174	–	200	200	70	370	866	220	M10	20	294	–	120	204
50/270-30/2	50	440	122	178	174	–	200	200	70	415	971	220	M10	20	306	–	120	249
65/110-3/2	65	340	120	112	134	156	140	140	60	217	524	160	M12	20	–	156	110	66
65/120-3/2	65	340	120	112	134	156	140	140	60	217	524	160	M12	20	–	156	110	66
65/120-4/2	65	340	120	112	134	168	140	140	60	232	602	160	M12	20	–	168	110	73
65/130-4/2	65	340	120	112	134	168	140	140	60	232	602	160	M12	20	–	168	110	73
65/130-5.5/2	65	340	120	112	134	–	140	140	60	279	654	160	M12	20	188	–	110	84
65/140-5.5/2	65	340	120	112	134	–	140	140	60	279	654	160	M12	20	188	–	110	84
65/140-7.5/2	65	340	120	112	134	–	140	140	60	279	654	160	M12	20	188	–	110	92
65/150-5.5/2	65	430	110	126	146	182	180	195	60	279	657	215	M12	20	–	182	120	90
65/160-5.5/2	65	430	110	126	146	182	180	195	60	279	657	215	M12	20	–	182	120	90
65/160-7.5/2	65	430	110	126	146	182	180	195	60	279	657	215	M12	20	–	182	120	100
65/170-11/2	65	430	110	126	146	–	180	195	60	323	788	215	M12	20	250	–	120	124
65/200-11/2	65	475	130	150	168	–	200	225	50	323	782	245	M12	20	250	–	110	134
65/200-15/2	65	475	130	150	168	–	200	225	50	323	782	245	M12	20	250	–	110	145
65/210-15/2	65	475	130	150	168	–	200	225	50	323	782	245	M12	20	250	–	110	145
65/210-18.5/2	65	475	130	150	168	–	200	225	50	370	825	245	M12	20	250	–	110	158
65/220-18.5/2	65	475	130	150	168	–	200	225	50	370	825	245	M12	20	250	–	110	158
65/220-22/2	65	475	130	150	168	–	200	225	50	370	867	245	M12	20	294	–	110	181
65/240-30/2	65	475	140	187	174	–	200	215	80	415	975	235	M12	20	306	–	120	253
65/260-30/2	65	475	140	187	174	–	200	215	80	415	975	235	M12	20	306	–	120	253
65/260-37/2	65	475	140	187	174	–	200	215	80	415	975	235	M12	20	306	–	120	276
80/110-3/2	80	400	105	123	151	156	180	173	57	217	541	200	M12	20	–	156	120	74
80/120-4/2	80	400	105	123	151	168	180	173	57	232	619	200	M12	20	–	168	120	80
80/130-5.5/2	80	400	105	123	151	–	180	173	57	279	671	200	M12	20	188	–	120	91
80/140-7.5/2	80	400	105	123	151	–	180	173	57	279	671	200	M12	20	188	–	120	99
80/150-7.5/2	80	440	120	136	162	182	180	173	72	279	655	200	M12	20	–	182	120	109
80/160-11/2	80	440	120	136	162	–	180	173	72	323	786	200	M12	20	250	–	120	134
80/170-11/2	80	440	120	136	162	–	180	173	72	323	786	200	M12	20	250	–	120	134
80/170-15/2	80	440	120	136	162	–	180	173	72	323	786	200	M12	20	250	–	120	147
80/190-15/2	80	500	145	157	182	–	220	208	62	323	790	230	M12	20	250	–	120	154
80/190-18.5/2	80	500	145	157	182	–	220	208	62	370	833	230	M12	20	250	–	120	167
80/200-18.5/2	80	500	145	157	182	–	220	208	62	370	833	230	M12	20	250	–	120	167
80/200-22/2	80	500	145	157	182	–	220	208	62	370	875	230	M12	20	294	–	120	190
80/210-30/2	80	500	145	157	182	–	220	208	62	415	963	230	M12	20	306	–	120	245
80/220-22/2	80	500	145	157	182	–	220	208	62	370	875	230	M12	20	294	–	120	190
80/220-30/2	80	500	145	157	182	–	220	208	62	415	963	230	M12	20	306	–	120	245
100/145-11/2	100	500	120	159	197	–	200	226	60	323	821	250	M12	20	250	–	135	147
100/150-15/2	100	500	120	159	197	–	200	226	60	323	821	250	M12	20	250	–	135	160
100/160-15/2	100	500	120	159	197	–	200	226	60	323	821	250	M12	20	250	–	135	160

Standard pumps

Single pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoLine-IL

Dimensions, weights (2900 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Overall length	Dimensions															Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	x	M
	–	[mm]											–	[mm]				[kg]
100/160-18.5/2	100	500	120	159	197	–	200	226	60	370	864	250	M12	20	250	–	135	177
100/165-22/2	100	500	120	159	197	–	200	226	60	370	906	250	M12	20	294	–	135	192
100/170-22/2	100	500	120	159	197	–	200	226	60	370	906	250	M12	20	294	–	135	192
100/170-30/2	100	500	120	159	197	–	200	226	60	415	994	250	M12	20	306	–	135	247
100/190-30/2	100	550	155	173	202	–	220	231	99	415	973	255	M12	20	306	–	120	258
100/210-30/2	100	550	155	173	202	–	220	231	99	415	973	255	M12	20	306	–	120	258
100/210-37/2	100	550	155	173	202	–	220	231	99	415	973	255	M12	20	306	–	120	281

Flange dimensions

Wilo-CronoLine-IL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
32...	32	140	76	100	4 x 19
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19
100...	100	220	156	180	8 x 19
125...	125	250	184	210	8 x 19
150...	150	285	211	240	8 x 23
200...	200	340	266	295	12 x 23
250...	250	405	319	355	12 x 28

Pump flange dimensions – according to EN 1092-2 PN 16, n = number of drilled holes

Series description Wilo-VeroTwin-DPL

Design
Glanded double pump in in-line design with flange connection

Application
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**DPL 40/160-4/2**
DPL	In-line double pump
40	Nominal diameter DN of the pipe connection
160	Nominal impeller diameter
4	Nominal motor power P_2 in kW
2	Number of poles

Technical data
- Permissible temperature range -10°C to +120°C
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter DN 32 to DN 100
- Max. operating pressure 10 bar (special version: 16 bar)

Special features/product benefits
- Reduction of space required and installation costs due to double pump design
- Main/standby mode or peak-load operation (by means of auxiliary external device)
- Standard condensate drainage holes in the motor housings and lanterns
- High corrosion protection due to cataphoretic coating
- Series version: Motor with one-piece shaft
- Version N: Standard motor B5 or V1 with stainless steel plug shaft
- Bidirectional mechanical seal with forced flushing

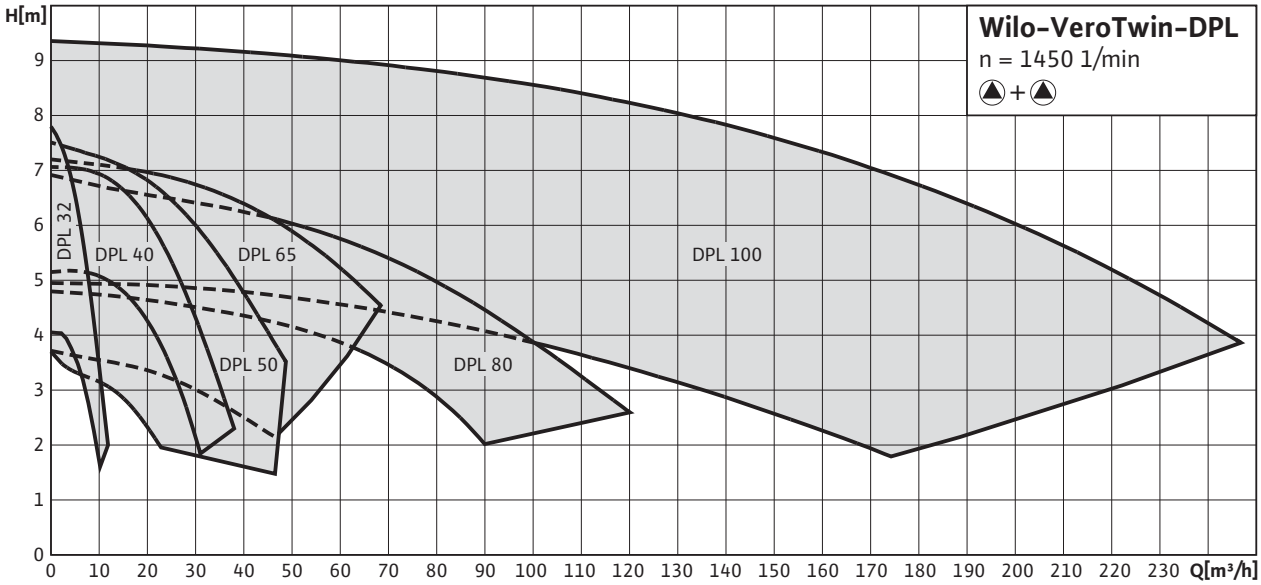
Materials
- Pump housing and lantern: EN-GJL-250
- Impeller: PP fibreglass-reinforced / EN-GJL-200 (depending on pump type)
- Shaft: 1.4021 (version N: 1.4404)
- Mechanical seal: AQ1EGG; other mechanical seals on request

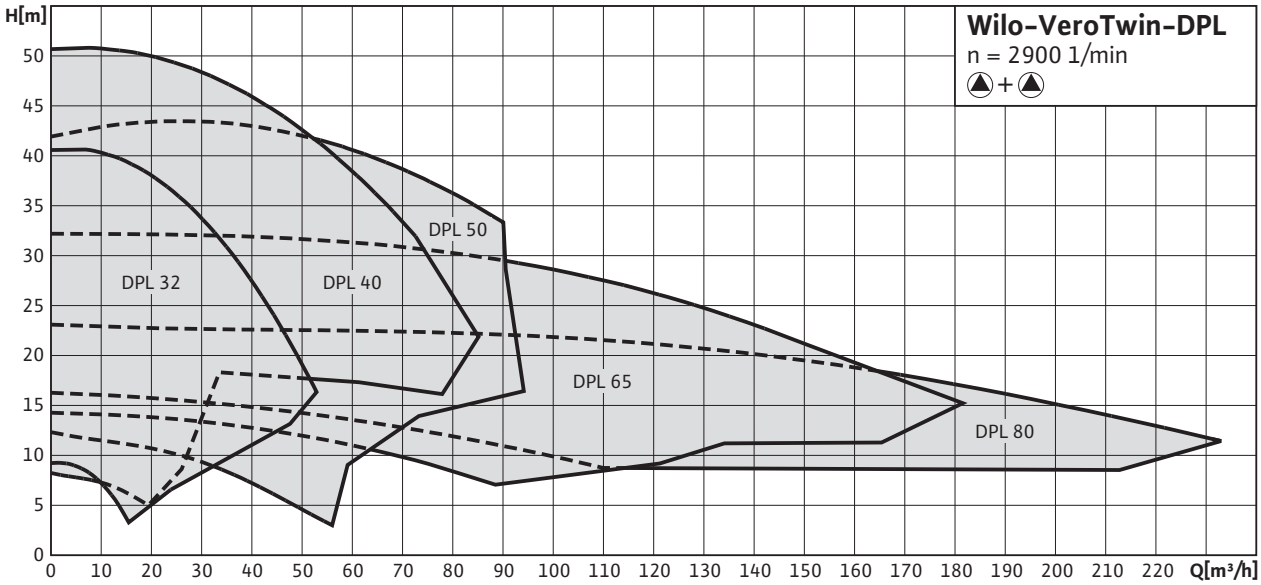
Description/design
Single-stage, low-pressure double pump in in-line design with
- Switchover valve
- Mechanical seal
- Flange connection with pressure measuring connection R $^1/_8$
- Motor with one-piece shaft

Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-VeroTwin-DPL

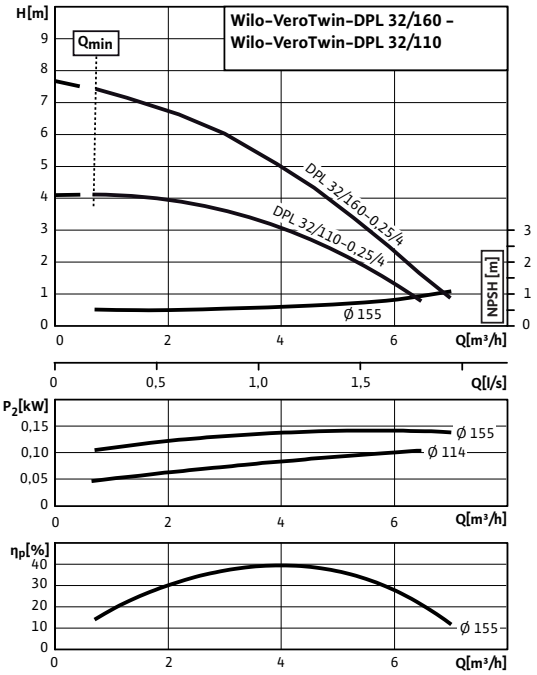




Pump curves Wilo-VeroTwin-DPL

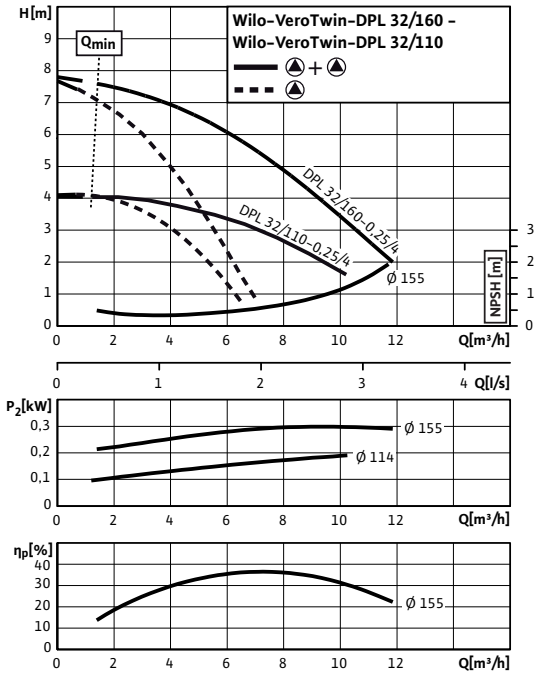
Wilo-VeroTwin-DPL 32/110-0,25/4 - 32/160-0,25/4

Speed 1450 rpm - individual operation



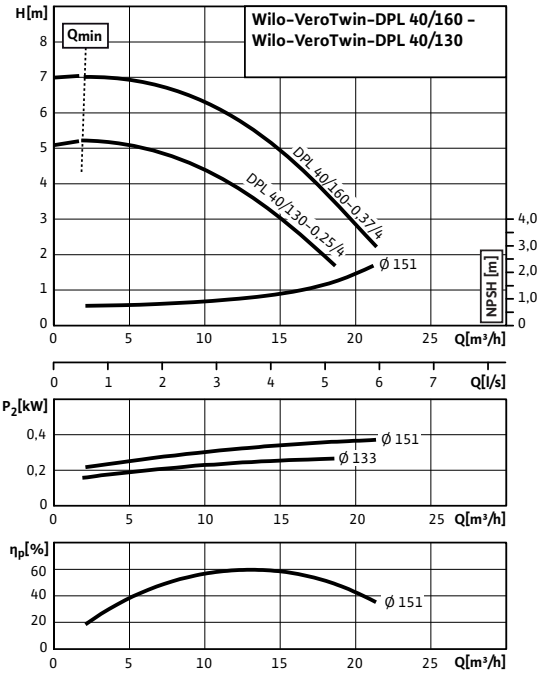
Wilo-VeroTwin-DPL 32/110-0,25/4 - 32/160-0,25/4

Speed 1450 rpm - parallel operation



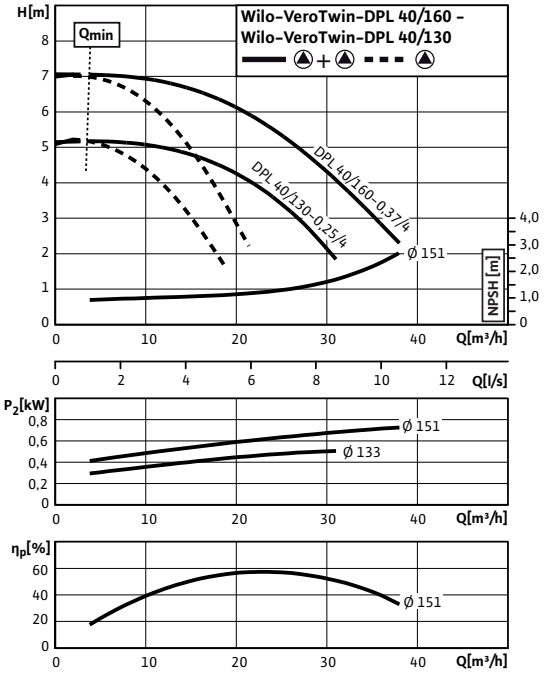
Wilo-VeroTwin-DPL 40/130-0,25/4 - 40/160-0,37/4

Speed 1450 rpm - individual operation



Wilo-VeroTwin-DPL 40/130-0,25/4 - 40/160-0,37/4

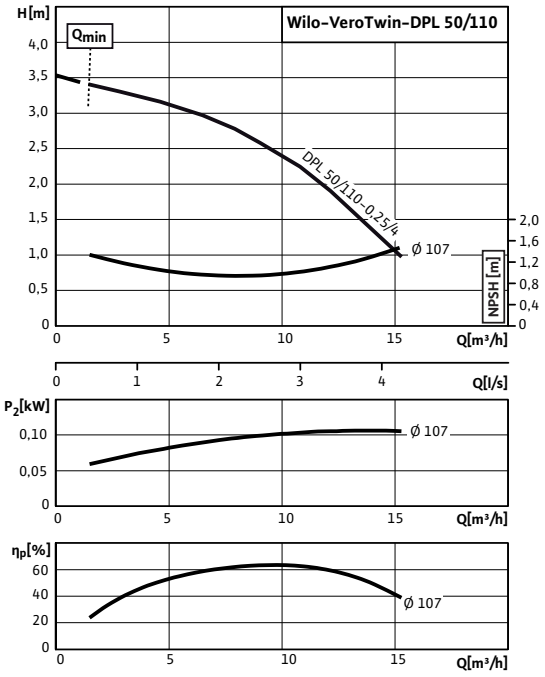
Speed 1450 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

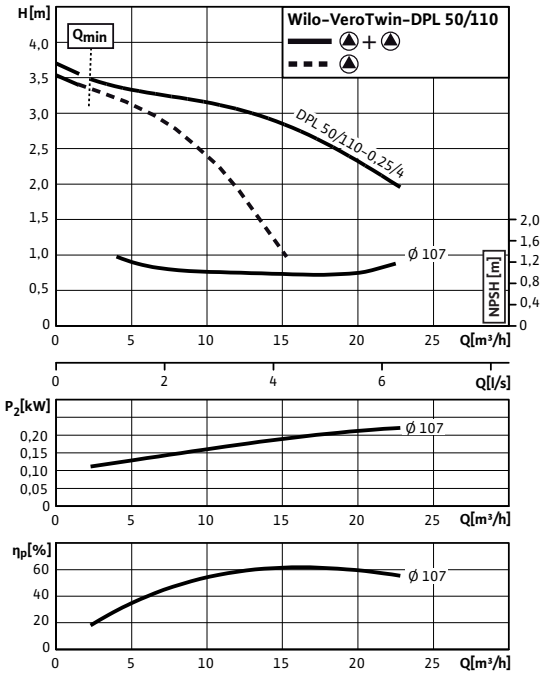
Wilo-VeroTwin-DPL 50/110-0,25/4

Speed 1450 rpm - individual operation



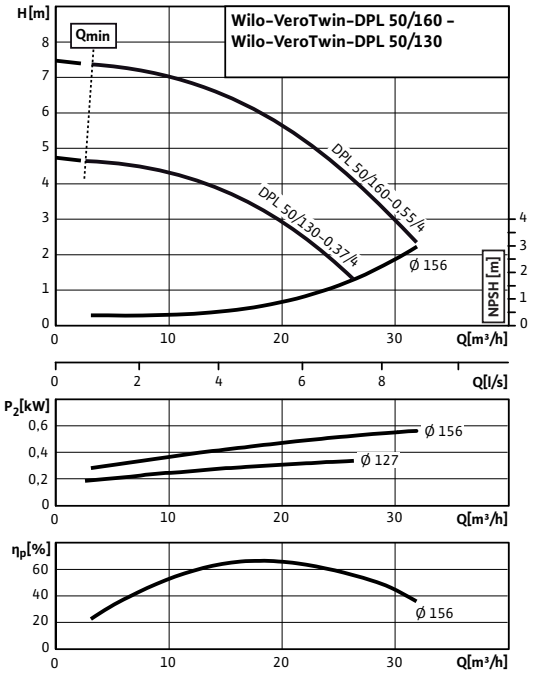
Wilo-VeroTwin-DPL 50/110-0,25/4

Speed 1450 rpm - parallel operation



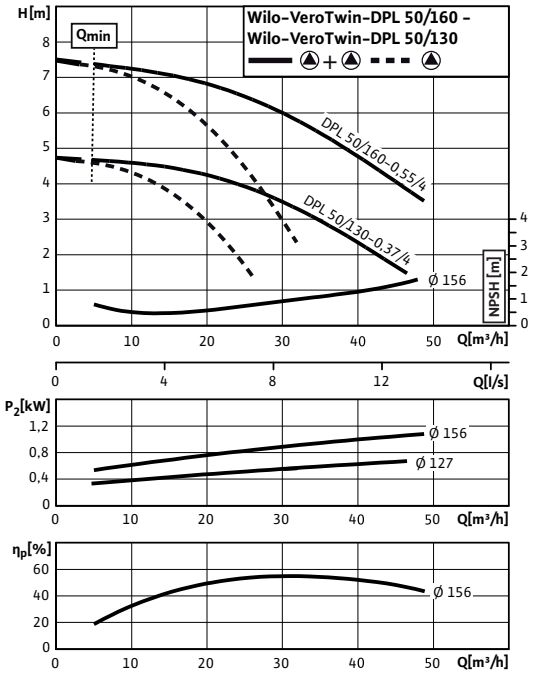
Wilo-VeroTwin-DPL 50/130-0,37/4 - 50/160-0,55/4

Speed 1450 rpm - individual operation



Wilo-VeroTwin-DPL 50/130-0,37/4 - 50/160-0,55/4

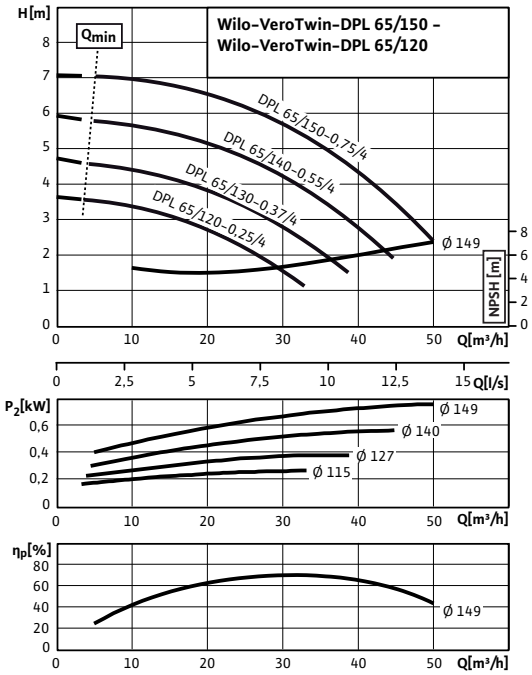
Speed 1450 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

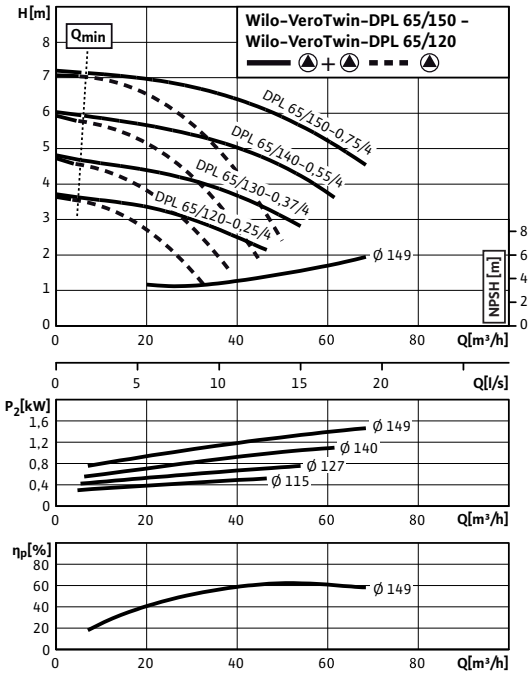
Wilo-VeroTwin-DPL 65/120-0,25/4 - 65/150-0,75/4

Speed 1450 rpm - individual operation



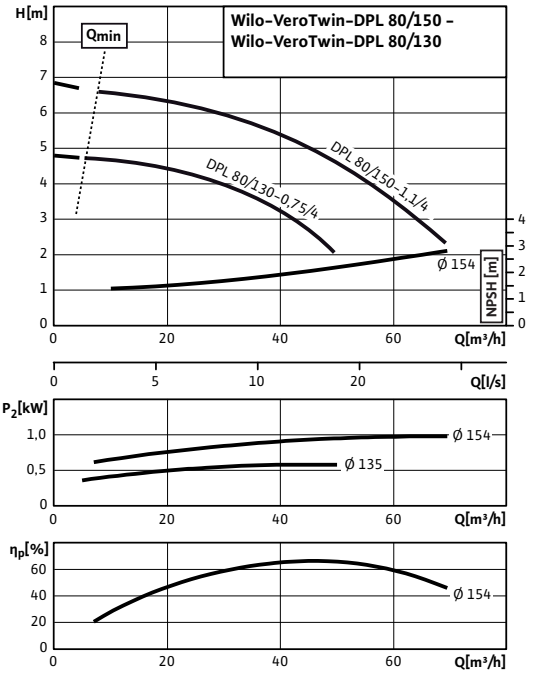
Wilo-VeroTwin-DPL 65/120-0,25/4 - 65/150-0,75/4

Speed 1450 rpm - parallel operation



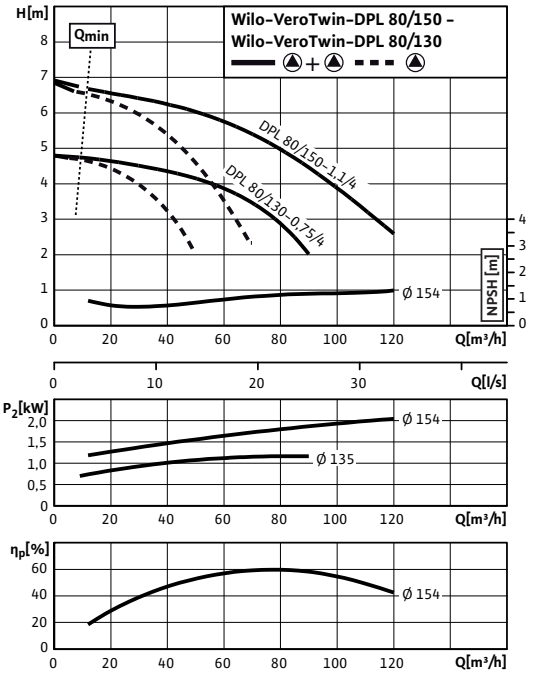
Wilo-VeroTwin-DPL 80/130-0,75/4 - 80/150-1,1/4

Speed 1450 rpm - individual operation



Wilo-VeroTwin-DPL 80/130-0,75/4 - 80/150-1,1/4

Speed 1450 rpm - parallel operation



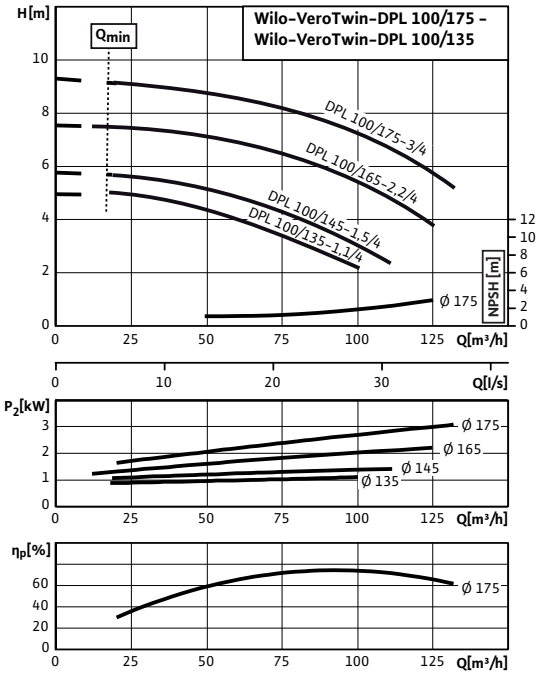
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DPL

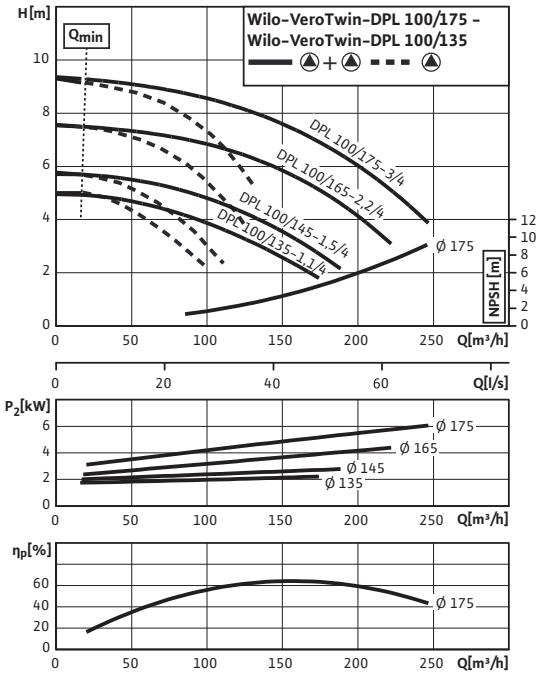
Wilo-VeroTwin-DPL 100/135-1,1/4 - 100/175-3/4

Speed 1450 rpm - individual operation



Wilo-VeroTwin-DPL 100/135-1,1/4 - 100/175-3/4

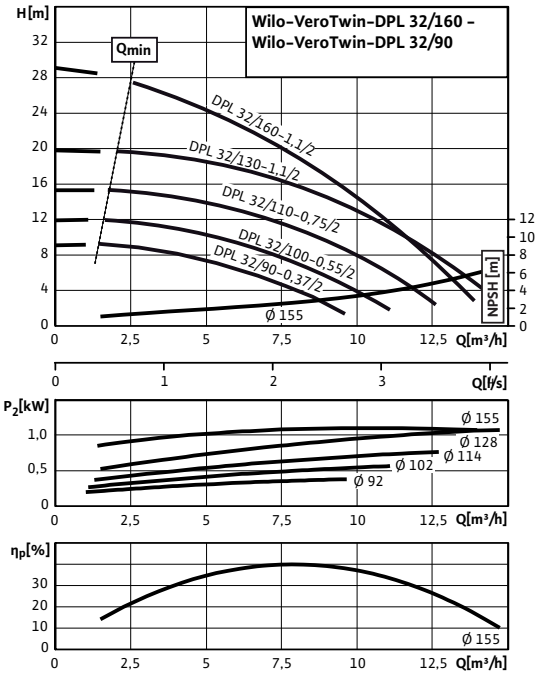
Speed 1450 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

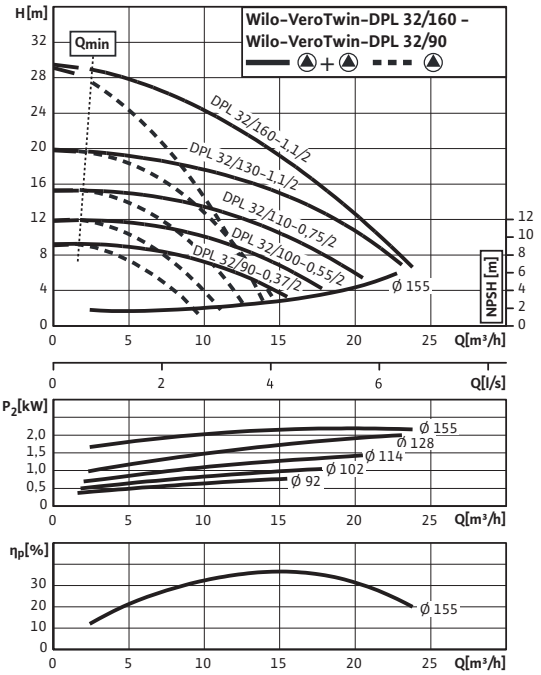
Wilo-VeroTwin-DPL 32/90-0,37/2 - 32/160-1,1/2

Speed 2900 rpm - individual operation



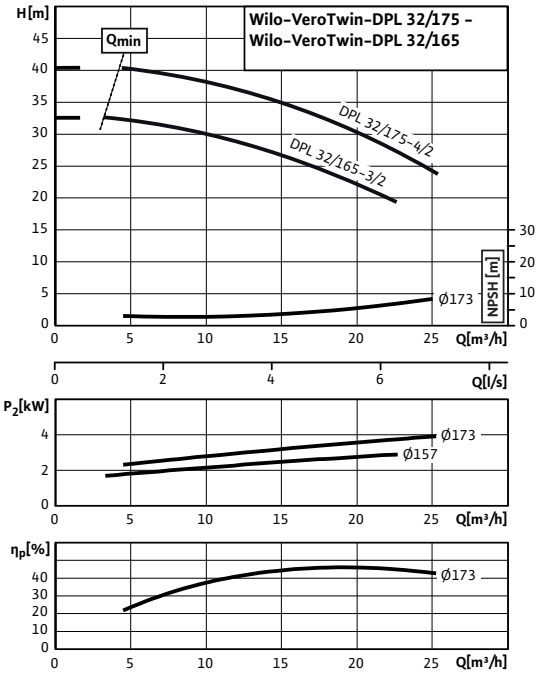
Wilo-VeroTwin-DPL 32/90-0,37/2 - 32/160-1,1/2

Speed 2900 rpm - parallel operation



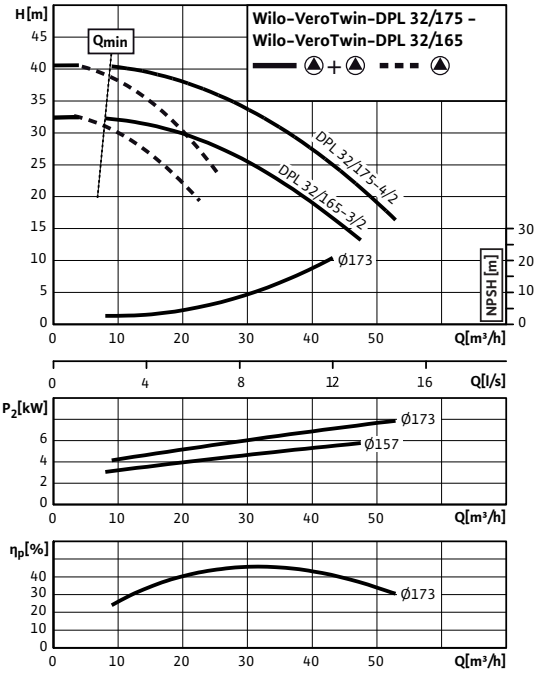
Wilo-VeroTwin-DPL 32/165-3/2 - 32/175-4/2

Speed 2900 rpm - individual operation



Wilo-VeroTwin-DPL 32/165-3/2 - 32/175-4/2

Speed 2900 rpm - parallel operation



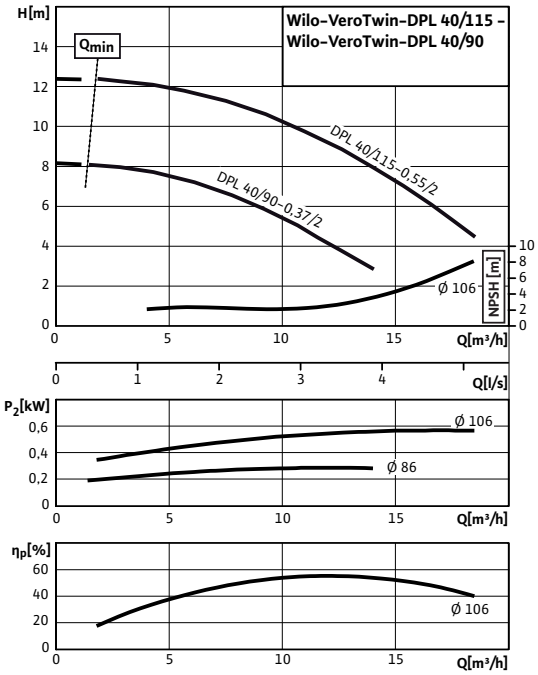
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DPL

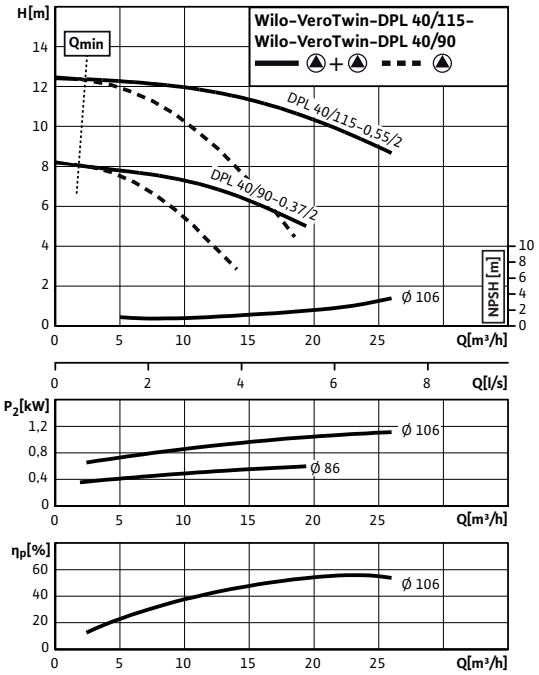
Wilo-VeroTwin-DPL 40/90-0,37/2 - 40/115-0,55/2

Speed 2900 rpm - individual operation



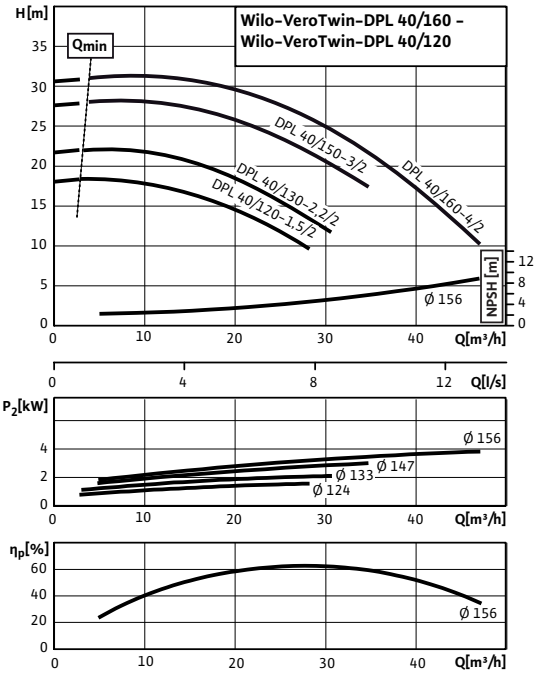
Wilo-VeroTwin-DPL 40/90-0,37/2 - 40/115-0,55/2

Speed 2900 rpm - parallel operation



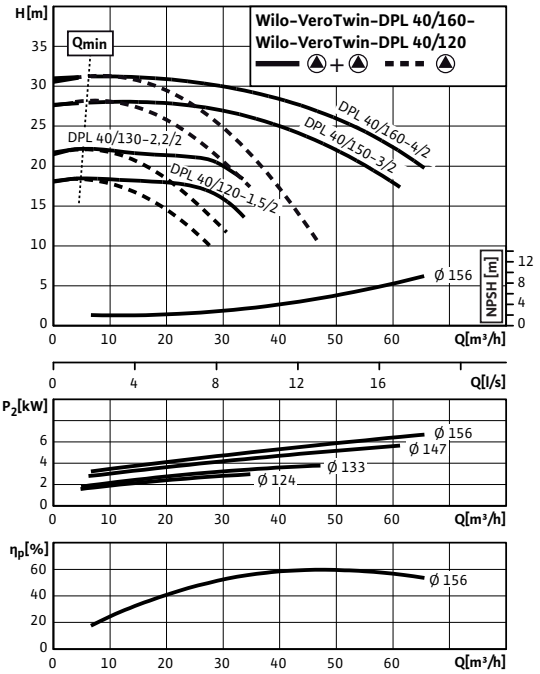
Wilo-VeroTwin-DPL 40/120-1,5/2 - 40/160-4/2

Speed 2900 rpm - individual operation



Wilo-VeroTwin-DPL 40/120-1,5/2 - 40/160-4/2

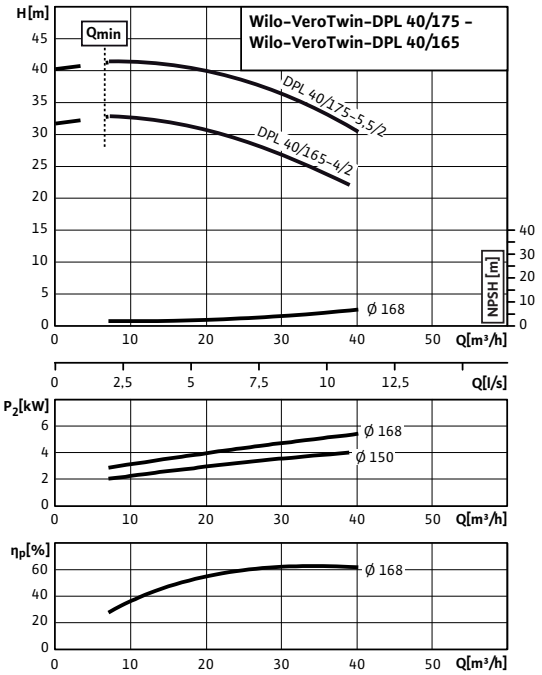
Speed 2900 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

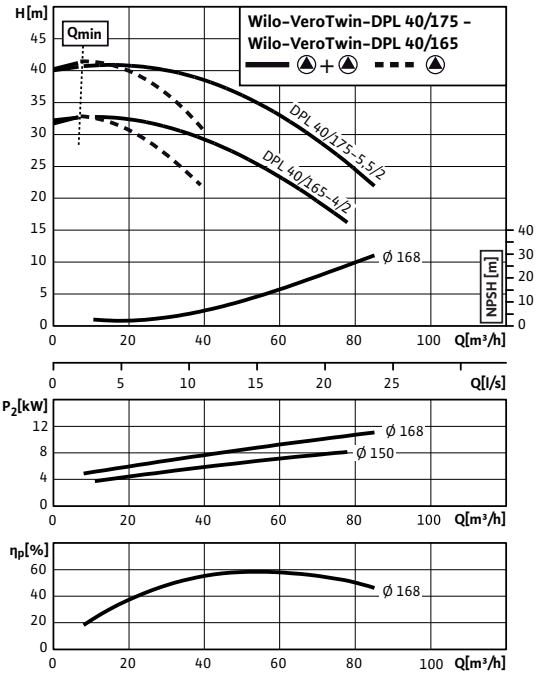
Wilo-VeroTwin-DPL 40/165-4/2 – 40/175-5,5/2

Speed 2900 rpm – individual operation



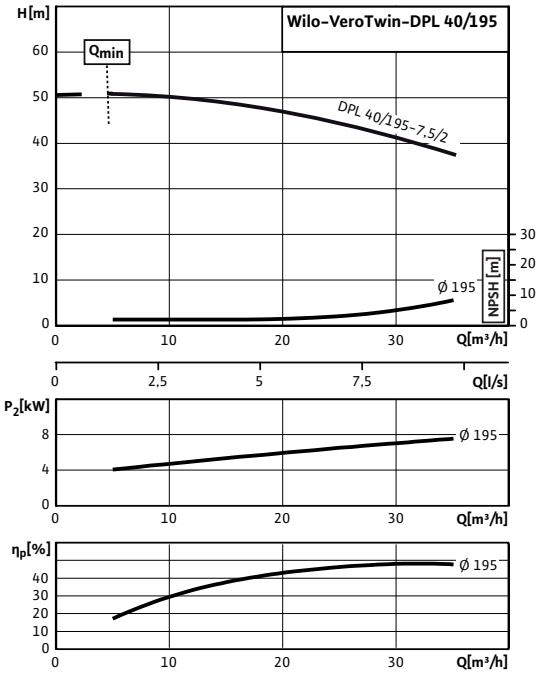
Wilo-VeroTwin-DPL 40/165-4/2 – 40/175-5,5/2

Speed 2900 rpm – parallel operation



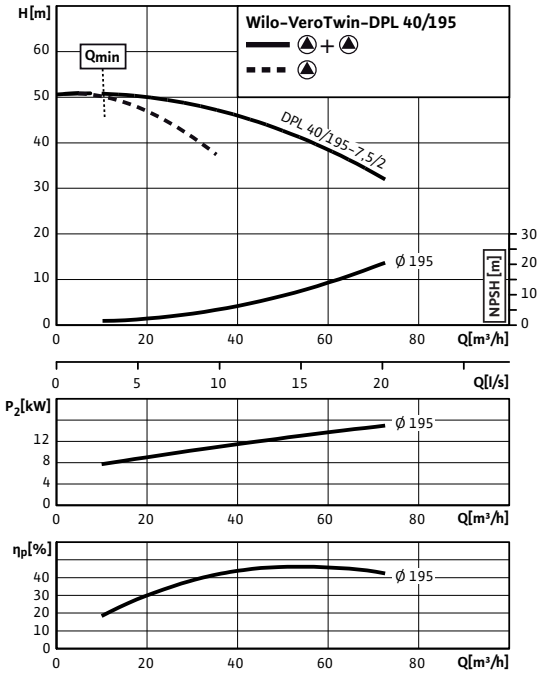
Wilo-VeroTwin-DPL 40/195-7,5/2

Speed 2900 rpm – individual operation



Wilo-VeroTwin-DPL 40/195-7,5/2

Speed 2900 rpm – parallel operation



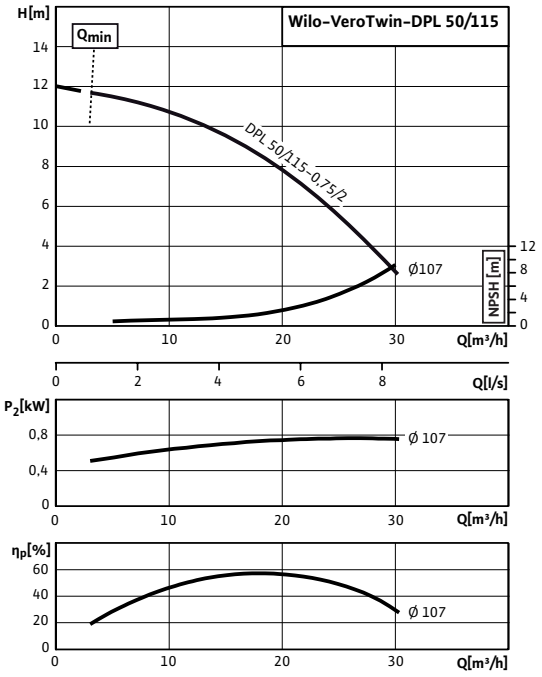
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-VeroTwin-DPL

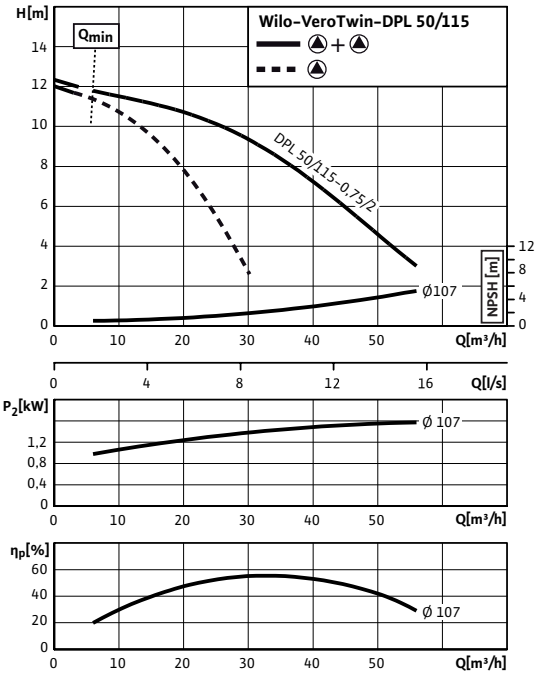
Wilo-VeroTwin-DPL 50/115-0,75/2

Speed 2900 rpm - individual operation



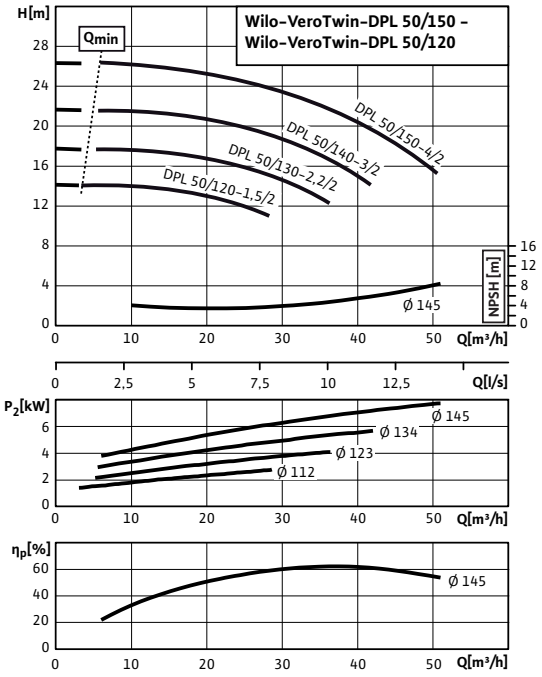
Wilo-VeroTwin-DPL 50/115-0,75/2

Speed 2900 rpm - parallel operation



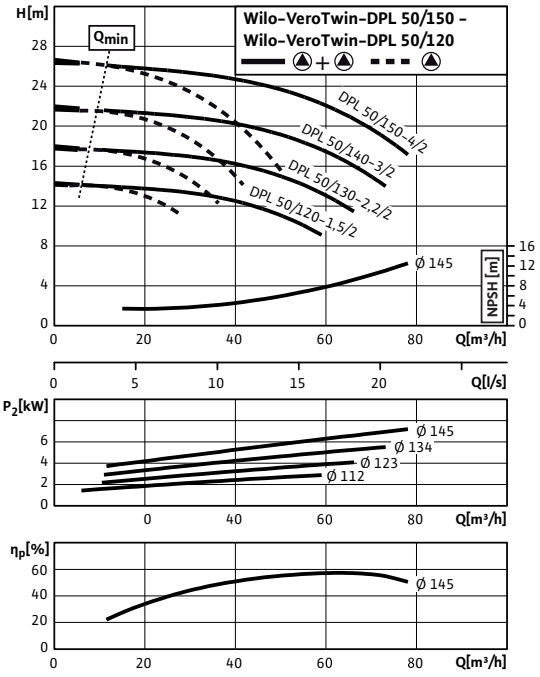
Wilo-VeroTwin-DPL 50/120-1,5/2 - 50/150-4/2

Speed 2900 rpm - individual operation



Wilo-VeroTwin-DPL 50/120-1,5/2 - 50/150-4/2

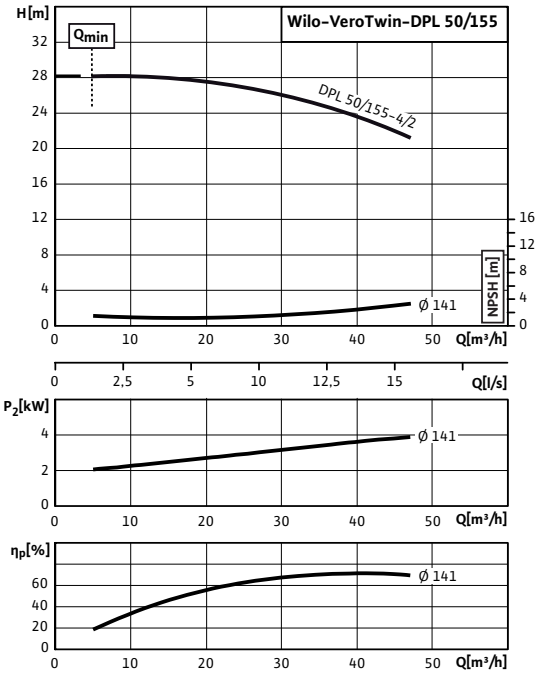
Speed 2900 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

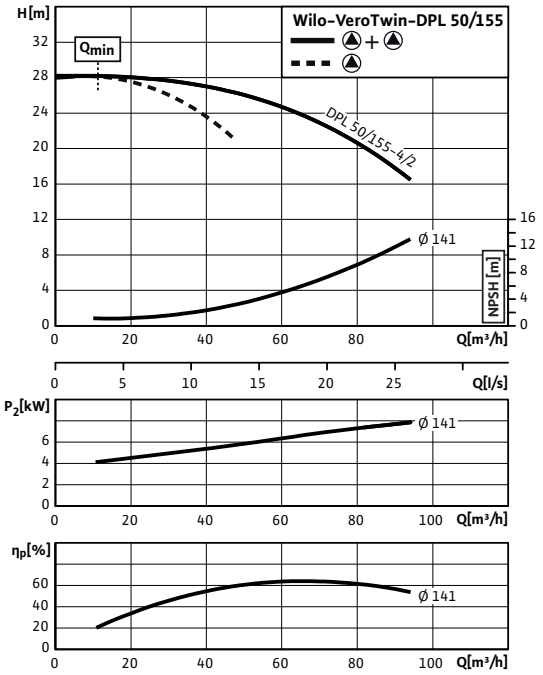
Wilo-VeroTwin-DPL 50/155-4/2

Speed 2900 rpm – individual operation



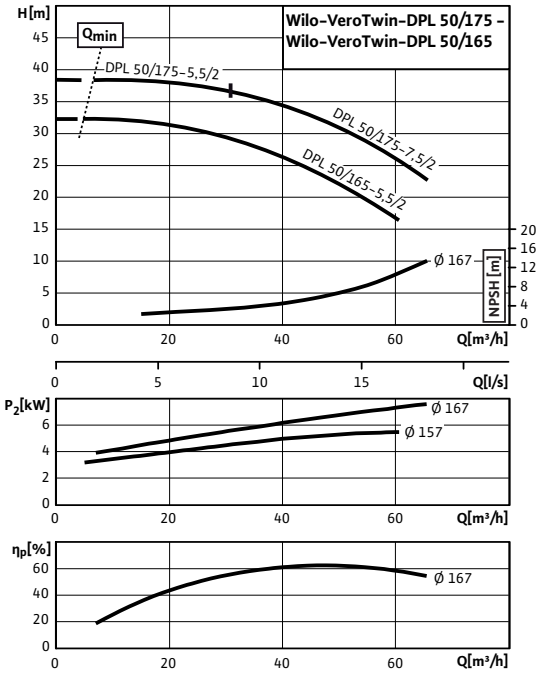
Wilo-VeroTwin-DPL 50/155-4/2

Speed 2900 rpm – parallel operation



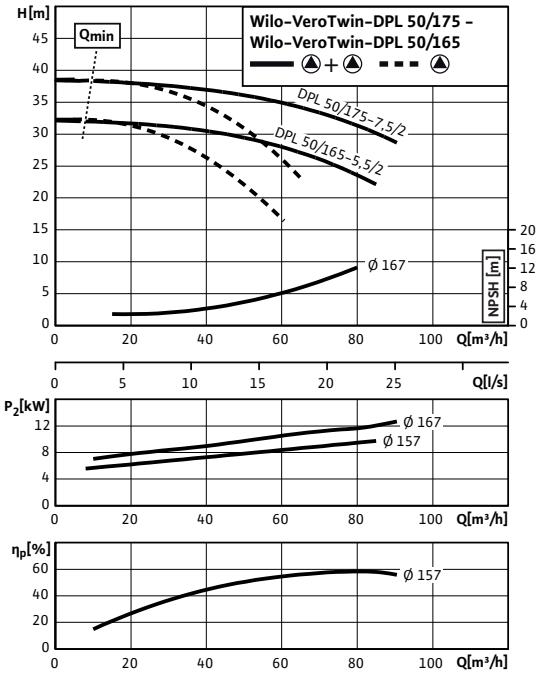
Wilo-VeroTwin-DPL 50/165-5,5/2 – 50/175-5,5/2

Speed 2900 rpm – individual operation



Wilo-VeroTwin-DPL 50/165-5,5/2 – 50/175-5,5/2

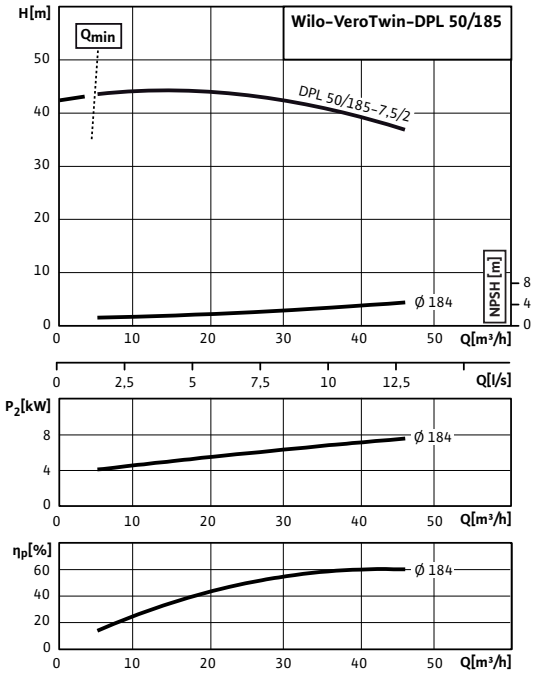
Speed 2900 rpm – parallel operation



Pump curves Wilo-VeroTwin-DPL

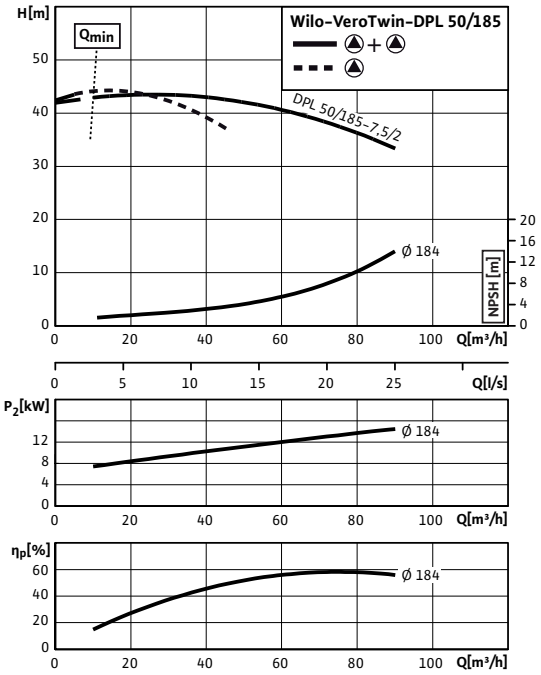
Wilo-VeroTwin-DPL 50/185-7,5/2

Speed 2900 rpm - individual operation



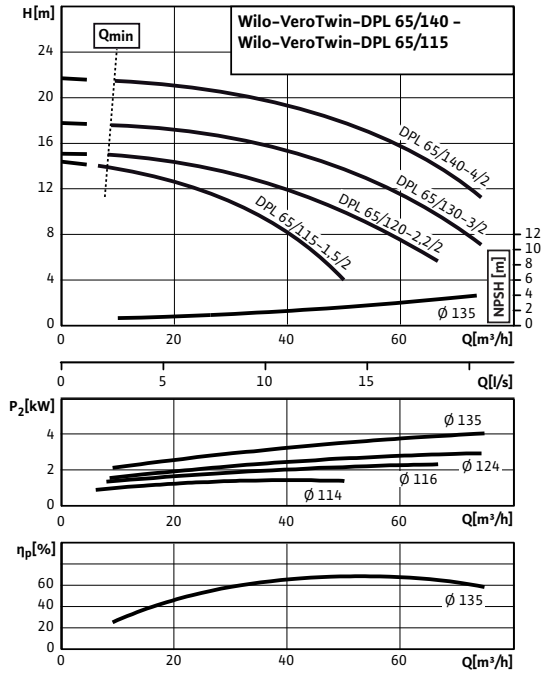
Wilo-VeroTwin-DPL 50/185-7,5/2

Speed 2900 rpm - parallel operation



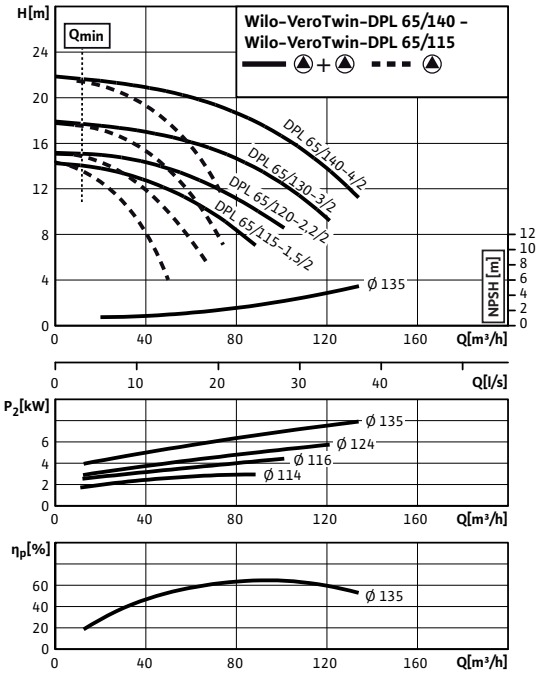
Wilo-VeroTwin-DPL 65/115-1,5/2 - 65/140-4/2

Speed 2900 rpm - individual operation



Wilo-VeroTwin-DPL 65/115-1,5/2 - 65/140-4/2

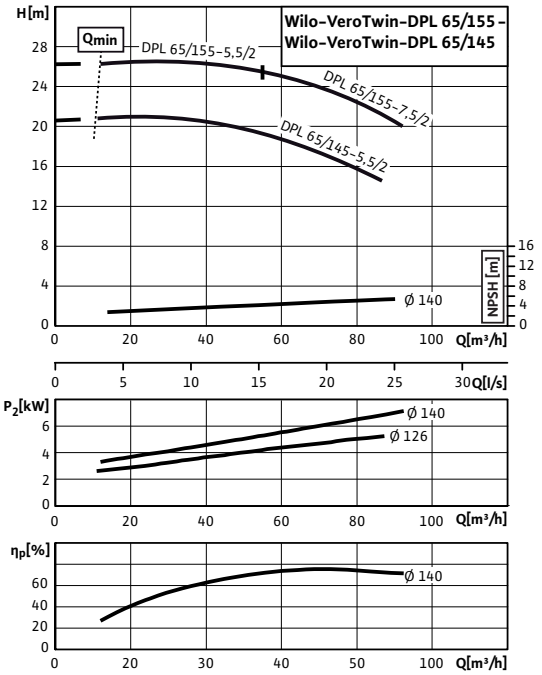
Speed 2900 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

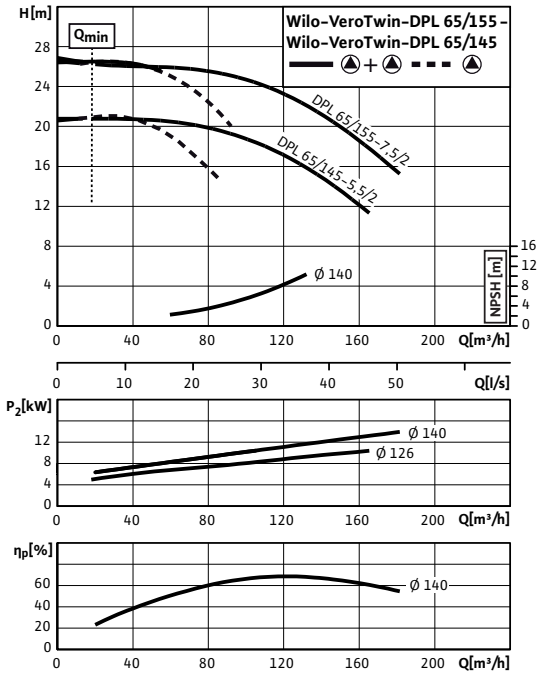
Wilo-VeroTwin-DPL 65/145-5,5/2 - 65/155-7,5/2

Speed 2900 rpm - individual operation



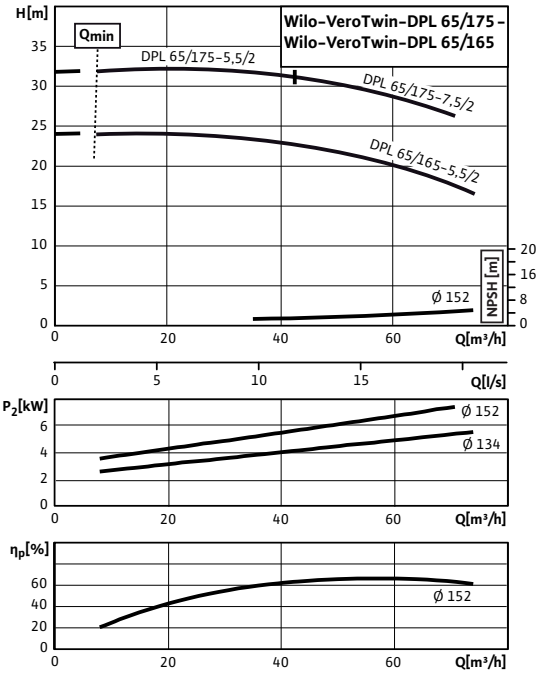
Wilo-VeroTwin-DPL 65/145-5,5/2 - 65/155-7,5/2

Speed 2900 rpm - parallel operation



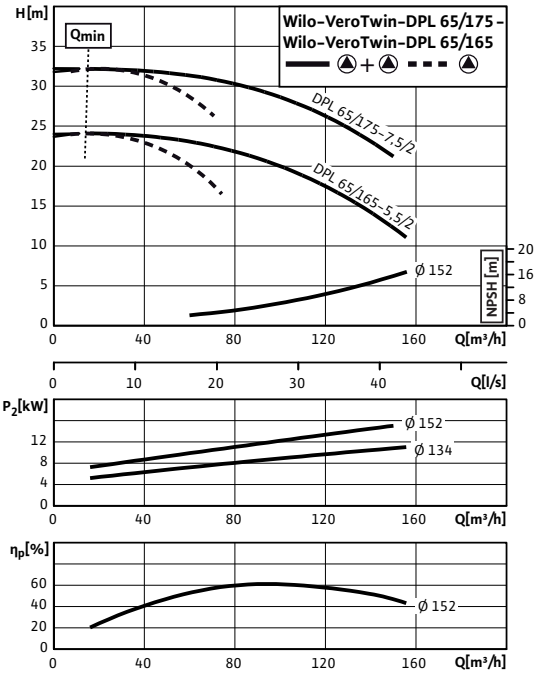
Wilo-VeroTwin-DPL 65/165-5,5/2 - 65/175-7,5/2

Speed 2900 rpm - individual operation



Wilo-VeroTwin-DPL 65/165-5,5/2 - 65/175-7,5/2

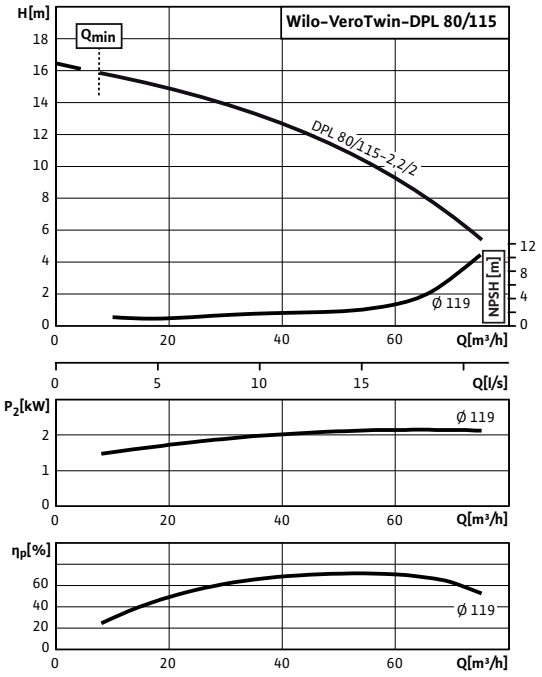
Speed 2900 rpm - parallel operation



Pump curves Wilo-VeroTwin-DPL

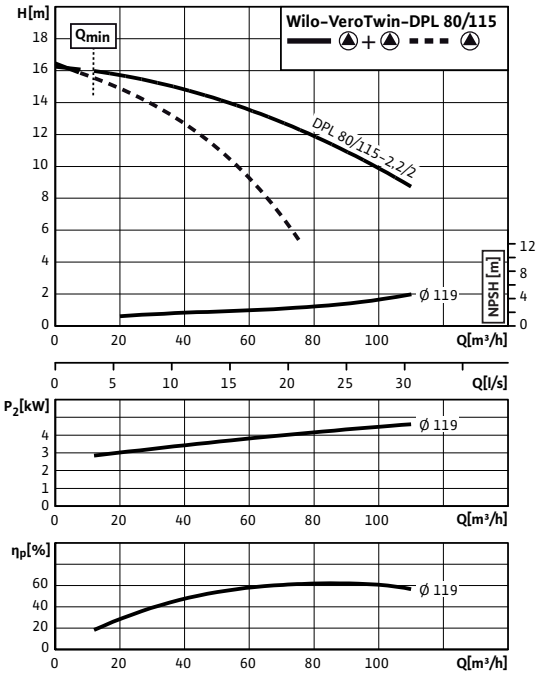
Wilo-VeroTwin-DPL 80/115-2,2/2

Speed 2900 rpm – individual operation



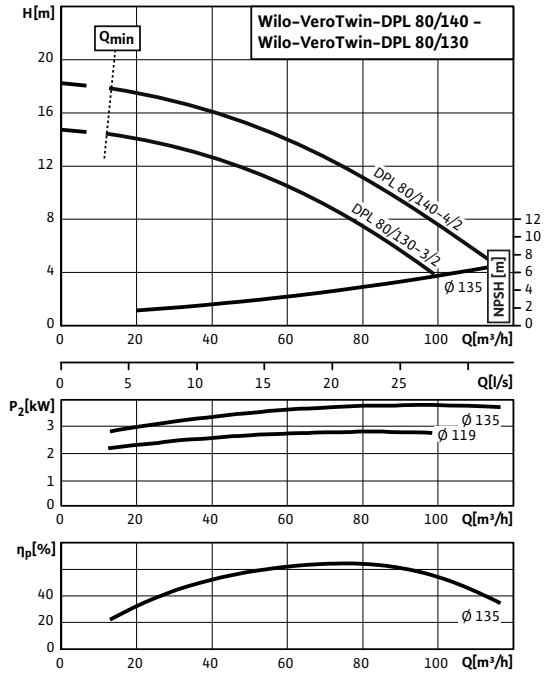
Wilo-VeroTwin-DPL 80/115-2,2/2

Speed 2900 rpm – parallel operation



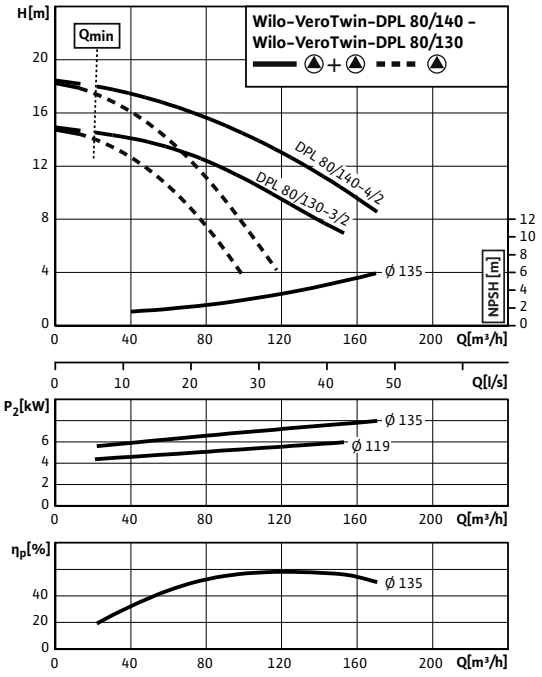
Wilo-VeroTwin-DPL 80/130-3/2 – 80/140-4/2

Speed 2900 rpm – individual operation



Wilo-VeroTwin-DPL 80/130-3/2 – 80/140-4/2

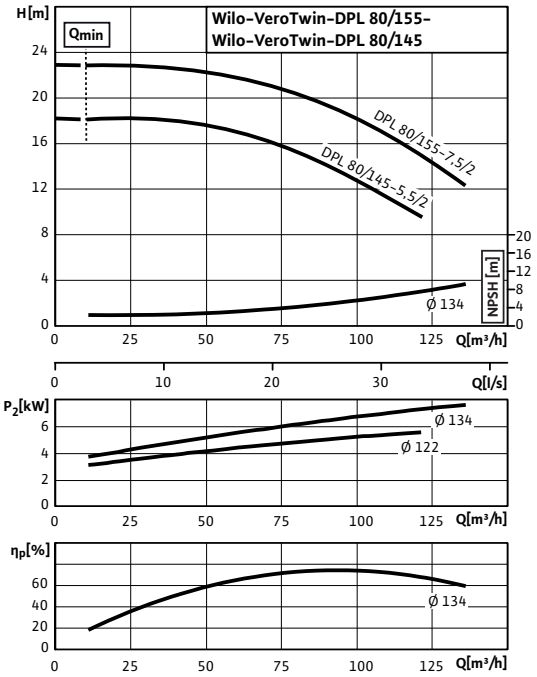
Speed 2900 rpm – parallel operation



Pump curves Wilo-VeroTwin-DPL

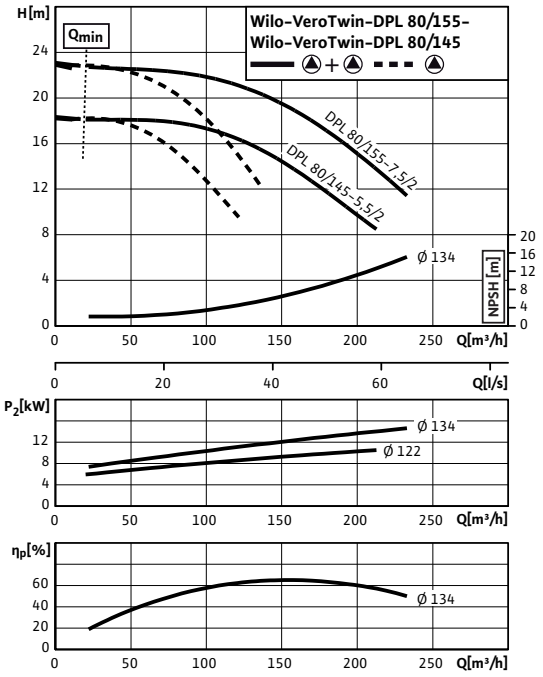
Wilo-VeroTwin-DPL 80/145-5,5/2 - 80/155-7,5/2

Speed 2900 rpm - individual operation



Wilo-VeroTwin-DPL 80/145-5,5/2 - 80/155-7,5/2

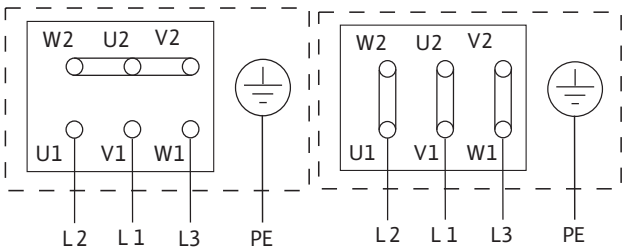
Speed 2900 rpm - parallel operation



Terminal diagram, motor data Wilo-VeroTwin-DPL

Terminal diagrams

Star switching Y **Delta switching Δ**



Motor protection switch required onsite. Check the direction of rotation.
To change the direction of rotation, swap any two phases.

$P_2 \leq 3$ kW	3~400 V Y 3~230 V Δ
$P_2 \geq 4$ kW	3~690 V Y 3~400 V Δ

After removing the bridges, Y-Δ starting is possible.

Motor data (1450 rpm)

Wilo-VeroTwin-DPL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.25 kW	0.86	0.74	0.61
0.37 kW	1.10	0.75	0.65
0.55 kW	1.70	0.69	0.70
0.75 kW	1.95	0.76	0.73
1.1 kW	2.90	0.78	0.74
1.5 kW	3.35	0.82	0.79
2.2 kW	4.70	0.83	0.82
3 kW	6.40	0.83	0.83

Observe motor name plate data

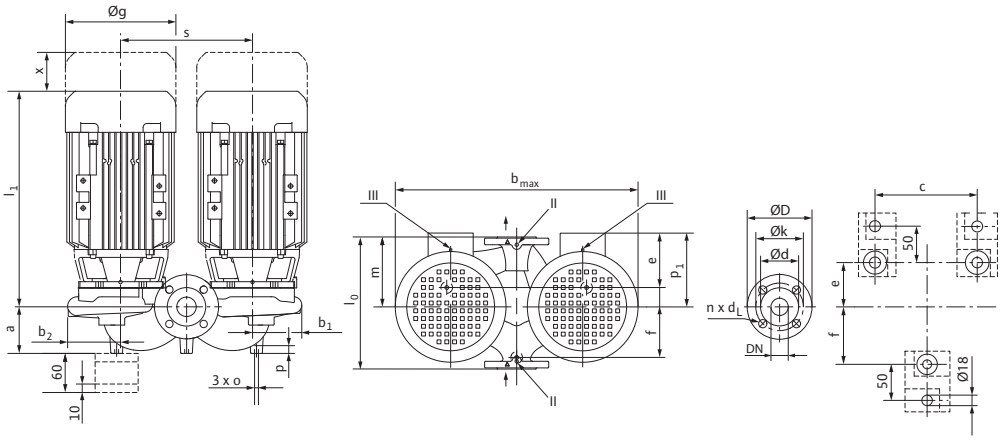
Motor data (2900 rpm)

Wilo-VeroTwin-DPL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.37 kW	1.00	0.84	0.68
0.55 kW	1.40	0.82	0.70
0.75 kW	2.00	0.86	0.68
1.1 kW	2.60	0.84	0.79
1.5 kW	3.25	0.81	0.80
2.2 kW	4.60	0.87	0.81
3 kW	6.10	0.86	0.84
4 kW	8.20	0.86	0.85
5.5 kW	10.50	0.90	0.84
7.5 kW	14.30	0.90	0.86

Observe motor name plate data

Dimensions, weights Wilo-VeroTwin-DPL

Dimension drawing



Note:
Housing with feet for installation on a base, brackets on request; II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimensions, weights (1450 rpm)

Wilo-VeroTwin-DPL ...	Nominal flange diameter	Overall length	Dimensions															Impeller*	Weight approx.
	DN	l_0	A	b_1	b_2	b_{max}	c	e	f	Ø g	l_{1max}	m	o	p	p_1	s	x	–	M
	–	[mm]											–	[mm]				–	[kg]
32/110-0.25/4	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	120	205	150	CI	34
32/160-0.25/4	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	120	205	150	CI	34
40/130-0.25/4	40	320	75	113	119	456	240	45	135	143	289	167	M10	20	120	224	150	CI	41
40/160-0.37/4	40	320	75	113	119	456	240	45	135	143	289	167	M10	20	120	224	150	CI	43
50/110-0.25/4	50	280	83	95	101	390	228	50	107	143	300	155	M10	20	120	194	150	CI	38
50/130-0.37/4	50	340	86	120	130	500	240	48	132	143	291	190	M10	20	120	250	150	CI	45
50/160-0.55/4	50	340	86	120	130	500	240	48	132	185	327	190	M10	20	128	250	150	CI	50
65/120-0.25/4	65	340	93	125	135	550	240	43	137	143	297	185	M10	20	120	290	150	CI	50
65/130-0.37/4	65	340	93	125	135	550	240	43	137	143	297	185	M10	20	120	290	150	CI	52
65/140-0.55/4	65	340	93	125	135	550	240	43	137	185	333	185	M10	20	128	290	150	CI	57
65/150-0.75/4	65	340	93	125	135	550	240	43	137	185	333	185	M10	20	128	290	150	CI	59
80/130-0.75/4	80	360	103	134	147	601	240	30	150	185	339	192	M10	20	128	320	150	CI	62
80/150-1.1/4	80	360	103	134	147	601	240	30	150	185	339	192	M10	20	128	320	150	CI	63
100/135-1.1/4	100	500	180	173	188	801	580	80	250	176	373	226	M12	20	148	440	150	CI	135
100/145-1.5/4	100	500	180	173	188	801	580	80	250	176	398	226	M12	20	148	440	150	CI	135
100/165-2.2/4	100	500	180	173	188	801	580	80	250	196	425	226	M12	20	155	440	150	CI	147
100/175-3/4	100	500	180	173	188	801	580	80	250	196	425	226	M12	20	155	440	150	CI	150

Note concerning l_1
For version N (standard motor), the dimensions depend on the motor version
*impeller material: CI grey cast iron; P plastic

Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-VeroTwin-DPL

Dimensions, weights (2900 rpm)

Wilo-VeroTwin-DPL ...	Nominal flange diameter	Overall length	Dimensions															Impeller*	Weight approx.
	DN	l_0	A	b_1	b_2	b_{max}	c	e	f	Ø g	l_{1max}	m	o	p	p_1	s	x	–	M
	–	[mm]											–	[mm]				–	[kg]
32/90-0.37/2	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	120	205	150	CI	35
32/100-0.55/2	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	120	205	150	CI	36
32/110-0.75/2	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	120	205	150	CI	38
32/130-1.1/2	32	260	70	101	105	410	225	56	106	185	331	136	M10	20	128	205	150	CI	44
32/160-1.1/2	32	260	70	101	105	410	225	56	106	185	331	136	M10	20	128	205	150	CI	44
32/165-3/2	32	320	100	117	122	539	360	43	137	217	393	155	M10	20	160	300	150	CI	85
32/175-4/2	32	320	100	117	122	539	360	43	137	220	409	155	M10	20	168	300	150	CI	99
40/90-0.37/2	40	250	75	85	91	350	225	35	97	143	294	135	M10	20	120	174	150	CI	37
40/115-0.55/2	40	250	75	85	91	350	225	35	97	143	294	135	M10	20	120	174	150	CI	39
40/120-1.5/2	40	320	75	113	119	456	240	45	135	185	325	167	M10	20	128	224	150	CI	59
40/130-2.2/2	40	320	75	113	119	456	240	45	135	193	353	167	M10	20	151	224	150	CI	63
40/150-3/2	40	320	75	113	119	456	240	45	135	217	388	167	M10	20	160	224	150	CI	73
40/160-4/2	40	320	75	113	119	456	240	45	135	232	421	167	M10	20	168	224	150	CI	87
40/165-4/2	40	340	100	120	127	587	400	52	145	220	413	170	M10	20	168	340	150	CI	104
40/175-5.5/2	40	340	100	120	127	587	400	52	145	232	433	170	M10	20	168	340	150	CI	104
40/195-7.5/2	40	440	110	145	147	692	500	38	192	279	515	220	M10	20	188	400	150	CI	175
50/115-0.75/2	50	280	83	95	101	390	228	50	107	143	300	155	M10	20	120	194	150	CI	41
50/120-1.5/2	50	340	86	120	130	500	240	48	132	185	327	190	M10	20	128	250	150	CI	60
50/130-2.2/2	50	340	86	120	130	500	240	48	132	193	350	190	M10	20	151	250	150	CI	64
50/140-3/2	50	340	86	120	130	500	240	48	132	217	390	190	M10	20	160	250	150	CI	74
50/150-4/2	50	340	86	120	130	500	240	48	132	232	423	190	M10	20	168	250	150	CI	88
50/155-4/2	50	340	105	108	116	532	360	52	148	232	463	170	M10	20	168	300	150	CI	101
50/165-5.5/2	50	340	120	126	136	619	360	50	130	279	503	180	M10	20	188	340	150	CI	148
50/175-5.5/2	50	340	120	126	136	619	360	50	130	279	503	180	M10	20	188	340	150	CI	148
50/175-7.5/2	50	340	120	126	136	619	360	50	130	279	503	180	M10	20	188	340	150	CI	164
50/185-7.5/2	50	440	120	145	148	693	500	50	200	279	521	220	M10	20	188	400	150	CI	172
65/115-1.5/2	65	340	93	103	117	432	225	25	137	193	361	185	M10	20	151	212	150	CI	66
65/120-2.2/2	65	340	93	125	135	550	240	43	137	193	356	185	M10	20	151	290	150	CI	72
65/130-3/2	65	340	93	125	135	550	240	43	137	217	396	185	M10	20	160	290	150	CI	82
65/140-4/2	65	340	93	125	135	550	240	43	137	232	429	185	M10	20	168	290	150	CI	96
65/145-5.5/2	65	340	120	121	130	619	400	50	150	279	521	170	M12	20	188	340	150	CI	153
65/155-5.5/2	65	340	120	121	130	619	400	50	150	279	521	170	M12	20	188	340	150	CI	154
65/155-7.5/2	65	340	120	121	130	619	400	50	150	279	521	170	M12	20	188	340	150	CI	170
65/165-5.5/2	65	430	153	134	144	679	440	55	185	279	521	215	M12	20	188	400	150	CI	169
65/175-5.5/2	65	430	153	134	144	679	440	55	185	279	521	215	M12	20	188	400	150	CI	169
65/175-7.5/2	65	430	153	134	144	679	440	55	185	279	521	215	M12	20	188	400	150	CI	185
80/115-2.2/2	80	360	100	113	132	480	240	43	137	193	378	205	M10	20	151	235	150	CI	76
80/130-3/2	80	360	103	134	147	601	240	30	150	217	402	192	M10	20	160	320	150	CI	85
80/140-4/2	80	360	103	134	147	601	240	30	150	232	435	192	M10	20	168	320	150	CI	99
80/145-5.5/2	80	400	155	134	146	630	400	62	178	279	528	200	M12	20	188	350	150	CI	168

Dimensions, weights Wilo-VeroTwin-DPL

Dimensions, weights (2900 rpm)

Wilo-VeroTwin-DPL ...	Nominal flange diameter	Overall length	Dimensions															Impeller*	Weight approx.
	DN	l_0	A	b_1	b_2	b_{max}	c	e	f	Ø g	l_{1max}	m	o	p	p_1	s	x	–	M
	–	[mm]											–	[mm]				–	[kg]
80/155-7.5/2	80	400	155	134	146	630	400	62	178	279	528	200	M12	20	188	350	150	CI	184

Note concerning l_1
For version N (standard motor), the dimensions depend on the motor version
*impeller material: CI grey cast iron; P plastic

Flange dimensions

Wilo-VeroTwin-DPL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19
100...	100	220	156	180	8 x 19

Pump flange dimensions - drilled according to EN 1092-2 PN 16, n = number of drilled holes

Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-CronoTwin-DL

Design
Glanded double pump in in-line design with flange connection

Application
For pumping heating water (according to VDI 2035), water-glycol mixtures and cooling and cold water without abrasive substances in heating, cold water and cooling water systems

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**DL 40/160-4/2**
DL	In-line double pump
40	Nominal diameter DN of the pipe connection
160	Nominal impeller diameter
4	Nominal motor power P_2 in kW
2	Number of poles

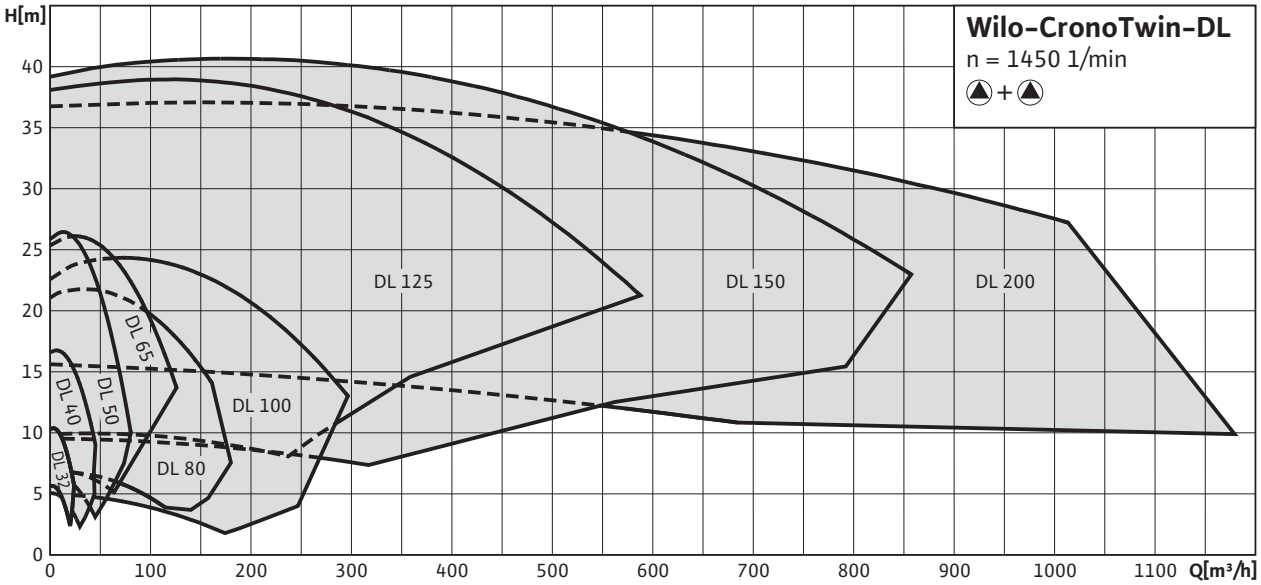
Technical data
- Permissible temperature range -20°C to +140°C
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter DN 32 to DN 200
- Max. operating pressure 16 bar

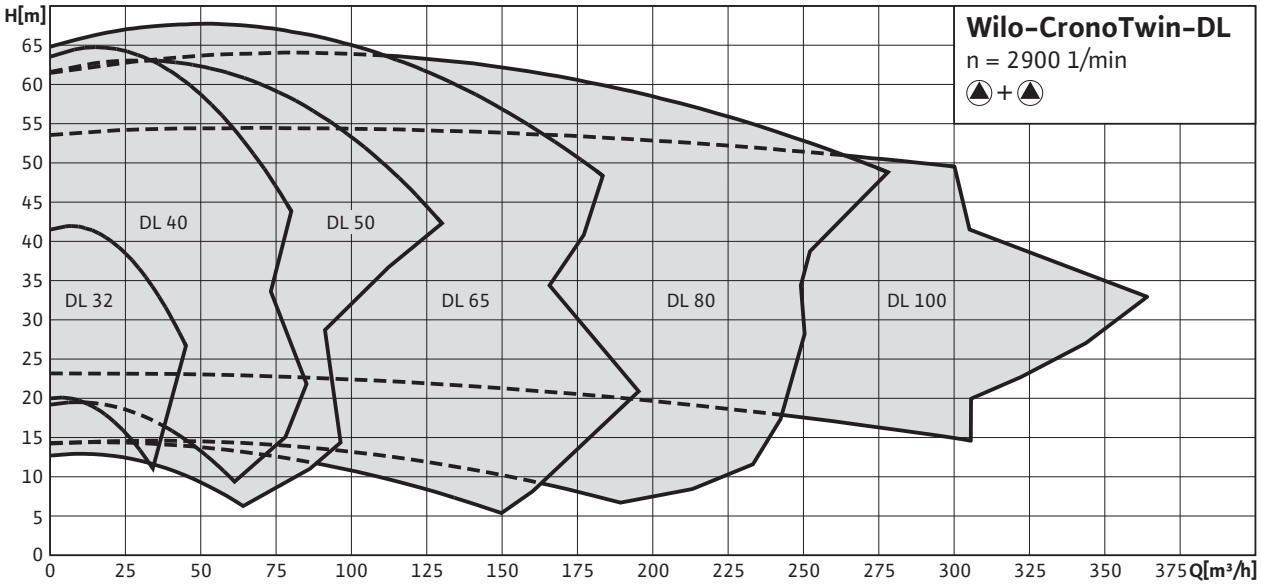
Special features/product benefits
- Reduced life cycle costs due to optimised efficiency
- Reduction of space required and installation costs due to double pump design
- Main/standby mode or peak-load operation (by means of external auxiliary device)
- Peak-load operation (by means of external auxiliary device)
- Standard condensate drainage holes in the motor housings
- Can be used flexibly in air-conditioning and cooling systems, with application benefits due to direct draining of condensate via optimised lantern design (patented)
- High corrosion protection due to cataphoretic coating
- Bidirectional mechanical seal with forced flushing
- High worldwide availability of standard motors (according to Wilo specifications) and standard mechanical seals

Materials
- Pump housing and lantern: Standard: EN-GJL-250
- Impeller: Standard: EN-GJL-200; Special version: Red brass G-CuSn10
- Shaft: 1.4122
- Mechanical seal: AQ1EGG; other mechanical seals on request

Description/design
Single-stage, low-pressure double pump in in-line design with
- Switchover valve
- Mechanical seal
- Flange connection with pressure measuring connection R $^1/_8$
- Lantern
- Coupling
- IEC standard motor

Series description Wilo-CronoTwin-DL

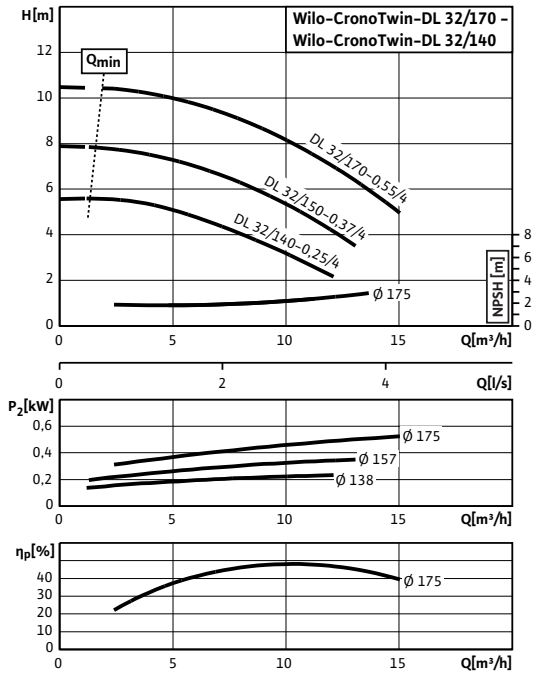




Pump curves Wilo-CronoTwin-DL

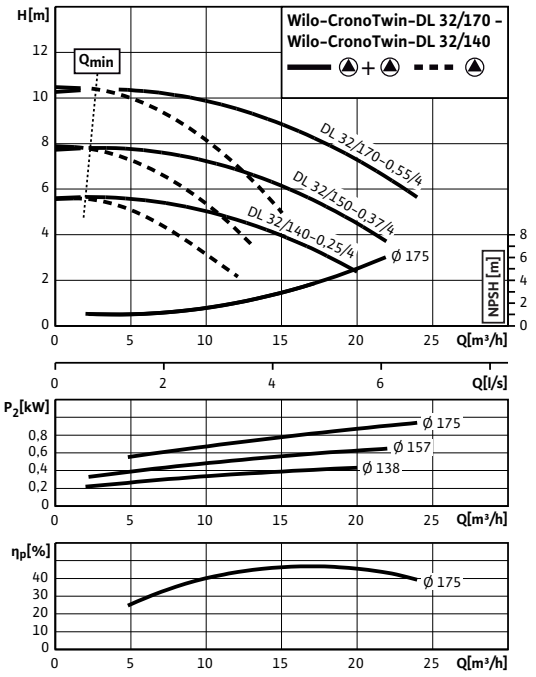
Wilo-CronoTwin-DL 32/140-0,25/4 - 32/170-0,55/4

Speed 1450 rpm - individual operation



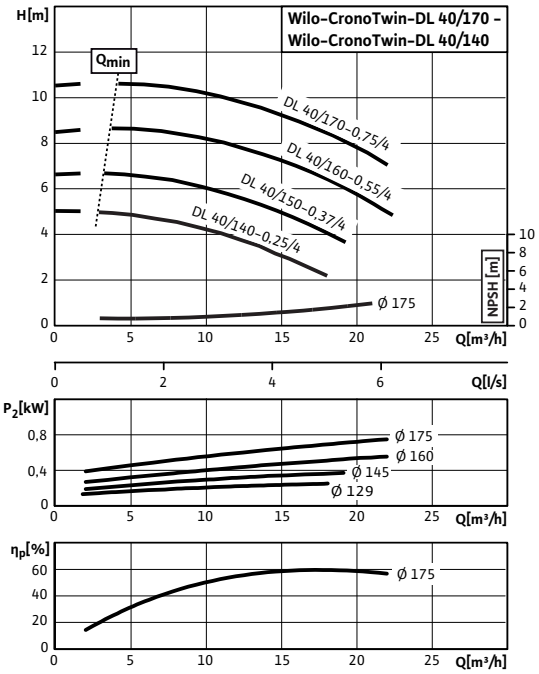
Wilo-CronoTwin-DL 32/140-0,25/4 - 32/170-0,55/4

Speed 1450 rpm - parallel operation



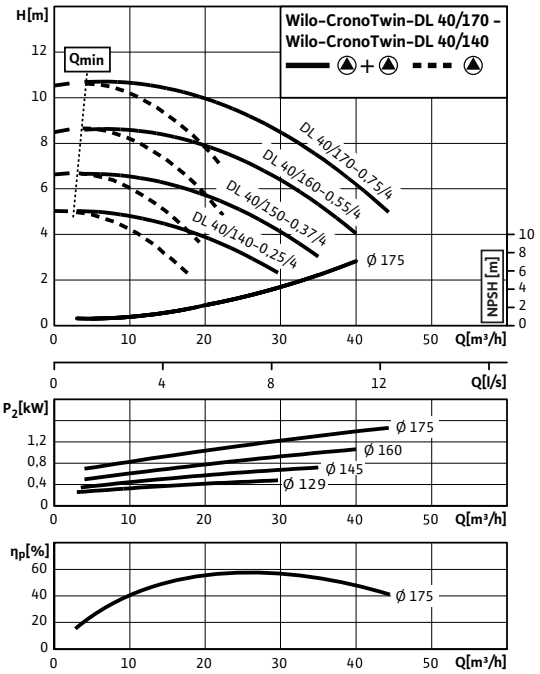
Wilo-CronoTwin-DL 40/140-0,25/4 - 40/170-0,75/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 40/140-0,25/4 - 40/170-0,75/4

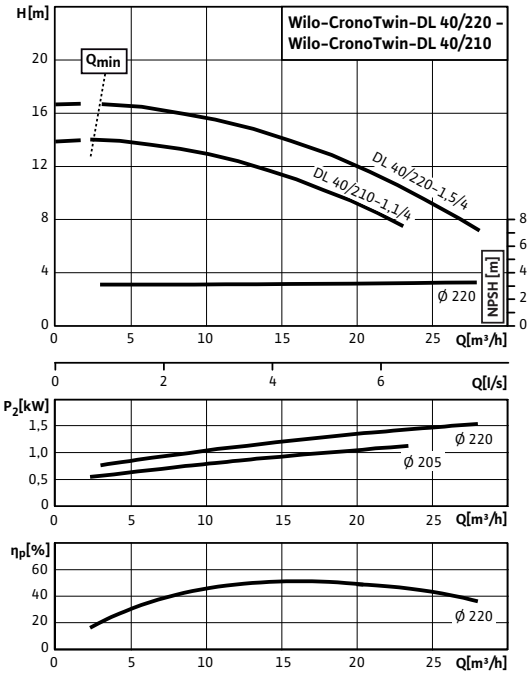
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

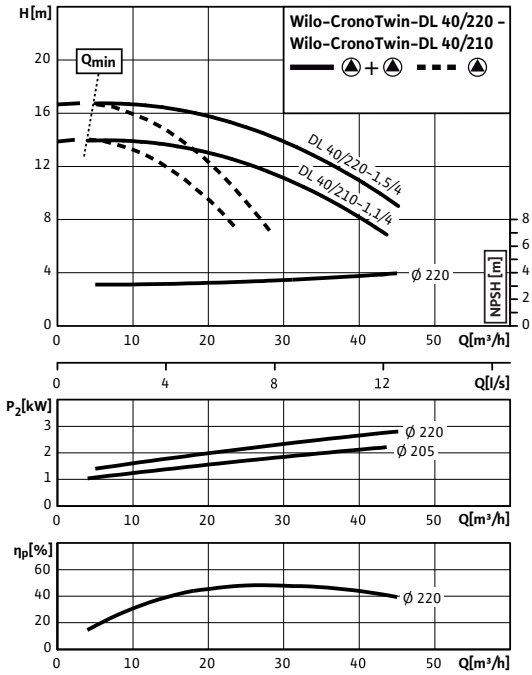
Wilo-CronoTwin-DL 40/210-1,1/4 - 40/220-1,5/4

Speed 1450 rpm - individual operation



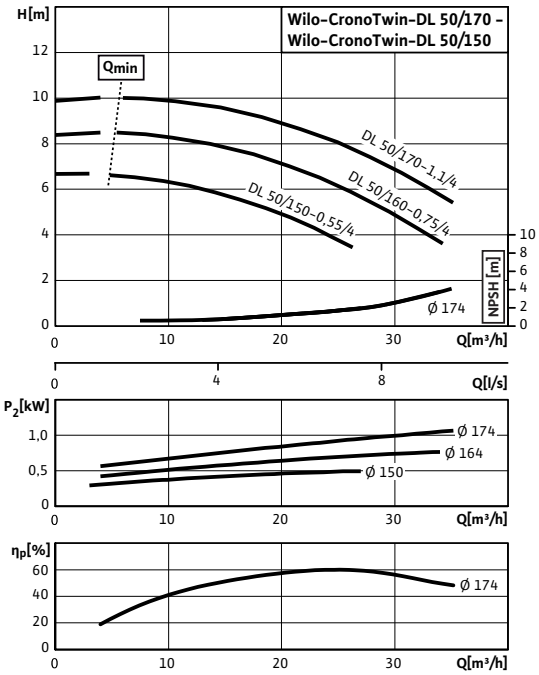
Wilo-CronoTwin-DL 40/210-1,1/4 - 40/220-1,5/4

Speed 1450 rpm - parallel operation



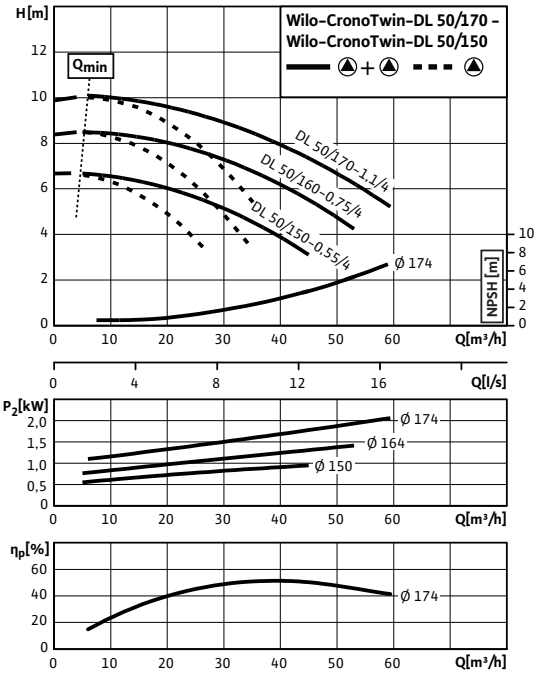
Wilo-CronoTwin-DL 50/150-0,55/4 - 50/170-1,1/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 50/150-0,55/4 - 50/170-1,1/4

Speed 1450 rpm - parallel operation



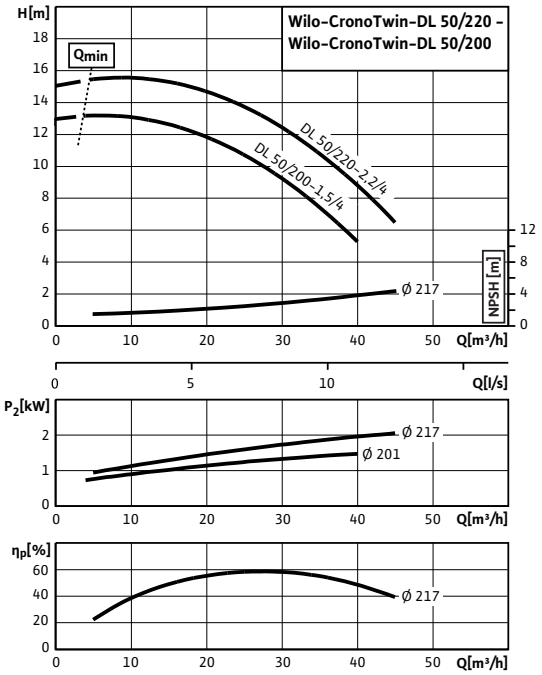
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL

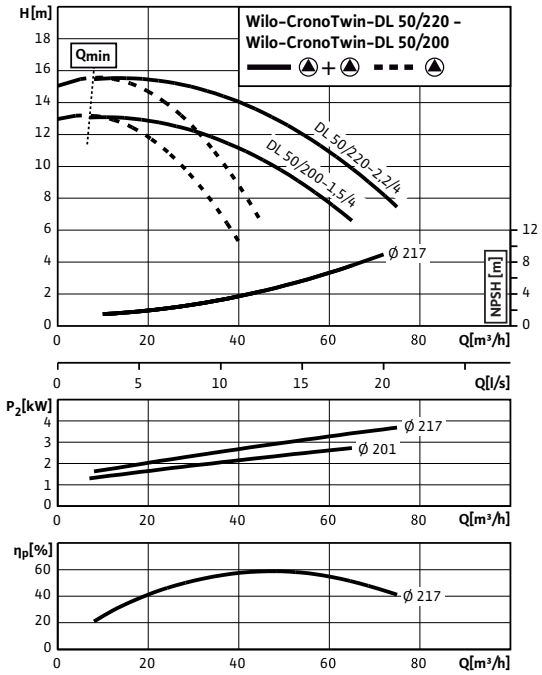
Wilo-CronoTwin-DL 50/200-1,5/4 - 50/220-2,2/4

Speed 1450 rpm - individual operation



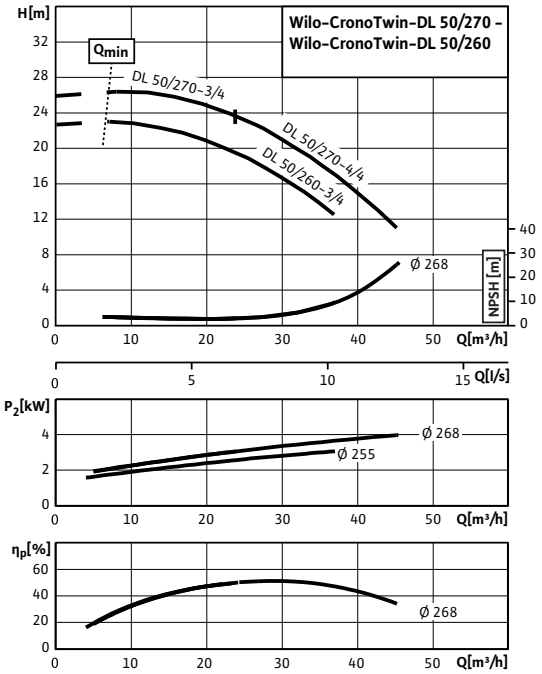
Wilo-CronoTwin-DL 50/200-1,5/4 - 50/220-2,2/4

Speed 1450 rpm - parallel operation



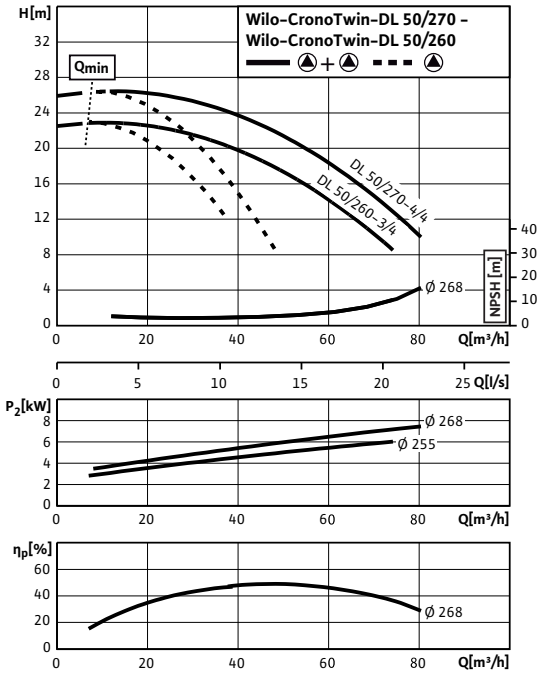
Wilo-CronoTwin-DL 50/260-3/4 - 50/270-4/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 50/260-3/4 - 50/270-4/4

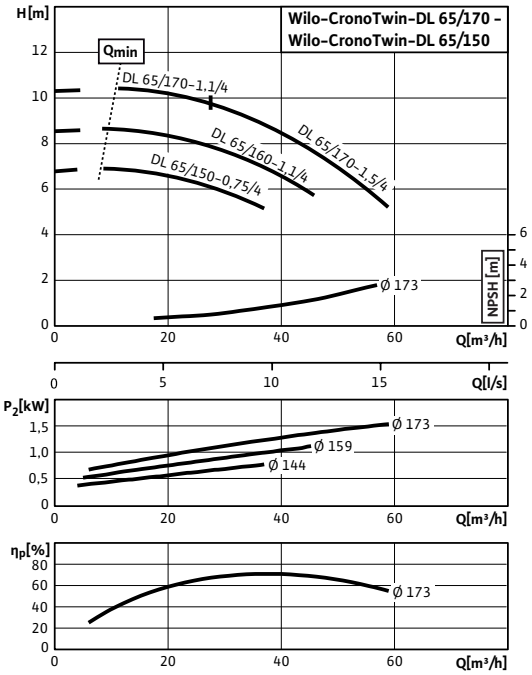
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

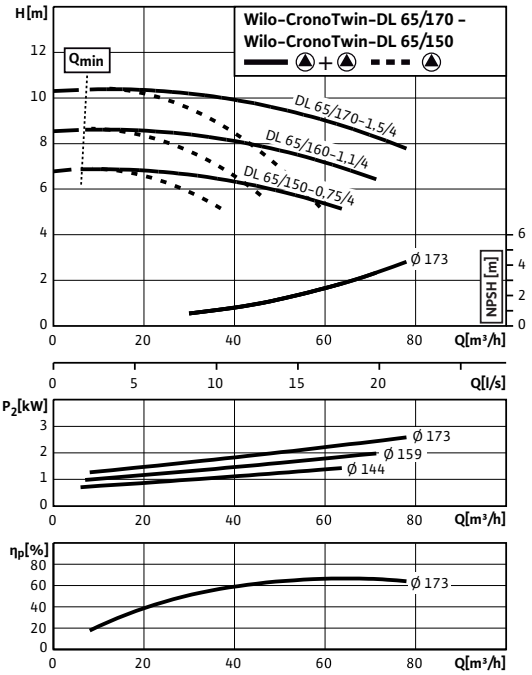
Wilo-CronoTwin-DL 65/150-0,75/4 - 65/170-1,5/4

Speed 1450 rpm - individual operation



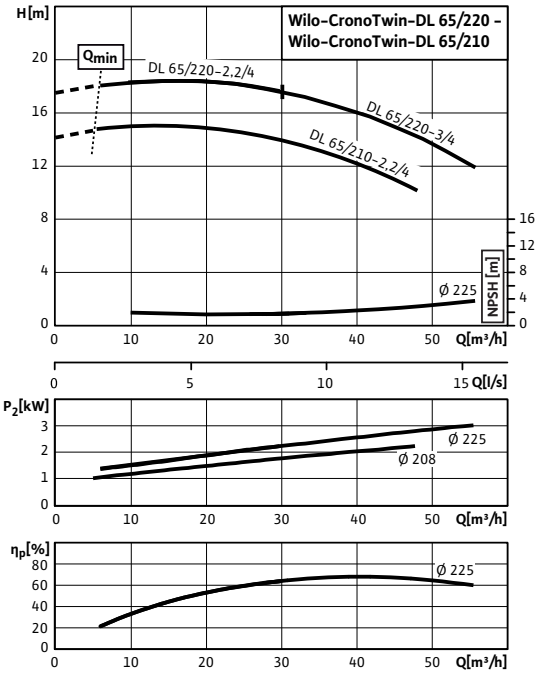
Wilo-CronoTwin-DL 65/150-0,75/4 - 65/170-1,5/4

Speed 1450 rpm - parallel operation



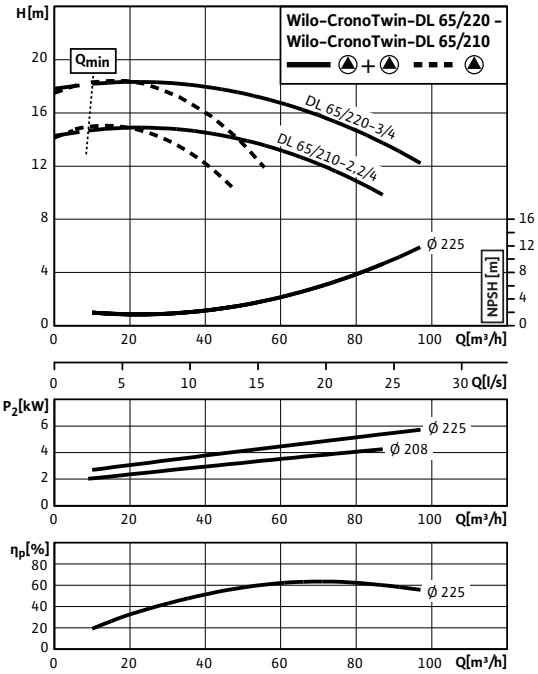
Wilo-CronoTwin-DL 65/210-2,2/4 - 65/220-3/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 65/210-2,2/4 - 65/220-3/4

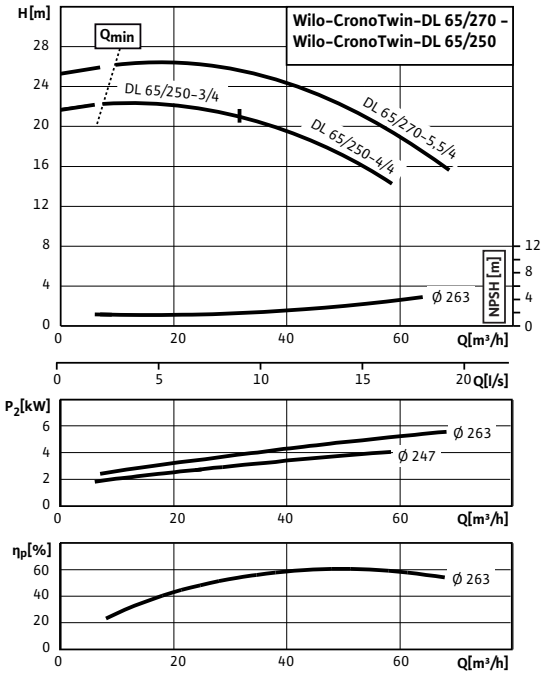
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

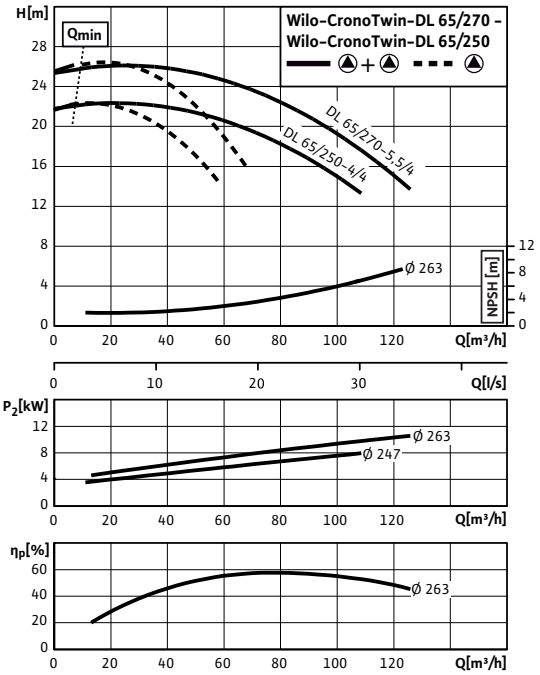
Wilo-CronoTwin-DL 65/250-3/4 - 65/270-5,5/4

Speed 1450 rpm - individual operation



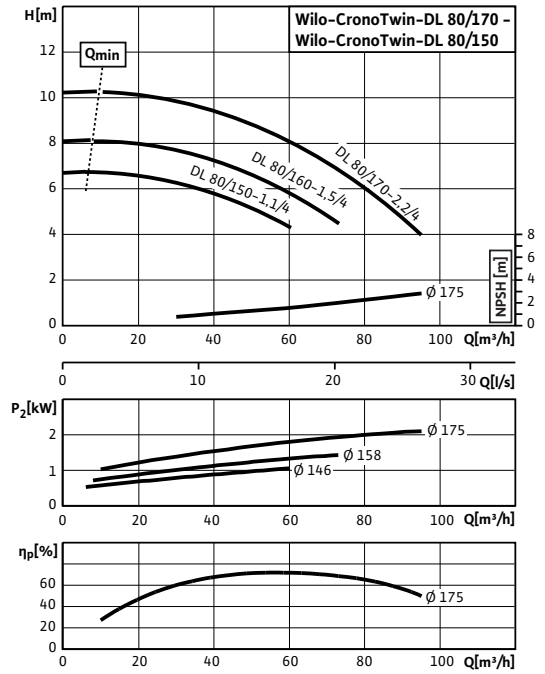
Wilo-CronoTwin-DL 65/250-3/4 - 65/270-5,5/4

Speed 1450 rpm - parallel operation



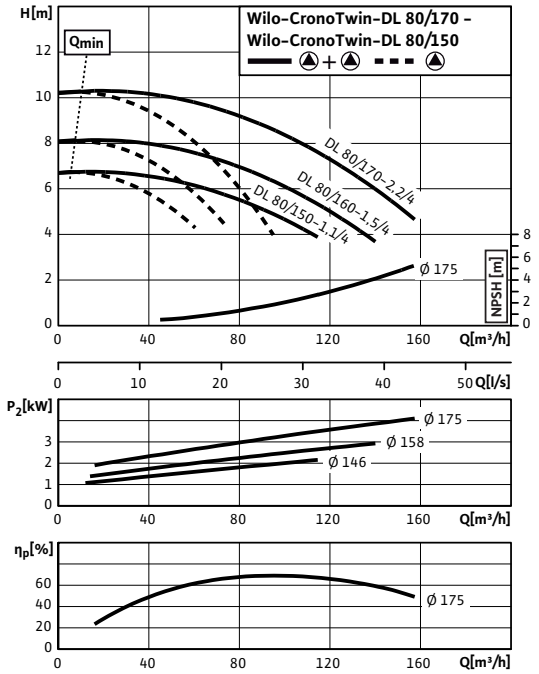
Wilo-CronoTwin-DL 80/150-1,1/4 - 80/170-2,2/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 80/150-1,1/4 - 80/170-2,2/4

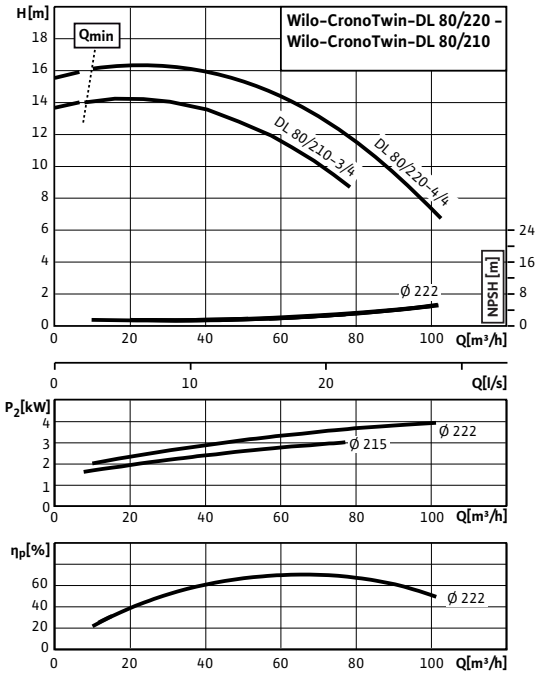
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

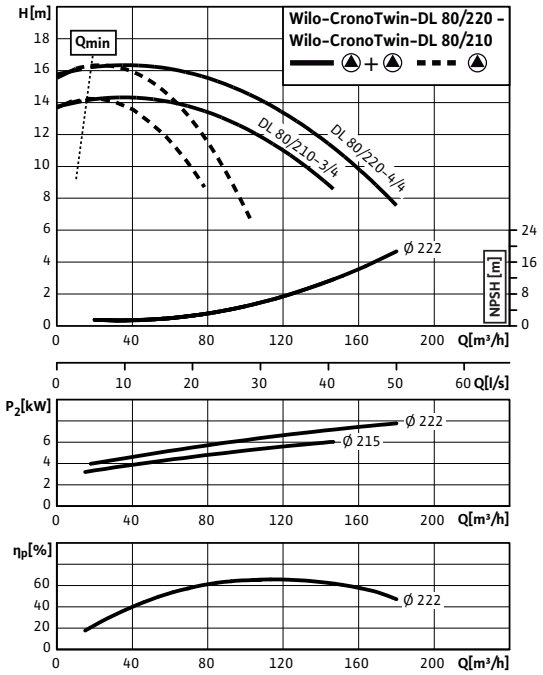
Wilo-CronoTwin-DL 80/210-3/4 - 80/220-4/4

Speed 1450 rpm - individual operation



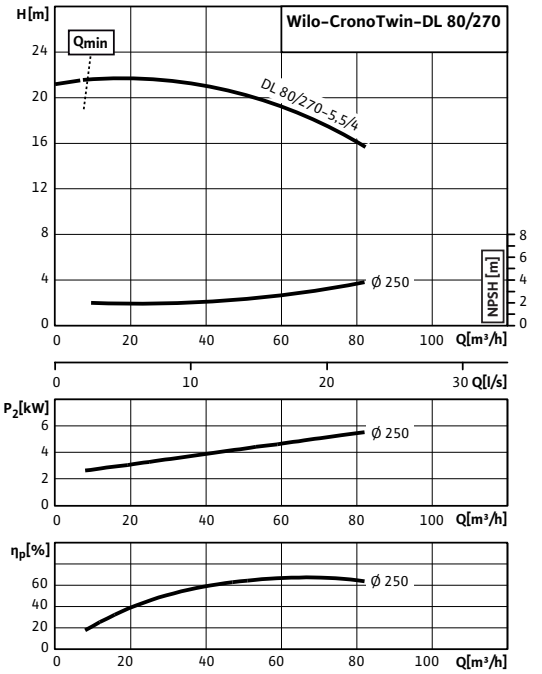
Wilo-CronoTwin-DL 80/210-3/4 - 80/220-4/4

Speed 1450 rpm - parallel operation



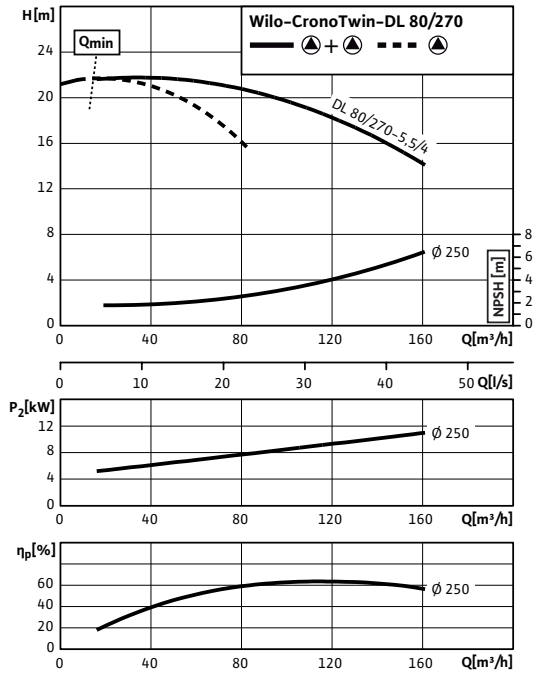
Wilo-CronoTwin-DL 80/270-5,5/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 80/270-5,5/4

Speed 1450 rpm - parallel operation



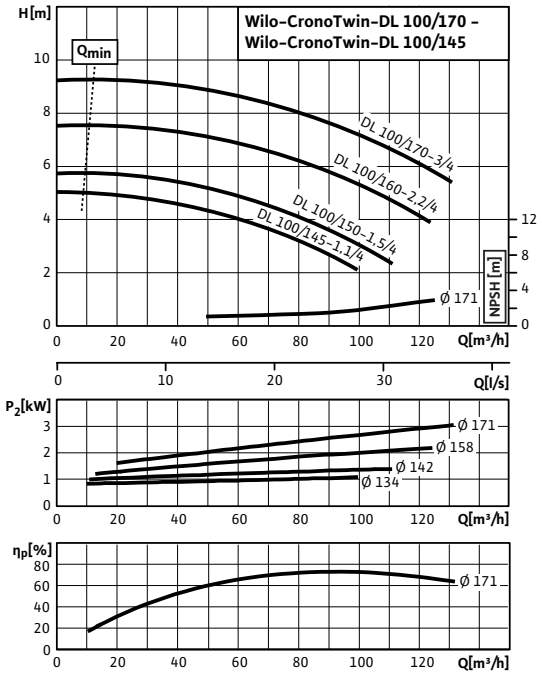
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL

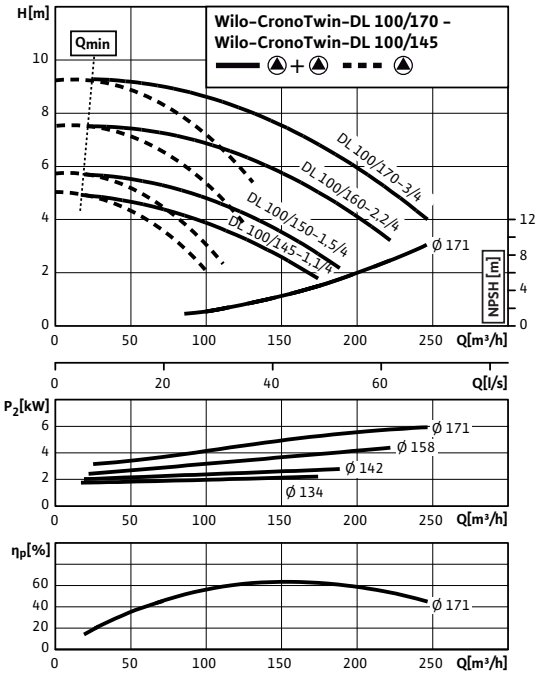
Wilo-CronoTwin-DL 100/145-1,1/4 - 100/170-3/4

Speed 1450 rpm - individual operation



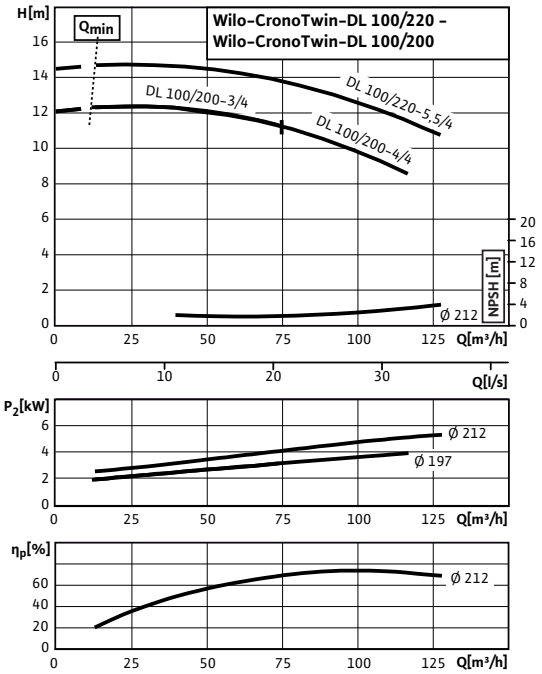
Wilo-CronoTwin-DL 100/145-1,1/4 - 100/170-3/4

Speed 1450 rpm - parallel operation



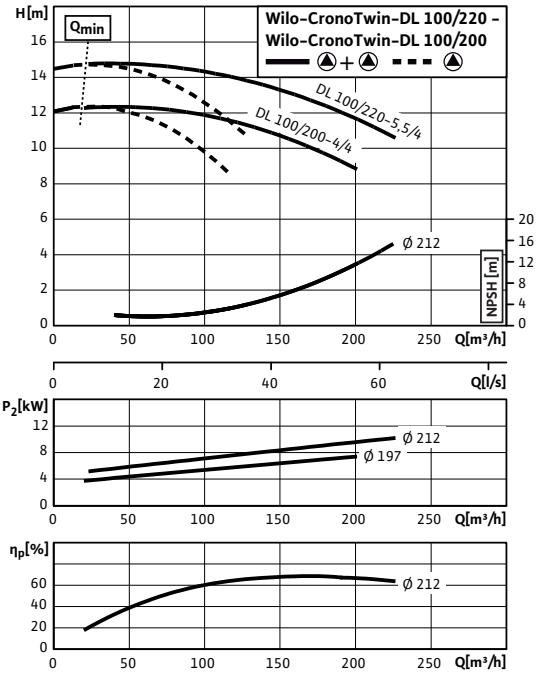
Wilo-CronoTwin-DL 100/200-3/4 - 100/220-5,5/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 100/200-3/4 - 100/220-5,5/4

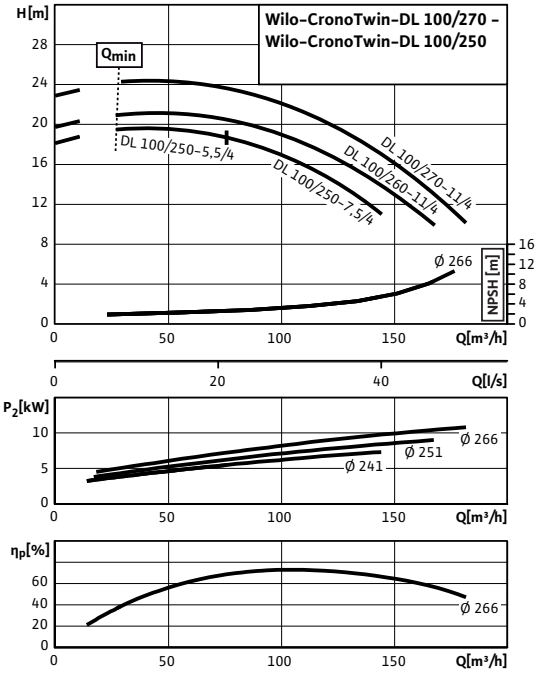
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

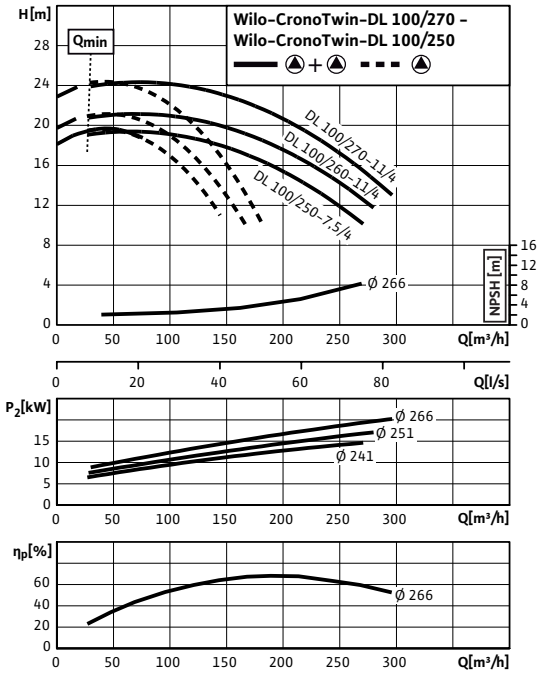
Wilo-CronoTwin-DL 100/250-5,5/4 - 100/270-11/4

Speed 1450 rpm - individual operation



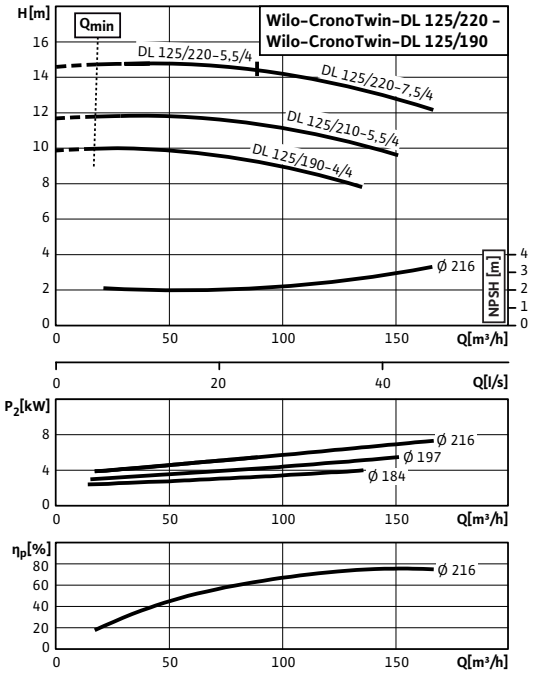
Wilo-CronoTwin-DL 100/250-5,5/4 - 100/270-11/4

Speed 1450 rpm - parallel operation



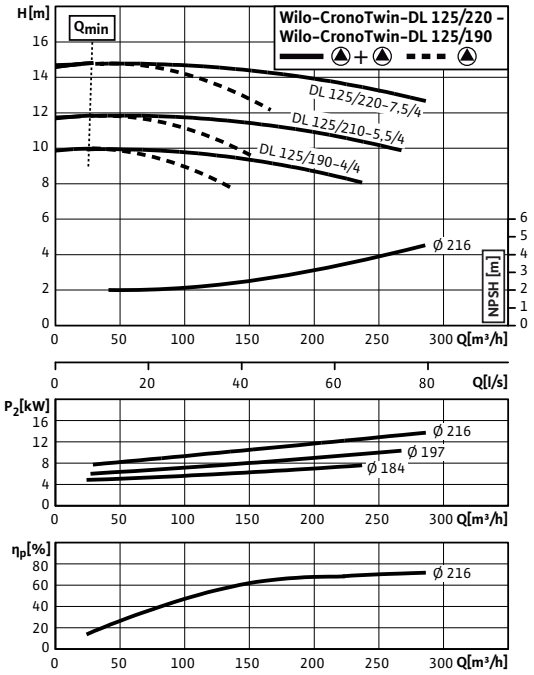
Wilo-CronoTwin-DL 125/190-4/4 - 125/220-7,5/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 125/190-4/4 - 125/220-7,5/4

Speed 1450 rpm - parallel operation



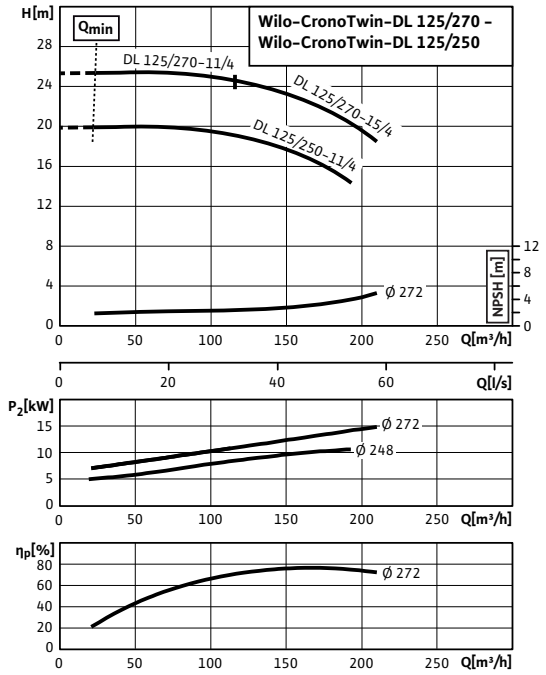
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL

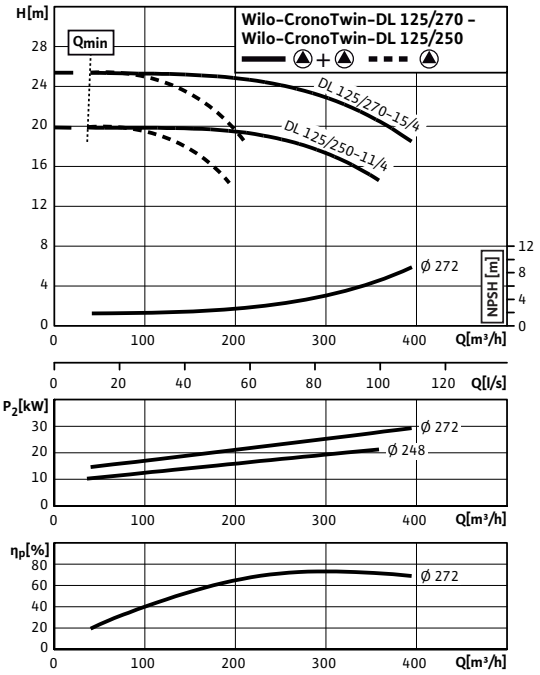
Wilo-CronoTwin-DL 125/250-11/4 - 125/270-15/4

Speed 1450 rpm - individual operation



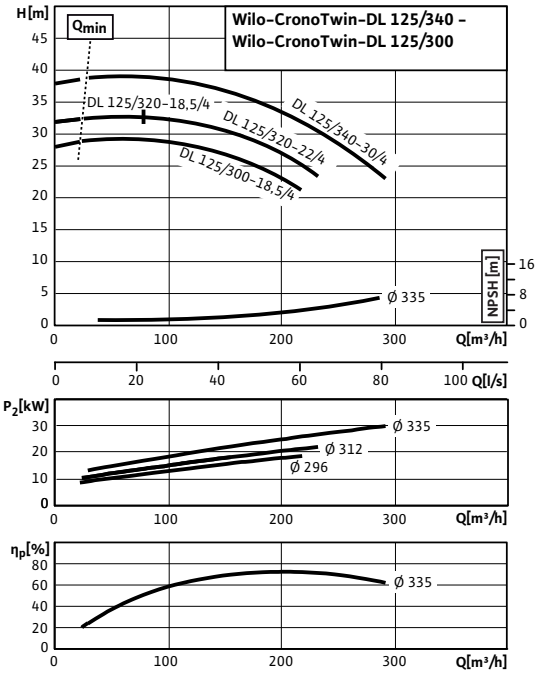
Wilo-CronoTwin-DL 125/250-11/4 - 125/270-15/4

Speed 1450 rpm - parallel operation



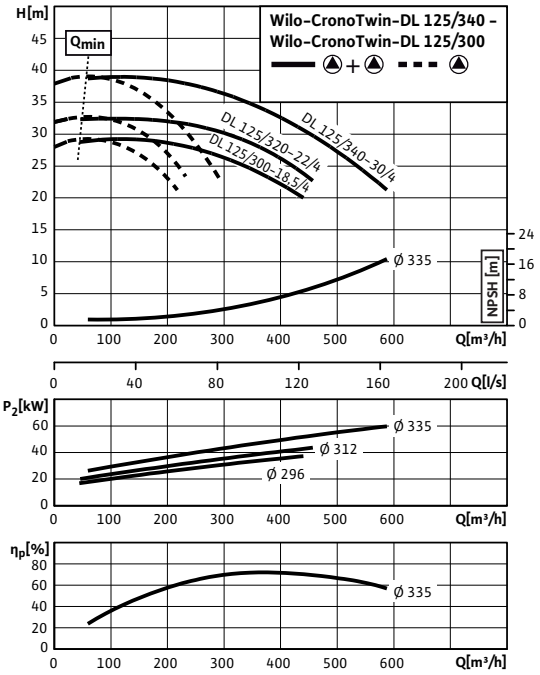
Wilo-CronoTwin-DL 125/300-18,5/4 - 125/340-30/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 125/300-18,5/4 - 125/340-30/4

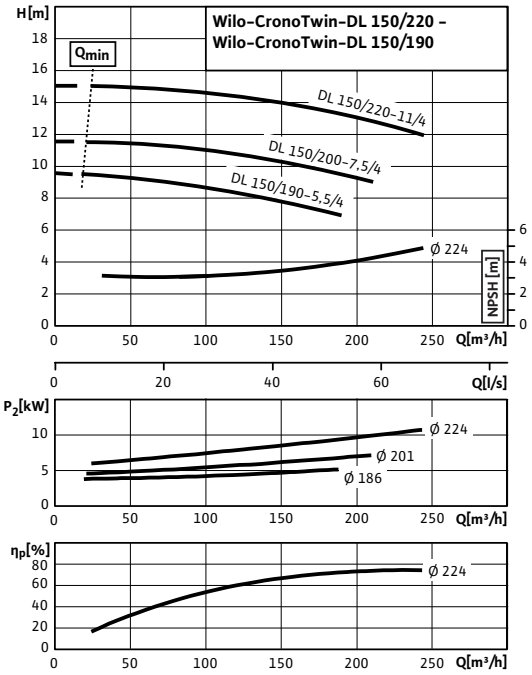
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

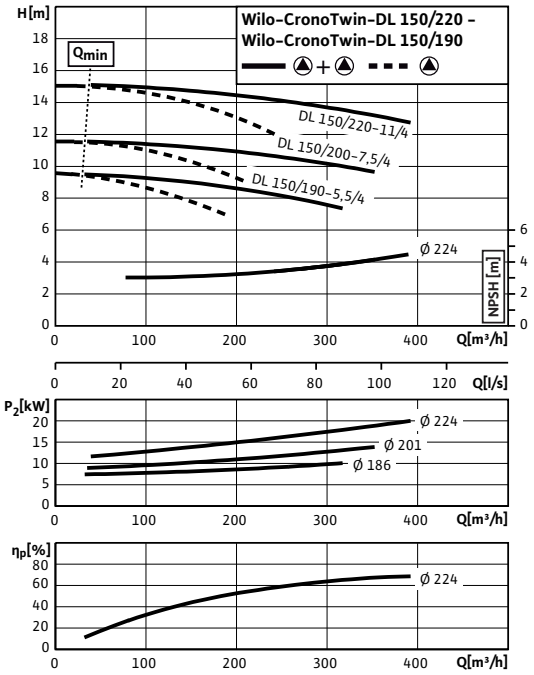
Wilo-CronoTwin-DL 150/190-5,5/4 - 150/220-11/4

Speed 1450 rpm - individual operation



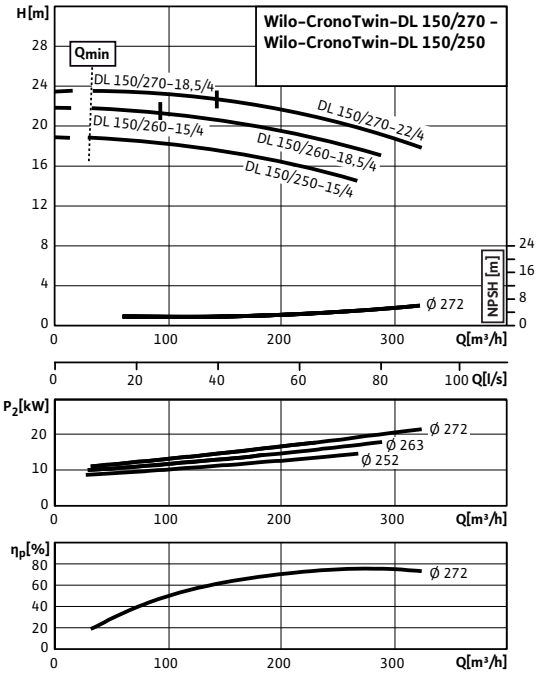
Wilo-CronoTwin-DL 150/190-5,5/4 - 150/220-11/4

Speed 1450 rpm - parallel operation



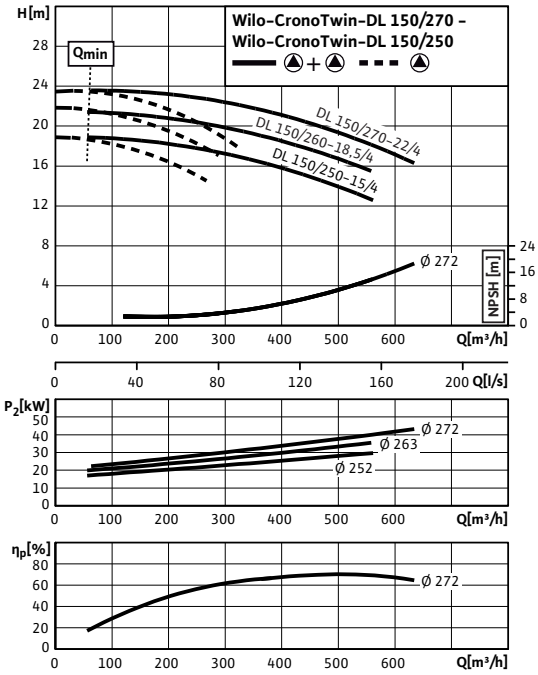
Wilo-CronoTwin-DL 150/250-15/4 - 150/270-22/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 150/250-15/4 - 150/270-22/4

Speed 1450 rpm - parallel operation



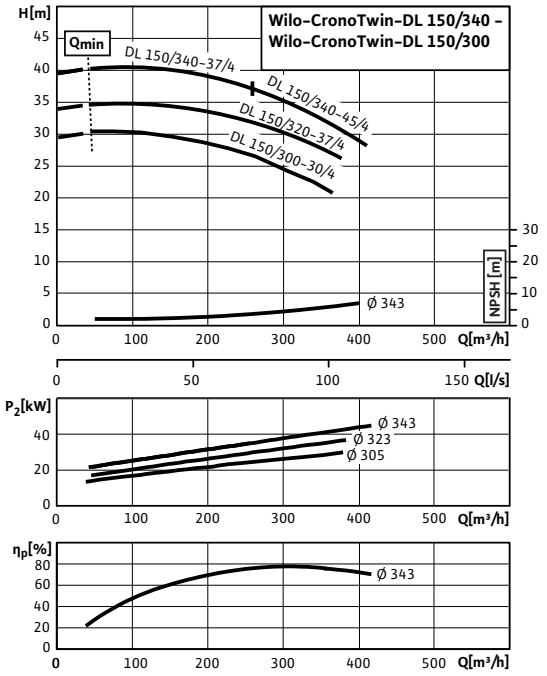
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL

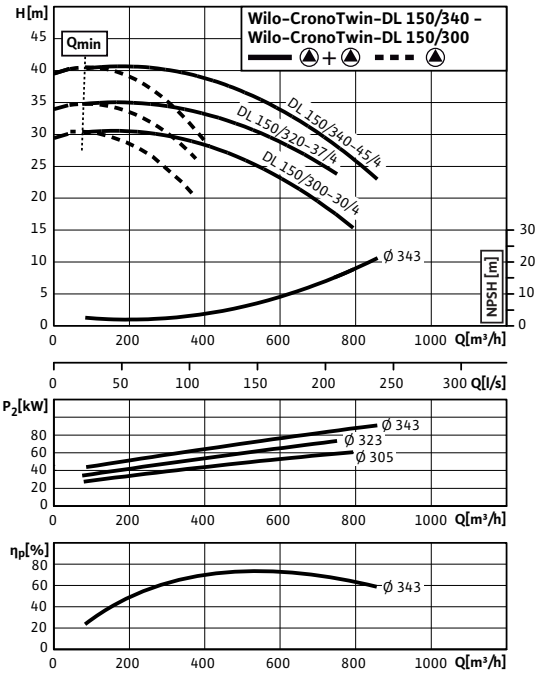
Wilo-CronoTwin-DL 150/300-30/4 - 150/340-45/4

Speed 1450 rpm - individual operation



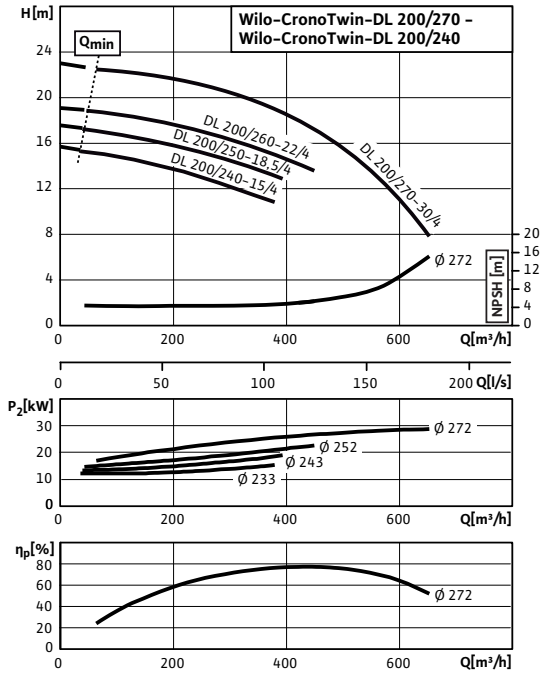
Wilo-CronoTwin-DL 150/300-30/4 - 150/340-45/4

Speed 1450 rpm - parallel operation



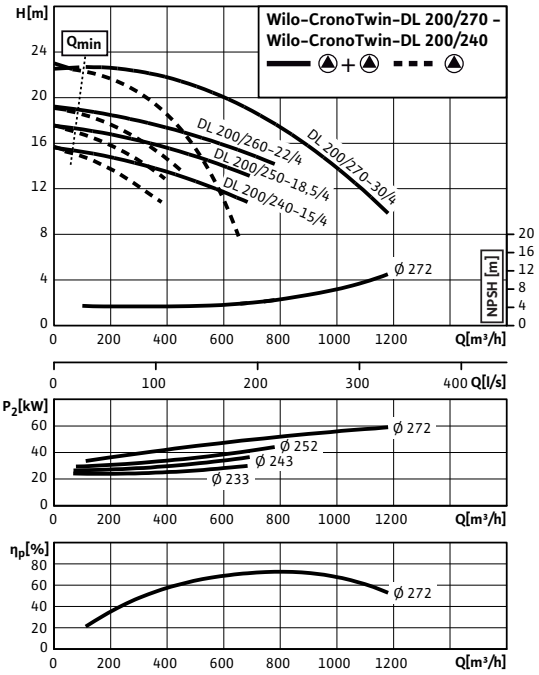
Wilo-CronoTwin-DL 200/240-15/4 - 200/270-30/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 200/240-15/4 - 200/270-30/4

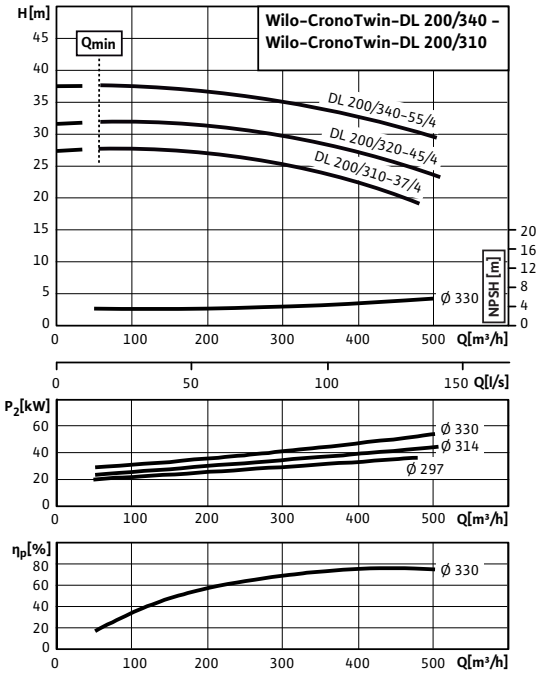
Speed 1450 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

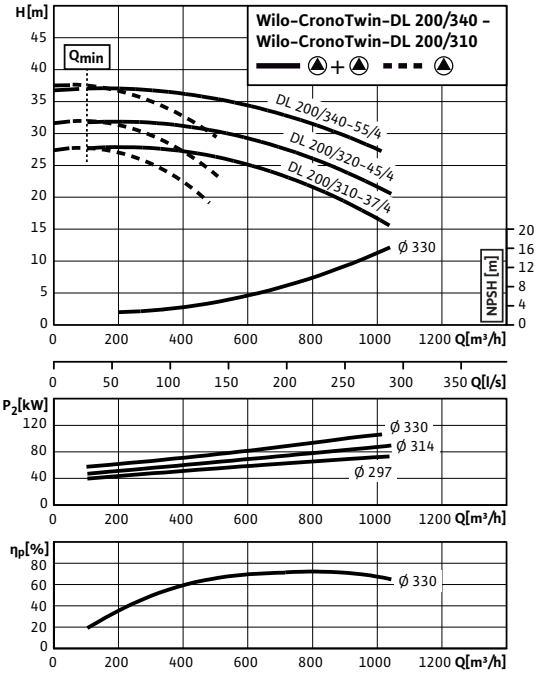
Wilo-CronoTwin-DL 200/310-37/4 - 200/340-55/4

Speed 1450 rpm - individual operation



Wilo-CronoTwin-DL 200/310-37/4 - 200/340-55/4

Speed 1450 rpm - parallel operation



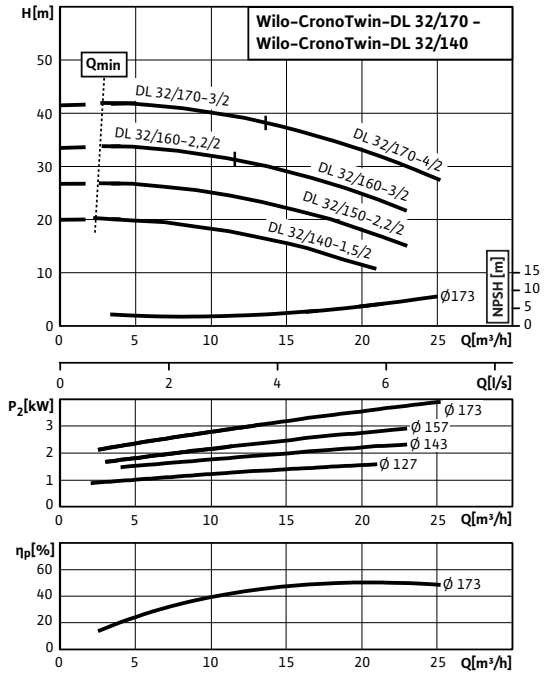
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL

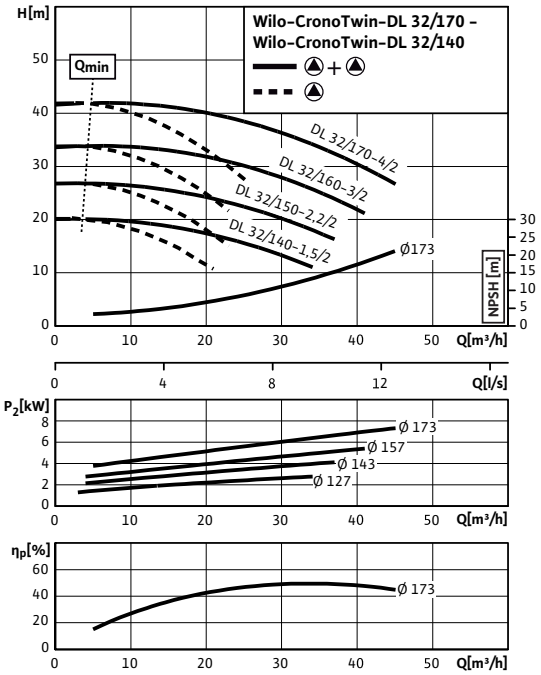
Wilo-CronoTwin-DL 32/140-1,5/2 - 32/170-4/2

Speed 2900 rpm - individual operation



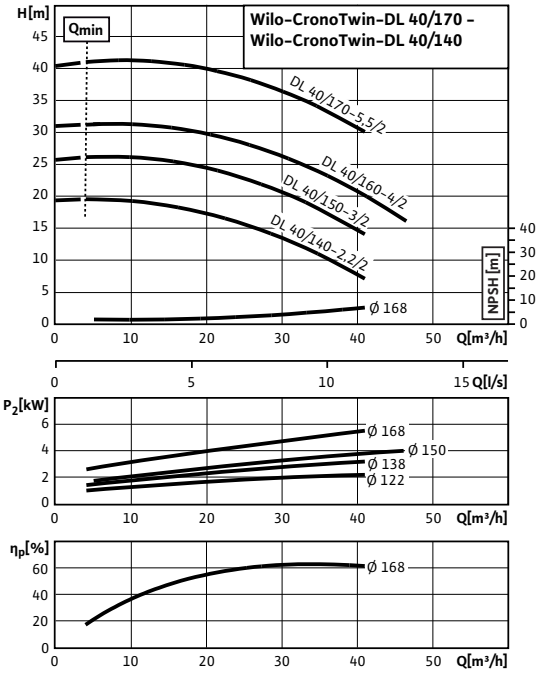
Wilo-CronoTwin-DL 32/140-1,5/2 - 32/170-4/2

Speed 2900 rpm - parallel operation



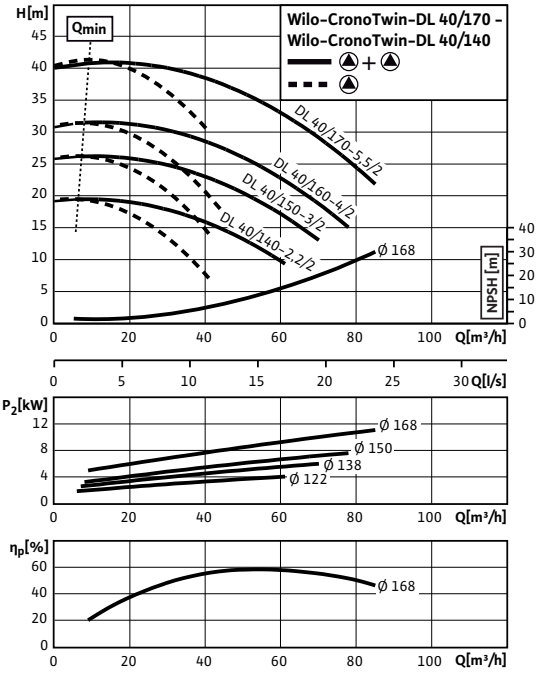
Wilo-CronoTwin-DL 40/140-2,2/2 - 40/170-5,5/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 40/140-2,2/2 - 40/170-5,5/2

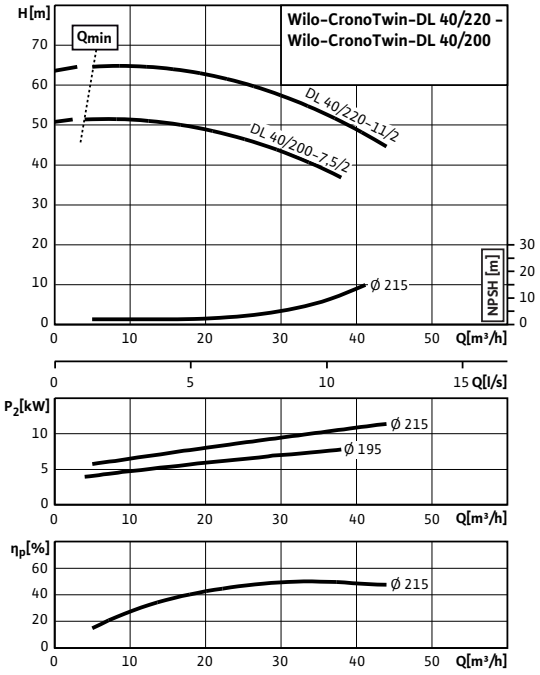
Speed 2900 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

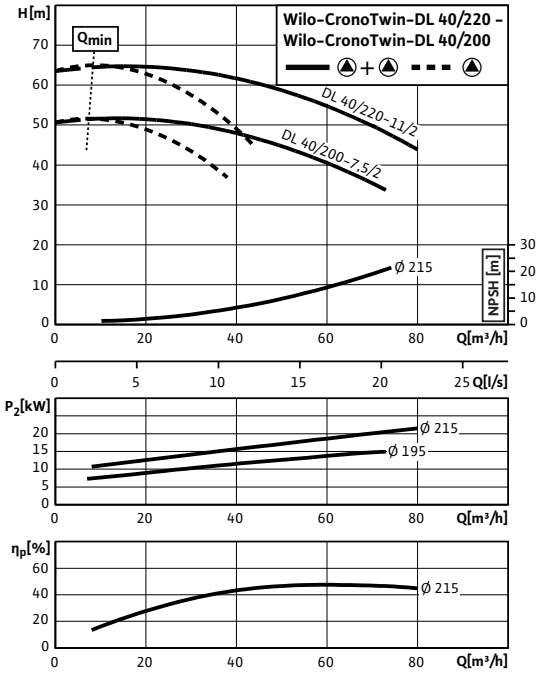
Wilo-CronoTwin-DL 40/200-7,5/2 - 40/220-11/2

Speed 2900 rpm - individual operation



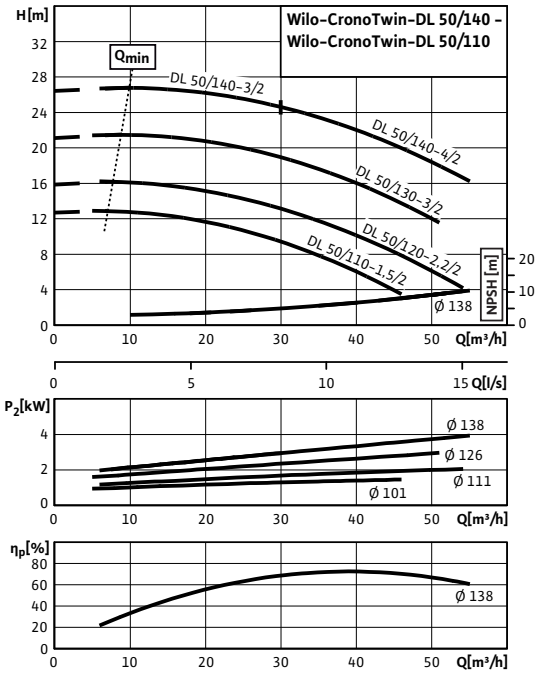
Wilo-CronoTwin-DL 40/200-7,5/2 - 40/220-11/2

Speed 2900 rpm - parallel operation



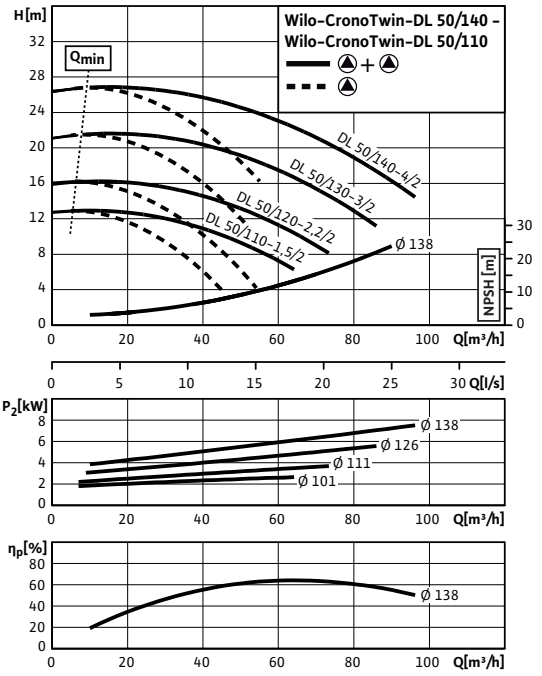
Wilo-CronoTwin-DL 50/110-1,5/2 - 50/140-4/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 50/110-1,5/2 - 50/140-4/2

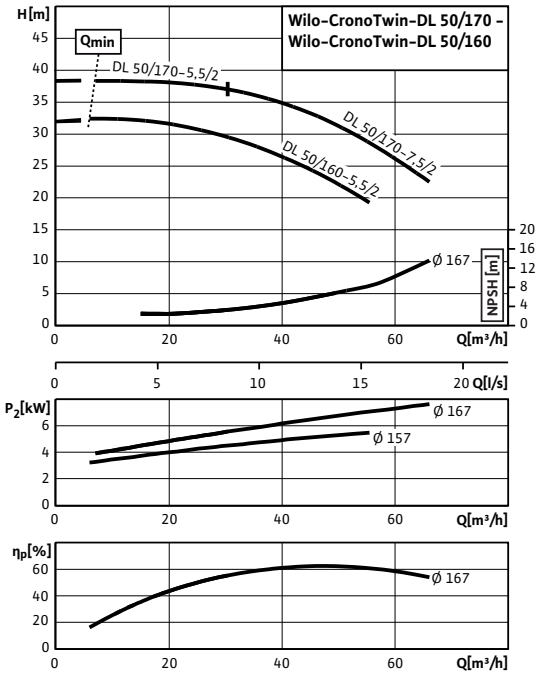
Speed 2900 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

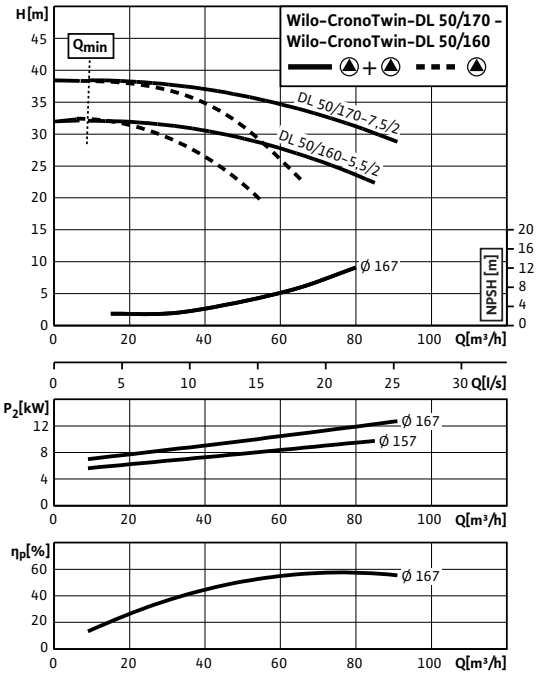
Wilo-CronoTwin-DL 50/160-5,5/2 - 50/170-7,5/2

Speed 2900 rpm - individual operation



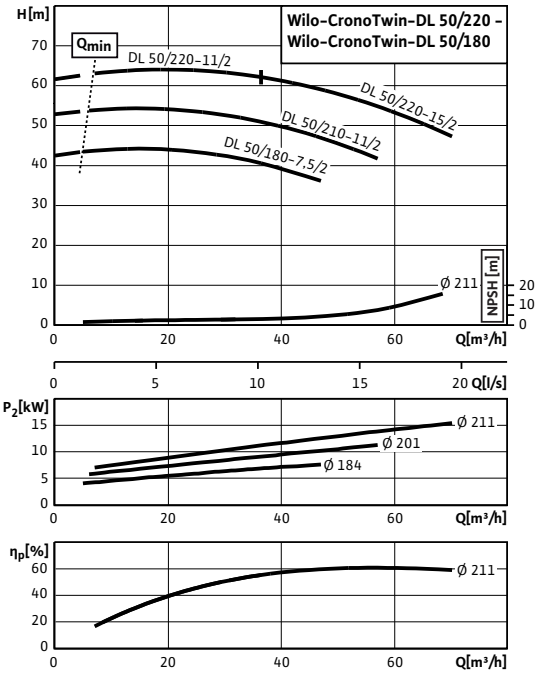
Wilo-CronoTwin-DL 50/160-5,5/2 - 50/170-7,5/2

Speed 2900 rpm - parallel operation



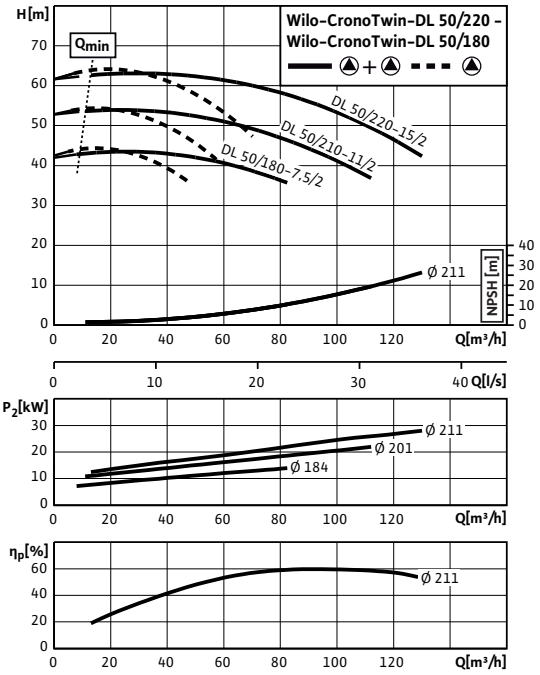
Wilo-CronoTwin-DL 50/180-7,5/2 - 50/220-15/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 50/180-7,5/2 - 50/220-15/2

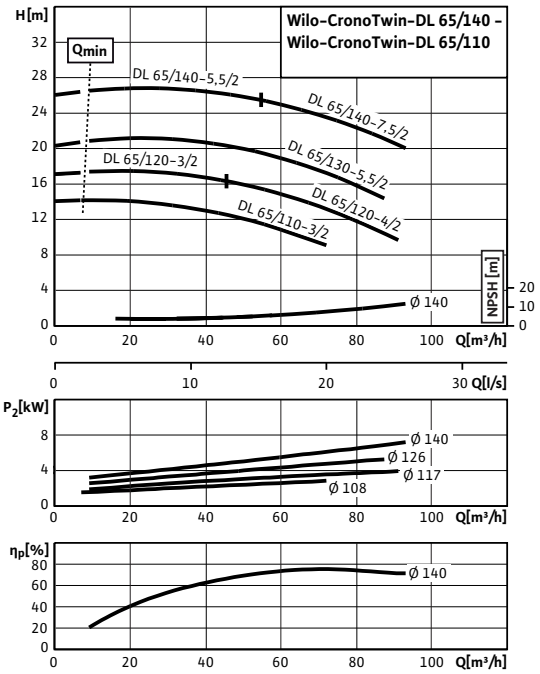
Speed 2900 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

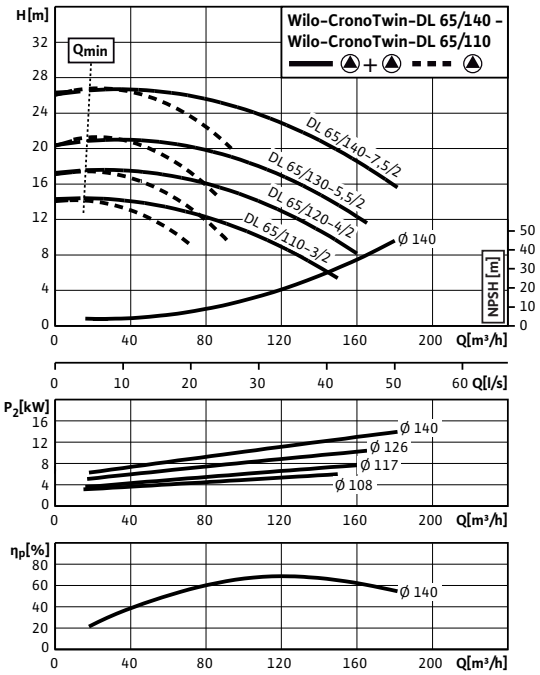
Wilo-CronoTwin-DL 65/110-3/2 - 65/140-7,5/2

Speed 2900 rpm - individual operation



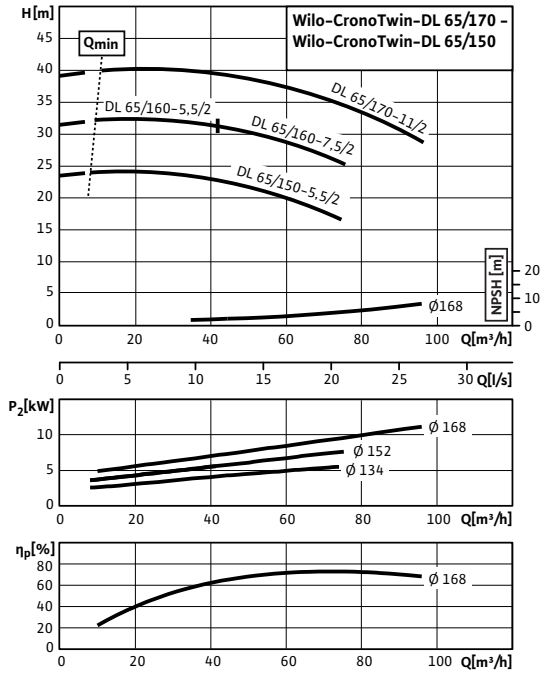
Wilo-CronoTwin-DL 65/110-3/2 - 65/140-7,5/2

Speed 2900 rpm - parallel operation



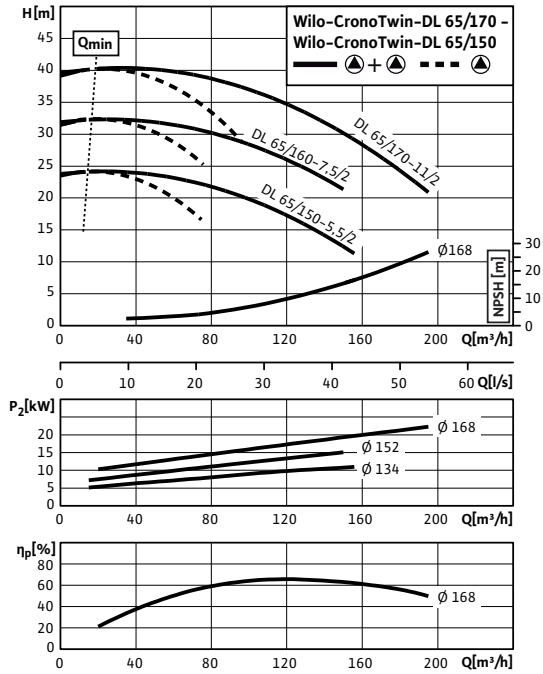
Wilo-CronoTwin-DL 65/150-5,5/2 - 65/170-11/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 65/150-5,5/2 - 65/170-11/2

Speed 2900 rpm - parallel operation



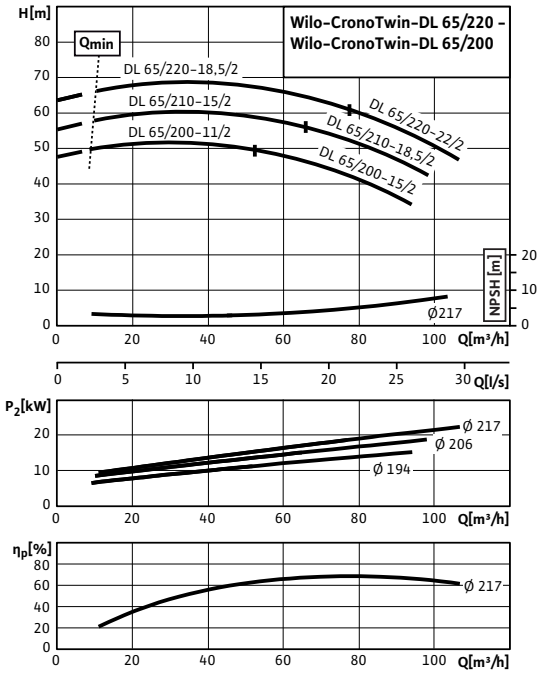
Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-CronoTwin-DL

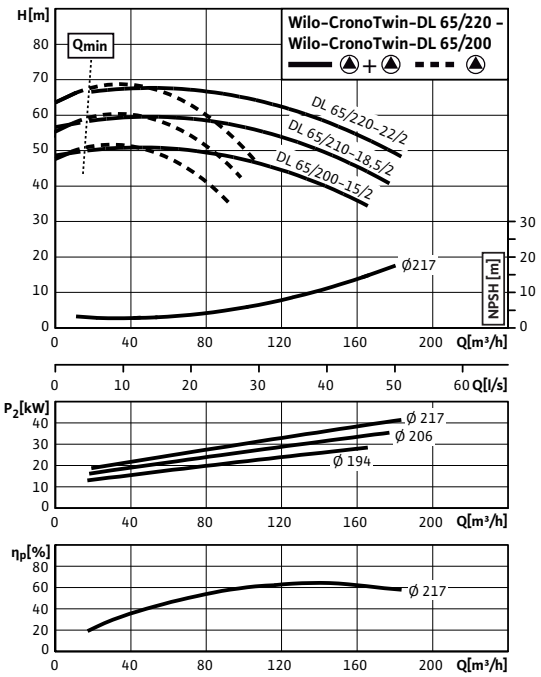
Wilo-CronoTwin-DL 65/220-11/2 - 65/220-22/2

Speed 2900 rpm - individual operation



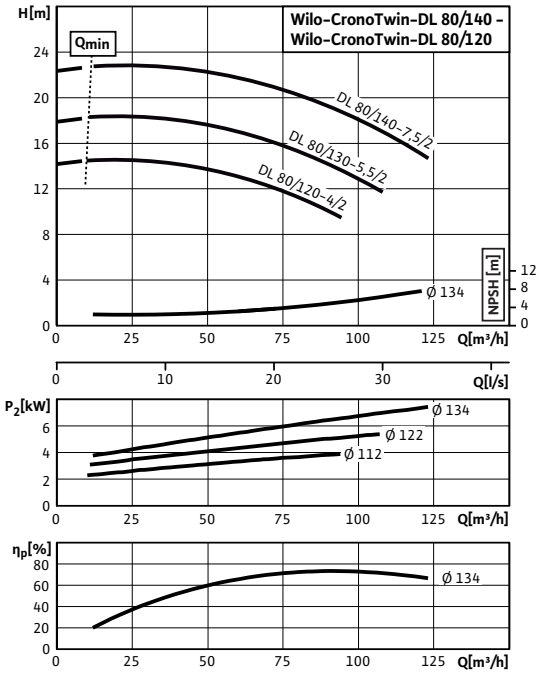
Wilo-CronoTwin-DL 65/200-11/2 - 65/220-22/2

Speed 2900 rpm - parallel operation



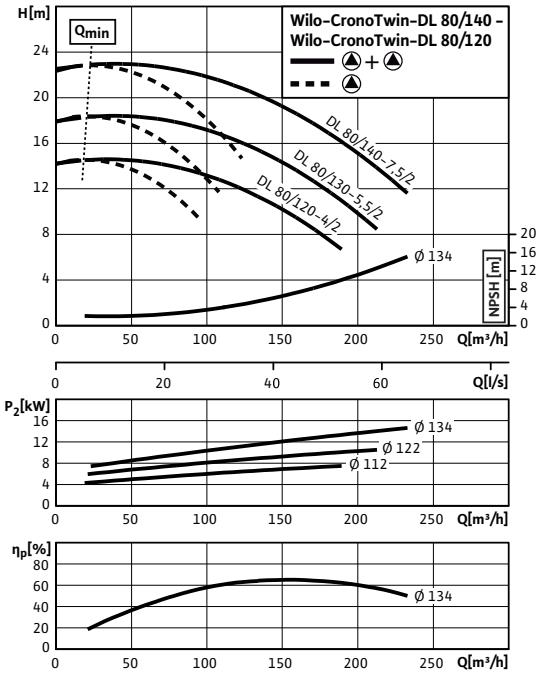
Wilo-CronoTwin-DL 80/120-4/2 - 80/140-7,5/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 80/120-4/2 - 80/140-7,5/2

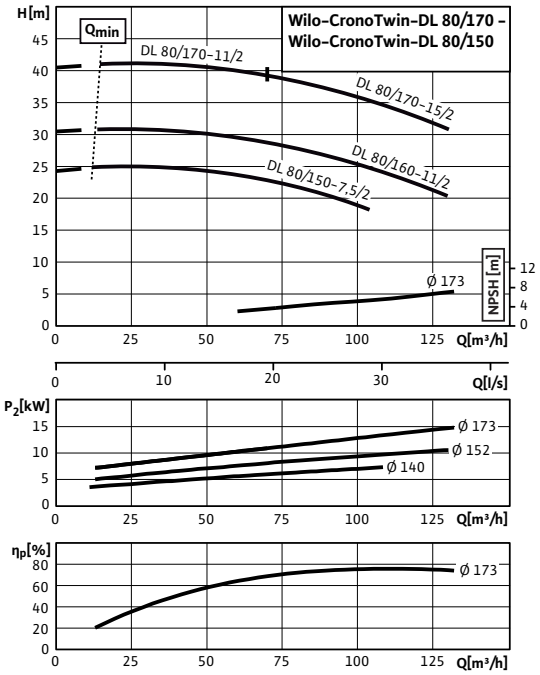
Speed 2900 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

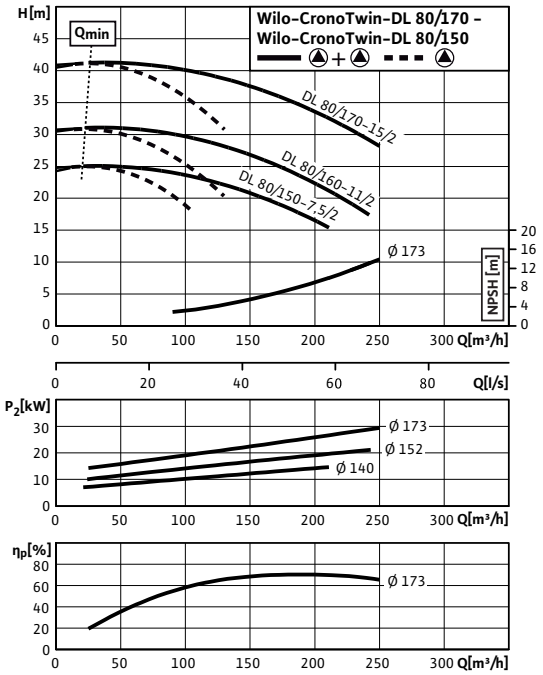
Wilo-CronoTwin-DL 80/150-7,5/2 - 80/170-15/2

Speed 2900 rpm - individual operation



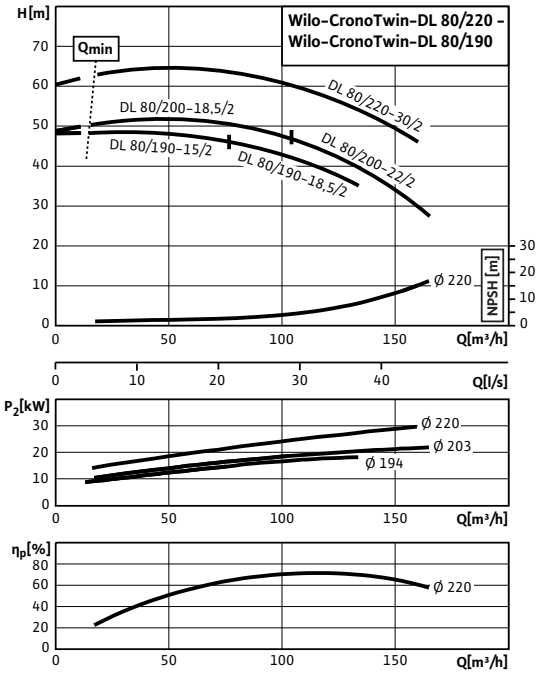
Wilo-CronoTwin-DL 80/150-7,5/2 - 80/170-15/2

Speed 2900 rpm - parallel operation



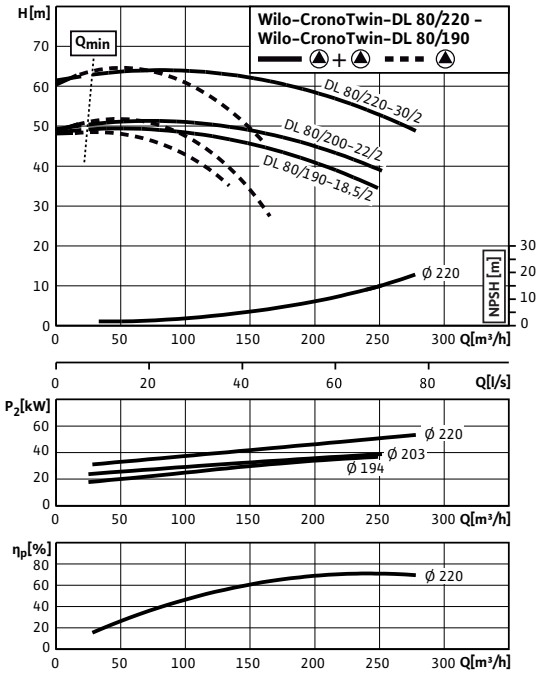
Wilo-CronoTwin-DL 80/190-15/2 - 80/220-30/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 80/190-15/2 - 80/220-30/2

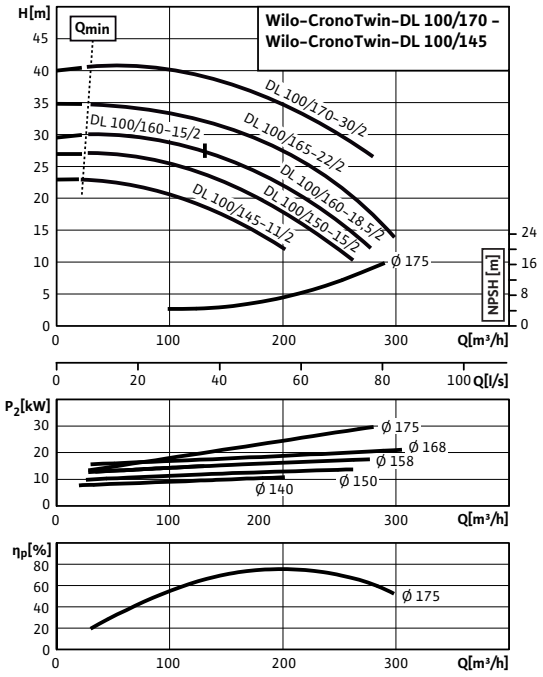
Speed 2900 rpm - parallel operation



Pump curves Wilo-CronoTwin-DL

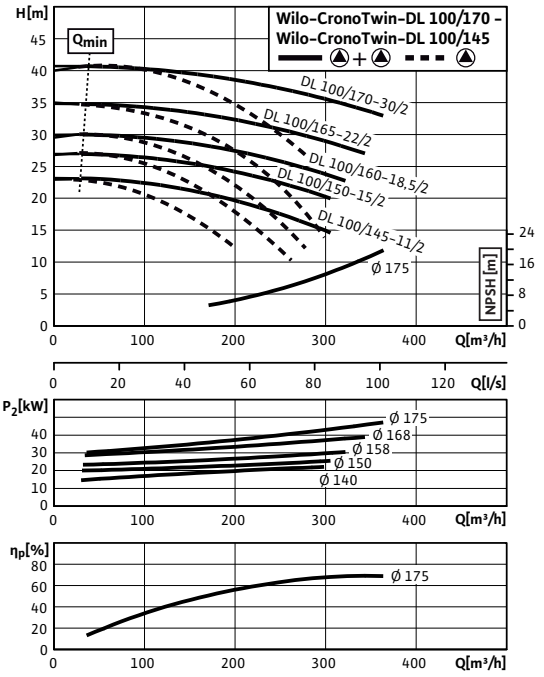
Wilo-CronoTwin-DL 100/145-11/2 - 100/170-30/2

Speed 2900 rpm - individual operation



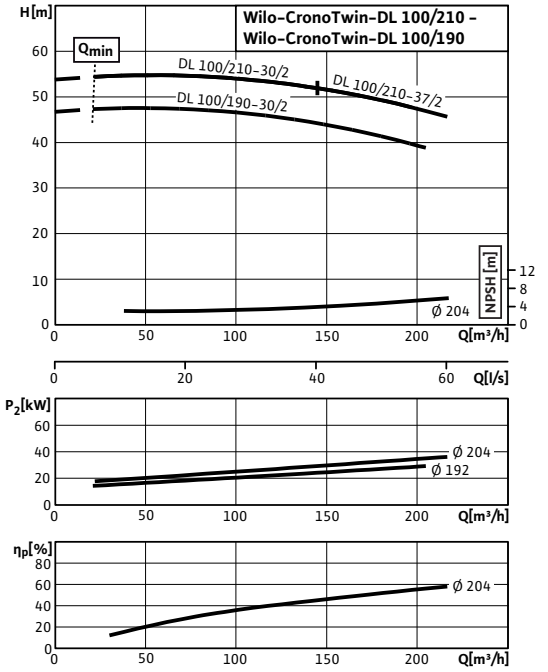
Wilo-CronoTwin-DL 100/145-11/2 - 100/170-30/2

Speed 2900 rpm - parallel operation



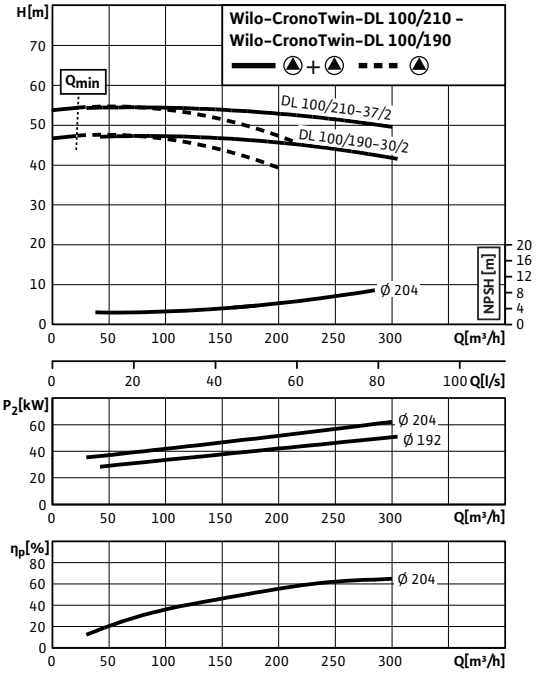
Wilo-CronoTwin-DL 100/190-30/2 - 100/210-37/2

Speed 2900 rpm - individual operation



Wilo-CronoTwin-DL 100/190-30/2 - 100/210-37/2

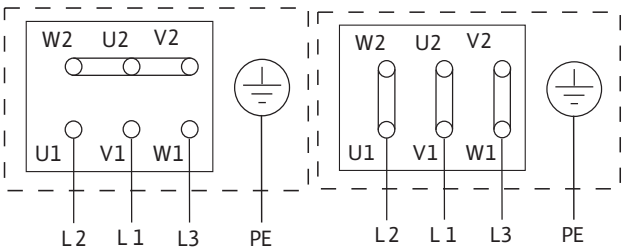
Speed 2900 rpm - parallel operation



Terminal diagram, motor data Wilo-CronoTwin-DL

Terminal diagrams

Star switching Y **Delta switching Δ**



Motor protection switch required onsite. Check the direction of rotation.
To change the direction of rotation, swap any two phases.

$P_2 \leq 3$ kW	3~400 V Y 3~230 V Δ
$P_2 \geq 4$ kW	3~690 V Y 3~400 V Δ

After removing the bridges, Y-Δ starting is possible.

Motor data (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.25 kW	0.77	0.78	0.60
0.37 kW	1.06	0.78	0.65
0.55 kW	1.44	0.82	0.67
0.75 kW	1.91	0.81	0.72
1.1 kW	2.55	0.81	0.77
1.5 kW	3.40	0.81	0.79
2.2 kW	4.70	0.82	0.82
3 kW	6.40	0.82	0.83
4 kW	8.20	0.83	0.85
5.5 kW	11.40	0.81	0.86
7.5 kW	15.20	0.82	0.87
11 kW	21.50	0.84	0.89
15 kW	28.50	0.84	0.90
18.5 kW	35.50	0.83	0.91
22 kW	41.50	0.84	0.91
30 kW	55.00	0.86	0.92
37 kW	66.00	0.87	0.93
45 kW	80.00	0.87	0.93
55 kW	100.00	0.85	0.94

Observe motor name plate data

Motor data (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
1.5 kW	3.25	0.85	0.79
2.2 kW	4.55	0.85	0.82
3 kW	6.10	0.85	0.84
4 kW	7.80	0.86	0.86
5.5 kW	10.40	0.89	0.86
7.5 kW	13.80	0.89	0.88
11 kW	20.00	0.88	0.90

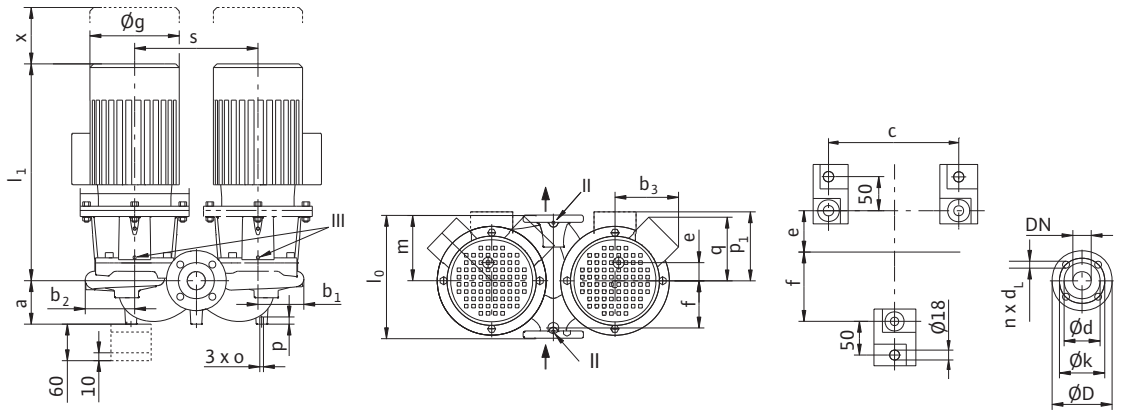
Terminal diagram, motor data Wilo-CronoTwin-DL

Motor data (2900 rpm)			
Wilo-CronoTwin-DL ...	Nominal current (approx.)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
15 kW	26.50	0.90	0.90
18.5 kW	32.00	0.91	0.91
22 kW	39.50	0.88	0.92
30 kW	53.00	0.89	0.92
37 kW	65.00	0.89	0.93

Observe motor name plate data

Dimensions, weights Wilo-CronoTwin-DL

Dimension drawing



II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimensions, weights (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Overall length	Dimensions																Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	s	x	M
	–	[mm]											–	[mm]					[kg]
32/140-0.25/4	32	320	100	117	122	118	360	43	137	145	395	155	M10	20	–	118	300	90	77
32/150-0.37/4	32	320	100	117	122	118	360	43	137	145	395	155	M10	20	–	118	300	90	80
32/170-0.55/4	32	320	100	117	122	124	360	43	137	188	430	155	M10	20	–	124	300	90	84
40/140-0.25/4	40	340	100	120	127	118	400	52	145	145	399	170	M10	20	–	118	340	95	82
40/150-0.37/4	40	340	100	120	127	118	400	52	145	145	399	170	M10	20	–	118	340	95	84
40/160-0.55/4	40	340	100	120	127	124	400	52	145	188	424	170	M10	20	–	124	340	95	88
40/170-0.75/4	40	340	100	120	127	124	400	52	145	188	424	170	M10	20	–	124	340	95	90
40/210-1.1/4	40	440	110	145	147	–	500	38	192	193	466	220	M10	20	151	–	400	100	111
40/220-1.5/4	40	440	110	145	147	–	500	38	192	193	466	220	M10	20	151	–	400	100	118
50/150-0.55/4	50	340	120	126	136	124	360	50	130	188	420	180	M10	20	–	124	340	100	92
50/160-0.75/4	50	340	120	126	136	124	360	50	130	188	420	180	M10	20	–	124	340	100	95
50/170-1.1/4	50	340	120	126	136	145	360	50	130	193	460	180	M10	20	–	145	340	100	102
50/200-1.5/4	50	440	120	145	148	–	500	50	200	193	472	220	M10	20	151	–	400	100	115
50/220-2.2/4	50	440	120	145	148	–	500	50	200	217	516	220	M10	20	160	–	400	100	134
50/260-3/4	50	440	122	177	174	–	480	50	200	217	542	220	M10	20	160	–	400	120	158
50/270-3/4	50	440	122	177	174	–	480	50	200	217	540	220	M10	20	160	–	400	120	158
50/270-4/4	50	440	122	177	174	–	480	50	200	232	620	220	M10	20	178	–	400	120	172
65/150-0.75/4	65	430	153	134	144	124	440	55	185	188	438	215	M12	20	–	124	400	120	114
65/160-1.1/4	65	430	153	134	144	145	440	55	185	193	478	215	M12	20	–	145	400	120	121
65/170-1.1/4	65	430	153	134	144	145	440	55	185	193	478	215	M12	20	–	145	400	120	122
65/170-1.5/4	65	430	153	134	144	149	440	55	185	193	478	215	M12	20	–	149	400	120	128
65/210-2.2/4	65	475	140	157	166	–	520	45	210	217	525	245	M12	20	160	–	400	110	145
65/220-2.2/4	65	475	140	157	166	–	520	45	210	217	525	245	M12	20	160	–	400	110	145
65/220-3/4	65	475	140	157	166	–	520	45	210	217	525	245	M12	20	160	–	400	110	151
65/250-3/4	65	475	140	184	176	–	500	50	220	217	545	235	M12	20	160	–	400	120	168

Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoTwin-DL

Dimensions, weights (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Overall length	Dimensions																Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	s	x	M
	–	[mm]											–	[mm]					[kg]
65/250-4/4	65	475	140	184	176	–	500	50	220	232	623	235	M12	20	178	–	400	120	180
65/270-5.5/4	65	475	140	184	176	–	500	50	220	279	679	235	M12	20	188	–	400	120	204
80/150-1.1/4	80	440	155	144	160	145	440	62	188	193	483	220	M12	20	–	145	400	120	133
80/160-1.5/4	80	440	155	144	160	149	440	62	188	193	483	220	M12	20	–	149	400	120	140
80/170-2.2/4	80	440	155	144	160	156	440	62	188	217	527	220	M12	20	–	156	400	120	162
80/210-3/4	80	500	145	166	176	–	550	72	228	217	530	250	M12	20	160	–	450	120	169
80/220-4/4	80	500	145	166	176	–	550	72	228	232	608	250	M12	20	178	–	450	120	181
80/270-5.5/4	80	500	125	188	198	–	560	62	233	279	667	245	M12	20	188	–	450	115	234
100/145-1.1/4	100	500	180	173	188	145	580	80	250	193	497	226	M12	20	–	145	440	135	154
100/150-1.5/4	100	500	180	173	188	149	580	80	250	193	497	226	M12	20	–	149	440	135	161
100/160-2.2/4	100	500	180	173	188	156	580	80	250	217	540	226	M12	20	–	156	440	135	183
100/170-3/4	100	500	180	173	188	156	580	80	250	217	540	226	M12	20	–	156	440	135	188
100/200-3/4	100	550	155	183	197	–	560	79	251	217	538	275	M12	20	160	–	450	120	188
100/200-4/4	100	550	155	183	197	–	560	79	251	232	616	275	M12	20	178	–	450	120	200
100/220-5.5/4	100	550	155	183	197	–	560	79	251	279	672	275	M12	20	188	–	450	120	228
100/250-5.5/4	100	550	180	198	210	–	600	54	266	279	677	260	M12	20	188	–	480	120	263
100/250-7.5/4	100	550	180	198	210	–	600	54	266	323	718	260	M12	20	188	–	480	120	275
100/260-11/4	100	550	180	198	210	–	600	54	266	323	800	260	M12	20	250	–	480	120	346
100/270-11/4	100	550	180	198	210	–	600	54	266	323	800	260	M12	20	250	–	480	120	346
125/190-4/4	125	620	180	205	189	–	640	68	283	232	635	312	M16	25	178	–	500	120	225
125/210-5.5/4	125	620	180	205	189	–	640	68	283	279	691	312	M16	25	188	–	500	120	257
125/220-5.5/4	125	620	180	205	189	–	640	68	283	279	691	312	M16	25	188	–	500	120	257
125/220-7.5/4	125	620	180	205	189	–	640	68	283	323	732	312	M16	25	188	–	500	120	273
125/250-11/4	125	620	200	255	267	–	591	86	314	323	813	280	M16	25	250	–	520	130	397
125/270-11/4	125	620	200	255	267	–	591	86	314	323	813	280	M16	25	250	–	520	130	397
125/270-15/4	125	620	200	255	267	–	591	86	314	370	856	280	M16	25	250	–	520	130	421
125/300-18.5/4	125	700	200	277	292	–	800	51	334	370	924	340	M16	25	294	–	550	140	615
125/320-18.5/4	125	700	200	277	292	–	800	51	334	370	924	340	M16	25	294	–	550	140	615
125/320-22/4	125	700	200	277	292	–	800	51	334	370	952	340	M16	25	294	–	550	140	635
125/340-30/4	125	700	200	277	292	–	800	51	334	415	1012	340	M16	25	306	–	550	140	729
150/190-5.5/4	150	700	210	215	241	–	640	91	309	279	695	365	M16	25	188	–	550	130	324
150/200-7.5/4	150	700	210	215	241	–	640	91	309	323	736	365	M16	25	188	–	550	130	340
150/220-11/4	150	700	210	215	241	–	640	91	309	323	818	365	M16	25	250	–	550	130	409
150/250-15/4	150	700	230	293	310	–	696	116	344	370	887	330	M16	25	250	–	600	135	548
150/260-15/4	150	700	230	293	310	–	696	116	344	370	887	330	M16	25	250	–	600	135	548
150/260-18.5/4	150	700	230	293	310	–	696	116	344	370	929	330	M16	25	294	–	600	135	604
150/270-18.5/4	150	700	230	293	310	–	696	116	344	370	929	330	M16	25	294	–	600	135	604
150/270-22/4	150	700	230	293	310	–	696	116	344	370	957	330	M16	25	294	–	600	135	624
150/300-30/4	150	770	230	314	329	–	758	130	374	415	1025	370	M16	25	306	–	650	145	639
150/320-37/4	150	770	230	314	329	–	758	130	374	456	1061	370	M16	25	327	–	650	145	748
150/340-37/4	150	770	230	314	329	–	758	130	374	456	1061	370	M16	25	327	–	650	145	748

Dimensions, weights Wilo-CronoTwin-DL

Dimensions, weights (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Overall length	Dimensions																Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	s	x	M
	–	[mm]											–	[mm]					[kg]
150/340-45/4	150	770	230	314	329	–	758	130	374	456	1125	370	M16	25	327	–	650	145	800
200/240-15/4	200	800	250	322	347	–	1000	62	400	370	912	370	M16	25	250	–	700	140	688
200/250-18.5/4	200	800	250	322	347	–	1000	62	400	370	954	370	M16	25	294	–	700	140	745
200/260-22/4	200	800	250	322	347	–	1000	62	400	370	982	370	M16	25	294	–	700	140	765
200/270-30/4	200	800	250	322	347	–	1000	62	400	415	1042	370	M16	25	306	–	700	140	856
200/310-37/4	200	820	245	339	361	–	808	129	391	456	1086	400	M16	25	327	–	700	155	1000
200/320-45/4	200	820	245	339	361	–	808	129	391	456	1155	400	M16	25	327	–	700	155	1051
200/340-55/4	200	820	245	339	361	–	808	129	391	495	1230	400	M16	25	392	–	700	155	1359

Dimensions, weights (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Overall length	Dimensions																Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	s	x	M
	–	[mm]											–	[mm]					[kg]
32/140-1.5/2	32	320	100	117	122	145	360	43	137	193	460	155	M10	20	–	145	300	90	94
32/150-2.2/2	32	320	100	117	122	149	360	43	137	193	460	155	M10	20	–	149	300	90	99
32/160-2.2/2	32	320	100	117	122	149	360	43	137	193	460	155	M10	20	–	149	300	90	99
32/160-3/2	32	320	100	117	122	156	360	43	137	217	503	155	M10	20	–	156	300	90	118
32/170-3/2	32	320	100	117	122	156	360	43	137	217	501	155	M10	20	–	156	300	90	118
32/170-4/2	32	320	100	117	122	168	360	43	137	232	581	155	M10	20	–	168	300	90	132
40/140-2.2/2	40	340	100	120	127	149	400	52	145	193	464	170	M10	20	–	149	340	95	104
40/150-3/2	40	340	100	120	127	156	400	52	145	217	507	170	M10	20	–	156	340	95	123
40/160-4/2	40	340	100	120	127	168	400	52	145	232	585	170	M10	20	–	168	340	95	137
40/170-5.5/2	40	340	100	120	127	182	400	52	145	279	631	170	M10	20	–	182	340	95	159
40/200-7.5/2	40	440	110	145	147	–	500	38	192	279	644	220	M10	20	188	–	400	100	200
40/220-11/2	40	440	110	145	147	–	500	38	192	323	767	220	M10	20	250	–	400	100	258
50/110-1.5/2	50	340	105	108	116	145	360	52	148	193	463	170	M10	20	–	145	300	100	87
50/120-2.2/2	50	340	105	108	116	149	360	52	148	193	463	170	M10	20	–	149	300	100	92
50/130-3/2	50	340	105	108	116	156	360	52	148	217	510	170	M10	20	–	156	300	100	116
50/140-3/2	50	340	105	108	116	156	360	52	148	217	510	170	M10	20	–	156	300	100	116
50/140-4/2	50	340	105	108	116	168	360	52	148	232	588	170	M10	20	–	168	300	100	130
50/160-5.5/2	50	340	120	126	136	182	360	50	130	279	628	180	M10	20	–	182	340	100	168
50/170-5.5/2	50	340	120	126	136	182	360	50	130	279	628	180	M10	20	–	182	340	100	168
50/170-7.5/2	50	340	120	126	136	182	360	50	130	279	628	180	M10	20	–	182	340	100	189
50/180-7.5/2	50	440	120	145	148	–	500	50	200	279	650	220	M10	20	188	–	400	100	197
50/200-11/2	50	440	120	145	148	–	500	50	200	323	773	220	M10	20	250	–	400	100	255
50/220-11/2	50	440	120	145	148	–	500	50	200	323	773	220	M10	20	250	–	400	100	255
50/220-15/2	50	440	120	145	148	–	500	50	200	323	773	220	M10	20	250	–	400	100	278

Standard pumps

Double pumps (heating, air-conditioning, cooling and industry)

Dimensions, weights Wilo-CronoTwin-DL

Dimensions, weights (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Overall length	Dimensions																Weight approx.
	DN	l_0	A	b_1	b_2	b_3	c	e	f	Ø g	l_{1max}	m	o	p	p_1	q	s	x	M
	–	[mm]											–	[mm]					[kg]
65/110-3/2	65	340	120	121	130	156	400	50	150	217	514	170	M12	20	–	156	340	110	129
65/120-3/2	65	340	120	121	130	156	400	50	150	217	514	170	M12	20	–	156	340	110	129
65/120-4/2	65	340	120	121	130	168	400	50	150	232	592	170	M12	20	–	168	340	110	143
65/130-5.5/2	65	340	120	121	130	–	400	50	150	279	644	170	M12	20	188	–	340	110	166
65/140-5.5/2	65	340	120	121	130	–	400	50	150	279	644	170	M12	20	188	–	340	110	166
65/140-7.5/2	65	340	120	121	130	–	400	50	150	279	644	170	M12	20	188	–	340	110	182
65/150-5.5/2	65	430	153	134	144	182	440	55	185	279	647	215	M12	20	–	182	400	120	188
65/160-5.5/2	65	430	153	134	144	182	440	55	185	279	647	215	M12	20	–	182	400	120	189
65/160-7.5/2	65	430	153	134	144	182	440	55	185	279	647	215	M12	20	–	182	400	120	207
65/170-11/2	65	430	153	134	144	–	440	55	185	323	778	215	M12	20	250	–	400	120	257
65/200-11/2	65	475	140	157	166	–	520	45	210	323	783	245	M12	20	250	–	400	110	267
65/200-15/2	65	475	140	157	166	–	520	45	210	323	783	245	M12	20	250	–	400	110	289
65/210-15/2	65	475	140	157	166	–	520	45	210	323	783	245	M12	20	250	–	400	110	289
65/210-18.5/2	65	475	140	157	166	–	520	45	210	370	826	245	M12	20	250	–	400	110	315
65/220-18.5/2	65	475	140	157	166	–	520	45	210	370	826	245	M12	20	250	–	400	110	315
65/220-22/2	65	475	140	157	166	–	520	45	210	370	868	245	M12	20	294	–	400	110	360
80/120-4/2	80	400	155	134	146	168	400	62	178	232	600	200	M12	20	–	168	350	120	157
80/130-5.5/2	80	400	155	134	146	–	400	62	178	279	652	200	M12	20	188	–	350	120	180
80/140-7.5/2	80	400	155	134	146	–	400	62	178	279	652	200	M12	20	188	–	350	120	196
80/150-7.5/2	80	440	155	144	160	182	440	62	188	279	651	220	M12	20	–	182	400	120	218
80/160-11/2	80	440	155	144	160	–	440	62	188	323	783	220	M12	20	250	–	400	120	267
80/170-11/2	80	440	155	144	160	–	440	62	188	323	783	220	M12	20	250	–	400	120	267
80/170-15/2	80	440	155	144	160	–	440	62	188	323	783	220	M12	20	250	–	400	120	294
80/190-15/2	80	500	145	166	176	–	550	72	228	323	787	250	M12	20	250	–	450	120	307
80/190-18.5/2	80	500	145	166	176	–	550	72	228	370	830	250	M12	20	250	–	450	120	333
80/200-18.5/2	80	500	145	166	176	–	550	72	228	370	830	250	M12	20	250	–	450	120	333
80/200-22/2	80	500	145	166	176	–	550	72	228	370	872	250	M12	20	294	–	450	120	378
80/220-30/2	80	500	145	166	176	–	550	72	228	415	960	250	M12	20	306	–	450	120	489
100/145-11/2	100	500	180	173	188	–	580	80	250	323	796	226	M12	20	250	–	440	135	289
100/150-15/2	100	500	180	173	188	–	580	80	250	323	796	226	M12	20	250	–	440	135	315
100/160-15/2	100	500	180	173	188	–	580	80	250	323	796	226	M12	20	250	–	440	135	315
100/160-18.5/2	100	500	180	173	188	–	580	80	250	370	839	226	M12	20	250	–	440	135	350
100/165-22/2	100	500	180	173	188	–	580	80	250	370	881	226	M12	20	294	–	440	135	379
100/170-30/2	100	500	180	173	188	–	580	80	250	415	969	226	M12	20	306	–	440	135	490
100/190-30/2	100	550	155	183	197	–	560	79	251	415	969	275	M12	20	306	–	450	120	507
100/210-30/2	100	550	155	183	197	–	560	79	251	415	969	275	M12	20	306	–	450	120	507
100/210-37/2	100	550	155	183	197	–	560	79	251	415	969	275	M12	20	306	–	450	120	553

Dimensions, weights Wilo-CronoTwin-DL

Flange dimensions					
Wilo-CronoTwin-DL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
32...	32	140	76	100	4 x 19
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19
100...	100	220	156	180	8 x 19
125...	125	250	184	210	8 x 19
150...	150	285	211	240	8 x 23
200...	200	340	266	295	12 x 23

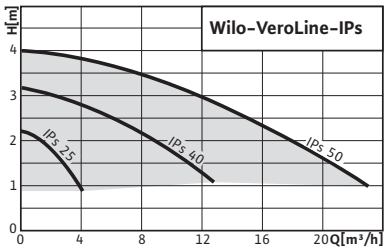
Pump flange dimensions - according to EN 1092-2 PN 16, n = number of drilled holes

Special in-line pumps

Single pumps (heating, air-conditioning, cooling and industry)

Series overview

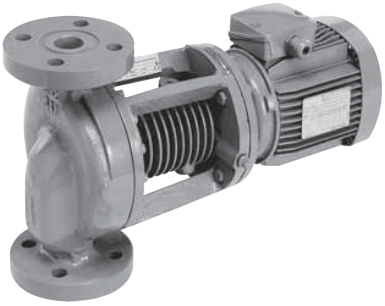
Series: Wilo-VeroLine-IPS

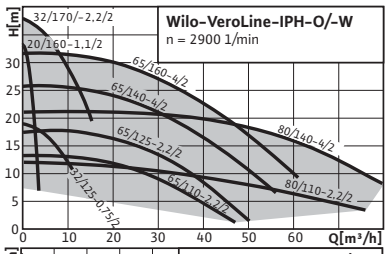


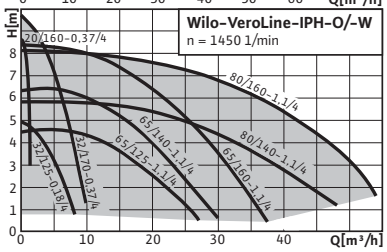
> **Design**
Glanded pump in in-line design with screwed connection or flange connection

> **Application**
For pumping cold and hot water (in accordance with VDI 2035) without abrasive substances in heating, cold water and cooling water systems

Series: Wilo-VeroLine-IPH-O







> **Design**
Glanded pump in in-line design with flange connection

> **Application**
For pumping heat transfer oil in closed industrial circulation systems

Series overview

Series: Wilo-VeroLine-IPS

> Special features/product benefits
- Worldwide availability of the standard motors used

Series: Wilo-VeroLine-IPH-O

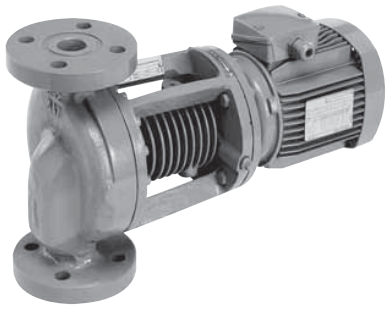
> Special features/product benefits
- Bidirectional, self-cooled mechanical seal
- Large range of applications due to wide fluid temperature range from -10°C to +350°C and operating pressure range up to 9 bar without additional wearing parts

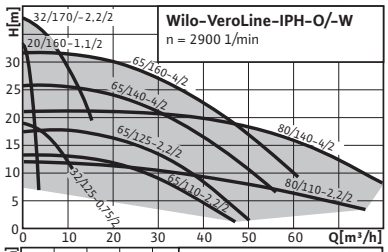
Special in-line pumps

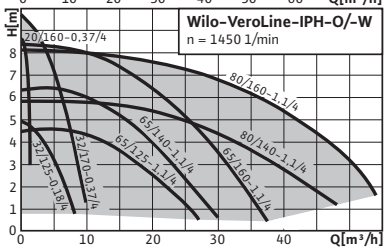
Single pumps (heating, air-conditioning, cooling and industry)

Series overview

Series: Wilo-VeroLine-IPH-W



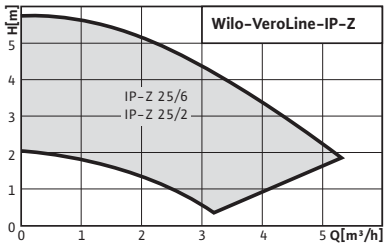




> **Design**
Glanded pump in in-line design with flange connection

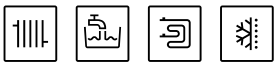
> **Application**
For pumping hot water without abrasive matter in closed industrial circulation systems, district heating, closed heating systems, etc.

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



Series overview

Series: Wilo-VeroLine-IPH-W

> Special features/product benefits
- Bidirectional, self-cooled mechanical seal
- Large range of applications due to wide fluid temperature range from -10 °C to +210°C and operating pressure range up to 23 bar without additional wearing parts

> More information **Page**

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**

Special in-line pumps

Single pumps (heating, air-conditioning, cooling and industry)

Technical data

	Wilo- Vero-Line-IPS 25	Wilo- Vero-Line-IPS 40	Wilo- Vero-Line-IPS 50	Wilo- Vero-Line-IPH-O	Wilo- Vero-Line-IPH-W	Wilo- Vero-Line-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	Special version at additional charge			up to +350 °C	–	
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 (up to +120°C) 8 (up to +140°C)	6 (up to +120°C) 5 (up to +140°C)		9 (heat transfer oil)	23 (hot water)	10
Temperature range [°C]	-10 to +140			-10 to +350	-10 to +210	-8 to +110
Max. ambient temperature [°C]	40					
Installation in closed buildings	•	•	•	•	•	•
Outdoor installation	Special version at additional charge					
Pipe connections						
Threaded connection	R1	–	–	–	–	G1 1/2
Flange connection (counter flanges, seals and screws included in the scope of delivery)	–	•	•	•	•	–
Flange version	PN10	PN6 PN16 on request (in accordance with DIN EN 1092-2)		n		PN10
Nominal connection diameters DN	–	40	50	20 - 80	20 - 80	–
Flange with pressure-measurement connections	–	R 1/8	R 1/8	–	–	–
Materials						
Pump housing	EN-GJL-200			1.0625		1.4306
Lantern	EN-GJL-200			EN-GJS-400-15		1.4306
Impeller (standard)	PP, fibreglass-reinforced			EN-GJL-250		Noryl
Pump shaft	1.4021/1.4122			1.4005		1.4571
Mechanical seal	BVEGG			AQ1VGG	AQ1EGG	Ceramic/ graphite/EP-DM
Other mechanical seals	On request					

Technical data

	Wilo- Vero-Line-IPS 25	Wilo- Vero-Line-IPS 40	Wilo- Vero-Line-IPS 50	Wilo- Vero-Line-IPH-O	Wilo- Vero-Line-IPH-W	Wilo- Vero-Line-IP-Z
Electrical connection						
Mains connection	3~400 V, 50 Hz					1~230 V, 50 Hz 3~400 V, 50 Hz
Speed range [rpm]	1450			1450/2900		
Motor/electronics						
Integrated full motor protection	Special version with PTC thermistor sensor (TRS) at additional charge					–
Protection class	IP 55	IP 55	IP 55	IP 55	IP 55	IP 44
Terminal box protection class						IP 54
Insulation class	F	F	F	F	F	F
Motor protection required onsite	•	•	•	•	•	•
Speed control	Wilo-Control system					–
Motor winding up to 3 kW	230 V Δ/400 V Y, 50 Hz					
Motor winding from 4 kW	–				230 V Δ/400 V Y, 50 Hz	–
Installation options						
Pipe installation (≤ 15 kW motor power)	•			• with horizontal shaft only		•
Support-bracket mounting	–	–	–	–	–	–

• = available, – = not available

Special in-line pumps

Single pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-VeroLine-IPS

- Threaded or flange connection with pressure measuring connection R $^{1}/_{8}$
- Standard motor

Design
Glanded pump in in-line design with screwed connection or flange connection

Application
For pumping 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	**IPS 40 GRD**
IPS	In-line pump
40	Nominal diameter DN of the pipe connection
GRD	Mechanical seal

Technical data
- Permissible temperature range -10°C to +140°C
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter Rp 1, DN 40 and DN 50
- Max. operating pressure, 10 bar or 6 bar for flange connection.

Special features/product benefits
- Worldwide availability of the standard motors used

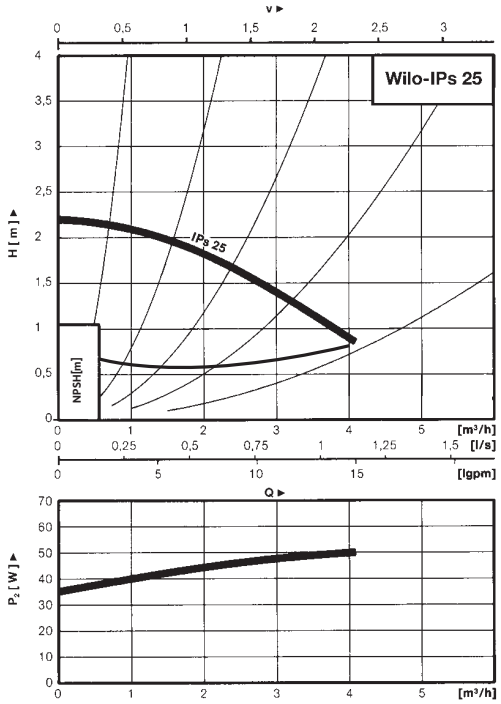
Materials
- Pump housing and lantern: EN-GJL-200
- Impeller: Plastic
- Shaft: 1.4021
- Mechanical seal: BVEGG; other mechanical seals on request

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal or stuffing box

Pump curves Wilo-VeroLine-IPS

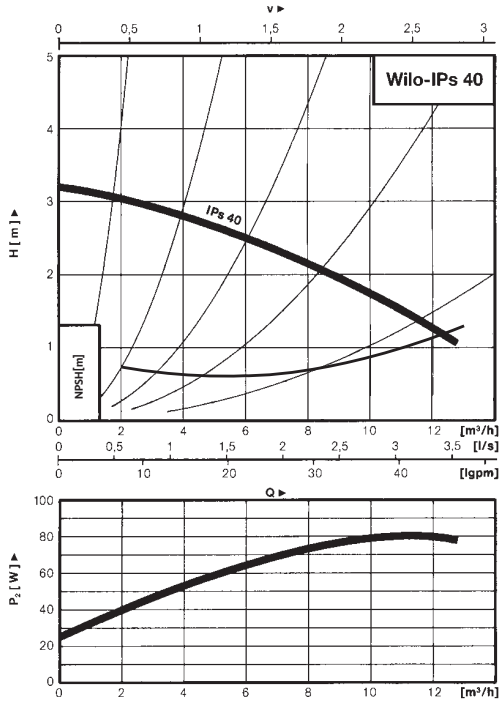
Wilo-VeroLine-IPS 25

Speed 1450 rpm



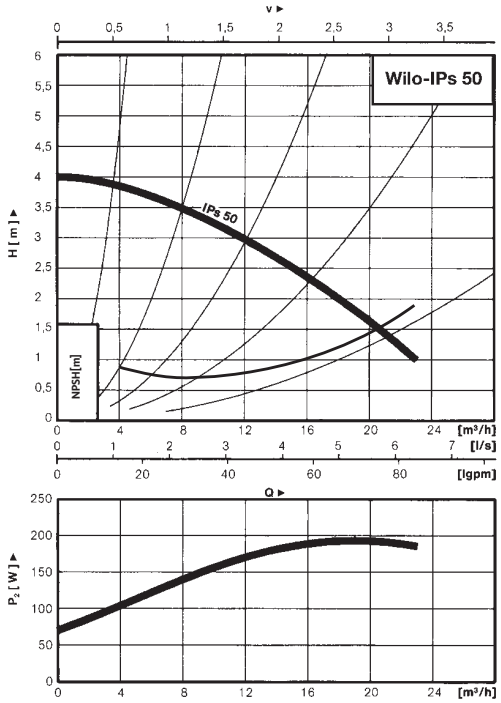
Wilo-VeroLine-IPS 40

Speed 1450 rpm



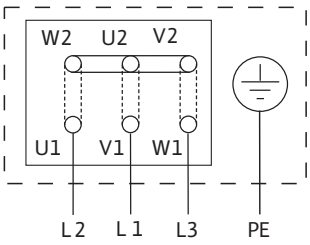
Wilo-VeroLine-IPS 50

Speed 1450 rpm



Terminal diagram, motor data Wilo-VeroLine-IPS

Terminal diagram



Mains 3~400 V, 50 Hz

3~230 V, 50 Hz Δ

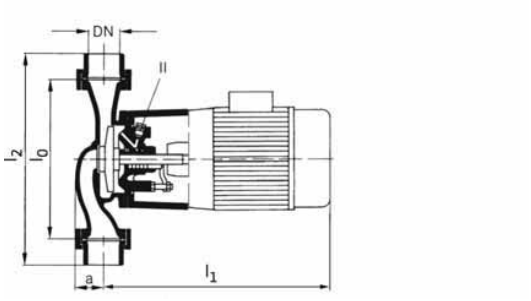
(dashed line)

Motor data			
Wilo-VeroLine-IPS ...	Nominal motor power	Nominal current (approx.)	
	P_2	I_N 3~400 V	I_N 3~230 V
	[kW]	[A]	
25	0.12	0.45	0.78
40	0.18	0.60	1.04
50	0.25	0.75	1.30

Observe motor name plate data

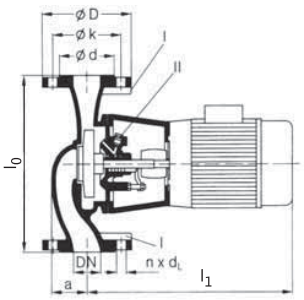
Dimensions, weights Wilo-VeroLine-IPS

Dimension drawing A



II) Ventilation

Dimension drawing B



I) Pressure measuring connection $R^1/_8$
II) Ventilation

Dimensions, weights

Wilo-VeroLine-IPS ...	Nominal flange diameter	Screwed connection	Overall length	Dimensions			Weight approx.	Dimension drawing
	DN	Rp	l_0	A	l_1	l_2	M	–
	–		[mm]				[kg]	–
25	–	1	180	35	300	234	12	A
40	40	–	250	53	305	–	20	B
50	50	–	280	62	340	–	23	B

Flange dimensions PN6 (DIN EN 1092-2)

Wilo-VeroLine-IPS ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
40	40	130	80	100	4 x 14
50	50	140	90	110	4 x 14

n = number of drilled holes

Flange dimensions PN 16 on request (DIN EN 1092-2)

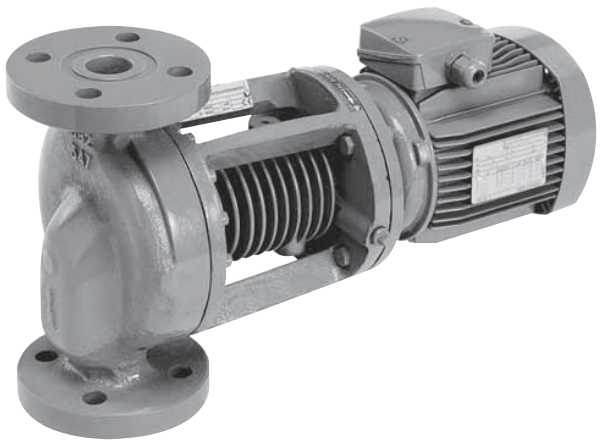
Wilo-VeroLine-IPS ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x Ø d_L
	–	[mm]			[pcs. x mm]
40	40	150	88	110	4 x 19
50	50	165	102	125	4 x 19

n = number of drilled holes

Special in-line pumps

Single pumps (heating, air-conditioning, cooling and industry)

Series description Wilo-VeroLine-IPH-O



Description/design

Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection
- Lantern
- Motor with special shaft

Design

Glanded pump in in-line design with flange connection

Application

For pumping heat transfer oil in closed industrial circulation systems

Scope of delivery

- Pump
- Installation and operating instructions

Type key

Example	**IPH-O 65/125-1.1/4**
IPH-O	In-line pump for heat transfer oil
65	Nominal diameter DN of the pipe connection
125	Impeller diameter
1.1	Nominal motor power P_2 in kW
4	Number of poles

Technical data

- Permissible temperature range -10°C to +350°C at max. 9 bar
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter DN 20 to DN 80

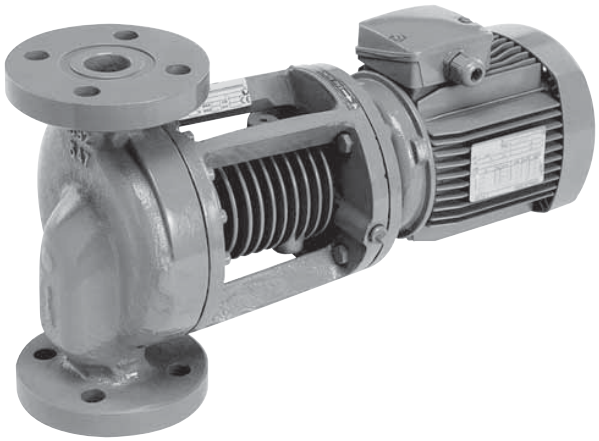
Special features/product benefits

- Bidirectional, self-cooled mechanical seal
- Large range of applications due to wide fluid temperature range from -10°C to +350°C and operating pressure range up to 9 bar without additional wearing parts

Materials

- Pump housing: Cast steel 1.0625
- Lantern: EN-GJS-400-15
- Impeller: EN-GJL-250
- Shaft: Stainless steel 1.4005
- Mechanical seal: AQ1VGG; other mechanical seals on request

Series description Wilo-VeroLine-IPH-W



Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Flange connection
- Lantern
- Motor with special shaft

Design
Glanded pump in in-line design with flange connection

Application
For pumping hot water without abrasive matter in closed industrial circulation systems, district heating, closed heating systems, etc.

Scope of delivery
- Pump
- Installation and operating instructions

Type key

Example	**IPH-W 65/125-1.1/4**
IPH-W	In-line pump for hot water applications
65	Nominal diameter DN of the pipe connection
125	Impeller diameter
1.1	Nominal motor power P_2 in kW
4	Number of poles

Technical data
- Permissible temperature range -10°C to +210°C at max. 23 bar
- Mains connection 3~400 V, 50 Hz
- Protection class IP 55
- Nominal diameter DN 20 to DN 80

Special features/product benefits
- Bidirectional, self-cooled mechanical seal
- Large range of applications due to wide fluid temperature range from -10 °C to +210°C and operating pressure range up to 23 bar without additional wearing parts

Materials
- Pump housing: Cast steel 1.0625
- Lantern: EN-GJS-400-15
- Impeller: EN-GJL-250
- Shaft: Stainless steel 1.4005
- Mechanical seal: AQ1EGG; other mechanical seals on request

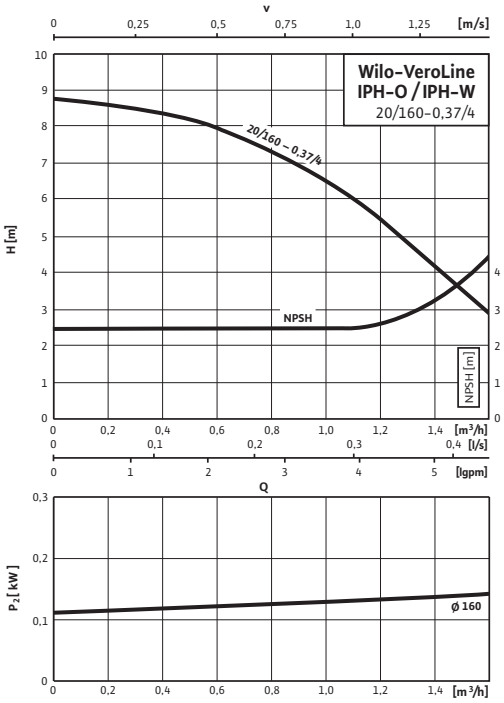
Special in-line pumps

Single pumps (heating, air-conditioning, cooling and industry)

Pump curves Wilo-Veroline-IPH-O/-W

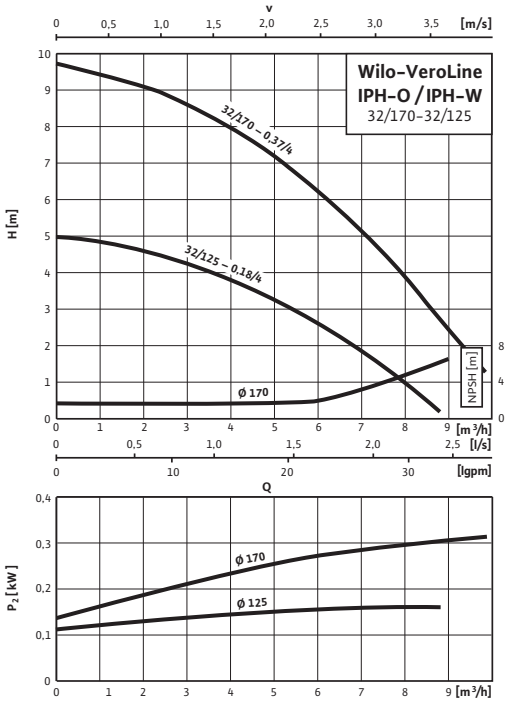
Wilo-VeroLine-IPH-O/-W 20/160-0,37/4

Speed 1450 rpm



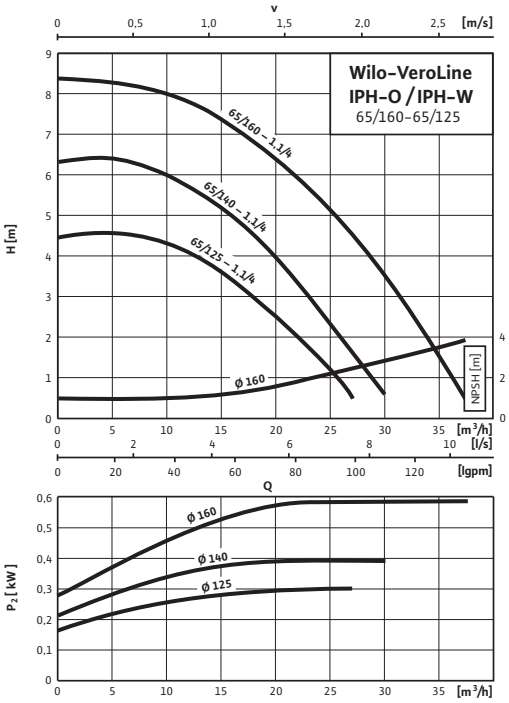
Wilo-VeroLine-IPH-O/-W 32/125-0,18/4 – 32/170-0,37/4

Speed 1450 rpm



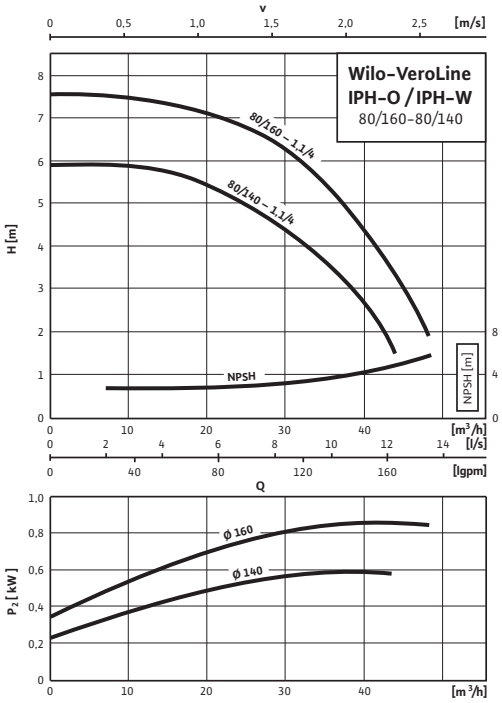
Wilo-VeroLine-IPH-O/-W 65/125-1,1/4 – 65/160-1,1/4

Speed 1450 rpm



Wilo-VeroLine-IPH-O/-W 80/140-1,1/4 – 80/160-1,1/4

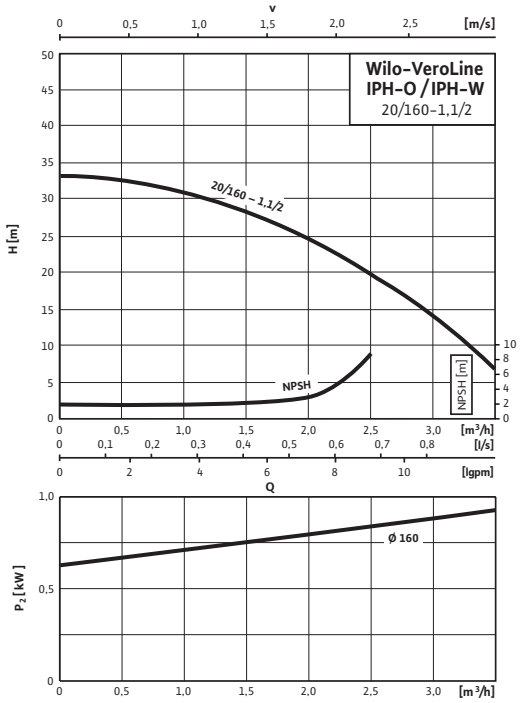
Speed 1450 rpm



Pump curves Wilo-Veroline-IPH-O/-W

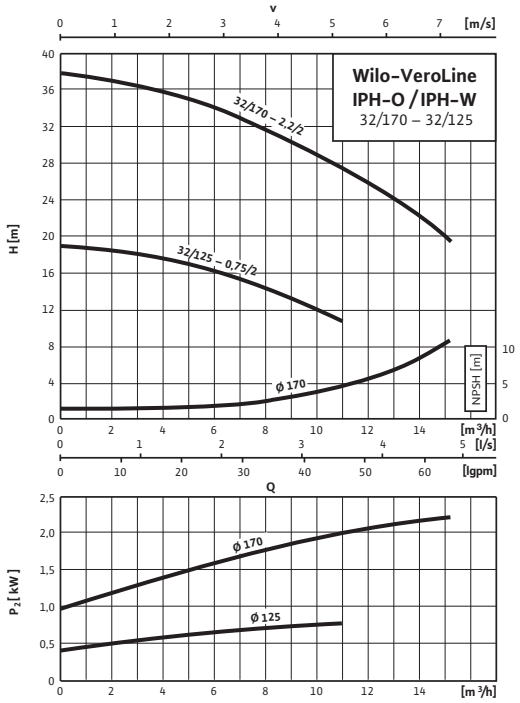
Wilo-VeroLine-IPH-O/-W 20/160-1,1/2

Speed 2900 rpm



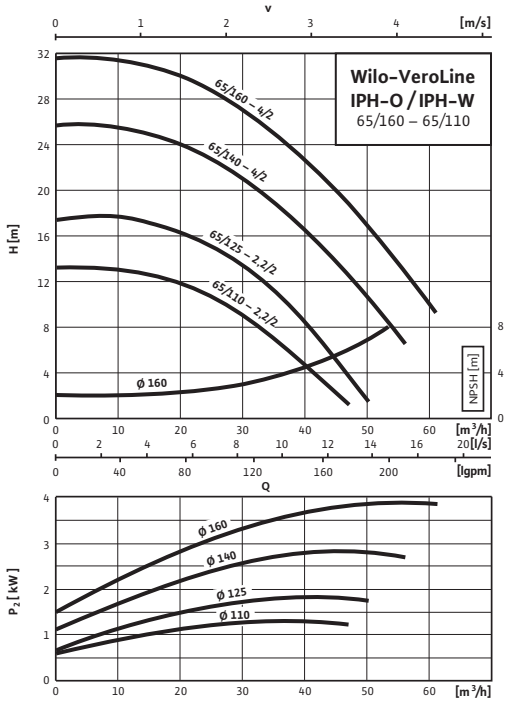
Wilo-VeroLine-IPH-O/-W 32/125-0,75/2 - 32/170-2,2/2

Speed 2900 rpm



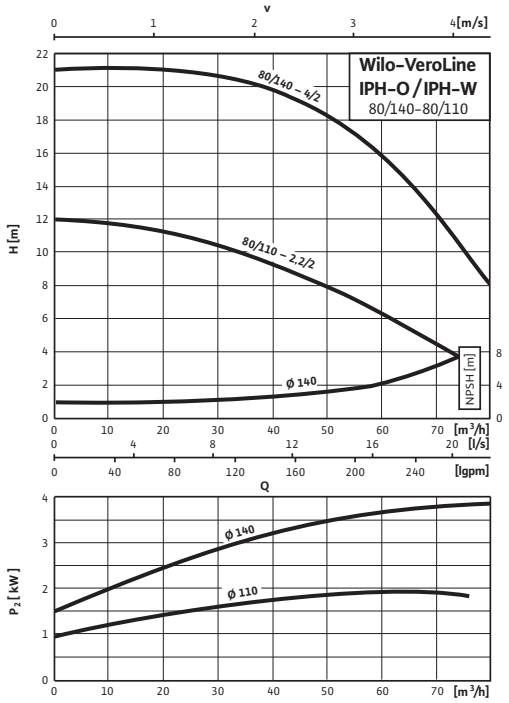
Wilo-VeroLine-IPH-O/-W 65/110-2,2/2 - 65/160-4/2

Speed 2900 rpm



Wilo-VeroLine-IPH-O/-W 80/110-2,2/2 - 80/140-4/2

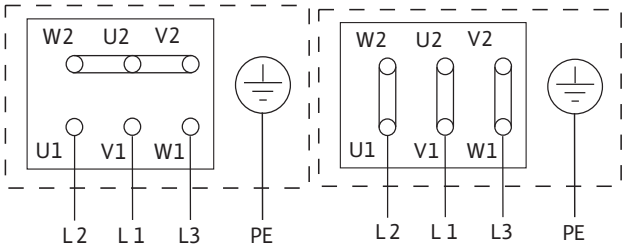
Speed 2900 rpm



Terminal diagram, motor data Wilo-VeroLine-IPH-O/-W

Terminal diagrams

Star switching Y **Delta switching Δ**



Motor protection switch required onsite. Check the direction of rotation.
To change the direction of rotation, swap any two phases.

$P_2 \leq 3$ kW	3~400 V Y 3~230 V Δ
$P_2 \geq 4$ kW	3~690 V Y 3~400 V Δ

After removing the bridges, Y-Δ starting is possible.

Motor data (1450 rpm)

Wilo-VeroLine-IPH-O/-W...	Nominal motor power	Nominal current	Power factor	Efficiency
	P_2	I_N3~400 V	cosφ	η_M
	[kW]	[A]	–	
20/160-0.37/4	0.37	1.12	0.70	72.00
32/125-0.18/4	0.18	0.62	0.65	62.00
32/170-0.37/4	0.37	1.12	0.70	72.00
65/125-1.1/4	1.10	2.70	0.84	76.80
65/140-1.1/4	1.10	2.70	0.84	76.80
65/160-1.1/4	1.10	2.70	0.84	76.80
80/140-1.1/4	1.10	2.70	0.84	76.80
80/160-1.1/4	1.10	2.70	0.84	76.80

Observe motor name plate data

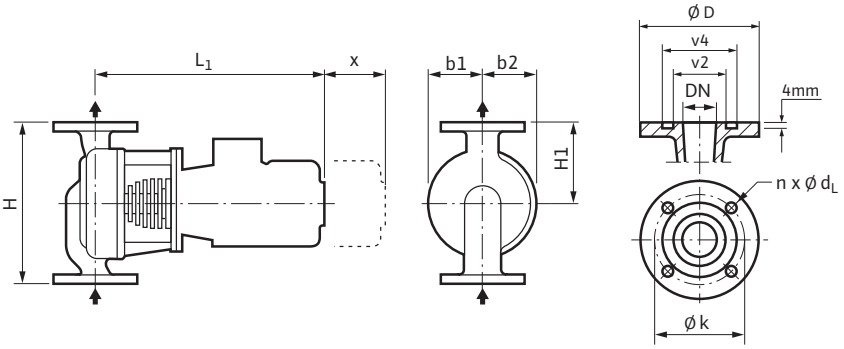
Motor data (2900 rpm)

Wilo-VeroLine-IPH-O/-W...	Nominal motor power	Nominal current	Power factor	Efficiency
	P_2	I_N3~400 V	cosφ	η_M
	[kW]	[A]	–	
20/160-1.1/2	1.10	2.60	0.84	78.00
32/125-0.75/2	0.75	1.90	0.87	76.00
32/170-2.2/2	2.20	4.40	0.88	83.60
65/110-2.2/2	2.20	4.40	0.88	83.60
65/125-2.2/2	2.20	4.40	0.88	83.60
65/140-4/2	4.00	8.20	0.85	86.00
65/160-4/2	4.00	8.20	0.85	86.00
80/110-2.2/2	2.20	4.40	0.88	83.60
80/140-4/2	4.00	8.20	0.85	86.00

Observe motor name plate data

Dimensions, weights Wilo-VeroLine-IPH-O/-W

Dimension drawing



Dimensions, weights (1450 rpm)								
Wilo-VeroLine-IPH-O/-W...	Nominal flange diameter	Dimensions						Weight approx.
	DN	b_1	b_2	H	H_1	L_1	X	M
	–	[mm]						[kg]
20/160-0.37/4	20	105	105	290	145	385	300	28
32/125-0.18/4	32	90	87	260	130	370	300	23
32/170-0.37/4	32	110	115	260	130	395	300	30
65/125-1.1/4	65	110	110	370	170	440	300	39
65/140-1.1/4	65	121	107	400	190	440	300	39
65/160-1.1/4	65	121	107	400	190	440	300	39
80/140-1.1/4	80	150	123	430	205	445	300	41
80/160-1.1/4	80	150	123	430	205	445	300	54

Dimensions, weights (2900 rpm)								
Wilo-VeroLine-IPH-O/-W...	Nominal flange diameter	Dimensions						Weight approx.
	DN	b_1	b_2	H	H_1	L_1	X	M
	–	[mm]						[kg]
20/160-1.1/2	20	105	105	290	145	417	300	31
32/125-0.75/2	32	90	87	260	130	402	300	26
32/170-2.2/2	32	110	115	260	130	477	300	41
65/110-2.2/2	65	110	110	370	170	467	300	43
65/125-2.2/2	65	110	110	370	170	467	300	43
65/140-4/2	65	121	107	400	190	503	300	61
65/160-4/2	65	121	107	400	190	503	300	61
80/110-2.2/2	80	133	106	400	190	472	300	51

Dimensions, weights Wilo-VeroLine-IPH-O/-W

Dimensions, weights (2900 rpm)								
Wilo-VeroLine-IPH-O/-W...	Nominal flange diameter	Dimensions						Weight approx.
	DN	b_1	b_2	H	H_1	L_1	X	M
	–	[mm]						[kg]
80/140-4/2	80	150	123	430	205	507	300	69

Flange dimensions						
Wilo-VeroLine-IPH-O/-W...	Nominal flange diameter	D	V2	V4	C	Pump flange dimensions
	DN	L				n x Ø d_L
	–	[mm]				[pcs. x mm]
20...	20	105	35	51	75	4 x 14
32...	32	140	50	66	100	4 x 18
65...	65	185	94	110	145	8 x 18
80...	80	200	105	121	160	8 x 18

Pump flange dimensions – according to DIN 2545 PN 25; 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

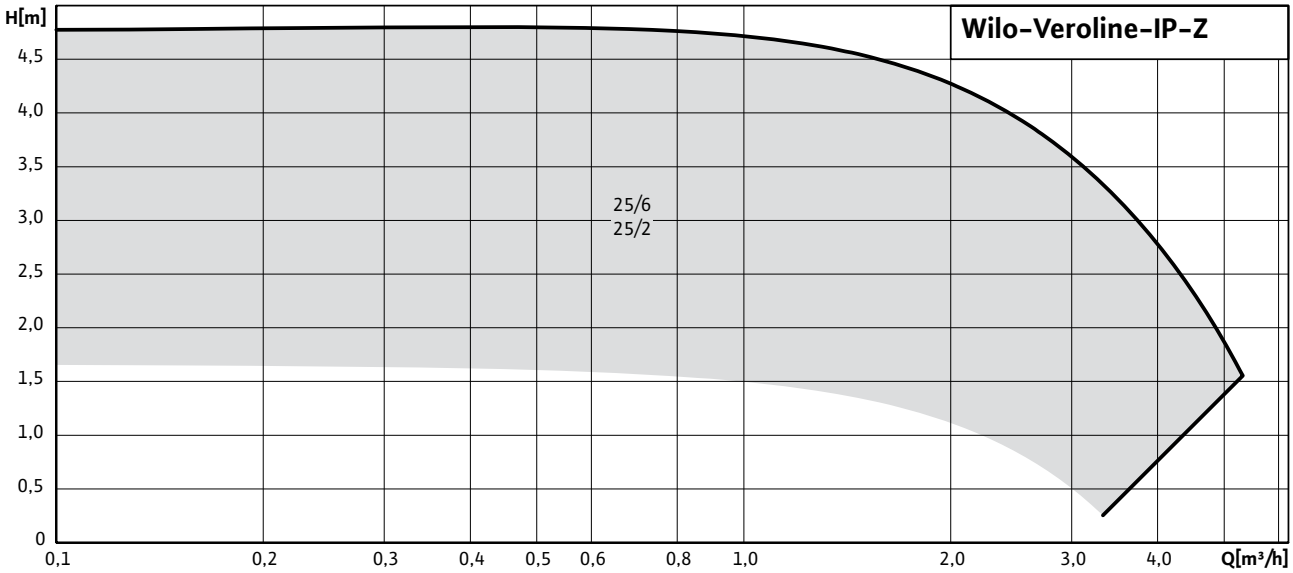
Materials
- Pump housing and lantern: 1.4306
- Impeller: Noryl
- Shaft: 1.4571
- Mechanical seal: Ceramic/graphite/EPDM

Description/design
Single-stage, low-pressure centrifugal pump in in-line design with
- Mechanical seal
- Threaded connection
- Motor with one-piece shaft

Special in-line pumps

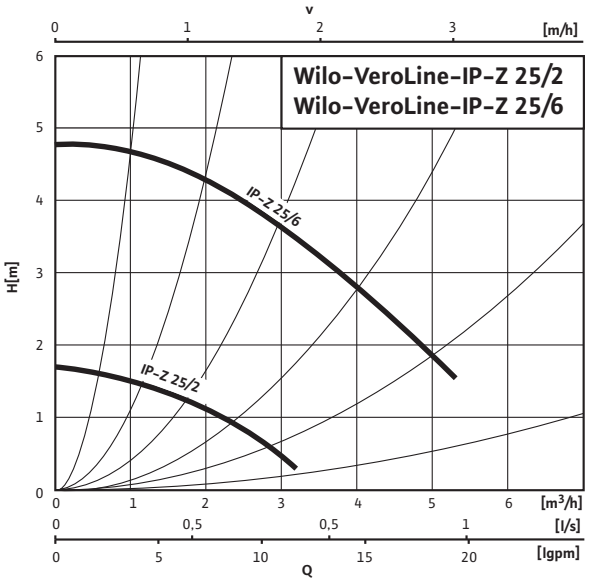
Single pumps (secondary hot water circulation)

Series description Wilo-VeroLine-IP-Z



Pump curves Wilo-VeroLine-IP-Z

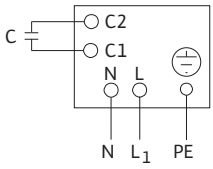
Wilo-VeroLine-IP-Z 25/2 - 25/6



Terminal diagram, motor data Wilo-VeroLine-IP-Z

Terminal diagram A

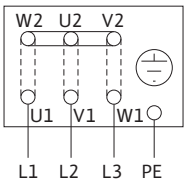
With attached capacitor



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

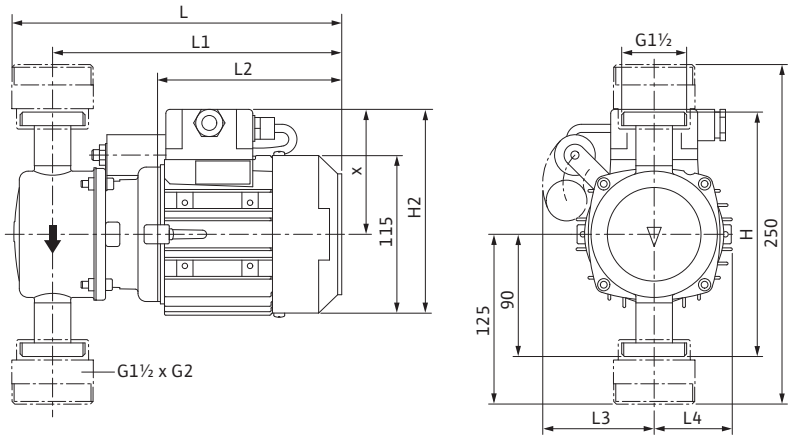
Motor data								
Wilo-VeroLine-IP-Z ...	Mains connection	Nominal motor power	Nominal current approx.		Nominal current	Capacity	Speed	Wiring diagram
	–	P_2	I_N1~230 V	I_N3~230 V	I_N3~400 V	C	V	–
	–	[kW]	[A]			[µF]	[rpm]	–
25/2	1~230 V	0.1	1.1	–	–	4.0	1450	A
25/2	3~400 V	0.09	–	0.5	0.29	–	1460	B
25/6	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

Dimensions, weights Wilo-VeroLine-IP-Z

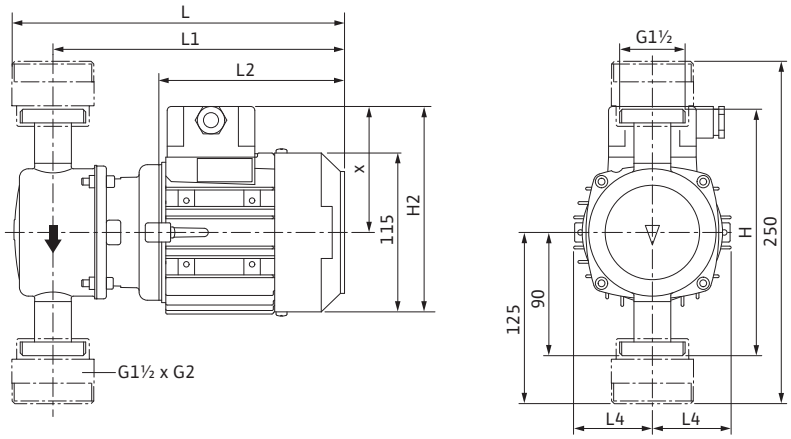
Dimension drawing A

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

Switchgears and control devices

Plug-in modules, switchgears, motor protection, accessories

Series overview

Control device: 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 %
- Includes full motor protection device

Control device: 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 device: 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 device: 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 %
- Includes full motor protection device

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.

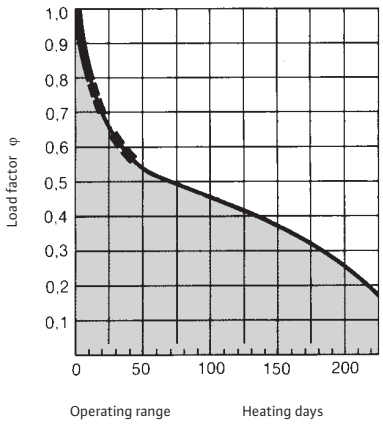


Fig.: Typical load factor of a central heating system during a heating period of roughly 5500 hours

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.

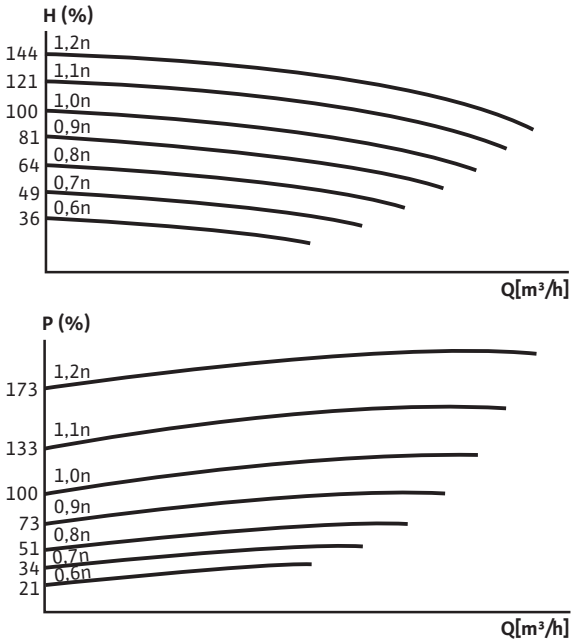


Fig.: Pump curves of a pump during operation at different speeds

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

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)

• = 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
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 modes

Differential pressure - constant (Δp - c)

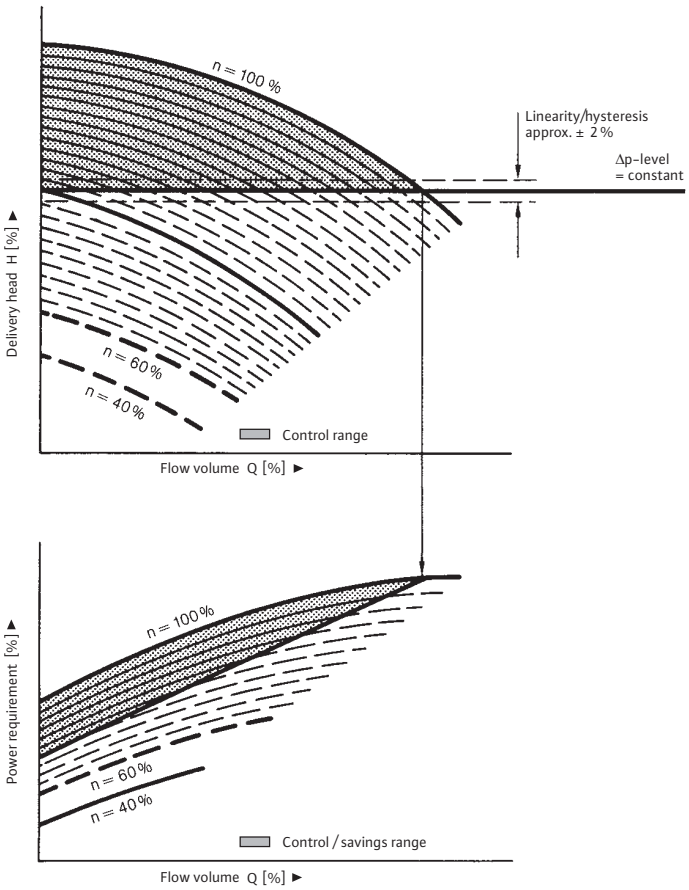


Fig.: Pump curve behaviour for infinitely variable constant differential pressure control (Δp - c)

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 modes

Differential pressure – variable (Δp – v)

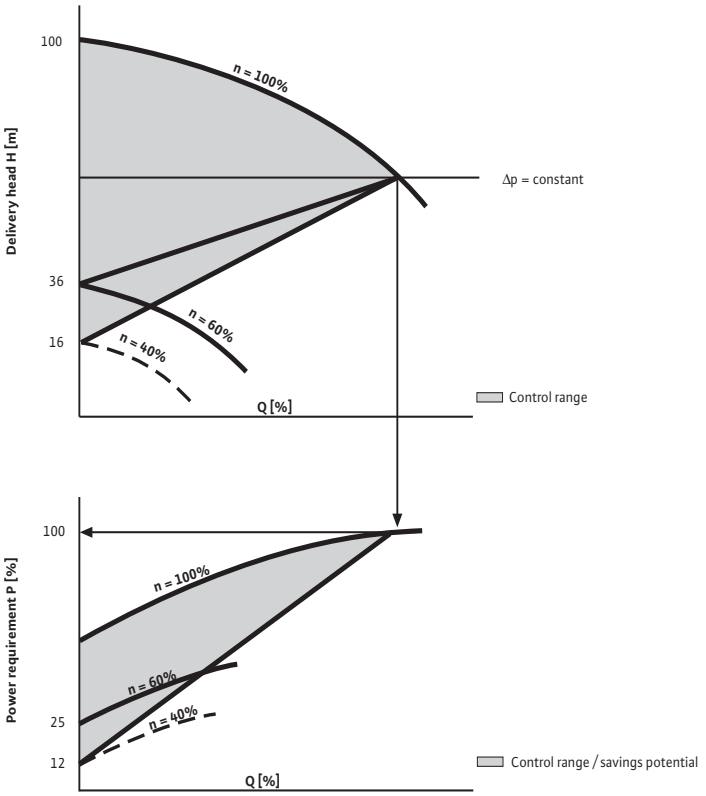


Fig.: Pump curve behaviour with infinitely variable differential pressure control (Δp – v)

When upgrading existing systems it is not always possible to evaluate the index circuit which. 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 modes

Differential pressure - delivery-superimposed (Δp - q)

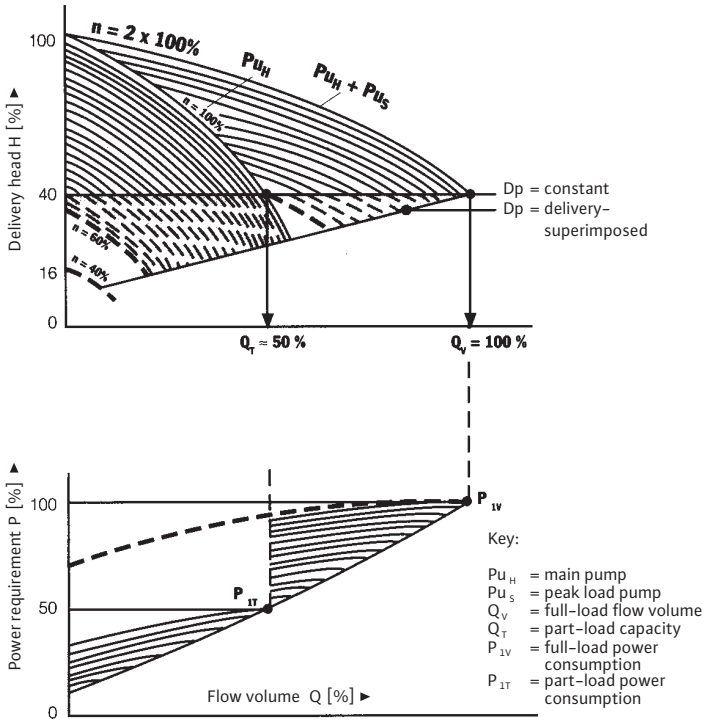


Fig.: Pump curve behaviour of a multi-pump system with infinitely variable delivery-superimposed differential pressure control (Δp - q)

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 modes

Differential pressure – temperature superimposed (Δp – T)

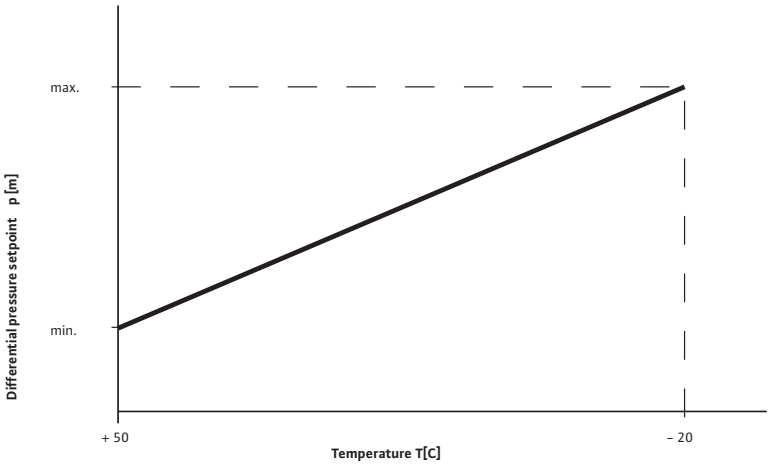


Fig.: Differential pressure setpoint variation according to a temperature

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 modes

Differential temperature control (ΔT)

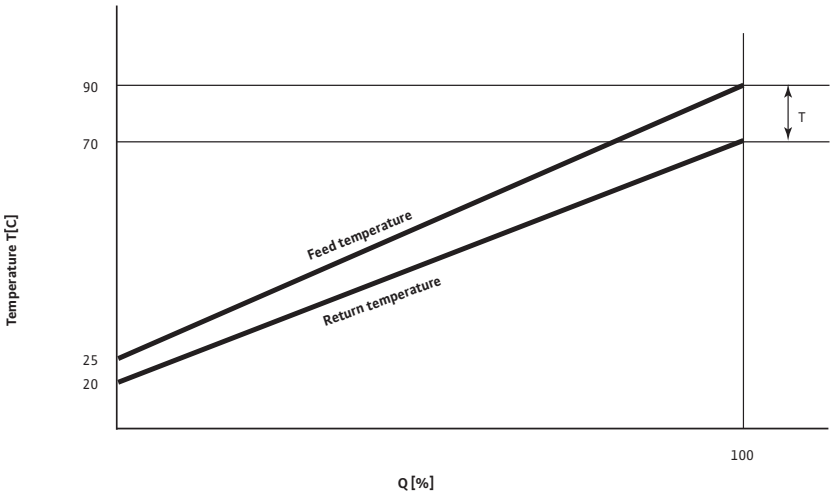


Fig.: Volume flow variation according to the temperature spread

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 modes

Temperature control (±T)

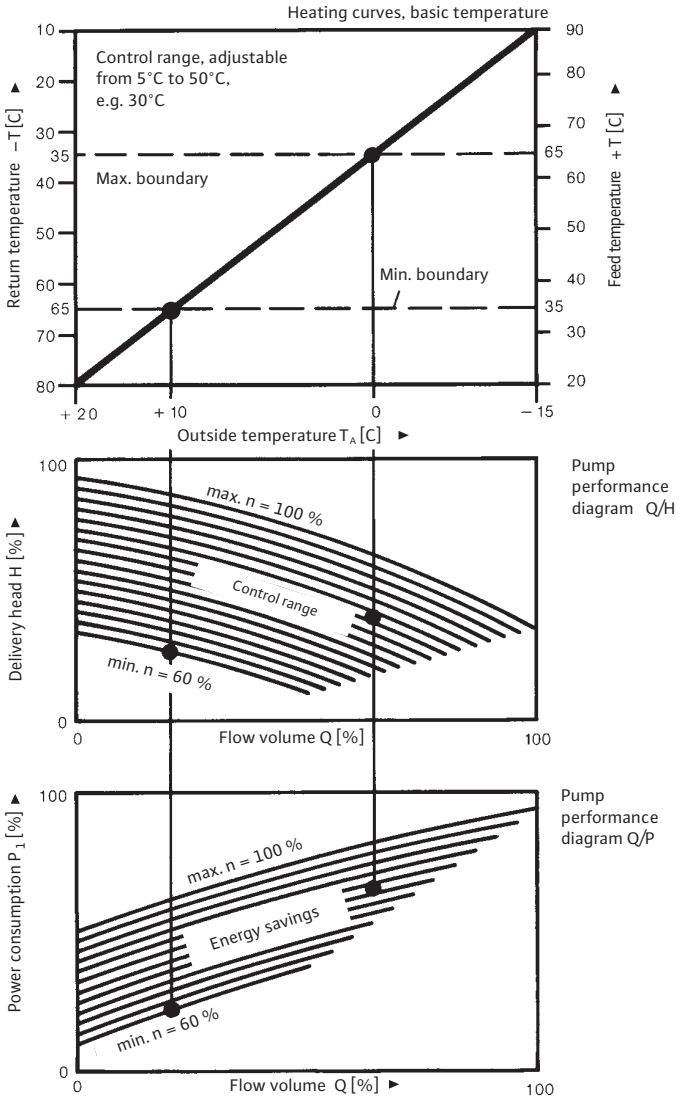


Fig.: System diagram of the infinitely variable temperature control

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 modes

Variable differential temperature (ΔT – v)

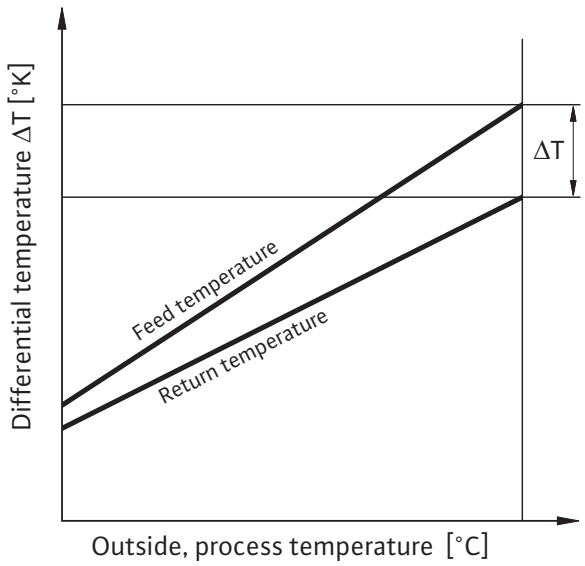


Fig.: Differential temperature according to the process or outdoor temperature

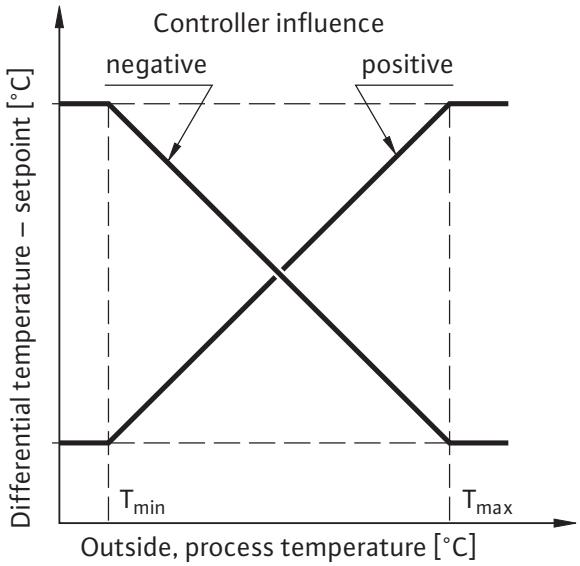


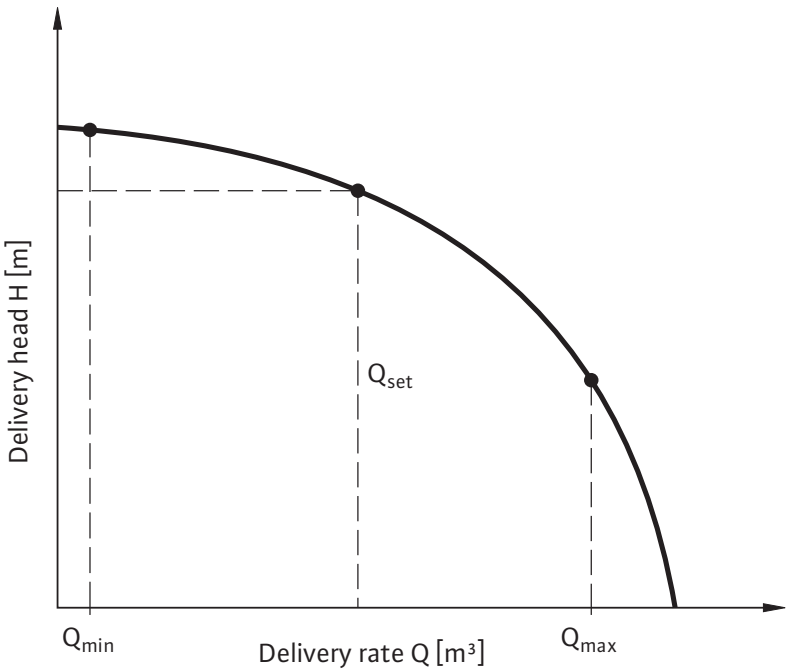
Fig.: Effect on the differential temperature

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

Control modes

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)

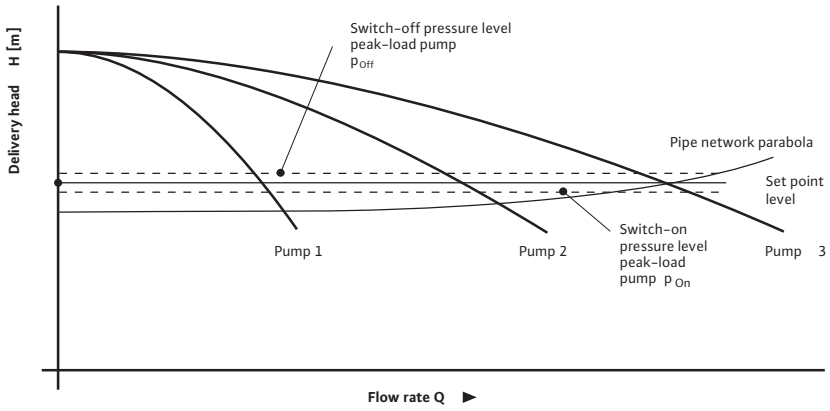


Fig.: Constant pressure control (p - c) using a 3-pump system as an example

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)

Series overview Wilo-VR-HVAC system

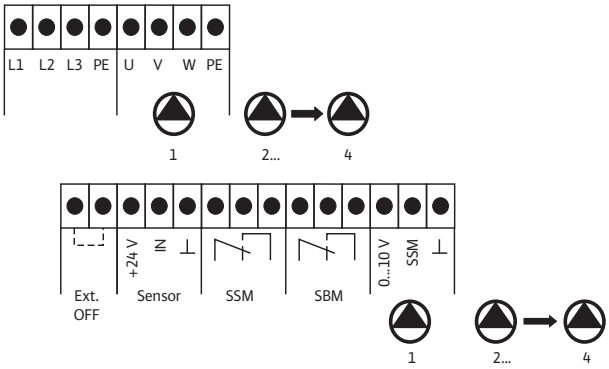
Dimensions, weights Wilo-VR-HVAC system		
Switchbox	Dimensions	Weight approx.
	Width x height x depth	M
	[mm]	[kg]
VR-HVAC 1x0.37WM	400 x 300 x 120	8.5
VR-HVAC 2x0.37WM	400 x 300 x 120	9.0
VR-HVAC 3x0.37WM	400 x 300 x 120	9.5
VR-HVAC 4x0.37WM	400 x 300 x 120	10.0
VR-HVAC 1x0.55WM	400 x 300 x 120	8.5
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

Series overview Wilo-VR-HVAC system

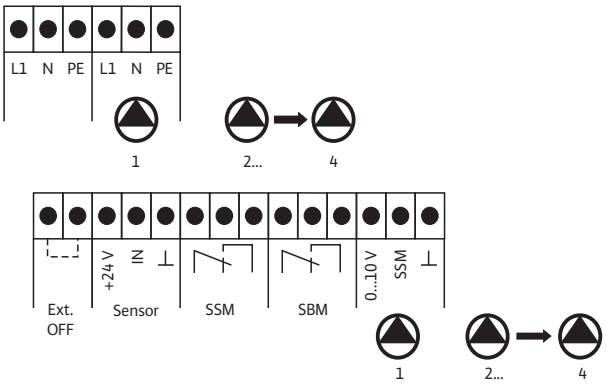
Dimensions, weights Wilo-VR-HVAC system		
Switchbox	Dimensions	Weight approx.
	Width x height x depth	M
	[mm]	[kg]
VR-HVAC 2x11WM	400 x 400 x 120	11.0
VR-HVAC 3x11WM	600 x 600 x 250	34.5
VR-HVAC 4X11WM	600 x 600 x 250	35.0
VR-HVAC 1x15WM	400 x 400 x 120	10.5
VR-HVAC 2x15WM	400 x 400 x 120	11.0
VR-HVAC 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

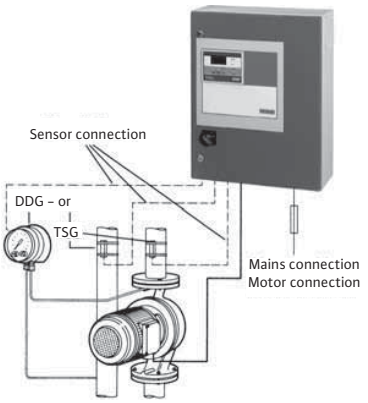


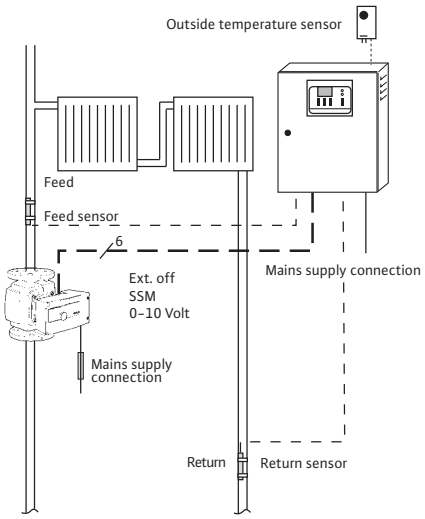
Terminal diagram VR-HVAC 1~230 V



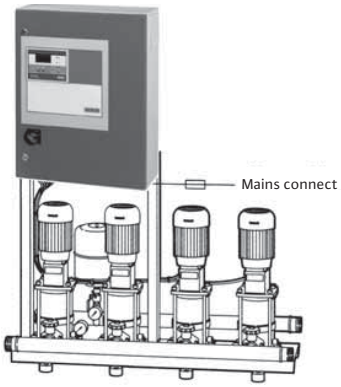
Series description Wilo-CR, Wilo-CRn, Wilo-CC

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%

Series description Wilo-CR, Wilo-CRn, Wilo-CC

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)
  - 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)

Type key, CR control device (example: CR 1.1-2 WM)	
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
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														

Technical data Wilo-CR, Wilo-CRn, Wilo-CC

Connection data Wilo-CC	
Electrical connection	3~400 V/PE Hz/50 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

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
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

[1] Control system consists of 2 switch rails.

Technical data Wilo-CR, Wilo-CRn, Wilo-CC

Dimensions and weights Wilo-CR system

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

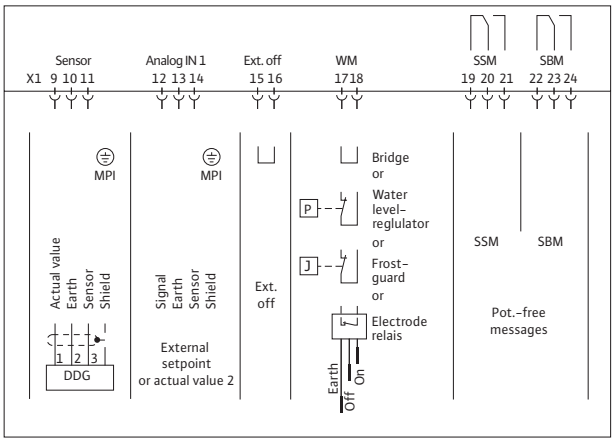
Nominal power P_2	Number of pumps	Dimensions (W x H x D)	Weight
[kW]	[pcs.]	[mm]	[kg]
0.75 – 4.0	1–4	600 x 760 x 250	50
	5–6	760 x 760 x 250	70
5.5 – 7.5	1–2	600 x 1900 x 500	175
	3–4	800 x 1900 x 500	205
	5–6	1000 x 1900 x 400	230
11.0 – 15.0	1–2	800 x 1900 x 500	220
	3–4	1000 x 1900 x 400	270
11.0	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

Switchgears and control devices

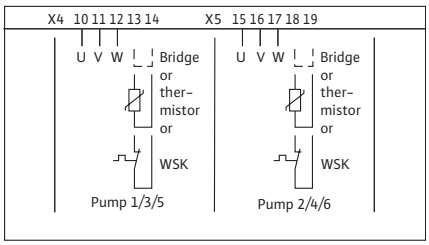
Wilo-Comfort control systems CR, CRn, CC

Terminal diagrams Wilo-CR, Wilo-CRn, Wilo-CC

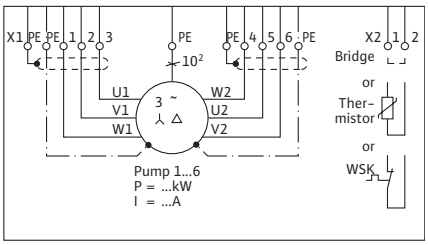
Terminal diagram, CR system base board



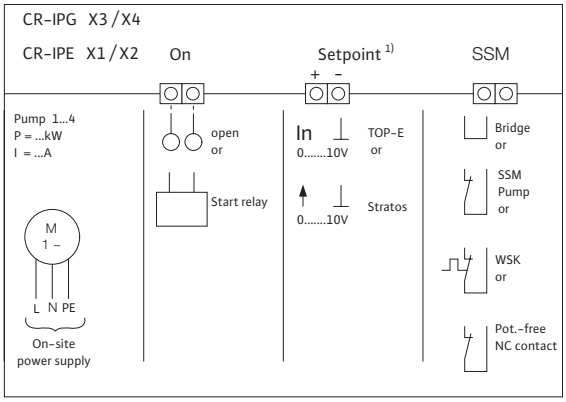
Terminal diagram drives CR system ($P_2 \leq 4$ kW)



Terminal diagram drives CR system (P_2 ▯ 5.5 kW)



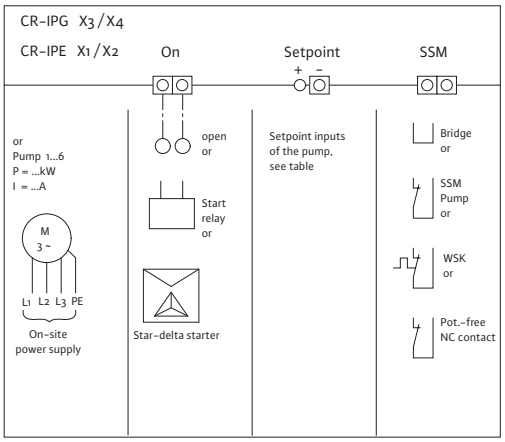
Terminal diagram base board CRn system (for pump drives 1~230 V)



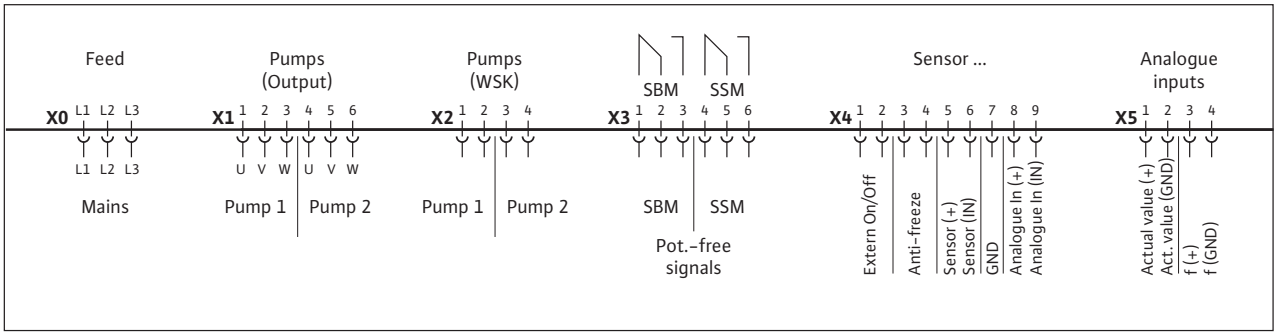
1) Required for Stratos IF-Modul with 0...10 V input
(IF-Modul Stratos SBM, Stratos Ext. Min, Stratos Ext. Aus)

Terminal diagrams Wilo-CR, Wilo-CRn, Wilo-CC

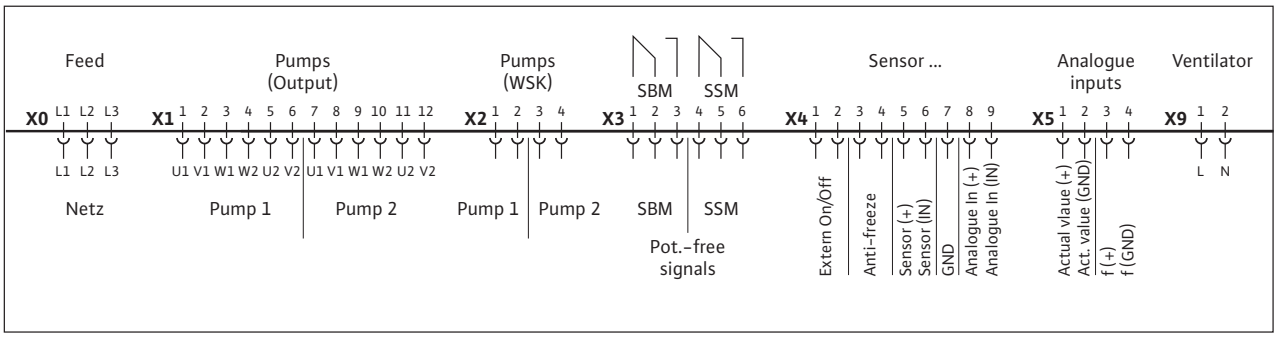
Terminal diagram expansion board CRn system (for pump drives 3~400 V)



Terminal diagram CC-HVAC, direct starting, with frequency converter



Terminal diagram CC-HVAC, ⅄-△-starting, with frequency converter

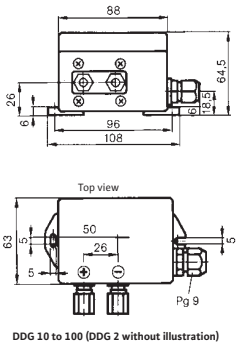


Terminal diagrams Wilo-CR, Wilo-CRn, Wilo-CC

Wilo-CRn system, assignment of the setpoint 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

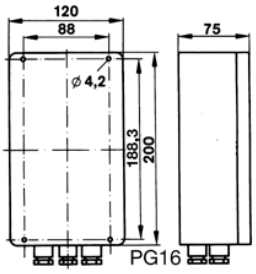
Maximum operating voltage: 15 – 30 VDC
Current output: 4 – 20 mA
Maximum load resistance: 500 Ω
Pressure measurement ranges:[2) 3)]

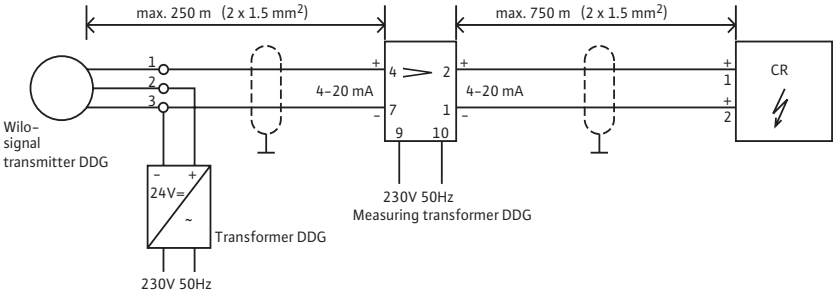
DDG	2:	0	to	0.2 bar*
DDG	10:	0	to	1.0 bar
DDG	20:	0	to	2.0 bar
DDG	40:	0	to	4.0 bar
DDG	60:	0	to	6.0 bar
DDG	100:	0	to	10.0 bar*

[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

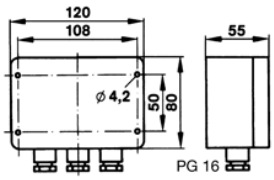
Maximum power consumption:	5 VA
Protection class:	IP 54
Ambient temperature:	0°C to + 40°C

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



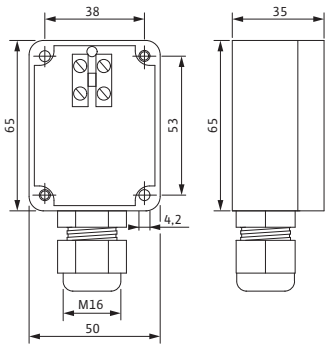
Fastening elements onsite

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



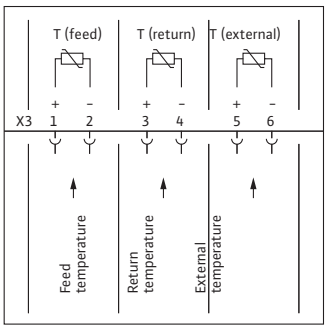
Signal transmitter for wall-mounted installation for outdoor temperature measurement.

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

> Technical data

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 (ΔT)
- Feed/return temperature control (±T)
- Differential pressure – temperature-superimposed (Δp-T)

3 analogue inputs for TSG temperature sensors:
- Feed temperature (+T)
- Return temperature (–T)
- Temperature setpoint (T)

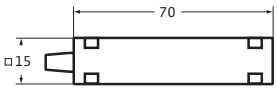
Fixation material, CAN bus cable and 2 TSG temperature signal transmitters are included in the scope of delivery.

> Technical data

Measurement range:	±T: - 20 ... +150°C ΔT: ≥ 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

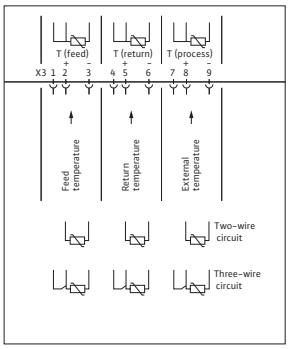
up to 25 m: 3 x 0.75 mm^2, shielded,
up to 100 m: 3 x 1.50 mm^2, shielded,
up to 250 m: 3 x 2.50 mm^2, shielded

KTY 10 PTC thermistor

– at +25 °C:	2 kΩ
– at +90 °C:	3.09 kΩ
Max. current:	2 mA

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 (ΔT)
- Feed/return temperature control (±T)
- Differential pressure – temperature-superimposed (Δp-T)

3 analogue inputs for PT 100 temperature sensors in 2-/3- and 4-conductor technology to be provided by the customer:

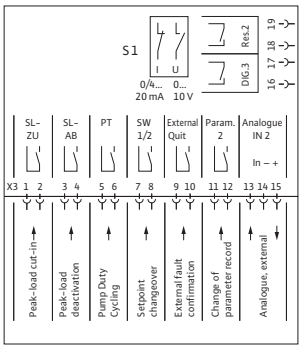
- Feed temperature (+T)
- Return temperature (–T)
- Temperature setpoint (T)

Fixation material and CAN bus cable are included in the scope of delivery.

> Technical data

Measurement range:	±T: – 20 … +150 °C ΔT: ≥ 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

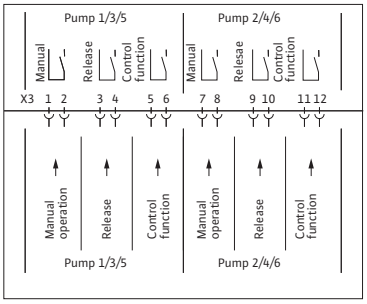
- Peak-load cut-in
- Peak-load deactivation
- Pump cycling
- Setpoint changeover
- Acknowledgement of the collective fault signal
- Parameter record switching
- Control input, 0/2 -10 V or 0/4 - 20 mA
- Signal input DIG 3

Fixation material and CAN bus cable are included in the scope of delivery.

Analogue input:	Correcting variable:
Measurement range:	0 – 10 V, 0/4 – 20 mA (= min.- max. speed)
Input resistance:	10kΩ or 50 Ω
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

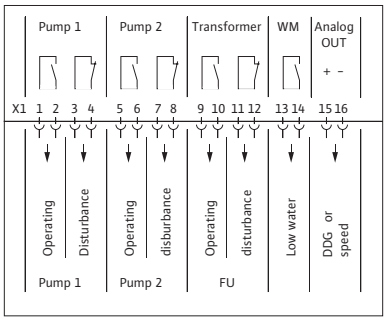
Connection for repair switches provided by the customer with auxiliary contact:

– closed:	Pump enabled
– open:	Pump disabled

Fixation material and CAN bus cable are included in the scope of delivery.

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

Signal 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.

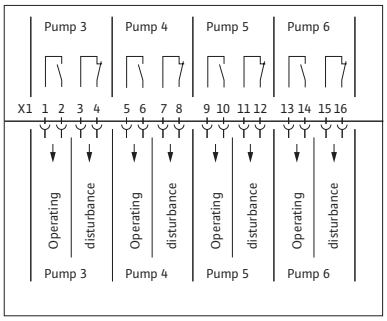
- Potential-free signalling contacts for operation (NO contact) and fault (NC contact) of: pump 1, pump 2, frequency converter
- Signals for the digital inputs DIG2 or DIG3, e.g. frost (heating) or low water (pressure boosting)
- Analogue output for actual speed value or actual value transmitter (can be preselected)

Fixation material and CAN bus cable are included in the scope of delivery.

Analogue output:	Actual value
Measurement range:	0 – 10 V, 0/4 – 20 mA (speed or transmitter)
Input resistance:	10 kΩ or 50 Ω
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

Signal 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-pump to six-pump systems (signal board 1 – 2 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.

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 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)

Series overview operating and service devices

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

Wilo-Control pump management systems

Pump control

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 operation 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.

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.

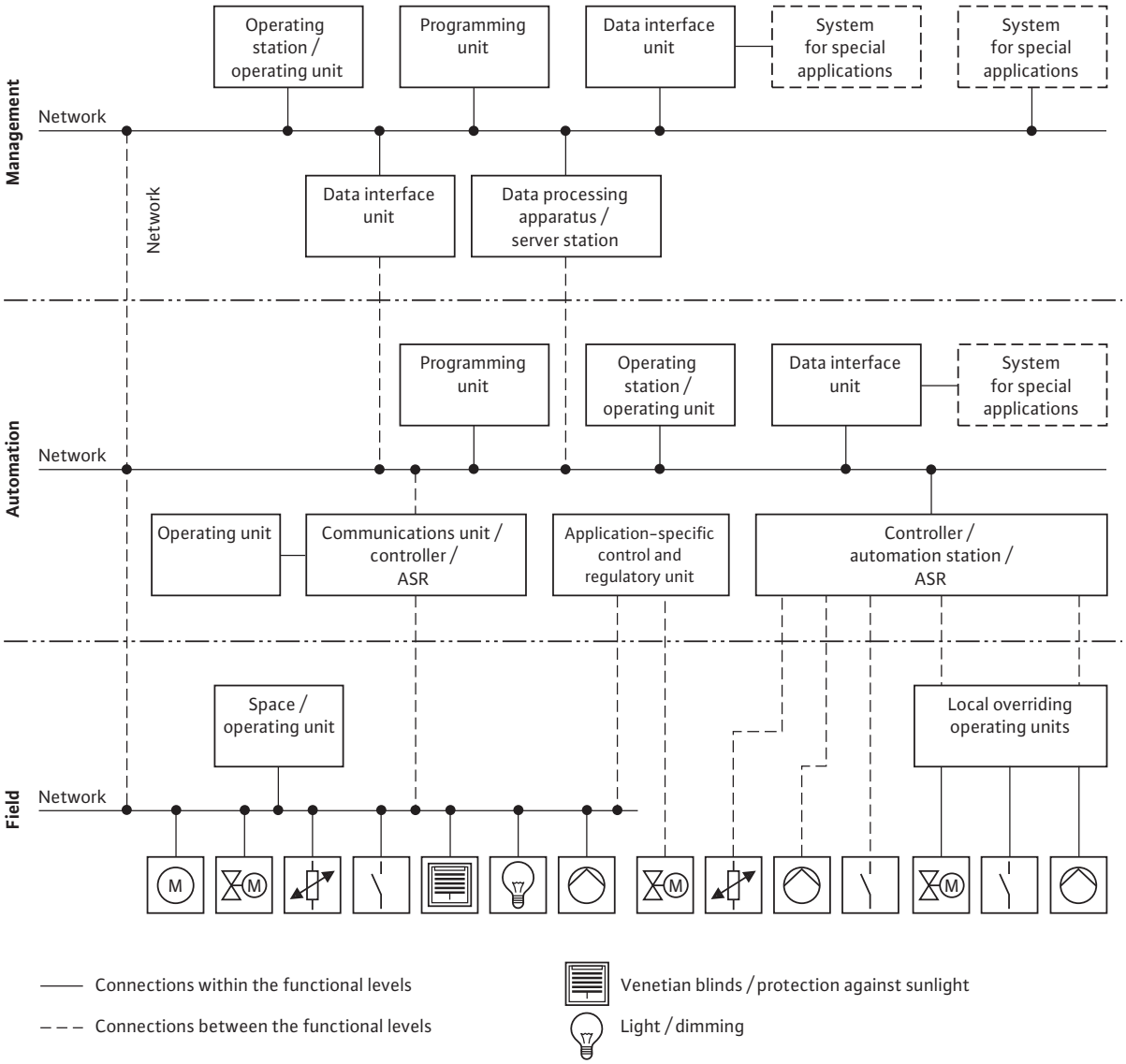


Fig.: Building automation - diagram

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 works 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

Building automation planning guide

- 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-capable 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

Building automation planning guide

- 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 ISO11898-2 is recommended for extending the bus length. The use of repeaters is not recommended.

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.

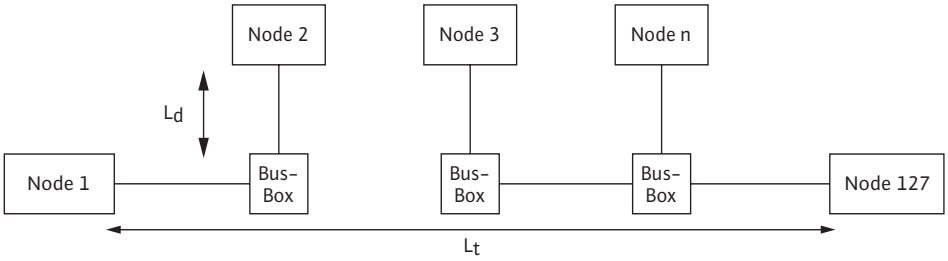


Fig. 1: Line structure with connection of all nodes via short spur lines

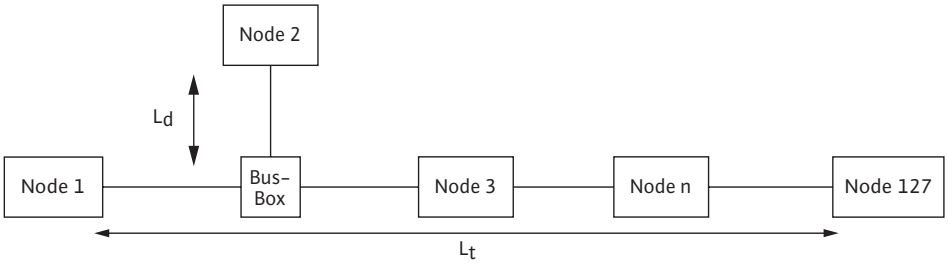


Fig. 2: Line structure with connection of individual nodes via short spur lines

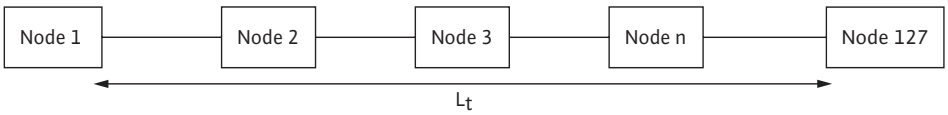


Fig. 3: Pure line structure

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

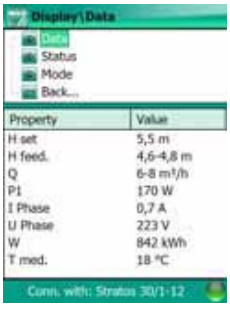
The main menu of the IR-Module provides access to ten function menus.

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.

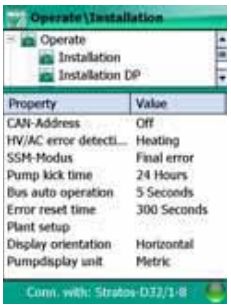
Function menu 2: "Display/Operating data"

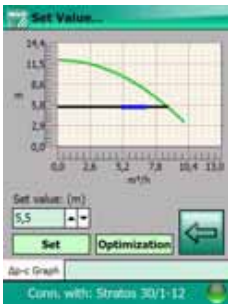
Hydraulic and electrical operating data is displayed in this function menu. Status signals and information on the pump mode can be accessed.



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.





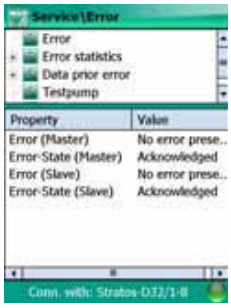
Function menu 4: "Statistics"

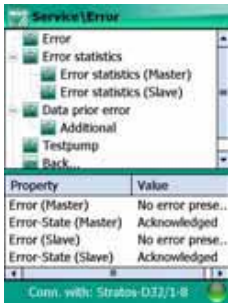
Statistical data is displayed in this function menu, which can also be reset here. A histogram shows the distribution in percent of the volume flow throughout the operating time. This makes the hydraulic load of the pump transparent.

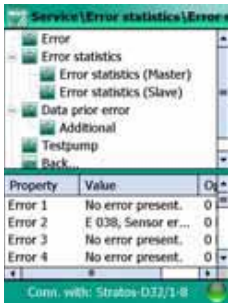
Series description Wilo-IR-Module

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.

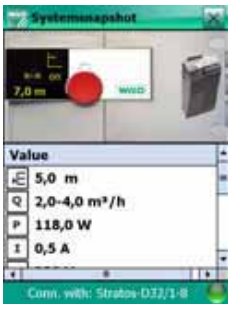
Series description Wilo-IR-Module

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.

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 button (single button 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

Technical data	
Display	50 x 50 mm, with backlight that can be switched on
Power supply	2 Mignon alkaline battery cells 1.5 V size AA (included in the scope of delivery)
Service life	approx. 24 hrs. 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

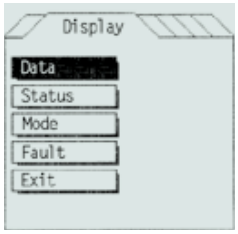
The main menu of the IR-Monitor is divided into 6 function menus:

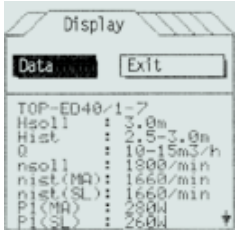
Menu 1: "Communication"

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"

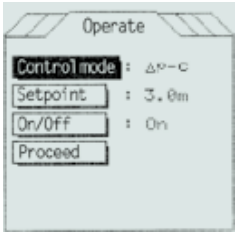
System data can be read here, e.g. actual electrical and hydraulic values, operating status, operating mode, fault messages.
The display always distinguishes clearly between "Single pump" and "Double pump".

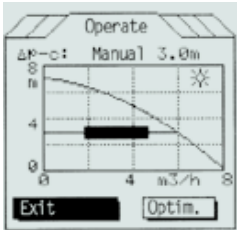




Menu 3: "Operation"

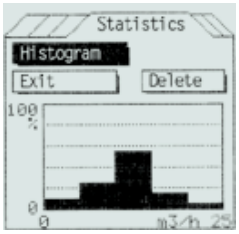
Data can be both displayed (current setpoint) and changed in this menu, e.g. control mode, setpoint, pump ON/OFF, disabling the manual control panel at the pump (pump ON/OFF, Ext. Off and SSM are still active).





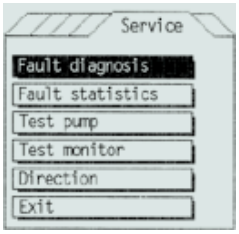
Menu 4: "Statistics"

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.

Function overview Wilo-IP-E/IL-E and DP-E/DL-E with Wilo-IF-Modules

Wilo-VeroLine-IP-E/CronoLine-IL-E

- 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 IF-Modules for functional extension

Wilo-VeroTwin-DP-E/CronoTwin-DL-E

- 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 IF-Modules for functional extension

Function table Wilo-IP-E/IL-E and DP-E/DL-E

Function	VeroLine-IP-E	CronoLine-IL-E	VeroTwin-DP-E	CronoTwin-DL-E
Electrical connection				
3~400 V/50 Hz	•	•	•	•
3~380 V/60 Hz	•	•	•	•
Manual function				
Pump On/Off	•	•	•	•
Control mode setting (Δp - c, Δp-v, controller)	•	•	•	•
Differential pressure setpoint setting	•	•	•	•
Speed setting (manual control mode)	•	•	•	•

• = 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) with 1 x IF-Module, CAN

Function overview Wilo-IP-E/IL-E and DP-E/DL-E with Wilo-IF-Modules

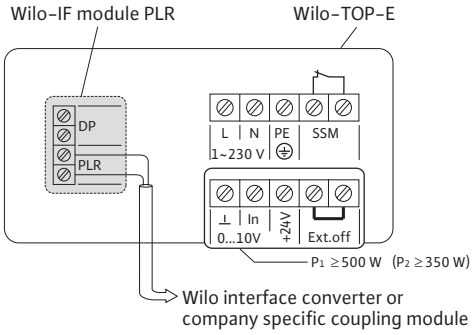
Function table Wilo-IP-E/IL-E and DP-E/DL-E				
Function	**VeroLine-IP-E**	**CronoLine-IL-E**	**VeroTwin-DP-E**	**CronoTwin-DL-E**
Automatic function				
Infinitely variable performance control Δp-c	•	•	•	•
Infinitely variable performance control Δp-v	•	•	•	•
Full motor protection with fault trip	•	•	•	•
External control function				
Overriding Off control input	•	•	•	•
Control input, 0 - 10 V (remote speed adjustment)	•	•	•	•
Signal and display function				
Collective fault signal	•	•	•	•
Collective run signal	•	•	•	•
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	•	•	•	•
Serial digital PLR interface for connection to BA via Wilo interface converter or company-specific coupling modules	•[1]	•[1]	•[1]	•[2]
Serial digital LON interface for connection to a LON-Works network	•[3]	•[3]	•[3]	•[4]
Serial digital CAN interface for connection to a CAN bus system	•[5]	–	•[5]	–
Dual pump management (2 x single pumps or 1 x double pump)				
Main/standby mode (automatic fault-actuated switchover/time-dependent pump cycling)	•	•	•	•
Parallel operation (peak load activation and deactivation)	•	•	•	•

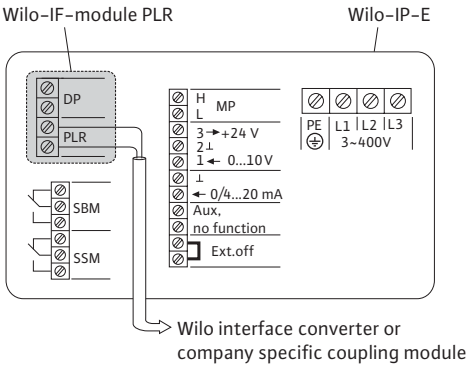
• = available, - = not available
[1] with 1 x IF-Module, PLR
[2] with 2 x IF-Modules, PLR/PLR
[3] with 1 x IF-Module, LON
[4] with 2 x IF-Modules, LON/PLR
[5] with 1 x IF-Module, CAN

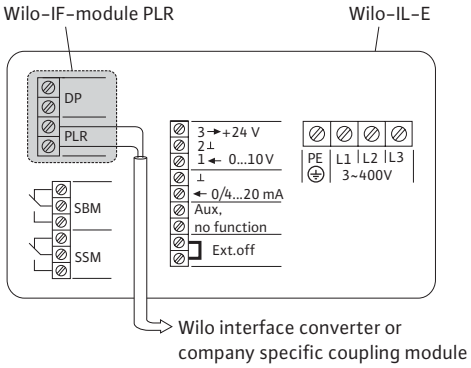
Wilo-IF-Modules for single pumps

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-Control pump management systems

Pump control

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)

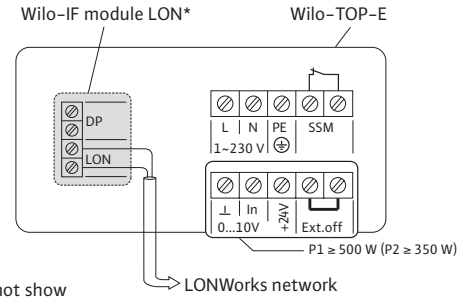
Delivery status

The LON IF-Module is supplied as "Application unconfigured" in accordance with the LONMark Application Layer Interoperability Guidelines.

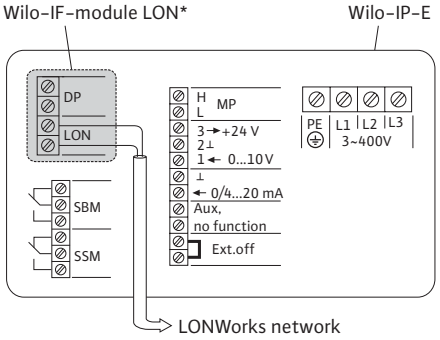
Documentation

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)

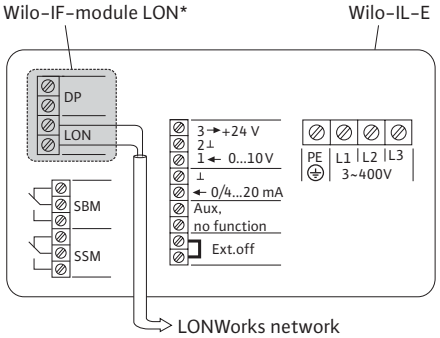
- Download application via network: *.NXE / *.APB
- External interface files: *.XIF / *.XFB
- Device resource files: *.ENU / *.FMT / *.FPT / *.TYP



* 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

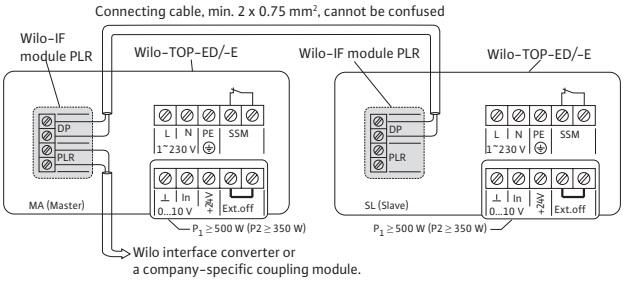
2 x Wilo-IF-Modules PLR

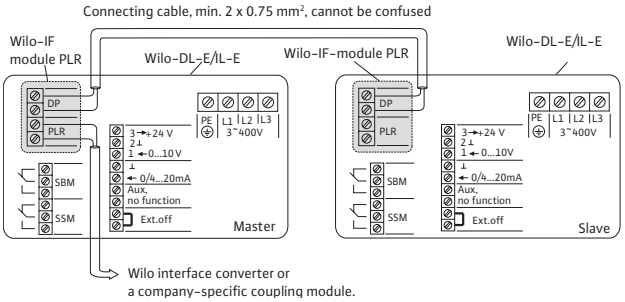
Plug-in modules for double pumps of the Wilo-TOP-ED and Wilo-TOP-E series (2 pc.) and Wilo-CronoTwin-DL-E and CronoLine-IL-E (2 x) with infrared interface

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 hrs 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





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 hrs 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)

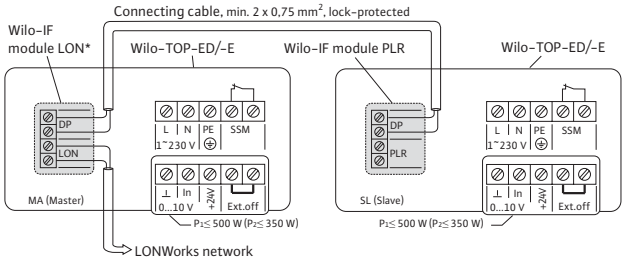
Delivery status

The LON IF-Module is supplied as "Application unconfigured" in accordance with the LONMark Application Layer Interoperability Guidelines.

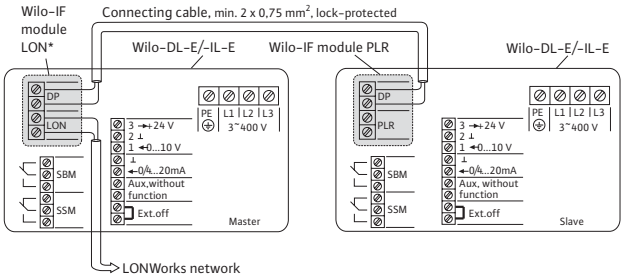
Documentation

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

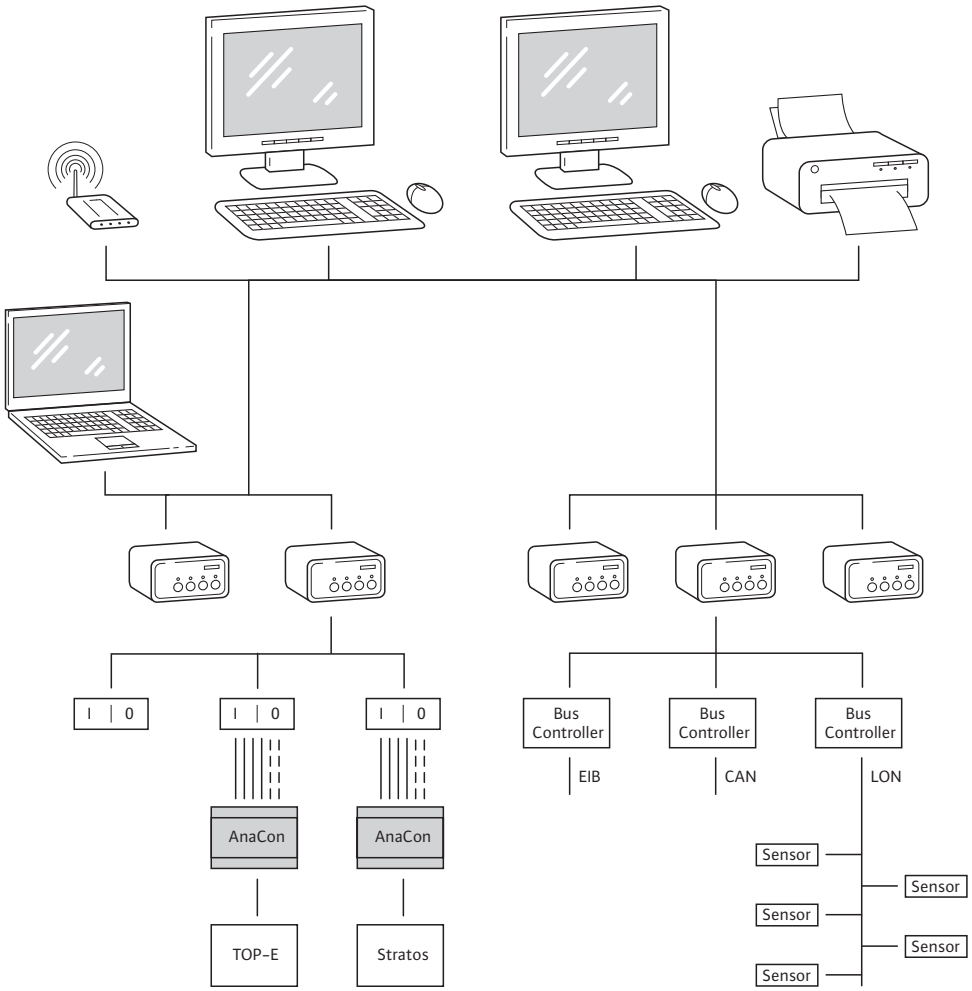


* Illustration does not reflect the actual position of the terminals

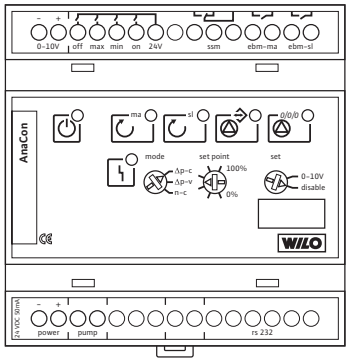


* Illustration does not reflect the actual position of the terminals

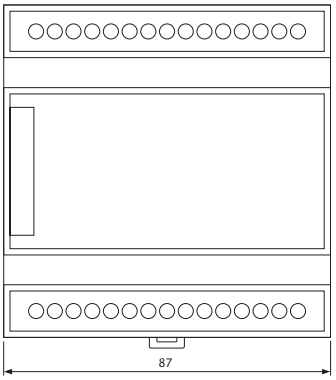
Wilo-Control AnaCon

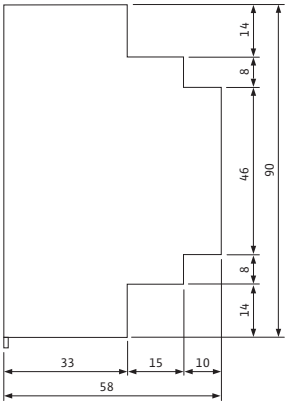


Front view



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

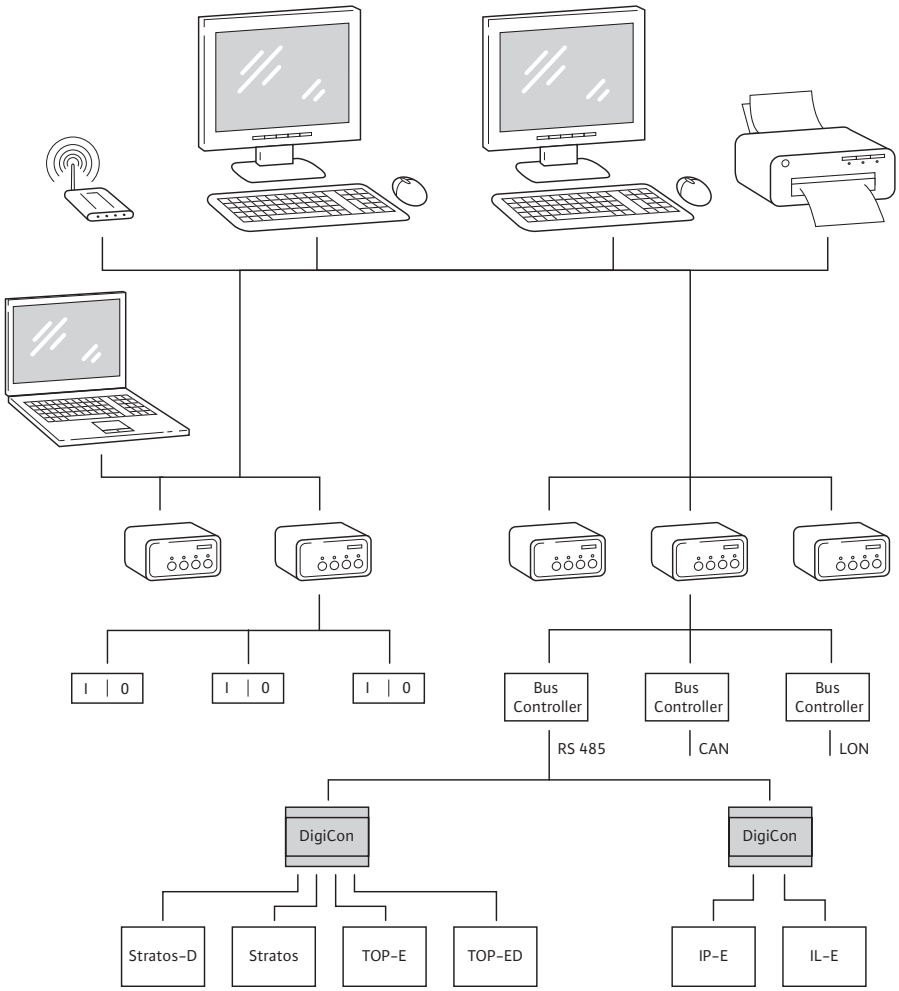
- Electromagnetic compatibility
  - Emitted interference: DIN EN 61000-6-3
  - Interference resistance: DIN EN 61000-6-2

- Analogue In 0 - 10 V control input
  - Input resistance: > 200 kW
  - Input protection: max. +/- 48 VDC

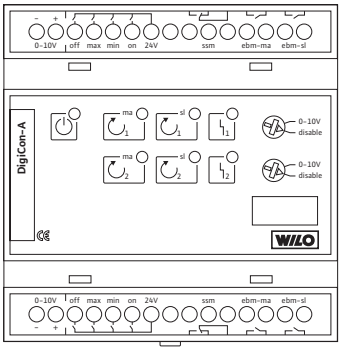
- PLR interface
  - Point-to-point interface with Wilo-specific hardware and Wilo-specific protocol
  - Two-core connection with interchangeable wires (no shielded cable necessary)
  - Maximum cable length: 1000 m

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.

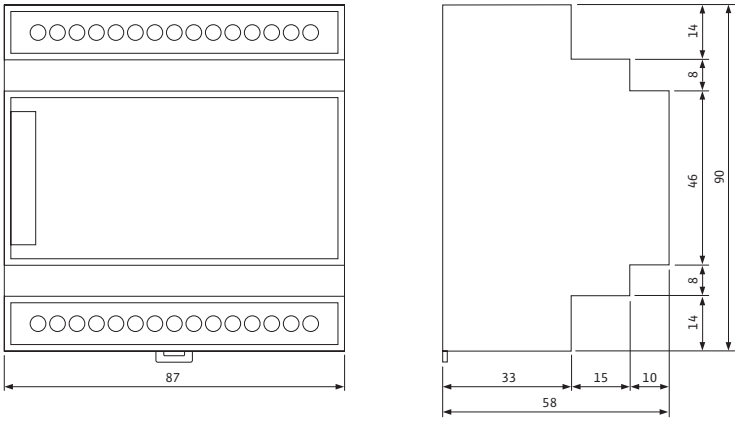
Wilo-Control DigiCon



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

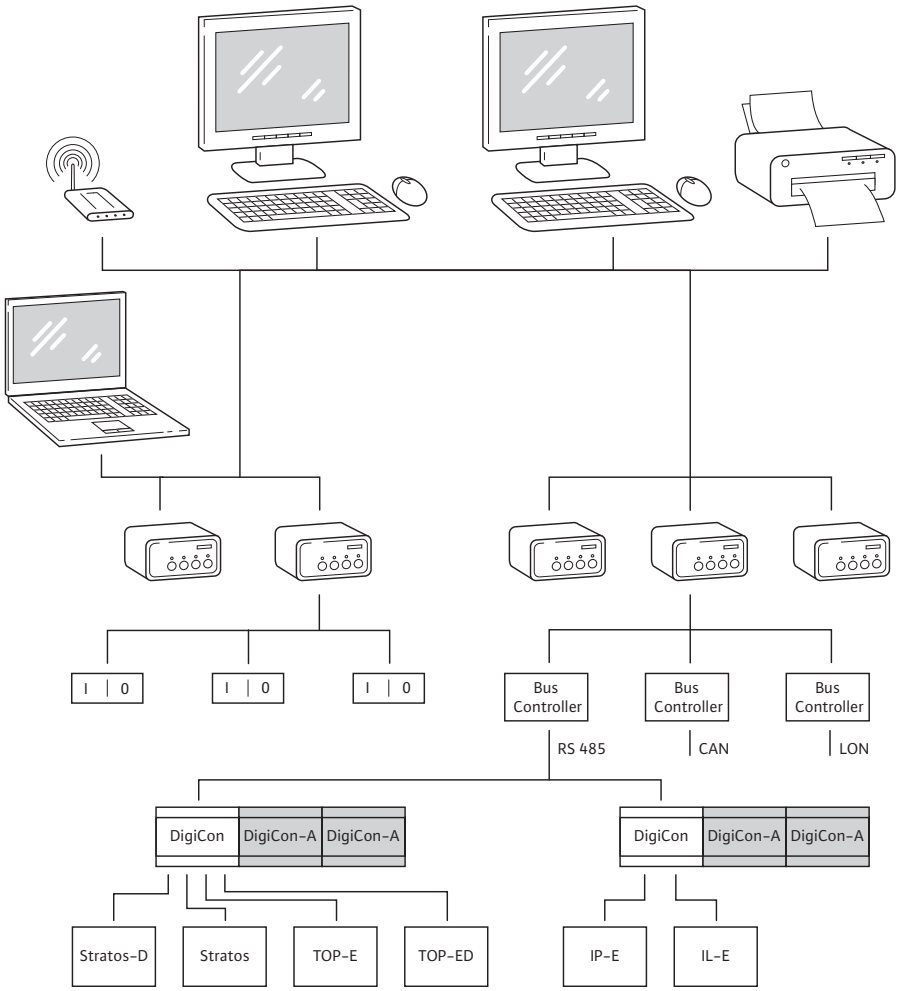
  Bus-capable interface with hardware in accordance with the RS 485 standard and the Wilo-specific protocol. The protocol is to be coordinated with the respective BA manufacturer.
  - Addressing of a maximum of 64 DigiCons (maximum of 256 pumps)
  - Maximum total length of the bus line: 1000 m
  - Cable 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.

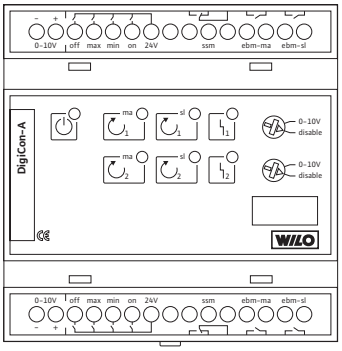
Accessories

Manual control panel Wilo-Control DigiCon-A for a maximum of 2 pumps

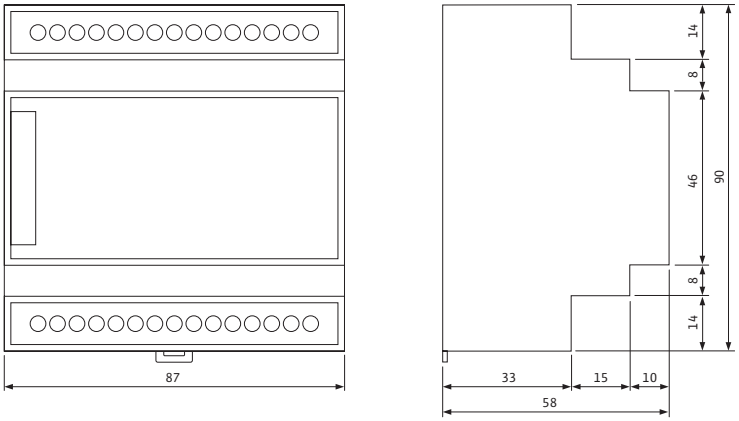
Wilo-Control DigiCon-A



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

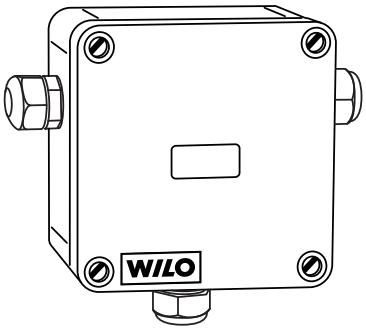


Fig.: Wilo-Control bus box

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

Pumpen Intelligenz.

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