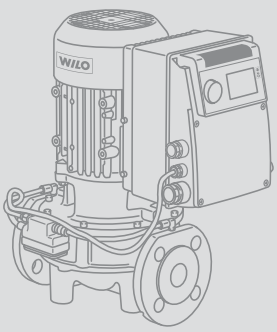
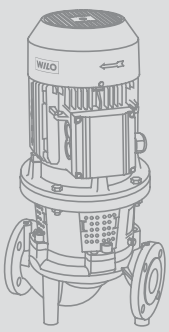
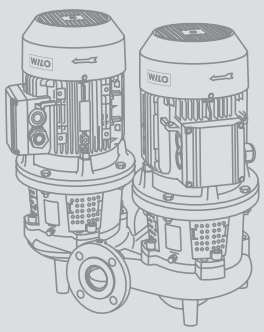
WILO
Pumpen Intelligenz.

Catalogue Heating, Air-Conditioning, Cooling

Glanded Pumps

In-Line Pumps
and Accessories

Catalogue A2 – 50 Hz – 2007

A2

Program overview and fields of application

Glanded pumps

	Pump type	Main field of application				Page
						
Energy-saving Pumps						**15**
Single-head pumps ☞	**Wilo-VeroLine-IP-E**	•	•	•		16
	Wilo-CronoLine-IL-E	•	•	•		16
	Wilo-CronoLine-IL-E...BF	•	•	•		16
Twin-head pumps	Wilo-VeroTwin-DP-E	•	•	•		16
	Wilo-CronoTwin-DL-E	•	•	•		16
Standard Pumps						**67**
Single-head pumps ☞	**Wilo-VeroLine-IPL**	•	•	•		68
	Wilo-CronoLine-IL	•	•	•		68
Twin-head pumps	Wilo-VeroTwin-DPL	•	•	•		68
	Wilo-CronoTwin-DL	•	•	•		68
Special Pumps						**149**
Single-head pumps	Wilo-VeroLine-IPS	•	•	•		150
	Wilo-VeroLine-IPH-O / -W	•	•	•		150
	Wilo-VeroLine-IP-Z	•	•	•	•	150
Monobloc Pumps						
Single-head pumps	Wilo-BAC		•	•		[1)]
	Wilo-CronoBloc-BL	•	•	•		

Legend:

- • Applicable
- [1)] See Catalogue A3 – Monobloc and Norm Pumps, Axially Split Case Pumps
- ☞ **New in the program or series expansion or modification**

Fields of application:

- Heating
- Air-conditioning / cooling
- Industrial applications
- Potable water circulation

Contents

General Notes and Abbreviations

Abbreviations and what they mean

Abbreviation	Meaning
1~	1-phase alternating current
1/min	revolutions per minute (rpm)
3~	3-phase current
Autopilot	Automatic adjustment of pump performance during setback phases, e.g. boiler setback operation overnight
blsf	Blocking current-proof, no motor protection
DM	3-phase AC motor
Δp-c	Control mode for constant differential pressure
Δp-T	Control mode for differential-pressure control as a function of media temperature
Δp-v	Control mode for variable differential pressure
ΔT	Control mode for differential temperature
ECM technology	Electronically commutated motor with new wet rotor encapsulation. Newly developed glandless drive concept for high-efficiency pumps.
EnEV	German energy-saving act (Energie-Einsparverordnung)
EM	1-phase AC motor
Ext. Off	Control input "Overriding Off"
Ext. Min	Control input "Overriding Min", e.g. for setback operation without autopilot
GRD	Residual-current device
GTW	Building automation
°d	Mechanical seal
H	Special cast iron: white malleable cast iron
IF	Degree of German water hardness, unit for assessing water hardness
Inox	Delivery head
Int. MS	Interface
IR	Stainless steel
KDS	Internal motor protection, pumps with internal protection against unacceptable high winding temperature
KLF	Infrared interface
Cap	capacitors
TRS	PTC thermistor sensor
KTL coating	Cataphoretic painting: Paintwork with high adhesive strength for long-lasting corrosion protection

Abbreviation	Meaning
KTW	Authorisation for products with plastics, for utilisation in potable water applications
LON	Local operating network (open, non-manufacturer-dependent, standardised databus system in LONWORKS networks)
MOT	Motor module (drive motor + impeller + terminal box / electronic module) for exchange in the TOP-..-series
PLR	Pump master computer
PT 100	Platinum temperature sensor with a resistance value of 100 Ω at 0 °C
Q (= $\dot{V}$)	Delivery rate
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
TOP-Control	Building automation management with pumps and accessories
TrinkwV 2001	German potable water ordinance of 2001 (valid from 01.01.2003)
VDI 2035	VDI guideline for preventing damage in hot-water heating installations
WSK	Thermal winding contacts (in motor for monitoring winding temperature, full motor protection through additional tripping unit)
WRAS	Water Regulations Advisory Scheme
▲	Operating mode of twin-head pumps: Individual operation of the respective operating pump
▲+▲	Operating mode of twin-head pumps: Parallel operation of both pumps
	No. of poles for the pumps: 2-pole
	No. of poles for the pumps: 4-pole
	No. of poles for the pumps: 6-pole

Note
According to the German energy-saving act EnEV, starting from 1.2.2002, boilers with outputs in excess of 25 kW must be equipped with either switchgear-equipped heating pumps for automatic performance control or electronically controlled pumps.

Pump replacement
Please refer to the current Wilo heating pumps replacement guide for more detailed information.

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, water condition) and the installation / usage situation and may result in the malfunction or failure at different times of the above-mentioned products / components including their electrical / electronic circuitry.
Wearing parts are all components subject to rotary or dynamic strain, including electronic components under tension, in particular:
- seals / gaskets (including rotating mechanical seals), seal ring
- bearings and shafts
- stuffing boxes
- capacitors
- relays / contactors / switches
- electronic circuits, semiconductor components, etc.
- impellers
- wearing rings / wearing plates

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

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

Note on range of application

This Planning Guide applies to:
- electronically controlled Inline pumps belonging to any of these series: IP-E, DP-E, IL-E, DL-E, IL-E .. BF
- non-controlled In-line pumps belonging to any of these 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 larger plant systems covering a wide range of applications in the field of hot water / central heating 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 design to satisfy the process parameters (e.g. pressure and temperature)
- The right materials to satisfy endurance requirements.

The overview duty charts in the **program overview** section of the catalogue allows you to roughly select the series of pump you need, helping you ultimately select the most suitable size of pump within the respective model series more quickly. Frequently, pumps of various model series are found to be hydraulically suitable in the edge region 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 within 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 pump equipment.

Pump curve

An optimally dimensioned pump has its duty point in the region of maximum efficiency. At the duty point there is equilibrium between the power output 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.

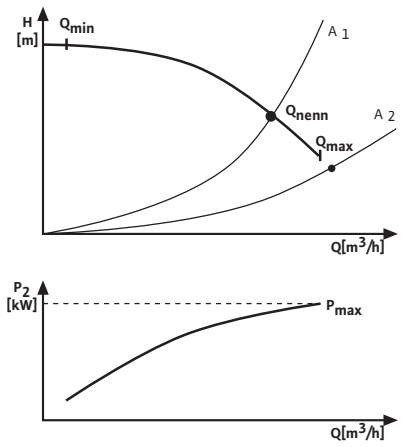


Figure 1

The point of highest efficiency is located approximately in the upper third of the pump curve, or is indicated on the performance diagram. The planning engineer must locate a dimensioned 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 occurring in practice lie on the pump curve to the left of the duty point Q_{nenn}. The pump thus operates in 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 A2). This may lead to an inadmissibly high power consumption and hence to an overload of the selected motor. In this case it is necessary to reassess the duty point and, if necessary, to use a more powerful pump. The minimum flow volume 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. When reliable knowledge of the duty point is unavailable, our basic recommendation is to select the pump with the maximum electrical power capability.

Cavitation

Avoidance of cavitation is an important part of correct pump selection. This is particularly so 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 reduces 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).

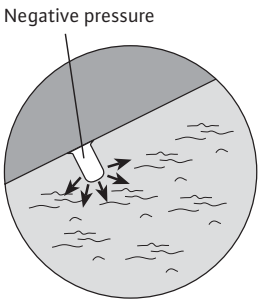


Figure 2

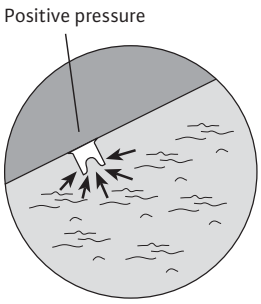


Figure 3

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 in the form of pitting.

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 (maintained pressure head or NPSH), appropriate measures will be required to increase the static head to at least achieve equilibrium. This can be implemented by:
- Increasing the static pressure (pump positioning).
- Reducing the fluid temperature (reduced vapour pressure pD)
- Selecting a pump with a lower maintained pressure head (NPSH) (as a rule a larger size pump)

Maintained pressure head NPSH

The maintained pressure 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 size. 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 **safety factor of 0.5 m**.

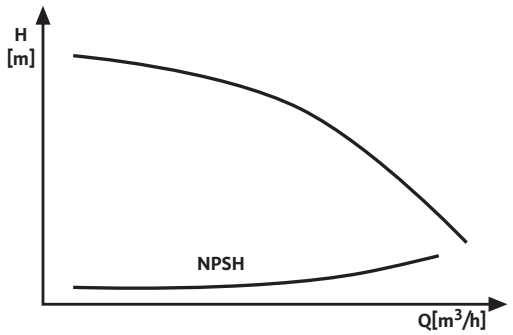


Fig. 4

Series

A hydraulically suitable pump must, in addition, satisfy the required operating conditions. To do so it is necessary to consider the maximum permissible operating temperature and pressure.

Construction

In-line pumps

Wilo In-line pumps are single-stage, low-pressure centrifugal pumps incorporating the In-line method of construction with inlet and outlet ports of the same nominal diameter and with air-cooled IEC standard motors. Flange PN 16 with pressure measuring connection R $^1/_8$. The pump housing is provided with feet as standard.

Monobloc pumps

Wilo Monobloc pumps are single-stage, low-pressure centrifugal pumps in monobloc construction in accordance with EN 733 with air-cooled IEC standard motors. Cast iron volute casing with axial inlet port and radial delivery port, flange PN 16 with pressure-measuring connection R $^1/_8$. The pumps are equipped, as standard, with angled or motor feet.

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

The materials selection table provides an overview of the most important components. In addition to the resistance and durability of glanded pump components, particular significance is attached to the functional capability of the mechanical seals.

Materials

Fluids	Application limits (The maximum permissible operating temperatures and pressures of the pump series must be adhered to)	Materials housing / impeller		Shaft seals mechanical seal			Housing seal		
		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 liquid, inorganic pH > 7.5 inhibited	up to 30 °C	•	–	•	–	–	•	–	–
Water-glycol mixture 20-40 Vol. % glycol	-20 °C to 40 °C	•	–	•	–	–	•	–	–
Water-glycol mixture 20-40 Vol. % glycol	40 °C to 90 °C	•	–	–	○	–	–	–	○
Water-glycol mixture 40-50 Vol. % glycol	-20 °C to 90 °C	•	–	–	○	–	–	–	○
Water-glycol mixture 20-50 Vol. % glycol	90 °C to 120 °C	•	–	–	○	–	–	–	○
Water with oil in suspension	0 °C to 90 °C	•	–	–	–	○	–	○	–
Mineral oil (Observe regulations relating to protection against explosions)	-20 °C to 140 °C	•	–	–	–	○	–	○	–
Swimming-pool water (Chloride <250 mg / l, install the pumps ahead of the filters	up to 35 °C	–	○	–	–	–	–	–	○
Firefighting water	up to 30 °C	–	○	–	–	–	–	–	○

• = Standard, ○ = Special equipment
[1] with Series IPL, DPL, IP-E, DP-E plastic impellers as standard equipment, IPL and DPL to some extent 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 working pressures. The dynamic sealing area of the mechanical seal comprises two surface-ground, wear-resistant faces (e.g. silicon carbide or carbon rings), which are held together by axial forces. The slip ring rotates with the shaft, whilst the mating ring remains stationary in the housing. The required axial force to maintain contact between the rings is exerted by a spring and the fluid pressure.

Fig. 5

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

Important:
Mechanical seals are subject to wear and tear. 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 medium temperature of ≤ 40 °C.

Outside the limits of these parameters silicate precipitation can take place which may damage the standard seals. Non-standard mechanical seals are available on request for use outside these limitations. When additives such as glycol are used or oil polluted water is encountered, then in addition to the suitability of the mechanical seal, **it may be necessary to check the performance of the pump (in the case of glycol additions from 20 % by volume).**
The **power requirement P_2** of a pump can be calculated from the following formula:

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

P_2 = Power requirement [kW]
ρ = Density [kg / dm³]
Q = Flow volume [m³ / 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: Seal face
2: Mating ring
3: Secondary seals
4: Spring
5: Other components

Typical materials:
1: **A** Carbon-graphite (antimony-impregnated)
B Carbon-graphite (artificial resin-impregnated), approved for use with food
Q1 Silicone carbide
2: **Q1** Silicon carbide
3: **E** EPDM
E3 EPDM, approved for use with food
V Viton
X4 HNBR
4: **G** Stainless steel
5: **G** Stainless steel
The standard seal on Wilo glanded pumps is **AQ1EGG**.

Cataphoretic painting

Wilo glanded pumps are provided as standard with a cataphoresis coating (Exceptions: Series IL 250, IPS, IPH-O, IPH-W, IP-Z). 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. Pumps with cast components with a cataphoresis coating and chromated components, to combat rust, are suitable for heating and air conditioning / cooling applications in both internal and outside use (a special motor is required for outside applications). These pumps also offer the advantage of low maintenance costs and longer life.

Heat insulation of pumps

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

Location / positioning of pumps

The standard pumps must be protected from the weather and installed in a frost / dust-free, well-ventilated and non-explosive atmosphere. Pipelines and pumps should be installed in a stress-free condition. The pipelines must be fixed in such a way that the pump is not supporting the weight of the pipeline.

In-line pumps are designed for direct horizontal and vertical installation in a pipeline. Installation with the motor and the terminal box facing downwards is not permissible. Sufficient clearance must be provided for the removal of motor, lantern and impeller. From a motor power of 18.5 kW it is not permissible to install the pump with the pump shaft in a horizontal attitude. On a vertically mounted pump the pipeline 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 permissible. All other installed attitudes are possible. Monobloc pumps are to be mounted on concrete foundations or support brackets.

Anticipated noise levels for In-line and monobloc pumps (Orientation 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 level on a square plate a distance of 1 m from the surface of the motor

Electrical pump drives

The **rated power data** and operating values for the electrical drives presented in this catalogue for glanded pumps (Inline and monobloc) apply at a rated frequency of 50 Hz, a rated voltage of 230 / 400 V to 3 kW or 400 / 690 V starting at 4 kW, a maximum coolant temperature (KT) of 40°C and an installation altitude of up to 1000 m above mean sea level.

For cases outside of these parameters a power rating reduction must be applied or a larger motor or a higher insulation class must be selected.

All Wilo glanded pumps are fitted as standard with electric motors, which satisfy the IEC standard in terms of power 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 motor speed categories / operating speeds are as follows:

No. of poles	50 Hz	60 Hz
2	2900 rpm	3500 rpm
4	1450 rpm	1750 rpm
6	960 rpm	1150 rpm

High-efficiency motor

EFF 1

From a motor power of 1.1 kW Wilo glanded pumps can be supplied to order with EFF1 high efficiency motors.

Application of explosion-protected pumps to directive 94 / 9 / EG (ATEX100a)

Areas made hazardous by the risk of explosion are those, in which an explosion-supporting atmosphere (gas / dust) can occur in sufficient measure to present 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 test organisations. Approval is granted by means of a prototype test certificate. Wilo glanded pumps of Series IL, DL, BL, IPL (only variant –N), DPL (only variant -N), IPS and IPH can be supplied with the appropriate approvals 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 Symbol
II = Equipment group
G = Ex-Atmospheres due to gases, vapours and mist
c = Design safety (Protection due to safe construction)
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 = Ignition protection category of the motor
e = increased safety
d = pressure-resistant enclosure

Particular attention must be paid to ensure that for applications in the temperature range T4 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 motor nominal power.

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

E = Motor in accordance with European standards
Ex = Explosion protection
e = ignition protection category “Increased safety”
II = Motor for potentially explosive areas
T3 = Temperature Class

and must likewise be approved in accordance with the directive 94 / 9 / EG (ATEX100a).
The approved operating conditions are illustrated in the following matrix:

Note:
Attention must also be paid in each application to the special features relating to the dependency on temperature, pressure, fluid medium and mechanical seal. The pumps must only be used for the permissible media listed in the following matrix (II B). However, outside the pump, the presence of gases satisfying the EX groups and temperature classifications 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				IPL / DPL maximum permissible fluid temperature	
			T4 [1]		T3		T4 [1]	T3
			P = 10 bar	P = 16 bar	P = 10 bar	P = 16 bar	P = 10 bar	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
Dealcalised 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	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	S2		90 °C	90 °C	90 °C	90 °C	90 °C	90 °C
Cooling water with frost protection (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 temperature range T4. This can be achieved by monitoring the differential pressure or the nominal power of the motor.

The application of solvents is not permissible, since these may attack the elastomers in the seals. In turn, this can lead to uncontrolled leakage!

Scope of delivery
Pump, including packing, installation and operating instructions

Accessories
Electronically controlled In-line pumps:
- IF Modul: PLR or LON for the Series IP-E, DP-E, IL-E, DL-E (see also Catalogue section "Switching Devices and Control Systems").
- IR-Monitor for the Series IP-E, DP-E, IL-E, DL-E.
- Analogue interface converter (see also Catalogue section "Switching Devices and Control Systems")
- Digital interface converter (see also Catalogue section "Switching Devices and Control Systems").
- Mounting brackets for installation on a base
- Blank flanges for twin-head pumps

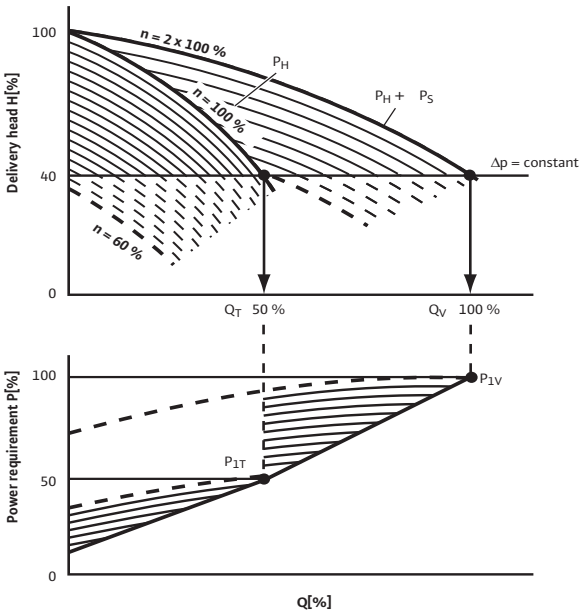
Uncontrolled In-line and monobloc pumps:
- Wilo control system for continuous regulation of motor speed to provide specified pump operating mode.
- Changeover switches for automatic control of operational and reserve pumps (see also Catalogue section "Switching Devices and Control Systems").
- Mounting brackets for installation on a base
- Blank flanges for twin-head pumps

Pump duty splitting
In association with the continuous regulation of power, the "Split solution" is available for optimisation, starting with the medium pump power range (1–1.5 kW). This provides for the use of 2 smaller pump aggregates or a twin-head pump in place of a large pump to distribute the maximum design performance.
In the normal case, i.e. over 85% of the heating season, one pump is adequate as the basic load aggregate. The second pump is available to satisfy peak load requirements.

Note:
The extra cost of the pumps is more than compensated by power savings on the control devices.

Advantages of pump duty splitting:
- Electricity savings of between 50% and 70%
- A second pump is always available for standby duty.
With the so-called "Split solutions" one pump is operated for basic load requirements, whilst the other pumps are in parallel circuit for peak load duty.
This ensures that the design requirement is in accordance with DIN 4701. In conjunction with an auto pump control system, continuous adjustment of pump capacity to the ever-changing load demand can be achieved.

Note:
Wilo Auto control systems for dual or multiple pump installations feature the peak-load operation facility.



Continuously controlled peak load operation of a twin-head pump with two equal power motor impeller units.

Caption:
P_H = Main pump (base load)
P_S = Trailing pump (peak load)
Q_V = Full-load flow volume
Q_T = Partial-load flow volume
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 with "Split-solutions". Particularly when use is made of twin-head pumps in place of single pumps, with their very high installation costs (Y-pipes, etc.)

Note:
Due to their low outlet velocities, Wilo twin-head pumps are particularly suitable for parallel operation.

Operating costs
Considerable reductions in the operating costs also ensue as a result of the large saving in current of the lower performance "Split aggregates", since these supports better utilisation in the partial load range and, in particular, in the low load range.

Standby facility
From an operating point of view there are other advantages, because in the event of failure in the partial load range and the low load range a 100 % reserve is available and in the peak load range, on the few extremely cold days, there is a so-called emergency reserve (75%).

Principle of operation

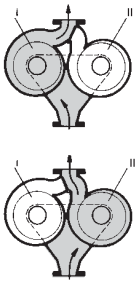
Auto speed control applies to the main (base-load) pump head.
With full stabilisation of this aggregate, i.e. with the nominal pump speed achieved and the start of the peak load requirement, the peak load aggregate switches in at a fixed speed (nominal speed), whilst the power of the controlled base load pump is directly reduced and adjusted to the load point. Pressure surges resulting from starting and stopping the trailing pumps are relatively minor and in practice have no appreciable effect. In parallel operation the constant speed peak load aggregate and the controllable base load aggregate are added, based on delivery flow, which in this operating situation readjusts for the respective peak load requirement.
The switch-point for adding the peak-load head is determined by means of a unit-integrated electronic assessment logic.

Note:
Peak-load control functions of Wilo auto control systems are only possible on head- or differential temperature-sensitive control modes.
Further information on pump regulation is contained in the catalogue section "Switching devices and control systems".

Twin-head pump switching
There are two operating modes for the operation of twin-head pumps:
- **Standby switching** of one pump with the other is on duty in single-pump operation.
- **Peak load switching** with parallel operation of both pumps, which are also combined from a control option on the respective operating pump.

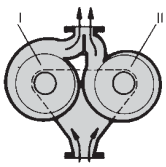
Operating modes

Standby operation



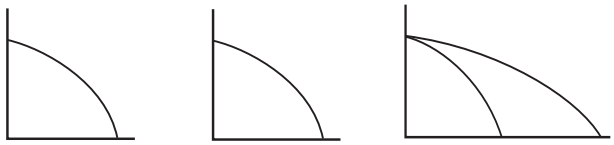
No. I or No. II pump in operation

Peak load operation



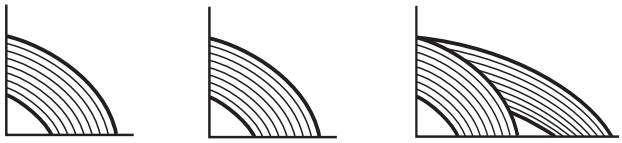
Both pumps operating

Duty pump uncontrolled



Pump I	Pump II	Pump I + II
Investment costs:	lower	higher
Operating costs:	high	low

Operating pump controlled by means of Wilo control system



Pump I	Pump II	Pump I + II
Investment costs (Including control):	higher	lower
Operating costs:	higher	low

Operating Functions
Wilo switching devices feature the following operating functions:
A standby switching, fault-sensitive or time-sensitive operational changeover Pump I <-> Pump II.
B Peak-load operation for load- or time-sensitive automatic load adjustment through ON / OFF control of the trailing pump.
C Infinitely-variable speed control of the leading pump for load- or time-sensitive automatic power adjustment when the trailing pump it switched on for infinitely-variable peak-load service.

Switchgear		Switch function		
		A	B	C
SD Series	**(Standby / Cut-in)**	•	•	–
S2R 3D	**(Standby / Cut-in)**	•	•	–
CR System	**(stepless)**	•	•	•

Series S2R 3D / SD
Changeover panels for auto-control of operating and standby pumps of dual sets. Automatic fault-actuated changeover from operating to standby pump. Automatic time-controlled routine duty changeover of operating and standby pumps.
Additional peak load switching through series standard connection option for the 2nd pump.
Short-term parallel running is integrated into the changeover sequence to avoid the occurrence of valve noise during uncontrolled changeover.
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 230 V, 50 Hz.
Non-standard voltages and frequencies 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

Energy-Saving Pumps

Contents

Energy-saving pumps

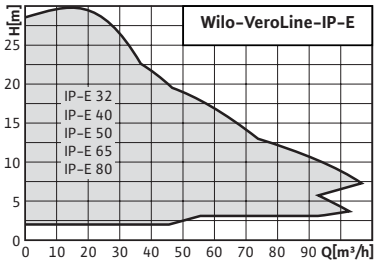
Energy-Saving Pumps

Single-head pumps In-line (Heating, Air-conditioning, Cooling and Industry)

Series overview

Series: Wilo-VeroLine-IP-E

Series expansion

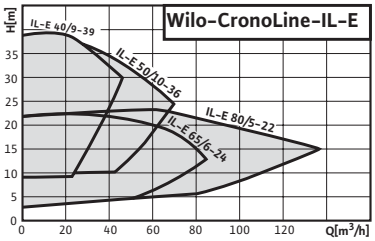


> Single-head pumps:
- Electronically controlled In-line pumps with flange connection

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

> Special features:
- Simple operation with infrared interface (IR-Monitoring)
- Optional interfaces via retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management

Series: Wilo-CronoLine-IL-E

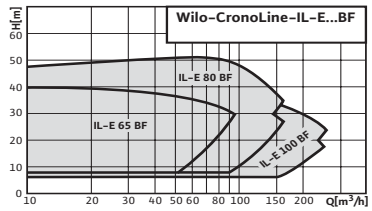


> Single-head pumps:
- Electronically controlled In-line pumps with flange connection

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

> Special features:
- Simple operation with infrared interface (IR-Monitoring)
- Optional interfaces via retrofit IF-Modules for bus communication, LON or PLR
- Retrofit twin-head pump management system

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



> Single-head pumps:
- Electronically controlled In-line pumps with 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

> Special features:
- Powerful, up to 22 kW

Series overview

Series: Wilo-VeroLine-IP-E

> Product advantages:
- Energy saving due to integrated electronic performance control
- Standard interfaces for connection with building automation systems
- Display of volumetric flow tendencies
- High corrosion protection thanks to cataphoretic painting
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores

> Additional information: **Page**

Series: Wilo-CronoLine-IL-E

> Product advantages:
- Energy saving due to integrated electronic performance control
- Available for flexible applications in air conditioning and cooling systems benefiting from targeted draining of condensate via optimised lantern design
- High corrosion protection thanks to cataphoretic painting
- High motor life due to the production standard condensate outlet holes in the motor housings
- Simple operation with infrared interface (IR-Monitoring)
- Optimised interfaces via retrofit IF-Modules for bus communication, LON or PLR for bus communication
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores
- Reduced Life Cycle Costs through optimised degrees of efficiency

> Additional information: **Page**

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

> Product advantages:
- Powerful, up to 22 kW
- High corrosion protection thanks to cataphoretic painting
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores

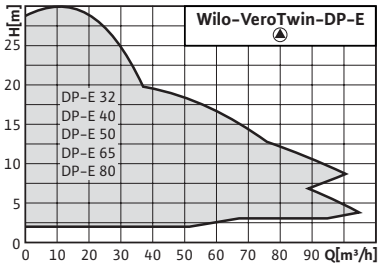
> Additional information: **Page**

Energy-Saving Pumps

Twin-head pumps In-line (Heating, Air-conditioning, Cooling and Industry)

Series overview

Series: Wilo-VeroTwin-DP-E

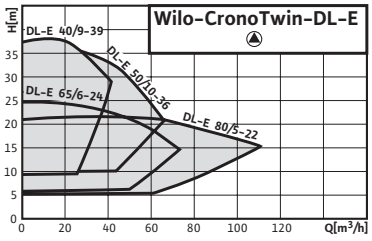


> Twin-head pumps:
- Electronically controlled In-line pumps with flange connection

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

> Special features:
- Simple operation with infrared interface (IR-Monitoring)
- Optional interfaces via retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management

Series: Wilo-CronoTwin-DL-E



> Twin-head pumps:
- Electronically controlled In-line pumps with 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

> Special features:
- Simple operation with infrared interface (IR-Monitoring)
- Optional interfaces via retrofit IF-Modules for bus communication, LON or PLR
- Integrated dual pump management

Series overview

Series: Wilo-VeroTwin-DP-E

> Product advantages:
- Energy saving due to integrated electronic performance control
- High corrosion protection thanks to cataphoretic painting
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores.

> Additional information: **Page**

Series: Wilo-CronoTwin-DL-E

> Product advantages:
- Energy saving due to integrated electronic performance control
- High corrosion protection thanks to cataphoretic painting
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores.

> Additional information: **Page**

Energy-Saving Pumps

Single-head pumps In-line, double pumps In-line

Equipment / Function

	Wilo-VeroLine-IP-E	Wilo-CronoLine-IL-E	Wilo-CronoLine-IL-E..BF	Wilo-CronoLine-IL-E..BF R1	Wilo-VeroTwin-DP-E	Wilo-CronoTwin-DL-E
Operating modes						
Δp-c for constant differential pressure	•	•	•	• (Differential pressure sensor required on installation)	•	•
Δp-v for variable differential pressure	•	•	–	–	•	•
Remote speed control (0 – 10 V) for connection to external control unit (DDC)	•	•	–	•	•	•
Remote speed control (2 – 10 V) for connection to external control unit (DDC)	•	–	–	•	•	–
Remote speed control (0 – 20 mA) for connection to external control unit (DDC)	•	•	–	•	•	•
Remote speed control (4 – 20 m) for connection to external control unit (DDC)	•	–	–	–	•	–
Manual speed setting	•	•	•	–	•	•
Manual settings						
Differential pressure setpoint	•	•	• (Pressure gauge required on installation)	–	•	•
Pump ON / OFF	•	•	–	–	•	•
Speed (manually set)	•	•	•	–	•	•
Manual Operation	•	•	•	–	•	•
Automatic functions						
Stepless performance control Δ p-c	•	•	•	–	•	•
Stepless performance control Δ p-v	•	•	–	–	•	•
Full motor protection with fault trip	•	•	•	•	•	•
External control functions						
Control input “Overriding Off”	•	•	•	•	• (Only on master pump)	• (Only on master pump)
Control input “analogue in 0 ... 10 V”	•	•	–	•	•	•
Control input “analogue in 0 ... 20 mA”	•	•	–	•	•	•

• = available, – = not available

Equipment / Function

	Wilo-VeroLine-IP-E	Wilo-CronoLine-IL-E	Wilo-CronoLine-IL-E..BF	Wilo-CronoLine-IL-E..BF R1	Wilo-VeroTwin-DP-E	Wilo-CronoTwin-DL-E
Signal and display functions						
Collective fault signal	•	•	•	•	•	•
Collective run signal	•	•	•	•	•	•
Fault light	•	•	•	•	•	•
Fault acknowledgement button	•	•	•	•	•	•
LCD to display pump data and error codes	•	•	–	–	•	•
Data exchange						
Infrared interface for wireless data exchange with IR-Monitor and indicator light (for functions, cf. 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)	• with 1 x IF Module (Accessory)	–	–	• with 1 x IF Module (Accessory)	• with 2 x IF Module (Accessory)
Serial digital LON interface for connection to a LONWORKS network	• with 1 x IF Module (Accessory)	• with 1 x IF Module (Accessory)	–	–	• with 1 x IF Module (Accessory)	• with 2 x IF Module (Accessory)
Twin-head pump management (twin-head pump or 2 single-head pumps)						
Main / standby operation (automatic changeover on fault / time dependent pump changeover after 24 hours)	•	• with 2 x IF Module (Accessory)	–	–	•	• with 2 x IF Module (Accessory)
Duty / assist mode (Efficiency-optimised peak load On / Off control)	•	• with 2 x IF Module (Accessory)	–	–	•	• with 2 x IF Module (Accessory)

• = available, – = not available

Energy-Saving Pumps

Single-head pumps In-line, double pumps In-line

Technical Data

	Wilo-VeroLine-IP-E	Wilo-CronoLine-IL-E	Wilo-CronoLine-IL-E..BF / BF R1	Wilo-VeroTwin-DP-E	Wilo-CronoTwin-DL-E
Approved fluids (other fluids on request)					
Heating water (In accordance with VDI 2035)	•	•	•	•	•
Water-glycol mixture (for 20-40 vol.-% glycol and media temperature ≤ 40 °C)	•	•	•	•	•
Cooling and cold water	•	•	•	•	•
Heat transfer oil	Special version at additional charge				
Permitted field of application					
Standard version with nominal pressure, p_{max} [bar]	10	13 (up to +140 °C) 16 (up to +120 °C)	13 (up to +140 °C) 16 (up to +120 °C)	10	13 (up to +140 °C) 16 (up to +120 °C)
Special version with nominal pressure, p_{max} [bar]	16	–	–	16	–
Temperature range [°C]	-10 to +120	-20 up to +140	-20 up to +140	-10 up to +120	-20 up to +140
Ambient temperature, maximum [°C]	40 (50 on request)	40	40	40 (50 on request)	40
Installation in closed buildings	•	•	•	•	•
Outdoor installation	–	–	–	–	–
Pipe connections					
Nominal connection diameter DN	32 – 80	40 – 80	65 – 100	32 – 80	40 – 80
Flange (in accordance with EN 1092-2)	PN16 (only flange fixing holes in accordance with EN 1092-2)	PN16	PN16	PN16 (only flange fixing holes in accordance with EN 1092-2)	PN16
Materials					
Pump housing and lantern	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250	EN-GJL-250
Impeller standard version	PP, fibreglass-reinforced	EN-GJL-200	EN-GJL-200	PP, fibreglass-reinforced	EN-GJL-200
Impeller special version	–	G-CuSn 10	G-CuSn 10	–	G-CuSn 10
Shaft	1.4021	1.4122	1.4122	1.4021	1.4122
Mechanical seal	AQ1EGG	AQ1EGG	AQ1EGG	AQ1EGG	AQ1EGG
Other mechanical seals	On request (at additional charge)				
Electrical connection (Other versions on request)					
Mains connection	3 ~400 V, 50 Hz 3 ~380 V, 60 Hz	3 ~400 V, 50 Hz 3 ~380 V, 60 Hz	3 ~400 V, 50 Hz 3 ~380 V, 60 Hz	3 ~400 V, 50 Hz 3 ~380 V, 60 Hz	3 ~400 V, 50 Hz 3 ~380 V, 60 Hz
Speed range [rpm]	1100 – 2900	1100 – 2900	1100 – 2900	1100 – 2900	1100 – 2900

• = available, – = not available

Technical Data

	Wilo-VeroLine-IP-E	Wilo-CronoLine-IL-E	Wilo-CronoLine-IL-E..BF / BF R1	Wilo-VeroTwin-DP-E	Wilo-CronoTwin-DL-E
Motor / electronics					
Integrated full motor protection	as standard. PTC thermistor sensor				
Protection class	IP 55	IP 54	IP 54	IP 55	IP 54
Insulation class	F	F	F	F	F
Emitted interference	EN 50081-1 EN 61000-3	EN 50081-1 EN 61000-3	EN 50081-1 EN 61000-3	EN 50081-1 EN 61000-3	EN 50081-1 EN 61000-3
Interference resistance	EN 50082-2 EN 61800-3	EN 50082-2 EN 61800-3	EN 50082-2 EN 61800-3	EN 50082-2 EN 61800-3	EN 50082-2 EN 61800-3
Residual-current device (RCD)	•	•	•	•	•
Installation options					
Pipe installation (up to 15 kW motor power)	•	•	•	•	•
Support-bracket mounting	•	•	•	•	•

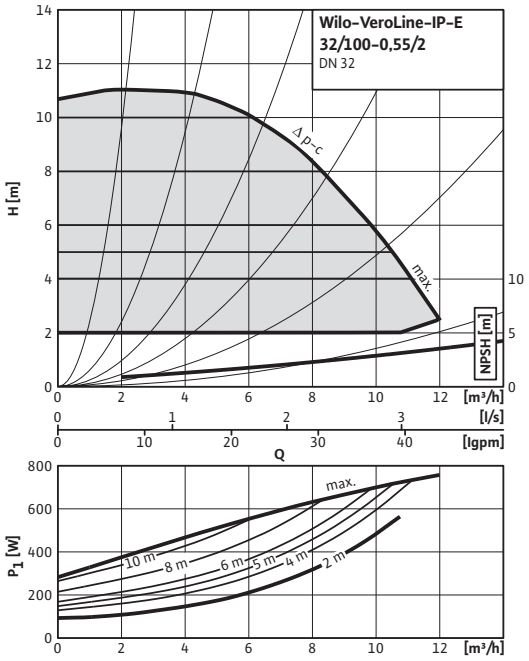
• = available, – = not available

Information on interference emission and resistance for IL-E...BF and IL-E...BF R1:
The standard version satisfies the limit values for the first environment with restricted availability.
EMC radio interference suppression filter for line-side interference EN 61800-3 Class B-1 – obtainable as an accessory for switch cabinet installation

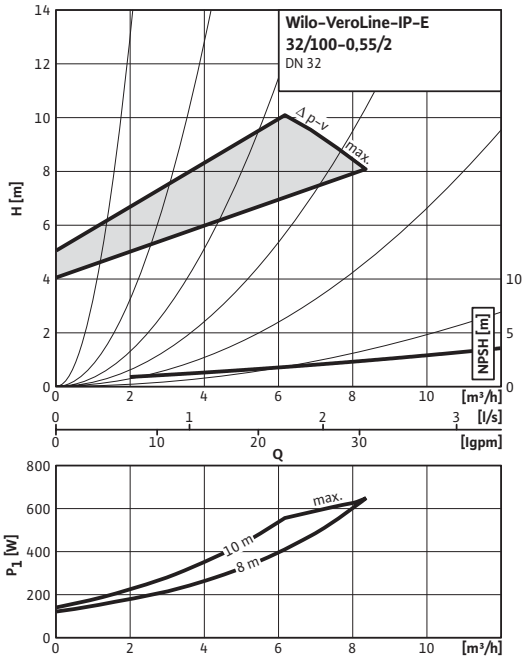
Pump curves Wilo-VeroLine-IP-E

Wilo-VeroLine-IP-E 32 / 100-0.55 / 2

Δp-c (constant)

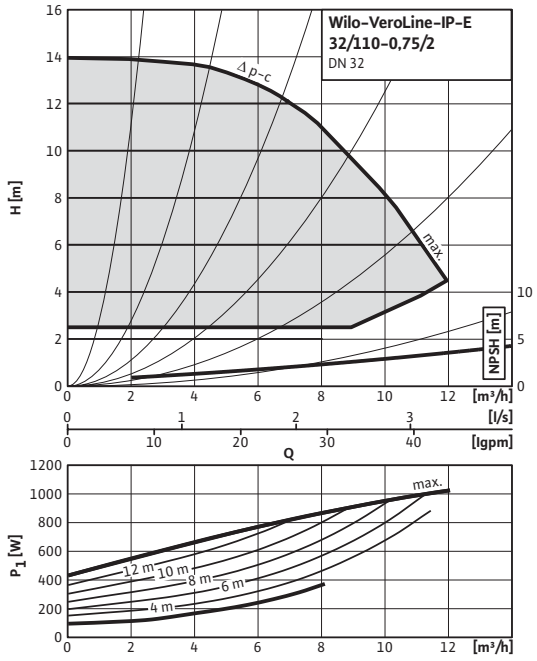


Δp-v (variable)

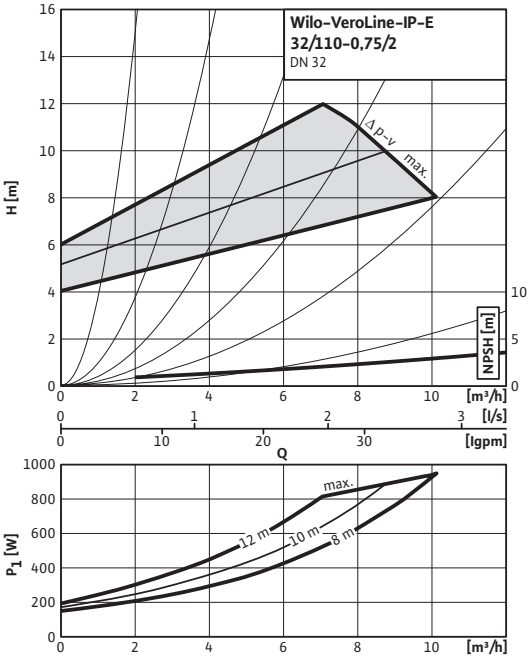


Wilo-VeroLine-IP-E 32 / 110-0.75 / 2

Δp-c (constant)



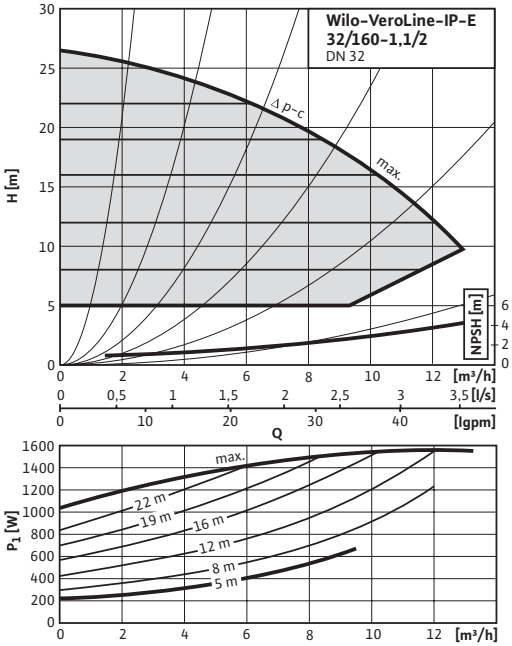
Δp-v (variable)



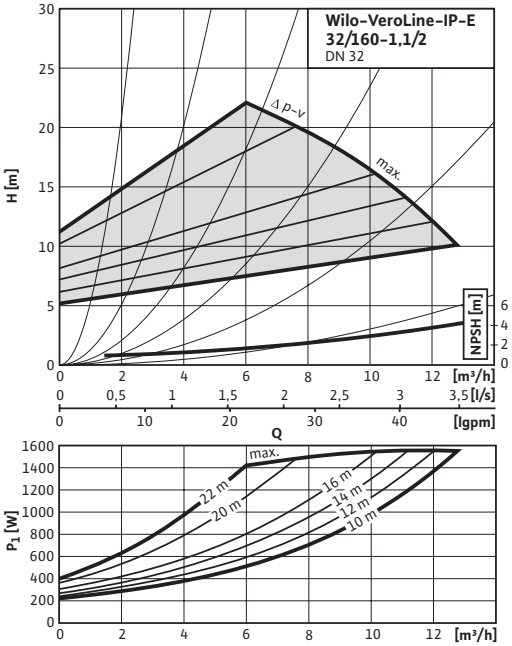
Pump curves Wilo-VeroLine-IP-E

Wilo-VeroLine-IP-E 32 / 160-1.1 / 2

Δp-c (constant)

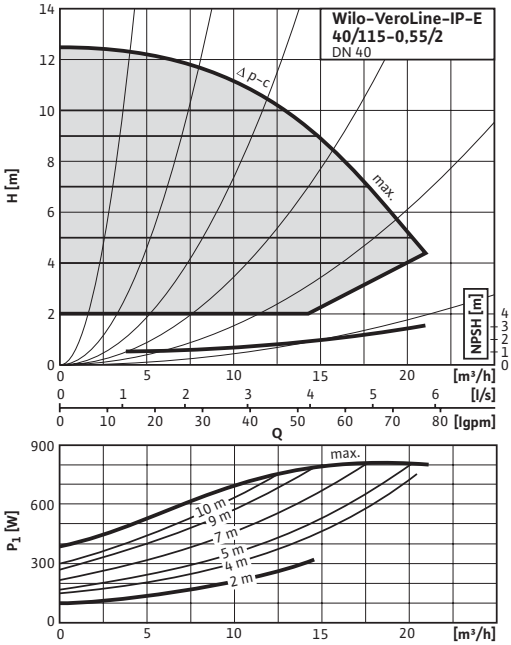


Δp-v (variable)

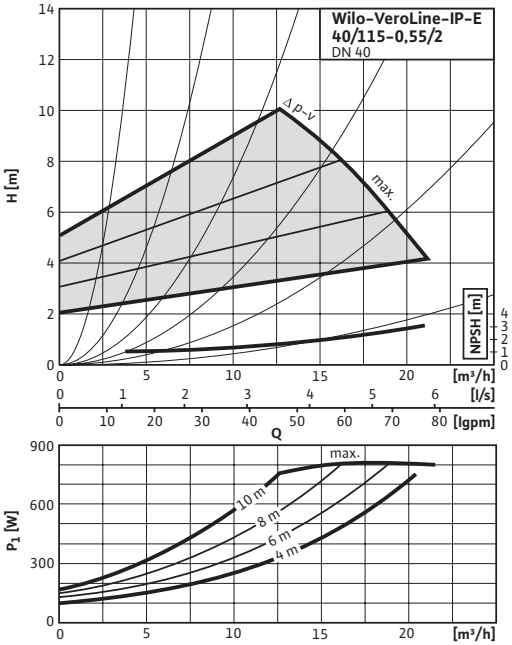


Wilo-VeroLine-IP-E 40 / 115-0.55 / 2

Δp-c (constant)



Δp-v (variable)



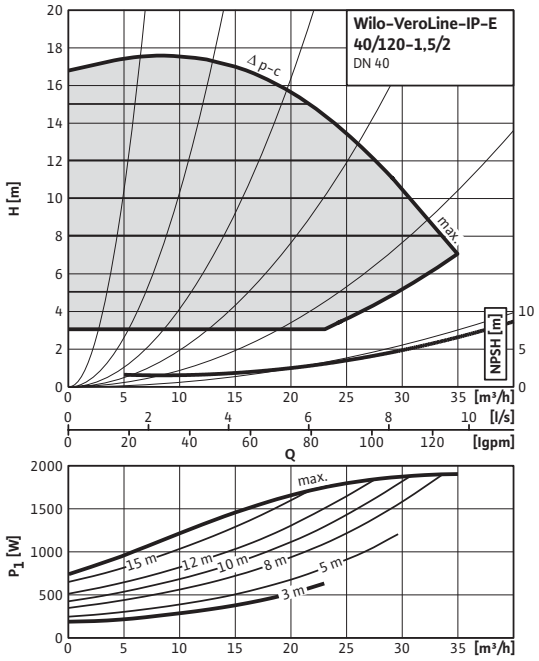
Energy-saving pumps

Single-head pumps (Heating, Air-conditioning, Cooling and Industry)

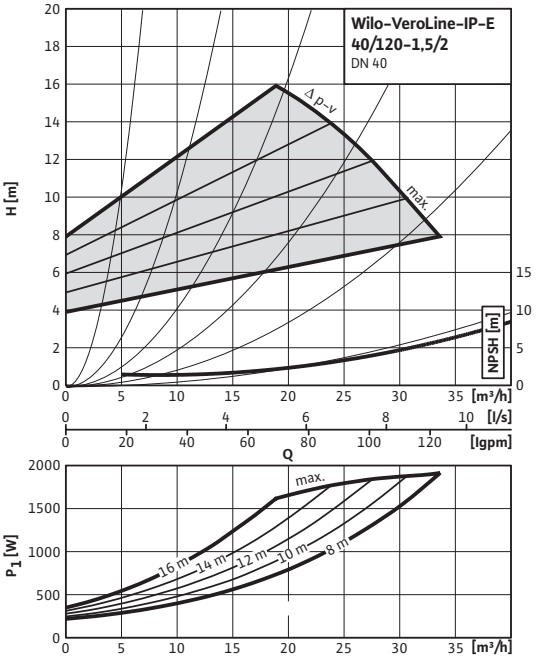
Pump curves Wilo-VeroLine-IP-E

Wilo-VeroLine-IP-E 40 / 120-1.5 / 2

Δp-c (constant)

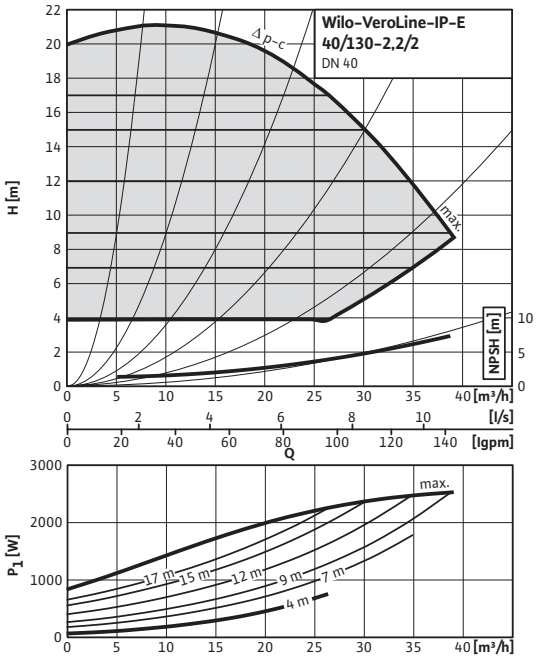


Δp-v (variable)

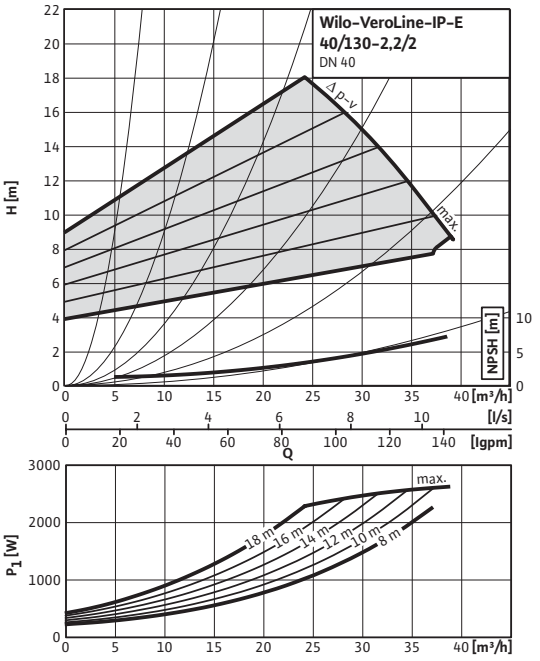


Wilo-VeroLine-IP-E 40 / 130-2.2 / 2

Δp-c (constant)



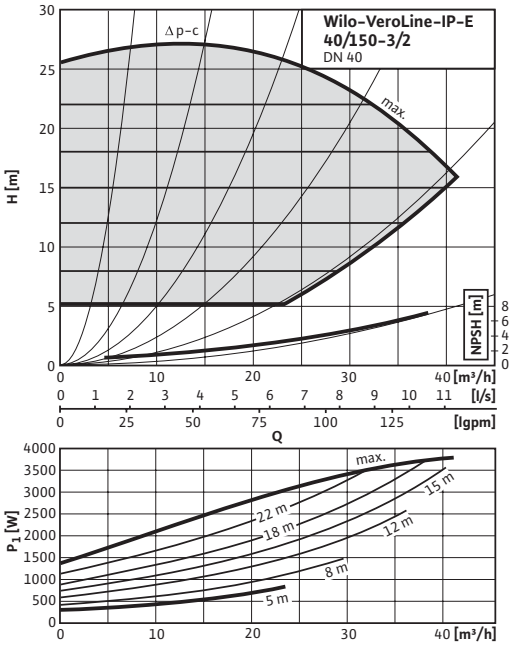
Δp-v (variable)



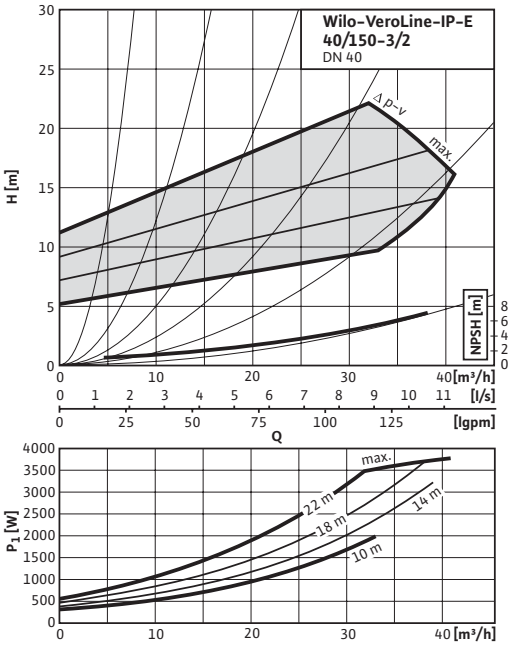
Pump curves Wilo-VeroLine-IP-E

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

Δp-c (constant)

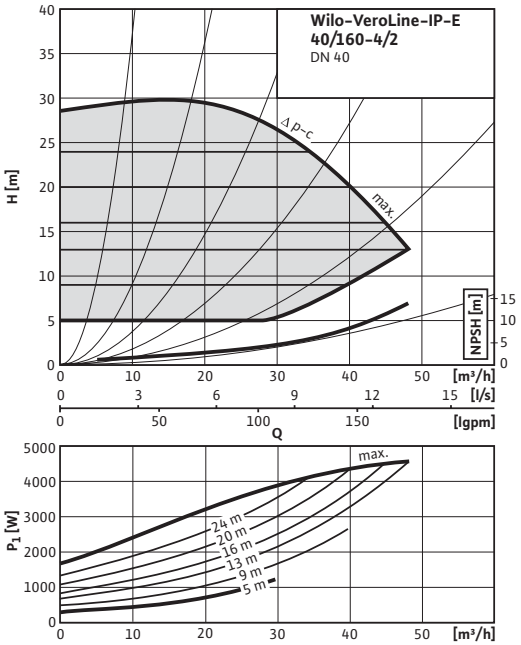


Δp-v (variable)

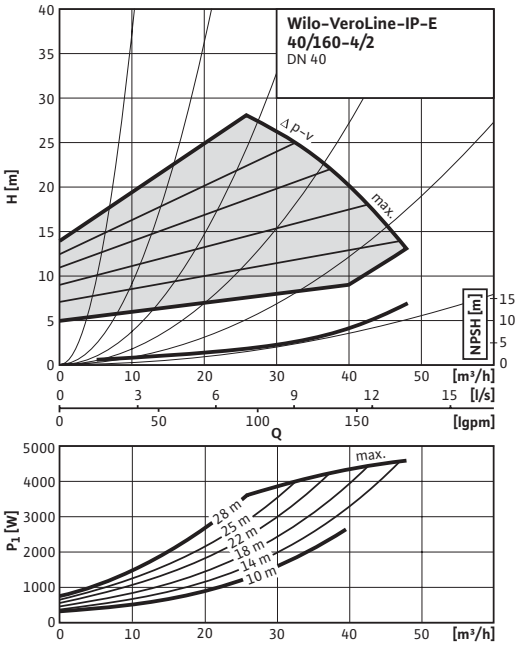


Wilo-VeroLine-IP-E 40 / 160-4 / 2

Δp-c (constant)



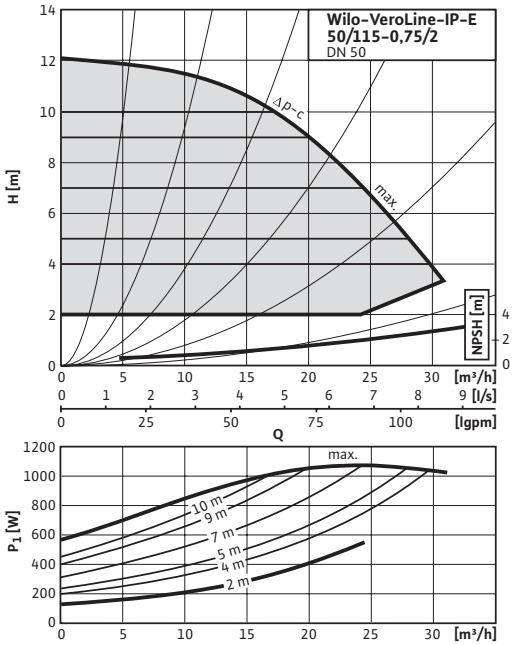
Δp-v (variable)



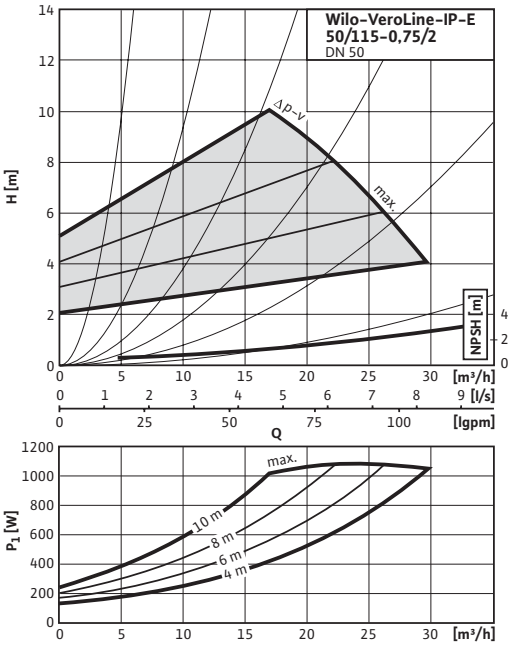
Pump curves Wilo-VeroLine-IP-E

Wilo-VeroLine-IP-E 50 / 115-0.75 / 2

Δp-c (constant)

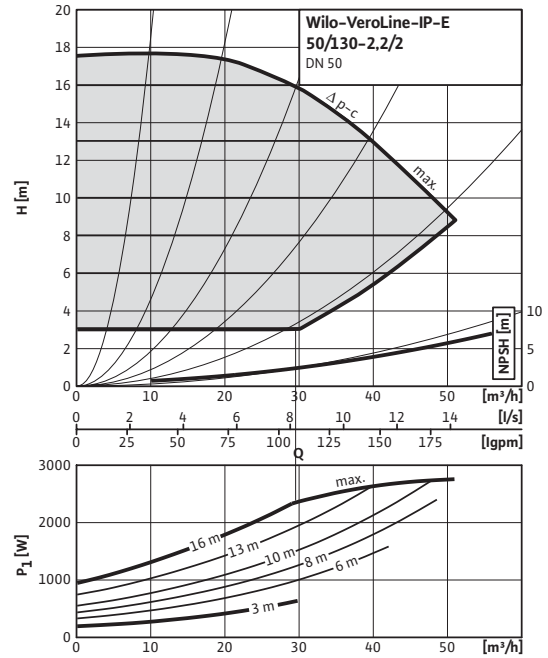


Δp-v (variable)

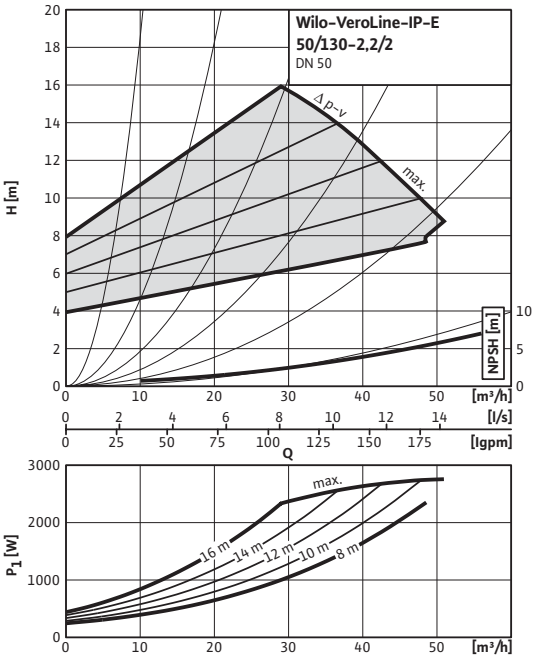


Wilo-VeroLine-IP-E 50 / 130-2.2 / 2

Δp-c (constant)



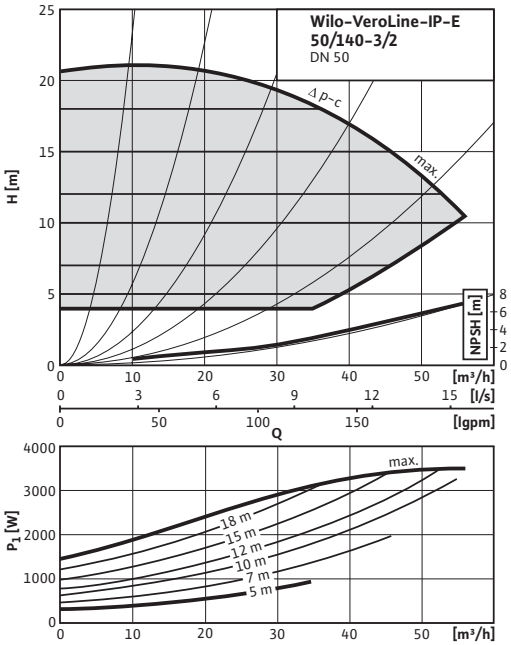
Δp-v (variable)



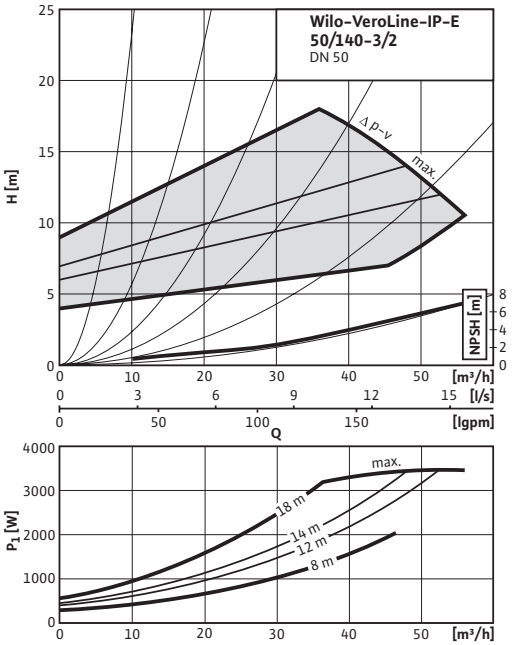
Pump curves Wilo-VeroLine-IP-E

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

Δp-c (constant)

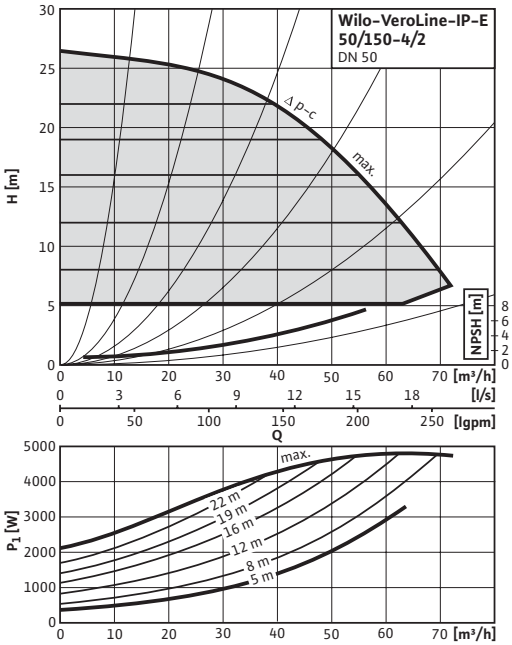


Δp-v (variable)

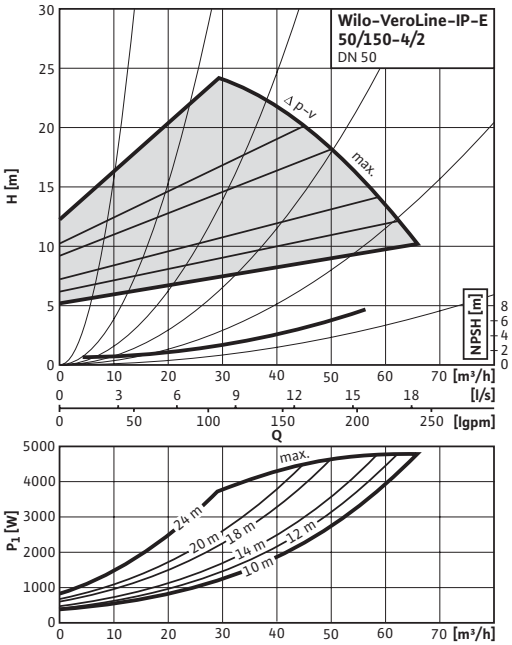


Wilo-VeroLine-IP-E 50 / 150-4 / 2

Δp-c (constant)



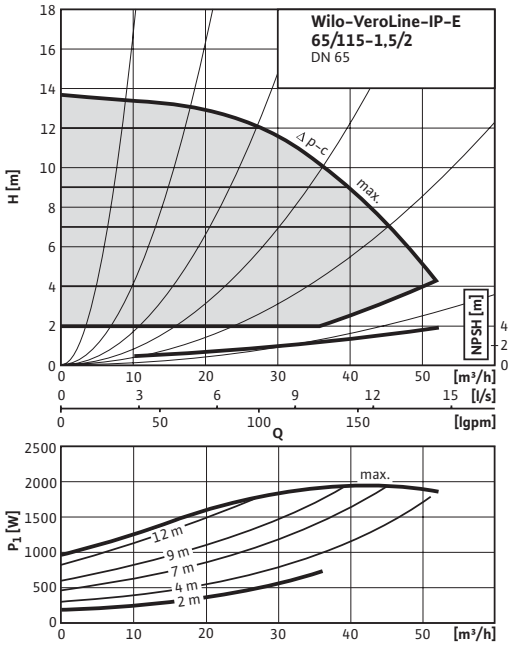
Δp-v (variable)



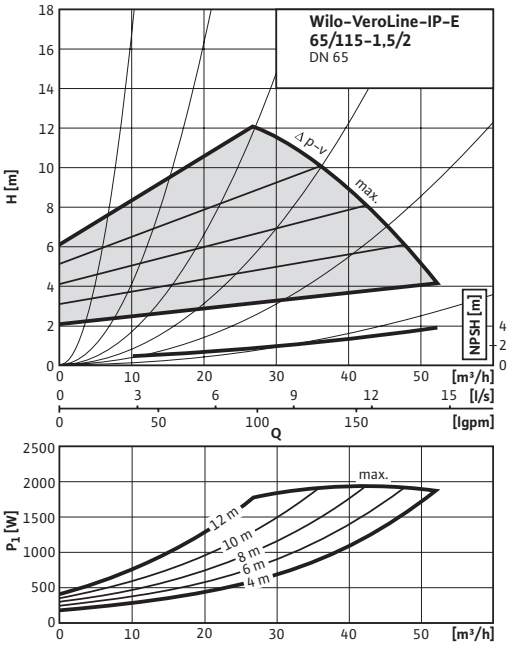
Pump curves Wilo-VeroLine-IP-E

Wilo-VeroLine-IP-E 65 / 115-1.5 / 2

Δp-c (constant)

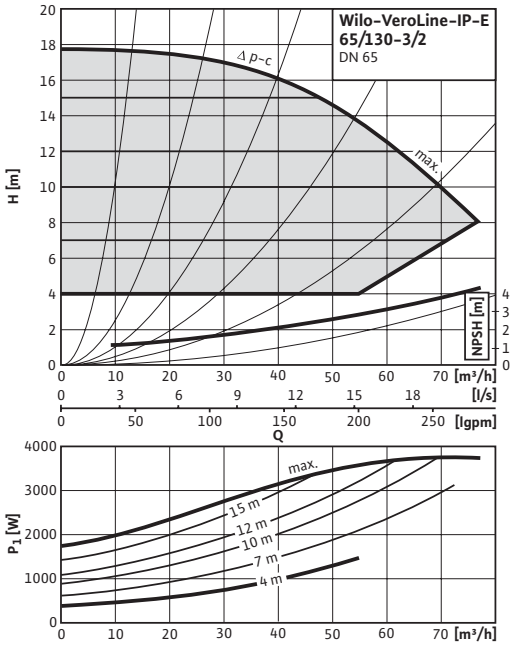


Δp-v (variable)

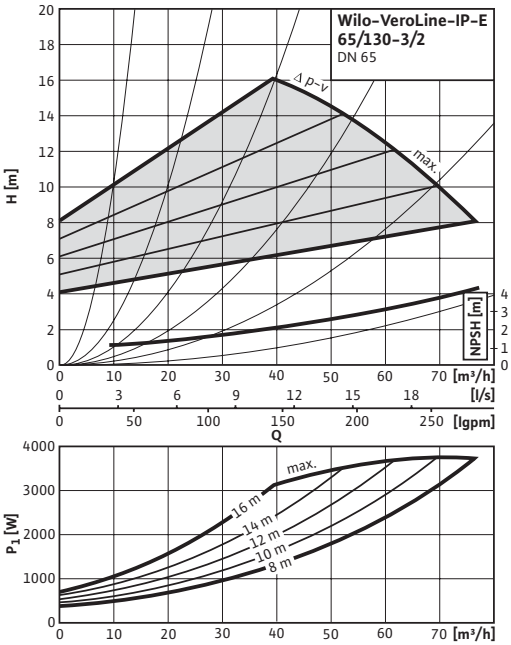


Wilo-VeroLine-IP-E 65 / 130-3 / 2

Δp-c (constant)



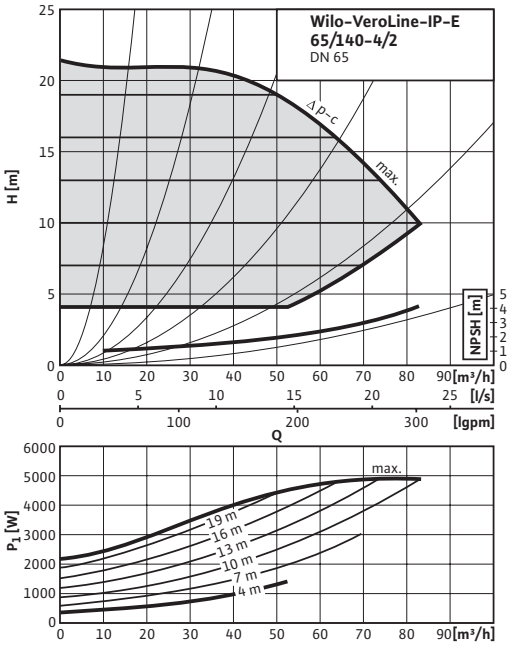
Δp-v (variable)



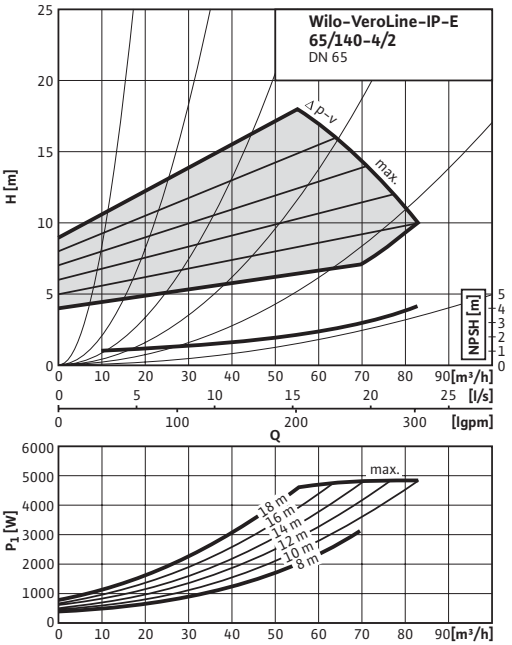
Pump curves Wilo-VeroLine-IP-E

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

Δp-c (constant)

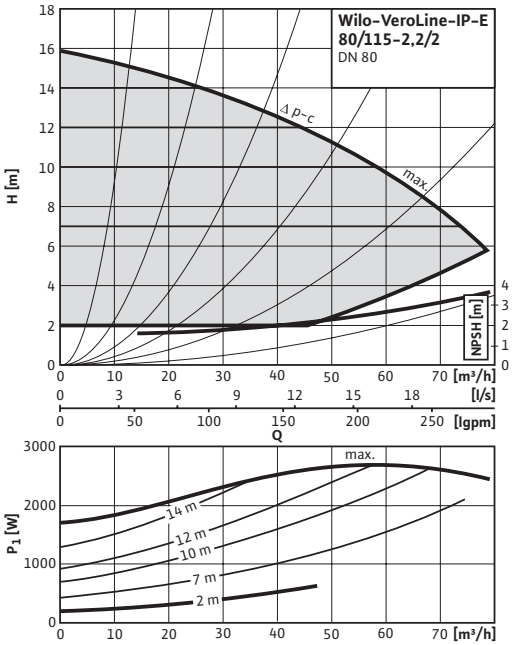


Δp-v (variable)

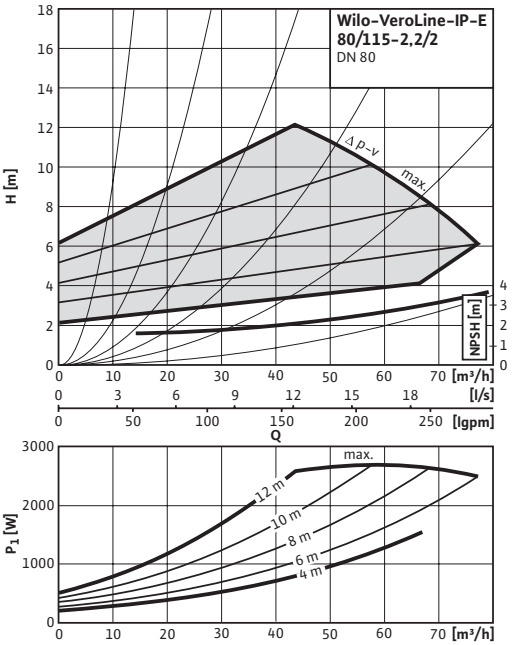


Wilo-VeroLine-IP-E 80 / 115-2.2 / 2

Δp-c (constant)



Δp-v (variable)



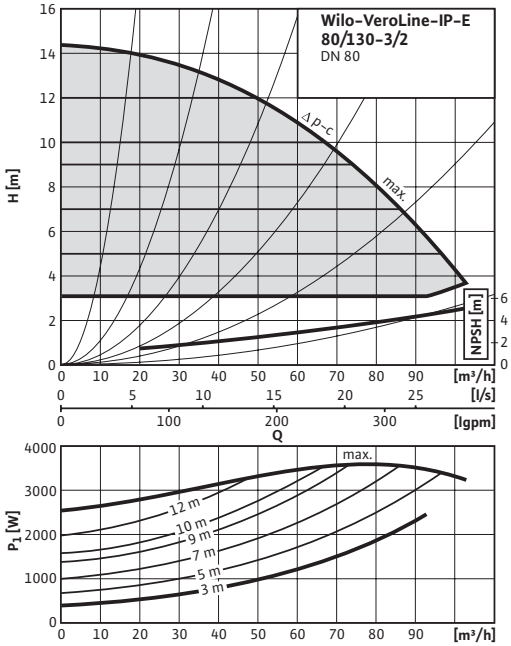
Energy-saving pumps

Single-head pumps (Heating, Air-conditioning, Cooling and Industry)

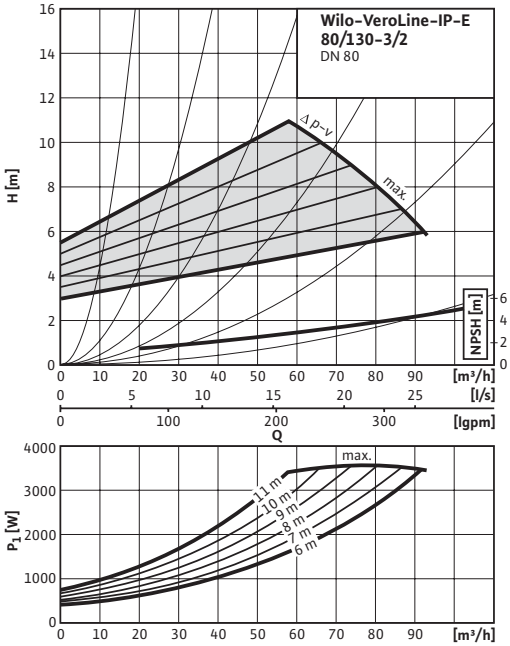
Pump curves Wilo-VeroLine-IP-E

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

Δp-c (constant)

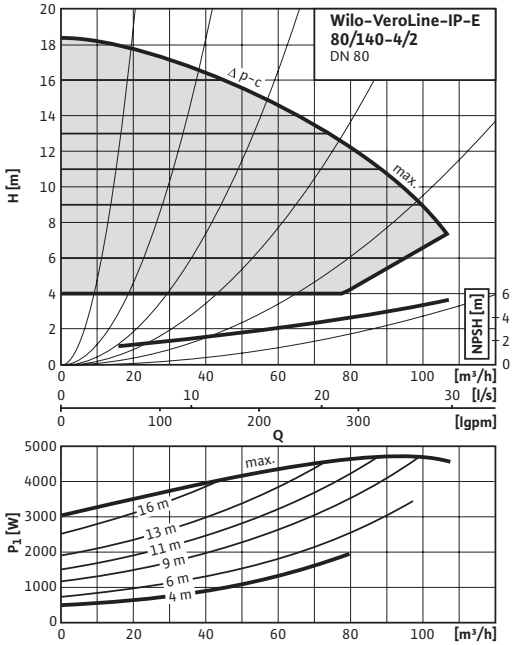


Δp-v (variable)

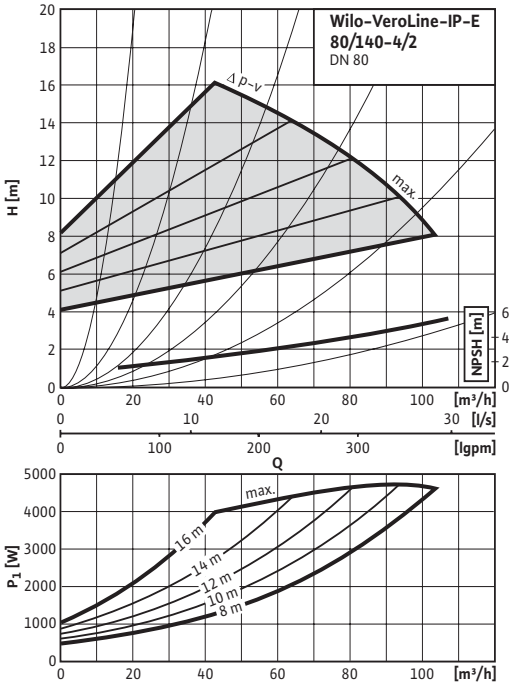


Wilo-VeroLine-IP-E 80 / 140-4 / 2

Δp-c (constant)

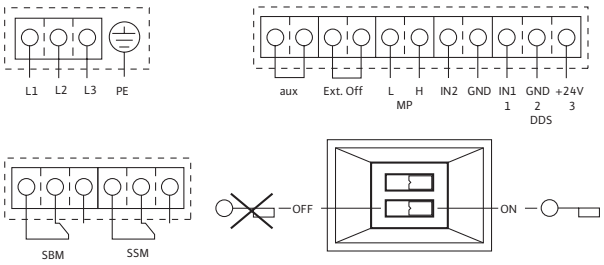


Δp-v (variable)



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

Terminal diagram



Maximum loading of contacts for collective run and fault signal:
min. 12 V DC / 10 mA, max. 250 V AC / 1 A.

L1, L2, L3, PE:	Mains connection 3~400 V / 50 Hz
SSM:	Potential-free collective fault signal (changeover contact in accordance with VDI 3814)
SBM:	Potential-free collective run signal (changeover contact in accordance with VDI 3814)
Off	Control input "Overriding OFF" (24 V)
MP	Interface for the connection of a slave pump for fully-integrated twin-head pump management
3	+24 V (output)
2	Earth (⊥)
1	0 – 10 V (input) corresponds to 40 % – 100 % of the rated motor speed
aux	without function

Switchover key activated / deactivated.
Option: IF-Modul (PLR / LON)

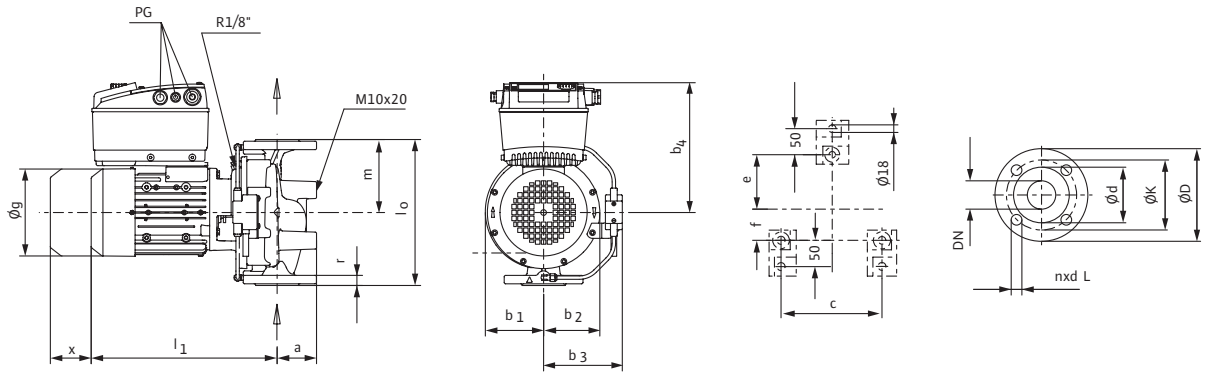
Motor data

Wilo-VeroLine-IP-E ...	Nominal power	Rotational speed	Power consumption	Nominal current (approximately)
	P_2	n	P_1	I_N 3~400 V
	[kW]	[rpm]	[W]	[A]
32/100-0.55/2	0.55	1100 – 2900	840	1.8
32/110-0.75/2	0.75	1100 – 2900	1120	2.9
32/160-1.1/2	1.10	1100 – 2900	1340	3.6
40/115-0.55/2	0.55	1100 – 2900	810	1.8
40/120-1.5/2	1.50	1100 – 2900	1910	4.8
40/130-2.2/2	2.20	1100 – 2900	2620	6.8
40/150-3/2	3.00	1100 – 2900	3570	7.5
40/160-4/2	4.00	1100 – 2900	4710	9.6
50/115-0.75/2	0.75	1100 – 2900	1120	2.9
50/130-2.2/2	2.20	1100 – 2900	2620	6.8
50/140-3/2	3.00	1100 – 2900	3530	7.8
50/150-4/2	4.00	1100 – 2900	4880	10.1
65/115-1.5/2	1.50	1100 – 2900	1910	4.8
65/130-3/2	3.00	1100 – 2900	3670	7.9
65/140-4/2	4.00	1100 – 2900	4950	10.1
80/115-2.2/2	2.20	1100 – 2900	2620	6.8
80/130-3/2	3.00	1100 – 2900	3510	7.7
80/140-4/2	4.00	1100 – 2900	4930	10.2

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

Dimensions, weight Wilo-VeroLine-IP-E

Dimension drawing



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

Dimensions, Weights

Wilo-VeroLine-IP-E ...	Nominal flange diameter	Dimensions												Cable screwed connection	Weight approxi-mately
	DN	l_0	a	b_1	b_2	b_3	b_4	c	e	f	Ø g	l_1	x	–	m
	–	[mm]												[PG]	[kg]
32/100-0.55/2	32	260	70	101	106	135	221	90	40	50	145	308	150	2xM12 1xM16 1xM20 1xM25	24
32/110-0.75/2	32	260	70	101	106	142	228	90	40	50	163	331	150		25
32/160-1.1/2	32	260	70	101	106	142	237	90	40	50	163	348	150		36
40/115-0.55/2	40	250	75	80	90	114	228	90	40	50	145	310	150		21
40/120-1.5/2	40	320	75	113	121	148	245	90	40	50	180	357	150		33
40/130-2.2/2	40	320	75	113	121	142	247	90	40	50	203	356	150		35
40/150-3/2	40	320	75	113	121	142	267	90	40	50	203	390	150		39
40/160-4/2	40	320	75	113	121	142	279	90	40	50	227	390	150		45
50/115-0.75/2	50	280	83	91	101	126	237	90	40	50	163	353	150		26
50/130-2.2/2	50	340	86	116	131	143	247	104	40	50	203	360	150		38
50/140-3/2	50	340	86	116	131	143	267	104	40	50	203	425	150		42
50/150-4/2	50	340	86	116	131	143	279	104	40	50	227	425	150		42
65/115-1.5/2	65	340	93	100	118	137	255	104	40	50	180	389	150		35
65/130-3/2	65	340	93	119	138	163	267	135	40	55	203	409	150		44
65/140-4/2	65	340	93	119	138	163	279	135	40	55	227	409	150		50
80/115-2.2/2	80	360	100	110	135	137	255	135	40	55	203	391	150		43
80/130-3/2	80	360	105	125	153	143	267	135	40	55	203	425	150		54
80/140-4/2	80	360	105	125	153	143	279	135	40	55	227	425	150		54

Dimensions, weight Wilo-VeroLine-IP-E

Flange dimensions

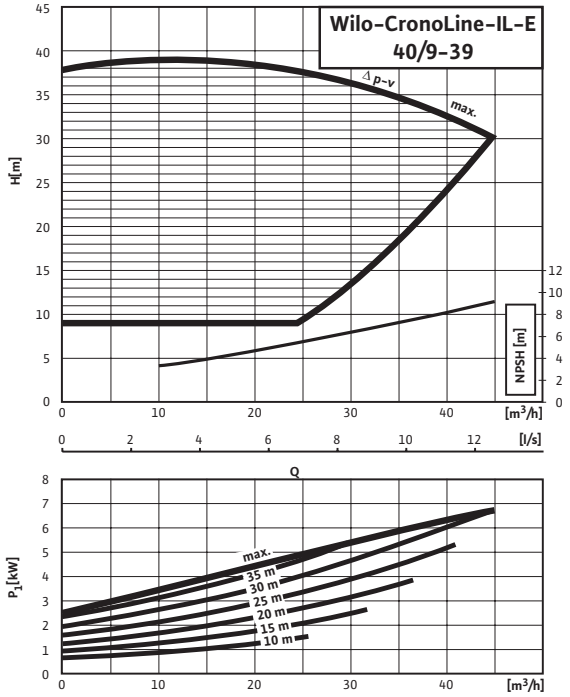
Wilo-VeroLine-IP-E ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[St. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19

Flange dimensions pump – bored in accordance with EN 1092-2 PN 16, n = number of drill holes

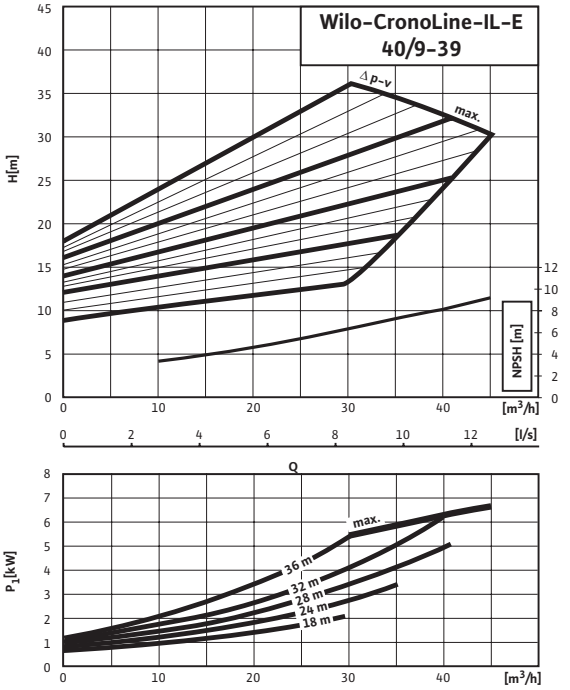
Pump curves Wilo-CronoLine-IL-E

Wilo-CronoLine-IL-E 40 / 9-39

Δp-c (constant)

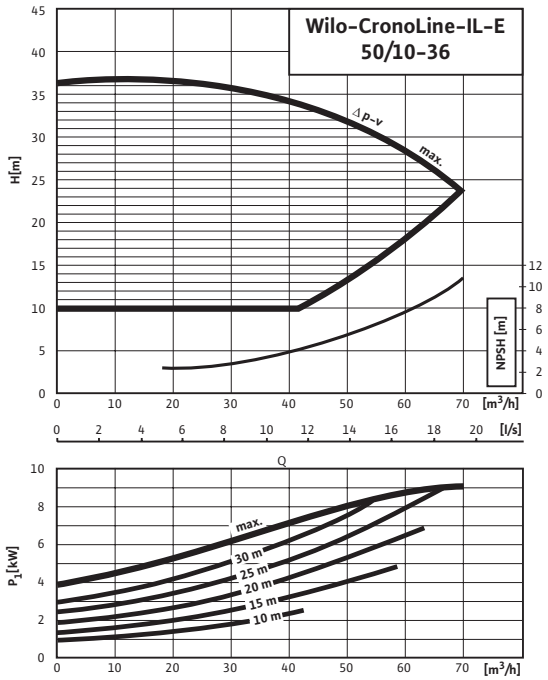


Δp-v (variable)

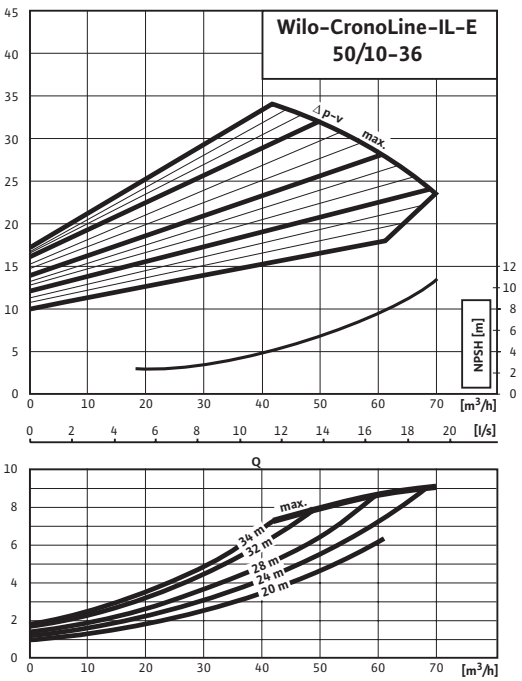


Wilo-CronoLine-IL-E 50 / 10-36

Δp-c (constant)



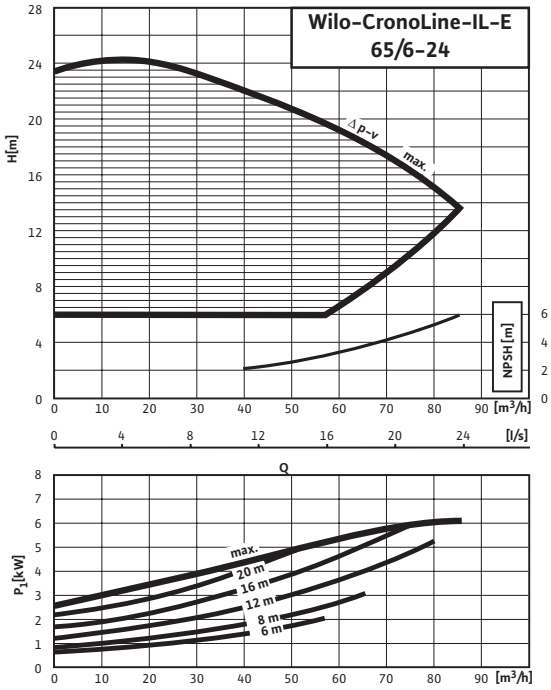
Δp-v (variable)



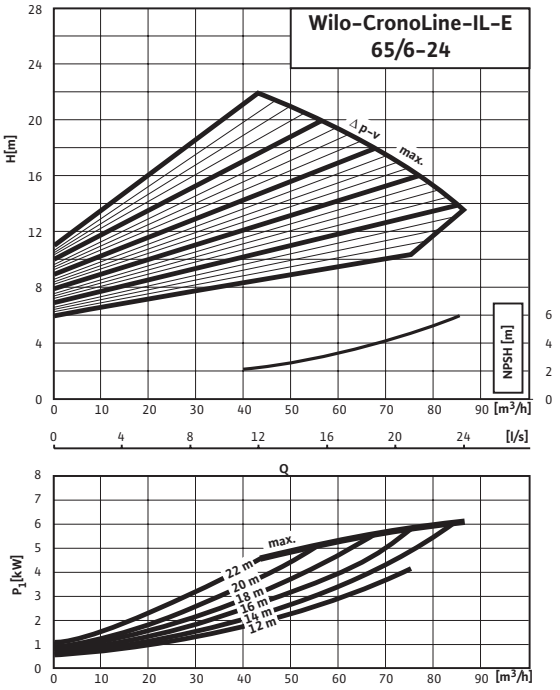
Pump curves Wilo-CronoLine-IL-E

Wilo-CronoLine-IL-E 65 / 6-24

Δp-c (constant)

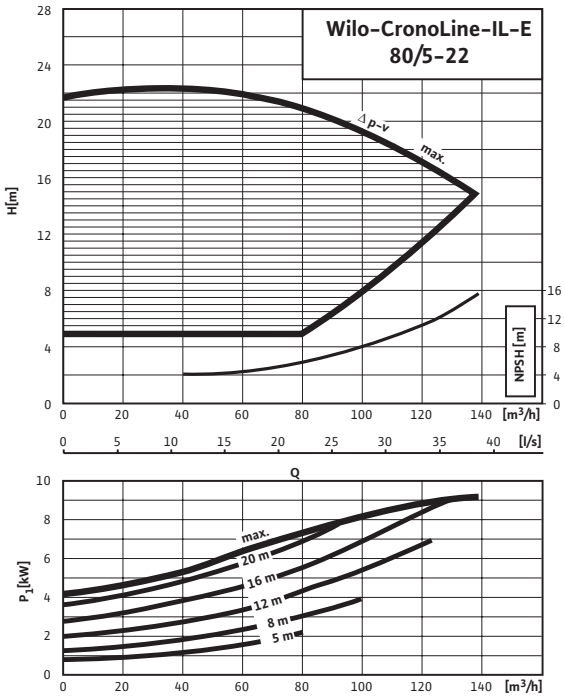


Δp-v (variable)

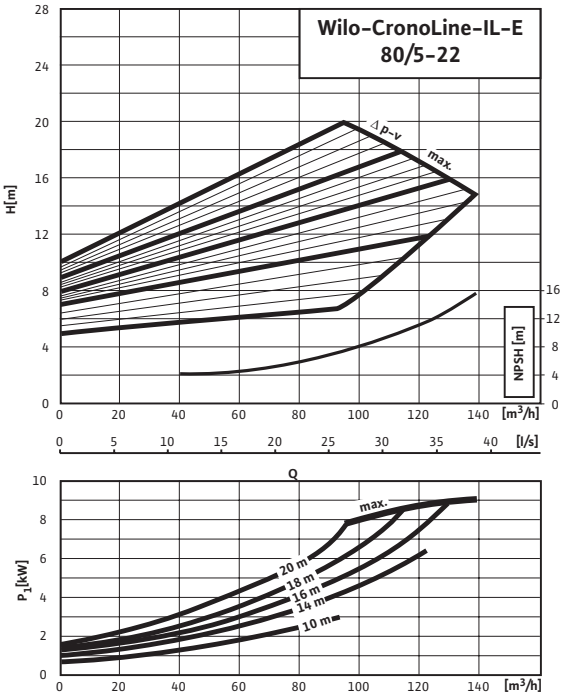


Wilo-CronoLine-IL-E 80 / 5-22

Δp-c (constant)

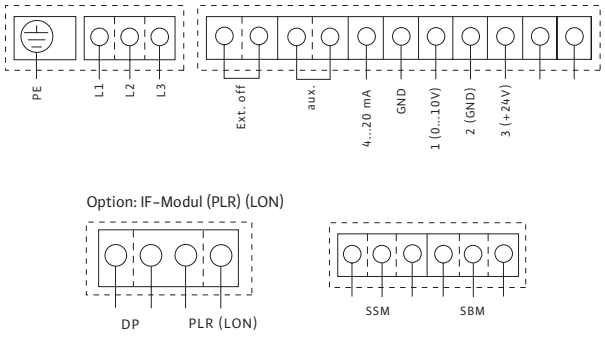


Δp-v (variable)



Terminal Diagrams, Motor Data Wilo-CronoLine-IL-E

Terminal diagram



Switch rating of the interference contacts for the collective Run and Fault signals: Minimum 12 V DC / 10 mA, max. 250 V AC / 1 A.

L1, L2, L3, PE:	Mains connection 3~400 V / 50 Hz; 3~380 V / 60 Hz
SSM:	Potential-free collective fault signal (changeover contact in accordance with VDI 3814, Function cf. Wilo-TOP-Control)
SBM:	Potential-free collective run signal (changeover contact in accordance with VDI 3814, Function cf. Wilo-TOP-Control)
3	+24 V (Output) for ext. consumer / sensor
2	Earth (⊥)
1	0 – 10 V (Input) Differential pressure sensor or external control parameter
4...20 mA:	not assigned
External off:	Control input "Overriding OFF" (24 V) for external potential-free contact (NC contact)
DP	Twin-head pump management (2 Pumps)
PLR	Serial digital building automation interface
LON	Serial digital GA interface (LONWORKS)

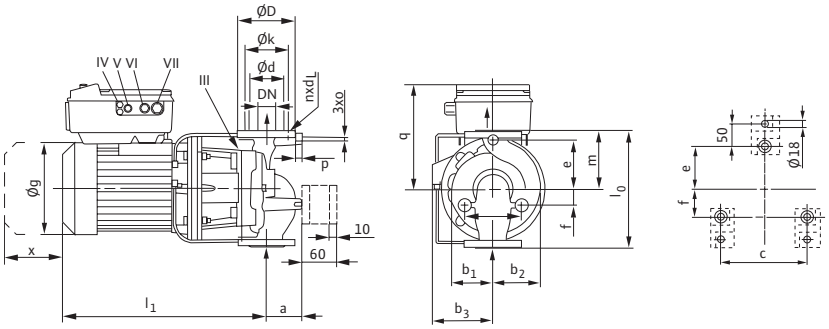
Motor data

Wilo-CronoLine-IL-E ...	Nominal power	Rotational speed	Power consumption	Current
	P_2	n	P_1	I_{max}
	[kW]	[rpm]	[kW]	[A]
40/9-39	5.5	1100-2900	7.2	11.5
50/10-36	7.5	1100-2900	9.3	14.5
65/6-24	5.5	1100-2900	7.2	11.5
80/5-22	7.5	1100-2900	9.3	14.5

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

Dimensions, Weights Wilo-CronoLine-IL-E

Dimension drawing



Dimensions, Weights

Wilo-CronoLine-IL-E ...	Nominal diameter	Dimensions															Weight approximately
	DN	l_0	a	b_1	b_2	b_3	c	e	f	Ø g	l_1	m	o	p	q	x	–
	–	[mm]															[kg]
40/9-39	40	340	82	113	129	180	130	149	58	266	583	170	M10	20	303	95	89
50/10-36	50	340	103	120	138	180	164	143	48	266	590	170	M10	20	303	100	101
65/6-24	65	430	110	126	146	180	180	195	60	266	596	215	M12	20	303	120	97
80/5-22	80	400	105	123	151	180	180	173	57	266	610	200	M12	20	303	120	106

Flange dimensions

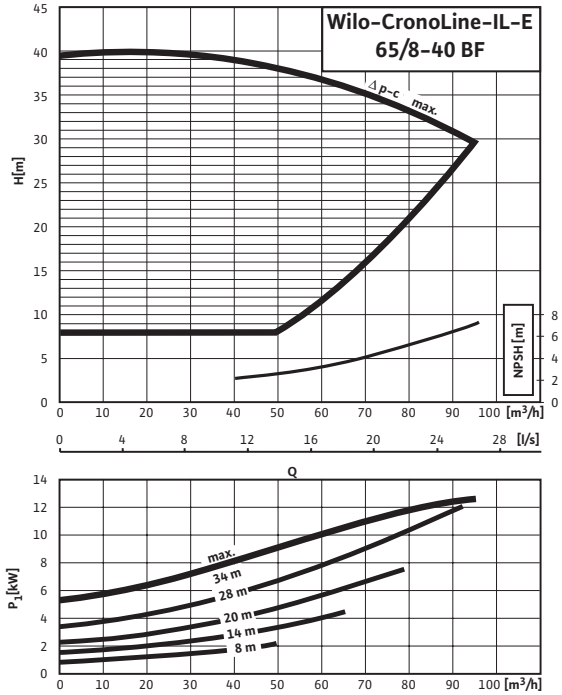
Wilo-CronoLine-IL-E ...	Nominal diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[St. x mm]
40/9-39	40	150	84	110	4 x 19
50/10-36	50	165	99	125	4 x 19
65/6-24	65	185	118	145	4 x 19
80/5-22	80	200	132	160	8 x 19

Flange dimensions pump – in accordance with EN 1092-2 PN 16, n = number of drill holes

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

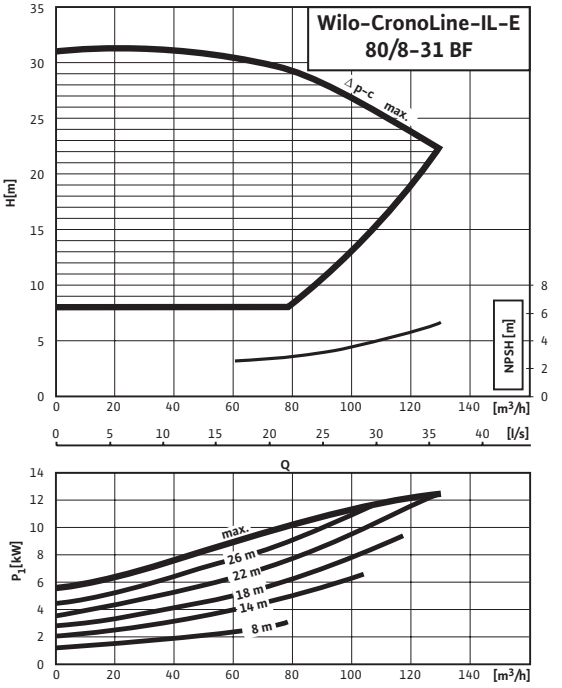
Wilo-IL-E 65 / 8-40 BF

Δp-c (constant)



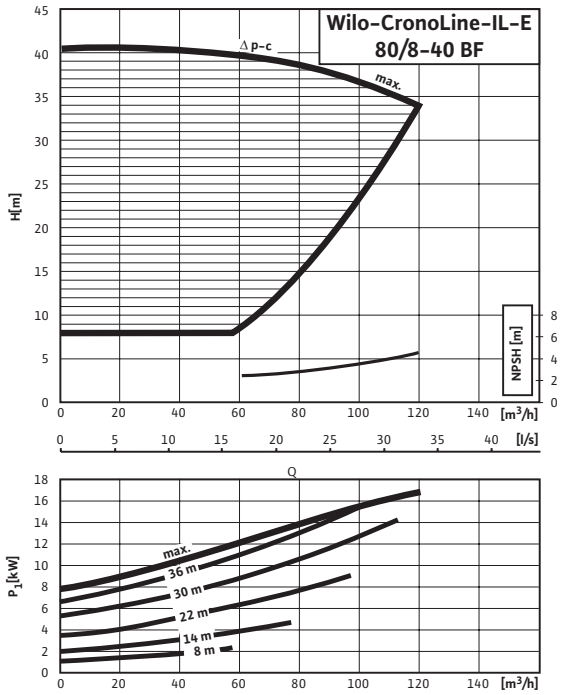
Wilo-IL-E 80 / 8-31 BF

Δp-c (constant)



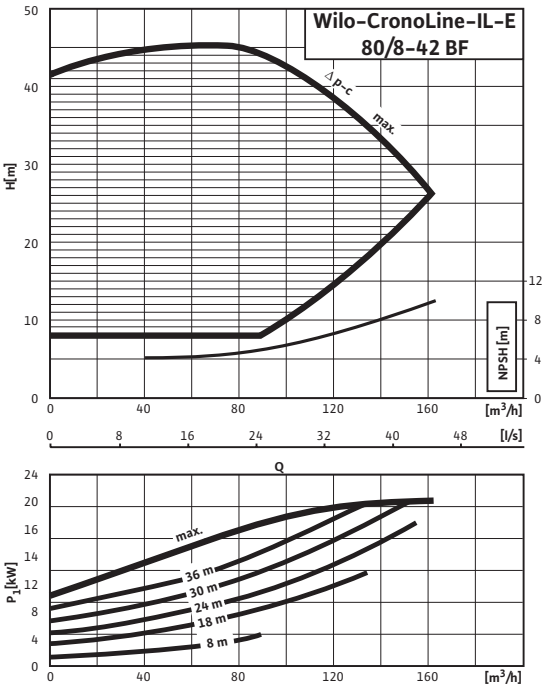
Wilo-IL-E 80 / 8-40 BF

Δp-c (constant)



Wilo-IL-E 80 / 8-42 BF

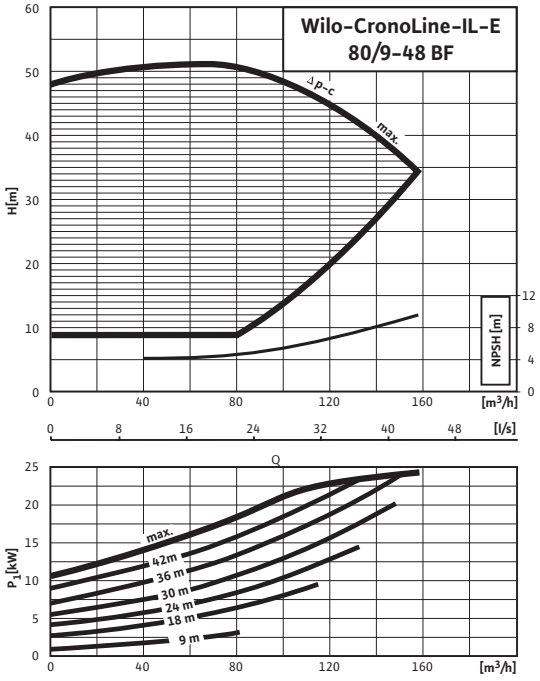
Δp-c (constant)



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

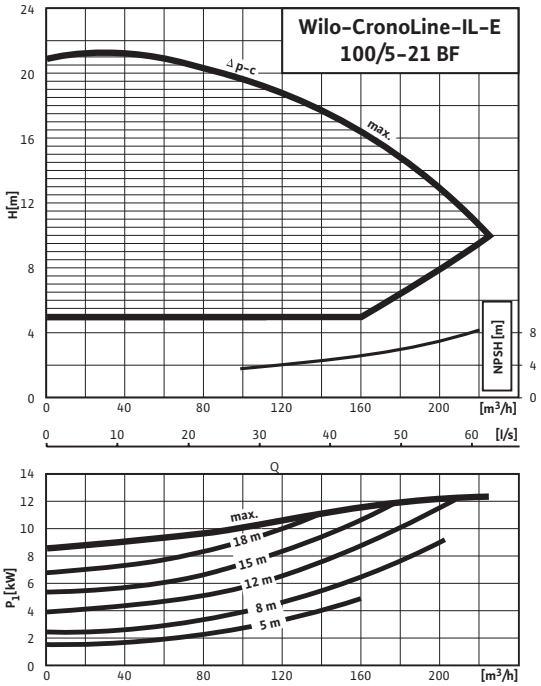
Wilo-IL-E 80 / 9-48 BF

Δp-c (constant)



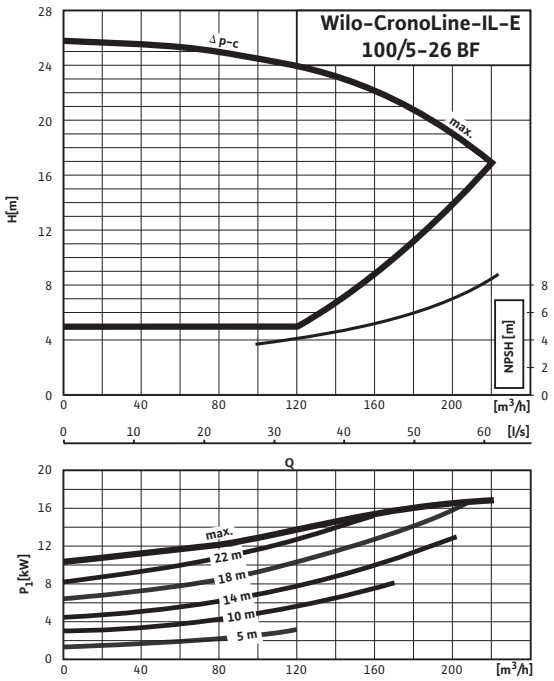
Wilo-IL-E 100 / 5-21 BF

Δp-c (constant)



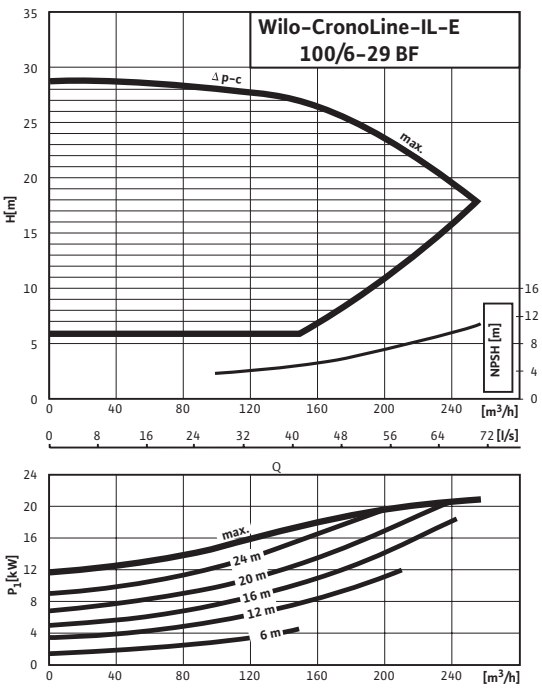
Wilo-IL-E 100 / 5-26 BF

Δp-c (constant)



Wilo-IL-E 100 / 6-29 BF

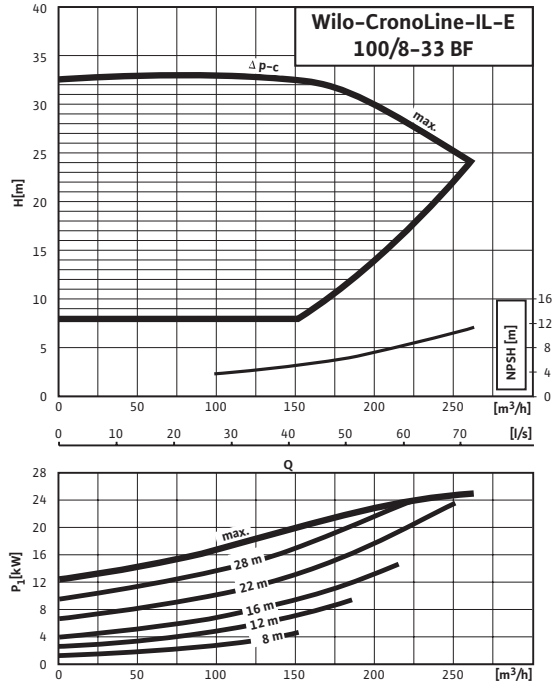
Δp-c (constant)



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

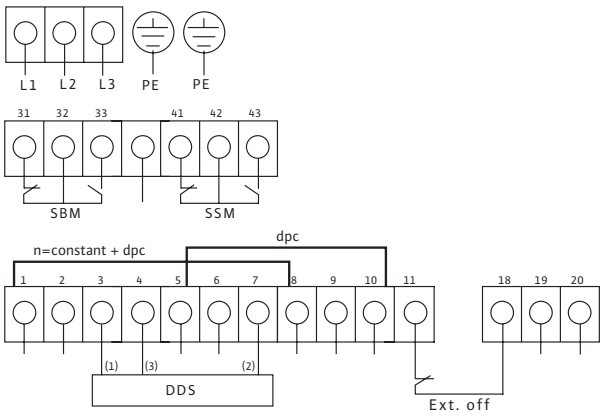
Wilo-IL-E 100 / 8-33 BF

Δp-c (constant)



Terminal Diagrams, Motor Data Wilo-CronoLine-IL-E... BF

Terminal diagram



Switch rating of the interference contacts for the collective Run and Fault signals: Minimum 12 V DC / 10 mA, max. 250 V AC / 1 A.

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

SSM: Potential-free collective fault signal (changeover contact in accordance with VDI 3814, Function cf. Wilo-TOP-Control)

SBM: Potential-free collective run signal (changeover contact in accordance with VDI 3814, Function cf. Wilo-TOP-Control)

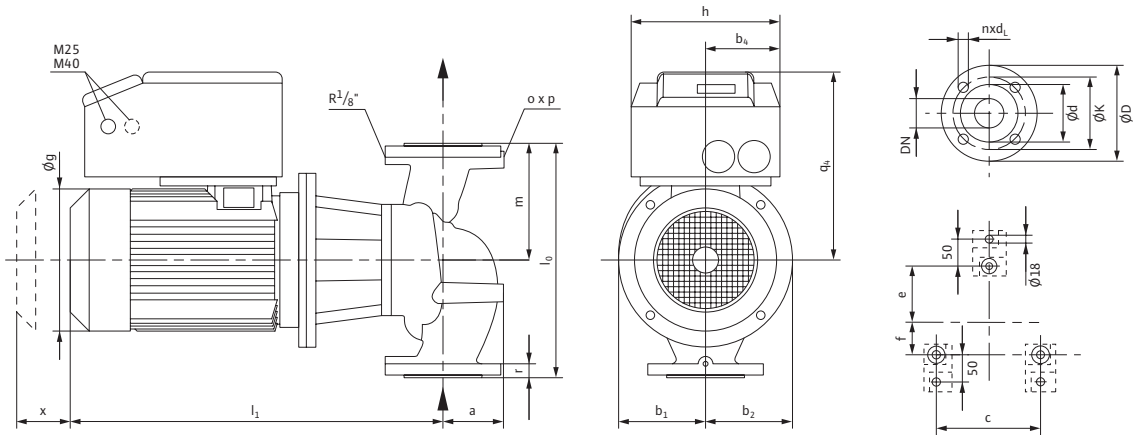
Motor data

Wilo-CronoLine-IL-E...BF	Nominal power	Rotational speed	Power consumption	Current
	P_2	n	P_1	I_{max}
	[kW]	[rpm]	[kW]	[A]
65/8-40	11.0	1180-2940	12.9	22.6
80/8-31	11.0	1180-2940	12.9	22.6
80/8-40	15.0	1180-2945	17.3	29.0
80/8-42	18.5	1180-2945	21.2	34.9
80/9-48	22.0	1180-2945	25.1	41.2
100/5-21	11.0	1180-2940	12.9	22.6
100/5-26	15.0	1180-2945	17.3	29.0
100/6-29	18.5	1180-2945	21.2	34.9
100/8-33	22.0	1180-2945	25.1	41.2

Three-phase motor (DM), 2-pole – 3~400 V, 50 Hz / 3~380 V, 60 Hz
Note motor type label data!

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

Dimension drawing



Dimensions, Weights

Wilo-CronoLine-IL-E...BF	Nominal diameter	Dimensions																	Weight approximately
	DN	l_0	a	b_1	b_2	b_4	c	e	f	h	Ø g	l_1	m	o	p	q_4	r	x	–
	–	[mm]																	[kg]
65/8-40	65	430	110	126	146	199	180	195	60	387	312	810	215	M12	20	394	24	120	158
80/8-31	80	440	120	136	162	199	180	173	72	387	312	807	200	M12	20	394	24	120	167
80/8-40	80	440	120	136	162	199	180	173	72	387	312	807	200	M12	20	394	24	120	184
80/8-42	80	500	145	157	182	214	220	208	62	417	312	884	230	M12	20	399	24	120	261
80/9-48	80	500	145	157	182	214	220	208	62	417	312	924	230	M12	20	399	24	120	292
100/5-21	100	500	120	159	197	199	200	226	60	387	312	842	250	M12	20	394	24	135	181
100/5-26	100	500	120	159	197	199	200	226	60	387	312	842	250	M12	20	394	24	135	218
100/6-29	100	500	120	159	197	214	200	226	60	417	312	842	250	M12	20	399	24	135	261
100/8-33	100	500	120	159	197	214	200	226	60	417	312	957	250	M12	20	399	24	135	292

Flange dimensions

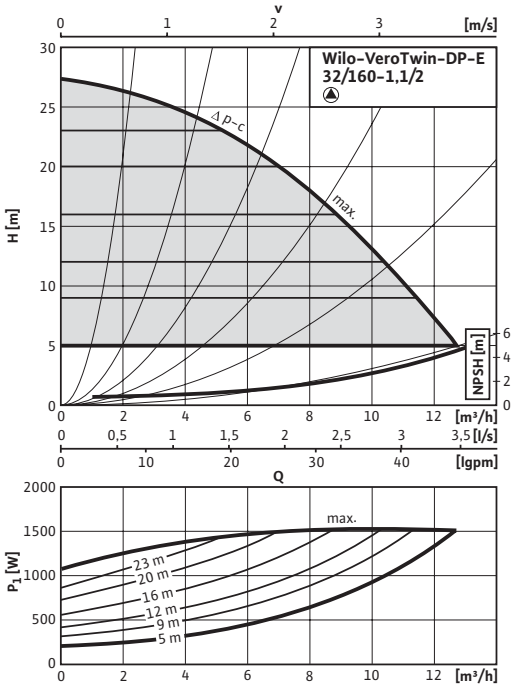
Wilo-CronoLine-IL-E...BF	Nominal diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[St. x mm]
65... BF	65	185	118	145	4 x 19
80... BF	80	200	132	160	8 x 19
100... BF	100	220	156	180	8 x 19

Flange dimensions pump – in accordance with EN 1092-2 PN 16, n = number of drill holes

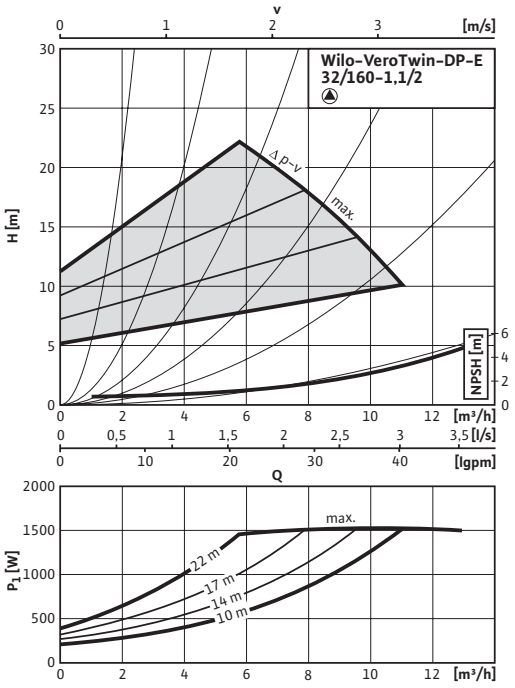
Wilo-VeroTwin-DP-E characteristic pump curves

Wilo-VeroTwin-DP-E 32/160-1.1/2

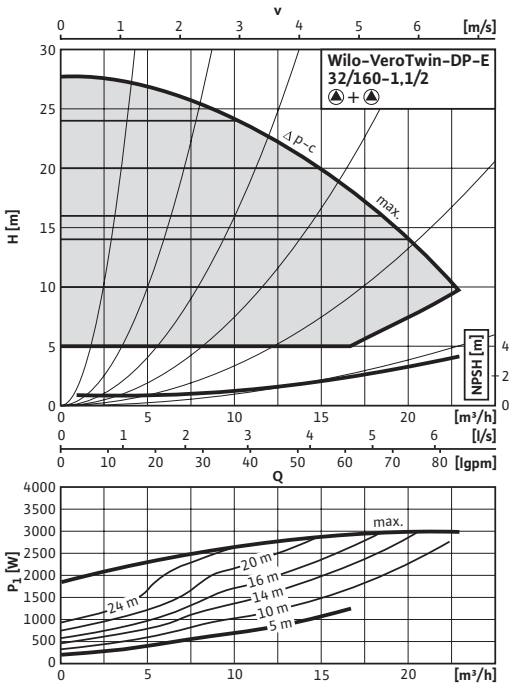
Δp-c (constant) individual operation



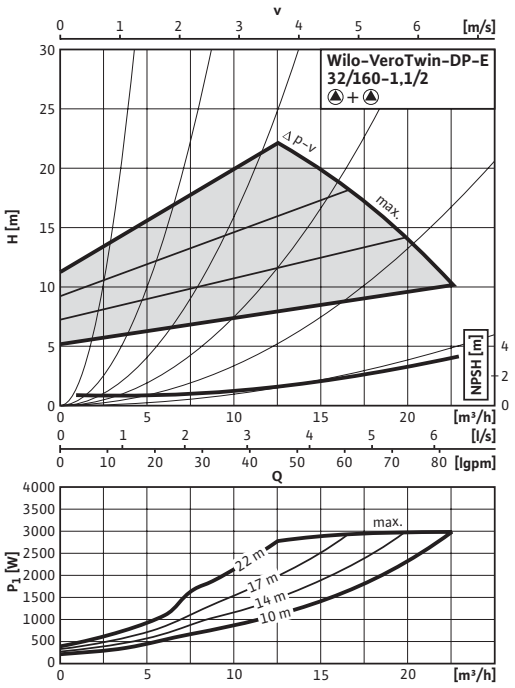
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



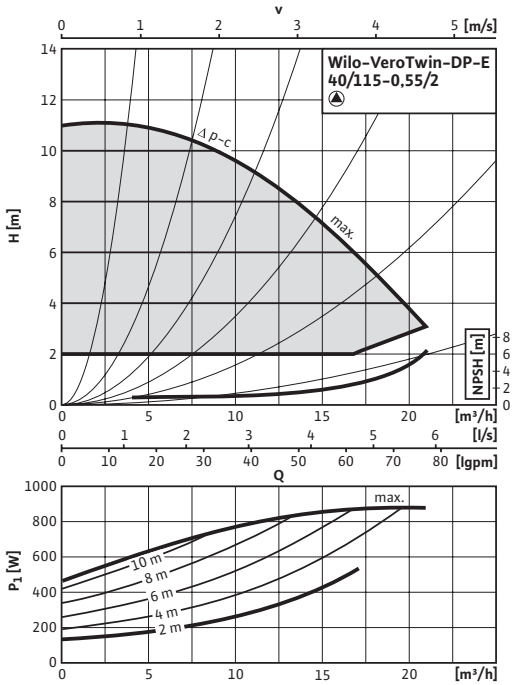
Δp-v (variable) parallel operation



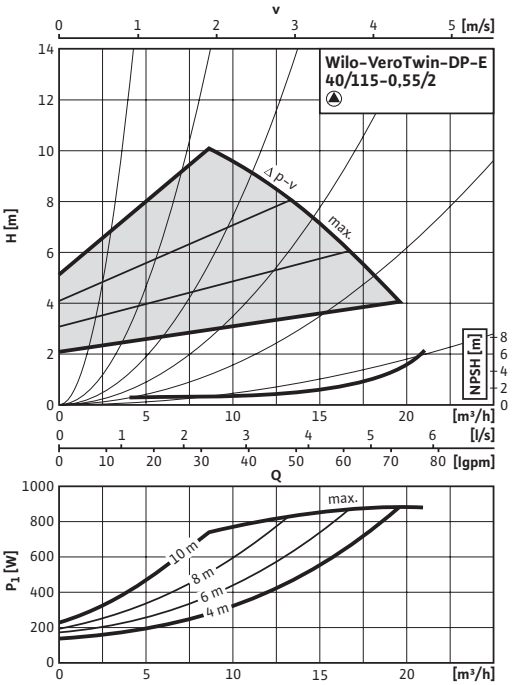
Wilo-VeroTwin-DP-E characteristic pump curves

Wilo-VeroTwin-DP-E 40 / 115-0.55 / 2

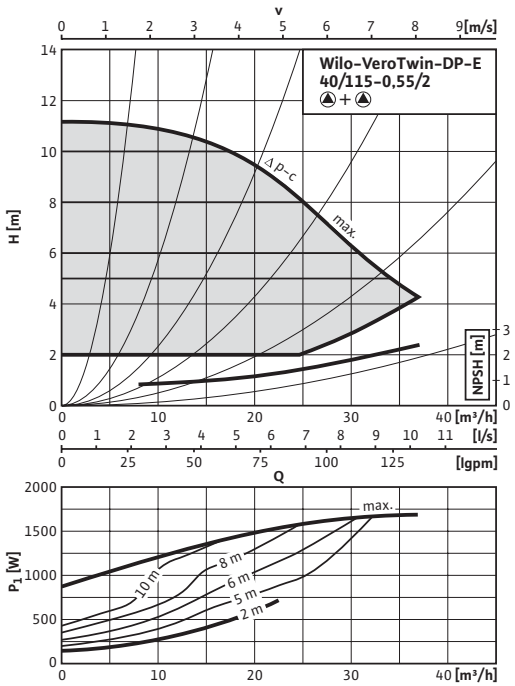
Δp-c (constant) individual operation



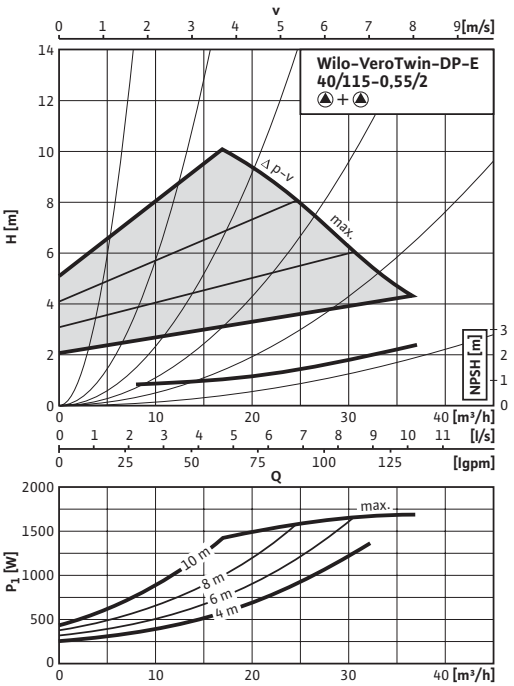
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



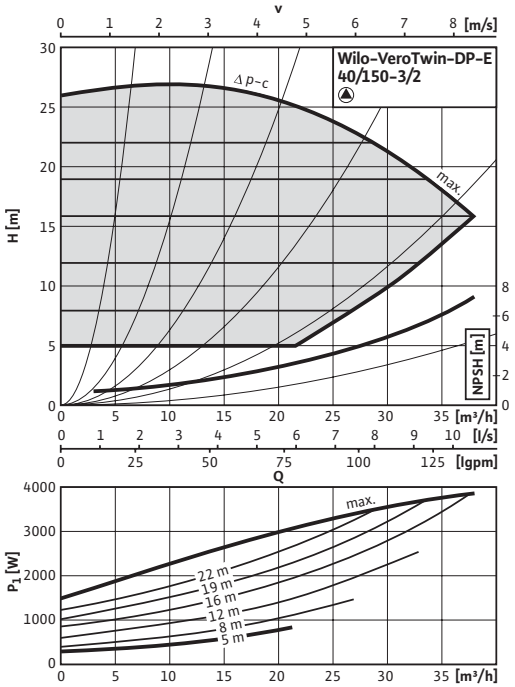
Δp-v (variable) parallel operation



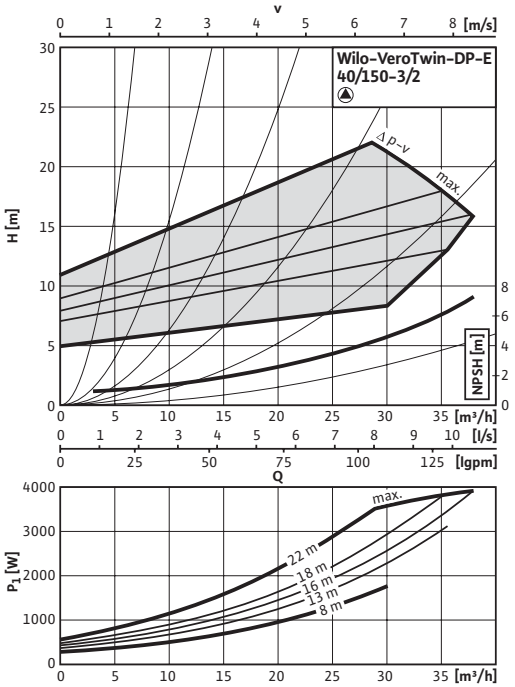
Wilo-VeroTwin-DP-E characteristic pump curves

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

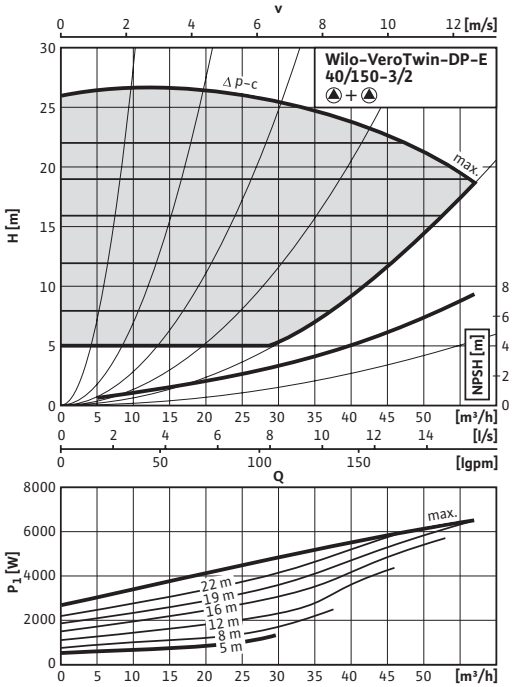
Δp-c (constant) individual operation



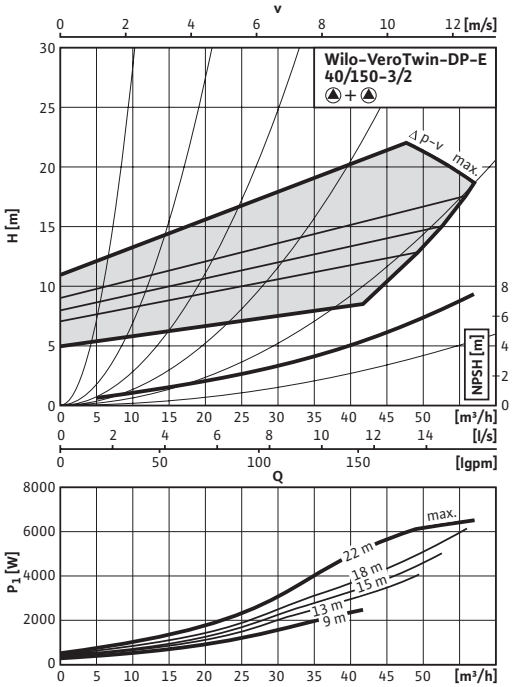
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



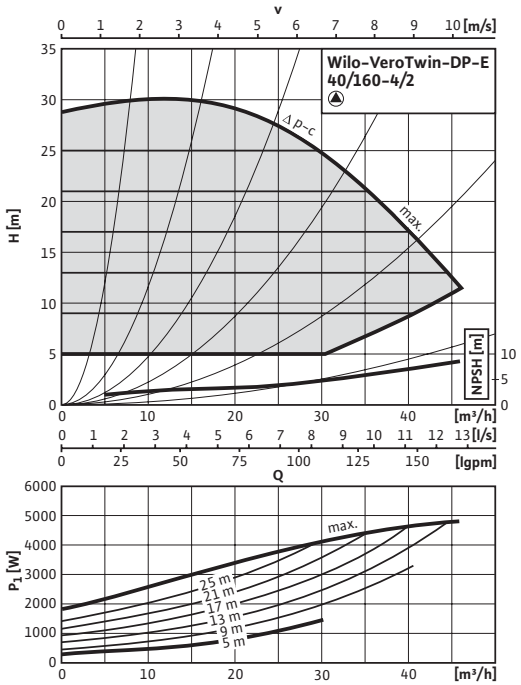
Δp-v (variable) parallel operation



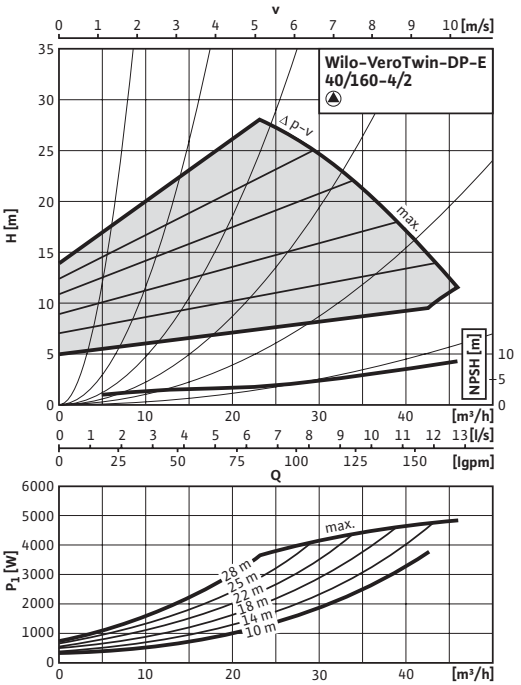
Wilo-VeroTwin-DP-E characteristic pump curves

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

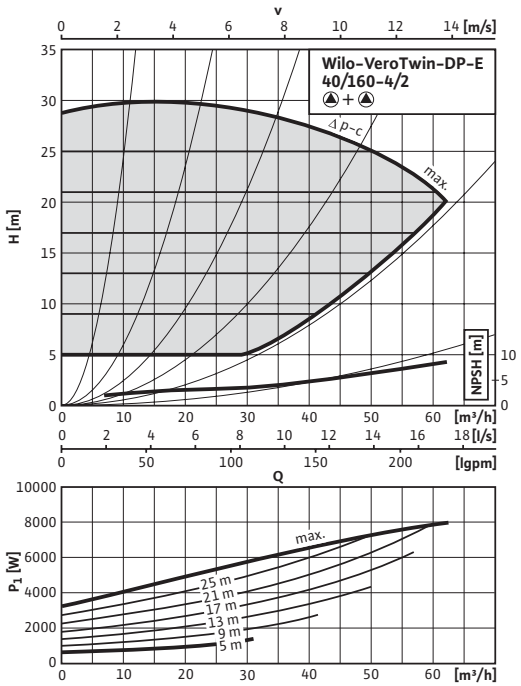
Δp-c (constant) individual operation



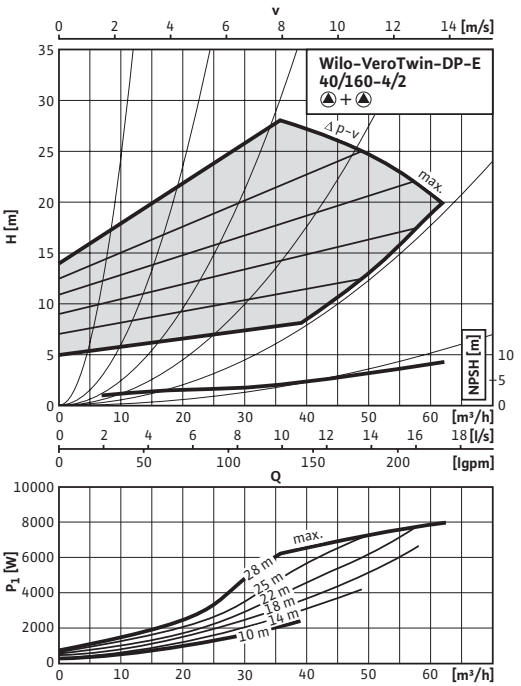
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



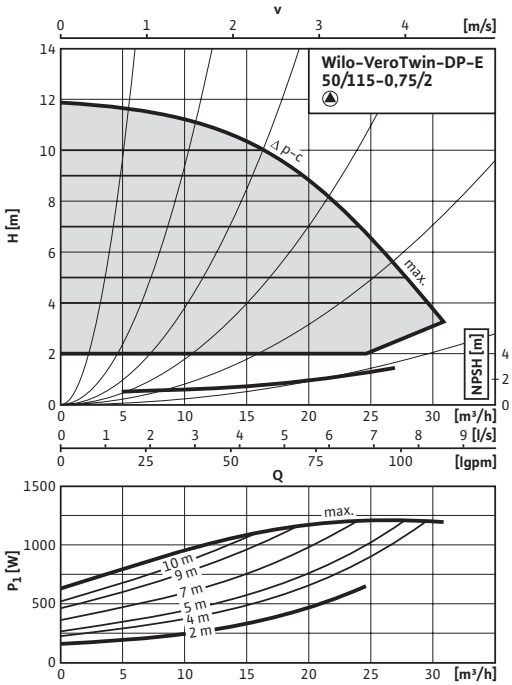
Δp-v (variable) parallel operation



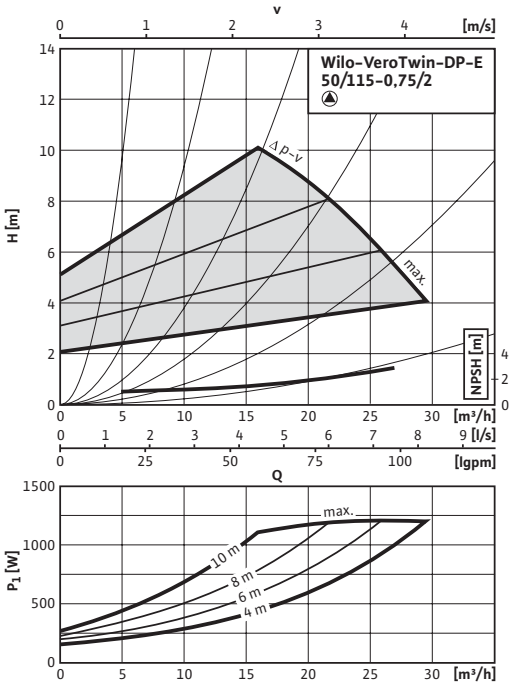
Wilo-VeroTwin-DP-E characteristic pump curves

Wilo-VeroTwin-DP-E 50 / 115-0.75 / 2

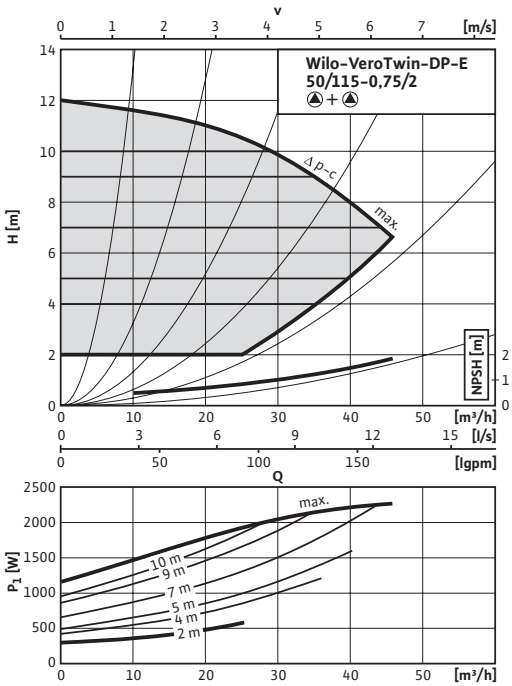
Δp-c (constant) individual operation



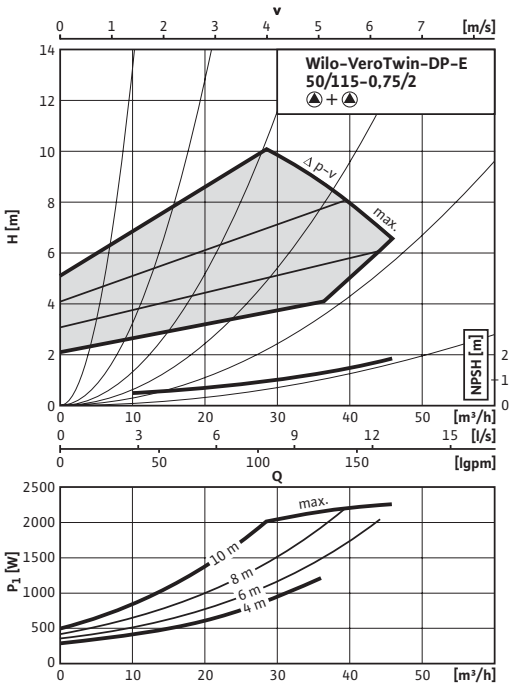
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



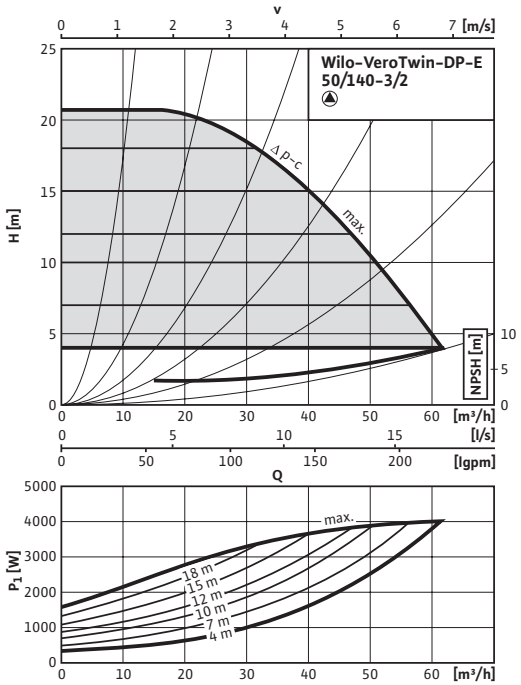
Δp-v (variable) parallel operation



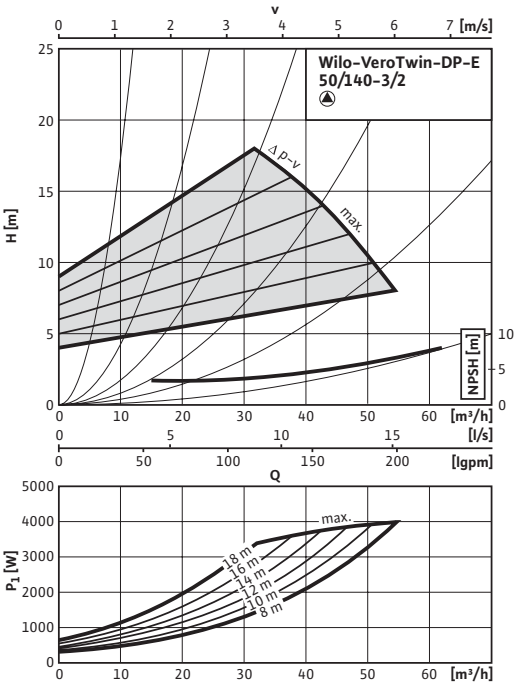
Wilo-VeroTwin-DP-E characteristic pump curves

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

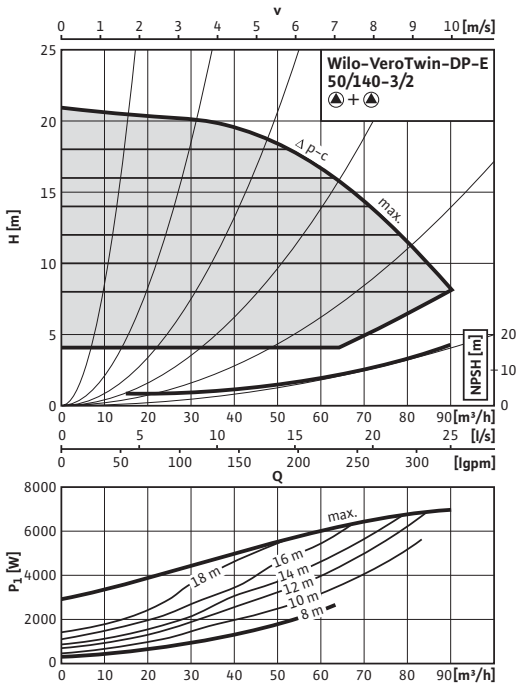
Δp-c (constant) individual operation



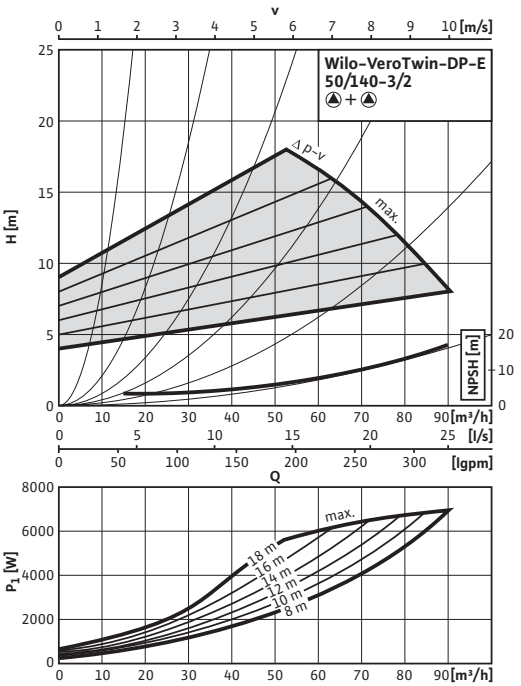
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



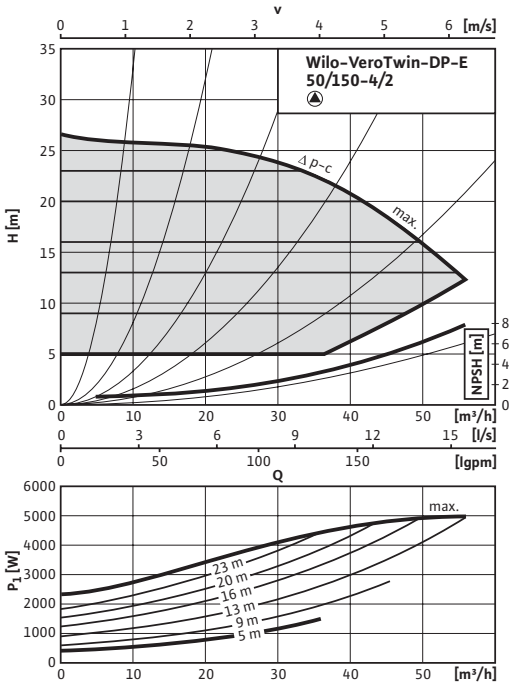
Δp-v (variable) parallel operation



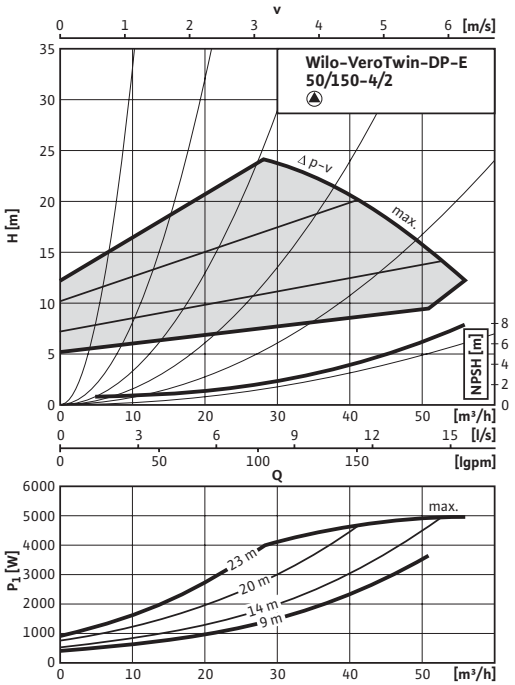
Wilo-VeroTwin-DP-E characteristic pump curves

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

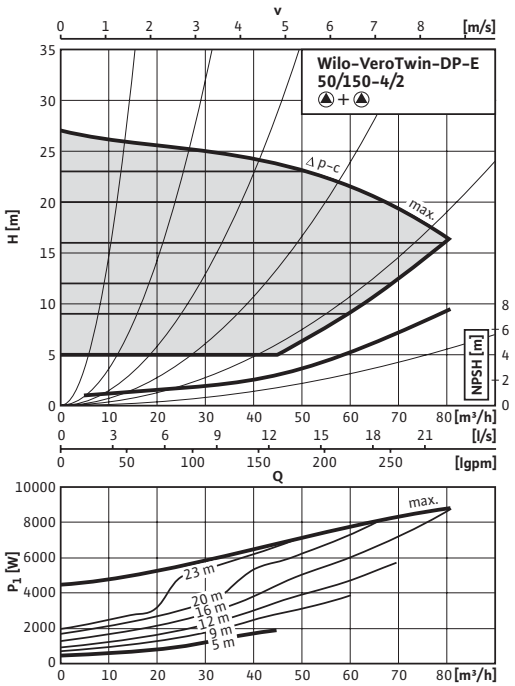
Δp-c (constant) individual operation



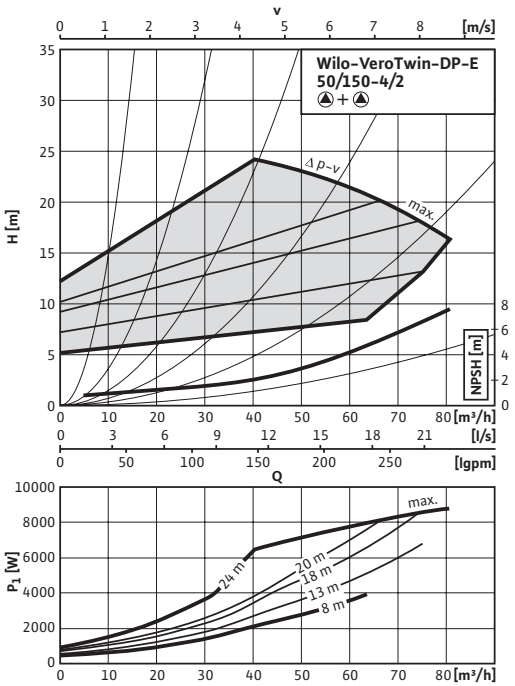
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



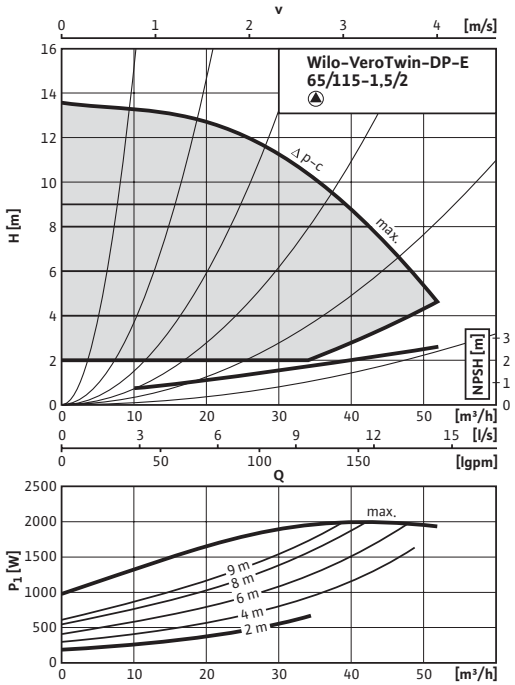
Δp-v (variable) parallel operation



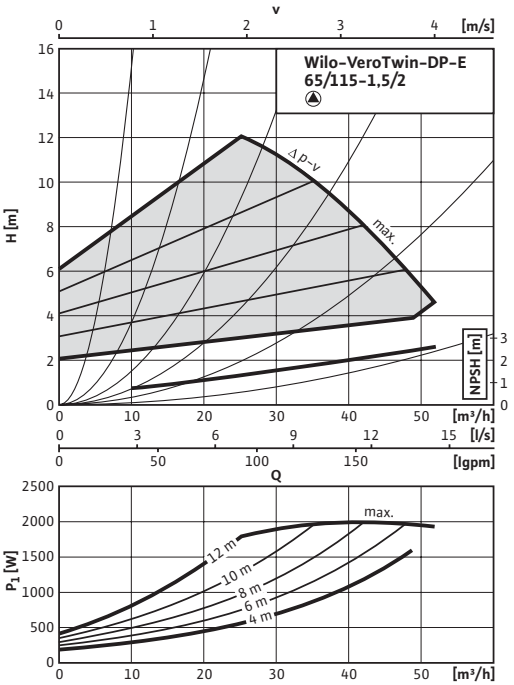
Wilo-VeroTwin-DP-E characteristic pump curves

Wilo-VeroTwin-DP-E 65 / 115-1.5 / 2

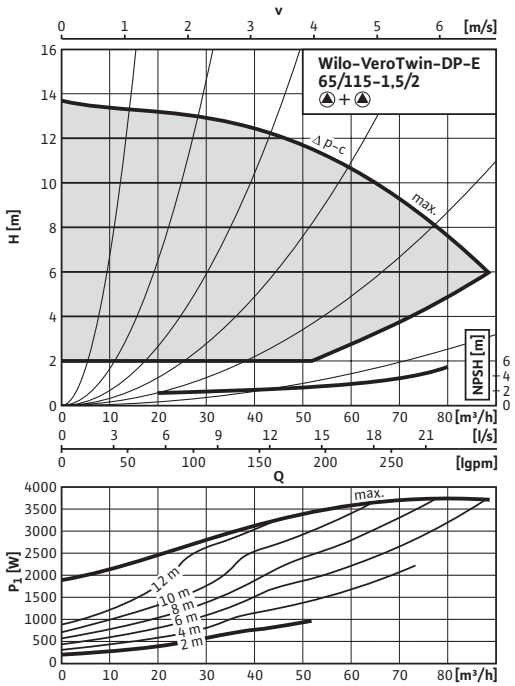
Δp-c (constant) individual operation



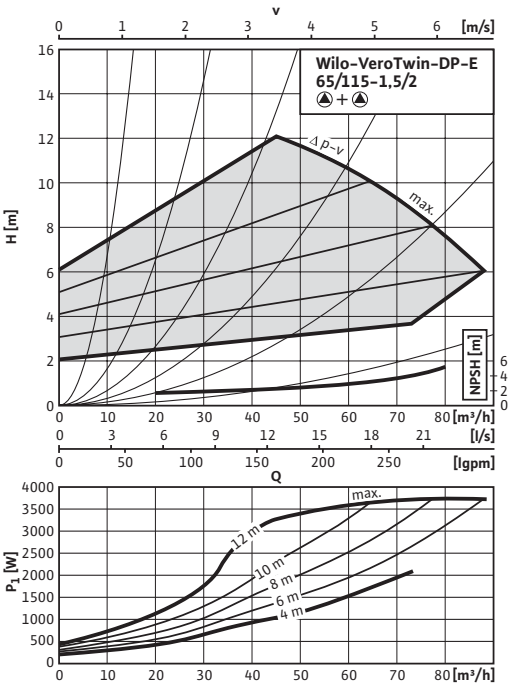
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



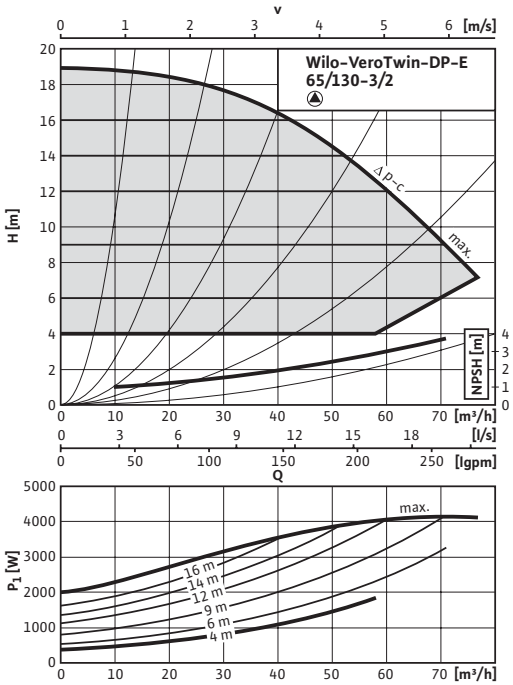
Δp-v (variable) parallel operation



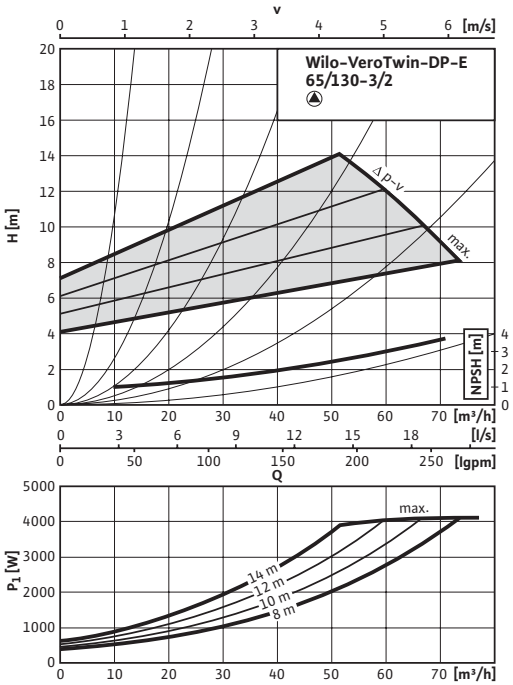
Wilo-VeroTwin-DP-E characteristic pump curves

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

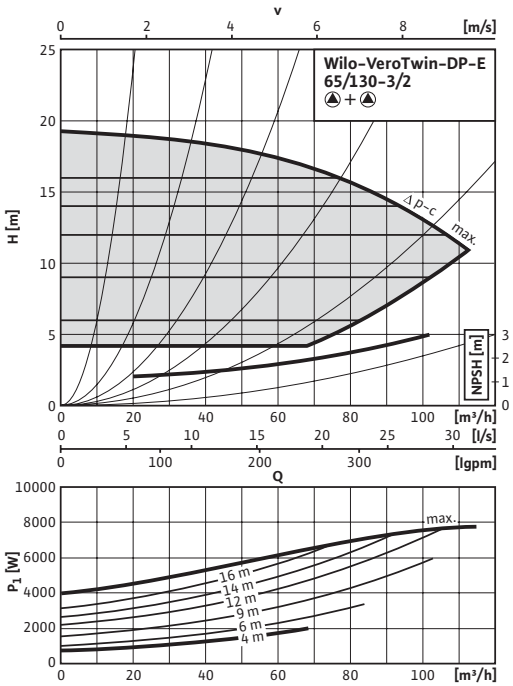
Δp-c (constant) individual operation



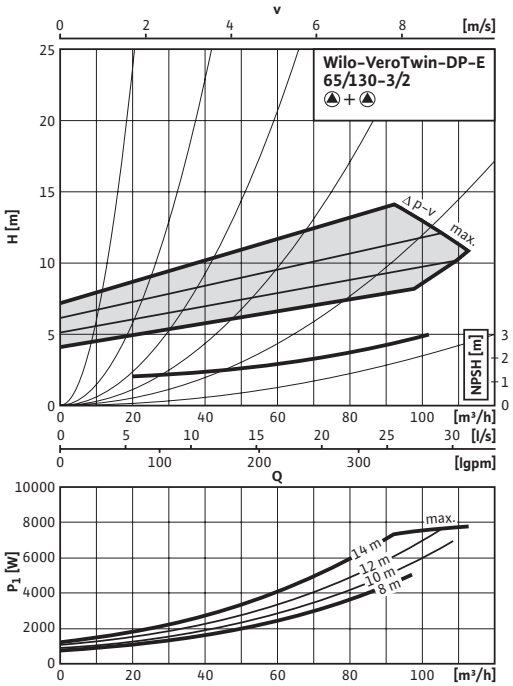
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



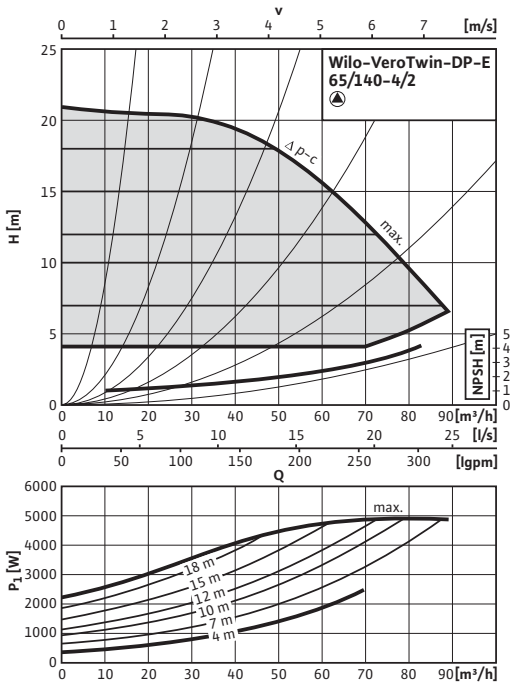
Δp-v (variable) parallel operation



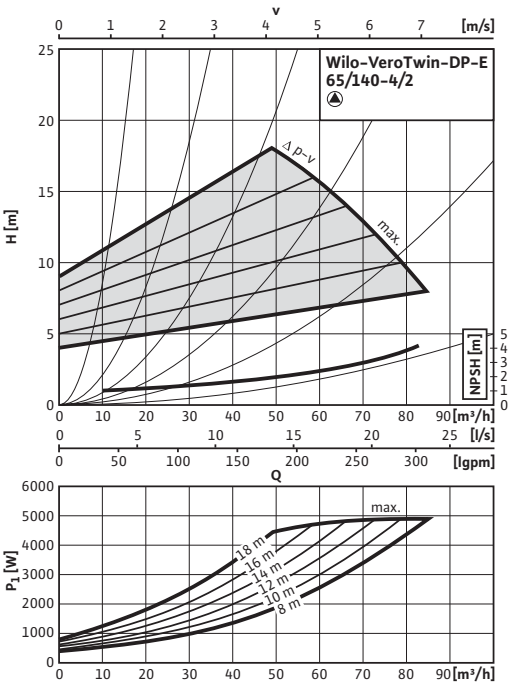
Wilo-VeroTwin-DP-E characteristic pump curves

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

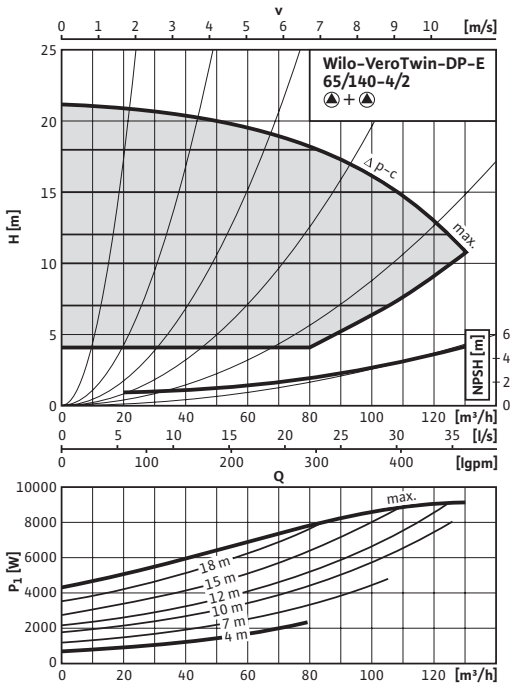
Δp-c (constant) individual operation



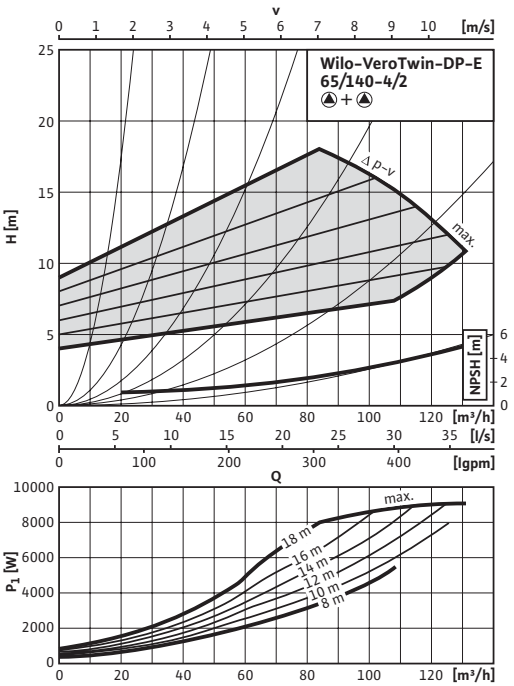
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



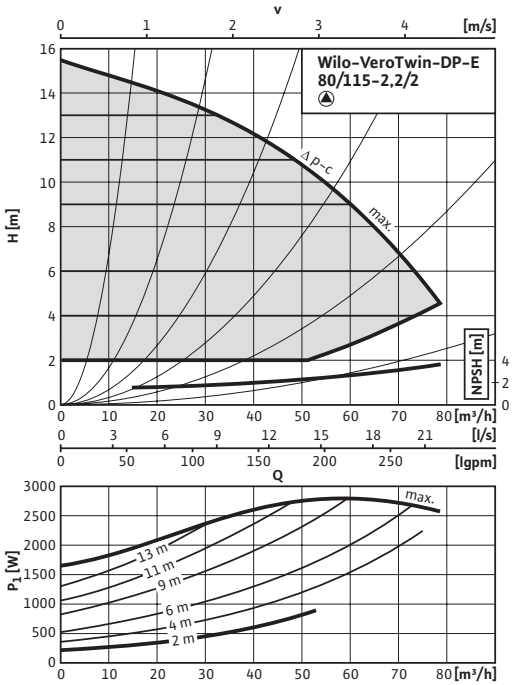
Δp-v (variable) parallel operation



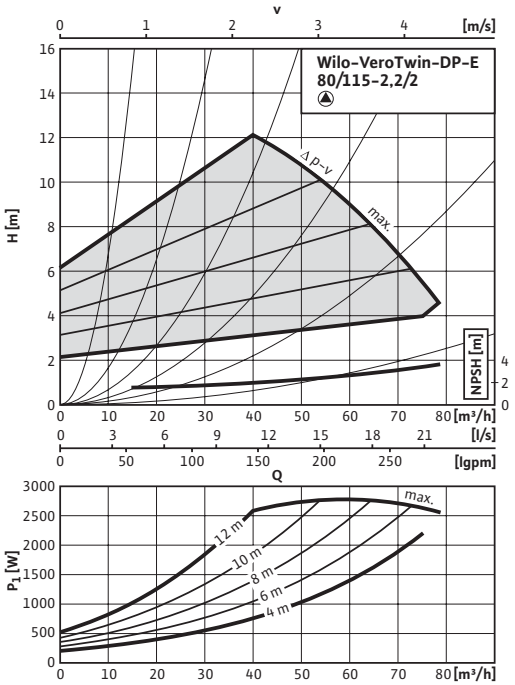
Wilo-VeroTwin-DP-E characteristic pump curves

Wilo-VeroTwin-DP-E 80/115-2.2/2

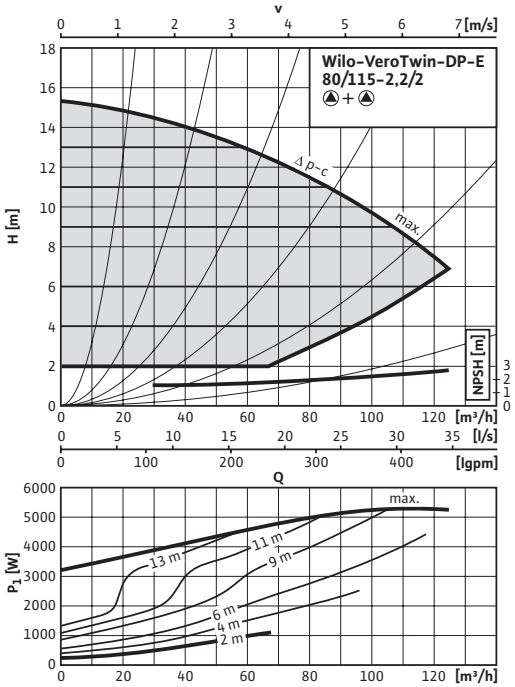
Δp-c (constant) individual operation



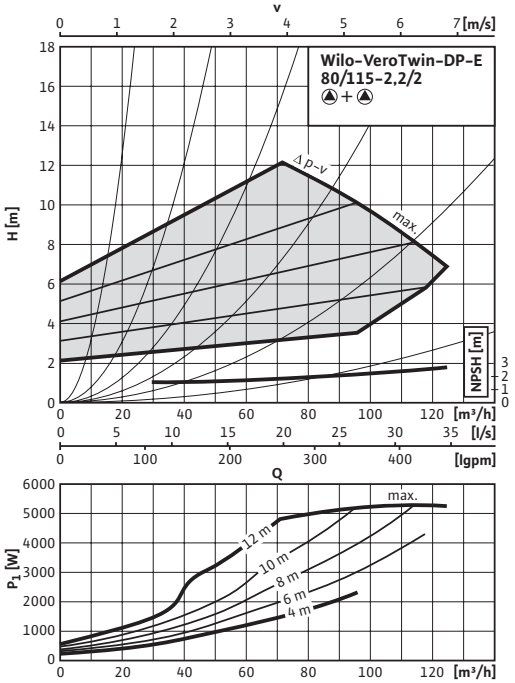
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



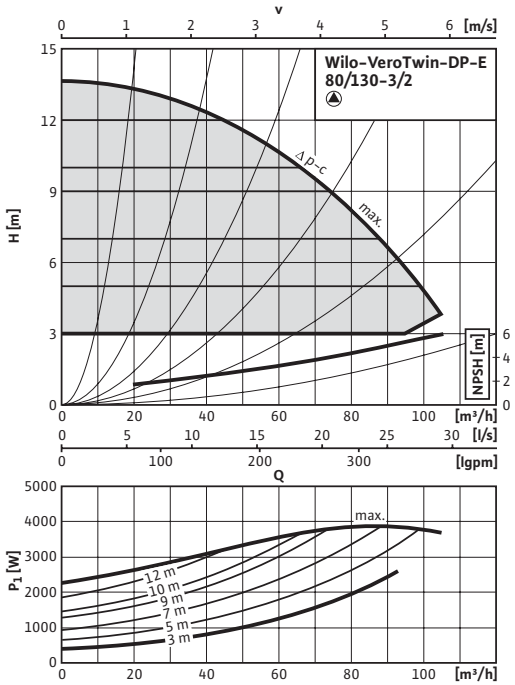
Δp-v (variable) parallel operation



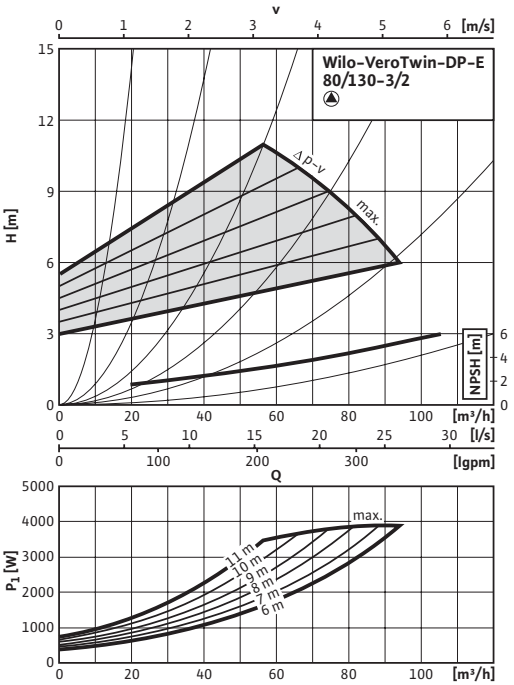
Wilo-VeroTwin-DP-E characteristic pump curves

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

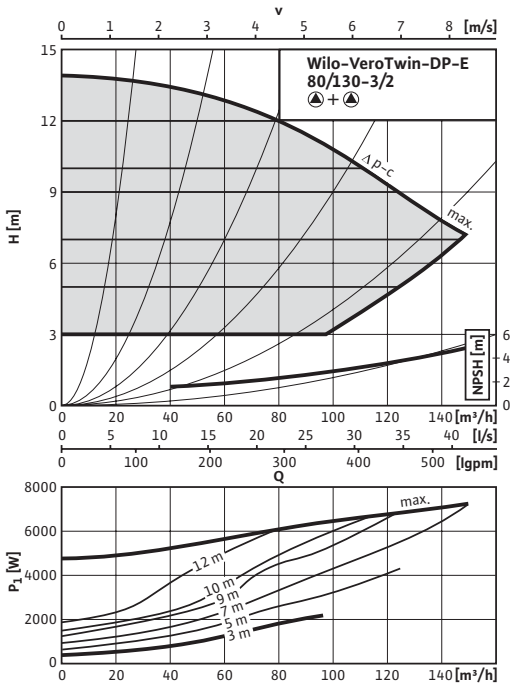
Δp-c (constant) individual operation



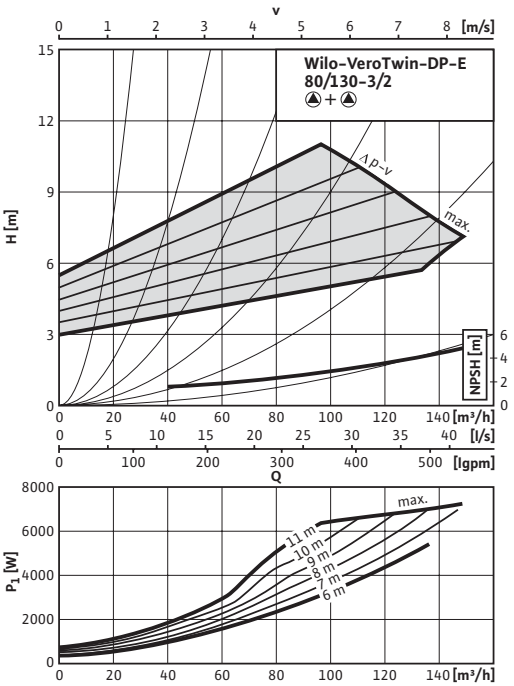
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



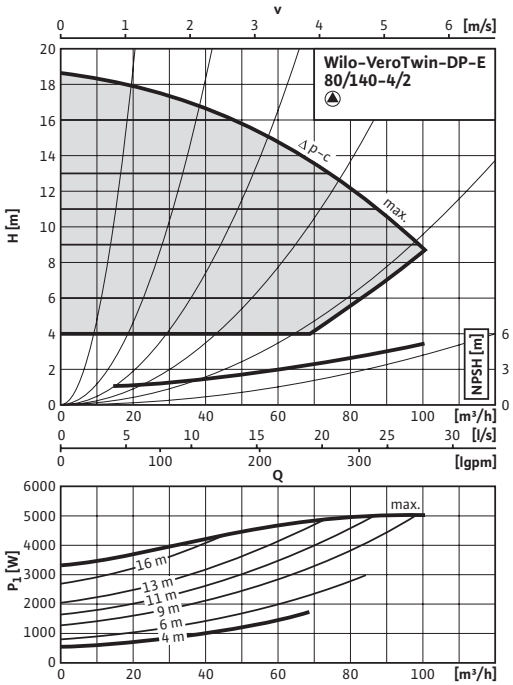
Δp-v (variable) parallel operation



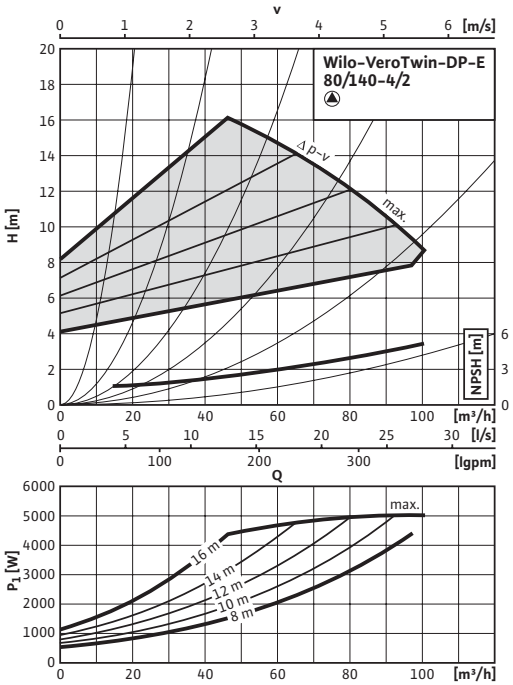
Wilo-VeroTwin-DP-E characteristic pump curves

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

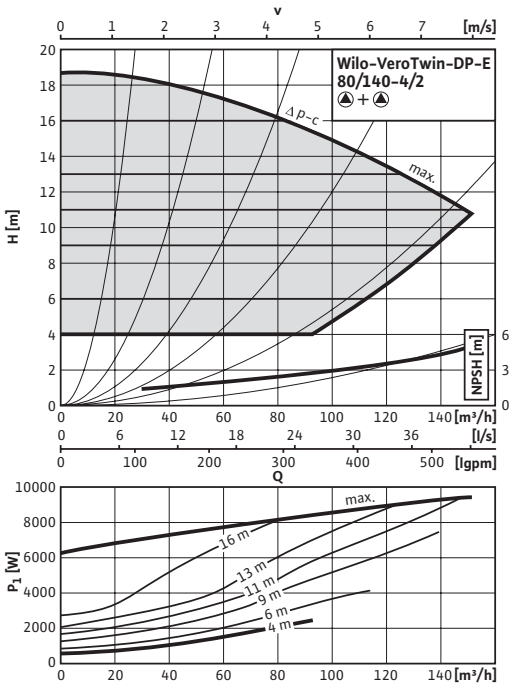
Δp-c (constant) individual operation



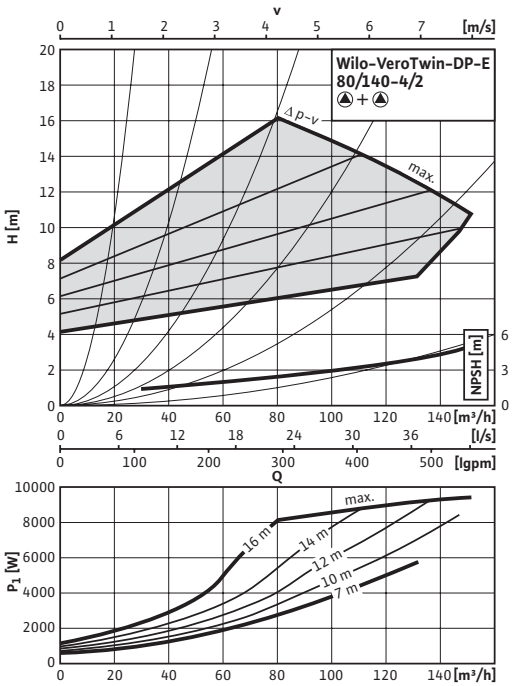
Δp-v (variable) individual operation



Δp-c (constant) parallel operation

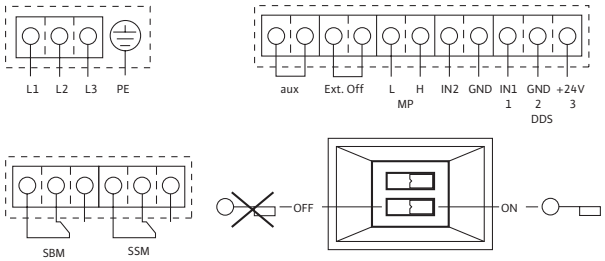


Δp-v (variable) parallel operation



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

Terminal diagram



Maximum loading of contacts for collective run and fault signal: min. 12 V DC / 10 mA, max. 250 V AC / 1 A.

L1, L2, L3, PE:	Mains connection 3~400 V / 50 Hz
SSM:	Potential-free collective fault signal (changeover contact in accordance with VDI 3814)
SBM:	Potential-free collective run signal (changeover contact in accordance with VDI 3814)
Off	Control input "Overriding OFF" (24 V)
MP	Interface for the connection of a slave pump for fully-integrated twin-head pump management
3	+24 V (output)
2	Earth (⊥)
1	0 – 10 V (input) corresponds to 40 % – 100 % of the rated motor speed
aux	without function

Switchover key activated / deactivated.

Option: IF-Modul (PLR / LON)

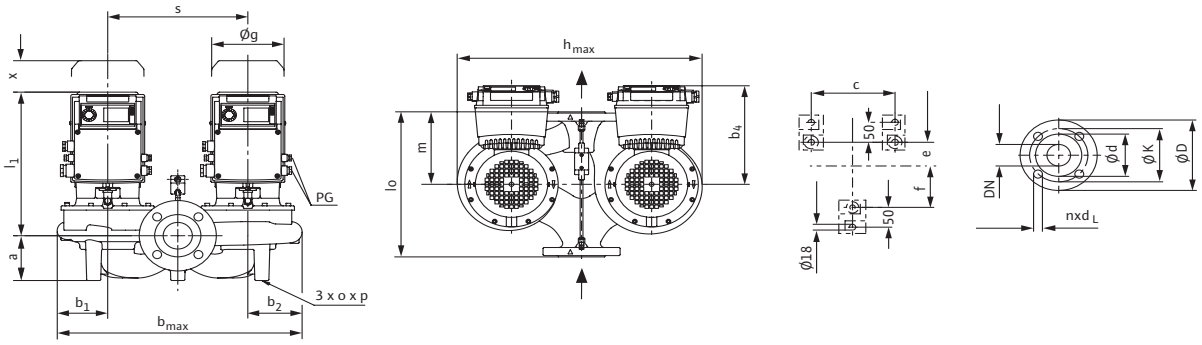
Motor data

Wilo-VeroTwin-DP-E ...	Nominal power	Rotational speed	Power consumption	Current
	P_2	n	P_{1max}	I_{max}
	[kW]	[rpm]	[W]	[A]
32 / 160-1.1 / 2	1.1	1100 – 2900	1535	3.5
40 / 115-0.55 / 2	0.55	1100 – 2900	865	1.8
40 / 150-3 / 2	3.0	1100 – 2900	3900	8.4
40 / 160-4 / 2	4.0	1200 – 2900	4540	9.5
50 / 115-0.75 / 2	0.75	1200 – 2900	1150	2.4
50 / 140-3 / 2	3.0	1100 – 2890	4030	8.5
50 / 150-4 / 2	4.0	1100 – 2900	5450	11.0
65 / 115-1.5 / 2	1.5	1100 – 2900	2100	4.7
65 / 130-3 / 2	3.0	1200 – 2900	4000	8.7
65 / 140-4 / 2	4.0	1200 – 2890	4950	10.2
80 / 115-2.2 / 2	2.2	1200 – 2900	2900	6.7
80 / 130-3 / 2	3.0	1200 – 2890	3880	8.4
80 / 140-4 / 2	4.0	1100 – 2900	5300	10.6

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

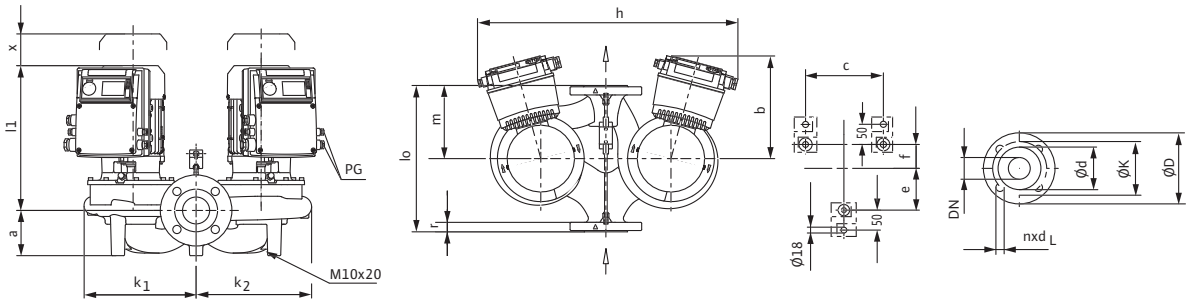
Dimensions, weights Wilo-VeroTwin-DP-E

Dimension drawing A



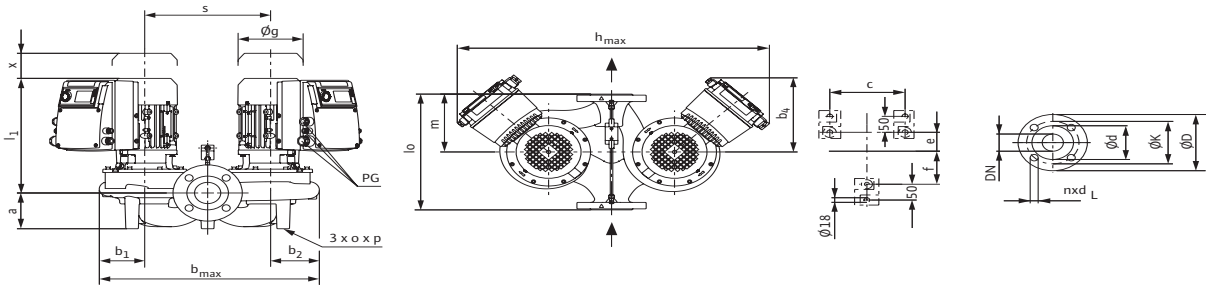
Note:
Housing with feet for installation on a base and bore holes M10, mounting brackets on request.

Dimension drawing B



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

Dimension drawing C



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

Dimensions, weights Wilo-VeroTwin-DP-E

Dimensions, Weights

Wilo-VeroTwin-DP-E ...	Nominal diameter	Dimensions													Pg screwed connection	Weight approximately	Dimension drawing
	DN	l_0	a	b	c	e	f	h	k_1	k_2	l_1	m	r	x	-	-	-
	-	[mm]													-	[kg]	-
32/160-1.1/2	32	260	70	186	225	56	106	559	207	203	343	136	18	70		55	A
40/115-0.55/2	40	250	75	193	225	35	97	393	178	172	305	135	18	60		48	B
40/150-3/2	40	320	75	208	240	45	135	624	231	225	322	167	18	65		77	A
40/160-4/2	40	320	75	272	240	40	135	570	231	225	327	180	18	150		89	B
50/115-0.75/2	50	280	83	200	228	50	107	415	198	192	348	155	18	70		44	B
50/140-3/2	50	340	86	267	240	48	132	582	255	245	413	180	18	150	1xM25	79	B
50/150-4/2	50	340	86	211	240	48	132	449	255	245	398	190	18	70	1xM20 1xM16	91	C
65/115-1.5/2	65	340	93	216	225	25	137	467	223	209	384	185	18	70	2xM12	67	B
65/130-3/2	65	340	93	211	240	43	137	489	280	270	404	185	18	70		86	C
65/140-4/2	65	340	93	272	240	43	137	550	280	270	409	180	18	150		98	C
80/115-2.2/2	80	360	100	216	240	43	137	490	249	231	386	205	18	75		84	B
80/130-3/2	80	360	103	267	240	30	150	480	249	231	413	192	18	150		89	C
80/140-4/2	80	360	103	211	240	30	150	519	307	294	380	192	18	75		101	C

Flange dimensions

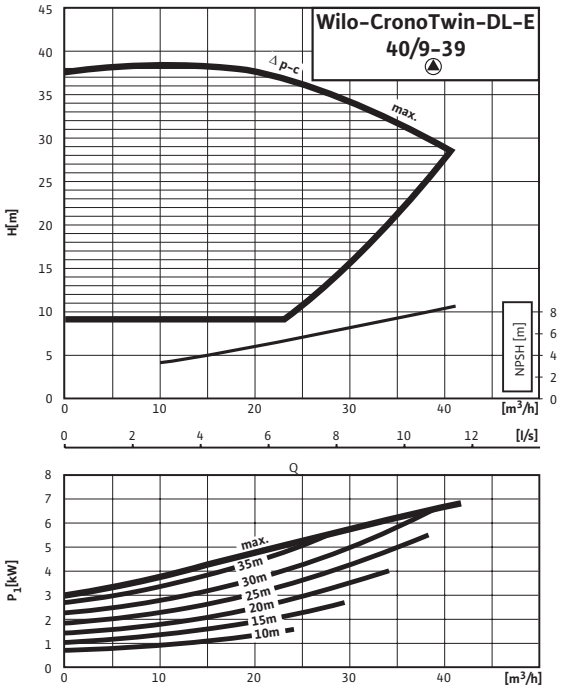
Wilo-VeroTwin-DP-E ...	Nominal diameter	Flange dimensions Pump			
	DN	Ø D	Ø d	Ø k	n x d_L
	-	[mm]			[St. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19

Flange dimensions pump – bored in accordance with EN 1092-2 PN 16, n = number of drill holes

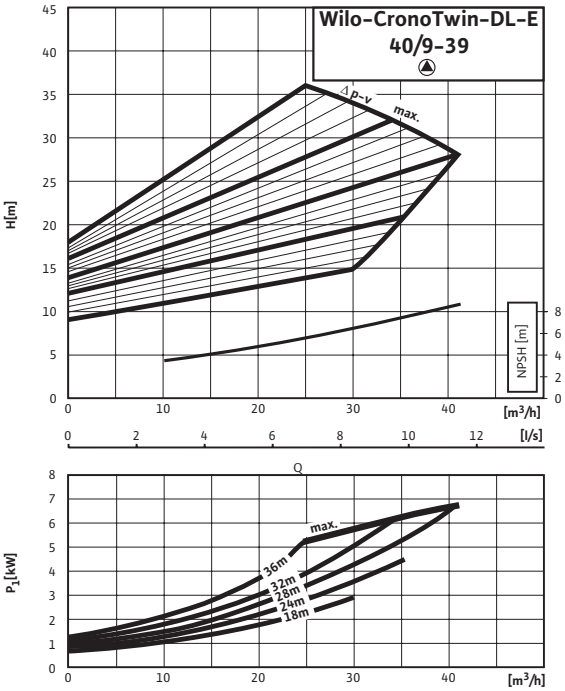
Pump curves Wilo-CronoTwin-DL-E

Wilo-CronoTwin-DL-E 40 / 9-39

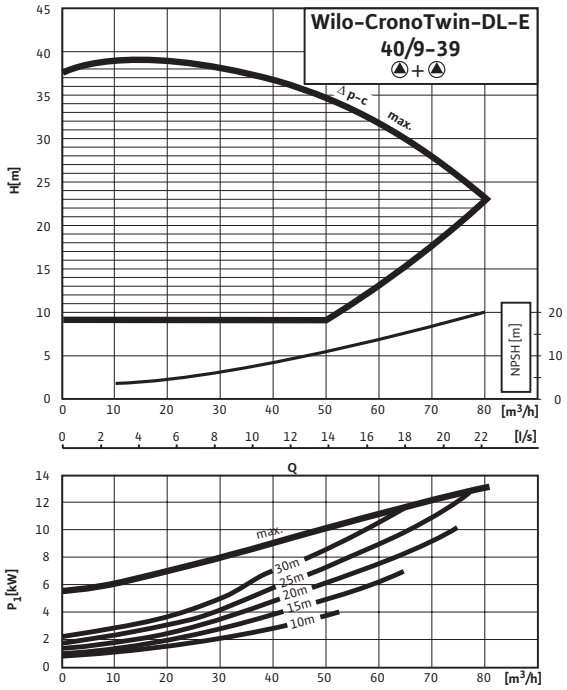
Δp-c (constant) individual operation



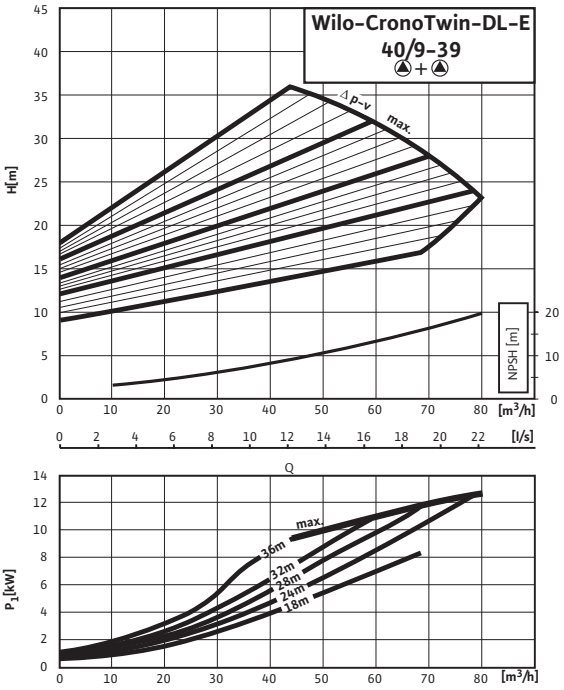
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



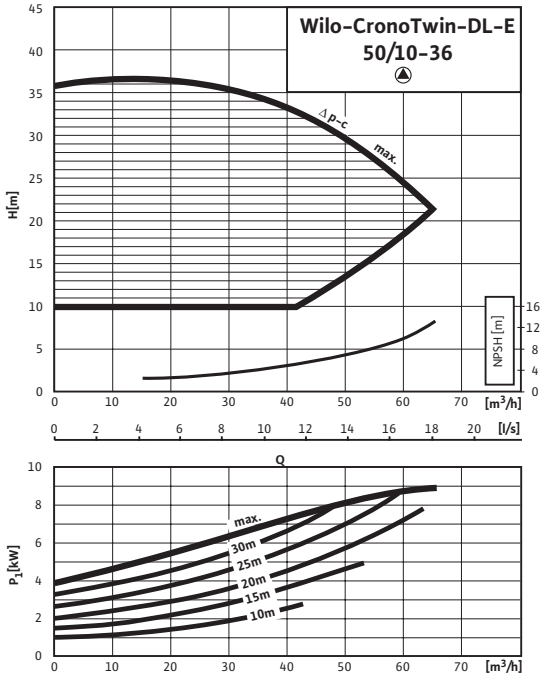
Δp-v (variable) parallel operation



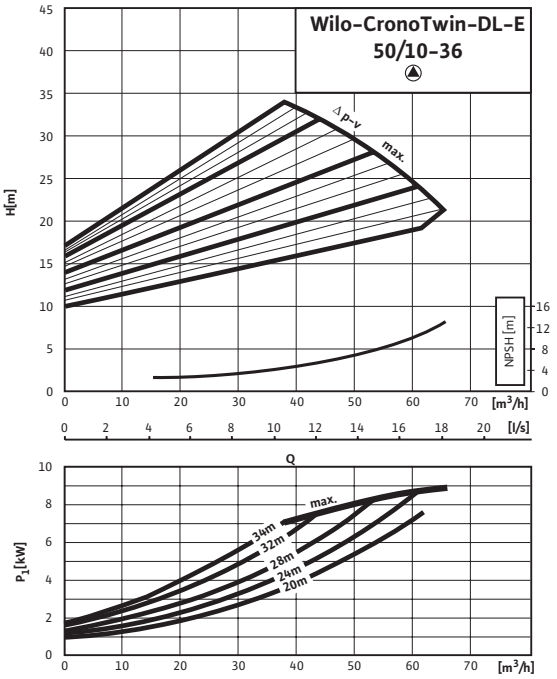
Pump curves Wilo-CronoTwin-DL-E

Wilo-CronoTwin-DL-E 50 / 10-36

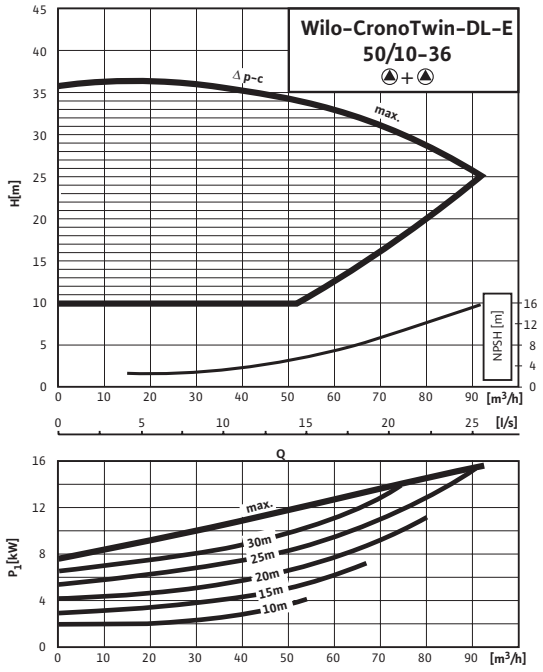
Δp-c (constant) individual operation



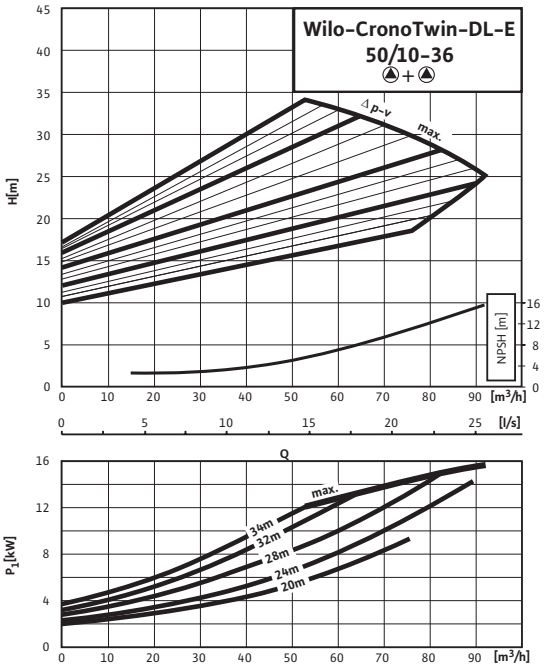
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



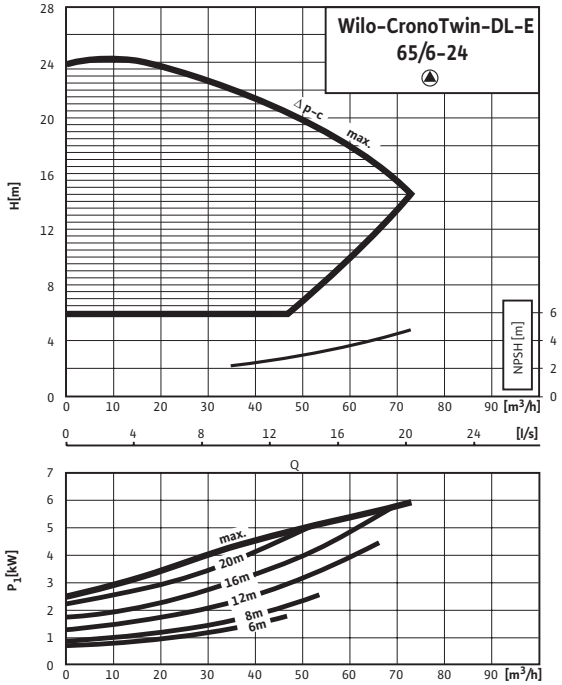
Δp-v (variable) parallel operation



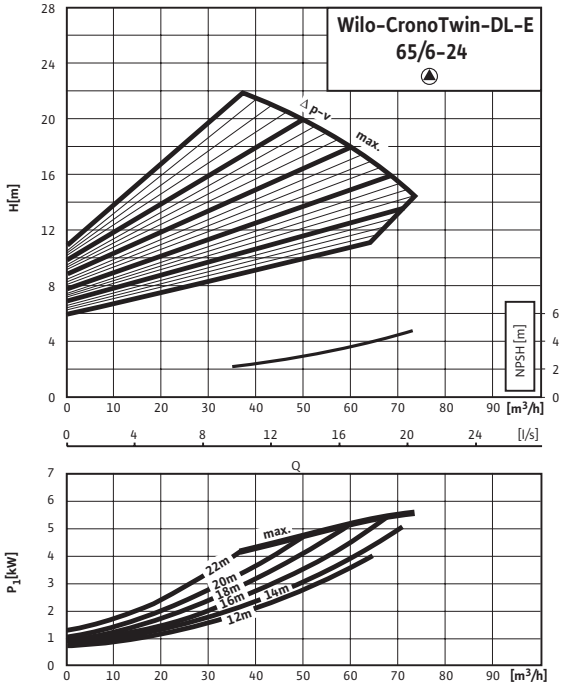
Pump curves Wilo-CronoTwin-DL-E

Wilo-CronoTwin-DL-E 65 / 6-24

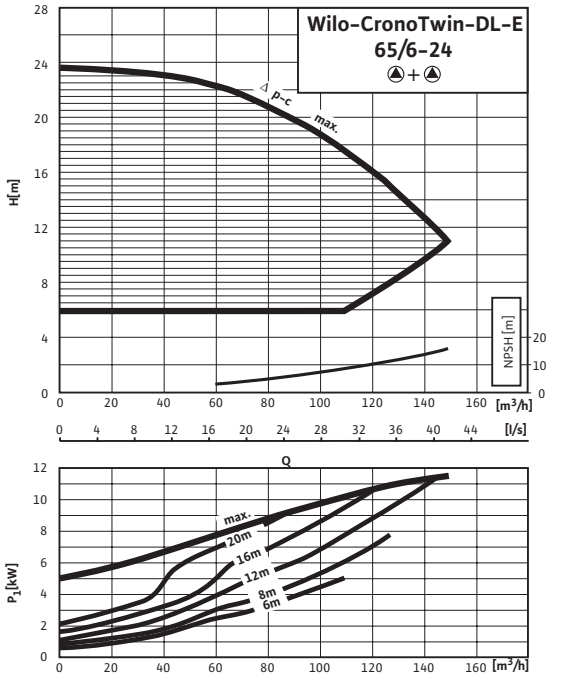
Δp-c (constant) individual operation



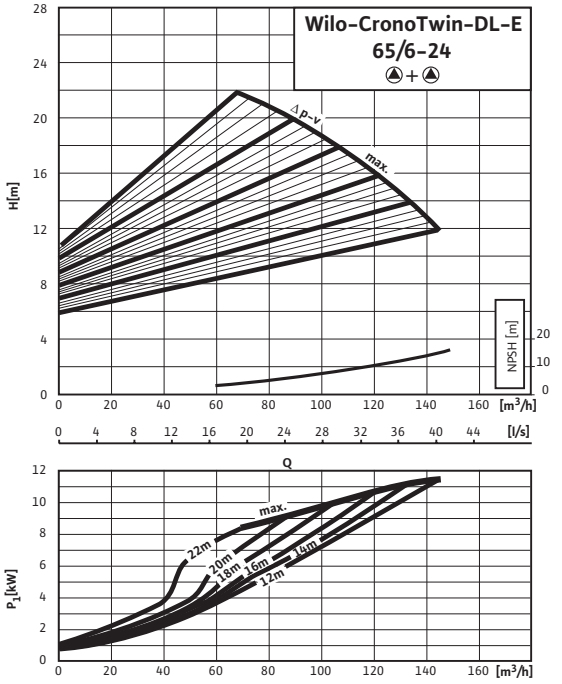
Δp-v (variable) individual operation



Δp-c (constant) parallel operation



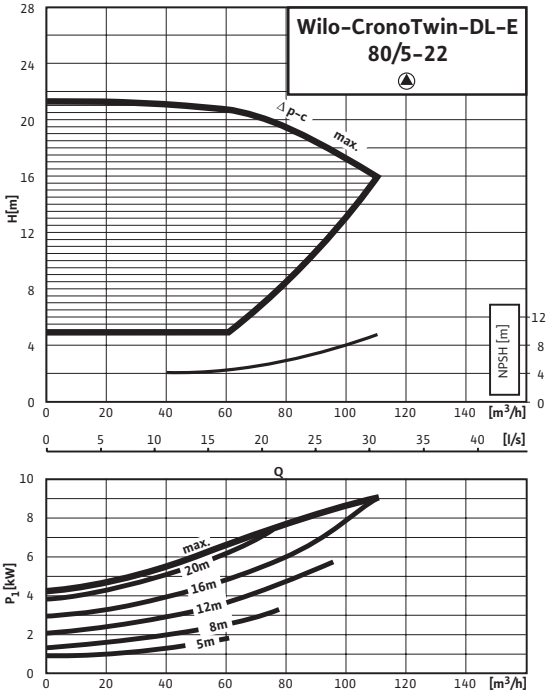
Δp-v (variable) parallel operation



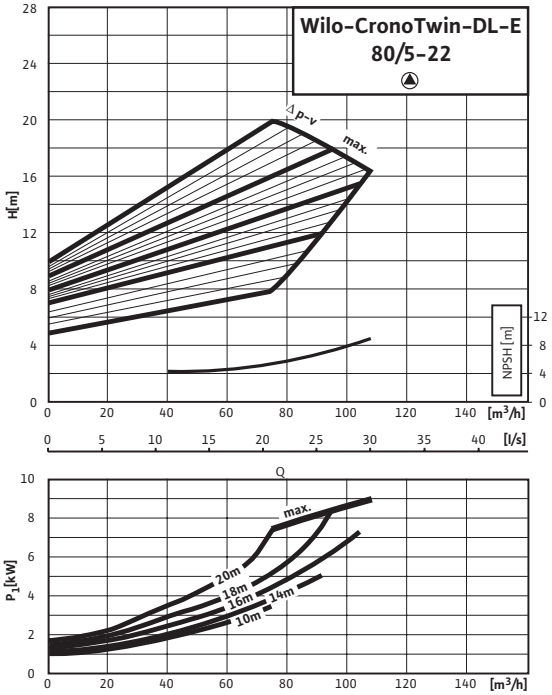
Pump curves Wilo-CronoTwin-DL-E

Wilo-CronoTwin-DL-E 80 / 5-22

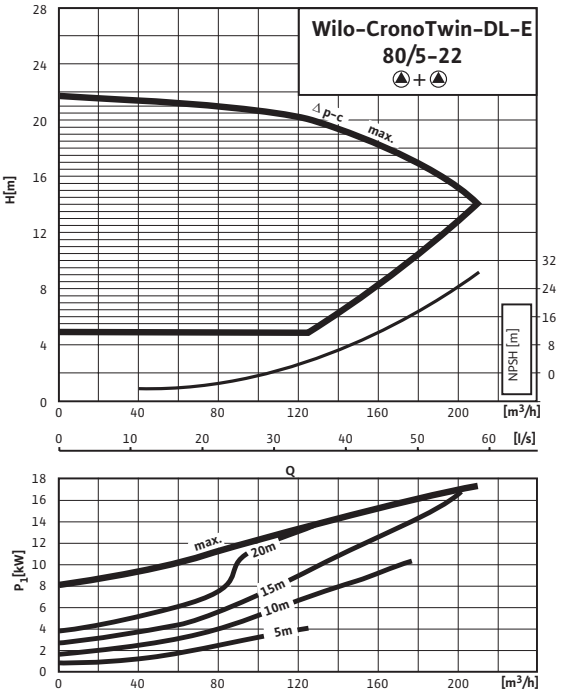
Δp-c (constant) individual operation



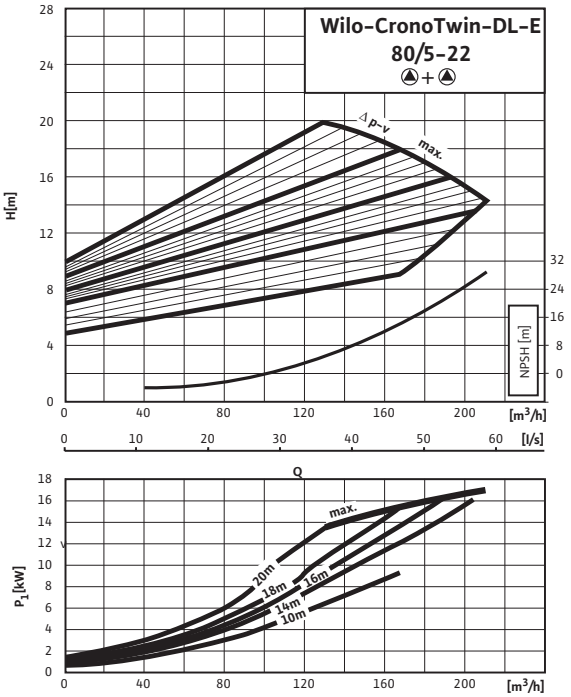
Δp-v (variable) individual operation



Δp-c (constant) parallel operation

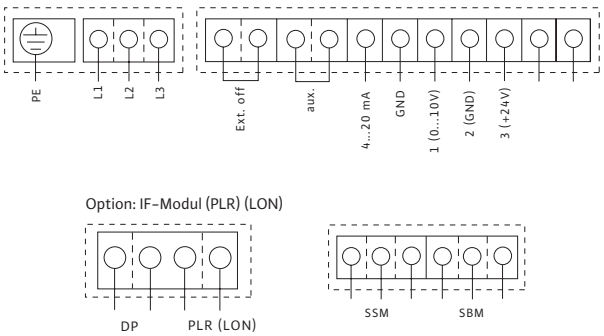


Δp-v (variable) parallel operation



Terminal Diagrams, Motor Data Wilo-CronoTwin-DL-E

Terminal diagram



Switch rating of the interference contacts for the collective Run and Fault signals: Minimum 12 V DC / 10 mA, max. 250 V AC / 1 A.

L1, L2, L3, PE:	Mains connection 3~400 V / 50 Hz; 3~380 V / 60 Hz
SSM:	Potential-free collective fault signal (changeover contact in accordance with VDI 3814, Function cf. Wilo-TOP-Control)
SBM:	Potential-free collective run signal (changeover contact in accordance with VDI 3814, Function cf. Wilo-TOP-Control)
3	+24 V (Output) for ext. consumer / sensor
2	Earth (⊥)
1	0 – 10 V (Input) Differential pressure sensor or external control parameter
4...20 mA:	not assigned
External off:	Control input "Overriding OFF" (24 V) for external potential-free contact (NC contact)
DP	Twin-head pump management (2 Pumps)
PLR	Serial digital building automation interface
LON	Serial digital GA interface (LONWORKS)

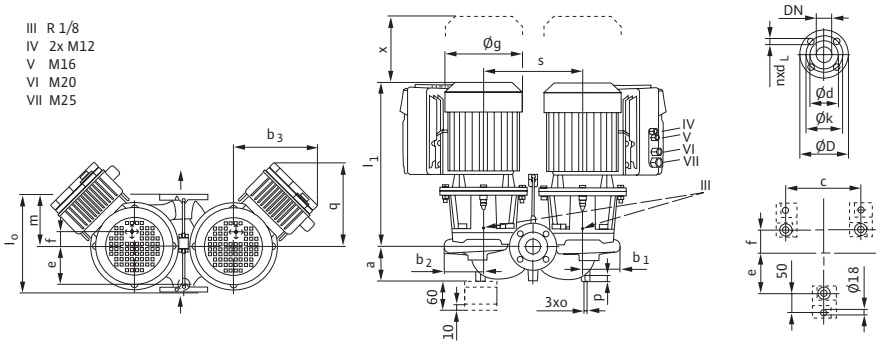
Motor data

Wilo-CronoTwin-DL-E ...	Nominal power	Rotational speed	Power consumption	Current
	P_2	n	P_1	I_{max}
	[kW]	[rpm]	[kW]	[A]
40/9-39	5.5	1100-2900	7.2	11.5
50/10-36	7.5	1100-2900	9.3	14.5
65/6-24	5.5	1100-2900	7.2	11.5
80/5-22	7.5	1100-2900	9.3	14.5

Three-phase motor (DM), 2-pole – 3~~400 V, 50 Hz / 3~380 V, 60 Hz
Note motor type label data!

Dimensions, Weights Wilo-CronoTwin-DL-E

Dimension drawing



Dimensions, Weights

Wilo-CronoTwin-DL-E ...	Nominal diameter	Dimensions																Weight approximately
	DN	l_0	a	b_1	b_2	b_3	c	e	f	Ø g	l_1	m	o	p	q	s	x	–
	–	[mm]																[kg]
40/9-39	40	340	100	120	127	288	400	52	145	266	570	170	M10	20	288	340	95	173
50/10-36	50	340	120	126	136	288	360	50	130	266	567	180	M10	20	288	340	100	203
65/6-24	65	430	154	134	144	288	440	55	185	266	586	215	M12	20	288	400	120	202
80/5-22	80	400	135	134	146	288	400	62	178	266	591	200	M12	20	288	350	120	210

Flange dimensions

Wilo-CronoTwin-DL-E ...	Nominal diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[St. x mm]
40/9-39	40	150	84	110	4 x 19
50/10-36	50	165	99	125	4 x 19
65/6-24	65	185	118	145	4 x 19
80/5-22	80	200	132	160	8 x 19

Flange dimensions pump – in accordance with EN 1092-2 PN 16, n = number of drill holes

Standard Pumps

Contents

Standard Pumps

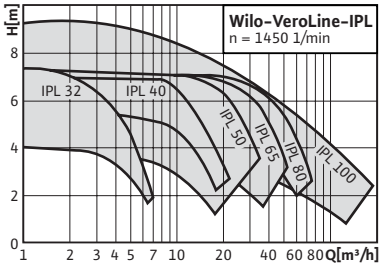
Standard Pumps

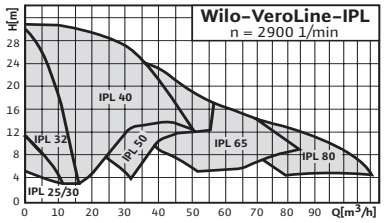
Single-head pumps In-line (Heating, Air-conditioning, Cooling and Industry)

Series overview

Series: Wilo-VeroLine-IPL

Series expansion



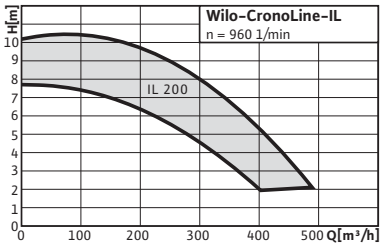


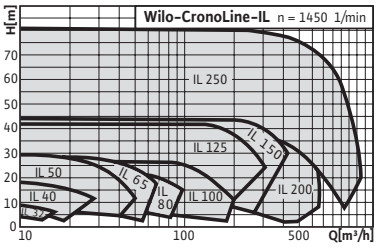
> Single-head pumps:
- Single-stage, low-pressure centrifugal pump with mechanical seal (In-line design)

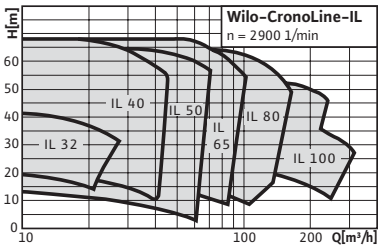
> Application:
- For pumping heating water in accordance with VDI 2035, water / glycol-mixtures, cooling / cold water (others on request)

> Special features:
- High motor life due to the production standard condensate outlet holes in the motor housings
- Series design:
- Shaft with one-piece shaft
- Version N:
- With plug shaft and IEC standard motor

Series: Wilo-CronoLine-IL







> Single-head pumps:
- Single-stage, low-pressure-centrifugal pump, In-line-design, with 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

> Special features:
- Standard-equipped cataphoresis coating of the cast iron components
- Patented lantern design for targeted draining of condensate

Series overview

Series: Wilo-VeroLine-IPL

> Product advantages:
- High corrosion protection thanks to cataphoretic painting
- High motor life due to the production standard condensate outlet holes in the motor housings
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores.

> Additional information: **Page**

Series: Wilo-CronoLine-IL

> Product advantages:
- Available for flexible applications in air conditioning and cooling systems benefiting from targeted draining of condensate via optimised lantern design
- High corrosion protection thanks to cataphoretic painting
- High motor life due to the production standard condensate outlet holes in the motor housings
- Mechanical seals with forced flushing independent of direction of rotation
- Easy to install. The pump housing is provided with feet and a threaded bores.
- High degree of availability through worldwide obtainability of standard motors (in accordance with Wilo specifications) and mechanical seals
- Reduced Life Cycle Costs through optimised degrees of efficiency

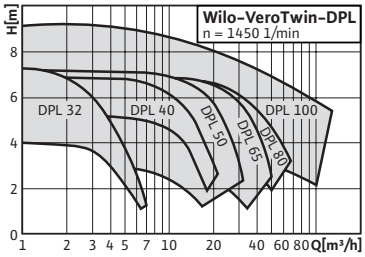
> Additional information: **Page**

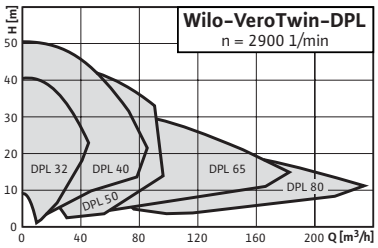
Standard Pumps

Double pumps In-line (Heating, Air-conditioning, Cooling and Industry)

Series overview

Series: Wilo-VeroTwin-DPL



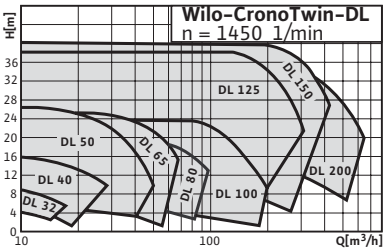


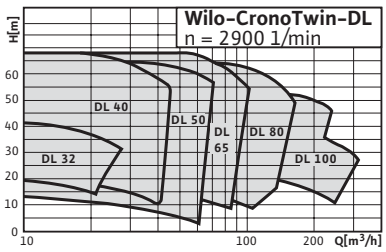
> Twin-head pumps:
- Single-stage, low-pressure centrifugal pump with mechanical seal (In-line design)

> Application:
- For pumping heating water in accordance with VDI 2035, water / glycol-mixtures, cooling / cold water (others on request)

> Special features:
- Reduction of space required and installation costs through twin-head pump design
- Main / standby operation (by means of additional external equipment)
- Peak load operation (by means of additional external equipment)

Series: Wilo-CronoTwin-DL





> Twin-head pumps:
- Single-stage, low-pressure centrifugal pump with mechanical seal (In-line design)

> Application:
- For pumping heating water in accordance with VDI 2035, water / glycol-mixtures, cooling / cold water (others on request)

> Special features:
- Reduction of space required and installation costs through twin-head pump design
- Main / standby operation (by means of additional external equipment)
- Peak load operation (by means of additional external equipment)

Series overview

Series: Wilo-VeroTwin-DPL

> Product advantages:
- High corrosion protection thanks to cataphoretic painting
- Mechanical seals with forced flushing independent of direction of rotation
- Series design: Shaft with one-piece shaft
- Version N: Standard motor B5 or V1
- High world-wide obtainability of standardised pumps (to Wilo specifications) and standard mechanical seals
- Easy to install. The pump housing is provided with feet and a threaded bores.
- Reduction of space required and installation costs through twin-head pump design

> Additional information: **Page**

Series: Wilo-CronoTwin-DL

> Product advantages:
- Available for flexible applications in air conditioning and cooling systems benefiting from targeted draining of condensate via optimised lantern design
- High corrosion protection thanks to cataphoretic painting
- Mechanical seals with forced flushing independent of direction of rotation
- Series design: Shaft with one-piece shaft
- High world-wide obtainability of standardised pumps (to Wilo specifications) and standard mechanical seals
- Easy to install. The pump housing is provided with feet and a threaded bores.
- Reduction of space required and installation costs through twin-head pump design
- Reduced Life Cycle Costs through optimised degrees of efficiency

> Additional information: **Page**

Standard Pumps

In-line pumps

Technical Data

	Wilo-VeroLine-IPL		Wilo-CronoLine-IL	Wilo-VeroTwin-DPL	Wilo-CronoTwin-DL
Approved fluids (other fluids / media on request)					
Heating water (In accordance with VDI 2035)	•		•	•	•
Water glycol mixture (for 20-40 vol.-% glycol and fluid temperature ≤ 40°C)	•		•	•	•
Cooling and cold water	•		•	•	•
Heat transfer oil	Special versions on request		Special versions on request	Special versions on request	Special versions on request
Potable water and water for food businesses in accordance with TrinkwV 2001	–		–	–	–
Permitted field of application					
Standard version with nominal 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)
Optionally with nominal pressure, p_{max} [bar]	16		–	16	–
Temperature range [C]	-10 up to +120		-20 up to +140	-10 up to +120	-20 up to +140
Ambient temperature, maximum [°C]	40		40	40	40
Installation in closed buildings	•		•	•	•
Outdoor installation	available in special design version		available in special design version	available in special design version	available in special design version
Pipe connections					
Threaded connection	Rp 1 – Rp 1 $^1/_4$	–	–	–	–
Flange connection – Nominal diameter DN	10	32 – 100	32 – 250	32 – 100	32 – 200
Flange	–	PN16	PN16	PN16	PN16 (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 and lantern – standard	Grey cast iron (EN-GJL-250)		Grey cast iron (EN-GJL-250)	Grey cast iron (EN-GJL-250)	Grey cast iron (EN-GJL-250)
Pump housing and lantern – optional	–		Spheroidal cast iron (EN-GJS-400-18-LT)	–	Spheroidal cast iron (EN-GJS-400-18-LT)
Impeller – standard	Plastic / grey cast iron (EN-GJL-200) (depending on type) *)		Grey cast iron (EN-GJL-200)	Plastic / grey cast iron (EN-GJL-200) (depending on type) *)	Grey cast iron (EN-GJL-200)
Impeller – optional	–		Red bronze (G-CuSn10)	–	Red bronze (G-CuSn10)
Shaft	Stainless steel 1.4021		Stainless steel 1.4122	Stainless steel 1.4021	Stainless steel 1.4122
Mechanical seal	AQEGG		AQEGG	AQEGG	AQEGG
Other mechanical seals	on request		on request	on request	on request

• = available, – = not available

*) See Table "Dimensions, weights"

Technical Data

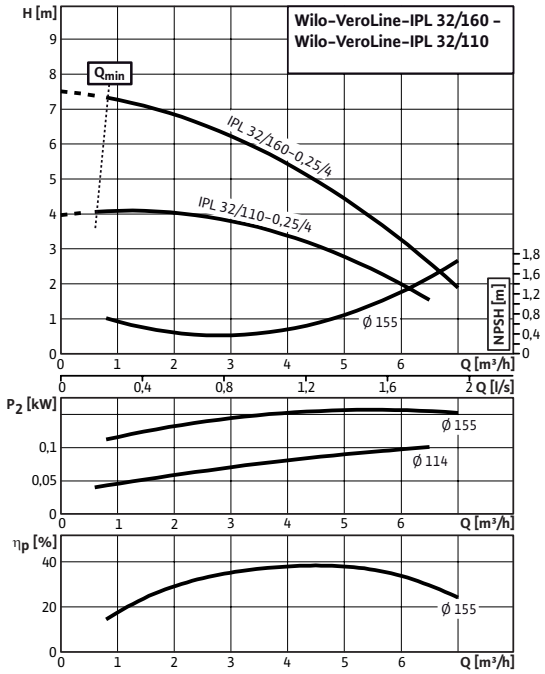
	Wilo-VeroLine-IPL	Wilo-CronoLine-IL	Wilo-VeroTwin-DPL	Wilo-CronoTwin-DL
Electrical connection (other design versions on request)				
Mains connection standard version	3~400 V, 50 Hz	3~400 V, 50 Hz	3~400 V, 50 Hz	3~400 V, 50 Hz
Rotational speed [rpm]	1450 / 2900	960 / 1450 / 2900	1450 / 2900	1450 / 2900
Motor / electronics				
Integrated full motor protection (see accessories for necessary tripping unit)	Special design version with PTC thermistor sensor (TRS)	Special design version with PTC thermistor sensor (TRS)	Special design version with PTC thermistor sensor (TRS)	Special design version with PTC thermistor sensor (TRS)
Protection Class	IP 55	IP 55	IP 55	IP 55
Insulation Class	F	F	F	F
Speed control	Wilo control system	Wilo control system	Wilo control system	Wilo control system
Motor winding up to 3 kW	230 V Δ / 400 V Y, 50 Hz	230 V Δ / 400 V Y, 50 Hz	230 V Δ / 400 V Y, 50 Hz	230 V Δ / 400 V Y, 50 Hz
Motor winding from 4 kW	400 V Δ / 690 V Y, 50 Hz	400 V Δ / 690 V Y, 50 Hz	400 V Δ / 690 V Y, 50 Hz	400 V Δ / 690 V Y, 50 Hz
Installation options				
Pipe mounting (up to 15 kW motor power)	•	•	•	•
Support-bracket mounting	•	•	•	•

• = available, – = not available
*) See Table “Dimensions, weights”

Pump curves Wilo-VeroLine-IPL

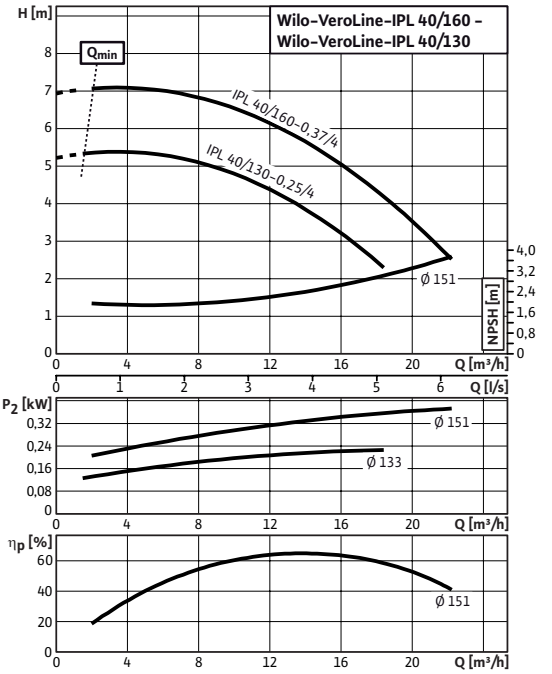
Wilo-VeroLine-IPL 32 / 110-0.25 / 4 – 32 / 160-0.25 / 4

Rotational speed 1450 rpm



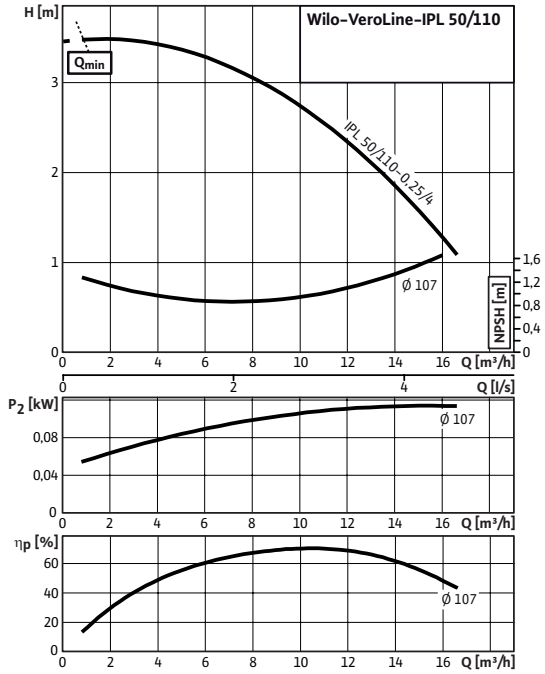
Wilo-VeroLine-IPL 40 / 130-0.25 / 4 – 40 / 160-0.37 / 4

Rotational speed 1450 rpm



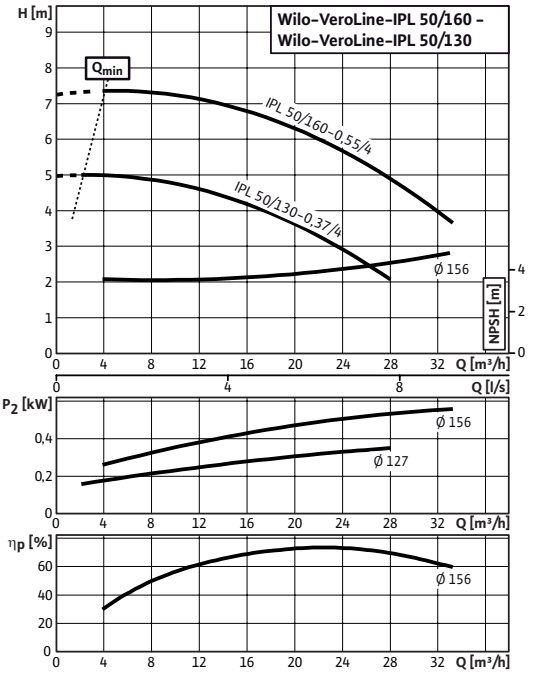
Wilo-VeroLine-IPL 50 / 110-0.25 / 4

Rotational speed 1450 rpm



Wilo-VeroLine-IPL 50 / 130-0.37 / 4 – 50 / 160-0.55 / 4

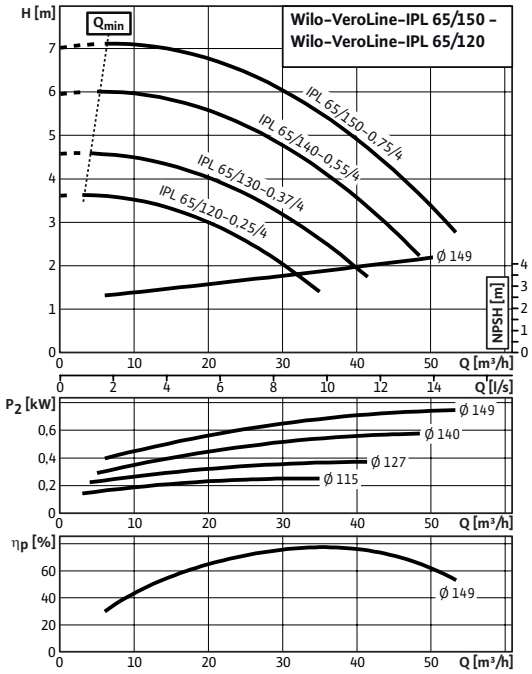
Rotational speed 1450 rpm



Pump curves Wilo-VeroLine-IPL

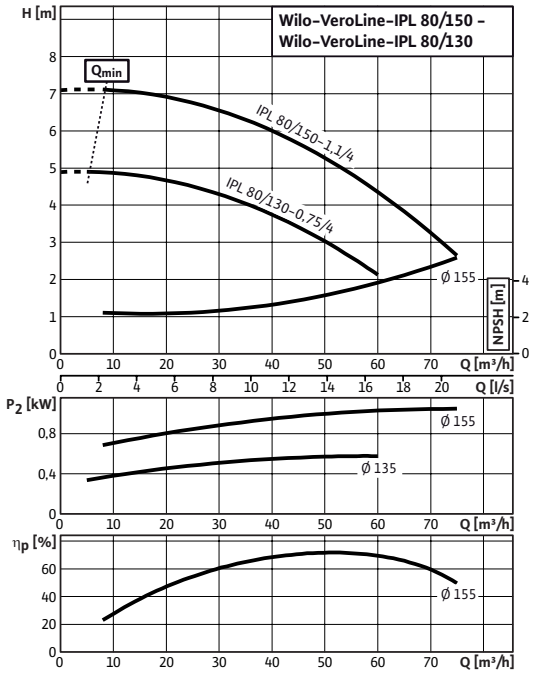
Wilo-VeroLine-IPL 65 / 120-0.25 / 4 – 65 / 150-0.75 / 4

Rotational speed 1450 rpm



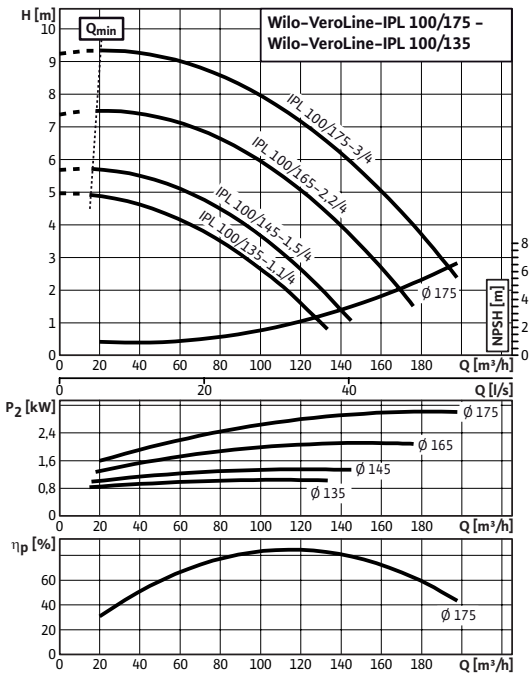
Wilo-VeroLine-IPL 80 / 130-0.75 / 4 – 80 / 150-1.1 / 4

Rotational speed 1450 rpm



Wilo-VeroLine-IPL 100 / 135-1.1 / 4 – 100 / 175-3 / 4

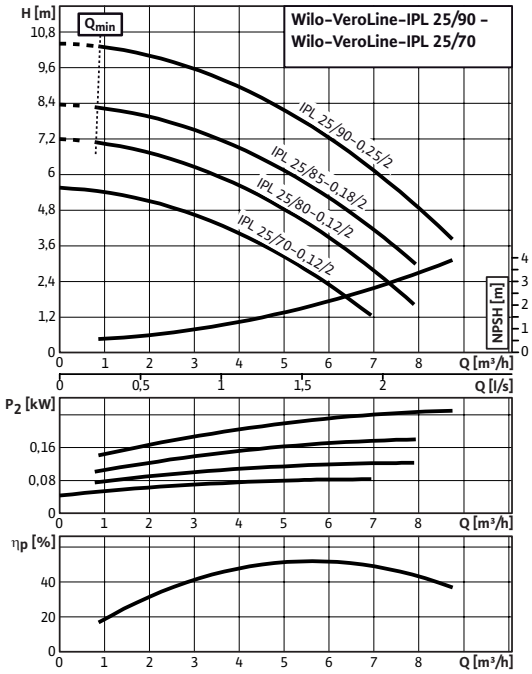
Rotational speed 1450 rpm



Pump curves Wilo-VeroLine-IPL

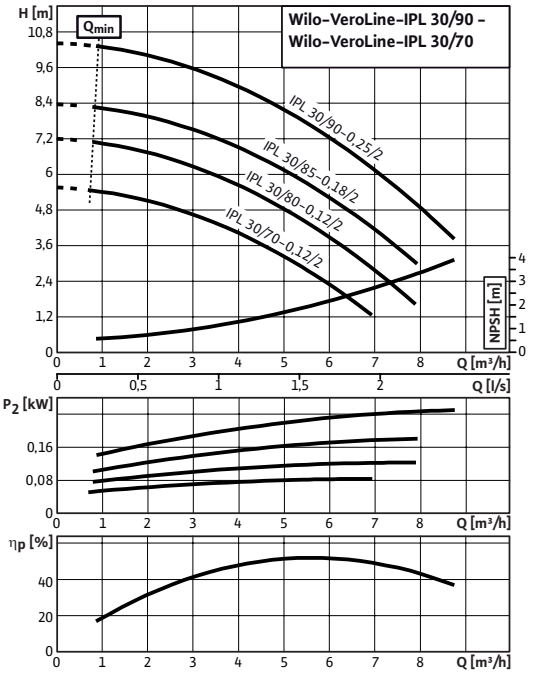
Wilo-VeroLine-IPL 25 / 70-0.12 / 2 – 25 / 90-0.25 / 2

Rotational speed 2900 rpm



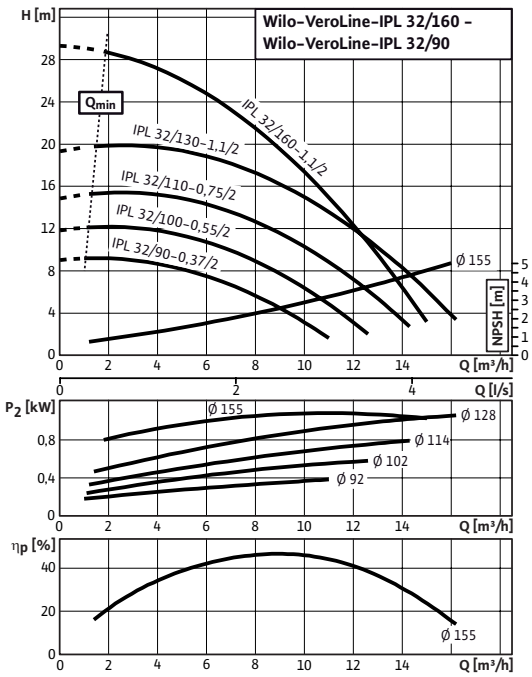
Wilo-VeroLine-IPL 30 / 70-0.12 / 2 – 30 / 90-0.25 / 2

Rotational speed 2900 rpm



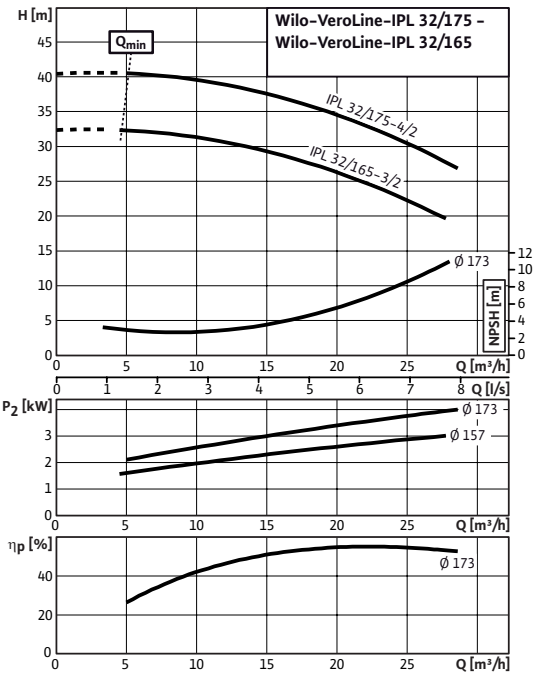
Wilo-VeroLine-IPL 32 / 90-0.37 / 2 – 32 / 160-1.1 / 2

Rotational speed 2900 rpm



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

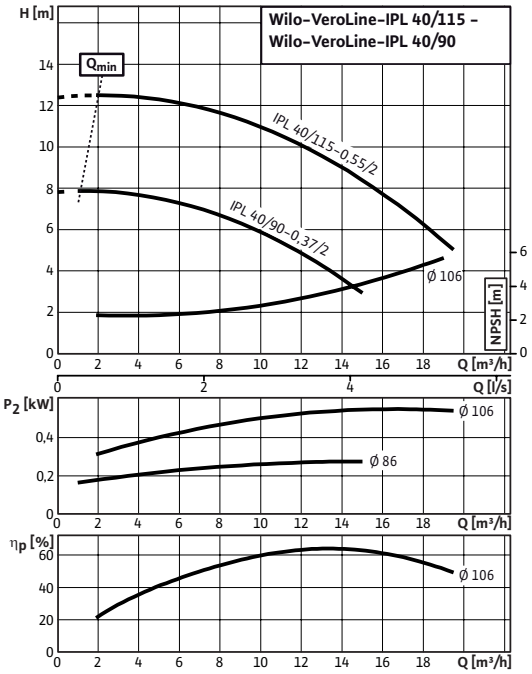
Rotational speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

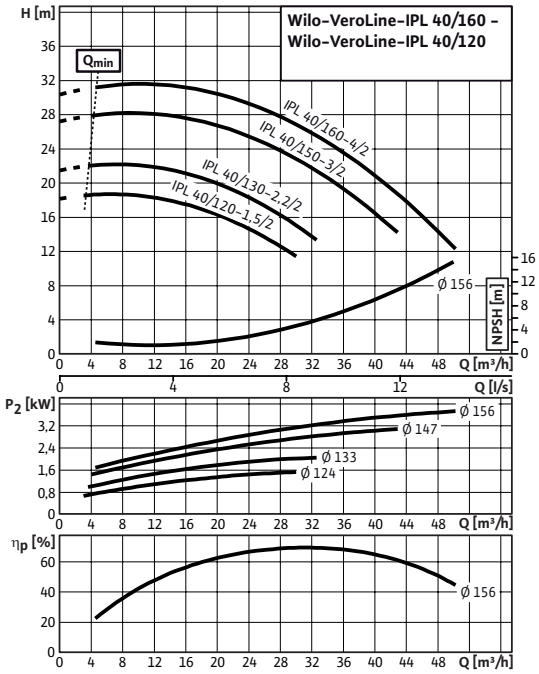
Wilo-VeroLine-IPL 40 / 90-0.37 / 2 – 40 / 115-0.55 / 2

Rotational speed 2900 rpm



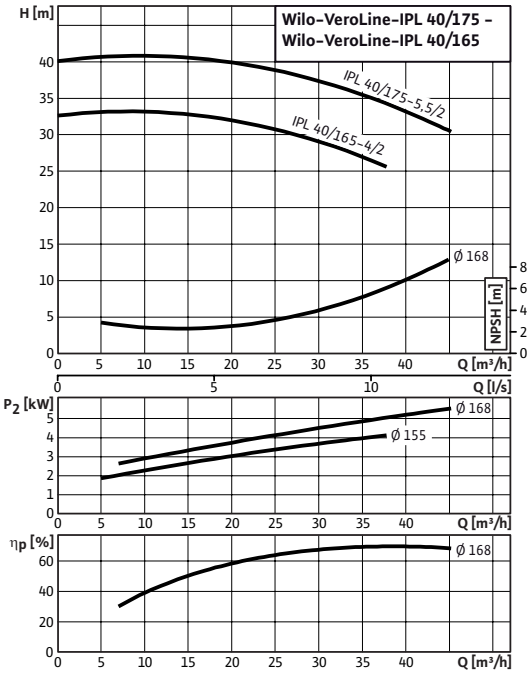
Wilo-VeroLine-IPL 40 / 120-1.5 / 2 – 40 / 160-4 / 2

Rotational speed 2900 rpm



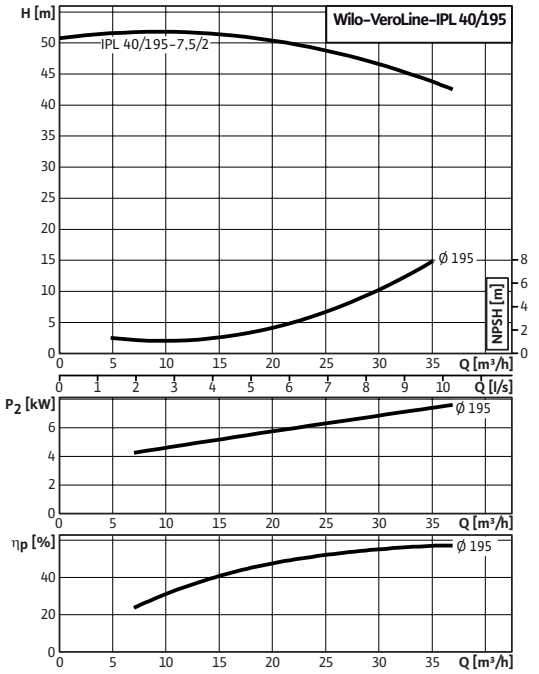
Wilo-VeroLine-IPL 40 / 165-4 / 2 – 40 / 175-5.5 / 2

Rotational speed 2900 rpm



Wilo-VeroLine-IPL 40 / 195-7.5 / 2

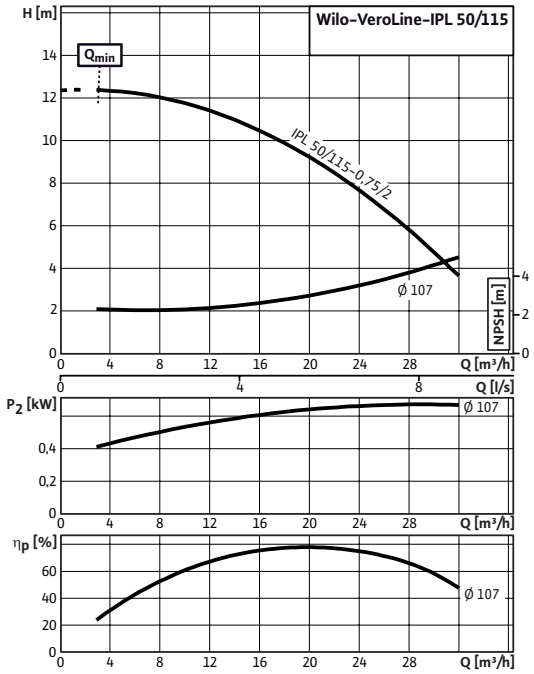
Rotational speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

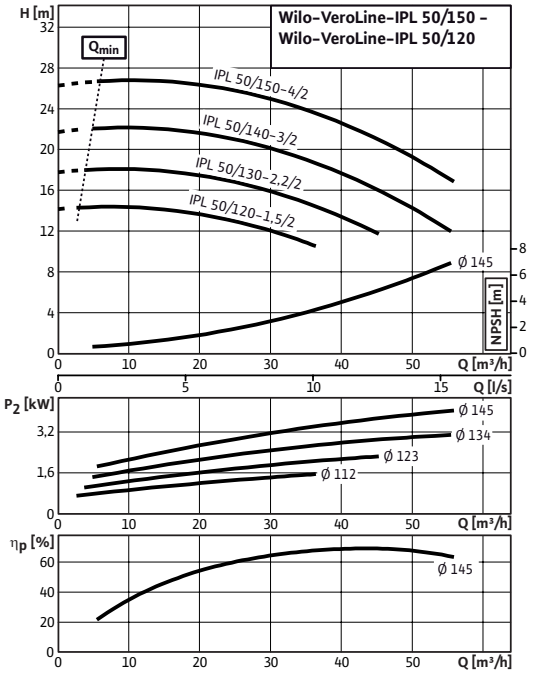
Wilo-VeroLine-IPL 50 / 115-0.75 / 2

Rotational speed 2900 rpm



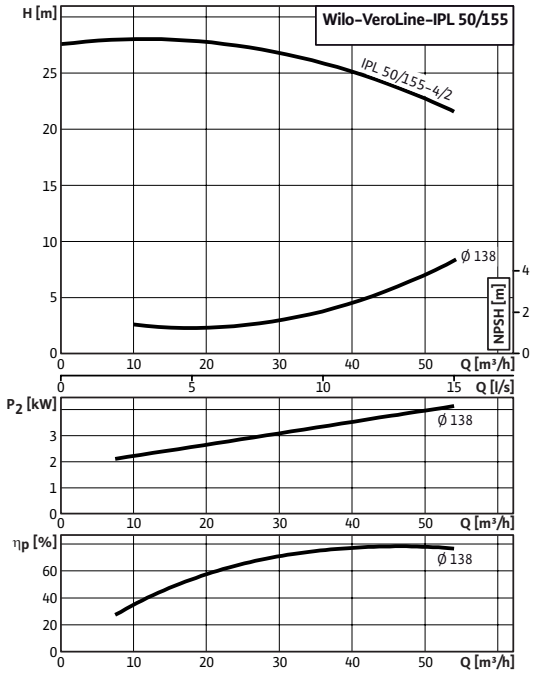
Wilo-VeroLine-IPL 50 / 120-1.5 / 2 – 50 / 150-4 / 2

Rotational speed 2900 rpm



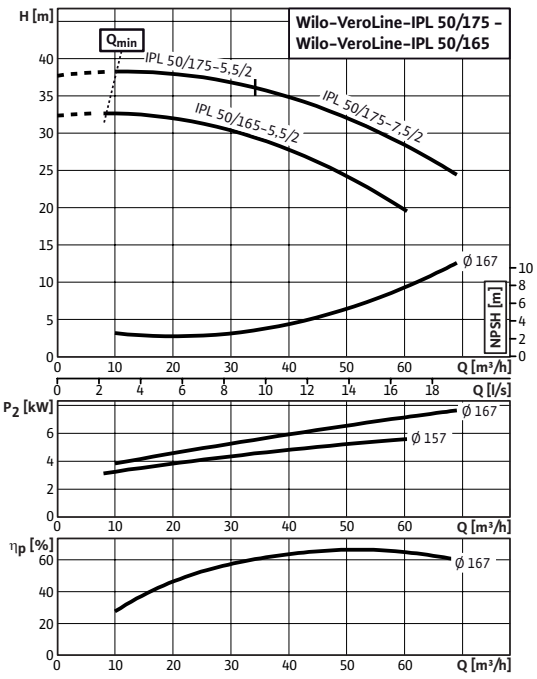
Wilo-VeroLine-IPL 50 / 155-4 / 2

Rotational speed 2900 rpm



Wilo-VeroLine-IPL 50 / 165-5.5 / 2 – 50 / 175-7.5 / 2

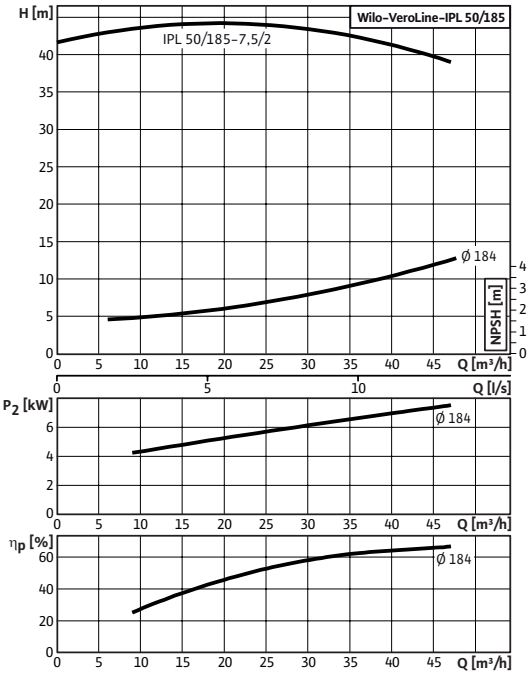
Rotational speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

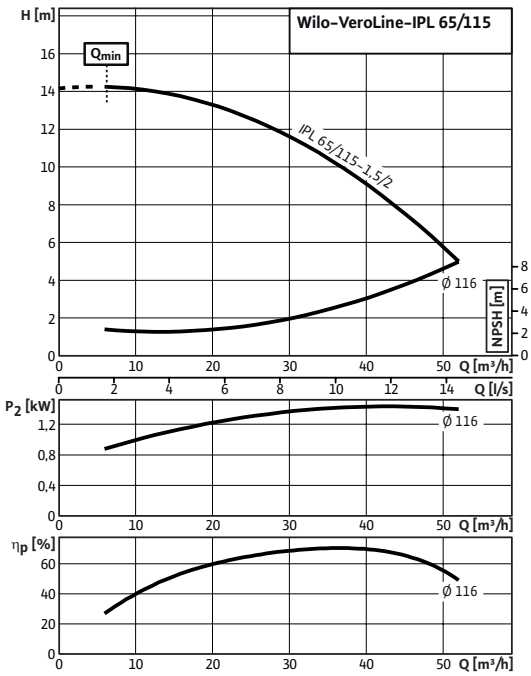
Wilo-VeroLine-IPL 50 / 185-7.5 / 2

Rotational speed 2900 rpm



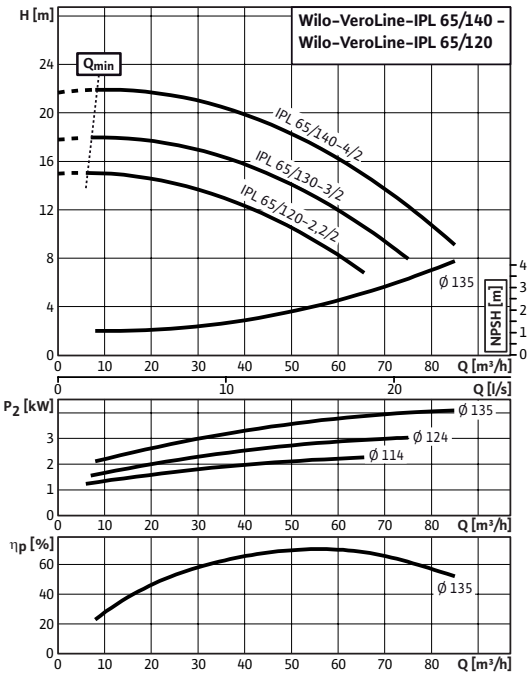
Wilo-VeroLine-IPL 65 / 115-1.5 / 2

Rotational speed 2900 rpm



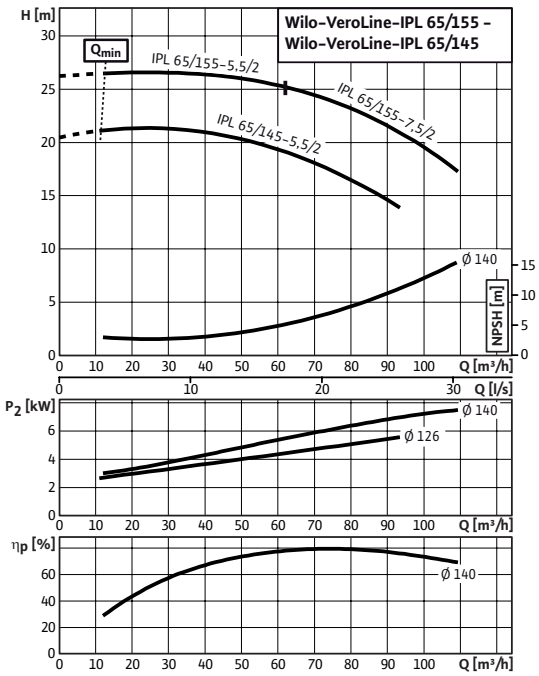
Wilo-VeroLine-IPL 65 / 120-2.2 / 2 – 65 / 140-4 / 2

Rotational speed 2900 rpm



Wilo-VeroLine-IPL 65 / 145-5.5 / 2 – 65 / 155-7.5 / 2

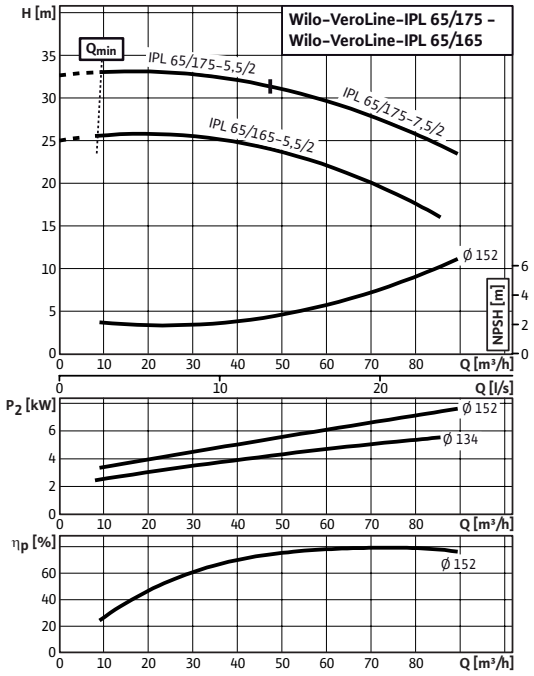
Rotational speed 2900 rpm



Pump curves Wilo-VeroLine-IPL

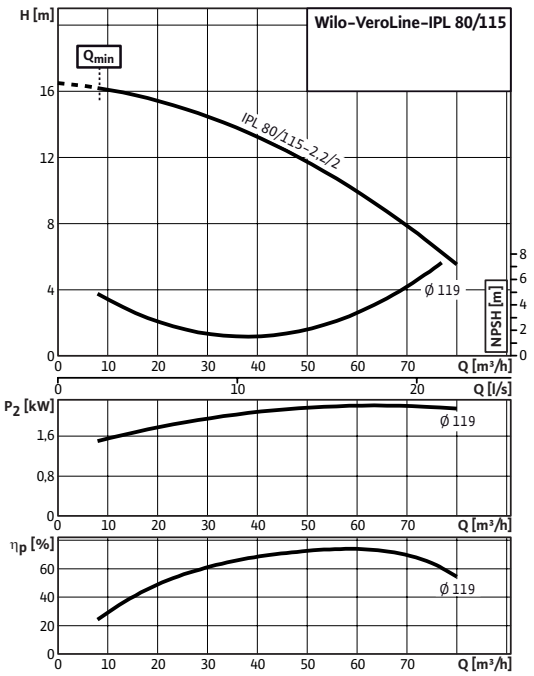
Wilo-VeroLine-IPL 65 / 165-5.5 / 2 – 65 / 175-7.5 / 2

Rotational speed 2900 rpm



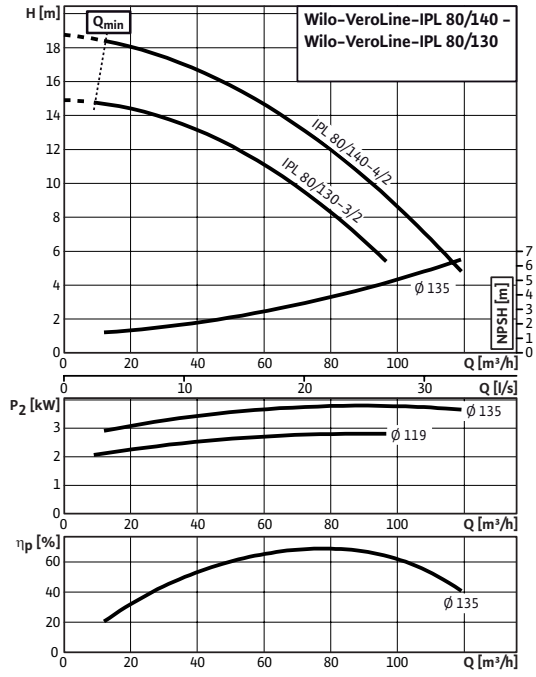
Wilo-VeroLine-IPL 80 / 115-2.2 / 2

Rotational speed 2900 rpm



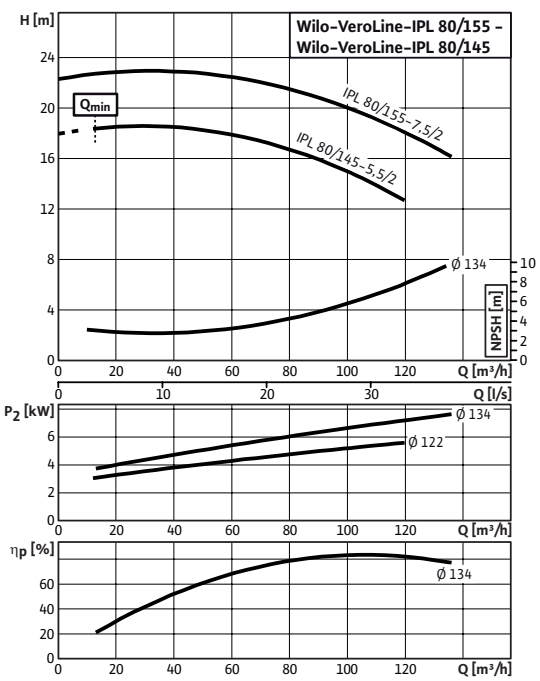
Wilo-VeroLine-IPL 80 / 130-3 / 2 – 80 / 140-4 / 2

Rotational speed 2900 rpm



Wilo-VeroLine-IPL 80 / 145-5.5 / 2 – 80 / 155-7.5 / 2

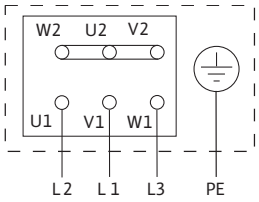
Rotational speed 2900 rpm



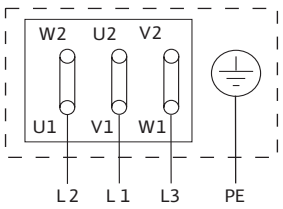
Terminal diagram, Motor Data Wilo-VeroLine-IPL

Terminal Diagrams

Star activation Y



Delta activation Δ



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

P2 ≤ 3 kW 3~400 V Y
3~230 V Δ
P2 ≥ 4 kW 3~690 V Y
3~400 V Δ

After removing the bridge Y-Δ-starting is possible.

Motor Data (1450 rpm)

Wilo-VeroLine-IPL ...	Nominal current (approximately)	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
1.10 kW	2.90	0.78	0.74
2.20 kW	4.70	0.83	0.82
3.00 kW	6.40	0.83	0.83

Note motor type label data!

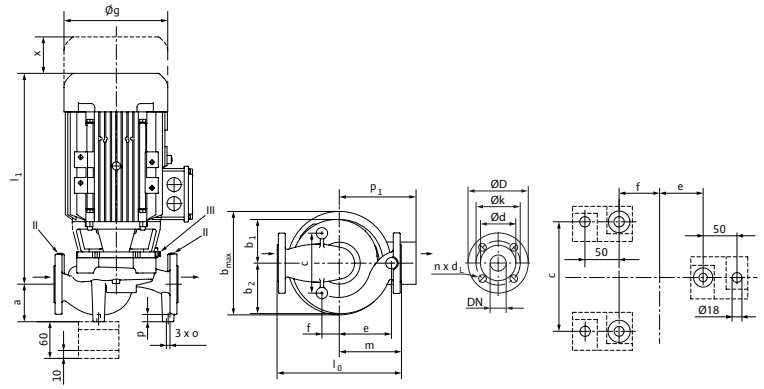
Motor Data (2900 rpm)

Wilo-VeroLine-IPL ...	Nominal current (approximately)	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	1.01	0.84	0.68
0.55 kW	1.40	0.82	0.70
0.75 kW	2.00	0.86	0.68
1.10 kW	2.60	0.84	0.79
1.50 kW	3.20	0.81	0.80
2.20 kW	4.60	0.87	0.81
3.00 kW	6.00	0.86	0.84
4.00 kW	8.05	0.86	0.85
5.50 kW	10.50	0.90	0.84
7.50 kW	14.30	0.90	0.86

Note motor type label data!

Dimensions, weights Wilo-VeroLine-IPL

Dimension drawing



Note:
Housing with feed for installation on a base, mounting brackets on request

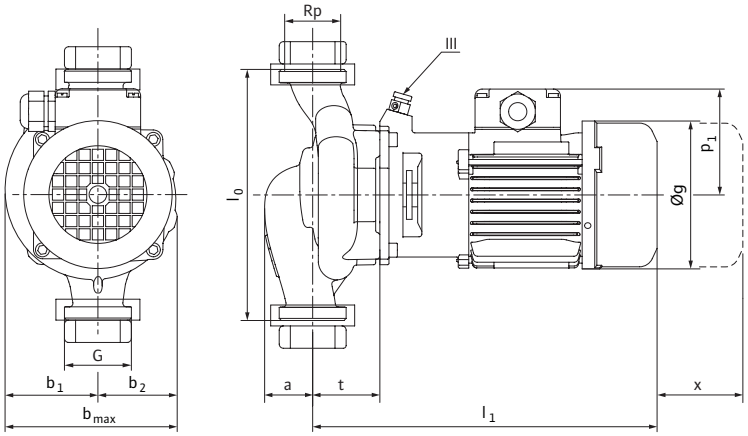
Dimensions, Weights (1450 rpm with flange connection)

Wilo-VeroLine-IPL ...	Nominal flange diameter	Dimensions															Impeller*	Weight approximately
	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]															–	[kg]
32/110-0.25/4	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	–	150	P	20
32/160-0.25/4	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	–	150	P	20
40/130-0.25/4	40	320	75	113	121	234	90	40	50	143	289	160	M10	20	–	150	P	21
40/160-0.37/4	40	320	75	113	121	234	90	40	50	143	289	160	M10	20	–	150	P	22
50/110-0.25/4	50	280	83	91	101	192	90	40	50	143	300	140	M10	20	–	150	P	22
50/130-0.37/4	50	340	86	116	131	247	104	40	50	143	291	170	M10	20	–	150	P	25
50/160-0.55/4	50	340	86	116	131	247	104	40	50	158	327	170	M10	20	–	150	P	27
65/120-0.25/4	65	340	93	119	138	257	135	40	55	143	297	170	M10	20	–	150	P	26
65/130-0.37/4	65	340	93	119	138	257	135	40	55	143	297	170	M10	20	–	150	P	27
65/140-0.55/4	65	340	93	119	138	257	135	40	55	158	333	170	M10	20	–	150	P	30
65/150-0.75/4	65	340	93	119	138	257	135	40	55	158	333	170	M10	20	–	150	P	31
80/130-0.75/4	80	360	105	125	153	278	135	40	55	158	339	180	M10	20	–	150	P	34
80/150-1.1/4	80	360	105	125	153	278	135	40	55	158	339	180	M10	20	–	150	P	35
100/135-1.1/4	100	500	120	159	197	356	200	226	60	176	398	250	M12	20	148	150	CI	69
100/145-1.5/4	100	500	120	159	197	356	200	226	60	176	423	250	M12	20	148	150	CI	69
100/165-2.2/4	100	500	120	159	197	356	200	226	60	196	450	250	M12	20	155	150	CI	76
100/175-3/4	100	500	120	159	197	356	200	226	60	196	450	250	M12	20	155	150	CI	77

Note concerning l_1
With version N (Standard motor) the dimensions depend on the motor version.
*Material impeller: CI grey cast iron; P Plastic

Dimensions, weights Wilo-VeroLine-IPL

Dimension drawing



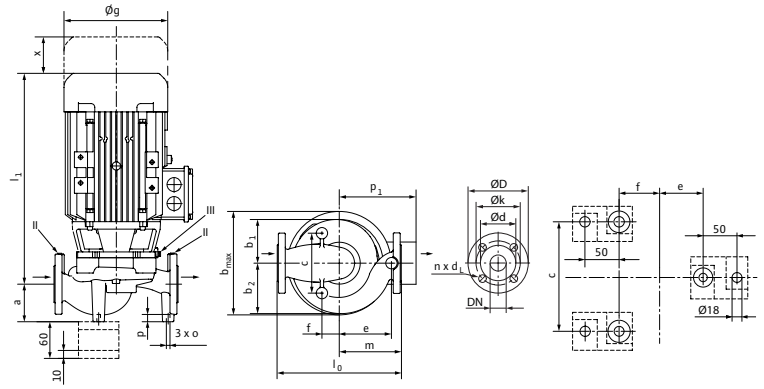
Dimensions, Weights (2900 rpm with threaded connection)

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

Note concerning l_1
With version N (Standard motor) the dimensions depend on the motor version.
*Material impeller: CI grey cast iron; P Plastic

Dimensions, weights Wilo-VeroLine-IPL

Dimension drawing



Note:
Housing with feed for installation on a base, mounting brackets on request

Dimensions, Weights (2900 rpm with flange connection)

Wilo-VeroLine-IPL ...	Nominal flange diameter	Dimensions															Impeller*	Weight approximately
	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]															–	[kg]
32/90-0.37/2	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	–	150	P	20
32/100-0.55/2	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	–	150	P	18
32/110-0.75/2	32	260	70	101	106	207	90	40	50	143	295	130	M10	20	–	150	P	22
32/130-1.1/2	32	260	70	101	106	207	90	40	50	158	331	130	M10	20	–	150	P	24
32/160-1.1/2	32	260	70	101	106	207	90	40	50	158	331	130	M10	20	–	150	P	24
32/165-3/2	32	320	100	112	124	236	120	132	68	217	396	155	M10	20	160	150	CI	43
32/175-4/2	32	320	100	112	124	236	120	132	68	220	412	155	M10	20	168	150	CI	50
40/90-0.37/2	40	250	75	80	90	170	90	40	50	143	294	125	M10	20	–	150	P	19
40/115-0.55/2	40	250	75	80	90	170	90	40	50	143	294	125	M10	20	–	150	P	19
40/120-1.5/2	40	320	75	113	121	234	90	40	50	193	325	160	M10	20	–	150	P	30
40/130-2.2/2	40	320	75	113	121	234	90	40	50	193	353	160	M10	20	–	150	P	32
40/150-3/2	40	320	75	113	121	234	90	40	50	217	376	160	M10	20	–	150	P	37
40/160-4/2	40	320	75	113	121	234	90	40	50	232	419.5	160	M10	20	–	150	P	44
40/165-4/2	40	340	82	113	129	242	130	149	58	220	426	170	M10	20	168	150	CI	54
40/175-5.5/2	40	340	82	113	129	242	130	149	58	232	446	170	M10	20	168	150	CI	55
40/195-7.5/2	40	440	110	145	149	294	180	172	78	279	520	190	M10	20	188	150	CI	84
50/115-0.75/2	50	280	83	91	101	192	90	40	50	143	300	140	M10	20	–	150	P	24
50/120-1.5/2	50	340	86	116	131	247	104	40	50	193	349.5	170	M10	20	–	150	P	33
50/130-2.2/2	50	340	86	116	131	247	104	40	50	193	349.5	170	M10	20	–	150	P	35
50/140-3/2	50	340	86	116	131	247	104	40	50	217	378	170	M10	20	–	150	P	40
50/150-4/2	50	340	86	116	131	247	104	40	50	232	421.5	170	M10	20	–	150	P	47
50/155-4/2	50	340	105	102	119	232	140	130	40	232	463	150	M10	20	168	150	CI	60
50/165-5.5/2	50	340	103	120	138	279	164	143	48	279	526	170	M10	20	188	150	CI	76
50/175-5.5/2	50	340	103	120	138	295	164	143	48	279	526	170	M10	20	188	150	CI	76

Dimensions, weights Wilo-VeroLine-IPL

Dimensions, Weights (2900 rpm with flange connection)

Wilo-VeroLine-IPL ...	Nominal flange diameter	Dimensions															Impeller*	Weight approximately
	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]															–	[kg]
50/175-7.5/2	50	340	103	120	138	279	164	143	48	279	526	170	M10	20	188	150	CI	84
50/185-7.5/2	50	440	120	145	150	295	160	170	70	279	521	190	M10	20	188	100	CI	86
65/115-1.5/2	65	340	93	100	118	218	104	40	50	193	360.5	170	M10	20	–	150	P	34
65/120-2.2/2	65	340	93	119	138	257	135	40	55	193	355.5	170	M10	20	–	150	P	37
65/130-3/2	65	340	93	119	138	257	135	40	55	217	384	170	M10	20	–	150	P	42
65/140-4/2	65	340	93	119	138	257	135	40	55	232	427.5	170	M10	20	–	150	P	49
65/145-5.5/2	65	340	120	112	134	279	140	140	60	279	531	160	M12	20	188	150	CI	78
65/155-5.5/2	65	340	120	112	134	279	140	140	60	279	531	160	M12	20	188	150	CI	78
65/155-7.5/2	65	430	110	126	146	279	180	195	60	279	531	215	M12	20	188	150	CI	86
65/165-5.5/2	65	430	110	126	146	279	180	195	60	279	532	215	M12	20	188	150	CI	80
65/175-5.5/2	65	430	110	126	146	279	180	195	60	279	532	215	M12	20	188	150	CI	81
65/175-7.5/2	65	430	110	126	146	279	180	195	60	279	532	215	M12	20	188	150	CI	89
80/115-2.2/2	80	360	100	110	135	245	135	40	55	193	378	180	M10	20	–	150	P	40
80/130-3/2	80	360	105	125	153	278	135	40	55	217	390	180	M10	20	–	150	P	46
80/140-4/2	80	360	105	125	153	278	135	40	55	232	433.5	180	M10	20	–	150	P	53
80/145-5.5/2	80	400	105	123	151	279	180	173	57	279	548	200	M12	20	188	150	CI	85
80/155-7.5/2	80	400	105	123	151	279	180	173	57	279	548	200	M12	20	188	120	CI	93

Note concerning l_1
With version N (Standard motor) the dimensions depend on the motor version.
*Material impeller: CI grey cast iron; P Plastic

Flange dimensions

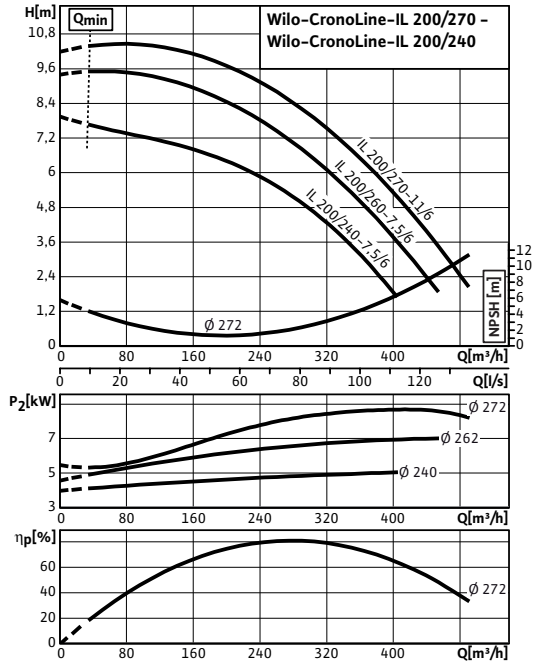
Wilo-VeroLine-IPL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[St. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19
100...	100	220	156	180	8 x 19

Flange dimensions pump – bored in accordance with EN 1092-2 PN 16, n = number of drill holes

Pump curves Wilo-CronoLine-IL

Wilo-CronoLine-IL 200 / 240-7.5 / 6 – 200 / 270-11 / 6

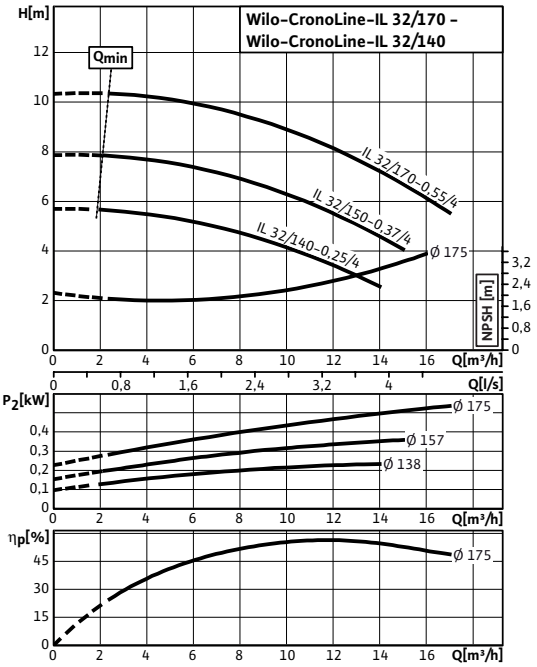
Rotational speed 960 rpm



Pump curves Wilo-CronoLine-IL

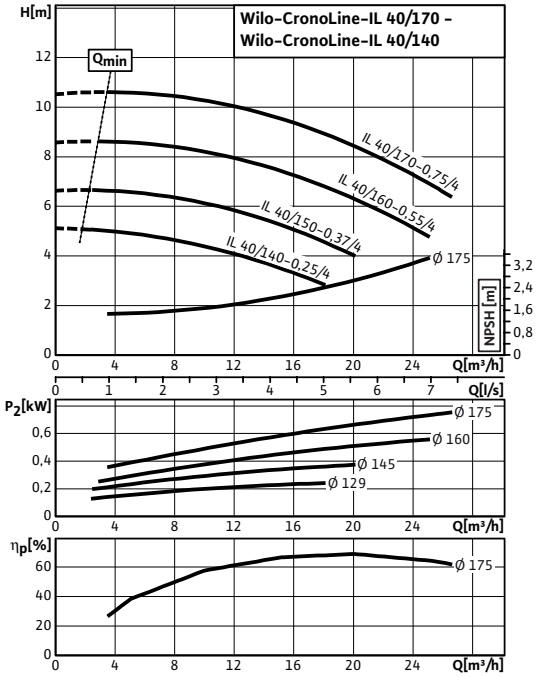
Wilo-CronoLine-IL 32 / 140-0.25 / 4 – 32 / 170-0.55 / 4

Rotational speed 1450 rpm



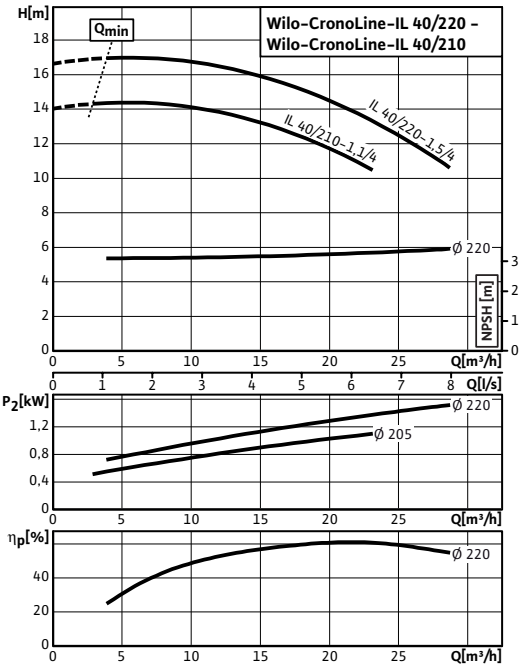
Wilo-CronoLine-IL 40 / 140-0.25 / 4 – 40 / 170-0.75 / 4

Rotational speed 1450 rpm



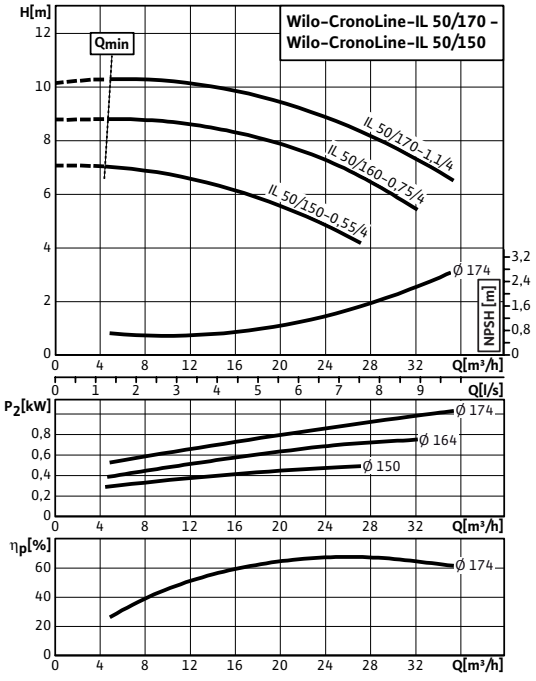
Wilo-CronoLine-IL 40 / 210-1.1 / 4 – 40 / 220-1.5 / 4

Rotational speed 1450 rpm



Wilo-CronoLine-IL 50 / 150-0.55 / 4 – 50 / 170-1.1 / 4

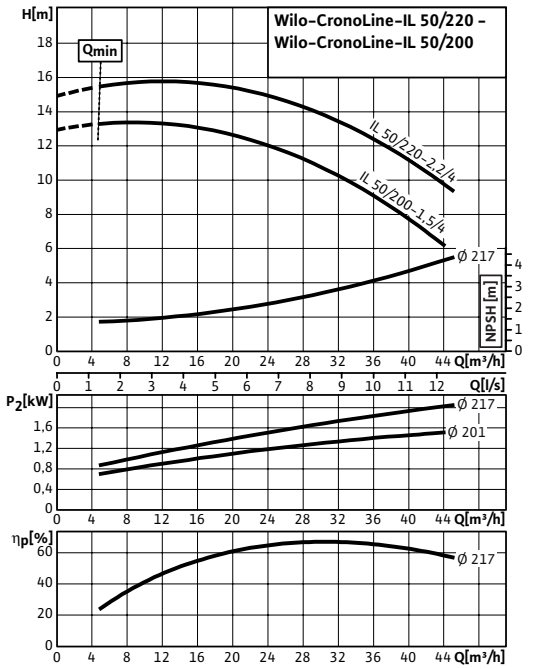
Rotational speed 1450 rpm



Pump curves Wilo-CronoLine-IL

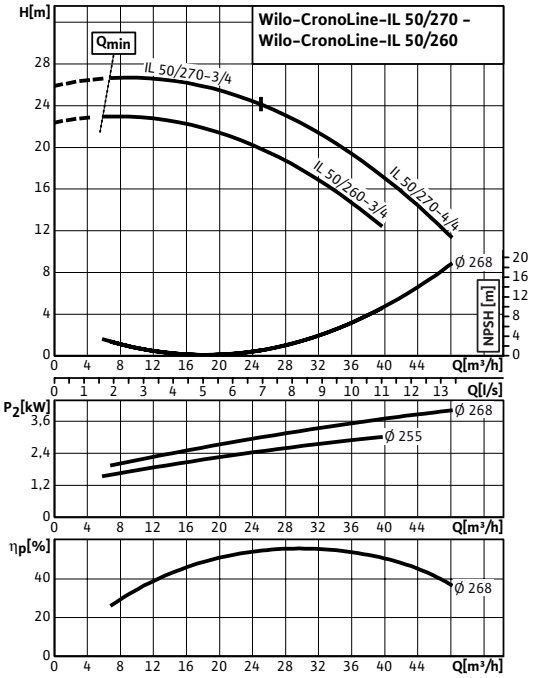
Wilo-CronoLine-IL 50 / 200-1.5 / 4 – 50 / 220-2.2 / 4

Rotational speed 1450 rpm



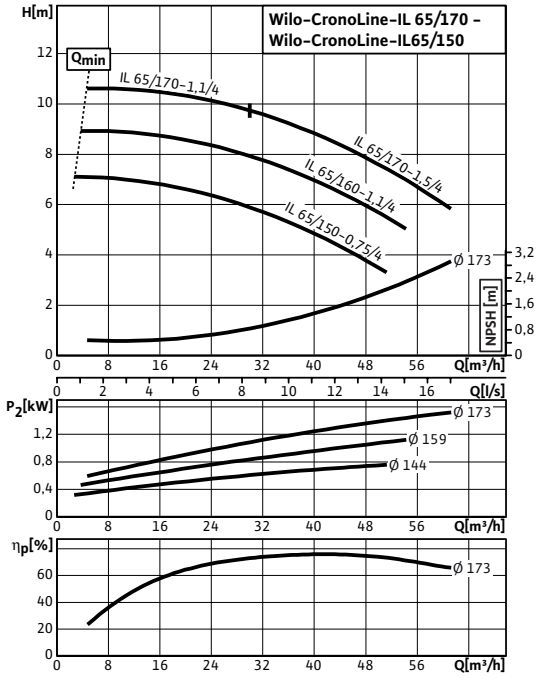
Wilo-CronoLine-IL 50 / 260-3 / 4 – 50 / 270-4 / 4

Rotational speed 1450 rpm



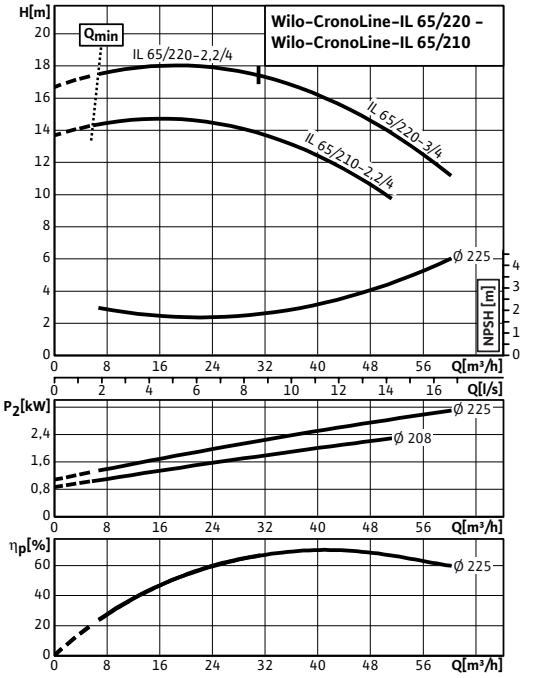
Wilo-CronoLine-IL 65 / 150-0.75 / 4 – 65 / 170-1.5 / 4

Rotational speed 1450 rpm



Wilo-CronoLine-IL 65 / 210-2.2 / 4 – 65-220 / 3 / 4

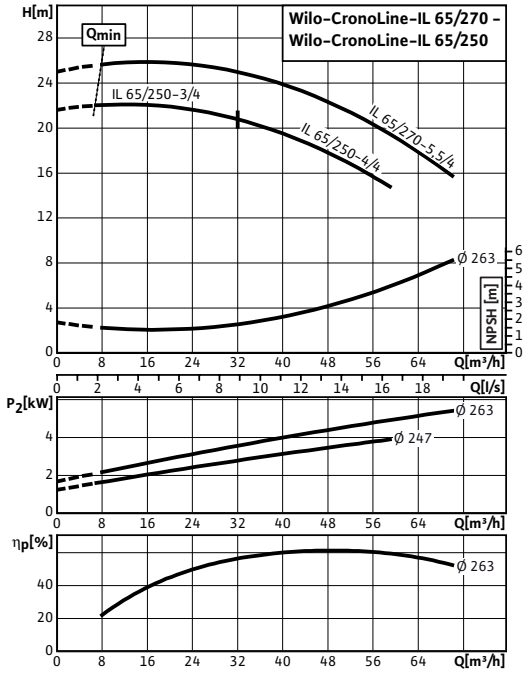
Rotational speed 1450 rpm



Pump curves Wilo-CronoLine-IL

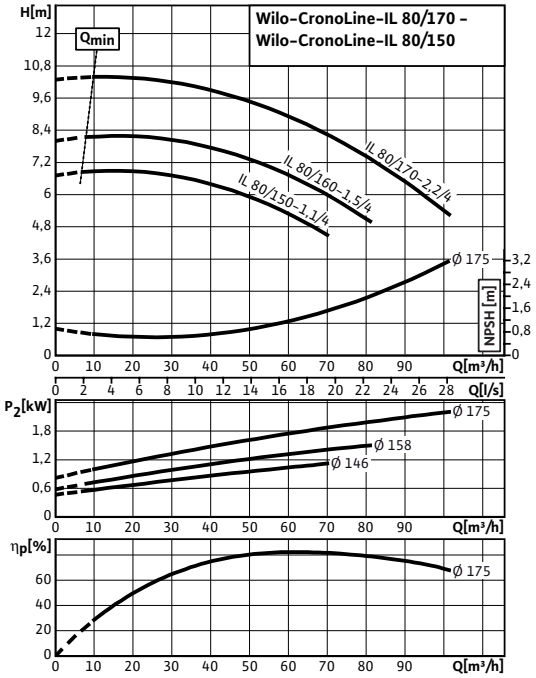
Wilo-CronoLine-IL 65 / 250-3 / 4 – 65 / 270-5.5 / 4

Rotational speed 1450 rpm



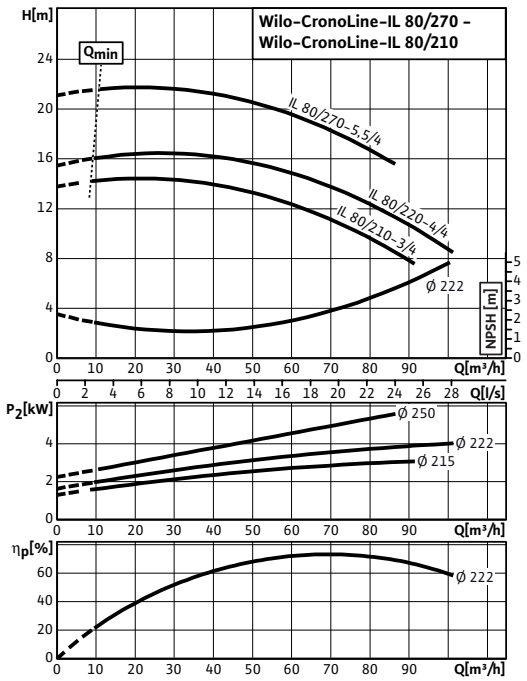
Wilo-CronoLine-IL 80 / 150-1.1 / 4 – 80 / 170-2.2 / 4

Rotational speed 1450 rpm



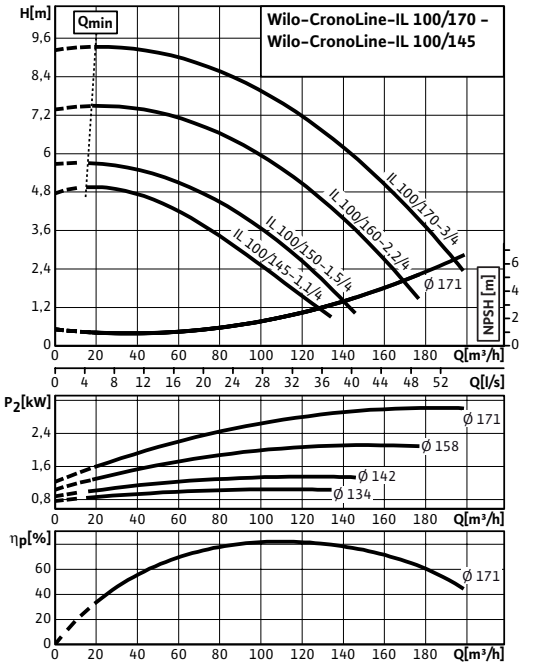
Wilo-CronoLine-IL 80 / 210-3 / 4 – 80 / 270-5.5 / 4

Rotational speed 1450 rpm



Wilo-CronoLine-IL 100 / 145-1.1 / 4 – 100 / 170-3 / 4

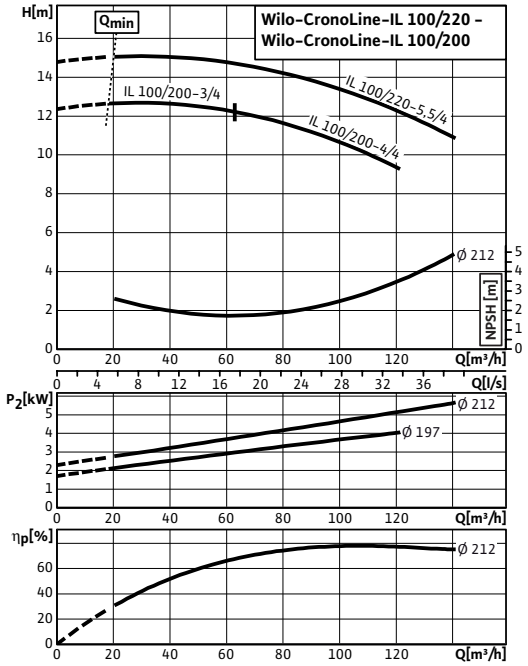
Rotational speed 1450 rpm



Pump curves Wilo-CronoLine-IL

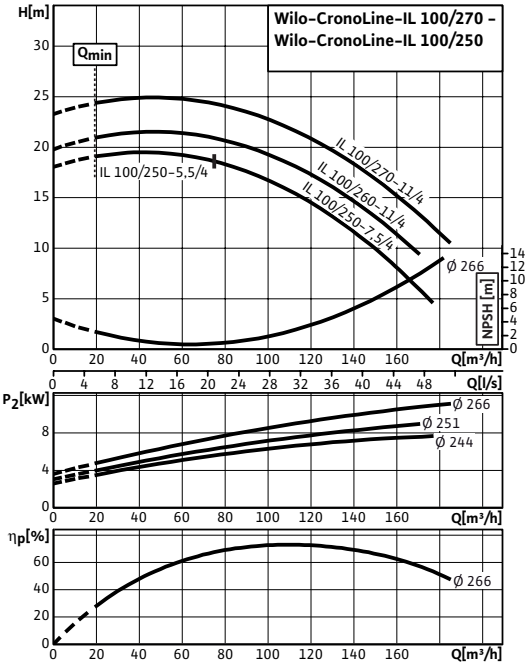
Wilo-CronoLine-IL 100 / 200-3 / 4 – 100 / 220-5.5 / 4

Rotational speed 1450 rpm



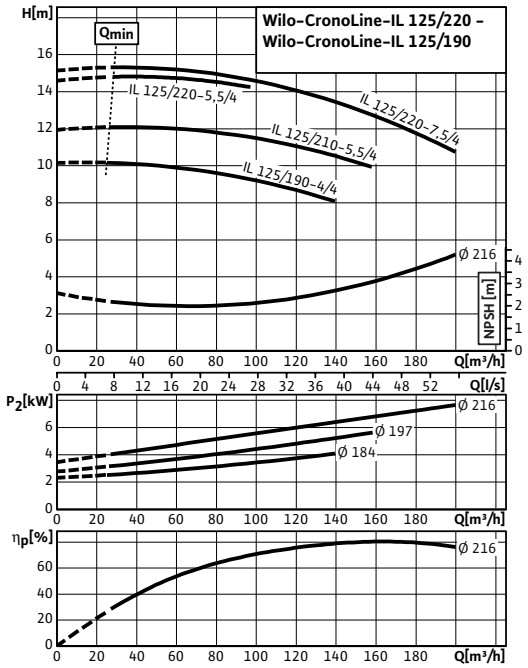
Wilo-CronoLine-IL 100 / 250-5.5 / 4 – 100 / 270-11 / 4

Rotational speed 1450 rpm



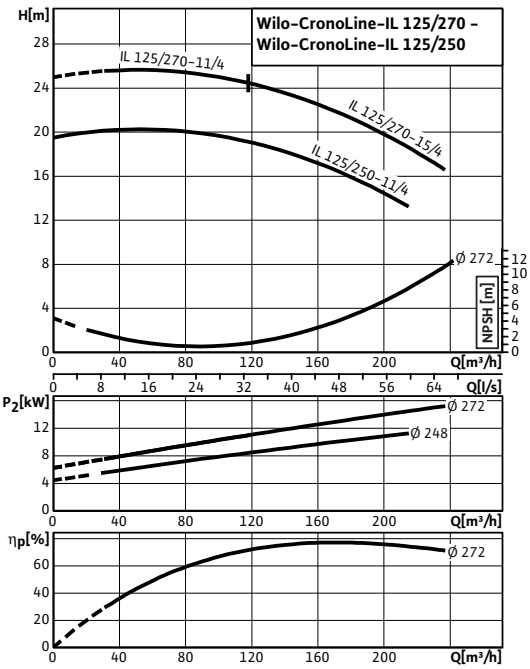
Wilo-CronoLine-IL 125 / 190-4 / 4 – 125 / 220-7.5 / 4

Rotational speed 1450 rpm



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

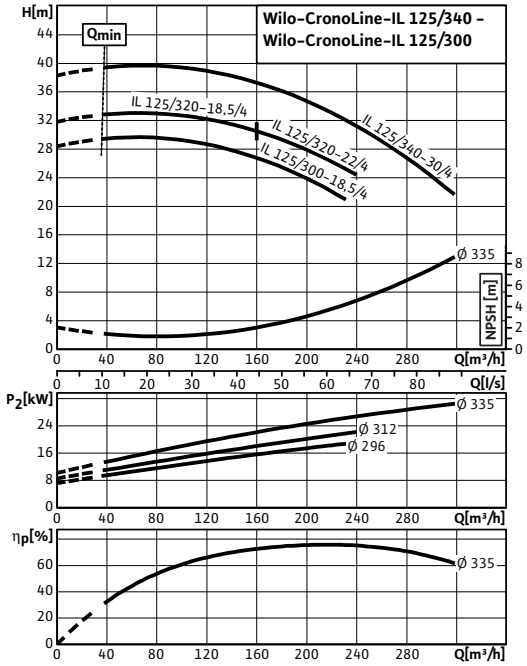
Rotational speed 1450 rpm



Pump curves Wilo-CronoLine-IL

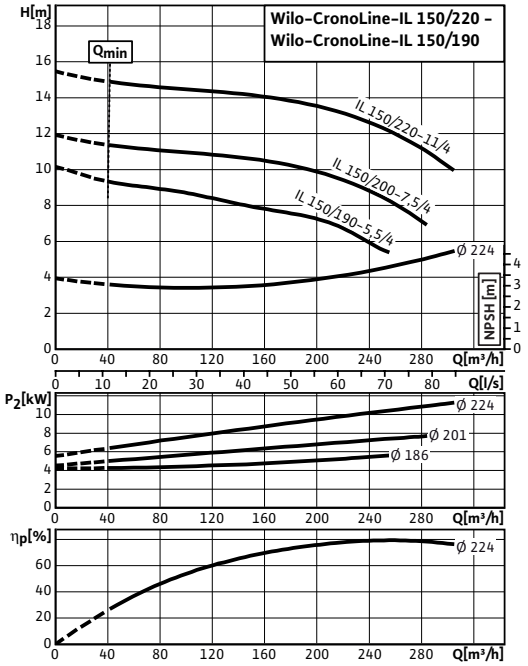
Wilo-CronoLine-IL 125 / 300-18.5 / 4 – 125 / 340-30 / 4

Rotational speed 1450 rpm



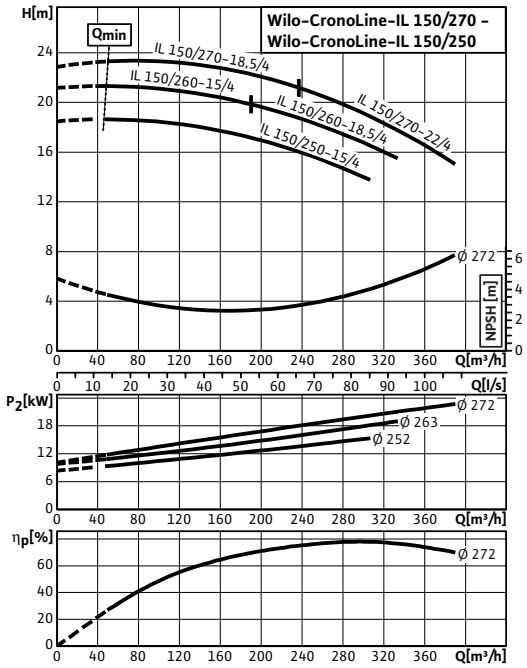
Wilo-CronoLine-IL 150 / 190-5.5 / 4 – 150 / 220-11 / 4

Rotational speed 1450 rpm



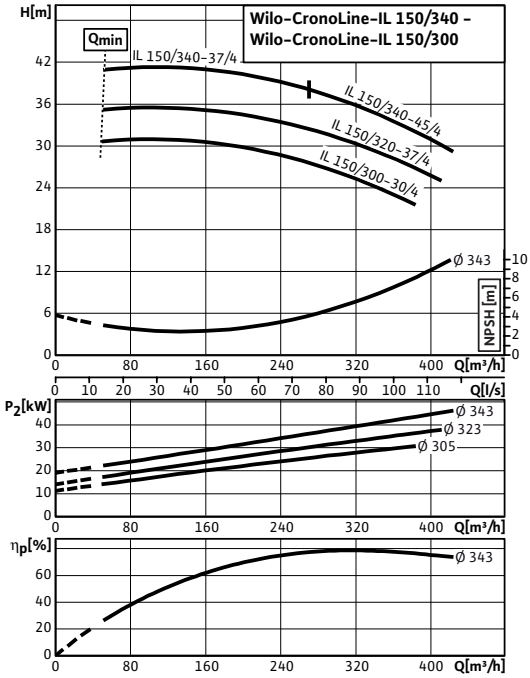
Wilo-CronoLine-IL 150 / 250-15 / 4 – 150 / 270-18.5 / 4

Rotational speed 1450 rpm



Wilo-CronoLine-IL 150 / 300-30 / 4 – 150 / 340-45 / 4

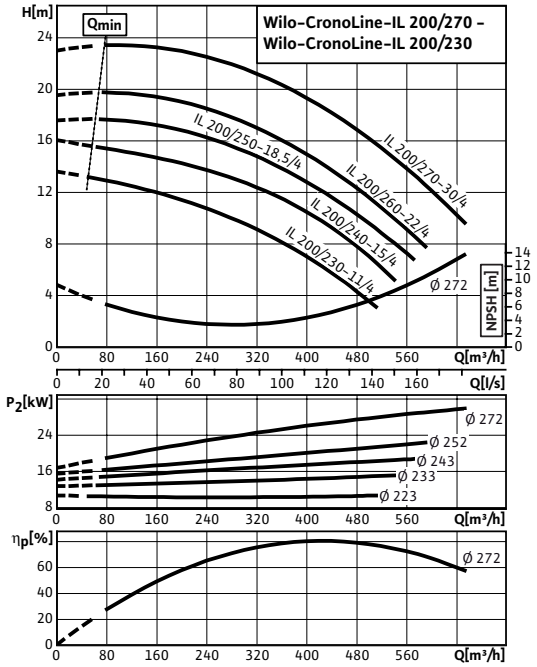
Rotational speed 1450 rpm



Pump curves Wilo-CronoLine-IL

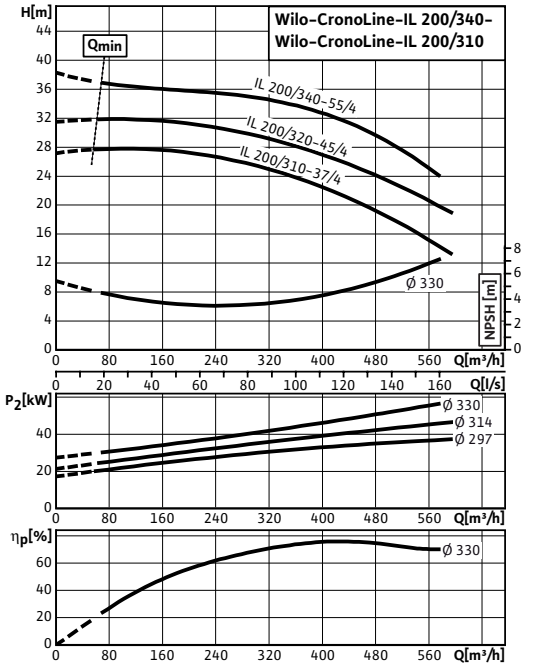
Wilo-CronoLine-IL 200 / 230-11 / 4 – 200 / 270-30 / 4

Rotational speed 1450 rpm



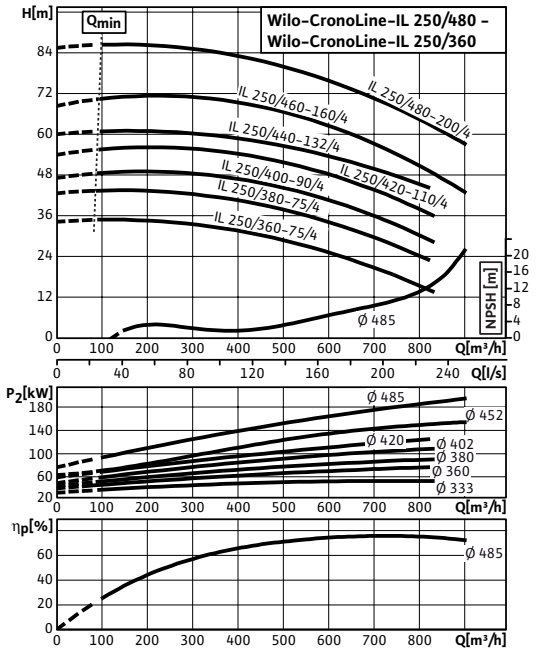
Wilo-CronoLine-IL 200 / 310-37 / 4 – 200 / 340-55 / 4

Rotational speed 1450 rpm



Wilo-CronoLine-IL 250 / 360-75 / 4 – 250 / 480-200 / 4

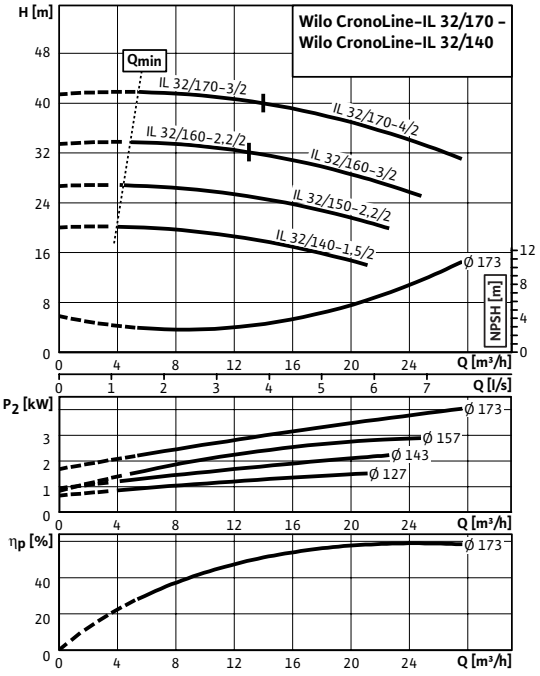
Rotational speed 1450 rpm



Pump curves Wilo-CronoLine-IL

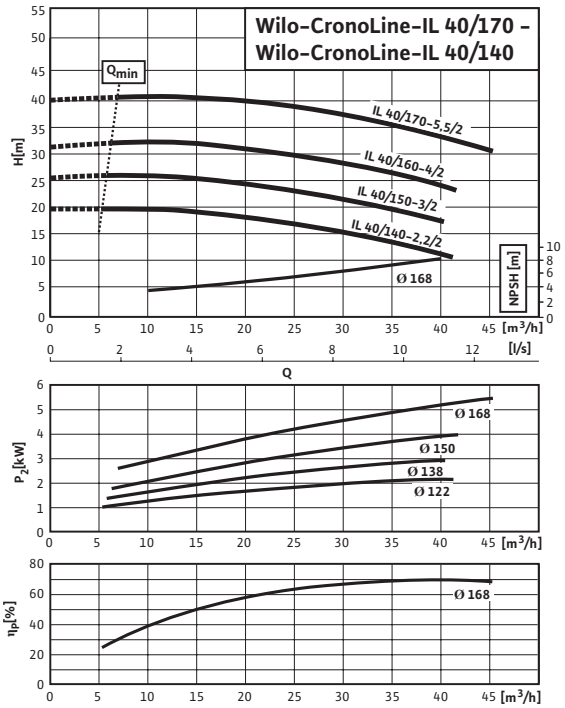
Wilo-CronoLine-IL 32 / 140-1.5 / 2 – 32 / 170-4 / 2

Rotational speed 2900 rpm



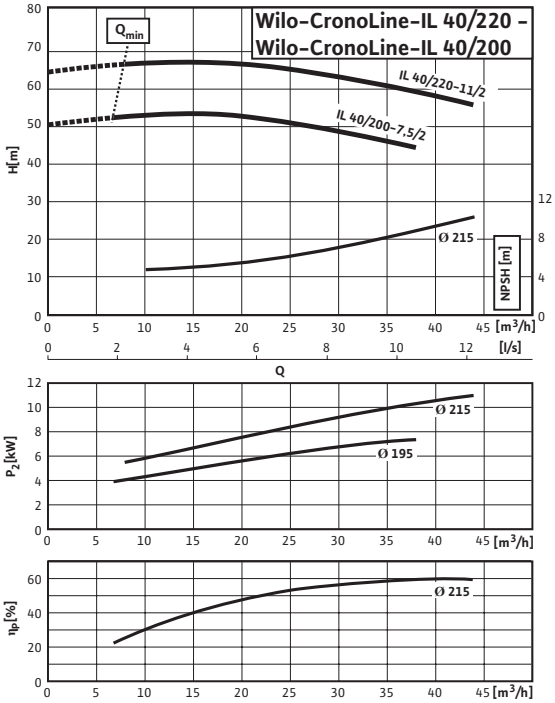
Wilo-CronoLine-IL 40 / 140-2.2 / 2 – 40 / 170-5.5 / 2

Rotational speed 2900 rpm



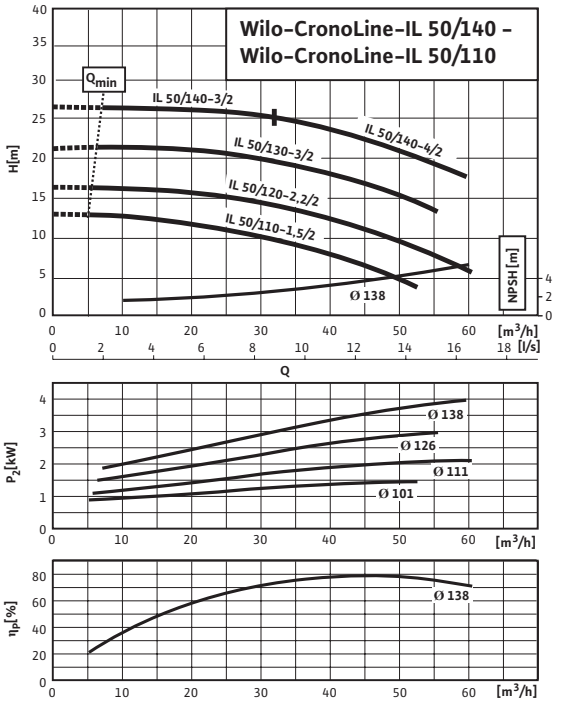
Wilo-CronoLine-IL 40 / 200-7.5 / 2 – 40 / 220-11 / 2

Rotational speed 2900 rpm



Wilo-CronoLine-IL 50 / 110-1.5 / 2 – 50 / 140-4 / 2

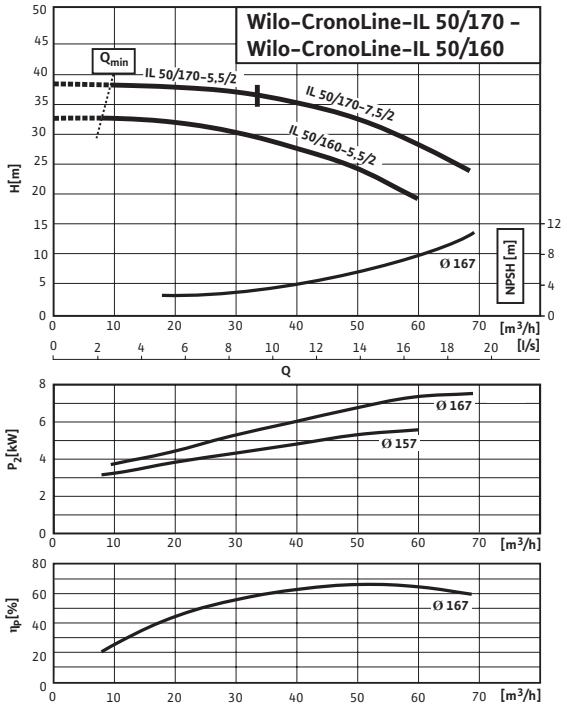
Rotational speed 2900 rpm



Pump curves Wilo-CronoLine-IL

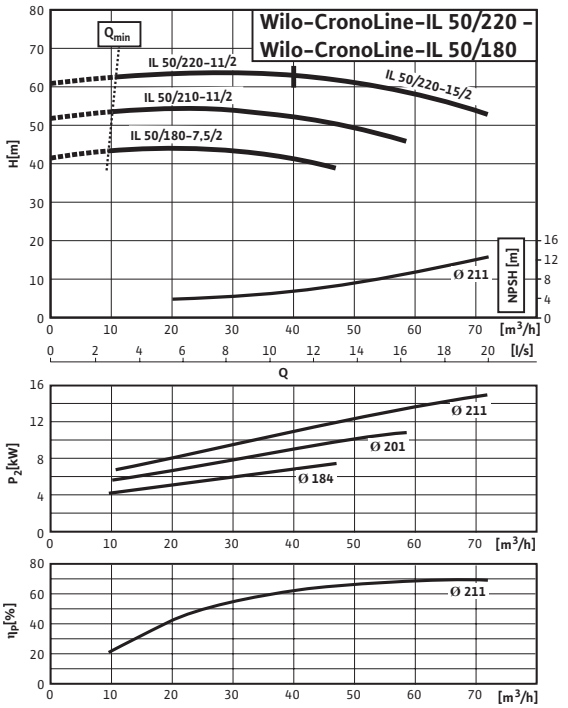
Wilo-CronoLine-IL 50 / 160-5.5 / 2 – 50 / 170-7.5 / 2

Rotational speed 2900 rpm



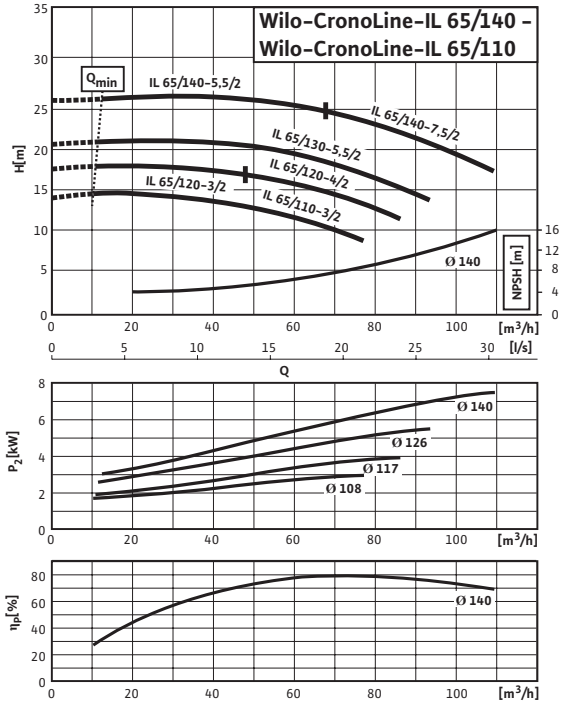
Wilo-CronoLine-IL 50 / 180-7.5 / 2 – 50 / 220-15 / 2

Rotational speed 2900 rpm



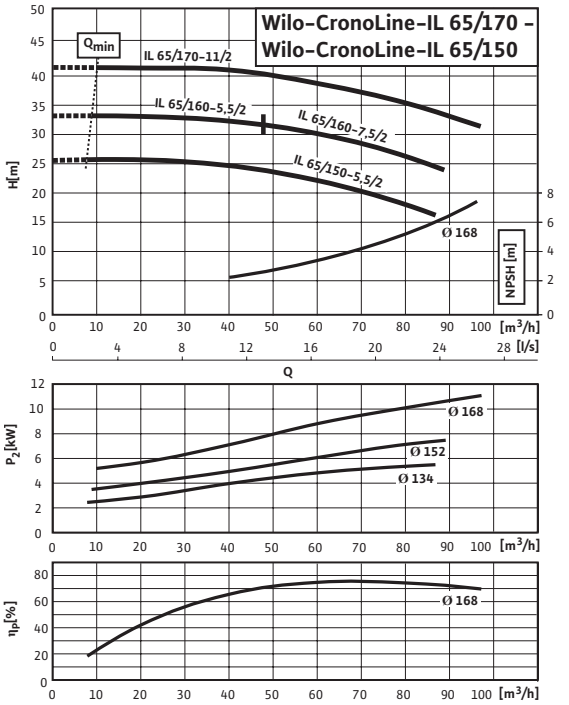
Wilo-CronoLine-IL 65 / 110-3 / 2 – 65 / 140-7.5 / 2

Rotational speed 2900 rpm



Wilo-CronoLine-IL 65 / 150-5.5 / 2 – 65 / 170-11 / 2

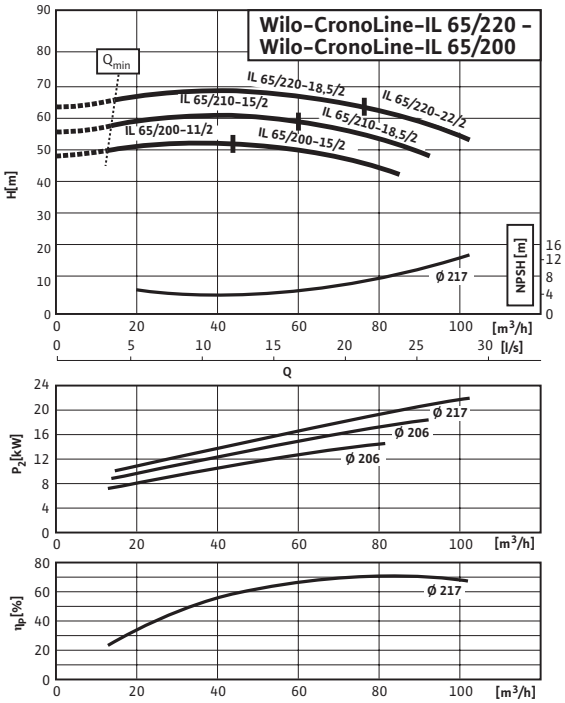
Rotational speed 2900 rpm



Pump curves Wilo-CronoLine-IL

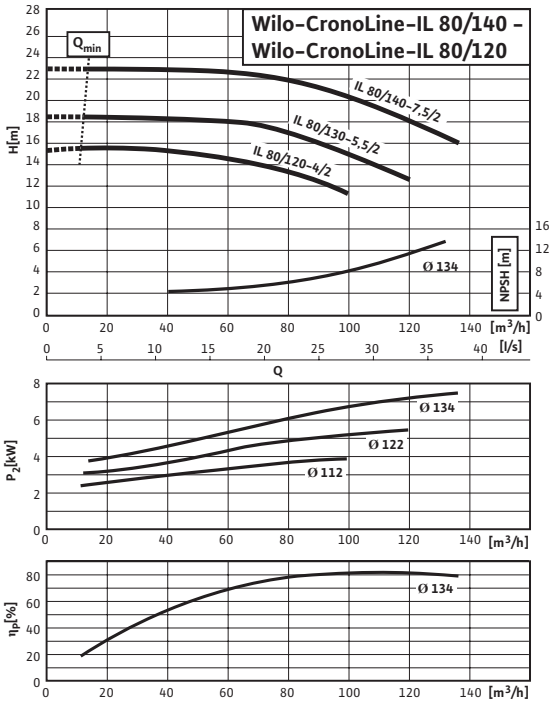
Wilo-CronoLine-IL 65 / 200-11 / 2 – 65 / 220-22 / 2

Rotational speed 2900 rpm



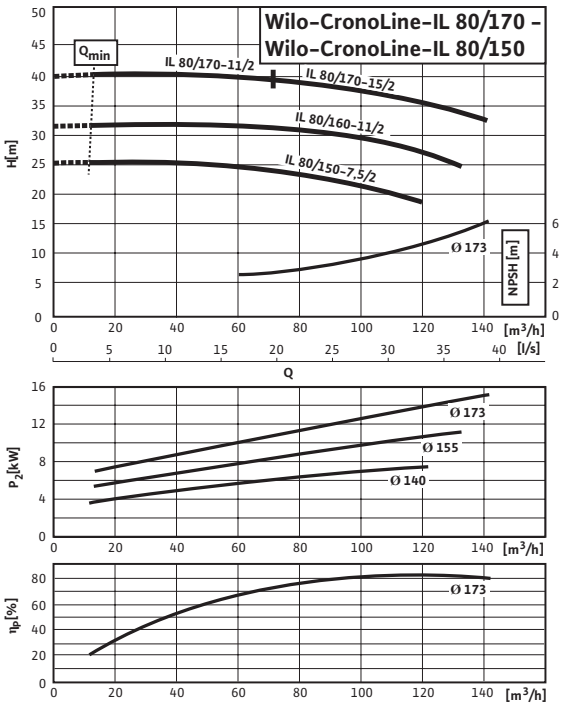
Wilo-CronoLine-IL 80 / 120-4 / 2 – 80 / 140-7.5 / 2

Rotational speed 2900 rpm



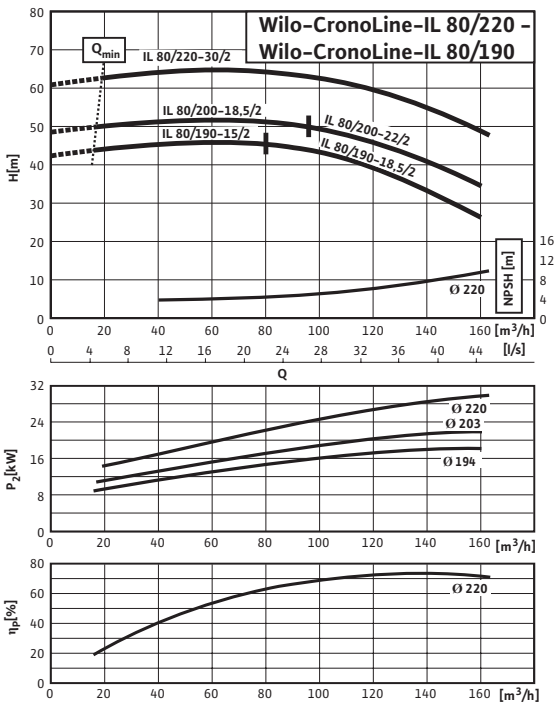
Wilo-CronoLine-IL 80 / 150-7.5 / 2 – 80 / 170-15 / 2

Rotational speed 2900 rpm



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

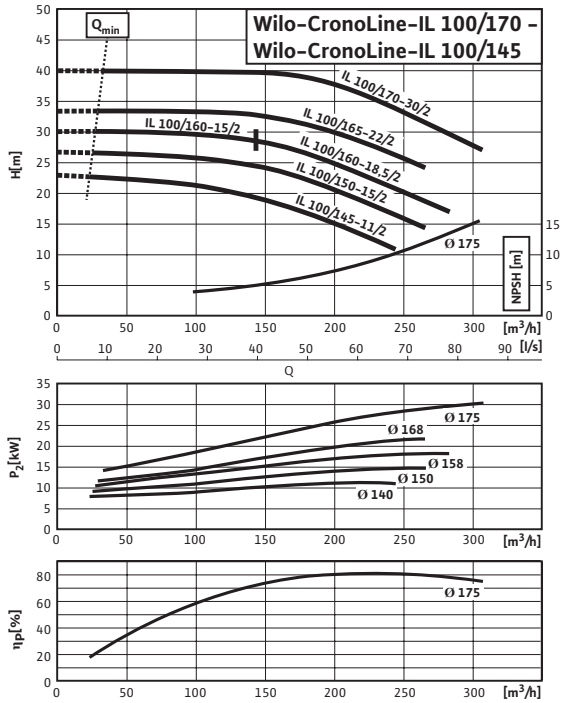
Rotational speed 2900 rpm



Pump curves Wilo-CronoLine-IL

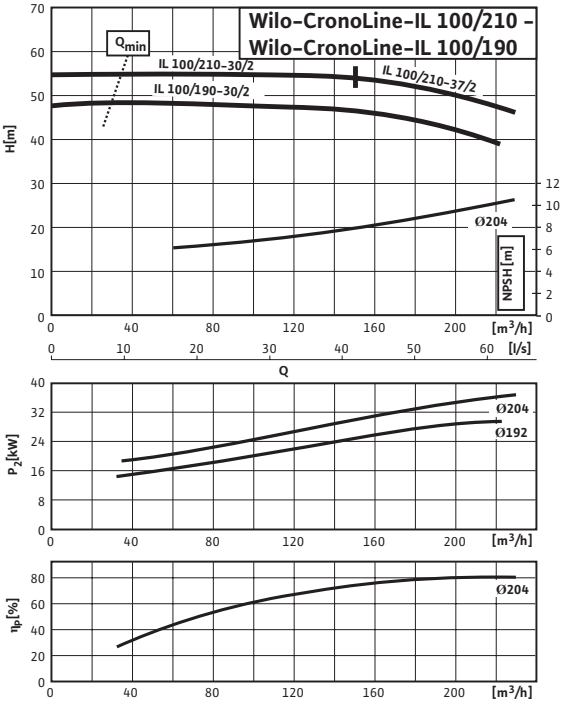
Wilo-CronoLine-IL 100/145-11/2 – 100/170-30/2

Rotational speed 2900 rpm



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

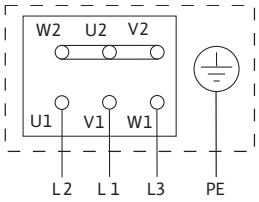
Rotational speed 2900 rpm



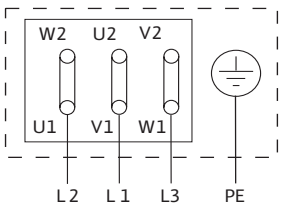
Terminal Diagram, Motor Data Wilo-CronoLine-IL

Terminal Diagrams

Star activation Y



Delta activation Δ



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

P2 ≤ 3 kW 3~400 V Y
3~230 V Δ
P2 ≥ 4 kW 3~690 V Y
3~400 V Δ

After removing the bridge Y-Δ-starting is possible.

Motor Data (960 rpm)

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

Note motor type label data!

Motor Data (1450 rpm)

Wilo-CronoLine-IL ...	Nominal current (approximately)	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
1.10 kW	2.55	0.81	0.77
1.50 kW	3.40	0.81	0.79
2.20 kW	4.70	0.82	0.82
3.00 kW	6.40	0.82	0.83
4.00 kW	8.20	0.83	0.85
5.50 kW	11.40	0.81	0.86
7.50 kW	15.20	0.82	0.87
11.00 kW	21.50	0.84	0.89
15.00 kW	28.50	0.84	0.90
18.50 kW	35.50	0.83	0.91
22.00 kW	41.50	0.84	0.91
30.00 kW	55.00	0.86	0.92
37.00 kW	66.00	0.87	0.93
45.00 kW	80.00	0.87	0.93
55.00 kW	100.00	0.85	0.94
75.00 kW	136.00	0.85	0.94
90.00 kW	160.00	0.86	0.95
110.00 kW	198.00	0.85	0.95

Terminal Diagram, Motor Data Wilo-CronoLine-IL

Motor Data (1450 rpm)

Wilo-CronoLine-IL ...	Nominal current (approximately)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
132.00 kW	235.00	0.85	0.95
160.00 kW	280.00	0.86	0.96
200.00 kW	340.00	0.88	0.96

Note motor type label data!

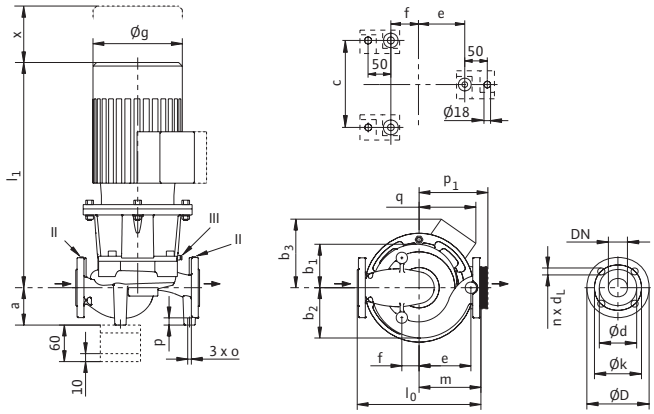
Motor Data (2900 rpm)

Wilo-CronoLine-IL ...	Nominal current (approximately)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
1.50 kW	3.25	0.85	0.79
2.20 kW	4.55	0.85	0.82
3.00 kW	6.10	0.85	0.84
4.00 kW	7.80	0.86	0.86
5.50 kW	10.40	0.89	0.87
7.50 kW	13.80	0.89	0.88
11.00 kW	20.00	0.88	0.90
15.00 kW	26.50	0.90	0.90
18.50 kW	32.00	0.91	0.91
22.00 kW	39.50	0.88	0.92
30.00 kW	53.00	0.89	0.92
37.00 kW	65.00	0.89	0.93

Note motor type label data!

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	Dimensions																Weight approximately
	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]																[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	323	912	370	M16	25	250	–	140	345

Dimensions, Weights Wilo-CronoLine-IL

Dimensions, Weights (1450 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Dimensions																Weight approximately
	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]																[kg]
32/140-0.25/4	32	320	100	112	124	105	120	132	68	145	388	155	M10	20	–	105	150	39
32/150-0.37/4	32	320	100	112	124	105	120	132	68	145	388	155	M10	20	–	105	150	40
32/170-0.55/4	32	320	100	112	124	111	120	132	68	188	408	155	M10	20	–	111	150	43
40/140-0.25/4	40	340	82	113	129	105	130	149	58	145	402	170	M10	20	–	105	95	43
40/160-0.37/4	40	340	82	113	129	105	130	149	58	145	402	170	M10	20	–	105	95	45
40/160-0.55/4	40	340	82	113	129	111	130	149	58	188	422	170	M10	20	–	111	95	46
40/170-0.75/4	40	340	82	113	129	111	130	149	58	188	422	170	M10	20	–	111	95	48
40/210-1.1/4	40	440	110	145	149	–	180	172	78	193	456	190	M10	20	128	–	100	51
40/220-1.5/4	40	440	110	145	149	–	180	172	78	193	456	190	M10	20	128	–	100	55
50/150-0.55/4	50	340	103	120	138	111	164	143	48	188	428	170	M10	20	–	111	100	48
50/160-0.75/4	50	340	103	120	138	111	164	143	48	188	428	170	M10	20	–	111	100	50
50/170-1.1/4	50	340	103	120	138	117	164	143	48	193	470	170	M10	20	–	117	100	53
50/200-1.5/4	50	440	120	145	150	–	160	170	70	193	457	190	M10	20	128	–	100	57
50/220-2.2/4	50	440	120	145	150	–	160	170	70	217	514	190	M10	20	135	–	100	67
50/260-3/4	50	440	122	178	174	–	200	200	70	217	540	220	M10	20	135	–	120	80
50/270-3/4	50	440	122	178	174	–	200	200	70	217	540	220	M10	20	135	–	120	80
50/270-4/4	50	440	122	178	174	–	200	200	70	232	620	220	M10	20	148	–	120	87
65/150-0.75/4	65	430	110	126	146	111	180	195	60	188	434	215	M12	20	–	111	120	53
65/160-1.1/4	65	430	110	126	146	117	180	195	60	193	476	215	M12	20	–	117	120	56
65/170-1.1/4	65	430	110	126	146	117	180	195	60	193	476	215	M12	20	–	117	120	57
65/170-1.5/4	65	430	110	126	146	117	180	195	60	193	476	215	M12	20	–	117	120	60
65/210-2.2/4	65	475	130	150	168	–	200	225	50	217	523	245	M12	20	135	–	110	73
65/220-2.2/4	65	475	130	150	168	–	200	225	50	217	523	245	M12	20	135	–	110	73
65/220-3/4	65	475	130	150	168	–	200	225	50	217	523	245	M12	20	135	–	110	76
65/250-3/4	65	475	140	187	174	–	200	215	80	217	544	235	M12	20	135	–	120	85
65/250-4/4	65	475	140	187	174	–	200	215	80	232	624	235	M12	20	148	–	120	91
65/270-5.5/4	65	475	140	187	174	–	200	215	80	279	695	235	M12	20	167	–	120	103
80/150-1.1/4	80	440	120	136	162	117	180	173	72	193	474	200	M12	20	–	117	120	66
80/160-1.5/4	80	440	120	136	162	117	180	173	72	193	474	200	M12	20	–	117	120	70
80/170-2.2/4	80	440	120	136	162	138	180	173	72	217	529	200	M12	20	–	138	120	81
80/210-3/4	80	500	145	157	182	–	220	208	62	217	531	230	M12	20	135	–	120	85
80/220-4/4	80	500	145	157	182	–	220	208	62	232	611	230	M12	20	148	–	120	91
80/270-5.5/4	80	500	125	180	202	–	240	223	102	279	682	245	M12	20	167	–	115	114
100/145-1.1/4	100	500	120	159	197	117	200	226	60	193	509	250	M12	20	–	117	135	79
100/150-1.5/4	100	500	120	159	197	117	200	226	60	193	509	250	M12	20	–	117	135	82
100/160-2.2/4	100	500	120	159	197	138	200	226	60	217	563	250	M12	20	–	138	135	93
100/170-3/4	100	500	120	159	197	138	200	226	60	217	563	250	M12	20	–	138	135	96
100/200-3/4	100	550	155	173	202	–	220	231	99	217	541	255	M12	20	135	–	120	98
100/200-4/4	100	550	155	173	202	–	220	231	99	232	621	255	M12	20	148	–	120	104
100/220-5.5/4	100	550	155	173	202	–	220	231	99	279	692	255	M12	20	167	–	120	118
100/250-5.5/4	100	550	180	188	214	–	240	236	114	279	692	260	M12	20	167	–	120	132
100/250-7.5/4	100	550	180	188	214	–	240	236	114	323	692	260	M12	20	167	–	120	138

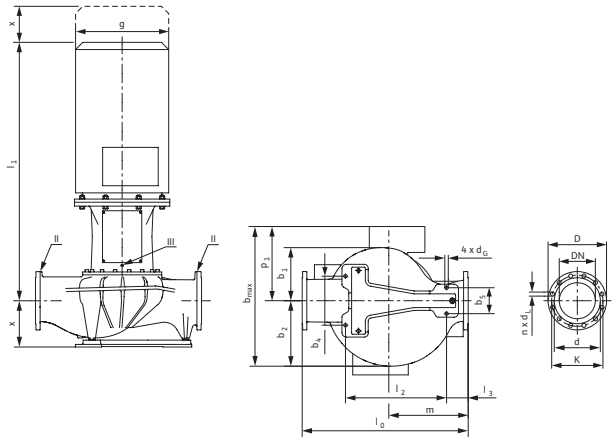
Dimensions, Weights Wilo-CronoLine-IL

Dimensions, Weights (1450 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Dimensions																Weight approximately
	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]																[kg]
100/260-11/4	100	550	180	188	214	–	240	236	114	323	843	260	M12	20	197	–	120	174
100/270-11/4	100	550	180	188	214	–	240	236	114	323	843	260	M12	20	197	–	120	174
125/190-4/4	125	620	175	177	212	–	280	266	54	232	633	280	M16	25	148	–	120	118
125/210-5.5/4	125	620	175	177	212	–	280	266	54	279	704	280	M16	25	167	–	120	134
125/220-5.5/4	125	620	175	177	212	–	280	266	54	279	704	280	M16	25	167	–	120	134
125/220-7.5/4	125	620	175	177	212	–	280	266	54	323	704	280	M16	25	167	–	120	142
125/250-11/4	125	620	200	232	264	–	250	254	125	323	856	280	M16	25	197	–	130	201
125/270-11/4	125	620	200	232	264	–	250	254	125	323	856	280	M16	25	197	–	130	201
125/270-15/4	125	620	200	232	264	–	250	254	125	370	856	280	M16	25	197	–	130	213
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
125/340-30/4	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	717	310	M16	25	167	–	130	166
150/200-7.5/4	150	700	200	202	249	–	260	284	116	323	717	310	M16	25	167	–	130	174
150/220-11/4	150	700	200	202	249	–	260	284	116	323	868	310	M16	25	197	–	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
150/300-30/4	150	770	230	300	337	–	300	344	150	415	1025	370	M16	25	306	–	145	392
150/320-37/4	150	770	230	300	337	–	300	344	150	456	1061	370	M16	25	327	–	145	446
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	370	M16	25	327	–	145	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
200/270-30/4	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
200/320-45/4	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 Wilo-CronoLine-IL with nominal diameter 250 (1450 rpm)



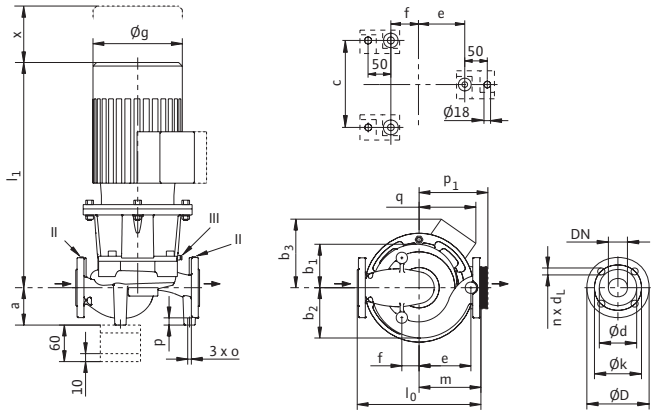
II Pressure measuring connection $R^1/_8$; III Ventilation $R^1/_8$

Dimensions, Weights (1450 rpm)

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

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	Dimensions																Weight approximately
	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]																[kg]
32/140-1.5/2	32	320	100	112	124	117	120	132	68	193	448	155	M10	20	–	117	150	48
32/150-2.2/2	32	320	100	112	124	117	120	132	68	193	448	155	M10	20	–	117	150	50
32/160-2.2/2	32	320	100	112	124	117	120	132	68	193	448	155	M10	20	–	117	90	50
32/160-3/2	32	320	100	112	124	138	120	132	68	217	504	155	M10	20	–	138	150	60
32/170-3/2	32	320	100	112	124	138	120	132	68	217	504	155	M10	20	–	138	90	60
32/170-4/2	32	320	100	112	124	147	120	132	68	232	584	155	M10	20	–	147	150	67
40/140-2.2/2	40	340	82	113	129	117	130	149	58	193	462	170	M10	20	–	117	95	55
40/150-3/2	40	340	82	113	129	138	130	149	58	217	518	170	M10	20	–	138	95	64
40/160-4/2	40	340	82	113	129	147	130	149	58	232	598	170	M10	20	–	147	95	71
40/170-5.5/2	40	340	82	113	129	168	130	149	58	279	659	170	M10	20	–	168	95	82
40/200-7.5/2	40	440	110	145	149	–	180	172	78	279	664	190	M10	20	167	–	100	96
40/220-11/2	40	440	110	145	149	–	180	172	78	323	815	190	M10	20	197	–	100	125
50/110-1.5/2	50	340	105	102	119	117	140	130	40	193	448	150	M10	20	–	117	100	53
50/120-2.2/2	50	340	105	102	119	117	140	130	40	193	448	150	M10	20	–	117	100	56
50/130-3/2	50	340	105	102	119	138	140	130	40	217	508	150	M10	20	–	138	100	68
50/140-3/2	50	340	105	102	119	138	140	130	40	217	508	150	M10	20	–	138	100	68
50/140-4/2	50	340	105	102	119	147	140	130	40	232	588	150	M10	20	–	147	100	75
50/160-5.5/2	50	340	103	120	138	168	164	143	48	279	666	170	M10	20	–	168	100	86
50/170-5.5/2	50	340	103	120	138	168	164	143	48	279	666	170	M10	20	–	168	100	86
50/170-7.5/2	50	340	103	120	138	168	164	143	48	279	666	170	M10	20	–	168	100	94
50/180-7.5/2	50	440	120	145	150	–	160	170	70	279	665	190	M10	20	167	–	100	99
50/210-11/2	50	440	120	145	150	–	160	170	70	323	816	190	M10	20	197	–	100	128
50/220-11/2	50	440	120	145	150	–	160	170	70	323	816	190	M10	20	197	–	100	128
50/220-15/2	50	440	120	145	150	–	160	170	70	323	816	190	M10	20	197	–	100	139

Dimensions, Weights Wilo-CronoLine-IL

Dimensions, Weights (2900 rpm)

Wilo-CronoLine-IL ...	Nominal flange diameter	Dimensions																Weight approximately
	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]																[kg]
65/110-3/2	65	340	120	112	134	138	140	140	60	217	522	160	M12	20	–	138	110	66
65/120-3/2	65	340	120	112	134	138	140	140	60	217	522	160	M12	20	–	138	110	66
65/120-4/2	65	340	120	112	134	147	140	140	60	232	602	160	M12	20	–	147	110	73
65/130-5.5/2	65	340	120	112	134	–	140	140	60	279	669	160	M12	20	167	–	110	84
65/140-5.5/2	65	340	120	112	134	–	140	140	60	279	669	160	M12	20	167	–	110	84
65/140-7.5/2	65	340	120	112	134	–	140	140	60	279	669	160	M12	20	167	–	110	92
65/150-5.5/2	65	430	110	126	146	168	180	195	60	279	672	215	M12	20	–	168	120	90
65/160-5.5/2	65	430	110	126	146	168	180	195	60	279	672	215	M12	20	–	168	120	90
65/160-7.5/2	65	430	110	126	146	168	180	195	60	279	672	215	M12	20	–	168	120	100
65/170-11/2	65	430	110	126	146	–	180	195	60	323	831	215	M12	20	197	–	120	124
65/200-11/2	65	475	130	150	168	–	200	225	50	323	825	245	M12	20	197	–	110	134
65/200-15/2	65	475	130	150	168	–	200	225	50	323	825	245	M12	20	197	–	110	145
65/210-15/2	65	475	130	150	168	–	200	225	50	323	825	245	M12	20	197	–	110	145
65/210-18.5/2	65	475	130	150	168	–	200	225	50	370	825	245	M12	20	197	–	110	158
65/220-18.5/2	65	475	130	150	168	–	200	225	50	370	825	245	M12	20	197	–	110	158
65/220-22/2	65	475	130	150	168	–	200	225	50	370	865	245	M12	20	259	–	110	181
80/120-4/2	80	400	105	123	151	147	180	173	57	232	619	200	M12	20	–	147	120	80
80/130-5.5/2	80	400	105	123	151	–	180	173	57	279	686	200	M12	20	167	–	120	91
80/140-7.5/2	80	400	105	123	151	–	180	173	57	279	686	200	M12	20	167	–	120	99
80/150-7.5/2	80	440	120	136	162	168	180	173	72	279	670	200	M12	20	–	168	120	109
80/160-11/2	80	440	120	136	162	–	180	173	72	323	829	200	M12	20	197	–	120	134
80/170-11/2	80	440	120	136	162	–	180	173	72	323	829	200	M12	20	197	–	120	134
80/170-15/2	80	440	120	136	162	–	180	173	72	323	829	200	M12	20	197	–	120	147
80/190-15/2	80	500	145	157	182	–	220	208	62	323	833	230	M12	20	197	–	120	154
80/190-18.5/2	80	500	145	157	182	–	220	208	62	370	833	230	M12	20	197	–	120	167
80/200-18.5/2	80	500	145	157	182	–	220	208	62	370	833	230	M12	20	197	–	120	167
80/200-22/2	80	500	145	157	182	–	220	208	62	370	873	230	M12	20	259	–	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	864	250	M12	20	197	–	135	147
100/150-15/2	100	500	120	159	197	–	200	226	60	323	864	250	M12	20	197	–	135	160
100/160-15/2	100	500	120	159	197	–	200	226	60	323	864	250	M12	20	197	–	135	160
100/160-18.5/2	100	500	120	159	197	–	200	226	60	370	864	250	M12	20	197	–	135	177
100/165-22/2	100	500	120	159	197	–	200	226	60	370	906	250	M12	20	259	–	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

Dimensions, Weights Wilo-CronoLine-IL

Flange dimensions

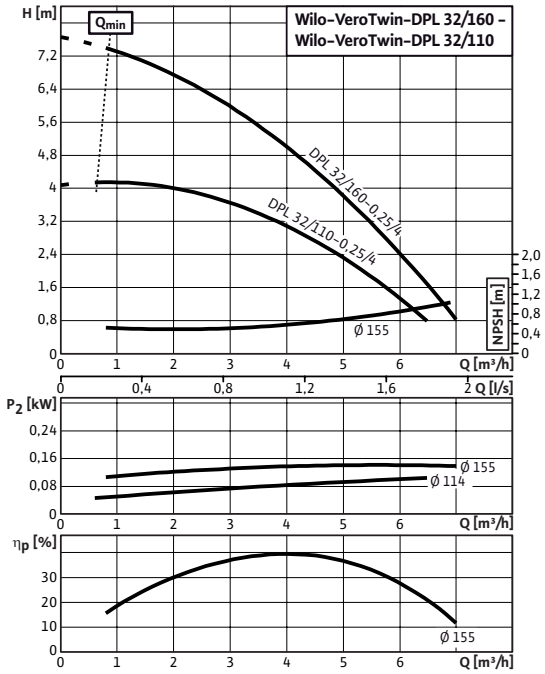
Wilo-CronoLine-IL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[St. x mm]
32...	32	140	76	100	4 x 19
40...	40	150	84	110	4 x 19
50...	50	165	99	125	4 x 19
65...	65	185	118	145	4 x 19
80...	80	200	132	160	8 x 19
100...	100	220	156	180	8 x 19
125...	125	250	184	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

Flange dimensions pump – in accordance with EN 1092-2 PN 16, n = number of drill holes

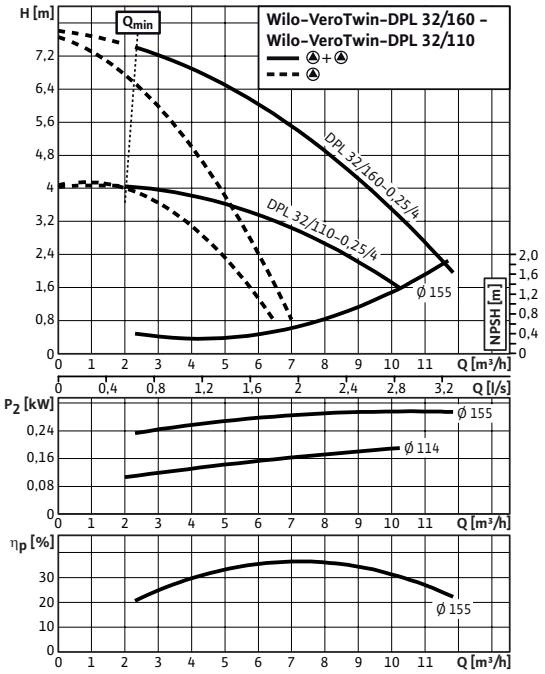
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 32 / 110-0.25 / 4 – 32 / 160-0.25 / 4

Rotational speed 1450 rpm – individual operation

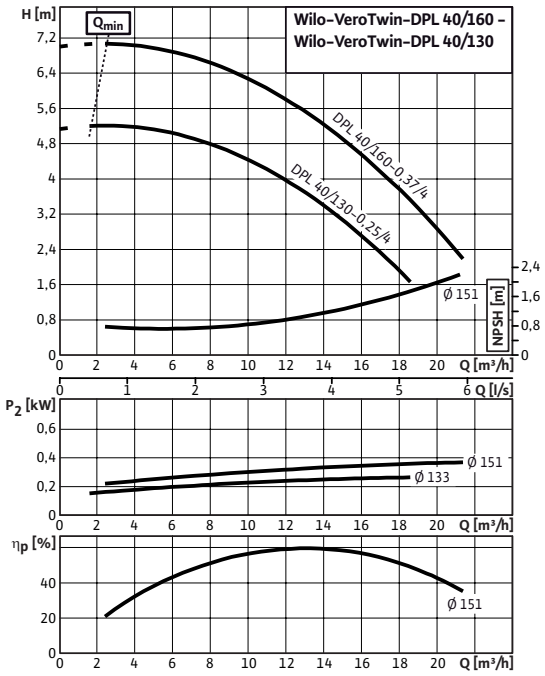


Rotational speed 1450 rpm – parallel operation

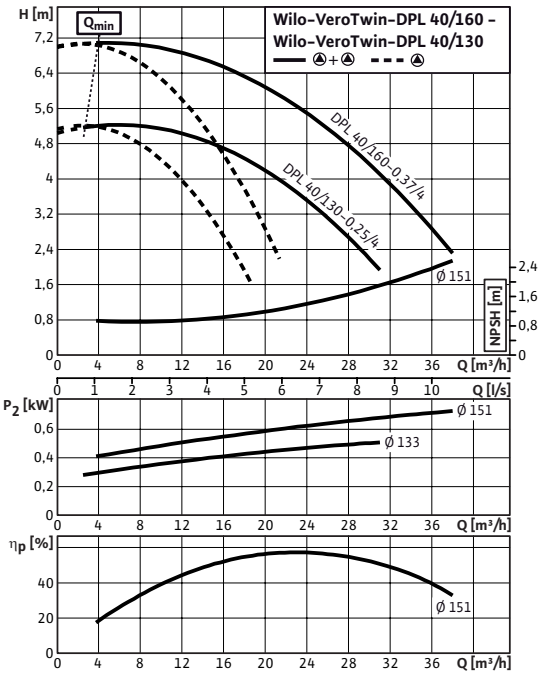


Wilo-VeroTwin-DPL 40 / 130-0.25 / 4 – 40 / 160-0.37 / 4

Rotational speed 1450 rpm – individual operation



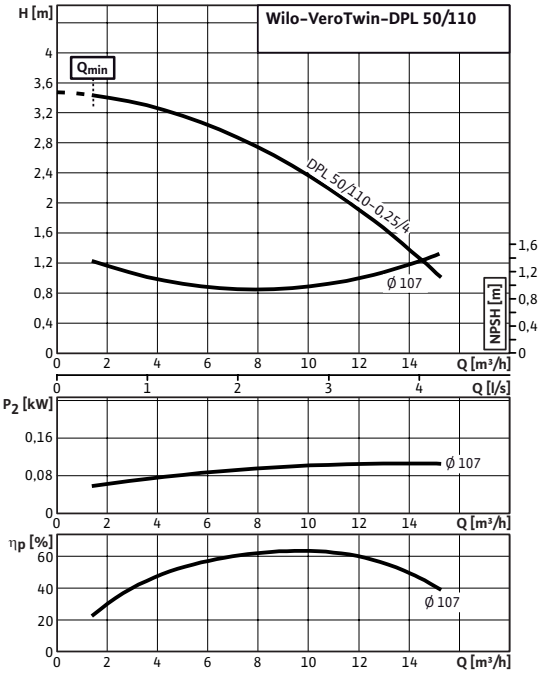
Rotational speed 1450 rpm – parallel operation



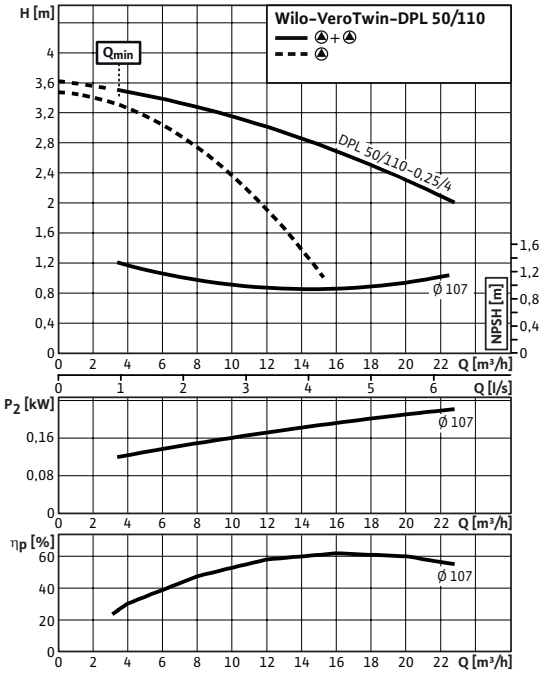
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 50 / 110-0.25 / 4

Rotational speed 1450 rpm – individual operation

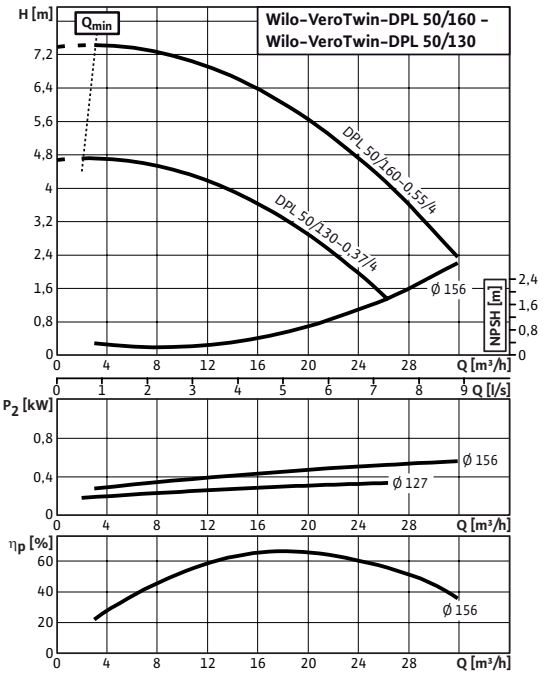


Rotational speed 1450 rpm – parallel operation

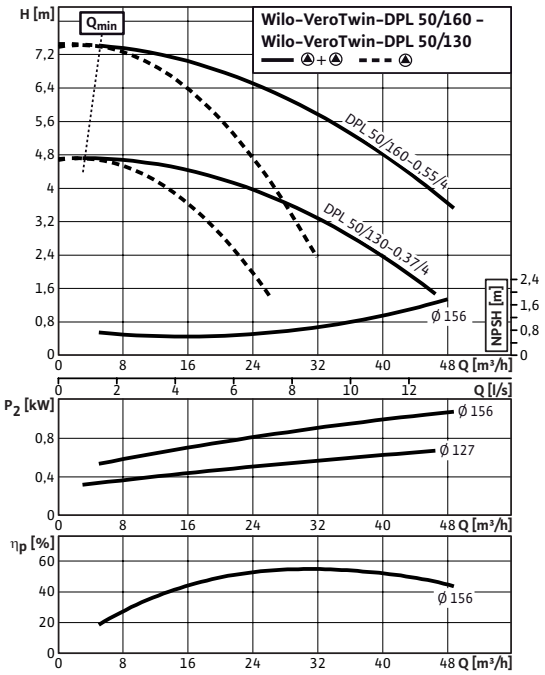


Wilo-VeroTwin-DPL 50 / 130-0.37 / 4 – 50 / 160-0.55 / 4

Rotational speed 1450 rpm – individual operation



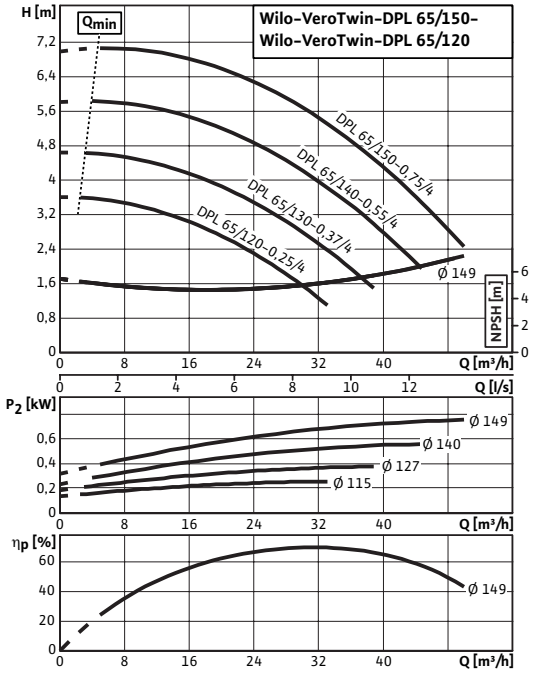
Rotational speed 1450 rpm – parallel operation



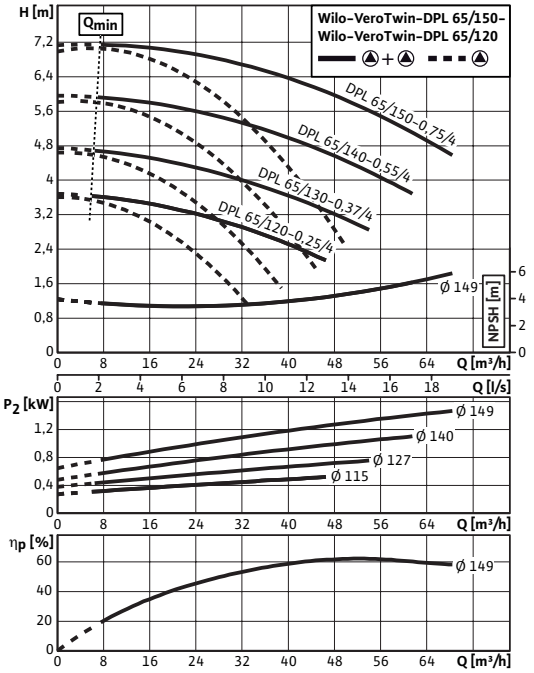
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 65 / 120-0.25 / 4 – 65 / 150-0.75 / 4

Rotational speed 1450 rpm – individual operation

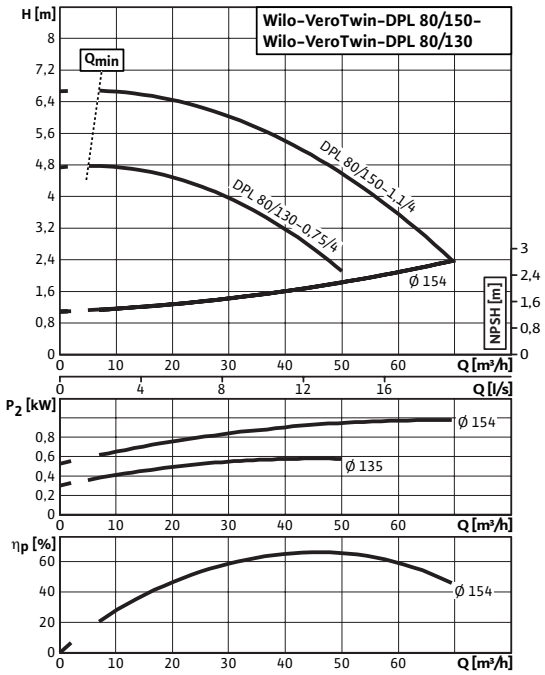


Rotational speed 1450 rpm – parallel operation

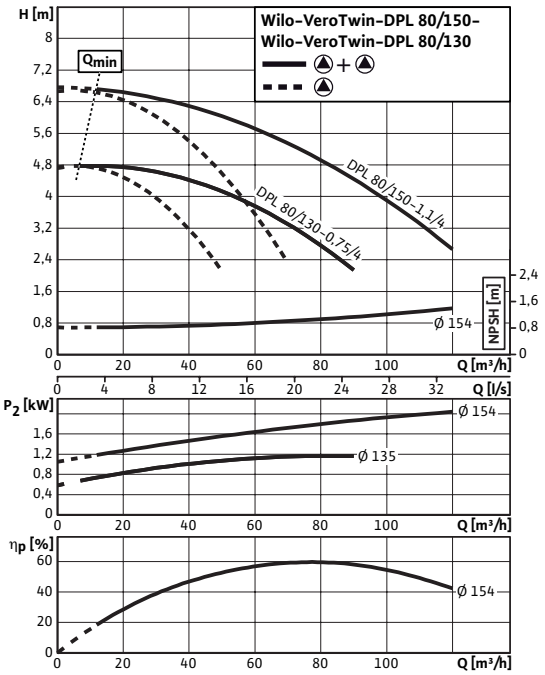


Wilo-VeroTwin-DPL 80 / 130-0.75 / 4 – 80 / 150-1.1 / 4

Rotational speed 1450 rpm – individual operation



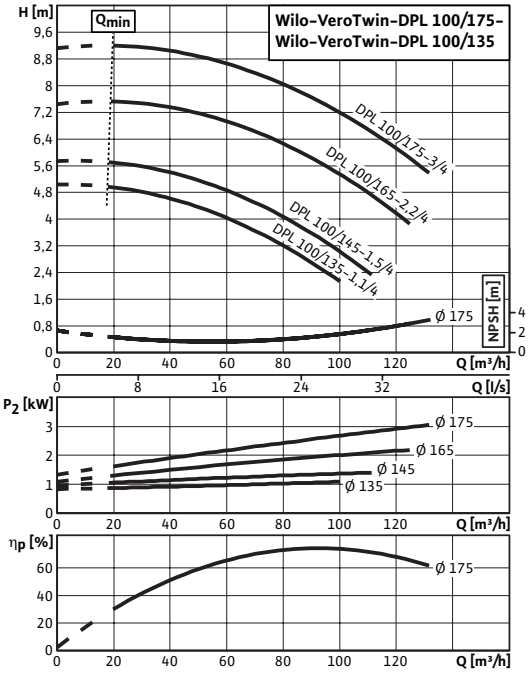
Rotational speed 1450 rpm – parallel operation



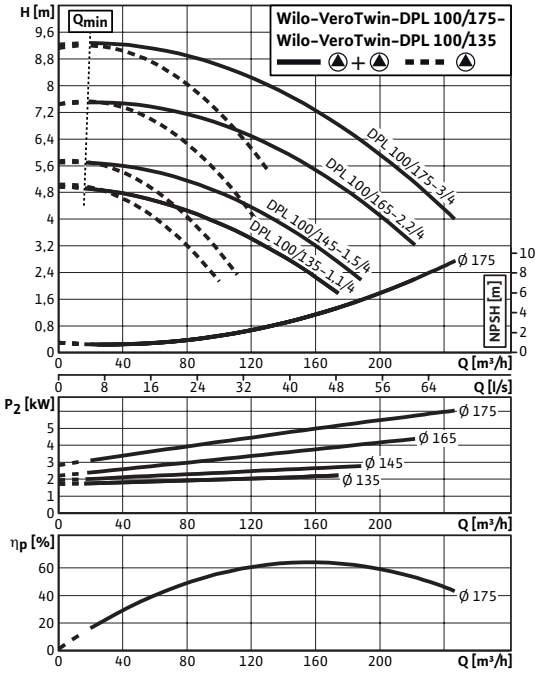
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 100 / 135-1.1 / 4 – 100 / 175-3 / 4

Rotational speed 1450 rpm – individual operation



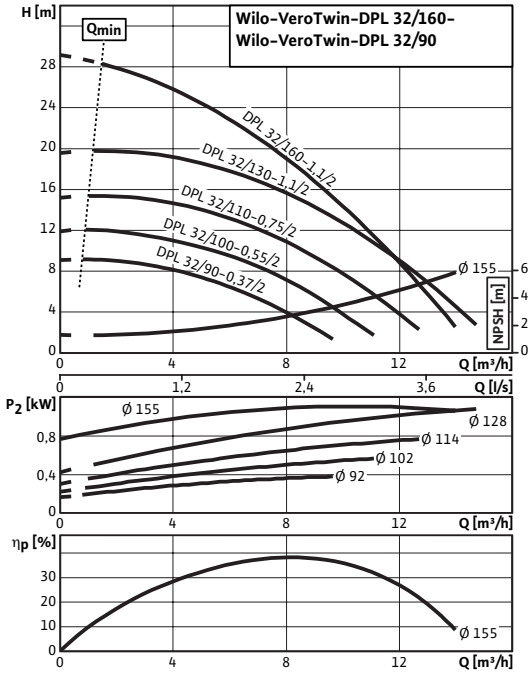
Rotational speed 1450 rpm – parallel operation



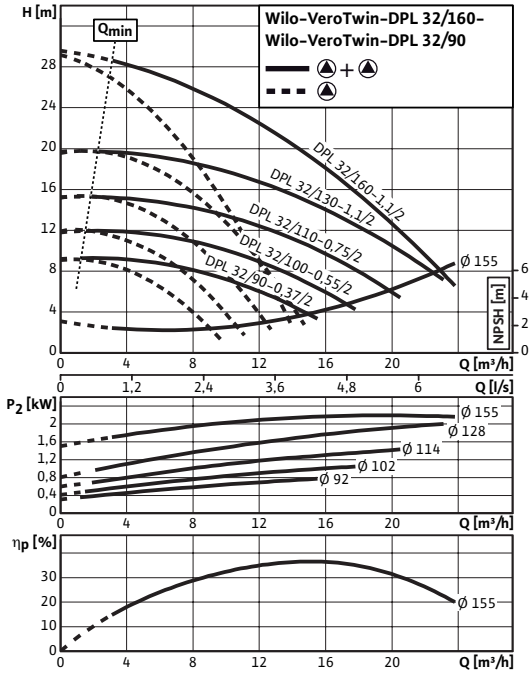
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 32 / 90-0.37 / 2 – 32 / 160-1.1 / 2

Rotational speed 2900 rpm – individual operation

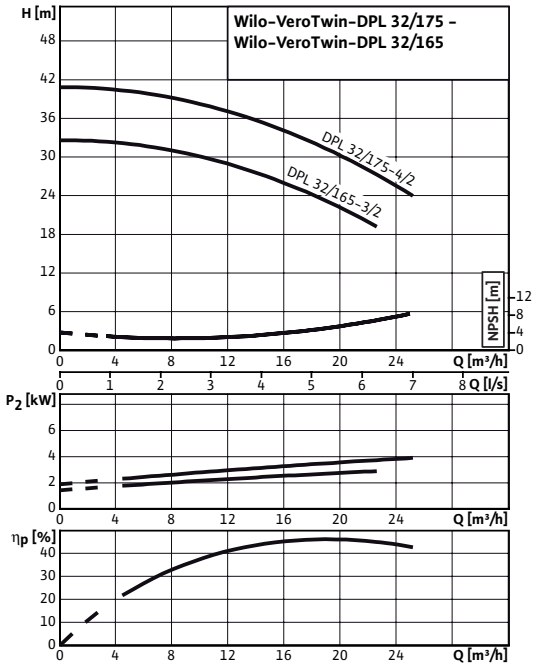


Rotational speed 2900 rpm – parallel operation

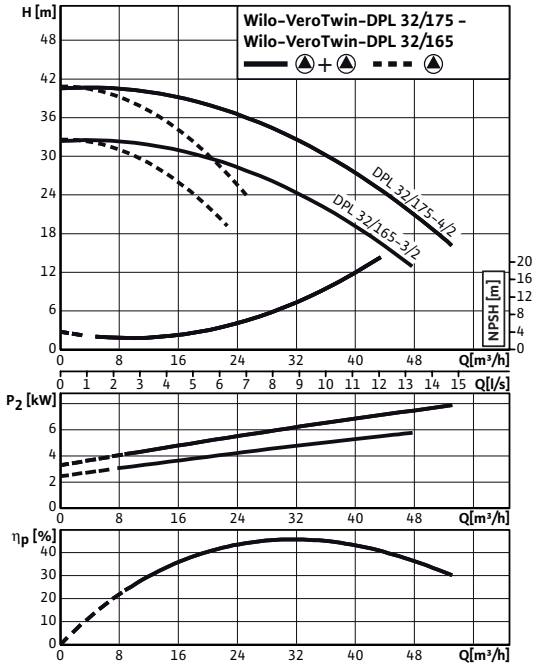


Wilo-VeroTwin-DPL 32 / 165-3 / 2 – 32 / 175-4 / 2

Rotational speed 2900 rpm – individual operation



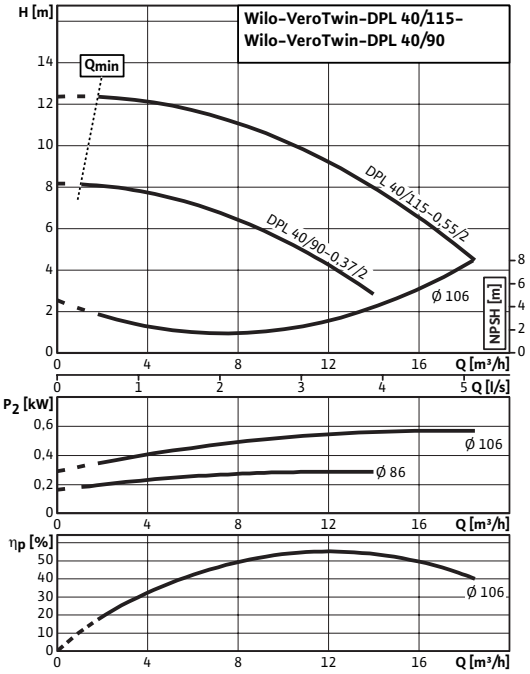
Rotational speed 2900 rpm – parallel operation



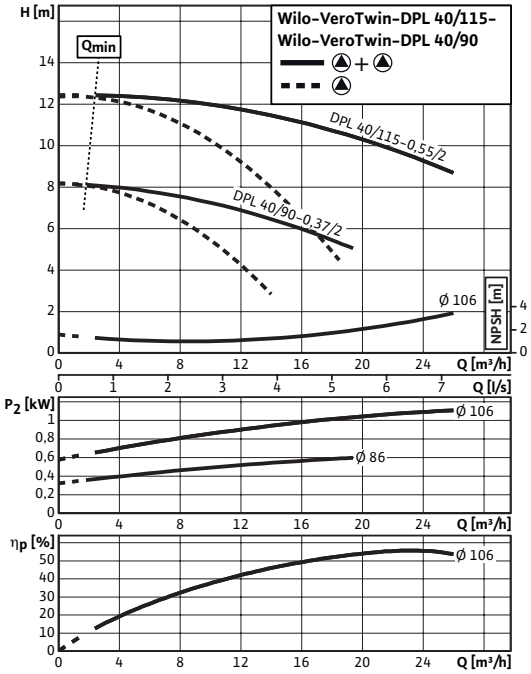
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 40 / 90-0.37 / 2 – 40 / 115-0.55 / 2

Rotational speed 2900 rpm – individual operation

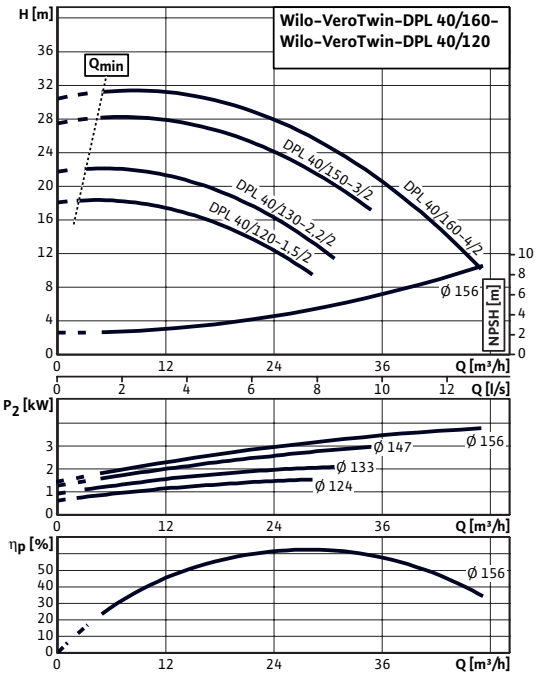


Rotational speed 2900 rpm – parallel operation

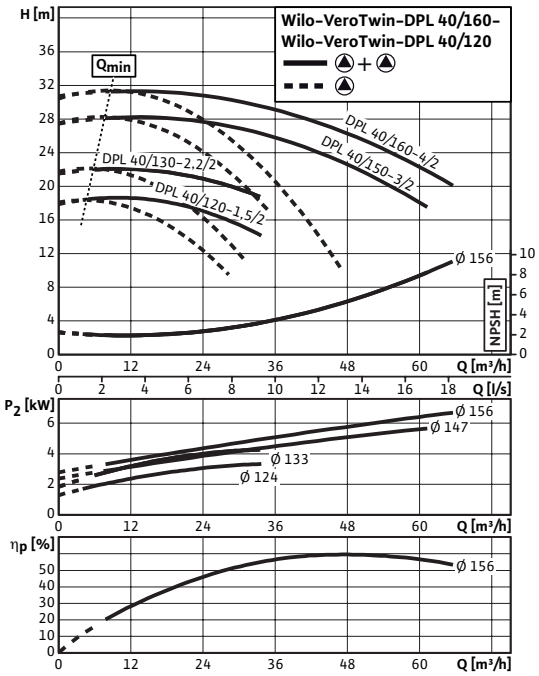


Wilo-VeroTwin-DPL 40 / 120-1.5 / 2 – 40 / 160-4 / 2

Rotational speed 2900 rpm – individual operation



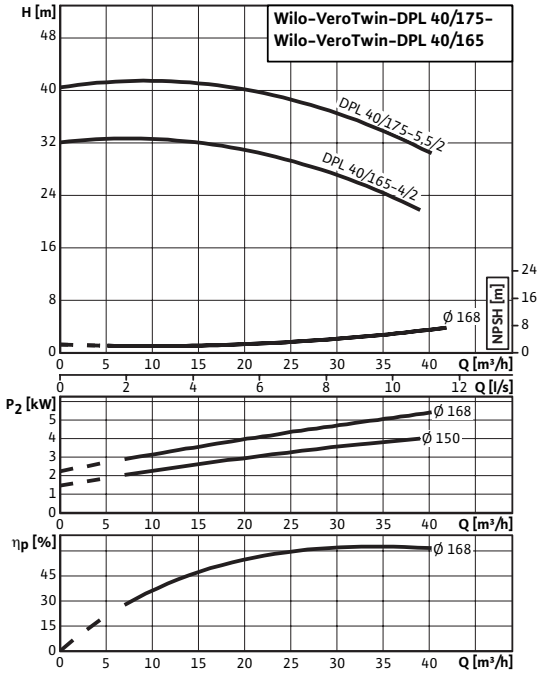
Rotational speed 2900 rpm – parallel operation



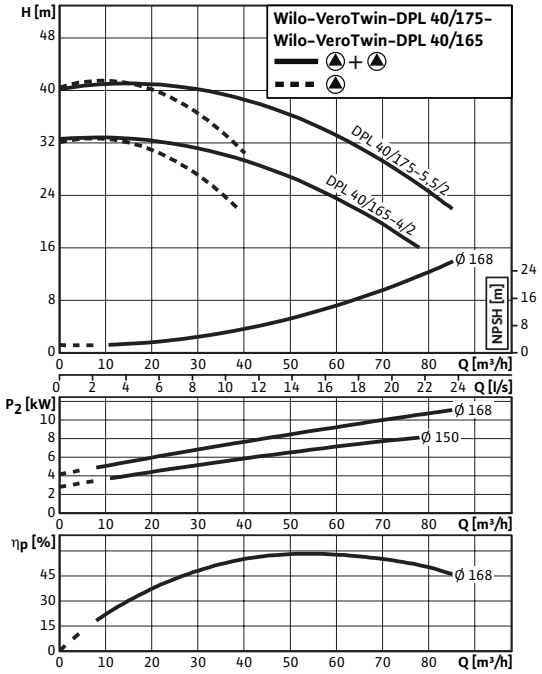
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 40 / 165-4 / 2 – 40 / 175-5.5 / 2

Rotational speed 2900 rpm – individual operation

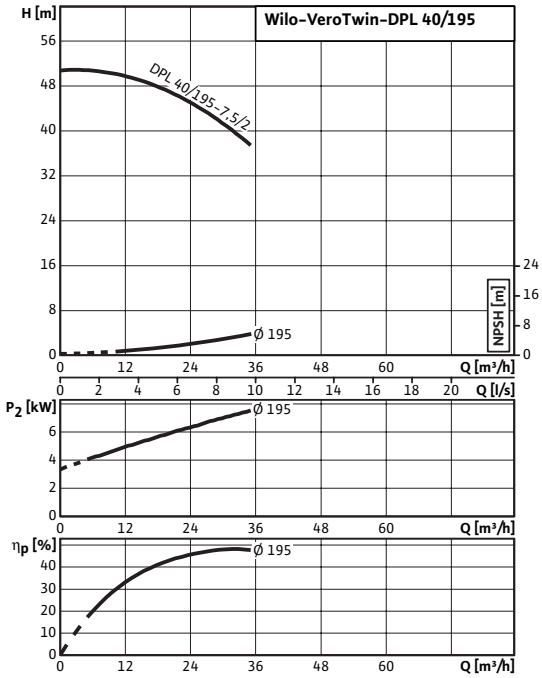


Rotational speed 2900 rpm – parallel operation

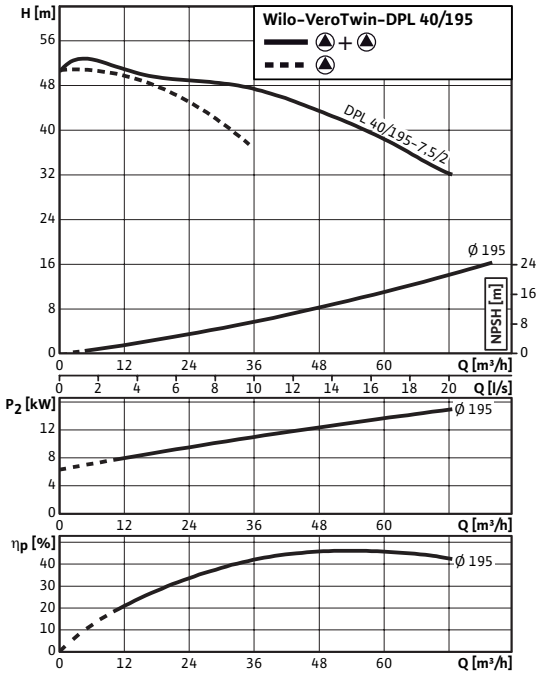


Wilo-VeroTwin-DPL 40 / 195-7.5 / 2

Rotational speed 2900 rpm – individual operation



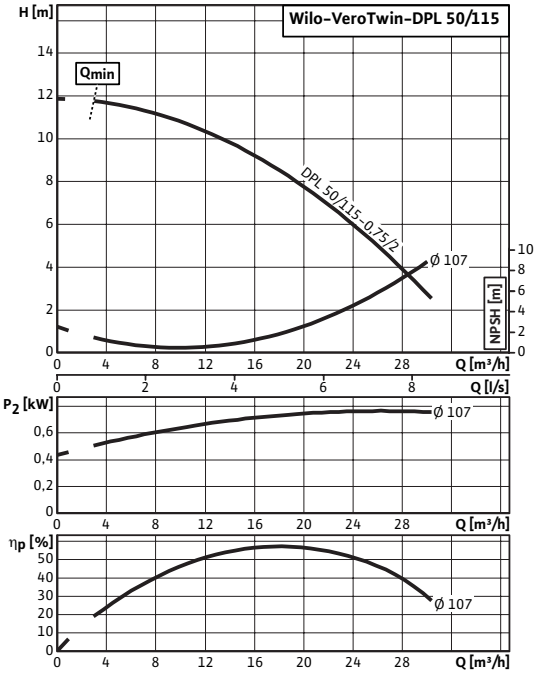
Rotational speed 2900 rpm – parallel operation



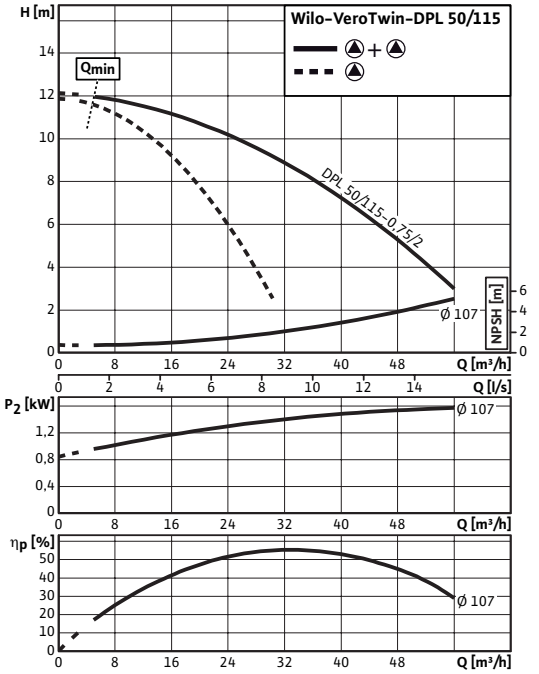
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 50 / 115-0.75 / 2

Rotational speed 2900 rpm – individual operation

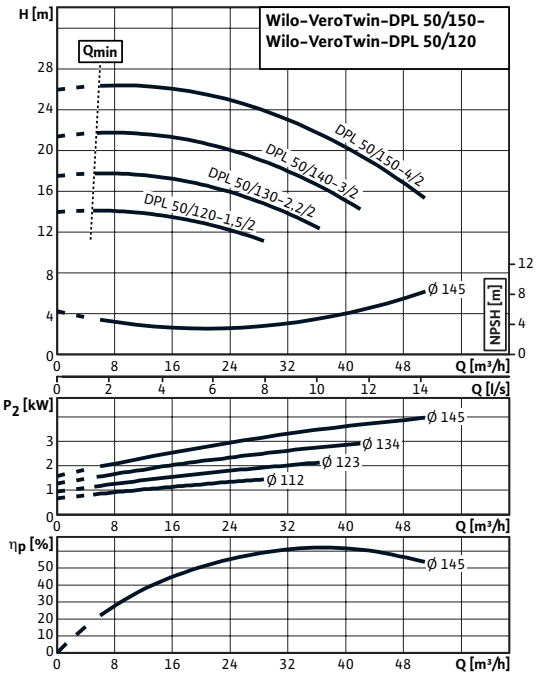


Rotational speed 2900 rpm – parallel operation

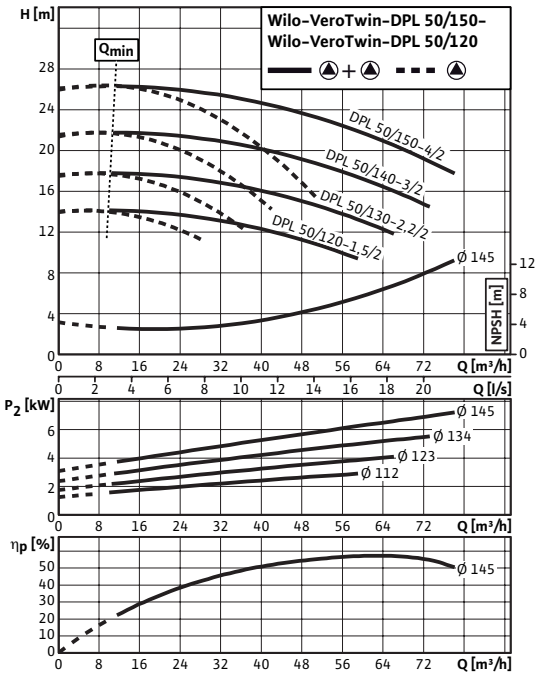


Wilo-VeroTwin-DPL 50 / 120-1.5 / 2 – 50 / 150-4 / 2

Rotational speed 2900 rpm – individual operation



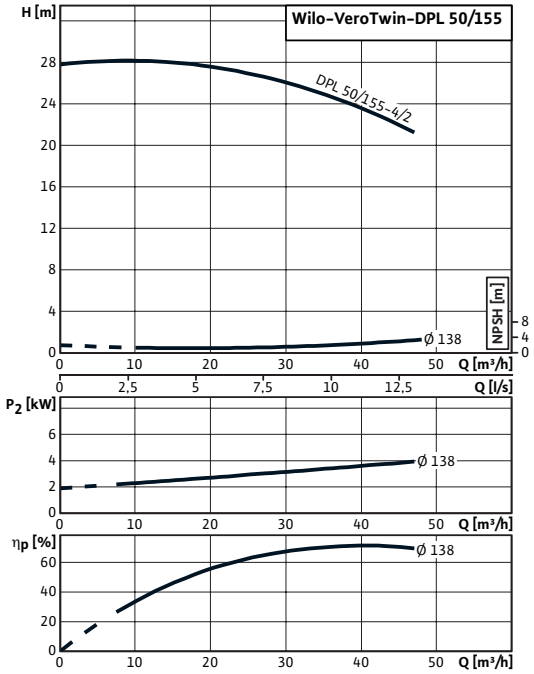
Rotational speed 2900 rpm – parallel operation



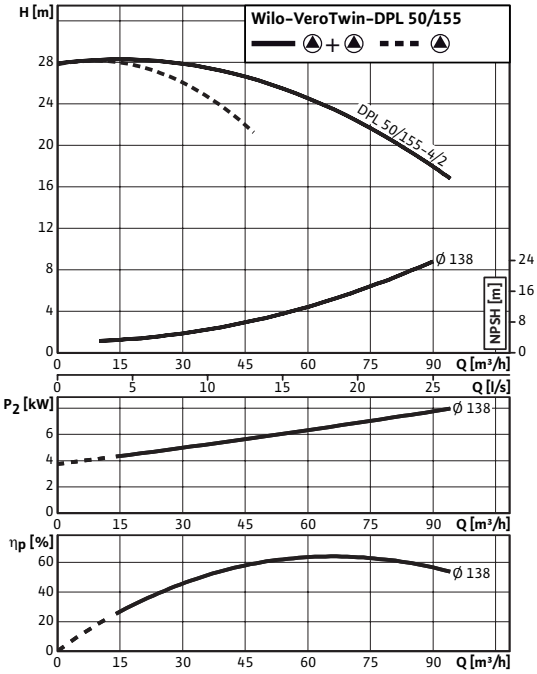
Pump curves Wilo-VeroTwin-DPL

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

Rotational speed 2900 rpm – individual operation

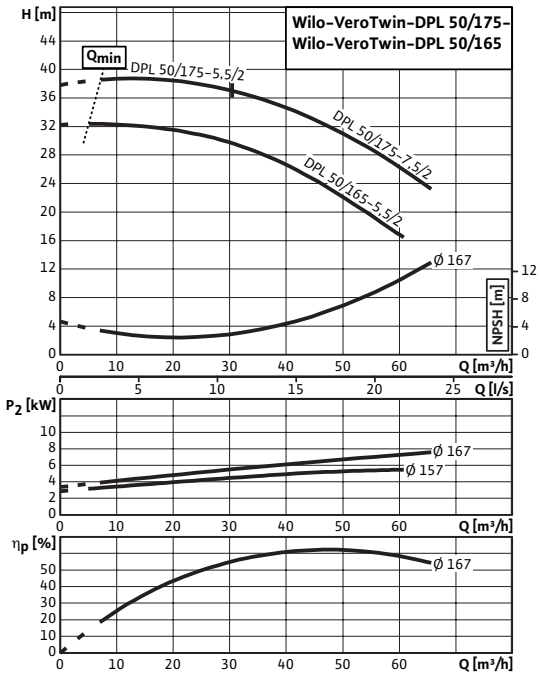


Rotational speed 2900 rpm – parallel operation

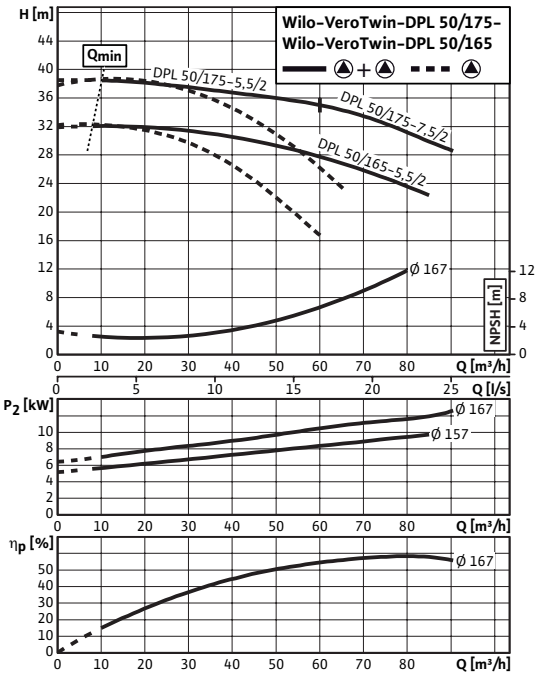


Wilo-VeroTwin-DPL 50 / 165-5.5 / 2 – 50 / 175-5.5 / 2

Rotational speed 2900 rpm – individual operation



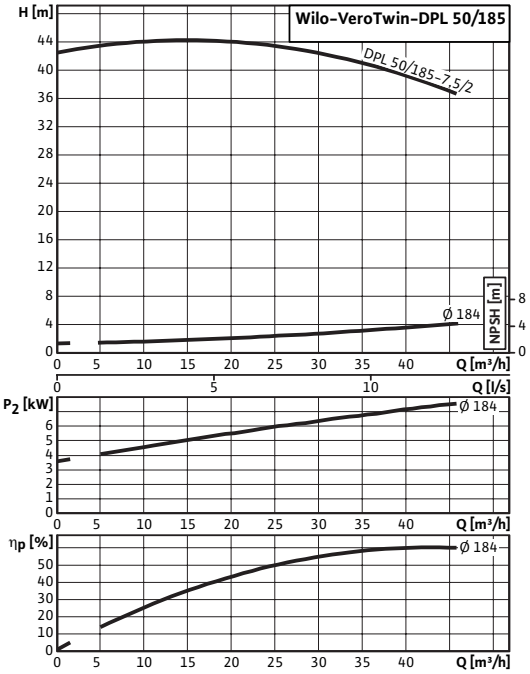
Rotational speed 2900 rpm – parallel operation



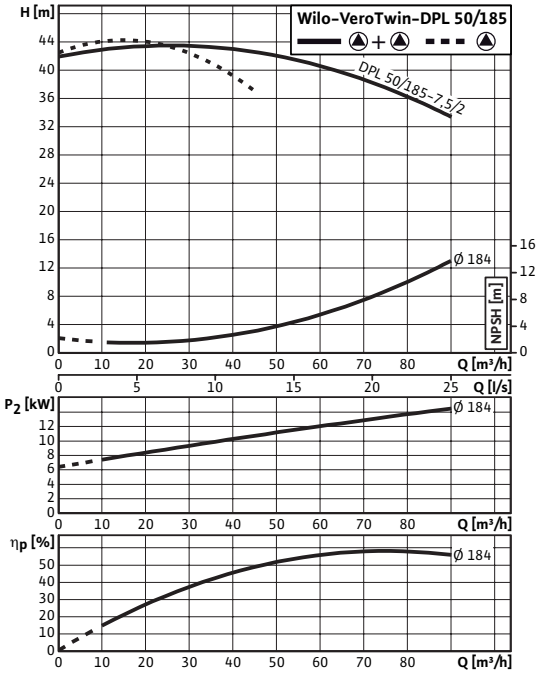
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 50 / 185-7.5 / 2

Rotational speed 2900 rpm – individual operation

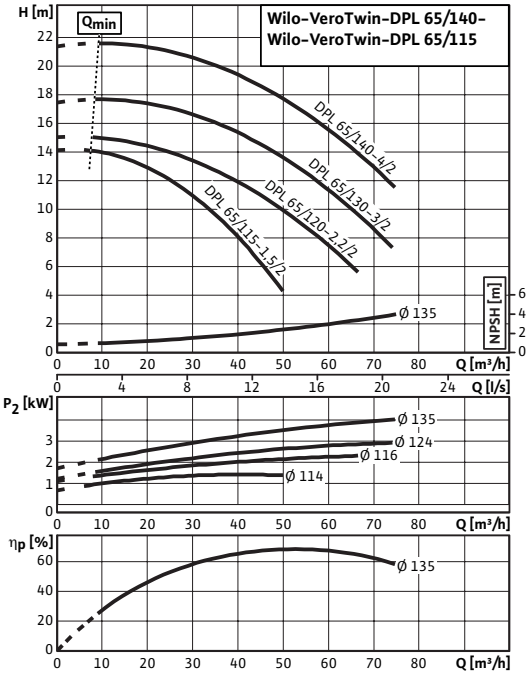


Rotational speed 2900 rpm – parallel operation

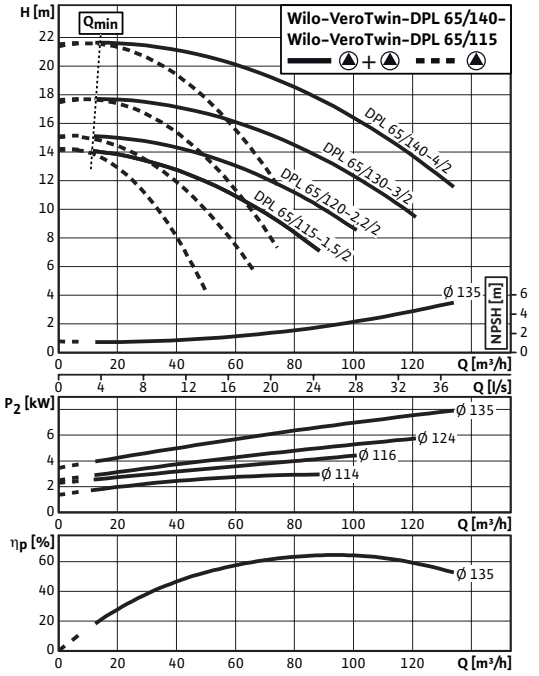


Wilo-VeroTwin-DPL 65 / 115-1.5 / 2 – 65 / 140-4 / 2

Rotational speed 2900 rpm – individual operation



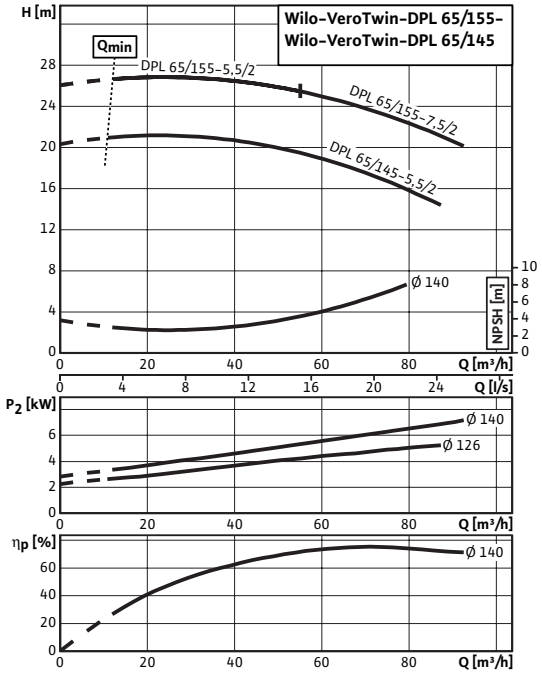
Rotational speed 2900 rpm – parallel operation



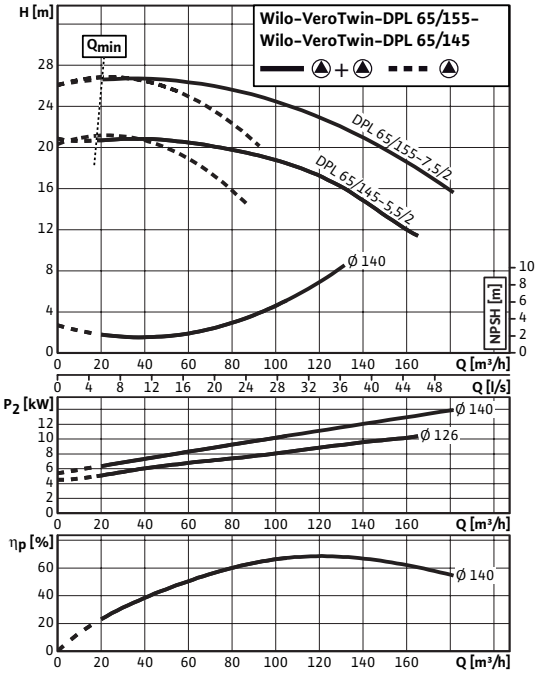
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 65 / 145-5.5 / 2 – 65 / 155-7.5 / 2

Rotational speed 2900 rpm – individual operation

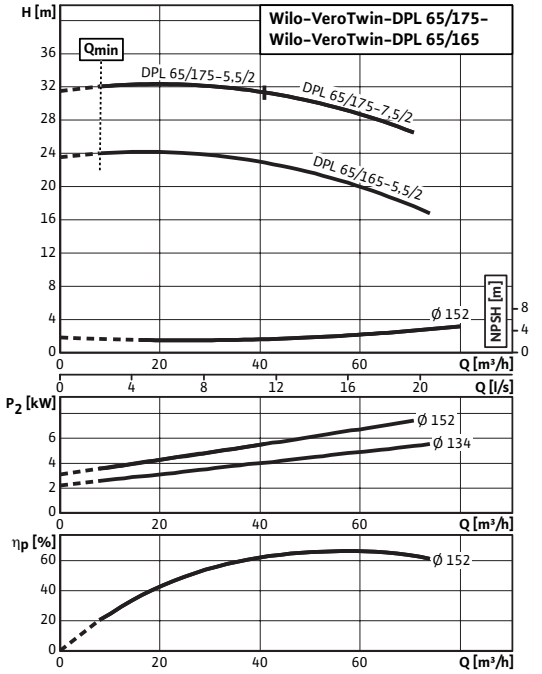


Rotational speed 2900 rpm – parallel operation

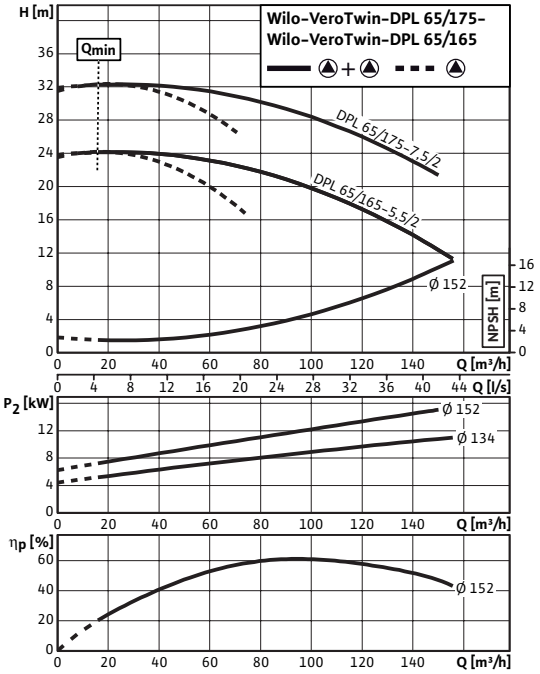


Wilo-VeroTwin-DPL 65 / 165-5.5 / 2 – 65 / 175-7.5 / 2

Rotational speed 2900 rpm – individual operation



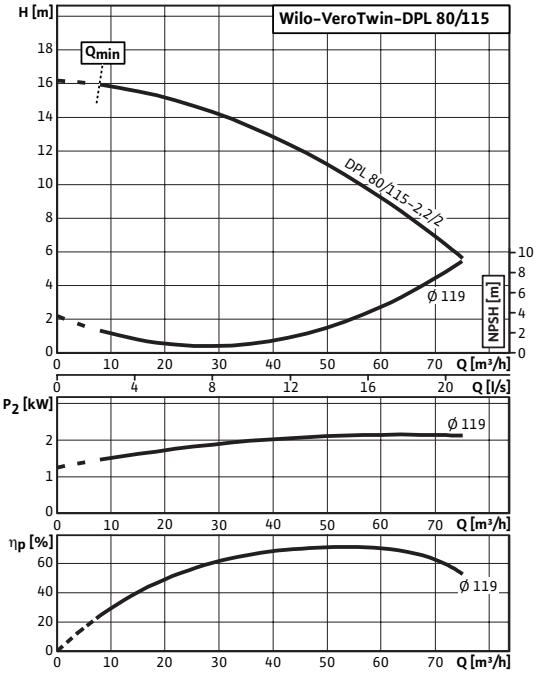
Rotational speed 2900 rpm – parallel operation



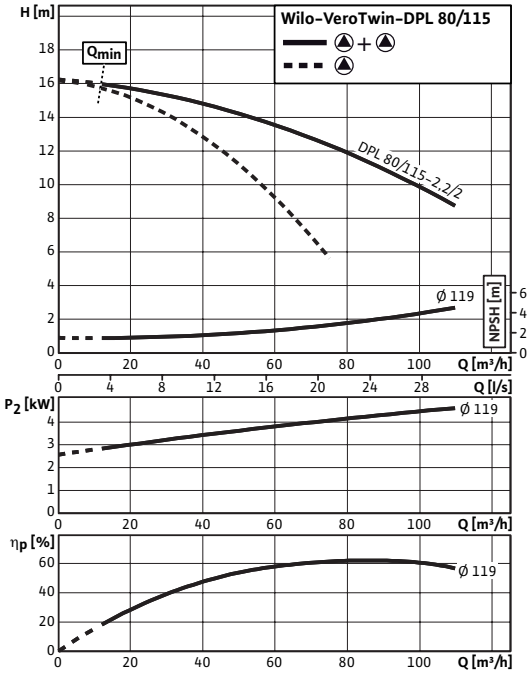
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 80 / 115-2.2 / 2

Rotational speed 2900 rpm – individual operation

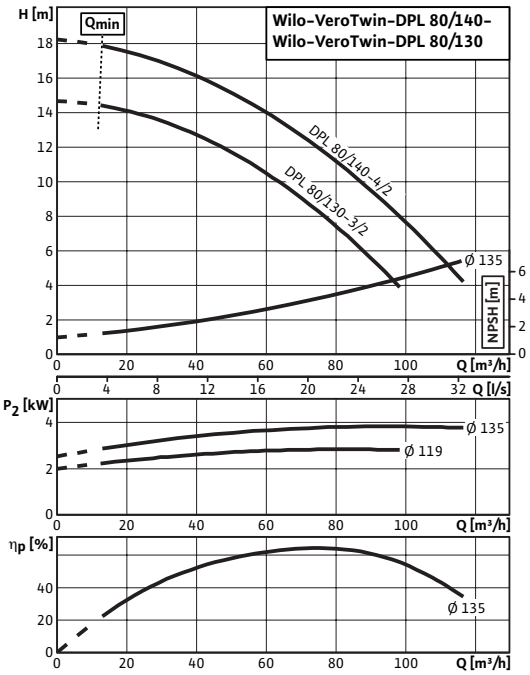


Rotational speed 2900 rpm – parallel operation

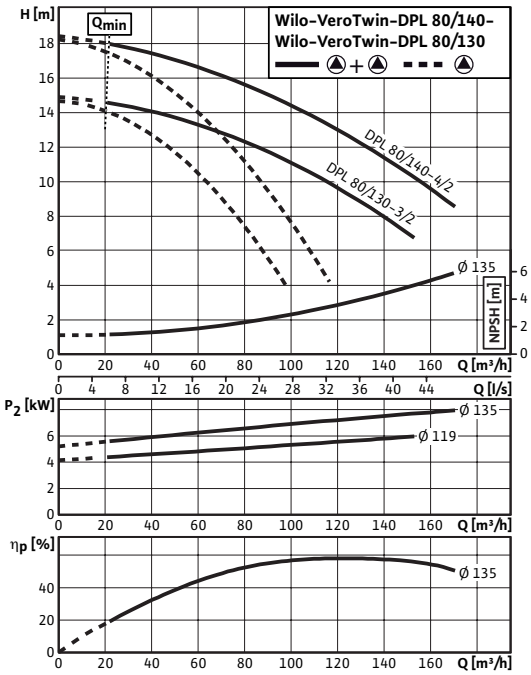


Wilo-VeroTwin-DPL 80 / 130-3 / 2 – 80 / 140-4 / 2

Rotational speed 2900 rpm – individual operation



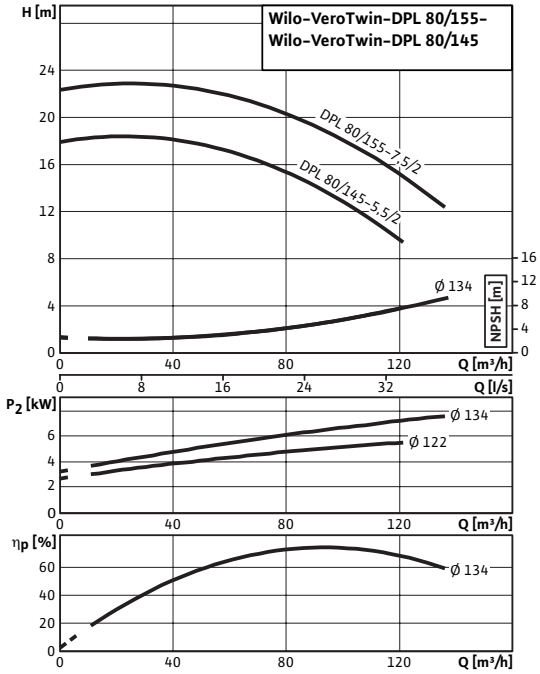
Rotational speed 2900 rpm – parallel operation



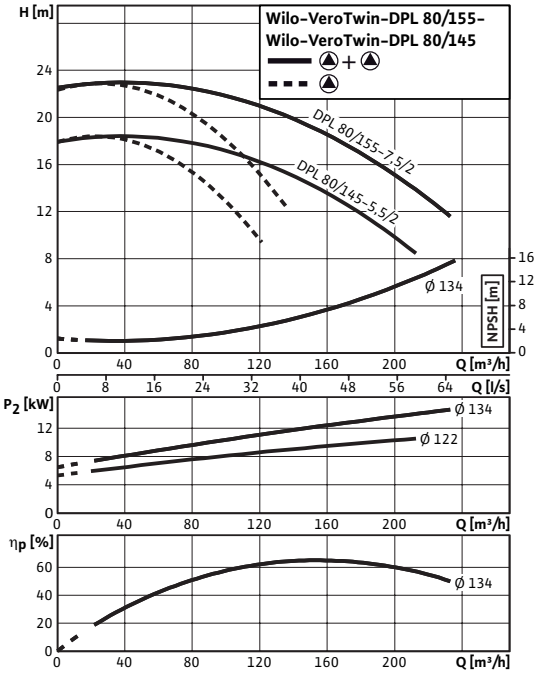
Pump curves Wilo-VeroTwin-DPL

Wilo-VeroTwin-DPL 80 / 145-5.5 / 2 – 80 / 155-7.5 / 2

Rotational speed 2900 rpm – individual operation



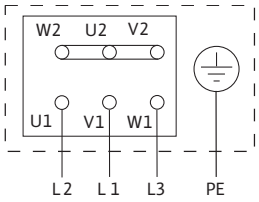
Rotational speed 2900 rpm – parallel operation



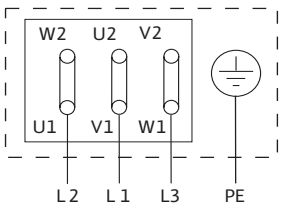
Terminal diagram, Motor Data Wilo-VeroTwin-DPL

Terminal Diagrams

Star activation Y



Delta activation Δ



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

P2 ≤ 3 kW 3~400 V Y
3~230 V Δ
P2 ≥ 4 kW 3~690 V Y
3~400 V Δ

After removing the bridge Y-Δ-starting is possible.

Motor Data (1450 rpm)

Wilo-VeroTwin-DPL ...	Nominal current (approximately)	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
1.10 kW	2.90	0.78	0.74
1.50 kW	3.35	0.82	0.79
2.20 kW	4.70	0.83	0.82
3.00 kW	6.40	0.83	0.83

Note motor type label data!

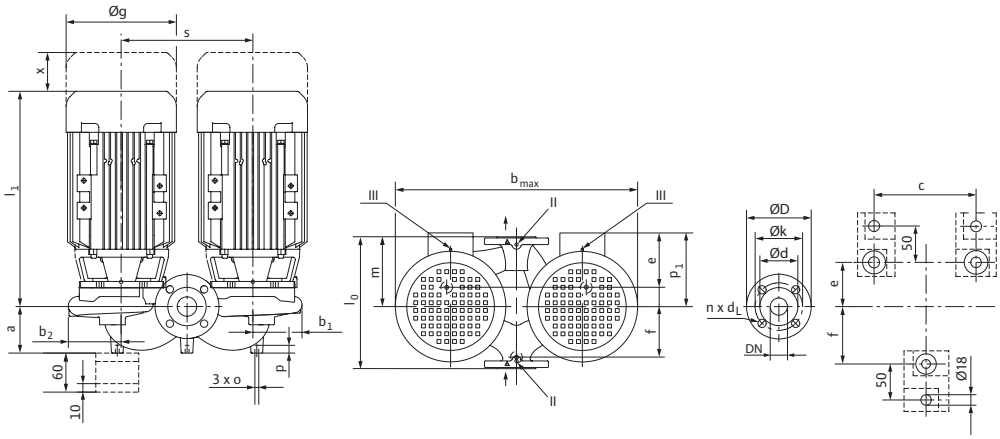
Motor Data (2900 rpm)

Wilo-VeroTwin-DPL ...	Nominal current (approximately)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
0.37 kW	1.01	0.84	0.68
0.55 kW	1.40	0.82	0.70
0.75 kW	2.00	0.86	0.68
1.10 kW	2.60	0.84	0.79
1.50 kW	3.20	0.81	0.80
2.20 kW	4.60	0.87	0.81
3.00 kW	6.00	0.86	0.84
4.00 kW	8.05	0.86	0.85
5.50 kW	10.50	0.90	0.84
7.50 kW	14.30	0.90	0.86

Note motor type label data!

Dimensions, weights Wilo-VeroTwin-DPL

Dimension drawing



Note:
Housing with feed for installation on a base, mounting brackets on request

Dimensions, Weights (1450 rpm)

Wilo-VeroTwin-DPL ...	Nominal flange diameter	Dimensions																Impeller*	Weight approximately
	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]																–	[kg]
32/110-0.25/4	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	–	205	150	P	34
32/160-0.25/4	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	–	205	150	P	34
40/130-0.25/4	40	320	75	113	119	456	240	45	135	143	289	167	M10	20	–	224	150	P	41
40/160-0.37/4	40	320	75	113	119	456	240	45	135	143	289	167	M10	20	–	224	150	P	43
50/110-0.25/4	50	280	83	95	101	390	228	50	107	143	300	155	M10	20	–	194	150	P	38
50/130-0.37/4	50	340	86	120	130	500	240	48	132	143	291	190	M10	20	–	250	150	P	45
50/160-0.55/4	50	340	86	120	130	500	240	48	132	158	327	190	M10	20	–	250	150	P	50
65/120-0.25/4	65	340	93	125	135	550	240	43	137	143	297	185	M10	20	–	290	150	P	50
65/130-0.37/4	65	340	93	125	135	550	240	43	137	143	297	185	M10	20	–	290	150	P	52
65/140-0.55/4	65	340	93	125	135	550	240	43	137	158	333	185	M10	20	–	290	150	P	57
65/150-0.75/4	65	340	93	125	135	550	240	43	137	158	333	185	M10	20	–	290	150	P	59
80/130-0.75/4	80	360	103	134	147	601	240	30	150	158	339	192	M10	20	–	320	150	P	62
80/150-1.1/4	80	360	103	134	147	601	240	30	150	158	339	192	M10	20	–	320	150	P	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
With version N (Standard motor) the dimensions depend on the motor version.
*Material impeller: CI grey cast iron; P Plastic

Dimensions, weights Wilo-VeroTwin-DPL

Dimensions, Weights (2900 rpm)

Wilo-VeroTwin-DPL ...	Nominal flange diameter	Dimensions																Impeller*	Weight approximately
	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]																–	[kg]
32/90-0.37/2	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	–	205	150	P	35
32/100-0.55/2	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	–	205	150	P	36
32/110-0.75/2	32	260	70	101	105	410	225	56	106	143	295	136	M10	20	–	205	150	P	38
32/130-1.1/2	32	260	70	101	105	410	225	56	106	158	331	136	M10	20	–	205	150	P	44
32/160-1.1/2	32	260	70	101	105	410	225	56	106	158	331	136	M10	20	–	205	150	P	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	–	174	150	P	37
40/115-0.55/2	40	250	75	85	91	350	225	35	97	143	294	135	M10	20	–	174	150	P	39
40/120-1.5/2	40	320	75	113	119	456	240	45	135	193	325	167	M10	20	–	224	150	P	59
40/130-2.2/2	40	320	75	113	119	456	240	45	135	193	353	167	M10	20	–	224	150	P	63
40/150-3/2	40	320	75	113	119	456	240	45	135	217	376	167	M10	20	–	224	150	P	73
40/160-4/2	40	320	75	113	119	456	240	45	135	232	419	167	M10	20	–	224	150	P	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	–	194	150	P	41
50/120-1.5/2	50	340	86	120	130	500	240	48	132	193	350	190	M10	20	–	250	150	P	60
50/130-2.2/2	50	340	86	120	130	500	240	48	132	193	350	190	M10	20	–	250	150	P	64
50/140-3/2	50	340	86	120	130	500	240	48	132	217	378	190	M10	20	–	250	150	P	74
50/150-4/2	50	340	86	120	130	500	240	48	132	232	422	190	M10	20	–	250	150	P	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	–	212	150	P	66
65/120-2.2/2	65	340	93	125	135	550	240	43	137	193	356	185	M10	20	–	290	150	P	72
65/130-3/2	65	340	93	125	135	550	240	43	137	217	384	185	M10	20	–	290	150	P	82
65/140-4/2	65	340	93	125	135	550	240	43	137	232	428	185	M10	20	–	290	150	P	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	430	153	134	144	619	440	55	185	279	521	215	M12	20	188	400	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	–	235	150	P	76
80/130-3/2	80	360	103	134	147	601	240	30	150	217	390	192	M10	20	–	320	150	P	85
80/140-4/2	80	360	103	134	147	601	240	30	150	232	434	192	M10	20	–	320	150	P	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	Dimensions																Impeller*	Weight approximately
	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]																–	[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
With version N (Standard motor) the dimensions depend on the motor version.
*Material impeller: CI grey cast iron; P Plastic

Flange dimensions

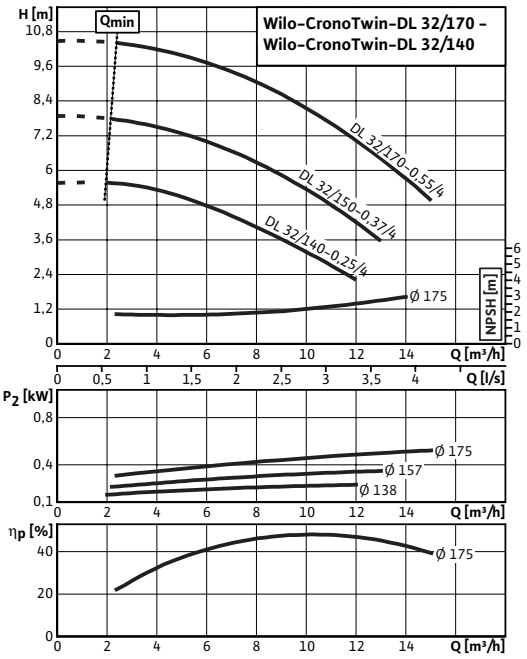
Wilo-VeroTwin-DPL ...	Nominal flange diameter	Pump flange dimensions			
	DN	Ø D	Ø d	Ø k	n x d_L
	–	[mm]			[pcs. x mm]
32...	32	140	78	100	4 x 19
40...	40	150	88	110	4 x 19
50...	50	165	102	125	4 x 19
65...	65	185	122	145	4 x 19
80...	80	200	138	160	8 x 19
100...	100	220	156	180	8 x 19

Flange dimensions pump – bored in accordance with EN 1092-2 PN 16, n = number of drill holes

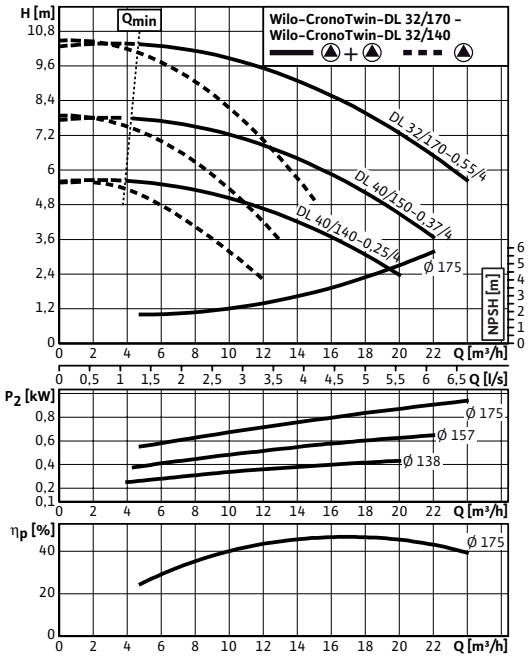
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 32/140-0.25/4 – 32/170-0.55/4

Rotational speed 1450 rpm – individual operation

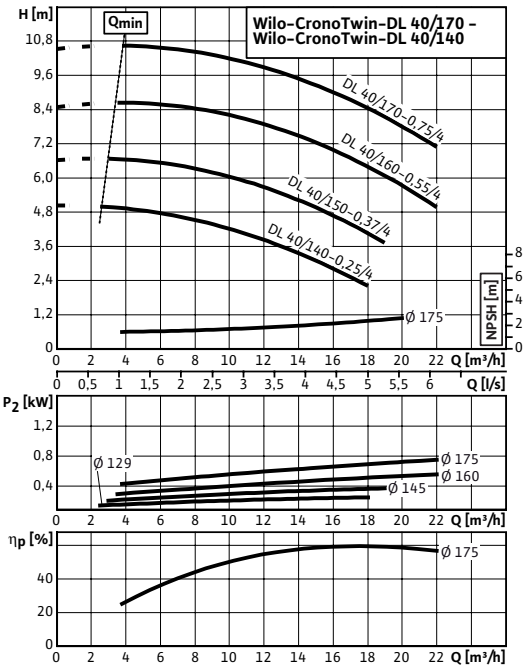


Rotational speed 1450 rpm – parallel operation

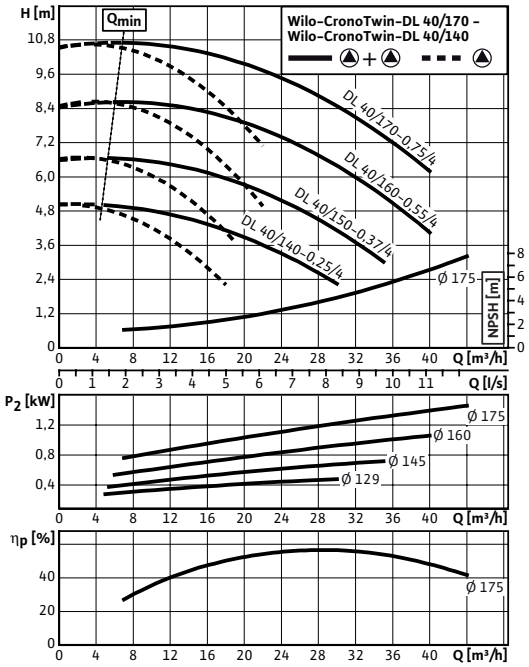


Wilo-CronoTwin-DL 40/140-0.25/4 – 40/170-0.75/4

Rotational speed 1450 rpm – individual operation



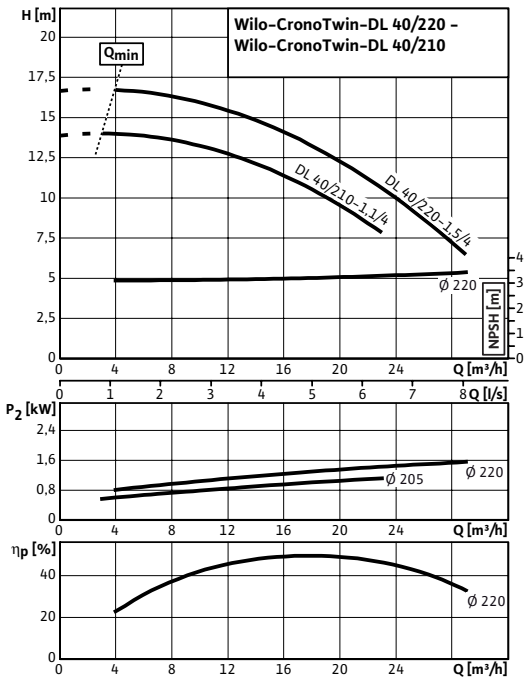
Rotational speed 1450 rpm – parallel operation



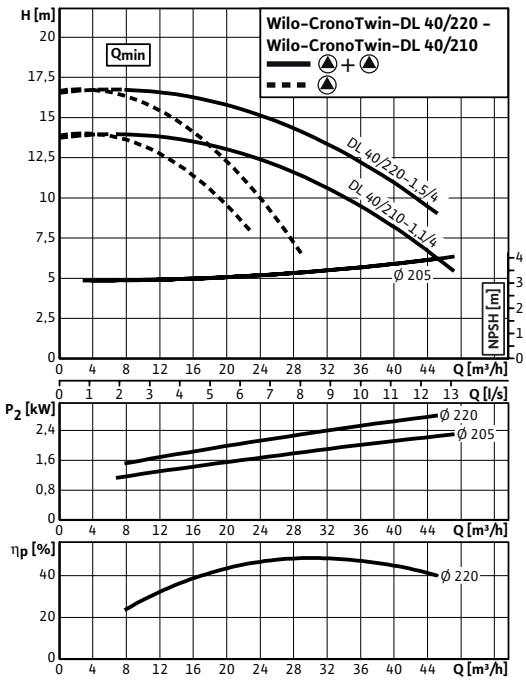
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 40 / 210-1.1 / 4 – 40 / 220-1.5 / 4

Rotational speed 1450 rpm – individual operation

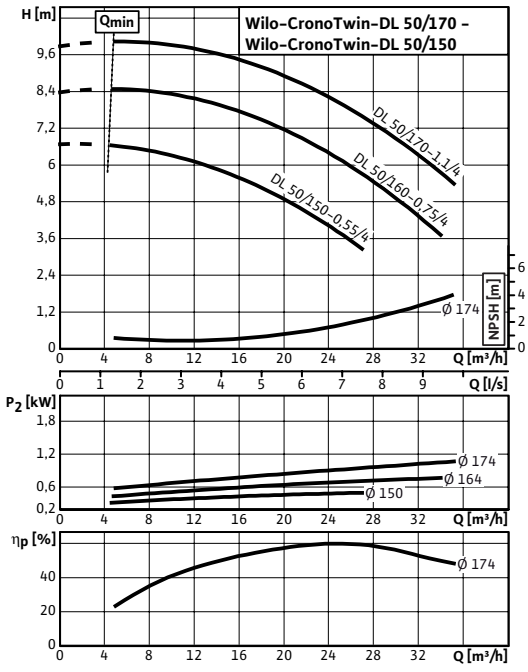


Rotational speed 1450 rpm – parallel operation

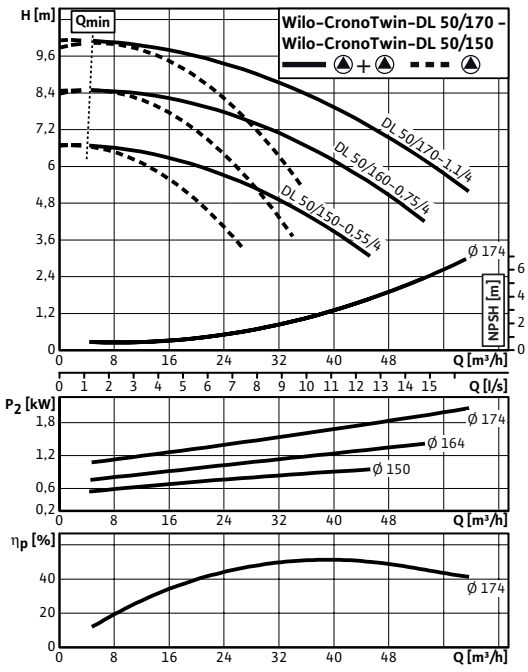


Wilo-CronoTwin-DL 50 / 150-0.55 / 4 – 50 / 170-1.1 / 4

Rotational speed 1450 rpm – individual operation



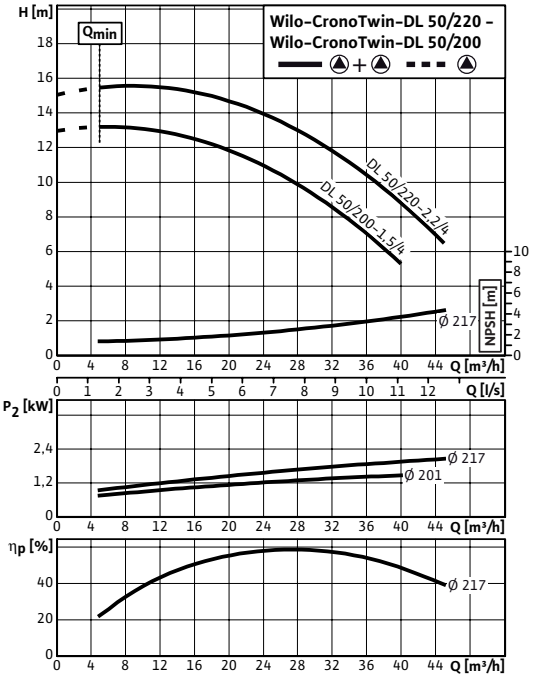
Rotational speed 1450 rpm – parallel operation



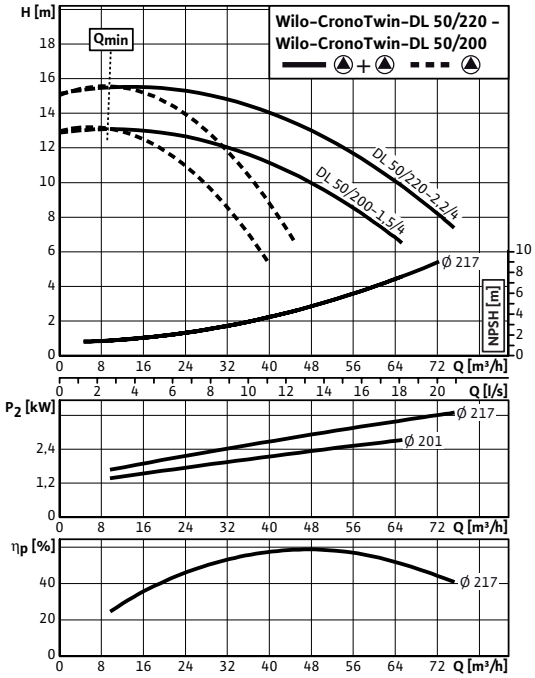
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 50 / 200-1.5 / 4 – 50 / 220-2.2 / 4

Rotational speed 1450 rpm – individual operation

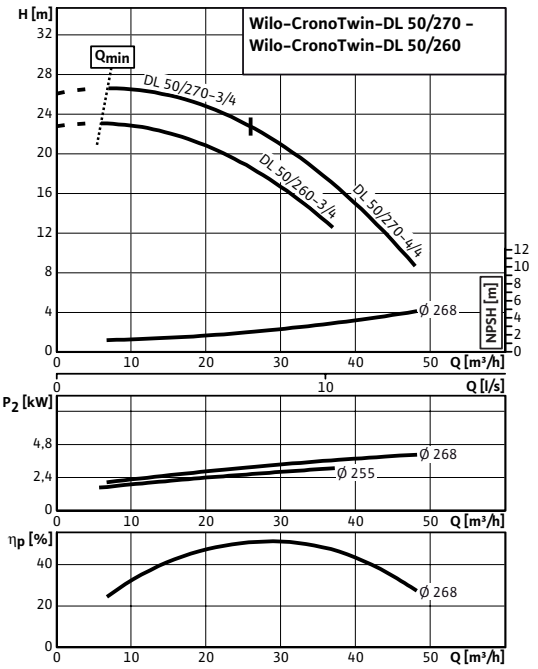


Rotational speed 1450 rpm – parallel operation

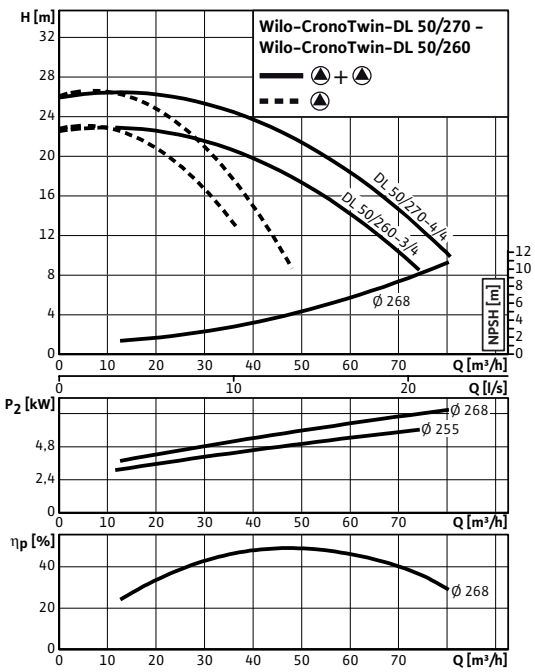


Wilo-CronoTwin-DL 50 / 260-3 / 4 – 50 / 270-4 / 4

Rotational speed 1450 rpm – individual operation



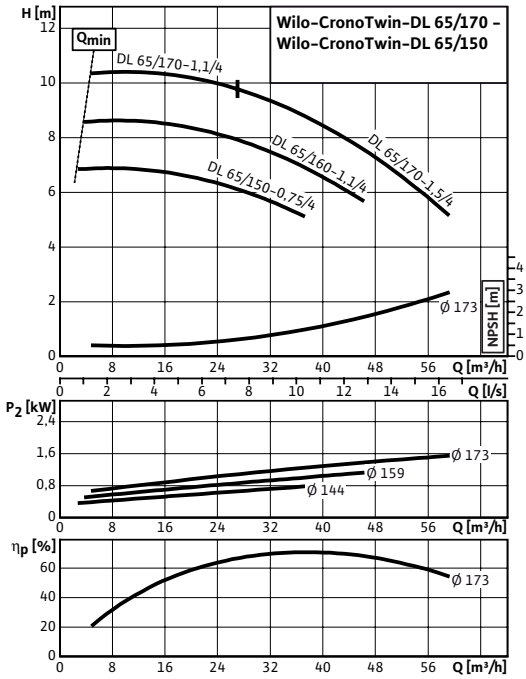
Rotational speed 1450 rpm – parallel operation



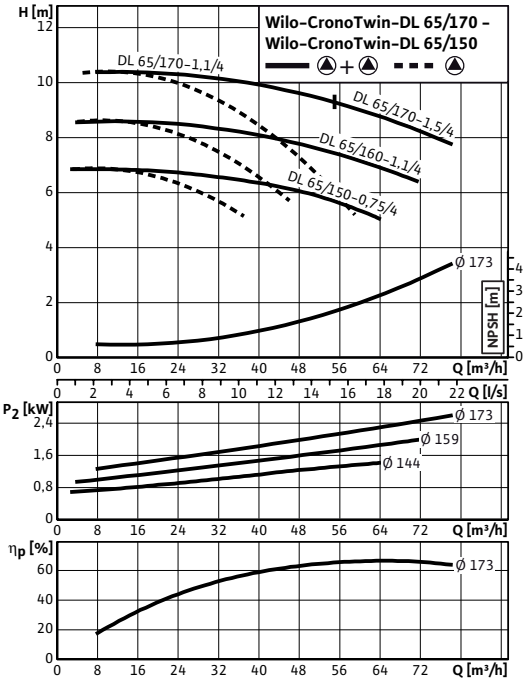
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 65 / 150-0.75 / 4 – 65 / 170-1.5 / 4

Rotational speed 1450 rpm – individual operation

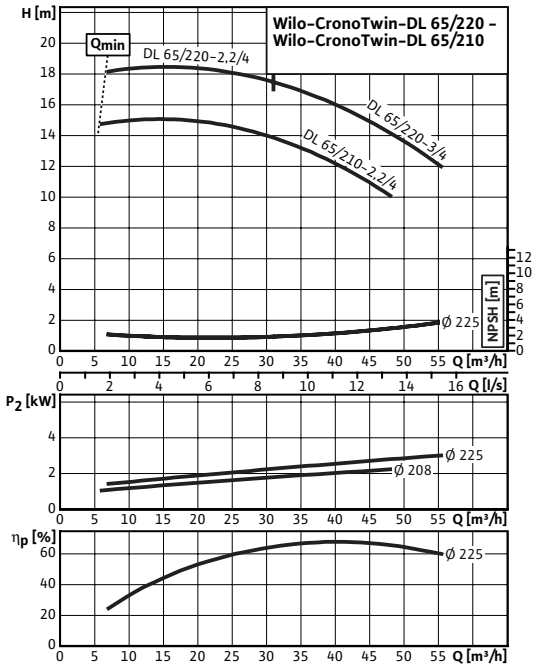


Rotational speed 1450 rpm – parallel operation

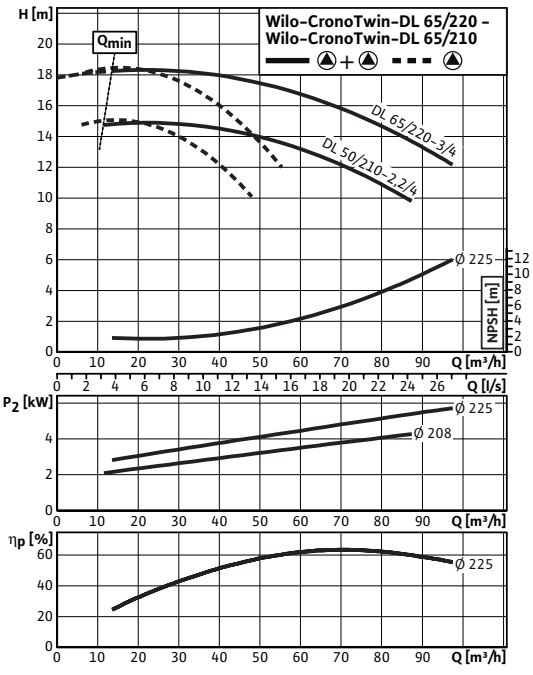


Wilo-CronoTwin-DL 65 / 210-2.2 / 4 – 65 / 220-3 / 4

Rotational speed 1450 rpm – individual operation



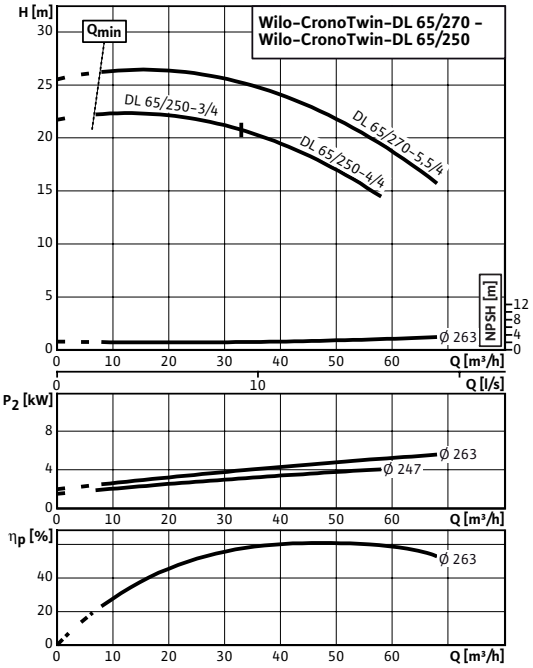
Rotational speed 1450 rpm – parallel operation



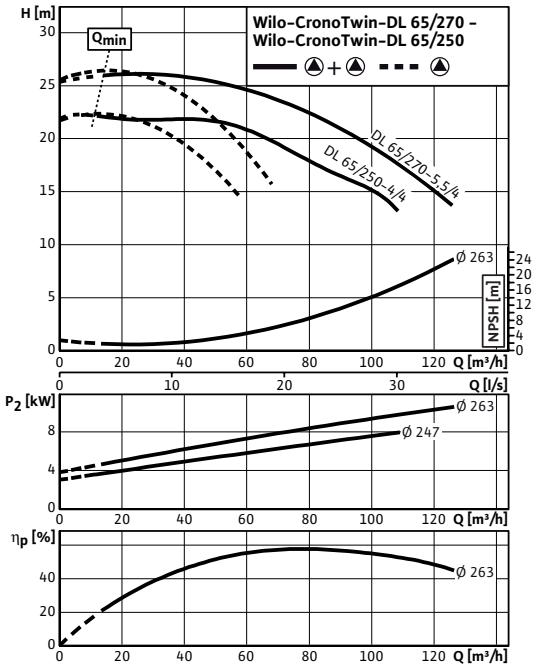
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 65 / 250-3 / 4 – 65 / 270-5.5 / 4

Rotational speed 1450 rpm – individual operation

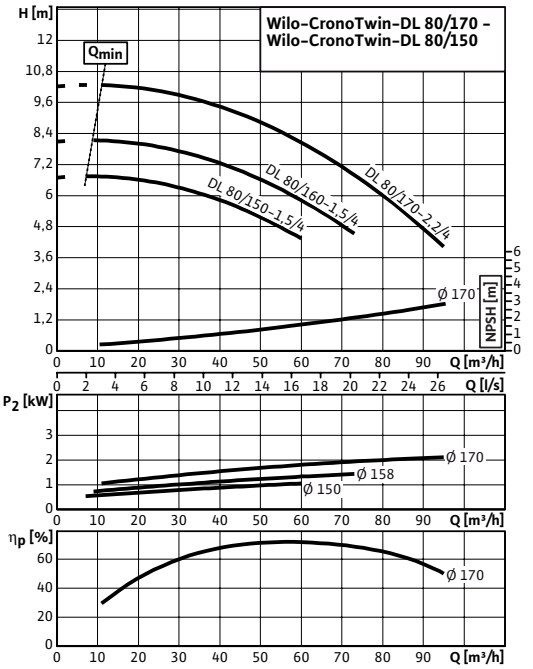


Rotational speed 1450 rpm – parallel operation

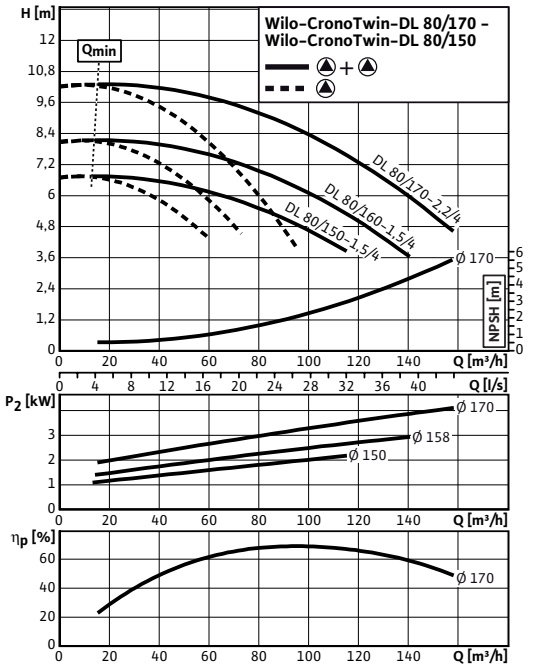


Wilo-CronoTwin-DL 80 / 150-1.1 / 4 – 80 / 170-2.2 / 4

Rotational speed 1450 rpm – individual operation



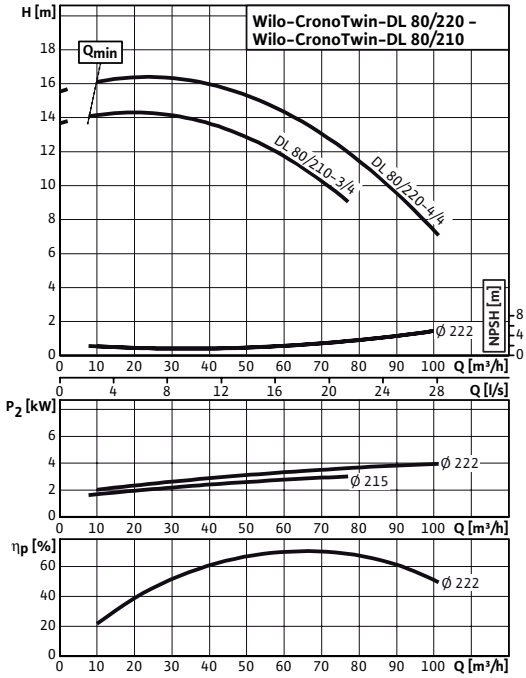
Rotational speed 1450 rpm – parallel operation



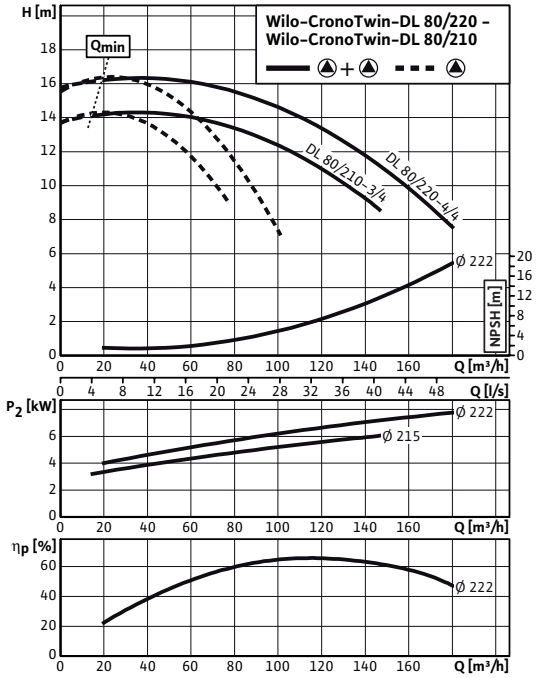
Pump curves Wilo-CronoTwin-DL

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

Rotational speed 1450 rpm – individual operation

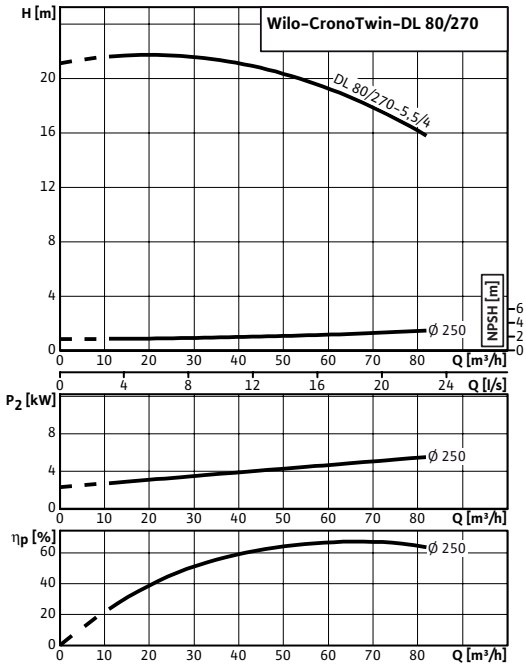


Rotational speed 1450 rpm – parallel operation

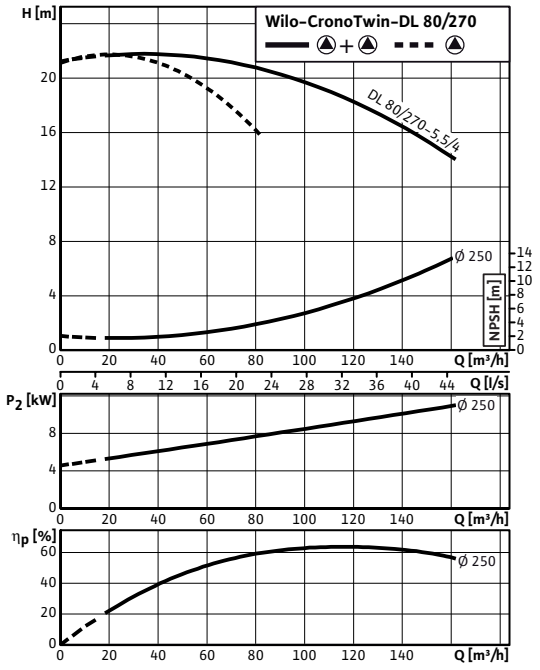


Wilo-CronoTwin-DL 80 / 270-5.5 / 4

Rotational speed 1450 rpm – individual operation



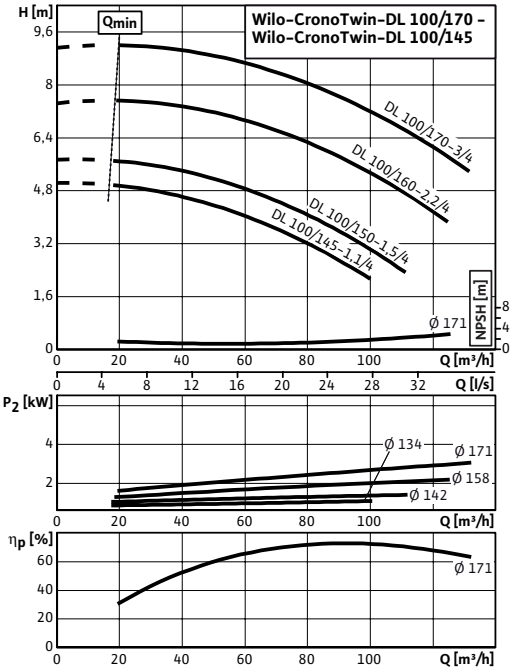
Rotational speed 1450 rpm – parallel operation



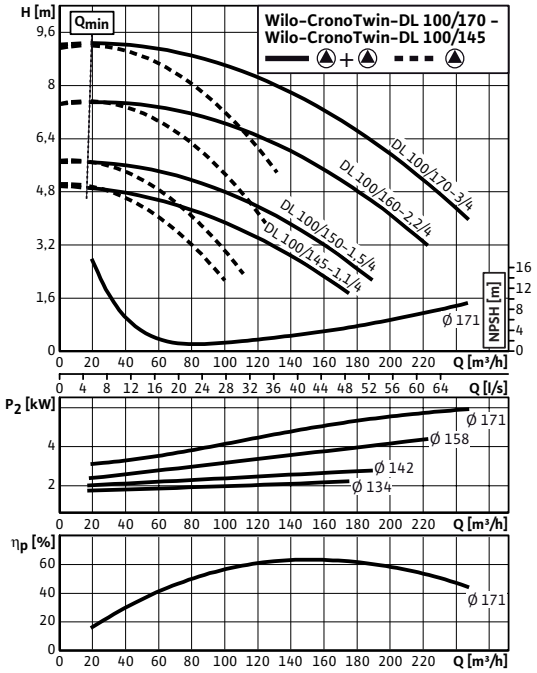
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 100 / 145-1.1 / 4 – 100 / 170-3 / 4

Rotational speed 1450 rpm – individual operation

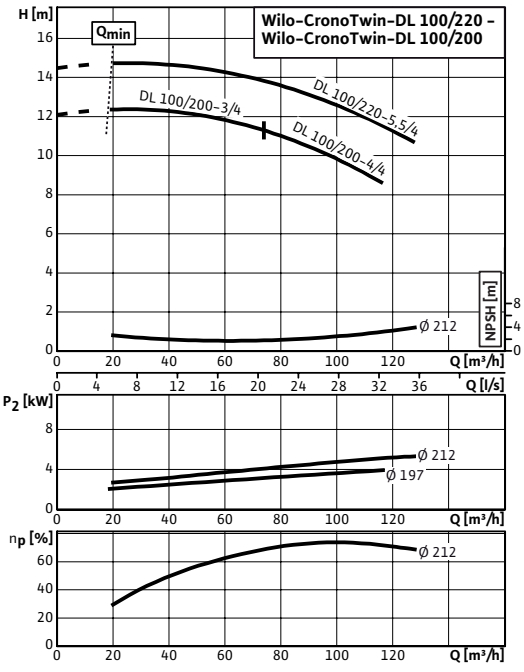


Rotational speed 1450 rpm – parallel operation

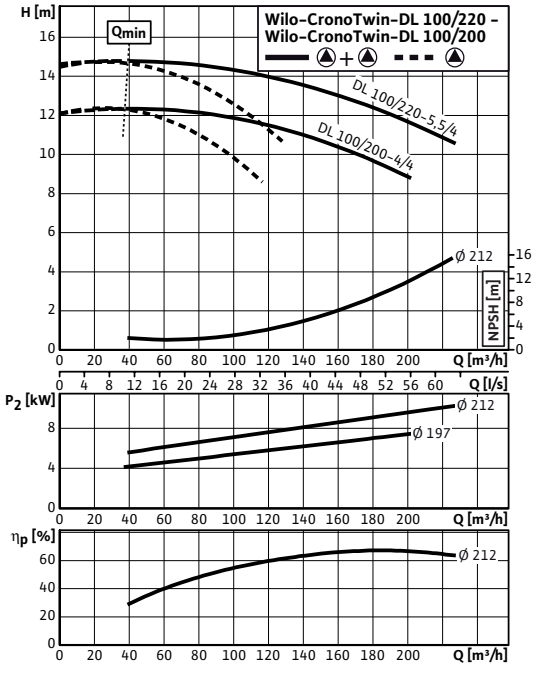


Wilo-CronoTwin-DL 100 / 200-3 / 4 – 100 / 220-5.5 / 4

Rotational speed 1450 rpm – individual operation



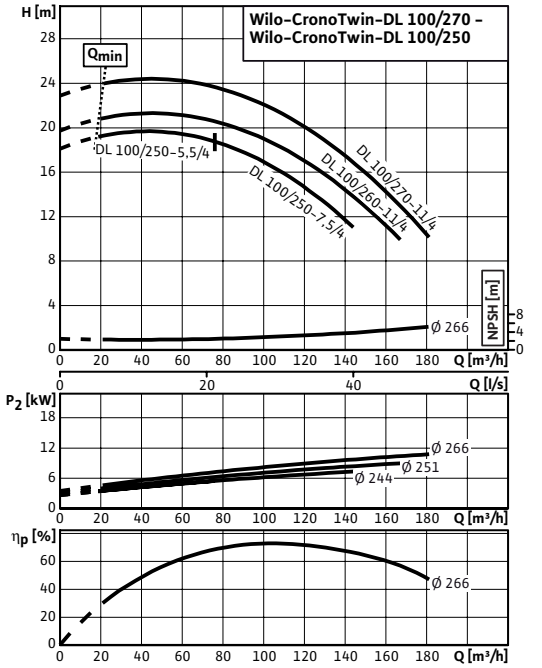
Rotational speed 1450 rpm – parallel operation



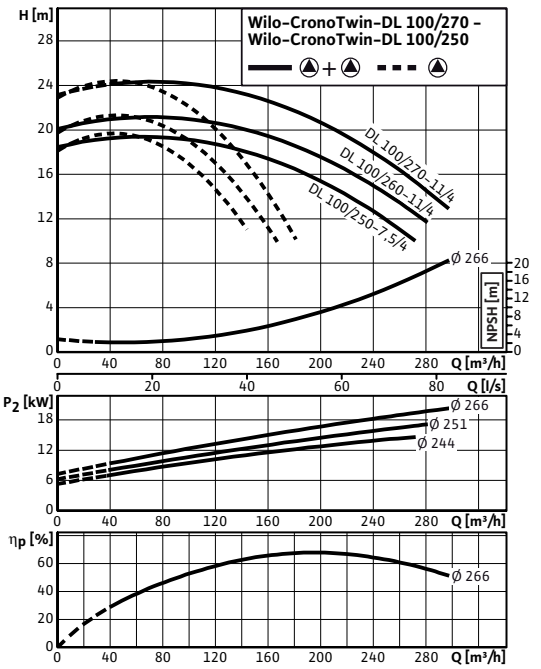
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 100 / 250-5.5 / 4 – 100 / 270-11 / 4

Rotational speed 1450 rpm – individual operation

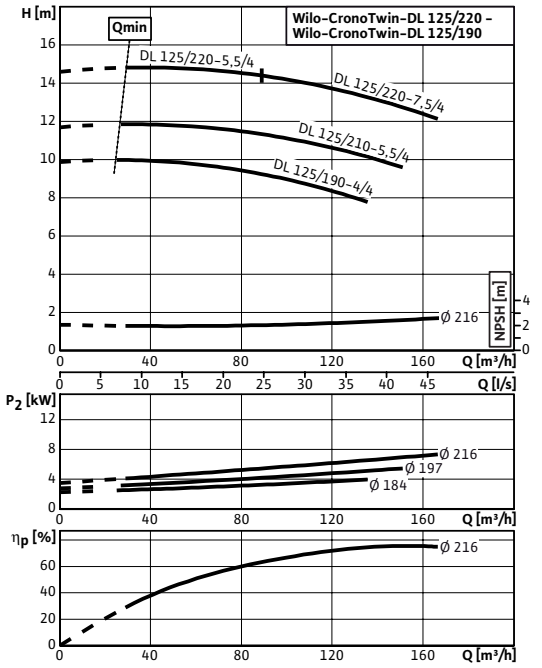


Rotational speed 1450 rpm – parallel operation

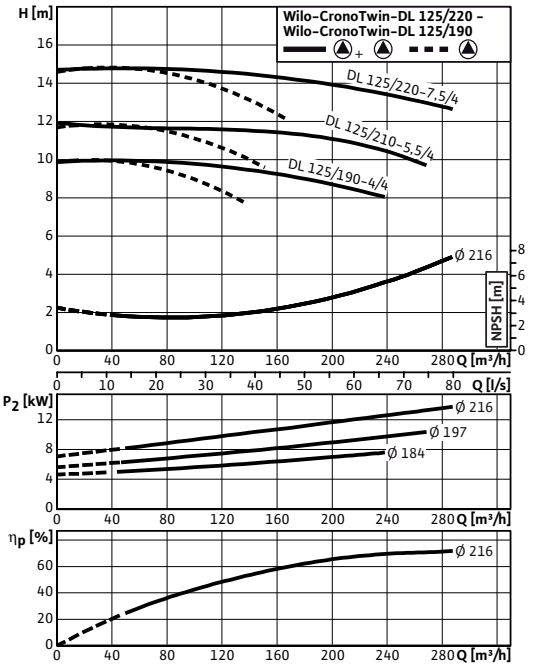


Wilo-CronoTwin-DL 125 / 190-4 / 4 – 125 / 220-7.5 / 4

Rotational speed 1450 rpm – individual operation



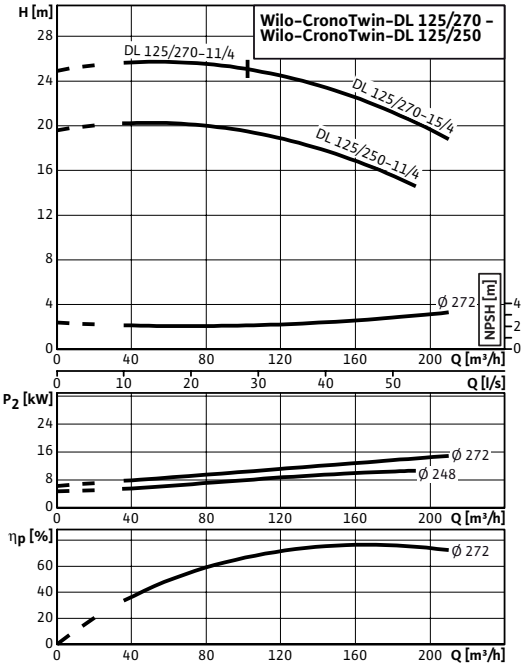
Rotational speed 1450 rpm – parallel operation



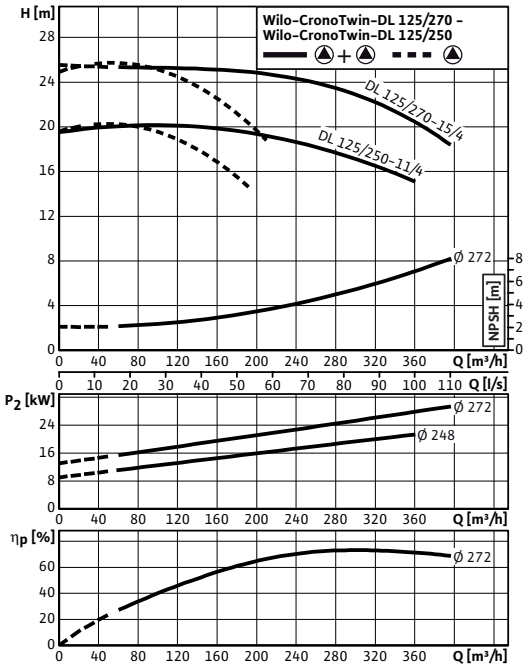
Pump curves Wilo-CronoTwin-DL

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

Rotational speed 1450 rpm – individual operation

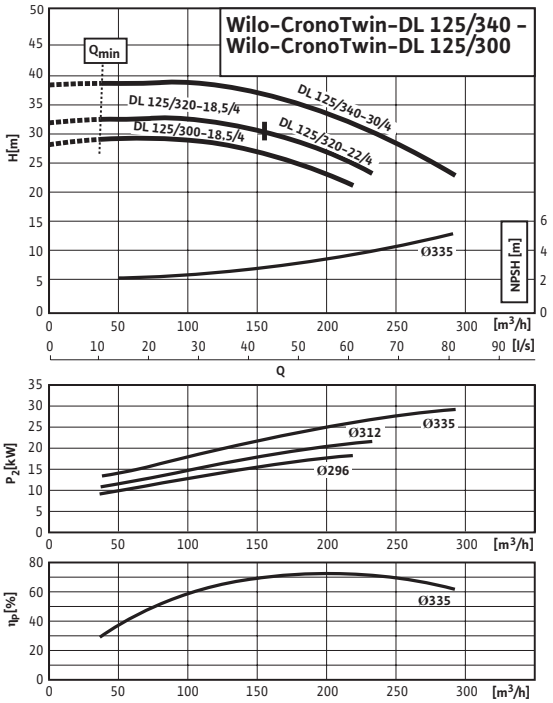


Rotational speed 1450 rpm – parallel operation

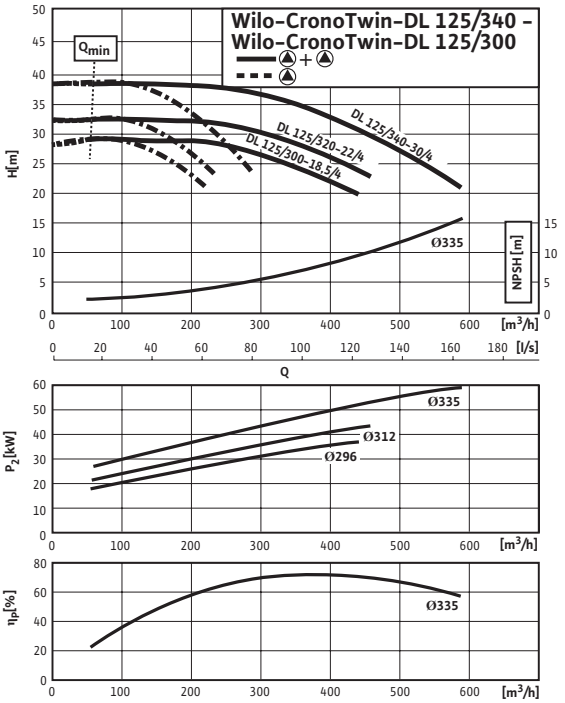


Wilo-CronoTwin-DL 125 / 300-18.5 / 4 – 125 / 340-30 / 4

Rotational speed 1450 rpm – individual operation



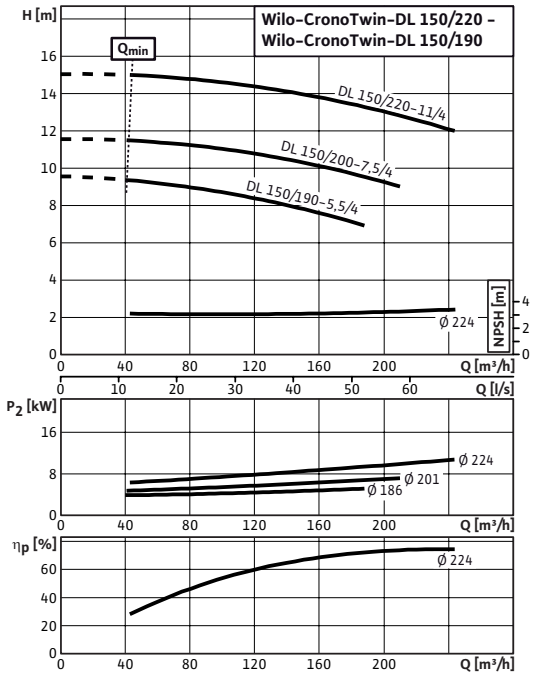
Rotational speed 1450 rpm – parallel operation



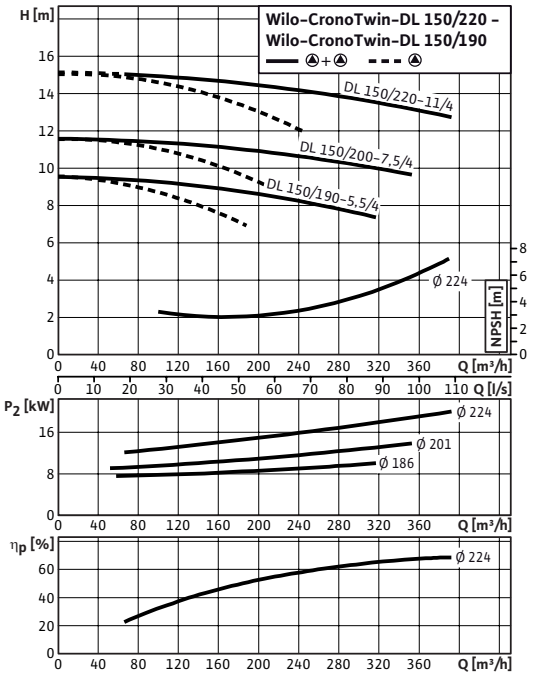
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 150 / 190-5.5 / 4 – 150 / 220-11 / 4

Rotational speed 1450 rpm – individual operation

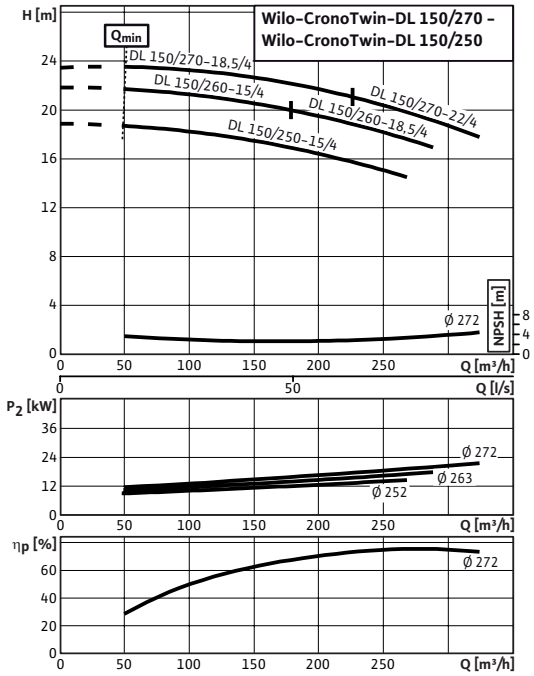


Rotational speed 1450 rpm – parallel operation

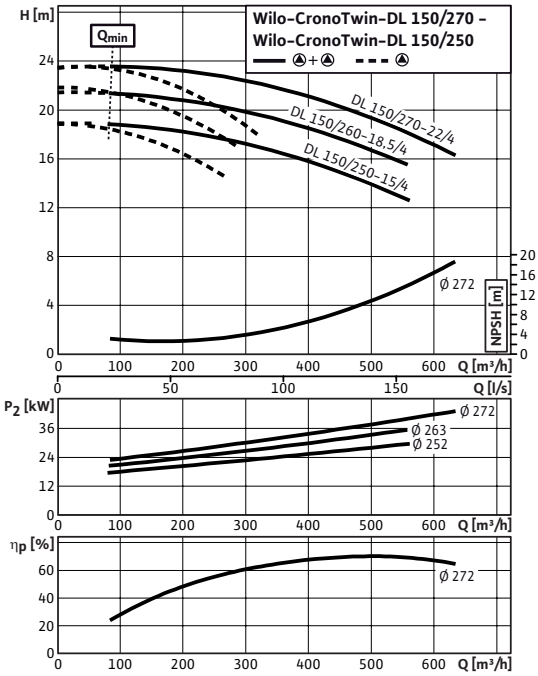


Wilo-CronoTwin-DL 150 / 250-15 / 4 – 150 / 270-22 / 4

Rotational speed 1450 rpm – individual operation



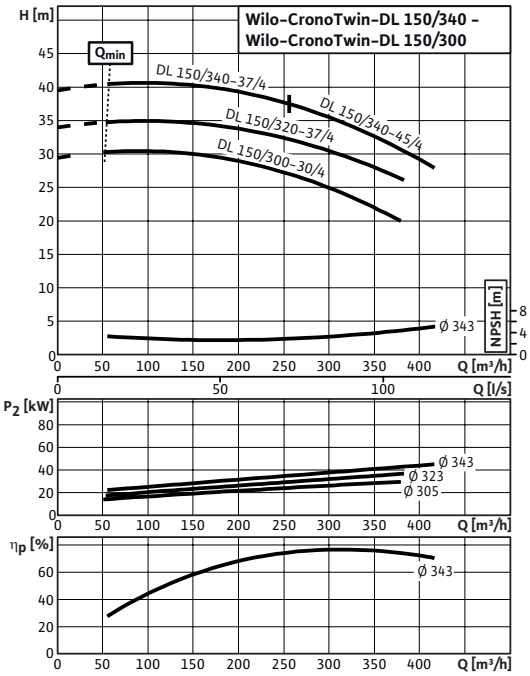
Rotational speed 1450 rpm – parallel operation



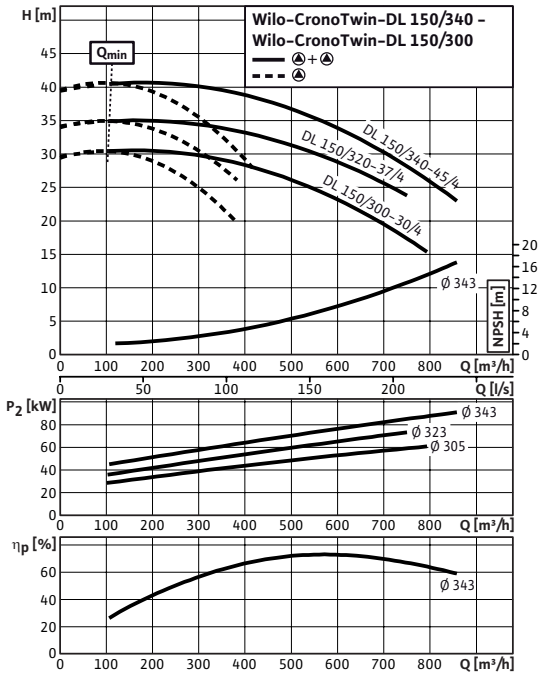
Pump curves Wilo-CronoTwin-DL

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

Rotational speed 1450 rpm – individual operation

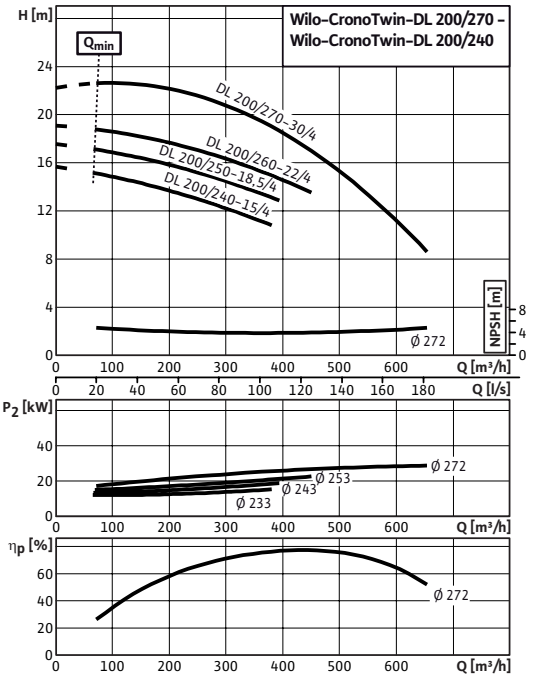


Rotational speed 1450 rpm – parallel operation

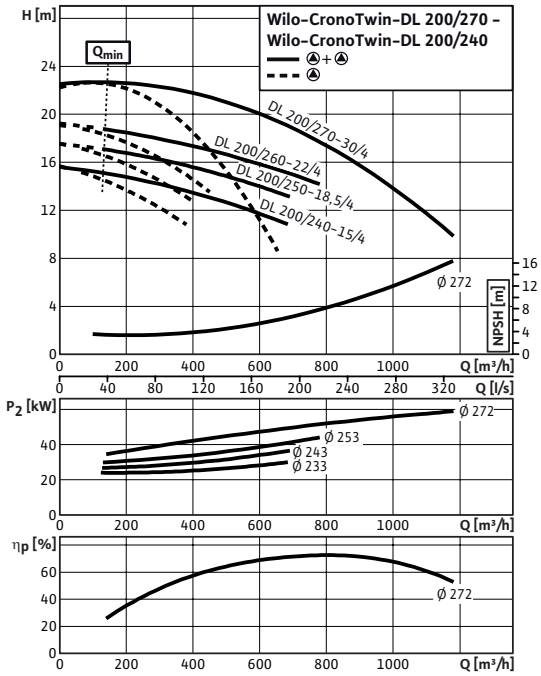


Wilo-CronoTwin-DL 200 / 240-15 / 4 – 200 / 270-30 / 4

Rotational speed 1450 rpm – individual operation



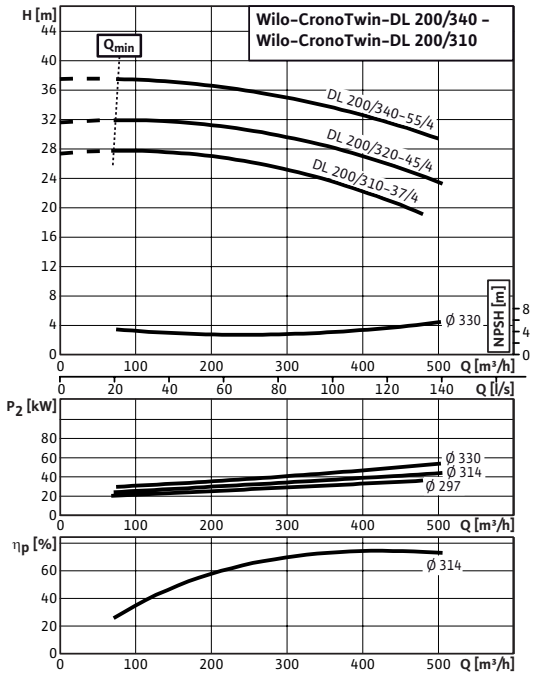
Rotational speed 1450 rpm – parallel operation



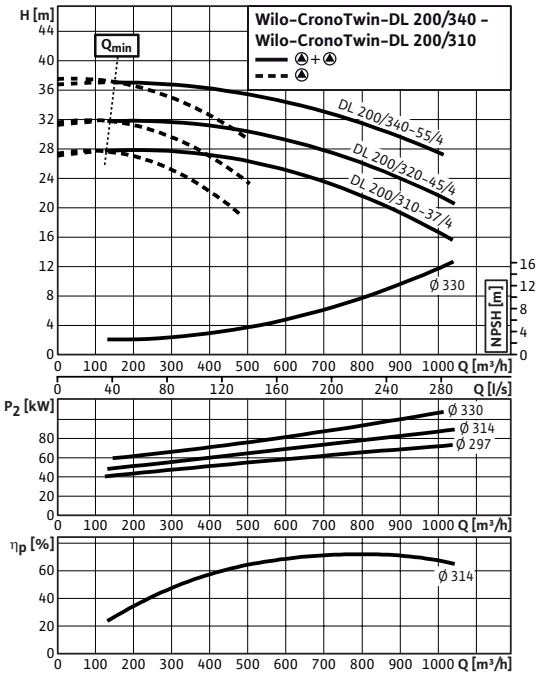
Pump curves Wilo-CronoTwin-DL

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

Rotational speed 1450 rpm – individual operation



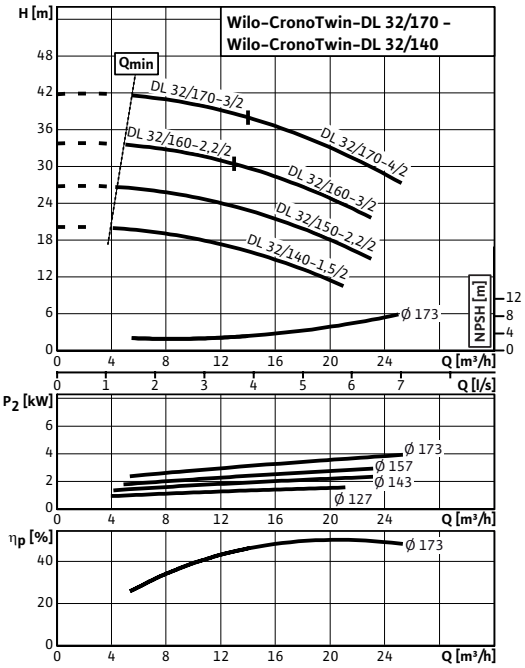
Rotational speed 1450 rpm – parallel operation



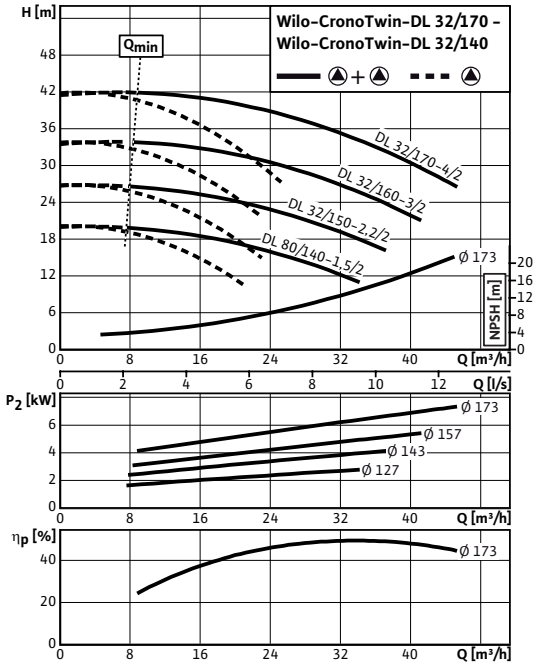
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 32 / 140-1.5 / 2 – 32 / 170-4 / 2

Rotational speed 2900 rpm – individual operation

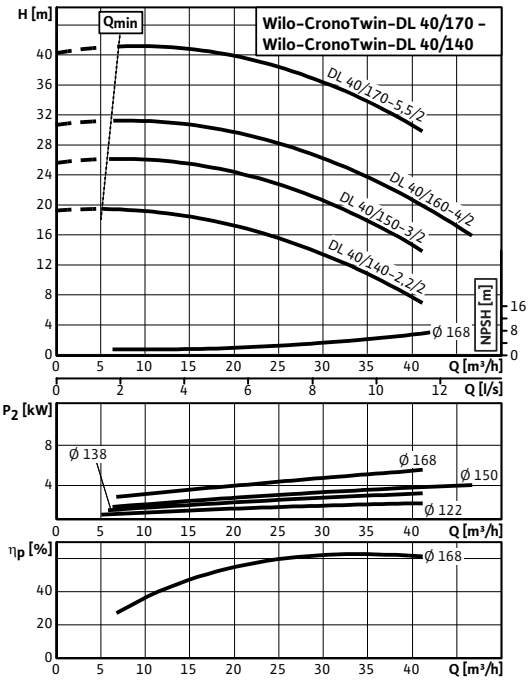


Rotational speed 2900 rpm – parallel operation

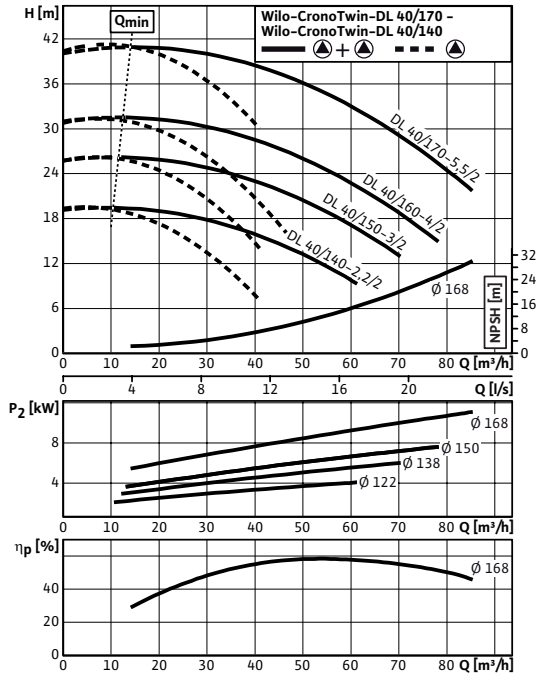


Wilo-CronoTwin-DL 40 / 140-2.2 / 2 – 40 / 170-5.5 / 2

Rotational speed 2900 rpm – individual operation



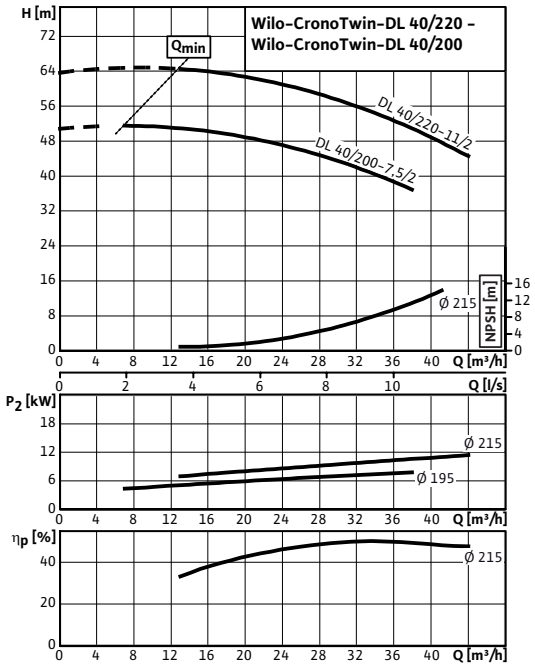
Rotational speed 2900 rpm – parallel operation



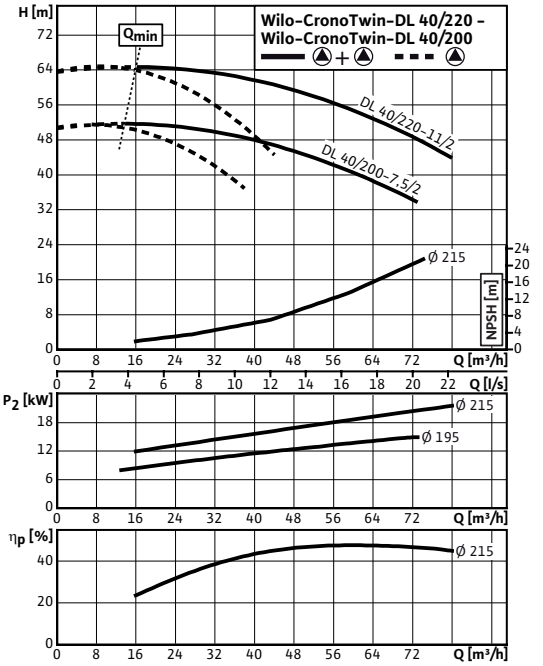
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 40 / 200-7.5 / 2 – 40 / 220-11 / 2

Rotational speed 2900 rpm – individual operation

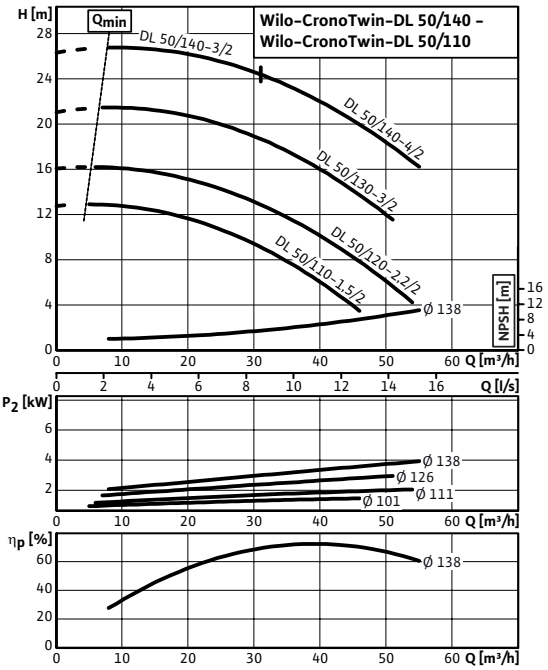


Rotational speed 2900 rpm – parallel operation

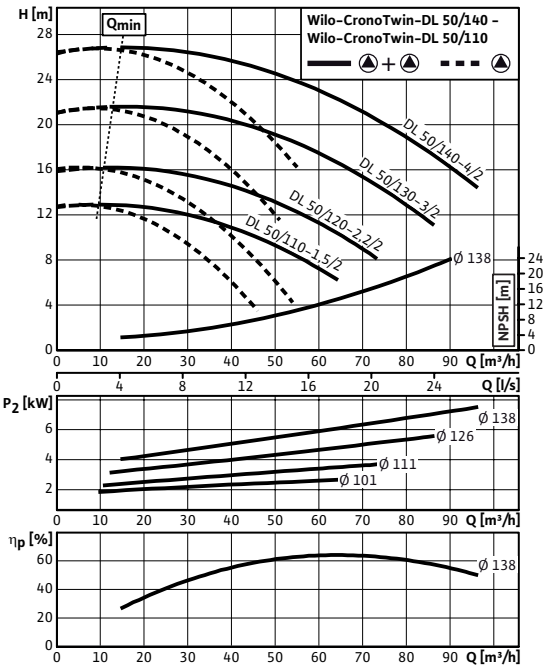


Wilo-CronoTwin-DL 50 / 110-1.5 / 2 – 50 / 140-4 / 2

Rotational speed 2900 rpm – individual operation



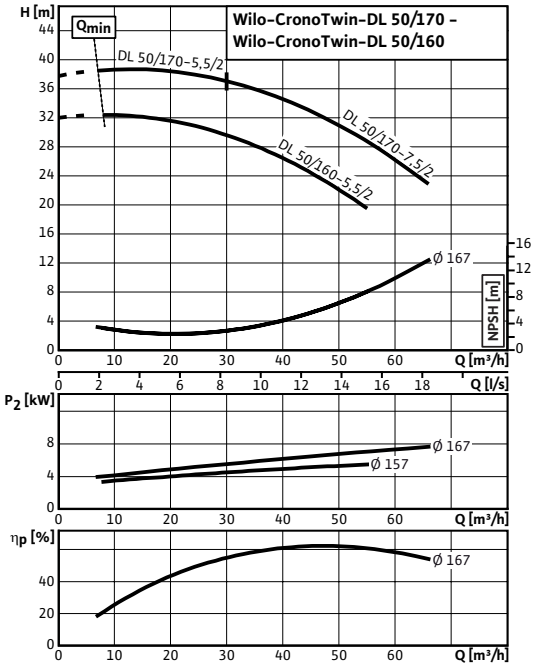
Rotational speed 2900 rpm – parallel operation



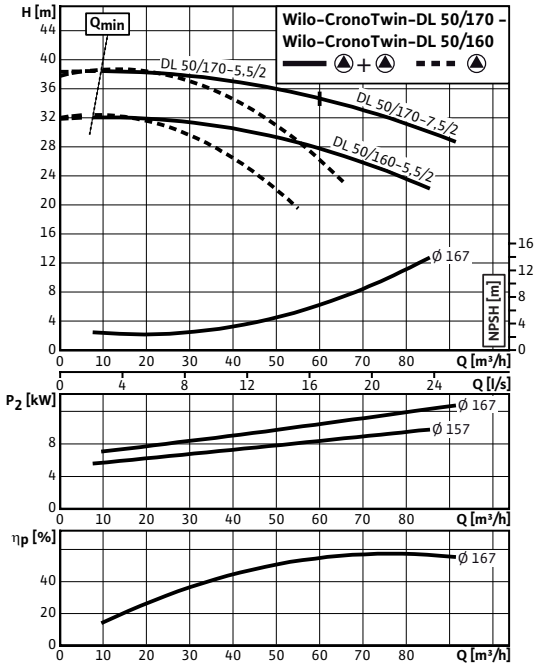
Pump curves Wilo–CronoTwin–DL

Wilo–CronoTwin–DL 50 / 160–5.5 / 2 – 50 / 170–7.5 / 2

Rotational speed 2900 rpm – individual operation

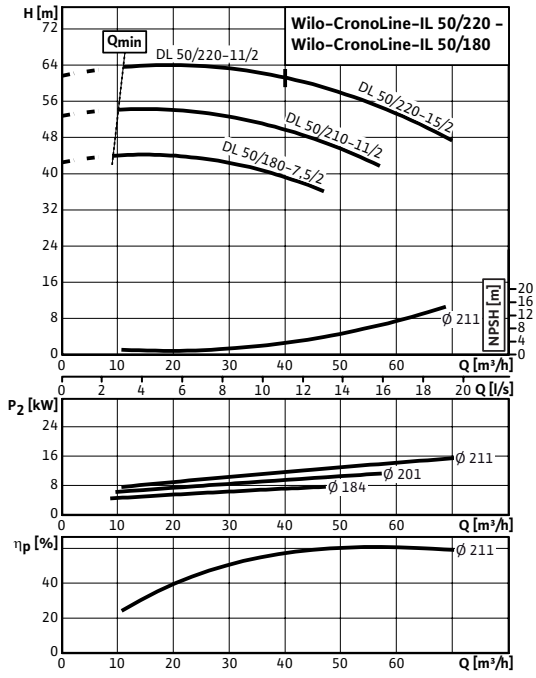


Rotational speed 2900 rpm – parallel operation

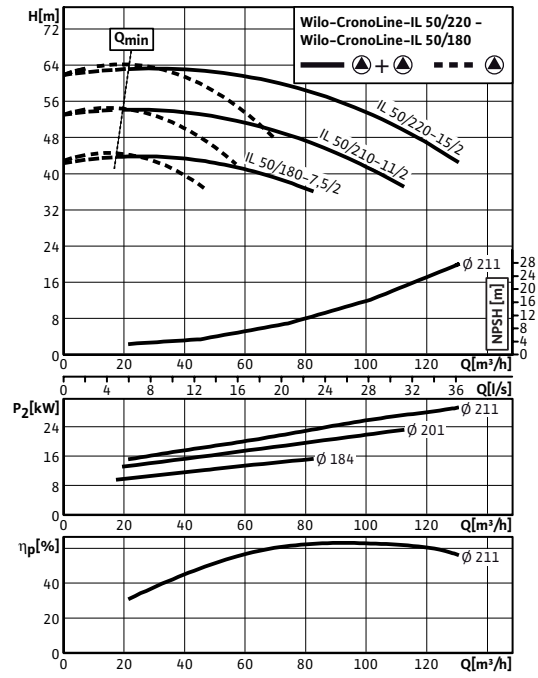


Wilo–CronoTwin–DL 50 / 180–7.5 / 2 – 50 / 220–15 / 2

Rotational speed 2900 rpm – individual operation



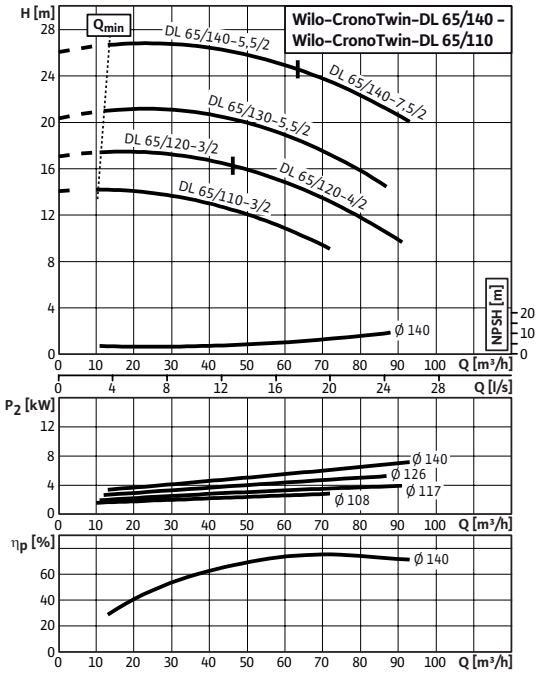
Rotational speed 2900 rpm – parallel operation



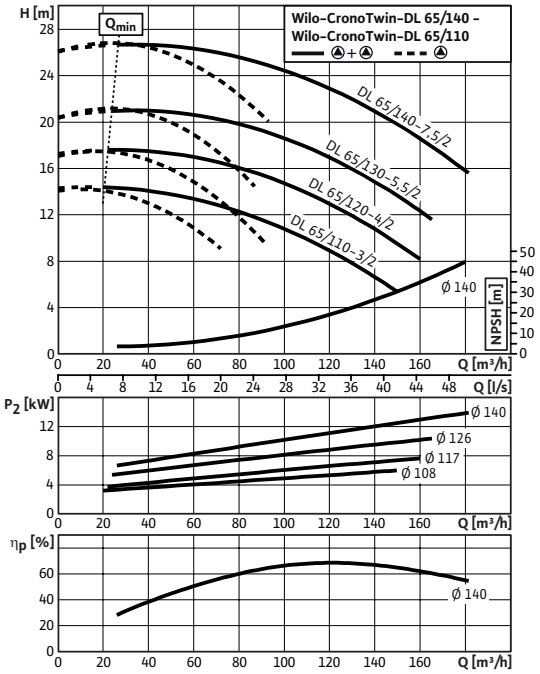
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 65 / 110-3 / 2 – 65 / 140-7.5 / 2

Rotational speed 2900 rpm – individual operation

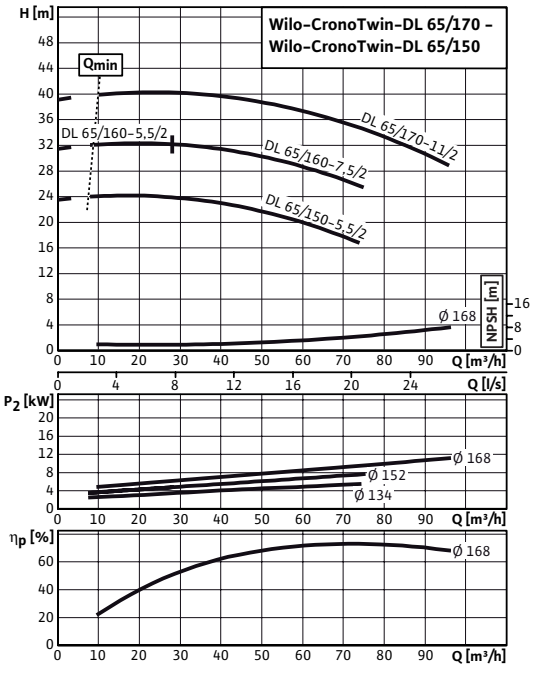


Rotational speed 2900 rpm – parallel operation

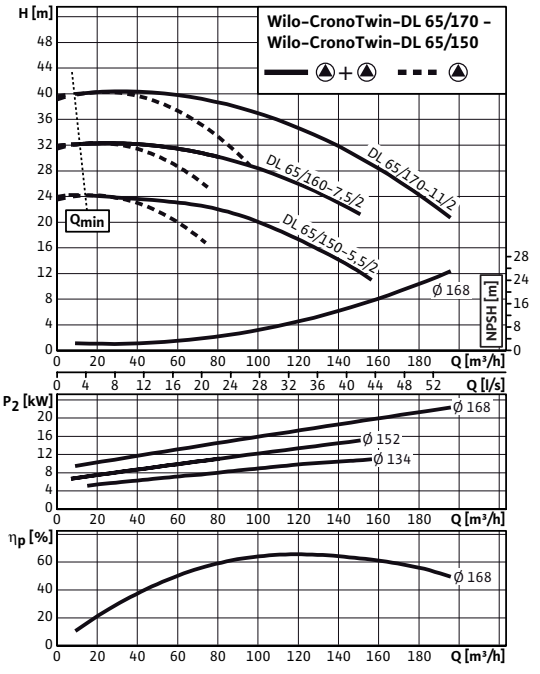


Wilo-CronoTwin-DL 65 / 150-5.5 / 2 – 65 / 170-11 / 2

Rotational speed 2900 rpm – individual operation



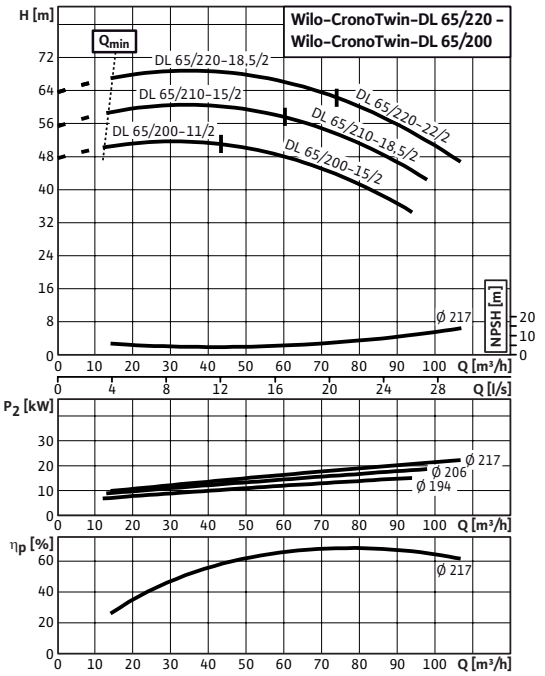
Rotational speed 2900 rpm – parallel operation



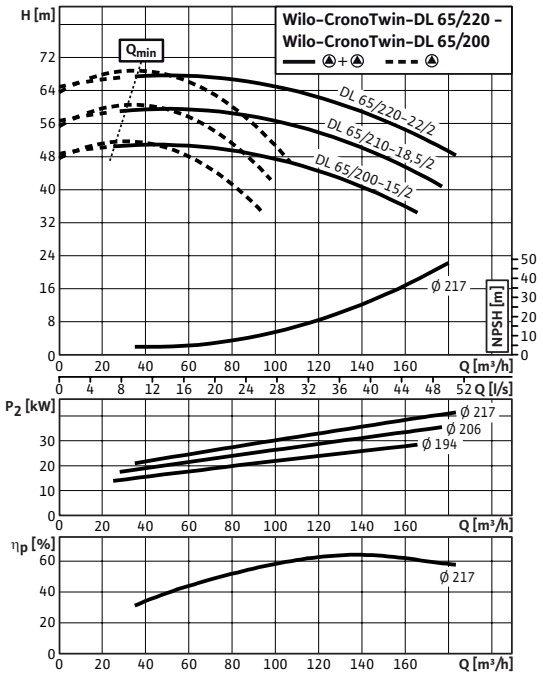
Pump curves Wilo-CronoTwin-DL

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

Rotational speed 2900 rpm – individual operation

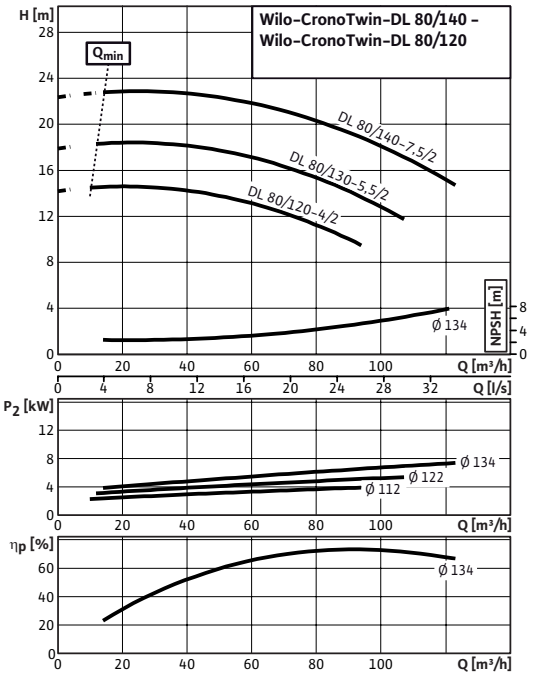


Rotational speed 2900 rpm – parallel operation

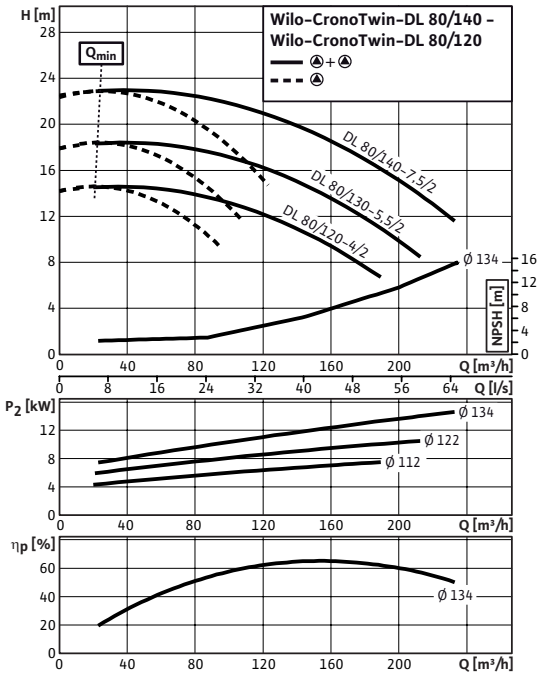


Wilo-CronoTwin-DL 80 / 120-4 / 2 – 80 / 140-7.5 / 2

Rotational speed 2900 rpm – individual operation



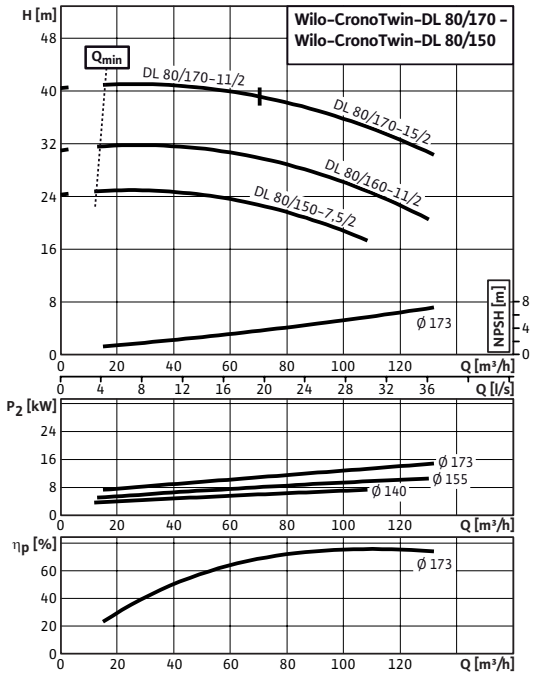
Rotational speed 2900 rpm – parallel operation



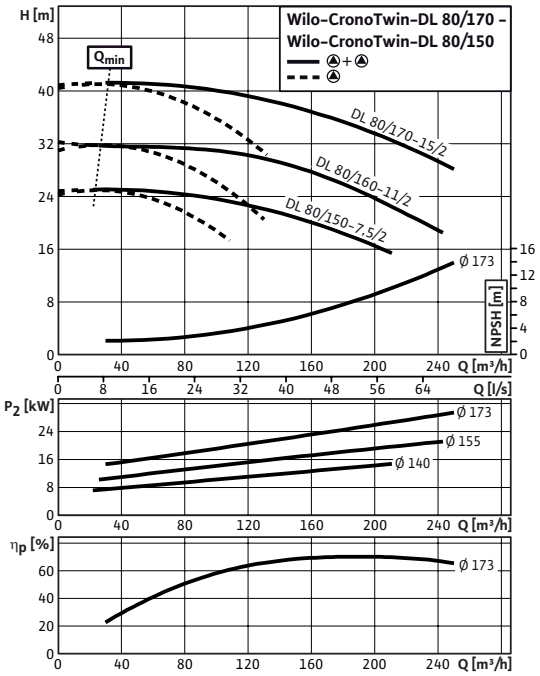
Pump curves Wilo-CronoTwin-DL

Wilo-CronoTwin-DL 80 / 150-7.5 / 2 – 80 / 170-15 / 2

Rotational speed 2900 rpm – individual operation

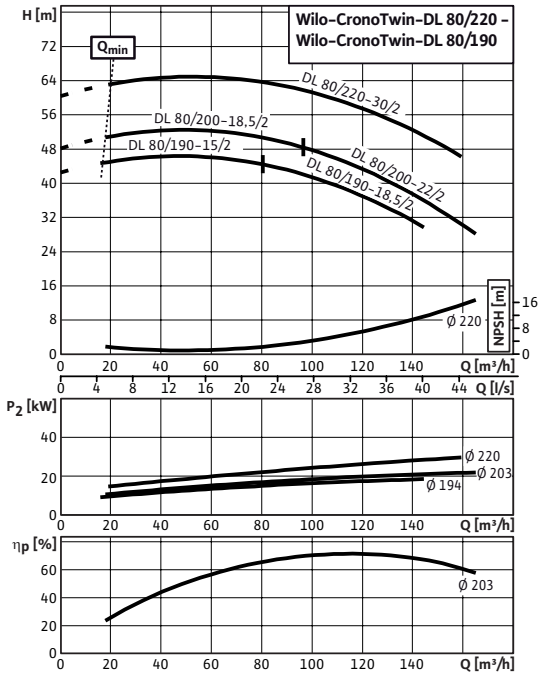


Rotational speed 2900 rpm – parallel operation

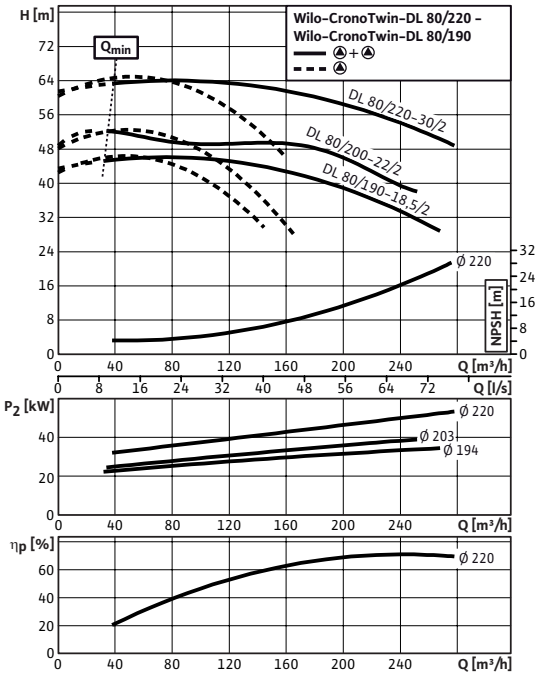


Wilo-CronoTwin-DL 80 / 190-15 / 2 – 80 / 220-30 / 2

Rotational speed 2900 rpm – individual operation



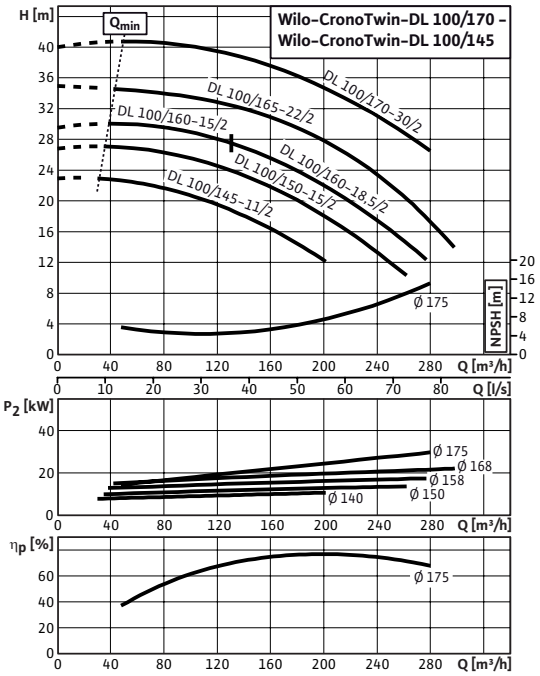
Rotational speed 2900 rpm – parallel operation



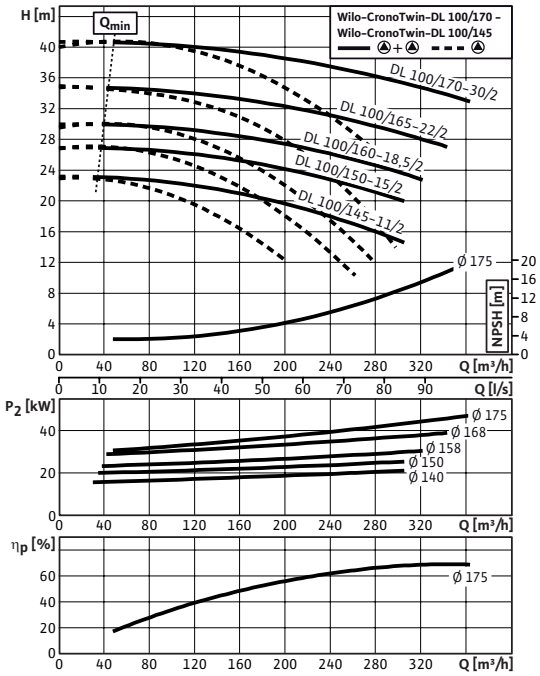
Pump curves Wilo-CronoTwin-DL

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

Rotational speed 2900 rpm – individual operation

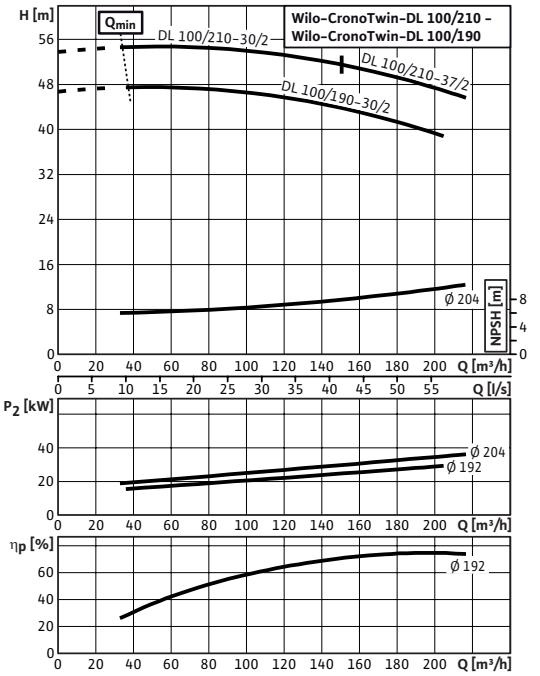


Rotational speed 2900 rpm – parallel operation

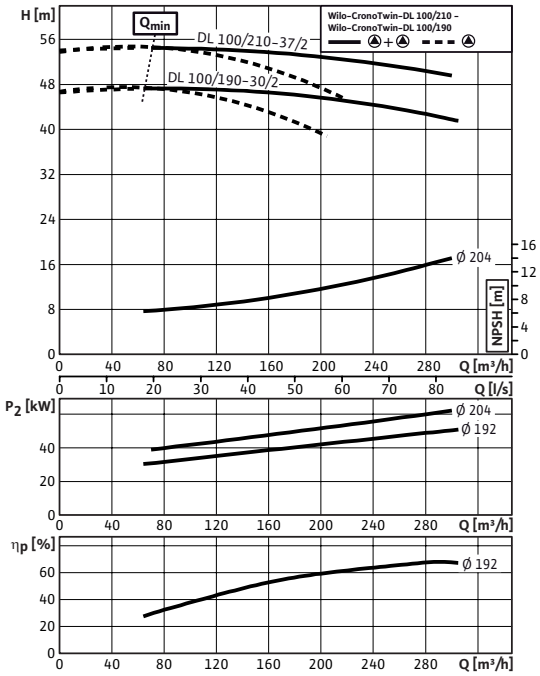


Wilo-CronoTwin-DL 100 / 190-30 / 2 – 100 / 210-37 / 2

Rotational speed 2900 rpm – individual operation



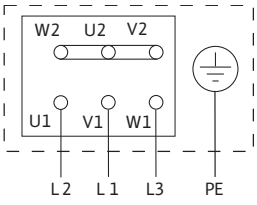
Rotational speed 2900 rpm – parallel operation



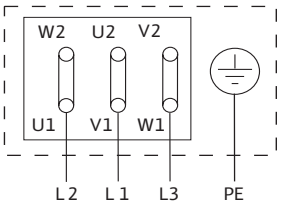
Terminal diagram, Motor Data Wilo-CronoTwin-DL

Terminal Diagrams

Star activation Y



Delta activation Δ



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

P2 ≤ 3 kW 3~400 V Y
3~230 V Δ
P2 ≥ 4 kW 3~690 V Y
3~400 V Δ

After removing the bridge Y-Δ-starting is possible.

Motor Data (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal current (approximately)	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
1.10 kW	2.55	0.81	0.77
1.50 kW	3.40	0.81	0.79
2.20 kW	4.70	0.82	0.82
3.00 kW	6.40	0.82	0.83
4.00 kW	8.20	0.83	0.85
5.50 kW	11.40	0.81	0.86
7.50 kW	15.20	0.82	0.87
11.00 kW	21.50	0.84	0.89
15.00 kW	28.50	0.84	0.90
18.50 kW	35.50	0.83	0.91
22.00 kW	41.50	0.84	0.91
30.00 kW	55.00	0.86	0.92
37.00 kW	66.00	0.87	0.93
45.00 kW	80.00	0.87	0.93
55.00 kW	100.00	0.85	0.94

Note motor type label data!

Motor Data (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal current (approximately)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
1.50 kW	3.25	0.85	0.79
2.20 kW	4.55	0.85	0.82
3.00 kW	6.10	0.85	0.84
4.00 kW	7.80	0.86	0.86
5.50 kW	10.40	0.89	0.87

Terminal diagram, Motor Data Wilo-CronoTwin-DL

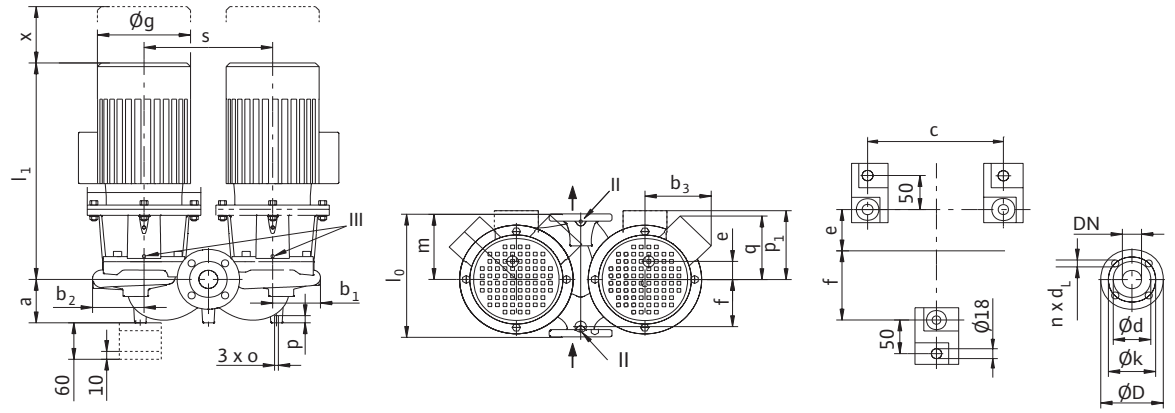
Motor Data (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal current (approximately)	Power factor	Efficiency
	I_N 3~400 V	cos φ	η_M
	[A]	–	
7.50 kW	13.80	0.89	0.88
11.00 kW	20.00	0.88	0.90
15.00 kW	26.50	0.90	0.90
18.50 kW	32.00	0.91	0.91
22.00 kW	39.50	0.88	0.92
30.00 kW	53.00	0.89	0.92
37.00 kW	65.00	0.89	0.93

Note motor type label 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	Dimensions																	Weight approximately
	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]																	[kg]
32/140-0.25/4	32	320	100	117	122	105	360	43	137	145	385	155	M10	20	–	105	300	90	77
32/150-0.37/4	32	320	100	117	122	105	360	43	137	145	385	155	M10	20	–	105	300	90	80
32/170-0.55/4	32	320	100	117	122	111	360	43	137	188	405	155	M10	20	–	111	300	90	84
40/140-0.25/4	40	340	100	120	127	105	400	52	145	145	389	170	M10	20	–	105	340	95	82
40/150-0.37/4	40	340	100	120	127	105	400	52	145	145	389	170	M10	20	–	105	340	95	84
40/160-0.55/4	40	340	100	120	127	111	400	52	145	188	409	170	M10	20	–	111	340	95	88
40/170-0.75/4	40	340	100	120	127	111	400	52	145	188	409	170	M10	20	–	111	340	95	90
40/210-1.1/4	40	440	110	145	147	–	500	38	192	193	451	220	M10	20	128	–	400	100	111
40/220-1.5/4	40	440	110	145	147	–	500	38	192	193	451	220	M10	20	128	–	400	100	118
50/150-0.55/4	50	340	120	126	136	111	360	50	130	188	405	180	M10	20	–	111	340	100	92
50/160-0.75/4	50	340	120	126	136	111	360	50	130	188	405	180	M10	20	–	111	340	100	95
50/170-1.1/4	50	340	120	126	136	117	360	50	130	193	447	180	M10	20	–	117	340	100	102
50/200-1.5/4	50	440	120	145	148	–	500	50	200	193	457	220	M10	20	128	–	400	100	115
50/220-2.2/4	50	440	120	145	148	–	500	50	200	217	514	220	M10	20	135	–	400	100	134
50/260-3/4	50	440	122	177	174	–	480	50	200	217	540	220	M10	20	135	–	400	120	158
50/270-3/4	50	440	122	177	174	–	480	50	200	217	540	220	M10	20	135	–	400	120	158
50/270-4/4	50	440	122	177	174	–	480	50	200	232	620	220	M10	20	148	–	400	120	172
65/150-0.75/4	65	430	153	134	144	111	440	55	185	188	423	215	M12	20	–	111	400	120	114
65/160-1.1/4	65	430	153	134	144	117	440	55	185	193	465	215	M12	20	–	117	400	120	121
65/170-1.1/4	65	430	153	134	144	117	440	55	185	193	465	215	M12	20	–	117	400	120	122
65/170-1.5/4	65	430	153	134	144	117	440	55	185	193	465	215	M12	20	–	117	400	120	128
65/210-2.2/4	65	475	140	157	166	–	520	45	210	217	523	245	M12	20	135	–	400	110	145
65/220-2.2/4	65	475	140	157	166	–	520	45	210	217	523	245	M12	20	135	–	400	110	145

Dimensions, Weights Wilo-CronoTwin-DL

Dimensions, Weights (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Dimensions																	Weight approximately
	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]																	[kg]
65/220-3/4	65	475	140	157	166	–	520	45	210	217	523	245	M12	20	135	–	400	110	151
65/250-3/4	65	475	140	184	176	–	500	50	220	217	543	235	M12	20	135	–	400	120	168
65/250-4/4	65	475	140	184	176	–	500	50	220	232	623	235	M12	20	148	–	400	120	180
65/270-5.5/4	65	475	140	184	176	–	500	50	220	279	694	235	M12	20	167	–	400	120	204
80/150-1.1/4	80	440	155	144	160	117	440	62	188	193	470	220	M12	20	–	117	400	120	133
80/160-1.5/4	80	440	155	144	160	117	440	62	188	193	470	220	M12	20	–	117	400	120	140
80/170-2.2/4	80	440	155	144	160	138	440	62	188	217	525	220	M12	20	–	138	400	120	162
80/210-3/4	80	500	145	166	176	–	550	72	228	217	528	250	M12	20	135	–	450	120	169
80/220-4/4	80	500	145	166	176	–	550	72	228	232	608	250	M12	20	148	–	450	120	181
80/270-5.5/4	80	500	125	188	198	–	560	62	233	279	682	245	M12	20	167	–	450	115	234
100/145-1.1/4	100	500	180	173	188	117	580	80	250	193	484	226	M12	20	–	117	440	135	154
100/150-1.5/4	100	500	180	173	188	117	580	80	250	193	484	226	M12	20	–	117	440	135	161
100/160-2.2/4	100	500	180	173	188	138	580	80	250	217	538	226	M12	20	–	138	440	135	183
100/170-3/4	100	500	180	173	188	138	580	80	250	217	538	226	M12	20	–	138	440	135	188
100/200-3/4	100	550	155	183	197	–	560	79	251	217	536	275	M12	20	135	–	450	120	188
100/200-4/4	100	550	155	183	197	–	560	79	251	232	616	275	M12	20	148	–	450	120	200
100/220-5.5/4	100	550	155	183	197	–	560	79	251	279	687	275	M12	20	167	–	450	120	228
100/250-5.5/4	100	550	180	198	210	–	600	54	266	279	692	260	M12	20	167	–	480	120	263
100/250-7.5/4	100	550	180	198	210	–	600	54	266	323	692	260	M12	20	167	–	480	120	275
100/260-11/4	100	550	180	198	210	–	600	54	266	323	843	260	M12	20	197	–	480	120	346
100/270-11/4	100	550	180	198	210	–	600	54	266	323	843	260	M12	20	197	–	480	120	346
125/190-4/4	125	620	180	205	189	–	640	68	283	232	635	312	M16	25	148	–	500	120	225
125/210-5.5/4	125	620	180	205	189	–	640	68	283	279	706	312	M16	25	167	–	500	120	257
125/220-5.5/4	125	620	180	205	189	–	640	68	283	279	706	312	M16	25	167	–	500	120	257
125/220-7.5/4	125	620	180	205	189	–	640	68	283	323	706	312	M16	25	167	–	500	120	273
125/250-11/4	125	620	200	255	267	–	591	86	314	323	856	280	M16	25	197	–	520	130	397
125/270-11/4	125	620	200	255	267	–	591	86	314	323	856	280	M16	25	197	–	520	130	397
125/270-15/4	125	620	200	255	267	–	591	86	314	370	856	280	M16	25	197	–	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	710	365	M16	25	167	–	550	130	324
150/200-7.5/4	150	700	210	215	241	–	640	91	309	323	710	365	M16	25	167	–	550	130	340
150/220-11/4	150	700	210	215	241	–	640	91	309	323	861	365	M16	25	197	–	550	130	409
150/250-15/4	150	700	230	293	310	–	696	116	344	370	887	330	M16	25	197	–	600	135	548
150/260-15/4	150	700	230	293	310	–	696	116	344	370	887	330	M16	25	197	–	600	135	548
150/260-18.5/4	150	700	230	293	310	–	696	116	344	370	929	330	M16	25	259	–	600	135	604
150/270-18.5/4	150	700	230	293	310	–	696	116	344	370	929	330	M16	25	259	–	600	135	604
150/270-22/4	150	700	230	293	310	–	696	116	344	370	957	330	M16	25	259	–	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	1130	370	M16	25	327	–	650	145	748

Dimensions, Weights Wilo-CronoTwin-DL

Dimensions, Weights (1450 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Dimensions																	Weight approximately
	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]																	[kg]
150/340-37/4	150	770	230	314	329	–	758	130	374	456	1130	370	M16	25	327	–	650	145	748
150/340-45/4	150	770	230	314	329	–	758	130	374	456	1130	370	M16	25	327	–	650	145	800
200/240-15/4	200	800	250	322	347	–	1000	62	400	370	912	370	M16	25	197	–	700	140	688
200/250-18.5/4	200	800	250	322	347	–	1000	62	400	370	954	370	M16	25	259	–	700	140	745
200/260-22/4	200	800	250	322	347	–	1000	62	400	370	982	370	M16	25	259	–	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	1155	400	M16	25	306	–	700	155	1000
200/320-45/4	200	820	245	339	361	–	808	129	391	456	1155	400	M16	25	306	–	700	155	1051
200/340-55/4	200	820	245	339	361	–	808	129	391	495	1250	400	M16	25	430	–	700	155	1359

Dimensions, Weights (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Dimensions																	Weight approximately
	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]																	[kg]
32/140-1.5/2	32	320	100	117	122	117	360	43	137	193	445	155	M10	20	–	117	300	90	94
32/150-2.2/2	32	320	100	117	122	117	360	43	137	193	445	155	M10	20	–	117	300	90	99
32/160-2.2/2	32	320	100	117	122	117	360	43	137	193	445	155	M10	20	–	117	300	90	99
32/160-3/2	32	320	100	117	122	138	360	43	137	217	501	155	M10	20	–	138	300	90	118
32/170-3/2	32	320	100	117	122	138	360	43	137	217	501	155	M10	20	–	138	300	90	118
32/170-4/2	32	320	100	117	122	147	360	43	137	232	581	155	M10	20	–	147	300	90	132
40/140-2.2/2	40	340	100	120	127	117	400	52	145	193	449	170	M10	20	–	117	340	95	104
40/150-3/2	40	340	100	120	127	138	400	52	145	217	505	170	M10	20	–	138	340	95	123
40/160-4/2	40	340	100	120	127	147	400	52	145	232	585	170	M10	20	–	147	340	95	137
40/175-5.5/2	40	340	100	120	127	168	400	52	145	279	646	170	M10	20	–	168	340	95	159
40/200-7.5/2	40	440	110	145	147	–	500	38	192	279	659	220	M10	20	167	–	400	100	200
40/220-11/2	40	440	110	145	147	–	500	38	192	323	810	220	M10	20	197	–	400	100	258
50/110-1.5/2	50	340	105	108	116	117	360	52	148	193	448	170	M10	20	–	117	300	100	87
50/120-2.2/2	50	340	105	108	116	117	360	52	148	193	448	170	M10	20	–	117	300	100	92
50/130-3/2	50	340	105	108	116	138	360	52	148	217	508	170	M10	20	–	138	300	100	116
50/140-3/2	50	340	105	108	116	138	360	52	148	217	508	170	M10	20	–	138	300	100	116
50/140-4/2	50	340	105	108	116	147	360	52	148	232	588	170	M10	20	–	147	300	100	130
50/160-5.5/2	50	340	120	126	136	168	360	50	130	279	643	180	M10	20	–	168	340	100	168
50/170-5.5/2	50	340	120	126	136	168	360	50	130	279	643	180	M10	20	–	168	340	100	168
50/170-7.5/2	50	340	120	126	136	168	360	50	130	279	643	180	M10	20	–	168	340	100	189
50/180-7.5/2	50	440	120	145	148	–	500	50	200	279	665	220	M10	20	167	–	400	100	197
50/200-11/2	50	440	120	145	148	–	500	50	200	323	816	220	M10	20	197	–	400	100	255
50/220-11/2	50	440	120	145	148	–	500	50	200	323	816	220	M10	20	197	–	400	100	255

Dimensions, Weights Wilo-CronoTwin-DL

Dimensions, Weights (2900 rpm)

Wilo-CronoTwin-DL ...	Nominal flange diameter	Dimensions																	Weight approximately
	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]																	[kg]
50/220-15/2	50	440	120	145	148	–	500	50	200	323	816	220	M10	20	197	–	400	100	278
65/110-3/2	65	340	120	121	130	138	400	50	150	217	512	170	M12	20	–	138	340	110	129
65/120-3/2	65	340	120	121	130	138	400	50	150	217	512	170	M12	20	–	138	340	110	129
65/120-4/2	65	340	120	121	130	147	400	50	150	232	592	170	M12	20	–	147	340	110	143
65/130-5.5/2	65	340	120	121	130	–	400	50	150	279	659	170	M12	20	167	–	340	110	166
65/140-5.5/2	65	340	120	121	130	–	400	50	150	279	659	170	M12	20	167	–	340	110	166
65/140-7.5/2	65	340	120	121	130	–	400	50	150	279	659	170	M12	20	167	–	340	110	182
65/150-5.5/2	65	430	153	134	144	168	440	55	185	279	662	215	M12	20	–	168	400	120	188
65/160-5.5/2	65	430	153	134	144	168	440	55	185	279	662	215	M12	20	–	168	400	120	189
65/160-7.5/2	65	430	153	134	144	168	440	55	185	279	662	215	M12	20	–	168	400	120	207
65/170-11/2	65	430	153	134	144	–	440	55	185	323	821	215	M12	20	197	–	400	120	257
65/200-11/2	65	475	140	157	166	–	520	45	210	323	826	245	M12	20	197	–	400	110	267
65/200-15/2	65	475	140	157	166	–	520	45	210	323	826	245	M12	20	197	–	400	110	289
65/210-15/2	65	475	140	157	166	–	520	45	210	323	826	245	M12	20	197	–	400	110	289
65/210-18.5/2	65	475	140	157	166	–	520	45	210	370	826	245	M12	20	197	–	400	110	315
65/220-18.5/2	65	475	140	157	166	–	520	45	210	370	826	245	M12	20	197	–	400	110	315
65/220-22/2	65	475	140	157	166	–	520	45	210	370	866	245	M12	20	259	–	400	110	360
80/120-4/2	80	400	155	134	146	147	400	62	178	232	600	200	M12	20	–	147	350	120	157
80/130-5.5/2	80	400	155	134	146	–	400	62	178	279	667	200	M12	20	167	–	350	120	180
80/140-7.5/2	80	400	155	134	146	–	400	62	178	279	667	200	M12	20	167	–	350	120	196
80/150-7.5/2	80	440	155	144	160	168	440	62	188	279	666	220	M12	20	–	168	400	120	218
80/160-11/2	80	440	155	144	160	–	440	62	188	323	826	220	M12	20	197	–	400	120	267
80/170-11/2	80	440	155	144	160	–	440	62	188	323	826	220	M12	20	197	–	400	120	267
80/170-15/2	80	440	155	144	160	–	440	62	188	323	826	220	M12	20	197	–	400	120	294
80/190-15/2	80	500	145	166	176	–	550	72	228	323	830	250	M12	20	197	–	450	120	307
80/190-18.5/2	80	500	145	166	176	–	550	72	228	370	830	250	M12	20	197	–	450	120	333
80/200-18.5/2	80	500	145	166	176	–	550	72	228	370	830	250	M12	20	197	–	450	120	333
80/200-22/2	80	500	145	166	176	–	550	72	228	370	870	250	M12	20	259	–	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	839	226	M12	20	197	–	440	135	289
100/150-15/2	100	500	180	173	188	–	580	80	250	323	839	226	M12	20	197	–	440	135	315
100/160-15/2	100	500	180	173	188	–	580	80	250	323	839	226	M12	20	197	–	440	135	315
100/160-18.5/2	100	500	180	173	188	–	580	80	250	370	839	226	M12	20	197	–	440	135	350
100/165-22/2	100	500	180	173	188	–	580	80	250	370	881	226	M12	20	259	–	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	Flange dimensions pump			
	DN	Ø D	Ø d	Ø k	n x 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

Flange dimensions pump – in accordance with EN 1092-2 PN 16, n = number of drill holes

Special In-line Pumps

Contents

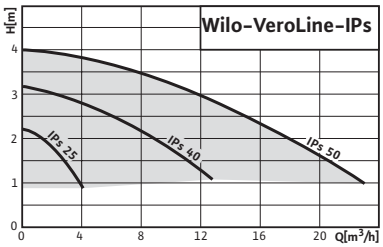
Special In-line Pumps

Special In-line Pumps

Single-head pumps (Heating, Air-conditioning, Cooling and Industry, Potable water circulation)

Series overview

Series: Wilo-VeroLine-IPS



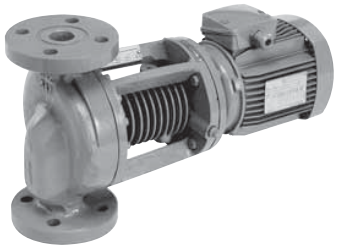
> Single-head pumps:

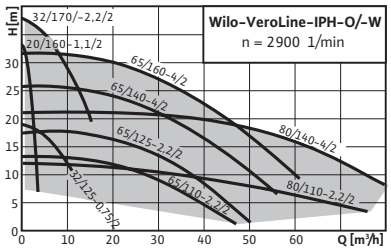
- Standard In-line pumps with flange or threaded connections

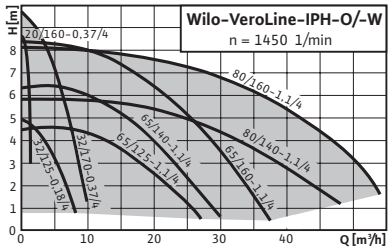
> Application:

- 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-W







> Single-head pumps:

- Non-cooled hot water pump, special In-line-version with flange connection

> Application:

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

Series overview

Series: Wilo-VeroLine-IPS

> Product advantages:
- Wide array of variants and high degree of availability through world-wide obtainability of the standard motors used
- Great versatility due to shaft sealing with mechanical seals or stuffing box packing

> Additional information: **Page**

Series: Wilo-VeroLine-IPH-W

> Product advantages:
- Self-cooled mechanical seal, independent of direction of rotation
- Great versatility due to an extensive media temperature range from -10 °C to +210 °C and wide operating pressure range of up to 23 bar

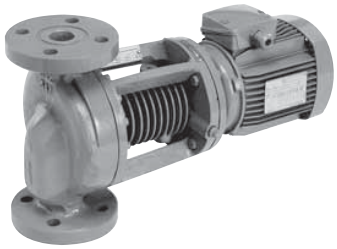
> Additional information: **Page**

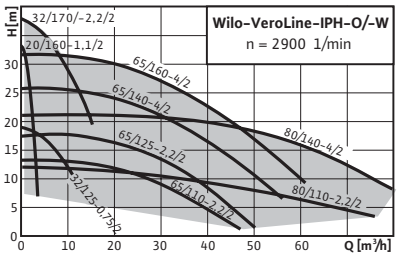
Special In-line Pumps

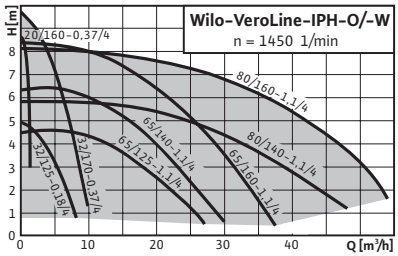
Single-head pumps (Heating, Air-conditioning, Cooling and Industry, Potable water circulation)

Series overview

Series: Wilo-VeroLine-IPH-O







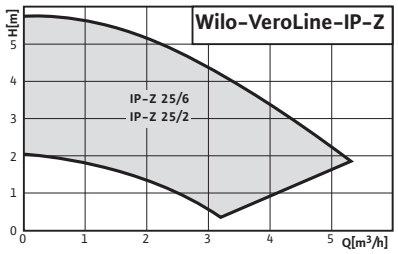
> Single-head pumps:

- Non-cooled heat transfer oil pump, special In-line-version with flange connection

> Application:

- For pumping heat transfer oil in closed industrial circulation systems

Series: Wilo-VeroLine-IP-Z



> Single-head pumps:

- Single-stage, low-pressure centrifugal pump in In-line construction with threaded connection

> Application:

- For the supply of 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-O

> Product advantages:
- Self-cooled mechanical seal, independent of direction of rotation
- Great versatility due to an extensive media temperature range from -10 °C to +350 °C and wide operating pressure range of up to 23 bar

> Additional information: **Page**

Series: Wilo-VeroLine-IP-Z

> Product advantages:
- High resistance to corrosive media, due to the stainless steel housing and Noryl impeller
- Great versatility due to suitability for water with hardness values up to 28 °d

> Additional information: **Page**

Special In-line Pumps

Single-head pumps (Heating, Air-conditioning, Cooling and Industry, Potable water circulation)

Technical Data

	Wilo-VeroLine-IPs..			Wilo-VeroLine-IPH		Wilo-VeroLine-IP-Z
	25	40	50	IPH-O	IPH-W	
Approved fluids (other fluids on request)						
Heating water (In accordance with VDI 2035)	•			•	•	•
Water-glycol mixture (for 20–40 Vol.-% glycol and fluid temperature ≤ 40 °C)	•			on request	–	•
Cooling and cold water	•			•	•	•
Hot water	–			–	• (up to +210 °C)	–
Heat transfer oil	Special version at additional charge			(up to +350 °C)	–	–
Potable water and water for food businesses in accordance with TrinkwV 2001	–			–	–	–
Permitted field of application						
Nominal pressure, maximum [bar] (at maximum temperature)	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 up to +140			-10 up to +350	-10 up to +210	-8 up to +110
Ambient temperature, maximum [°C]	40			40	40	40
Installation in closed buildings	•	•	•	•	•	•
Outdoor installation	Special version at additional charge					
Pipe connections						
Threaded connection	R1	–	–	–	–	G 1 1/2
Flange connection [1]	–	•	•	•	•	–
Flange version	PN10	PN6 (in accordance with DIN 2531) (PN16 in accordance with DIN 2533 on request)		Groove and tongue-faced flange PN25 (in accordance with DIN 2545)		PN10
Nominal connection diameter DN	–	40	50	20 – 80	20 – 80	–
Flange with pressure-measurement connections	–	R 1/8		–	–	–
Materials						
Pump housing and lantern	EN-GJL-200 (lantern EN-GJL-200)			Cast steel GS -60 (Lantern GGG-37)	Cast steel GS -60 (Lantern GGG-37)	1.4306
Impeller	Plastic			EN-GJL-250	EN-GJL-250	Noryl
Shaft	1.4021			X5CrNiCuNb174	X5CrNiCuNb174	1.4571
Mechanical seal	BVEGG			AQ1GG	AQ1EGG	Ceramic / graphite / EPDM
Other mechanical seals	on request			on request	on request	–

• = available, – = not available

[1] Mating flange, seals and screws included in the scope of delivery.

Technical Data

	Wilo-VeroLine-IPs..			Wilo-VeroLine-IPH		Wilo-VeroLine-IP-Z
	25	40	50	IPH-O	IPH-W	
Electrical connection (Other versions on request)						
Mains connection 3~ [V / Hz]	400 / 50			400 / 50	400 / 50	400 / 50
Mains connection 1~ [V / Hz]	–			–	–	230 / 50
Speed, maximum [rpm]	1450			1450 / 2900	1450 / 2900	1450 / 2900
Motor / electronics						
Integrated full motor protection (see accessories for necessary tripping unit)	Special version with PTC thermistor sensor (KLF) with surcharge					–
Protection class	IP 55			IP 55	IP 55	IP 44 (motor) IP 54 (terminal box)
Insulation class	F			F	F	F
Motor protection required onsite	•			•	•	•
Speed control	Wilo control systems					–
Motor winding up to 3 kW	3~230 V Δ / 400 V Y, 50 Hz					
Motor winding from 4 kW	–			400 V / Δ 690 V Y, 50 Hz	–	–
Installation options						
Pipe mounting (up to 15 kW motor power)	•			• (with horizontal shaft only)		•
Support-bracket mounting	–			–	–	–

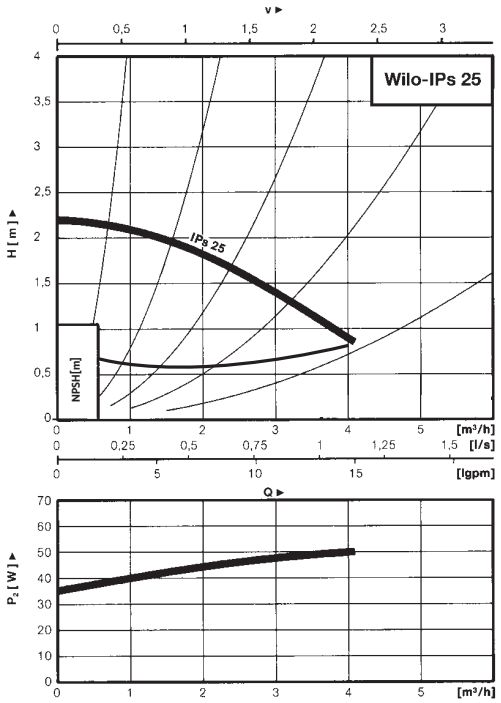
• = available, – = not available

Special In-line pumps

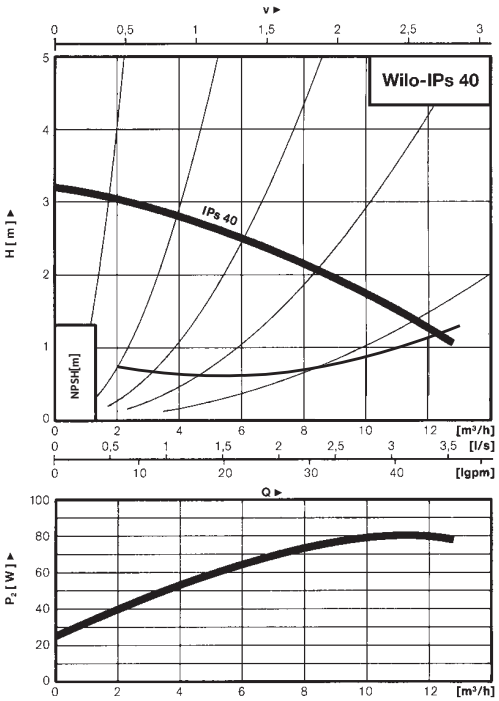
Single-head pumps (Heating, Air-conditioning, Cooling and Industry)

Pump curves Wilo-VeroLine-IPS

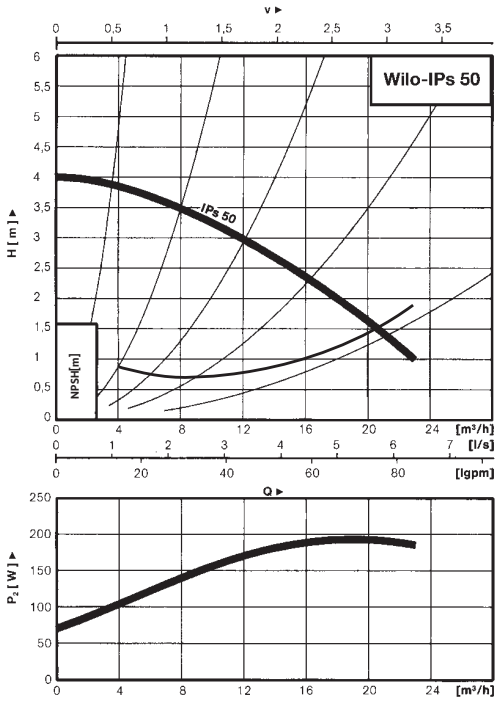
Wilo-VeroLine-IPS 25



Wilo-VeroLine-IPS 40

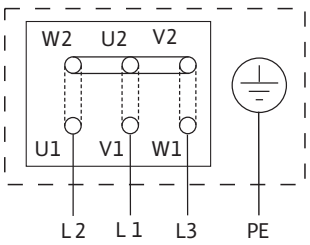


Wilo-VeroLine-IPS 50



Terminal diagram, Motor Data Wilo-VeroLine-IPS

Terminal diagram



Mains 3~400 V, 50 Hz

3~230 V, 50 Hz Δ

(illustrated in dashed lines)

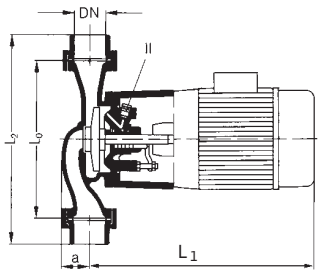
Motor data

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

Note motor type label data!

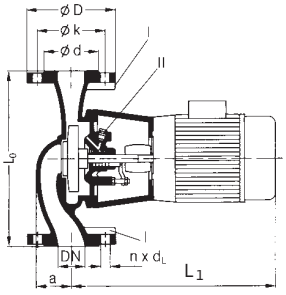
Dimensions, Weights Wilo-VeroLine-IPS

Dimension drawing A



II) Ventilation

Dimension drawing B



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

Dimensions, Weights

Wilo-VeroLine-IPS..	Nominal diameter	Dimensions				Weight approximately	Dimension drawing
	DN	L_0	L_2	a	L_1	–	–
	–	[mm]				[kg]	–
25	R1	180	234	35	300	12	A
40	40	250	–	53	305	20	B
50	50	280	–	62	340	23	B

Flange dimensions

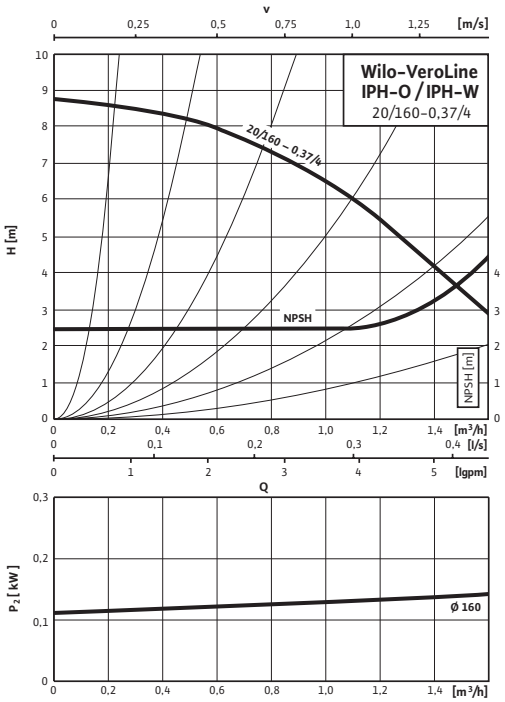
Wilo-VeroLine-IPS ...	Nominal diameter	Flange dimensions pump			
	DN	ØD	Ød	Øk	n x d_L
	–	[mm]			[pcs. x mm]
40	40	130 / 150	80 / 88	100 / 110	4 x 14 / 4 x 18
50	50	140 / 165	90 / 102	110 / 125	4 x 14 / 4 x 18

Flange dimensions pump (PN 6 – DIN 2531 / PN 16 – DIN 2533); n = number of drill holes

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

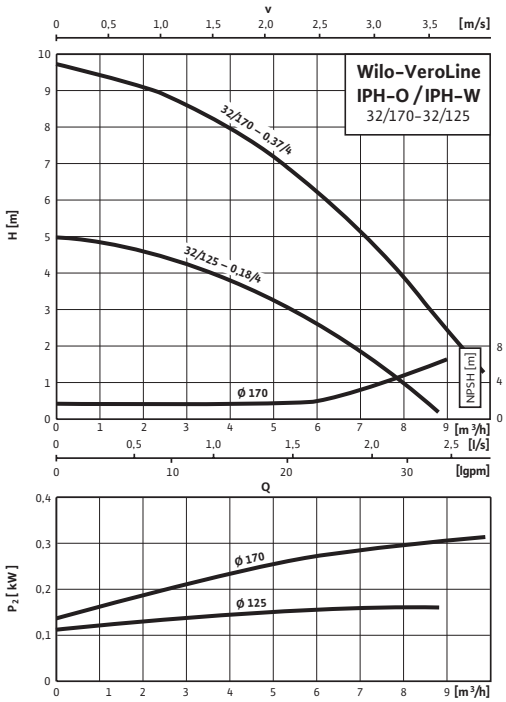
Wilo-VeroLine-IPH-O / -W 20 / 160-0.37 / 4

Rotational speed 1450 rpm



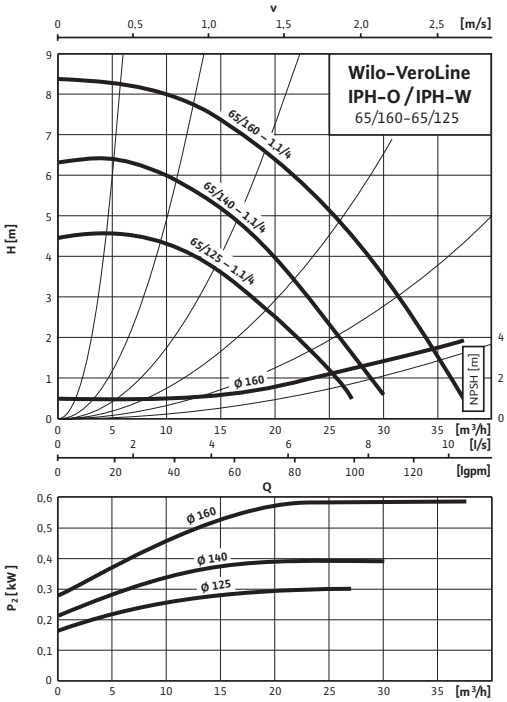
Wilo-VeroLine-IPH-O / -W 32 / 125-0.18 / 4 – 32 / 170-0.37 / 4

Rotational speed 1450 rpm



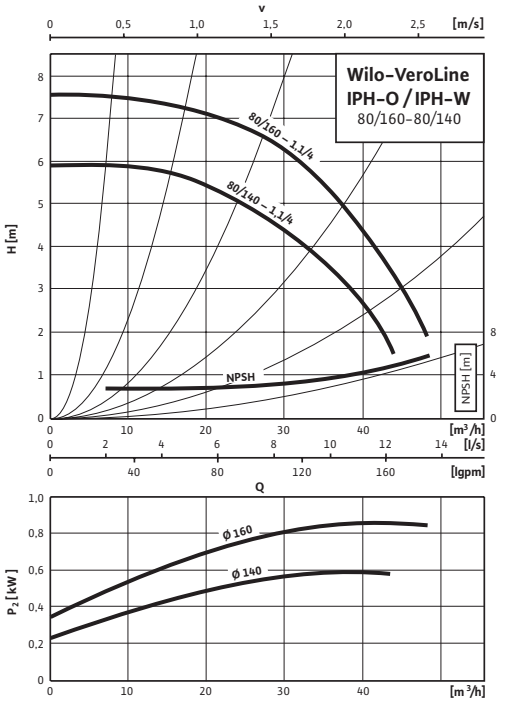
Wilo-VeroLine-IPH-O / -W 65 / 125-1.1 / 4 – 65 / 160-1.1 / 4

Rotational speed 1450 rpm



Wilo-VeroLine-IPH-O / -W 80 / 140-1.1 / 4 – 80 / 160-1.1 / 4

Rotational speed 1450 rpm



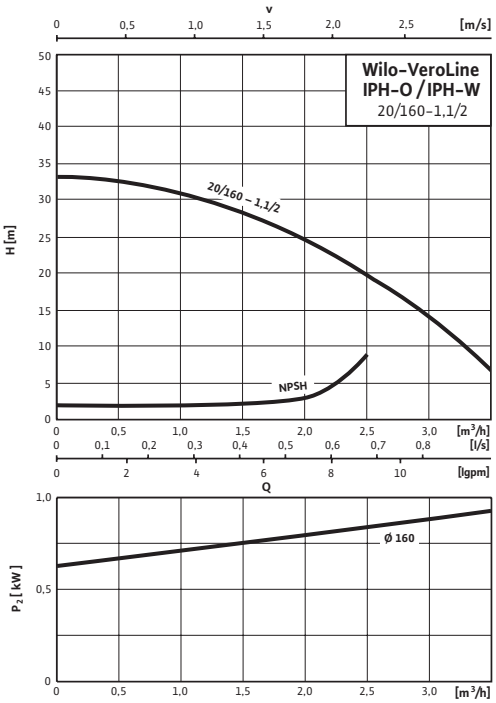
Special In-line Pumps

Single-head pumps (Heating, Air-conditioning, Cooling and Industry)

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

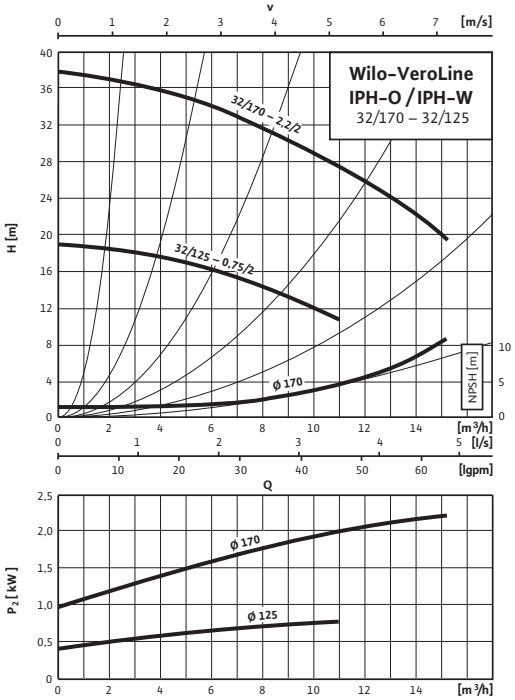
Wilo-VeroLine-IPH-O / -W 20 / 160-1.1 / 2

Rotational speed 2900 rpm



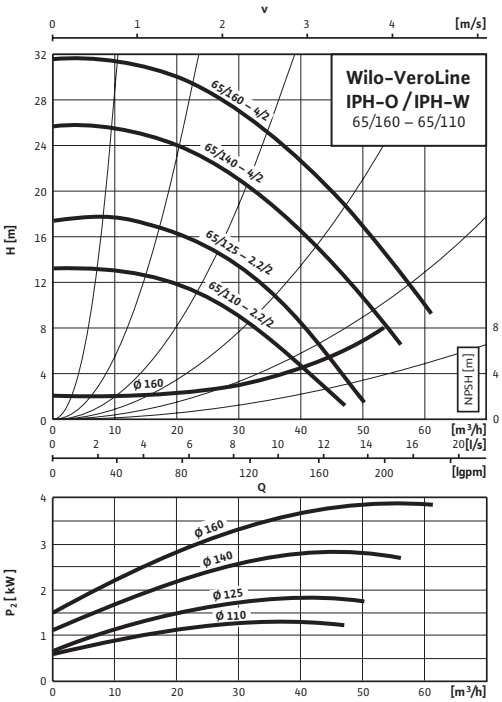
Wilo-VeroLine-IPH-O / -W 32 / 125-0.75 / 2 – 32 / 170-2.2 / 2

Rotational speed 2900 rpm



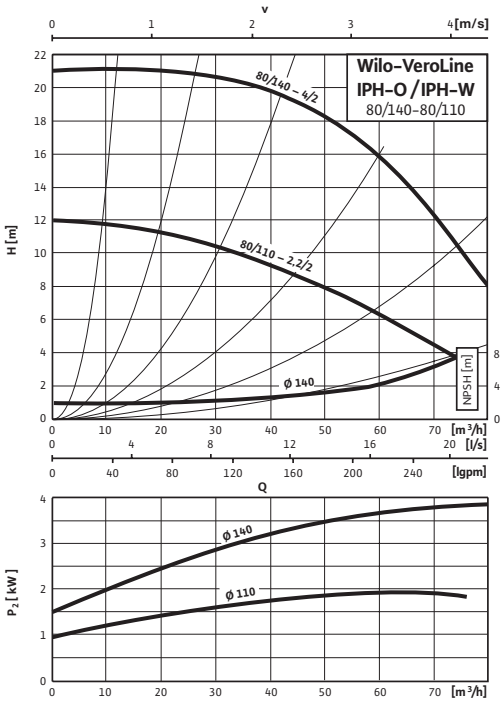
Wilo-VeroLine-IPH-O / -W 65 / 110-2.2 / 2 – 65 / 160-4 / 2

Rotational speed 2900 rpm



Wilo-VeroLine-IPH-O / -W 80 / 110-2.2 / 2 – 80 / 140-4 / 2

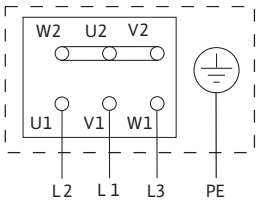
Rotational speed 2900 rpm



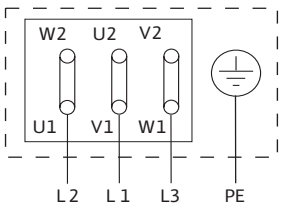
Terminal diagram, Motor Data Wilo-VeroLine-IPH-O / -W

Terminal Diagrams

Star activation Y



Delta activation Δ



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

P2 ≤ 3 kW	3~400 V Y
	3~230 V Δ
P2 ≥ 4 kW	3~690 V Y
	3~400 V Δ

After removing the bridge Y-Δ-starting is possible.

Motor Data (1450 rpm)

Wilo-VeroLine-IPH-O / -W ...	Nominal power	Nominal current	Power factor	Efficiency
	P_2	I_N 3~400 V	cos φ	η_M
	[kW]	[A]	–	-
20 / 160-0.37 / 4	0.37	1.12	0.70	0.72
32 / 125-0.18 / 4	0.18	0.62	0.65	0.62
32 / 170-0.37 / 4	0.37	1.12	0.70	0.72
65 / 125-1.1 / 4	1.10	2.70	0.84	0.77
65 / 140-1.1 / 4	1.10	2.70	0.84	0.77
65 / 160-1.1 / 4	1.10	2.70	0.84	0.77
80 / 140-1.1 / 4	1.10	2.70	0.84	0.77
80 / 160-1.1 / 4	1.10	2.70	0.84	0.77

Note motor type label data!

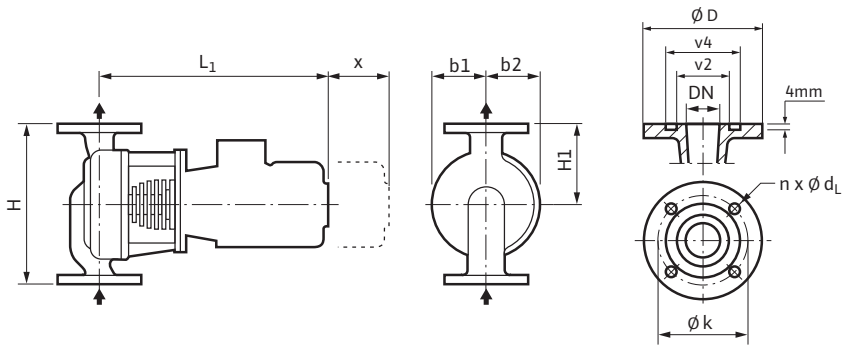
Motor Data (2900 rpm)

Wilo-VeroLine-IPH-O / -W ...	Nominal power	Nominal current	Power factor	Efficiency
	P_2	I_N3~400 V	cos φ	η_M
	[kW]	[A]	–	-
20 / 160-1.1 / 2	1.10	2.60	0.84	0.78
32 / 125-0.75 / 2	0.75	1.90	0.87	0.76
32 / 170-2.2 / 2	2.20	4.40	0.88	0.84
65 / 110-2.2 / 2	2.20	4.40	0.88	0.84
65 / 125-2.2 / 2	2.20	4.40	0.88	0.84
65 / 140-4 / 2	4.00	8.20	0.85	0.86
65 / 160-4 / 2	4.00	8.20	0.85	0.86
80 / 110-2.2 / 2	2.20	4.40	0.88	0.84
80 / 140-4 / 2	4.00	8.20	0.85	0.86

Note motor type label data!

Dimensions, Weights Wilo-VeroLine-IPH-O / -W

Dimension drawing



Dimensions, Weights (1450 rpm)

Wilo-VeroLine-IPH-O / -W ...	Nominal diameter	Dimensions						Weight approxi-mately
	DN	H	L_1	b_1	b_2	H_1	x	–
	–	[mm]						[kg]
20 / 160-0.37 / 4	20	290	472	105	90	145	300	28
32 / 125-0.18 / 4	32	260	417	90	87	130	300	23
32 / 170-0.37 / 4	32	260	410	110	115	130	300	30
65 / 125-1.1 / 4	65	370	472	110	115	170	300	39
65 / 140-1.1 / 4	65	400	472	121	107	190	300	39
65 / 160-1.1 / 4	65	400	472	121	107	190	300	39
80 / 140-1.1 / 4	80	430	472	150	123	205	300	47
80 / 160-1.1 / 4	80	430	472	150	123	205	300	47

Dimensions, Weights (2900 rpm)

Wilo-VeroLine-IPH-O / -W ...	Nominal diameter	Dimensions						Weight approxi-mately
	DN	H	L_1	b_1	b_2	H_1	x	–
	–	[mm]						[kg]
20 / 160-1.1 / 2	20	290	432	105	105	145	300	31
32 / 125-0.75 / 2	32	260	447	90	87	130	300	26
32 / 170-2.2 / 2	32	260	447	110	115	130	300	41
65 / 110-2.2 / 2	65	370	502	110	110	170	300	43
65 / 125-2.2 / 2	65	370	502	121	110	170	300	43
65 / 140-4 / 2	65	400	516	121	107	190	300	61

Dimensions, Weights Wilo-VeroLine-IPH-O / -W

Dimensions, Weights (2900 rpm)

Wilo-VeroLine-IPH-O / -W ...	Nominal diameter	Dimensions						Weight approxi-mately
	DN	H	L_1	b_1	b_2	H_1	x	–
	–	[mm]						[kg]
65 / 160-4 / 2	65	400	516	150	107	190	300	61
80 / 110-2.2 / 2	80	400	502	133	106	190	300	51
80 / 140-4 / 2	80	430	516	105	123	205	300	69

Flange dimensions

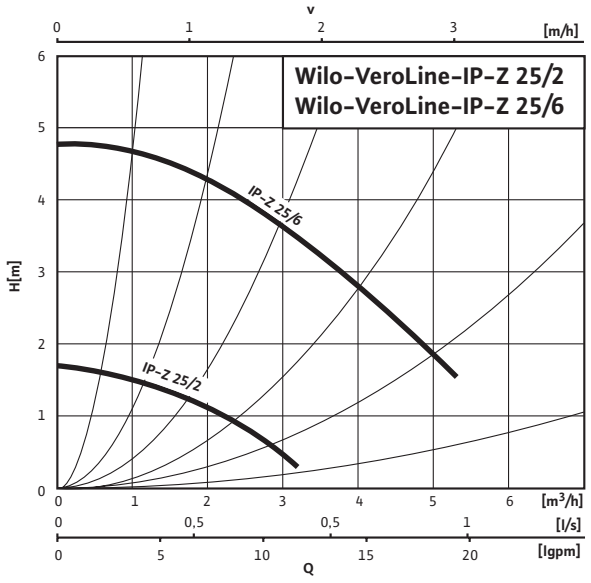
Wilo-VeroLine-IPH-O / -W ...	Nominal diameter	Flange dimensions pump				
	DN	ØD	v2	v4	Øk	n x d_L
	–	[mm]				[pcs. x mm]
20..	20	105	35	51	75	4 x 14
32..	32	140	50	56	100	4 x 18
65..	65	185	94	110	145	8 x 18
80..	80	200	105	121	160	8 x 18

Flange dimensions, pump – in accordance with DIN 2545 PN 25; n = number of drill holes

Pump curves Wilo-VeroLine-IP-Z

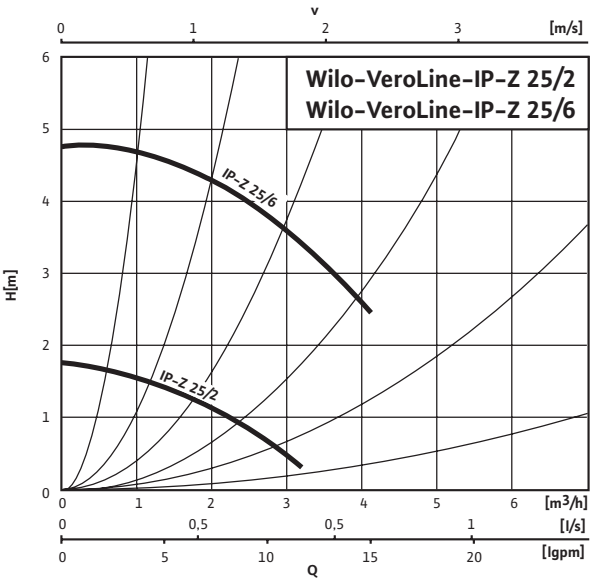
Wilo-VeroLine-IP-Z 25 / 2- 25 / 6

1~230 V



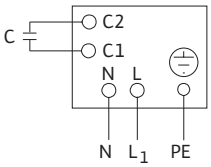
Wilo-VeroLine-IP-Z 25 / 2- 25 / 6

3~230 / 400 V



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

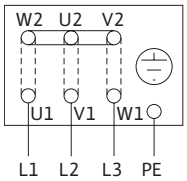
Terminal diagram A



With built-in capacitor

Single-phase AC motor 1~230 V, 50 Hz

Terminal diagram B



unbroken line = Y
dashed line = Δ

3~400 V Y
3~230 V Δ

Three-phase AC motor 3~230 / 400 V, 50 Hz

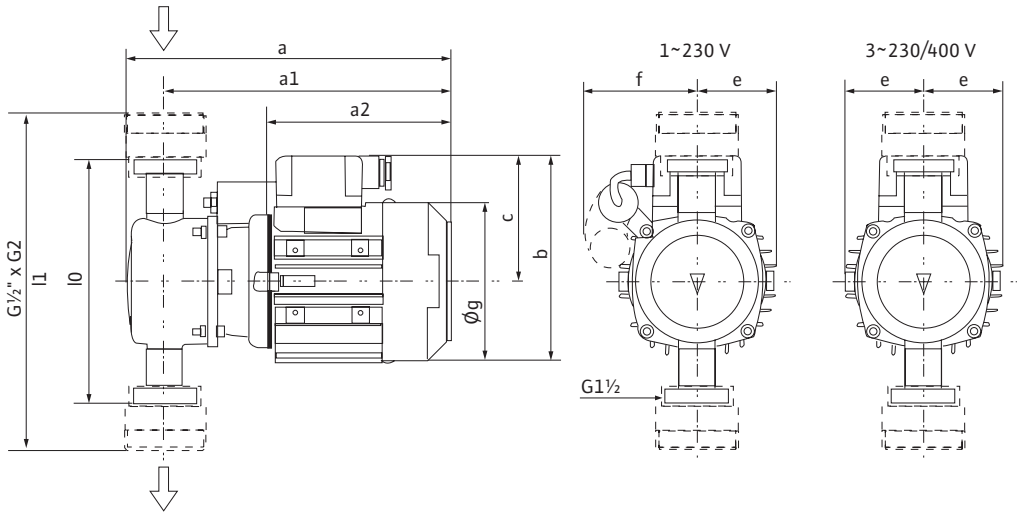
Motor data

Wilo-VeroLine-IP-Z ...	Nominal power	Nominal current (approximately)			Capacity	Rated motor speed	Terminal diagram
	P_2	I_N 1~230 V	I_N 3~230 V	I_N 3~400 V	C	n	–
	[kW]	[A]			[µF]	[rpm]	–
25 / 2 EM	0.10	1.05	–	–	4.0	1450	A
25 / 2 DM	0.09	–	0.50	0.29	–	1450	B
25 / 6 EM	0.18	1.15	–	–	6.3	2850	A
25 / 6 DM	0.12	–	0.66	0.38	–	2850	B

Note motor type label data!

Dimensions, Weights Wilo-VeroLine-IP-Z

Dimension drawing



Dimensions, Weights

Wilo-VeroLine-IP-Z ...	Nominal diameter	Dimensions										Weight approximately
	DN	l_0	l_1	a	a_1	a_2	b	c	e	f	Øg	–
	–	[mm]										[kg]
25 / 2 EM	25	180	250	241	213	136	148	92	58	82	115	5.5
25 / 2 DM	25	180	250	241	213	136	148	92	58	–	115	4.5
25 / 6 EM	25	180	250	241	213	136	148	92	58	82	115	5.5
25 / 6 DM	25	180	250	241	213	136	148	92	58	–	115	4.5

Contents

Switching and Control Devices

Switching and Control Devices

Control devices

Series overview

Series: Wilo-VR-HVAC-System

> Control device for glandless and glanded pumps
(electronically regulated stepless pumps and / or pumps with integrated frequency converter)
- Variable-control system for stepless performance control of pumps of the series TOP-E / -ED, Stratos-D / -Z / -ZD, IP-E / DP-E, IL-E / DL-E, IL-E...BF
- For control modes Δp-c and Δp-v in heating / air-conditioning technology and pressure boosting
- Pump performance splitting with up to 4 units
- Nominal power up to P_2 =22 kW
- Speed range between 100 % and 40 %
- including full motor protection apparatus

Series: Wilo-CRn-System

> Control device for glandless and glanded pumps
(electronically regulated stepless pumps and / or pumps with integrated frequency converter)
- Comfort-control device for stepless performance control of pumps of the series TOP-E / -ED, Stratos-D / -Z / -ZD, IP-E / DP-E, IL-E / DL-E, IL-E...BF
- 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 %

Series: Wilo-CR-System

> Control device for glandless and glanded pumps
(Standard pumps with fixed speeds)
- Comfort-control system for stepless performance control of commercially available circulating pumps with a three-phase AC motor
- Suitable for all control modes used in heating, air-conditioning and pressure boosting
- Pump performance splitting with up to 6 units
- Nominal power to P_2 = 30 kW (to P_2 = 200 kW on request)
- Speed range between 100 % and 40 %
- including full motor protection apparatus

Pump performance Control

Pump performance control

Load-conditioned excess pump performance

Circulating pumps for central heating and air-conditioning and the hydraulic pipe system as well must by necessity be designed to be capable to meet the maximum design load at minimum outside temperatures.

These maximum load conditions do however exist only on a very few days during the course of the heating / cooling season. A typical load factor curve for a central heating system is shown on the graph.

Centralised and decentralised control systems intervene continuously in the installation hydraulics in order to make adjustments to accommodate the actual load situation; in most cases, they cause a reduction of the flow volume while at the same time increasing the pump delivery head. Such operating states are non-economical for pump operations, because lower delivery heads would in fact be sufficient, particularly for low flow volumes; in addition, the noise levels that would result must be avoided under all circumstances.

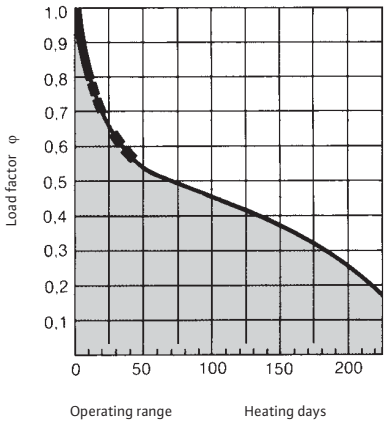


Fig.: Typical heating load factor graph for a central heating system: approximately 5500 h

The Wilo solution: Load-sensitive power adjustment

Type of control / control mode	Pump type / pump model	Signal / controlled variable	Control system
Integrated stepless differential-pressure control	Stratos / Stratos-Z Star-E / Star-ZE TOP-E IP-E / IL-E	Δp	Standard equipment
Time-sensitive ON / OFF control	TOP-Z	t	SK 601
– Single-head pumps	Star-Z	t	S1R-h / SK 601
	RS / RP	t	SK 601
Variable speed control – Single-head pumps	P	Δp, +T, ΔT, t	S2R 2.5 / S4R 2.5
– Twin-head pumps	DOP	Δp, +T, ΔT, t	S4R 2.5 D
Twin-pump control	Stratos / Stratos-Z / Stratos-D / Stratos-ZD	Δp, t	IF-Modul Stratos
	TOP-E / -ED	Δp, t	IF-Modul
	IP-E / DP-E	Δp, t	
	IL-E / DL-E	Δp, t	IF-Modul
	Glandless and glanded	Δp, +T, ΔT, t	S2R 3D / SD
Stepless performance control – Single and twin-head pumps	RP / RS / RSD P DOP	Δp, t	AS system
– Individual- and multi-pump systems	Glandless and glanded	Δp, ±T, ΔT, t, DDC	CR system
Motor protection	Glandless pumps		SK 602 / SK 622 / C-SK
Building automation			Wilo-Control

Δp = differential pressure
±T = feed / return temperature
ΔT = differential temperature
t = time

Pump performance Control

Need for control

Three main criteria, in line with the steady development of mechanical equipment for building services and the growing sensibility towards energy consumption, have led to the increased consideration of controls for utilisation in conjunction with heating pumps.

1. Function optimisation
Adjusting the pump capacity / heat flow to actual load demand, particularly to stabilise hydraulic conditions and to reduce circulating losses.

2. Economic efficiency
Reducing power consumption and operating costs, particularly in partial- or low-load operation (i.e. in over 80 % of the overall operating time).

3. Comfort and convenience
Avoiding system noise, in particular flow noise and noise in the thermostatic valves that are due to excessive flow and thermostatic radiator valves (TRV's).

Power savings in relation to reducing CO_2 emissions are in conjunction with environmental-protection considerations playing 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 current 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 within 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 at the planning stage, factors which considerably add to the energy balance. Over-dimensioning by a factor of 2 to 5 times is the usual standard.

Single-family house	Large buildings
Pumps account for 10 – 15 % of the overall power consumption, because...	Pumps account for 5 –8 % of the overall power consumption
- Two to four pumps are available (heating / potable water circulation / accumulator charging, etc.) each pump with about 1500 h to 5000 h operating time per year (depending on application), i.e. with three pumps on average: - 3 x 65 W x ca. 3500 h / a = ca. 700 kWh / a - In comparison: Mean statistically verified total power consumption of a single-family house: - about 5000 to 8000 kWh / a	

Pump performance control through speed variation

Of the many procedures developed and tried in the past to automatically control pump performance to actual load demands, among them mechanical / hydraulic processes (bypass / throttling control), the method of variable speed control has proved to be the most lasting. Particularly the high efficiency and the easy handling have ensured its dominance as the vital performance parameters – volumetric flow, head and input power – directly relate to changes of speed.

$$n_1 / n_2 = Q_1 / Q_2 \quad (n_1 / n_2)^2 = H_1 / H_2 \quad (n_1 / n_2)^3 = P_1 / P_2$$

Thus, for example, when motor speed is doubled, the flow volume is increased by a factor of two and the delivery head by a factor of 4 while the power input must be about 7 to 8 times greater.

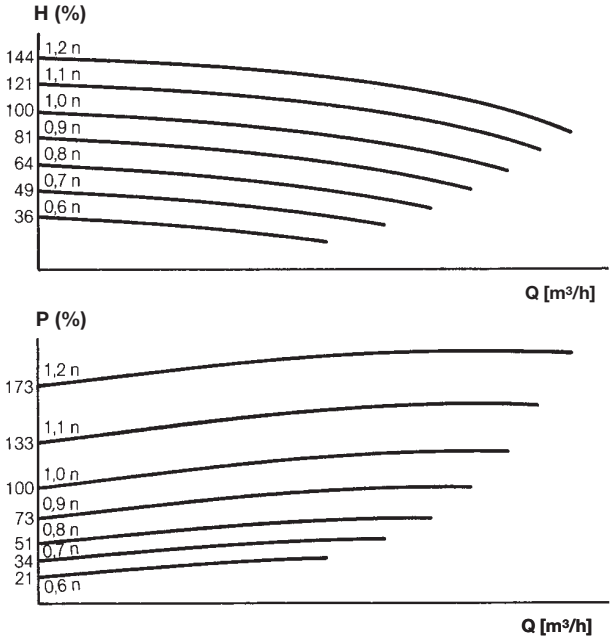


Fig.: Pump curves of a pump during operation at different speeds

Performance features

	Wilo Control Device...		
	VR-HVAC	**CRn**	**CR**
Applications			
Pump versions	Glandless / glanded pumps	Glandless / glanded pumps	Glandless / glanded pumps
Pump types	Electronically controlled pumps	Standard / Electronically controlled pumps	Standard Pumps
Number of pumps	1–4	1–6	1–6
Technical Data			
Complete device	•	Power supply for pumps required onsite	•
Modular construction	•	•	•
Nominal power range P_2	0.37–22.0 kW	1.1–200 kW	1.1–200 kW
Activation types:	Steplessly analogue	Steplessly analogue / St.-Delta opt.	direct / St.-Delta
Electrical connection standard version:	3~400 V, 50 Hz / 1~230 V, 50 Hz	1~230 V, 50 Hz Power connection of the pumps onsite	3~400 V, 50 Hz
Protection class	IP 54	IP 00 + IP 42 Standard / IP 54 optional	IP 00 + IP 42 standard / IP 54 optional
Permitted ambient temperature	0 °C up to +40 °C	0 °C up to +40 °C	0 °C up to +40 °C
Speed range	Stepless analogue, 2–10 V, 3–10 V, 4–10 V pre-selectable, minimum pump speed according to name plate up to 100 %	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 (T_A)	–	•	•
Δp-q (m³ / h)	–	•	•
Δp-v	•	•	•
T_A (outside temperature), controller	–	•	•
T-abs (process temp.), controller	–	•	•
T_{VL} (feed temperature), controller	–	•	•
T_{RL} (return temperature), controller	–	•	•
ΔT-c	–	•	•
ΔT-v	–	•	•
Manual control mode (DDC)	–	•	•
Q-c	–	•	•

• = available, – = not available

Switching and Control Devices

Wilo-VR, CRn, and CR control devices

Performance features

	Wilo Control Device...		
	VR-HVAC	**CRn**	**CR**
Control and signalling functions			
Remote speed adjustment (control input)	–	0 / 2- 10 V 0 / 4- 20 mA	0 / 2- 10 V 0 / 4- 20 mA
Remote setpoint adjustment	–	0 / 2- 10 V 0 / 4- 20 mA	0 / 2- 10 V 0 / 4- 20 mA
Run and fault signal lights	•	•	•
Control input "Setpoint switchover"	–	•	•
Control input "Overriding Off"	•	•	•
SBM	•	•	•
SSM	•	•	•
Fault-actuated switchover from frequency converter to mains operation	–	–	•
Fault-actuated switchover from main to standby pump	•	•	•
Status display for pumps and frequency converters	–	•	•
Equipment features			
Motor Protection	integrated in pump	WSK / SSM, integrated in pump	ETA / PTC / WSK
Graphics display	Menu navigation / Symbol display	Menu navigation / Text display	Menu navigation / Text display
User-oriented menu guide with multi-lingual text display	–	•	•
Manual Operation	Manual / 0 / Auto	Manual / 0 / Auto	Manual / 0 / Auto
Fault memory	9 messages	35 messages	35 messages
Fault-actuated switchover	•	•	•
Pump kick	•	•	•
Run-time optimisation / Pump alteration	only time-sensitive pump duty cycling	•	•
Proprietary BUS	–	–	–
RS 485	prepared	–	for parameterisation of the frequency converter
Pump duty splitting	up to 4 pumps	up to 6 pumps	up to 6 pumps
PID controller	•	•	•
Integrated real-time clock with summer / wintertime switchover	–	•	•
Integrated individual / common operating hours counter	•	•	•
Run-time optimisation on multi-pump systems	–	•	•
Conductivity tests of the actual value control circuit	•	•	•

• = available, – = not available

Performance features

	Wilo Control Device...		
	VR-HVAC	**CRn**	**CR**
Equipment features (Continued)			
"Mains – Emergency – Operation" service selector switch for maintenance purposes	–	•	•
Night setback to minimum speed or second controlled level by internal time switch	–	•	•
Remote confirmation of collective fault signal	–	• (with DDC board)	• (with DDC board)
Pilot pump function	–	•	•
Time switch	–	•	•
Switchover to a second setpoint level	–	• (with DDC board)	• (with DDC board)
Individual run and fault signals for pumps and converters	• (with Options board)	• (with signal board)	• (with signal board)
Manual- / Automatic-switchover with external switch	–	• (with control board)	• (with control board)
Connection option for a repair switch (potential-free contact)	–	• (with control board)	• (with control board)
more	prepared (RS 232)	–	–
Accessories			
DDG differential-pressure sensor	•	•	•
KTY temperature boards / PT100	–	•	•
TSG temperature sensors	–	•	•
KTY outdoor temperature sensors	–	•	•
PT 100 outdoor temperature sensors	–	– (to be provided by the customer)	– (to be provided by the customer)
PTC fault trip	–	•	•
Control board	–	•	•
Signal board	• (Options board)	•	•
DDC board	–	•	•
Volumetric-flow transmitter (onsite)	–	•	•
Special features			
DPM (twin-head pump management)	for DPM not required on the following series: Stratos-D / -Z / -ZD, TOP-E / -ED, VeroLine-IP-E, VeroTwin-DP-E, CronoLine-IL-E and CronoTwin-DL-E	for DPM not required on the following series: Stratos-D / -Z / -ZD, TOP-E / -ED, VeroLine-IP-E, VeroTwin-DP-E, CronoLine-IL-E and CronoTwin-DL-E	•

• = available, – = not available

Control modes

Differential pressure – constant (Δp-c)

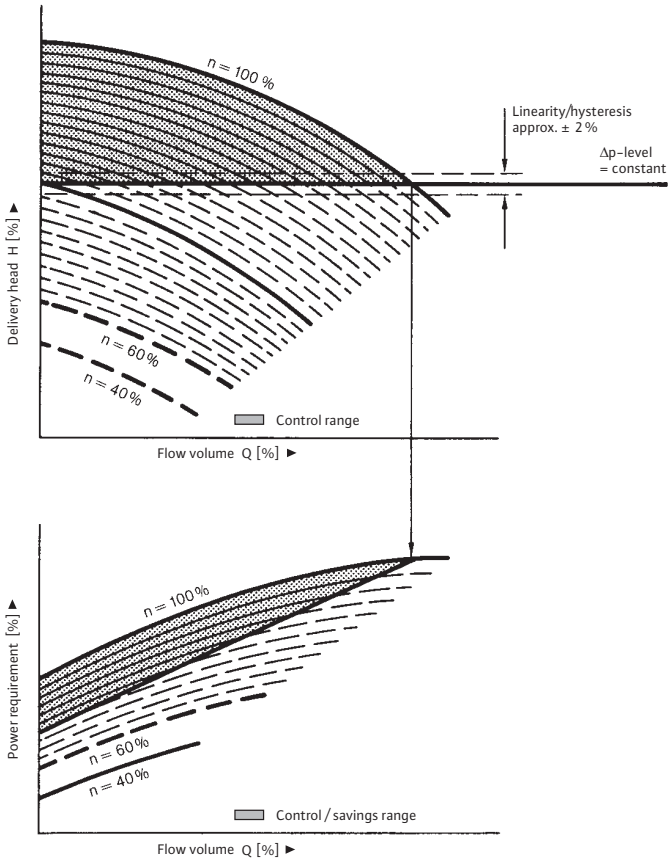


Fig.: Pump curve behaviour for stepless constant differential-pressure control (Δp-c)

The differential-pressure setpoint set at the CR / CRn unit will be maintained constant over the entire volume flow range. I.e., any reduction of flow volume (Q) due to throttling of the hydraulic regulating devices will in turn decrease the pump performance to match actual system demand by reducing the speed of the pump. In parallel with speed alteration, the power consumption is reduced to below 50 % of the nominal power. The application of differential-pressure control requires a variable flow volume in the system.
Peak-load operation, e. g. in conjunction with a twin-head pump, will be effected automatically and load-sensitively by the control system. If the capacity of the controlled base-load pump becomes insufficient to cover the increasing load demand the second pump will automatically be started to operate in parallel to cover the risen demand. The variable speed pump will then be run down until reaching the preset differential-pressure setpoint value.

> Required accessory:
- DDG differential-pressure sensor

Control modes

Index circuit evaluation

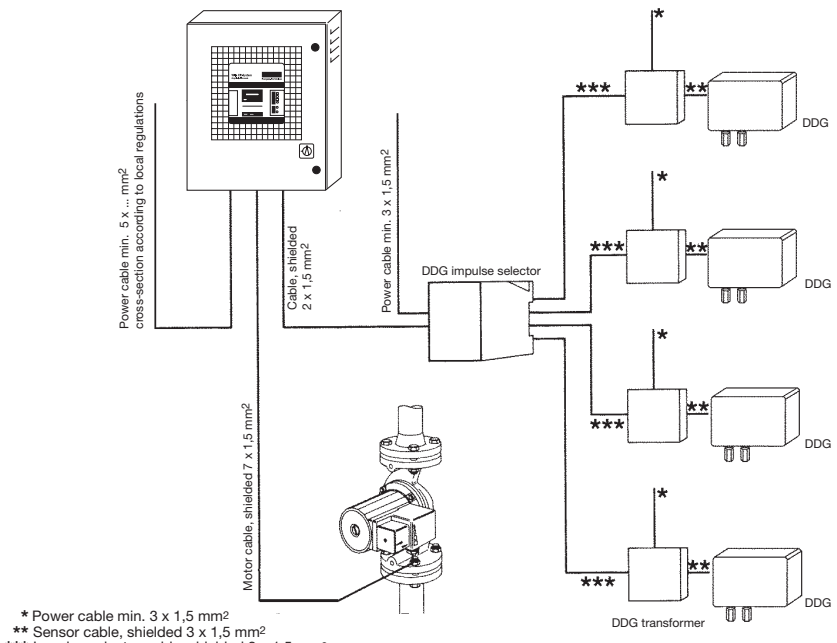


Fig.: Block diagram for impulse-selector operation

It is generally recommended to pick off the differential-pressure directly at the pump and to maintain it there at a constant level. An alternative would be to install the signal transmitter in the heating system as a **remote signal transmitter** in the so-called index circuit of the system (control-range extension). **Operation with a remote signal transmitter will partly allow much larger speed reductions and thus pump performance reductions.** It is essential in this respect that the selected measuring point be valid for the consumption performance of all the system sections.
Where this calculated measuring point in the index circuit may be subject to shifting to other parts of the pipe system, optimisation by means of the Wilo DDG impulse selector is preferable. Measuring points ranging from 2 to 4 can be compared on a continuous basis. Only the lowest measured value forms the basis for the setpoint / actual value comparison by the CR controller.

> Required accessory:
- DDG differential-pressure sensor
- Power supply unit DDG (for each DDG)
- Impulse selector DDG (2 ... 4 DDG)

Control modes

Differential pressure – variable (Δp-v)

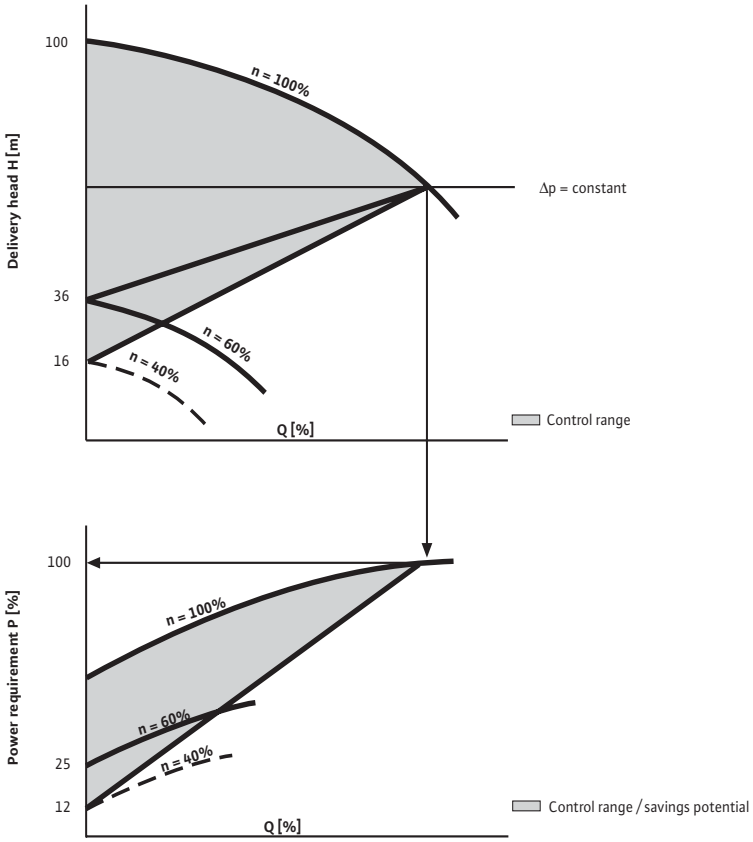


Fig.: Pump curve behaviour for stepless variable differential-pressure control (Δp-v)

When refurbishing or upgrading existing systems it is not always possible to evaluate the point in the circuit which shows the lowest differential pressure. 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 new sensor connections.
A control-range extension 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 predetermined variable differential-pressure curve by means of setpoint / actual-value comparison.
In addition operation, the differential pressure is kept constant at the design level after the first peak-load pump has been cut in.

> Required accessory:
- DDG differential-pressure sensor

Control modes

Differential pressure – delivery-superimposed (Δp-q)

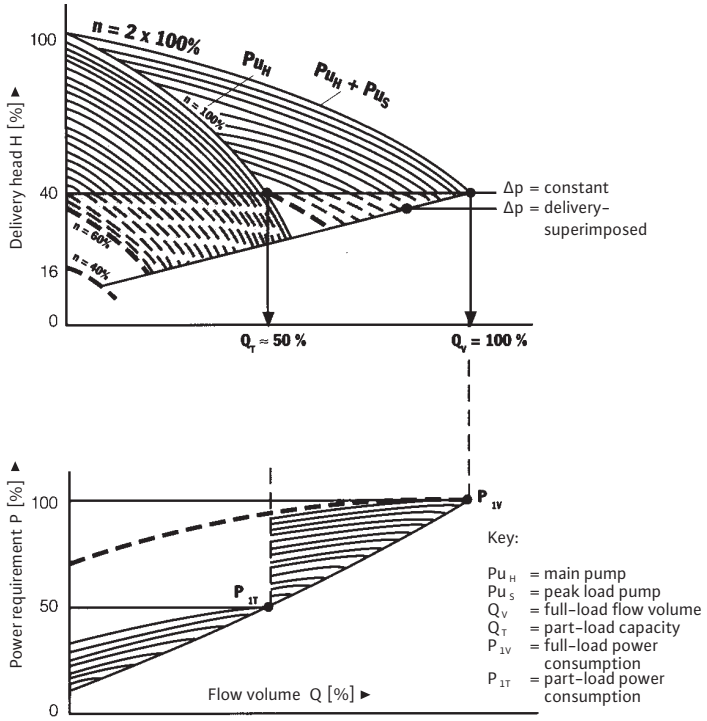


Fig.: The pump curve behaviour of a multi-pump system with stepless delivery-superimposed differential pressure control (Δp-q)

In order to avoid the time and expenditure associated with index-circuit evaluation (extensive and expensive cable routing, amplifiers, etc.), it is possible to superimpose the setpoint differential-pressure 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 onsite provision by the customer of a volumetric-flow transmitter (0 / 4– 20 mA) to be installed in the system's main feed pipe.
The use of 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 flow volumetric-flow transmitters are already available.

> Required accessory:
- DDG differential-pressure sensor
- Volumetric-flow transmitter (onsite)

Control modes

Differential pressure – temperature-superimposed (Δp-T)

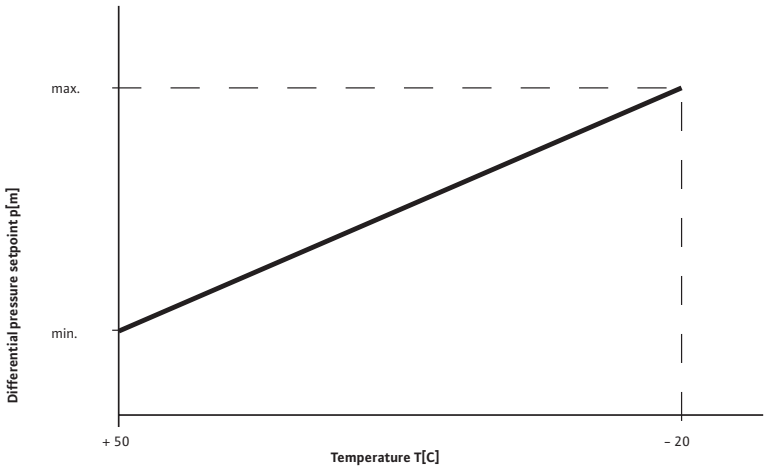


Fig.: Differential-pressure setpoint variation as a function of temperature

The operational performance of the hydraulic system can be further optimised by adapting the differential-pressure setpoint value for pump performance control as a function of a superimposed reference variable (e.g. outdoor temperature).
The setpoint differential-pressure value and thus the pump performance is reduced with rising outside temperatures, it will increase with falling outside temperatures.

> Required accessory:
- DDG differential-pressure sensor
- KTY 10 temperature board
  or
- PT 100 temperature board
- Process temperature sensors and outdoor temperature sensors PT 100 or KTY

Differential temperature control (ΔT)

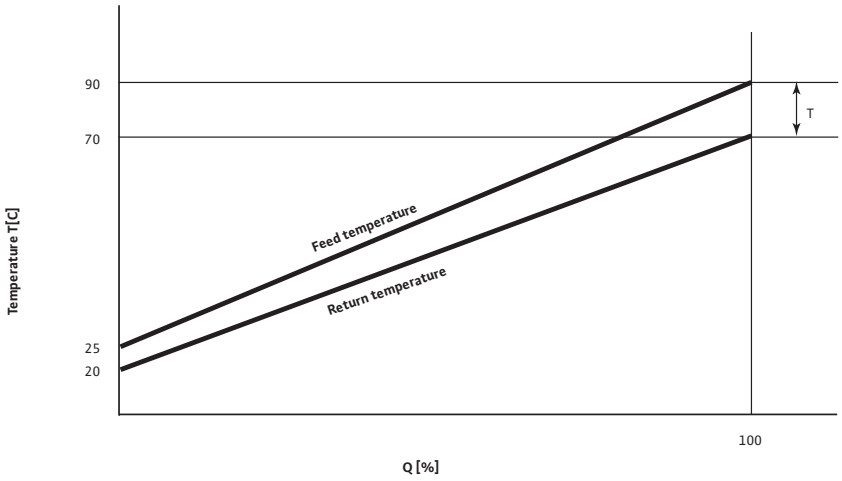


Fig.: Flow volume-rate variation as a function of temperature spread

Heating / air-conditioning systems vary in terms of their cooling / heating requirements with expectable outside temperature fluctuations. A number of installations are based on constant volume circulation without fittings to regulate the flow volume (one-pipe systems, primary circuits, etc.). Moreover, pure throttling or bypass controls are highly uneconomical. Added to this comes the unnecessarily high power consumption (current) to drive the pump during low load periods.
Differential-temperature control ΔT is one option of maintaining a constant difference between feed and return temperatures as a result of weather- and usage-related 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 control should for reasons of comprehensibility only be used with individual consumers or with systems with a known control-time constant.

> Required accessory:
- KTY 10 temperature board
  or
- PT 100 temperature board
- Temperature sensor TSG or PT 100 (onsite)

Control modes

Temperature control (±T)

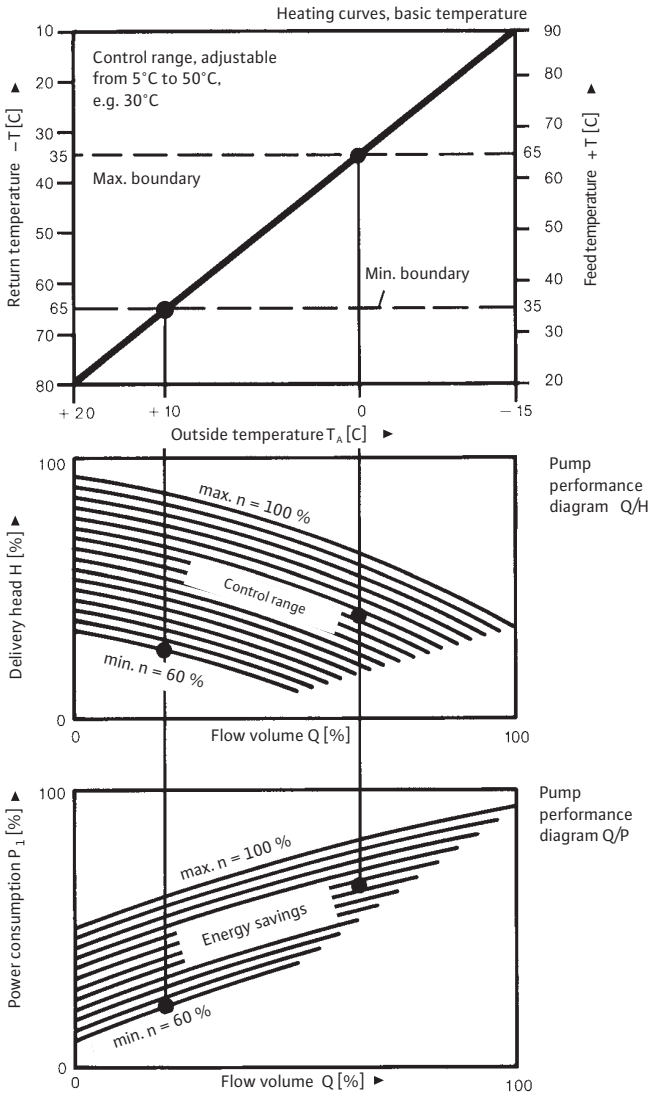


Fig.: System diagram of stepless temperature control

In the case of pump control as a function of temperature, the control signal (±T) brings about a variation of pump performance, but there is no adaptation by way of feedback and setpoint / actual value comparison of the variation or its results.
Fixed motor speeds have been allotted to the pump for certain feed / return temperatures in accordance with an empirically predetermined pump curve.
A decreasing feed temperature (+T) or a rising return temperature (-T) will result in a speed reduction and thus in decreasing 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 accessory:
- KTY 10 temperature board
  or
- PT 100 temperature board
- Temperature sensor TSG or PT 100 (onsite)

Control modes

Variable differential temperature (ΔT-v)

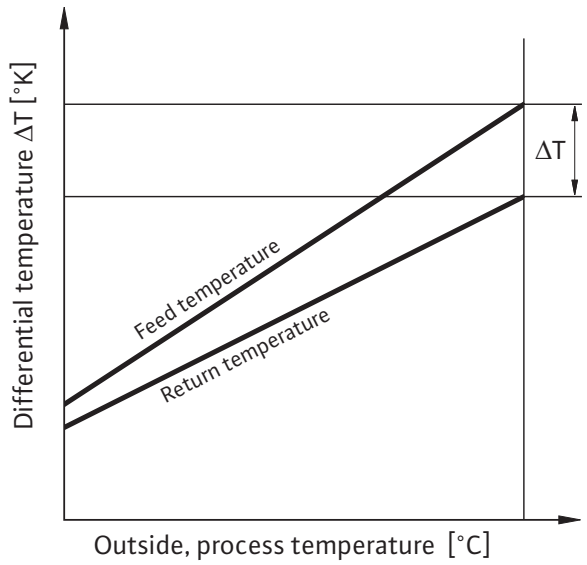


Fig.: Differential temperature as a function of the process- or outdoor temperature

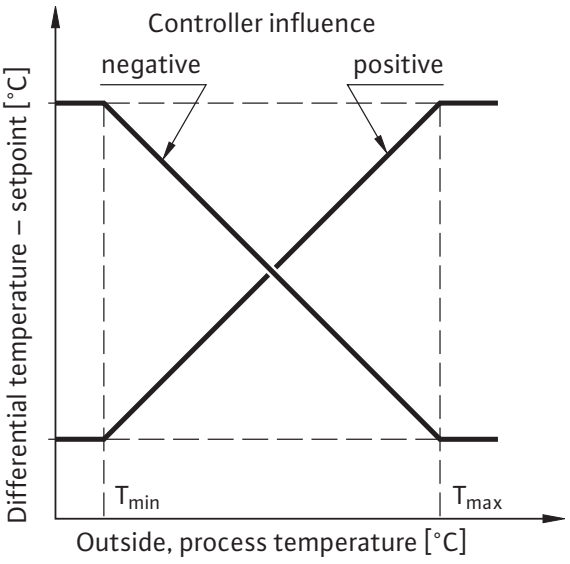


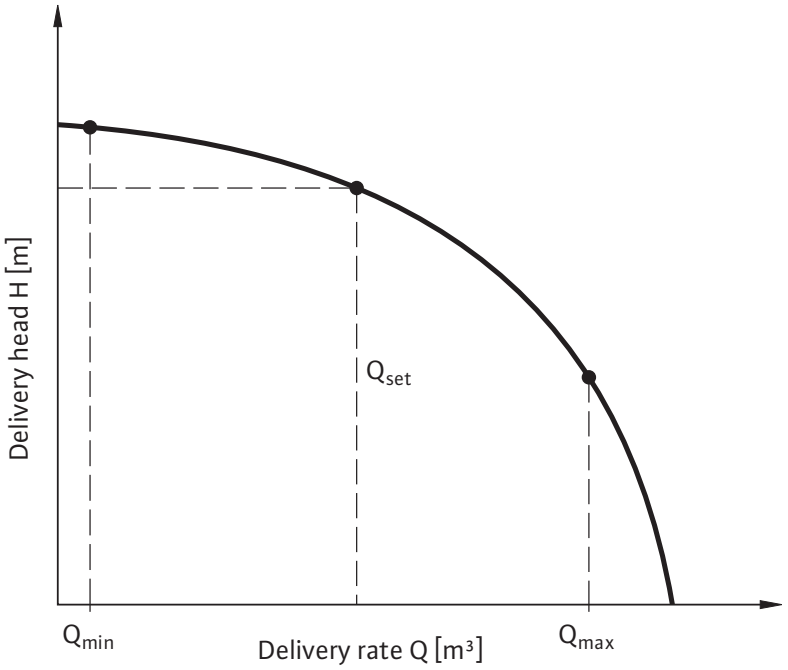
Fig.: Impact on the differential temperature

The ΔT-v control function is especially suitable for pump performance control in one-pipe systems, district heating, systems with condensing boiler technology as well as cooling systems.
The ΔT-v control mode ensures that the differential temperature is spread variably as a function of another temperature, e.g. the one outdoors. This allows that only the flow volume required for the heat transfer is circulated. This leads to significant energy-savings on the drive side. Furthermore, the return temperature can be dramatically reduced. The broad temperature spread improves the efficiency of boilers or heat exchangers, and return temperature limits, as they are required e.g. in most district heating networks, can be achieved.

> Required accessory:
- KTY 10 temperature board
  or
- PT 100 temperature board
- Temperature sensor TSG or PT 100 (onsite)
- Process temperature sensors and outdoor temperature sensors PT 100 or KTY

Control modes

Constant flow volume control Q-c



The flow volume which is set at the CR unit is kept constant. If the flow volume Q decreases, the speed of the pump system is increased until the set flow volume is covered again. If the flow volume increases, the speed is reduced so that only the required rate is delivered.

Fig.: Principle of the constant flow volume control

The Q-c control function is sensibly applied in such cases where a constant, determinable flow volume is to be delivered. Such cases are for example cooling systems, cooling towers, test stands or systems for water supply, wastewater treatment and sewage disposal.
Flow rates of 2 – 2,000 m³ / h can be controlled.

> Examples for the application of flow rate controls:
- Mixing of chemically different well waters in an elevated tank for achieving a constant water quality
- Delivery of cold and cooling water as a function of the connected cooling towers or consumers
- Mixing diverse sewage (municipal and industrial) for achieving a defined untreated sewage composition, adapted to the sewage treatment in a sewage treatment plant
- Proportioning of chemicals in chemical and environmental engineering
- Agricultural irrigation

> Required accessory:
- Flow rate meter on-site (Signal 0 / 2 – 10 V or 0 / 4 – 20 mA, connection to “transmitter 1” input of the CR / CRn)
- Monitoring of limit values is to be realised onsite (system protection)

Pressure – constant (p-c)

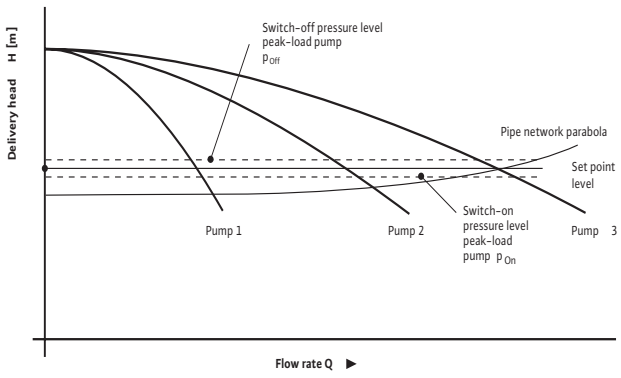


Fig.: Constant pressure control (p-c) depicted using a 3-pump system as an example

The constant pressure (p-c) control mode is suitable for utilisation in conjunction with open pipe systems, e.g. water supply and pressure booster applications.
pump performance is adapted according to water demand (pressure-sensitive) along a setpoint level. Multi pump operation features demand-sensitive On / Off control of base- and peak-load pumps. Problems of pressure surging originating from hunting between stop and start are fully eliminated. In a pressure boosting system, the base-load pump is shut down by the CR controller at Q = 0.

Series description Wilo-VR-HVAC

Wilo-VR-HVAC-Systems

Digitally controlled, stepless variable-control system for electronically controlled glandless and glanded pumps of the Stratos, TOP-E, VeroLine-IP-E and CronoLine-IL-E series, for setting up single- and multi-pump systems.

Typical fields of application of the Wilo-VR-HVAC-System is water circulation in heating, ventilation, cooling and air-conditioning systems of larger buildings like hospitals, hotels, schools, department stores, industry systems, residential, commercial and public buildings. Most advanced pump technology and digital control electronics realise all demands of the Wilo-VR-HVAC-System for new installations and refits:

- For all glandless and glanded pumps with integrated power electronics up to P_2 = 22 kW Nominal power.
- For pump splitting with up to 4 units (to utilise the lower-power individual units in low-load operation).
- Avoiding flow or cavitation noise.
- Reduction of operating costs thanks to energy-savings.

Principle of operation

The control device is responsible for controlling and regulating circulating pumps with electronic control or integrated pump performance electronics. The differential-pressure of a system is controlled as a function of the load with signal transmitters. The controller affects the frequency converter which has an impact on the pump speed. A modification of the speed changes the delivery head and thus the power output of the single pumps. Depending on load-demand, pumps are activated or deactivated. The control device can control up to 4 pumps.

Equipment features

- PID controller
- Lockable main switch
- Graphics LC display for displaying all values and operating states
- Red button technology (1-button operation)
- LEDs for displaying operational readiness, operating pump(s), faulty pump(s)
- Circuit-breakers and output terminals for power supply of pump(s)
- Integrated signal board (Option)
- Automatic pump alteration
- Emergency operation as an option
- Selection of a standby pump

Stepless speed control

An electronic differential-pressure sensor Wilo-DDG delivers the actual differential-pressure value as 4-20 mA current signal. Then the controller maintains the differential-pressure on a constant level by means of a setpoint / actual value comparison.
If there is no "External Off"-signal and no fault, at least pump is running. The pump speed here depends on the load. If the required output cannot be covered by this pump (base-load pump), another pump is activated,the speed of which is then, corresponding to the load consumption, controlled to the pressure setpoint. Pumps, which have been running already, keep operating at maximum speed (peak-load pumps). If demand decreases to such an extent that the controlling pump runs in its lowest performance range and is not needed to cover demand, this pump will be deactivated and the control function is assigned to another pump which has previously been working at maximum speed.
The control modes Δp-c and Δp-v can be preselected in the menu, only the first pump is controlled in Δp-v mode, and if more pumps are activated, these will be controlled 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 Wilo-VR-HVAC-System has at its disposal an extensive range of control inputs / outputs as standard for incorporation in external monitoring units to be provided by the customer:

- Analogue output Δp_{out} (0 – 10 VDC) for displaying the actual value of the differential-pressure sensor
- On / Off control by external potential-free contact
- Collective fault signal SSM as potential-free switchover contact
- Collective run signal SBM as potential-free switchover contact
- Individual fault signal ESM for each pump as potential-free switchover contact (optional)
- Individual run signal EBM as potential-free switchover contact (optional)

Series description Wilo-VR-HVAC

Dimensions, Weights Wilo-VR-HVAC

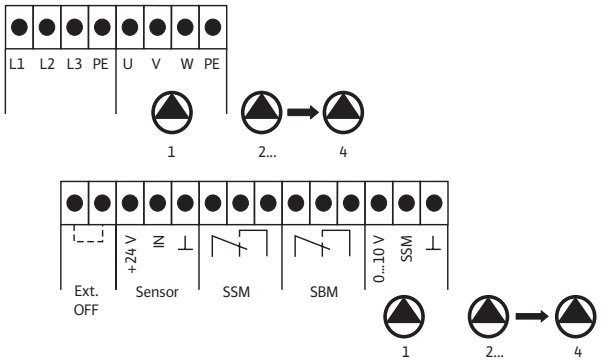
Switch cabinet	Dimensions (W x H x D) [mm]	Weight (without packaging) [kg]
VR-HVAC 1x0.37 WA	400 x 300 x 120	8.5
VR-HVAC 2x0.37 WA	400 x 300 x 120	9.0
VR-HVAC 3x0.37 WA	400 x 300 x 120	9.5
VR-HVAC 4x0.37 WA	400 x 300 x120	10.0
VR-HVAC 1x0.55 WA	400 x 300 x 120	8.5
VR-HVAC 2x0.55 WA	400 x 300 x 120	9.0
VR-HVAC 3x0.55 WA	400 x 300 x 120	9.5
VR-HVAC 4x0.55 WA	400 x 300 x 120	10.0
VR-HVAC 1x0.75 WA	400 x 300 x 120	8.5
VR-HVAC 2x0.75 WA	400 x 300 x 120	9.0
VR-HVAC 3x0.75 WA	400 x 300 x 120	9.5
VR-HVAC 4x0.75 WA	400 x 300 x 120	10.0
VR-HVAC 1x1.1 WA	400 x 300 x 120	8.5
VR-HVAC 2x1.1 WA	400 x 300 x 120	9.0
VR-HVAC 3x1.1 WA	400 x 300 x 120	9.5
VR-HVAC 4x1.1 WA	400 x 300 x 120	10.0
VR-HVAC 1x1.5 WA	400 x 300 x 120	8.5
VR-HVAC 2x1.5 WA	400 x 300 x 120	9.0
VR-HVAC 3x1.5 WA	400 x 300 x 120	9.5
VR-HVAC 4x1.5 WA	400 x 300 x 120	10.0
VR-HVAC 1x2.2 WA	400 x 300 x 120	8.5
VR-HVAC 2x2.2 WA	400 x 300 x 120	9.0
VR-HVAC 3x2.2 WA	400 x 300 x 120	9.5
VR-HVAC 4x2.2 WA	400 x 300 x 120	10.0
VR-HVAC 1x3.0 WA	400 x 300 x 120	8.5
VR-HVAC 2x3.0 WA	400 x 300 x 120	9.0
VR-HVAC 3x3.0 WA	400 x 300 x 120	9.5
VR-HVAC 4x3.0 WA	400 x 300 x 120	10.0
VR-HVAC 1x4.0 WA	400 x 300 x 120	8.5
VR-HVAC 2x4.0 WA	400 x 300 x 120	9.0
VR-HVAC 3x4.0 WA	400 x 300 x 120	9.5
VR-HVAC 4x4.0 WA	400 x 300 x 120	10.0
VR-HVAC 1x5.5 WA	400 x 300 x 120	8.5
VR-HVAC 2x5.5 WA	400 x 300 x 120	9.0
VR-HVAC 3x5.5 WA	400 x 300 x 120	9.5
VR-HVAC 4x5.5 WA	400 x 300 x 120	10.0
VR-HVAC 1x7.5 WA	400 x 300 x 120	8.5
VR-HVAC 2x7.5 WA	400 x 300 x 120	9.0
VR-HVAC 3x7.5 WA	400 x 400 x 120	11.5
VR-HVAC 4x7.5 WA	400 x 400 x 120	12.0
VR-HVAC 1x11 WA	400 x 400 x 120	10.5
VR-HVAC 2x11 WA	400 x 400 x 120	11.0
VR-HVAC 3x11 WA	600 x 600 x 250	34.5
VR-HVAC 4x11 WA	600 x 600 x 250	35.0
VR-HVAC 1x15 WA	400 x 400 x 120	10.5

Series description Wilo-VR-HVAC

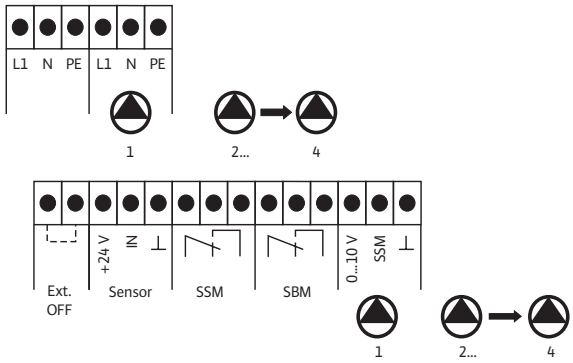
Dimensions, Weights Wilo-VR-HVAC		
Switch cabinet	**Dimensions (W x H x D) [mm]**	**Weight (without packaging) [kg]**
VR-HVAC 2x15 WA	400 x 400 x 120	11.0
VR-HVAC 3x15 WA	600 x 600 x 250	35.0
VR-HVAC 4x15 WA	600 x 600 x 250	35.5
VR-HVAC 1x18.5 WA	400 x 400 x 120	10.5
VR-HVAC 2x18.5 WA	400 x 400 x 120	11.0
VR-HVAC 3x18.5 WA	600 x 600 x 250	35.0
VR-HVAC 4x18.5 WA	600 x 600 x 250	35.5
VR-HVAC 1x22 WA	400 x 400 x 120	10.5
VR-HVAC 2x22 WA	400 x 400 x 120	11.0
VR-HVAC 3x22 WA	600 x 600 x 250	35.5
VR-HVAC 4x22 WA	600 x 600 x 250	36.0

Terminal Diagrams Wilo-VR-HVAC

Terminal diagram VR-HVAC 3~400 V



Terminal diagram VR-HVAC 1~230 V



Series description Wilo-CRn, Wilo-CR

Wilo-CR-Systems

Digitally controlled, stepless Comfort-control systems for glandless and glanded pumps of all makes, single and multi-pump systems.

CR version for conventional pumps with fixed speed.

CRn version for stepless electronically controlled pumps or pumps with integrated frequency converter.

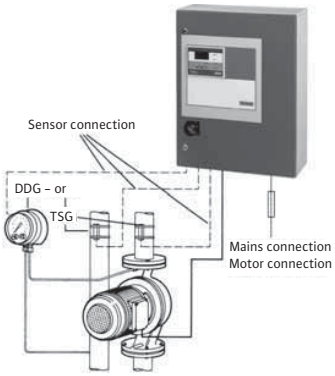


Fig.: Wilo-CR-System for heating / air-conditioning

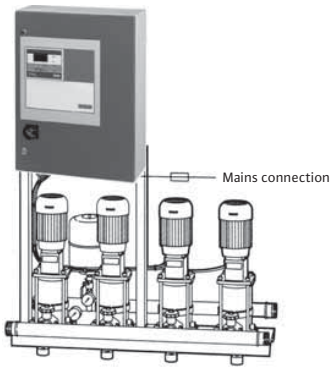


Fig.: Wilo-CR-System for pressure boosting

Typical fields of application of the Wilo-CR-Systems are water circulation, water supply (e.g. pressure boosting) and disposal in residential, commercial and public buildings, hotels, hospitals, department stores and industrial buildings.

Most advanced digital control electronics realise all demands of the Wilo-CR-Systems for new installations and refits:

- CR version for all glandless and glanded pumps with three-phase AC motors with rated power of up to P_2 = 30 kW (higher output ratings and other voltages on request)
- CRn version performance-dependent via analogue control signals
  0 / 2 – 10 V or
  0 / 4 – 20 mA
- for pump splitting with up to 6 units (to utilise the lower-power individual units in low-load operation)

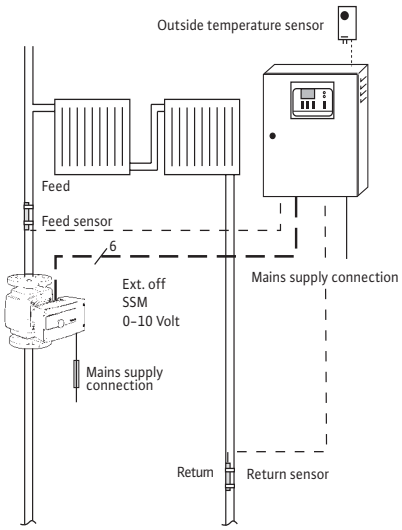


Fig.: System design, example of a one-pipe heating system with differential temperature control

- Avoidance of flow or cavitation noise
- Lower operating costs due to energy savings
- Speed control range between 100 % and 40 % of rated motor speed.

Principle of operation

The Wilo-CR-Systems offer stepless electronic power adjustment of pump performance to meet the continuously varying hydraulic conditions in a pipe installation as a function of the control variables of pressure (p), volumetric flow (Q), temperature (T).

The control system with microprocessor-guided digital control and CAN-bus technology ensures top performance and safe operation of the entire pump system.

Equipment features

- PID controller
- Integrated real-time clock with summertime- / wintertime switchover
- Integrated individual / common operating hours counter
- Run-time optimisation on multi-pump systems
- Full motor protection due to connection of WSK and PTC (on CR version)
- Motor protection due to connection of WSK and SSM (on CRn version)
- Alphanumeric LCD display (4-line) with backlighting
- Status display for drives (e.g. pumps and frequency converters)
- User-oriented menu navigation with multi-lingual text display
- Data logging and detailed operating data display
- Defined display of fault signals and history memory
- Monitoring of wire failures on the actual value and transmitter control circuits
- High reliability due to most up-to-date CAN-bus technology.

Series description Wilo-CRn, Wilo-CR

Stepless speed control
Stepless speed control must be regarded as the ideal solution to the problem of achieving 100 % harmonious matching of pump performance 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 % residual speed – cannot be realised 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 in the so-called index circuit of the system, i.e. line or consumer with the greatest pressure losses. Extremely low speeds below 40 % rated motor 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 performance control when using the Comfort controller of the Wilo-CR-Systems.
• 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-delivery 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-CR-Systems have at their disposal an extensive range of control inputs / outputs as **standard equipment** for incorporation in external monitoring units to be provided by the customer:
- Remote setpoint adjustment (0 – 10 V / 10– 20 mA) can be preselected
- On- / Off control by external potential-free contact
- Freeze-up protection by external potential-free contact (applicable only in conjunction with heating / air-conditioning) via digital input
- Low-water cut-out by external potential-free contact (only for pressure boosting) via digital input
- Collective fault / run signal as potential-free switchover contacts
- "Mains – Emergency – Operation" service selector switch for maintenance personnel
- Switchover to a second setpoint level
The following optional control inputs and outputs are available (only in conjunction with accessory boards)
- Remote confirmation of collective fault signal (in connection with DDC board)
- Switchover in manual control mode (in connection with DDC board)
- Individual run and fault signals for pumps and converters (in connection with signal board)

- Manual / automatic-switchover (in conjunction with control board)
- Connection for repair switch with potential-free contact (in conjunction with control board)

Type key CR control device (Example CR 1.1 2 WA)	
CR	User-friendly regulation technology
1.1	Maximum rated motor output P_2 of pump to be controlled in kW
2	Number of pumps to be controlled (1 – 6 pumps)
WA	Device version
	WA = wall-mounted installation IP 42 (IP 54 on request)
	SG = floor model IP 42 (IP 54 on request)
	SE = control-panel installation

Type Key CRn control device (Example CRn 1-2 TP WA)	
CRn	User-friendly regulation technology new
1-2	Number of connectable pumps: 1 – 2 3 – 4 5 – 6
TP, TK	Control mode: T = Temperature P = Sensor PT100 K = Sensor KTY
WA	Device version
	WA = wall-mounted installation IP 42 (IP 54 on request)
	SE = control-panel installation

Technical Data Wilo-CRn, Wilo-CR

Electrical data Wilo-CR-System

Main functions
Automatic, load-sensitive, stepless speed control of glanded and glandless pumps with three-phase AC motors. For heating / air-conditioning as a function of differential-pressure Δp, feed / return temperature (±T) or differential temperature (ΔT) including free adjustment of the duty point by means of advance correction of full-load pump performance. For pressure boosting as a function of pressure (p).

Device version
- Wall-mounted installation (WA) obtainable only up to 4 kW
- Floor models (SG) obtainable starting at 5.5 kW
- Control-panel installation (SE)

Connection data										
Device classification: Maximum rated 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 φ	> 0.9									
Efficiency: – at P_{max} – in 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 up to +40 °C									

Electrical Data Wilo-CRn-System

Main functions
Automatic, load-sensitive, stepless speed control of glanded and glandless pumps with integrated or external frequency converter. For heating / air-conditioning as a function of differential pressure (Δp), feed / return temperature (±T) or differential temperature (ΔT) including free adjustment of the duty point by means of advance correction of full-load pump performance.

Device version
- Wall-mounted installation (WA)
- Control-panel installation (SE)

Connection data	
Electrical connection	1~230 V (grounding plug) / N / 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 up to +40 °C

Technical Data Wilo-CRn, Wilo-CR

Switchgear and control functions with Wilo-CR / CRn Systems

Switchgear and control functions local and / or internal

- Mains – 0 – Auto manual switchover
- Fault-actuated switchover from 'frequency converter' to 'mains'
- Fault-actuated switchover from main to standby pump
- Peak-load cut-in for differential pressure Δp, pressure p
- or differential temperature ΔT
- Collective run / fault signals For connection details, see Terminal diagram, CR / CRn System base board
- Pump alteration every 24 hours
- Time-sensitive switchover to minimum speed or second controlled level

Switchgear and control functions available for remote control

- Remote setpoint adjustment 0 / 2 – 10 V or 0 / 4 – 20 mA (For connection details, see Terminal diagram CR / CRn System base board)
- Overriding On / Off control by switch provided by customer (For connection details, see Terminal diagram CR / CRn System base board)
- Standby control operation with test run every 24 hours

with auxiliary DDC board
(For connection details, see Terminal diagram DDC board)

- Night setback to Minimum speed or second controlled level
- Peak-duty pump(s) cut-in and pump duty cycling
- Switchover to manual control mode
- Remote speed adjustment
- Remote confirmation of collective fault signal

with auxiliary control board
(For connection details, see Terminal diagram control board)

- Mains / Automatic operating mode switchover
- Isolating individual pumps for repairs

Control functions for Wilo-CR / CRn Systems

Control functions for single-head pumps and multi-pump systems (heating / air-conditioning)
Flow volume constant Q-c

- Differential temperature variable ΔT-v
- Differential pressure constant Δp-c
- Differential temperature ΔT
- Differential pressure, delivery-superimposed Δp-q
- ΔT outdoor-temperature-superimposed ΔT-T_A
- Differential pressure, temperature-superimposed Δp-T
- Manual control mode DDC

Control functions for single-head pumps (heating / air-conditioning)

- Differential pressure variable Δp-v
- Process temperature ±T

Control functions for single-head pumps and multi-pump systems (pressure boosting)

- Constant pressure p-c
- Flow volume constant Q-c
- Flow volume constant Q-c

Accessories for Wilo-CR / CRn Systems

Accessories		
Sensor / transmitter	Differential pressure sensor DDG (4 – 20 mA) (observe measuring range)	Terminal diagram: Base board CR / CRn System
	Outdoor temperature sensor KTY or PT 100	
	TSG temperature signal transmitter (included in the scope of delivery of the temperature board)	Terminal diagram: KTY 10 temperature board
Temperature board Automatic, stepless speed control as a function of feed or return temperature or as a function of the difference between feed and return temperatures	Temperature board KTY 10: Heating systems with big differentials (T max: +140°C, ΔT min ≥ 10 K, ΔT max: 100 K), 2 temperature transmitter TSG included in scope of delivery	Terminal diagram: KTY 10 temperature board
	Temperature board PT 100: Cooling / air-conditioning systems with small differentials (T max: +140°C, ΔT min ≥ 5 K, ΔT max: 100 K)	Terminal diagram: PT 100 temperature board
Control board	Shutdown 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 pcs.) 3 control boards are required for 6 pumps	Terminal diagram: Control board
DDC board	Load adjustment of the pump system (setpoint-actual value comparison) by external controller, pump activation and deactivation, pump duty cycling, set-point switchover, switchover to manual control mode and confirmation of the collective fault signal by external potential-free contact	Terminal diagram: DDC board
Signal board 1 – 2	Potential-free individual operation / Individual fault signal for the pumps 1 – 2 and frequency converter, status signals to the digital inputs DIG2 or DIG3 (e.g. low water, antifreeze protection), speed-actual value or transmitter-actual value (can be preselected)	Terminal diagram: Signal board 1-2
Signal board 3 – 6	Potential-free individual operation / Individual fault signal for the pumps 3 – 6	Terminal diagram: Signal board 3-6

Technical Data Wilo-CRn, Wilo-CR

Dimensions and Weights Wilo-CR-System

Nominal power	Number of pumps	WA / SG				SE			
P_2		W	H	D	Weight	W	H	Rec. inst. depth	Weight
[kW]		[mm]			[kg]	[mm]			[kg]
1.1 – 2.2 – 3.0 – 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 – 15.0 – 22.0	1–2-fold	800	1900	515	270	699	1696	310	140
	3–4-fold	1200	1900	515	350	1099	1696	310	160
11.0 – 15.0	5–6-fold	1200	1900	515	365	1099	1696	310	175
22	5–6-fold[1)]	1200	1900	515	–	1099	1696	310	–
		600	1900	515	520	499	1696	310	230
30	1–2-fold	1200	1900	515	390	1099	1696	310	200
	3–4-fold[1)]	1200	1900	515	–	1099	1696	310	–
		600	1900	515	560	499	1696	310	270
	5–6-fold[1)]	1200	1900	515	–	1099	1696	310	–
		1200	1900	515	640	1099	1696	310	320
Cut-out dimension CR controller and operating unit	–	–	–	–	–	186	138	82	–

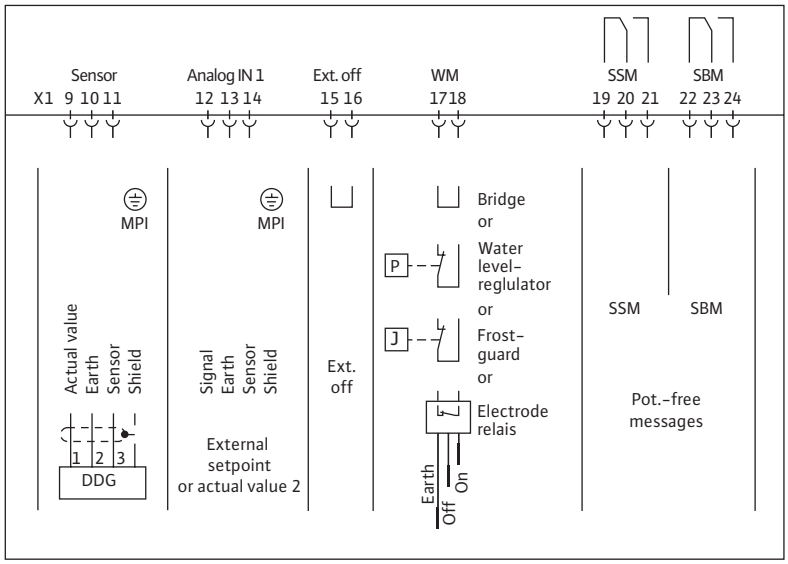
[1)] Control system consists of 2 switch cabinets.

Dimensions and Weights Wilo-CRn-System

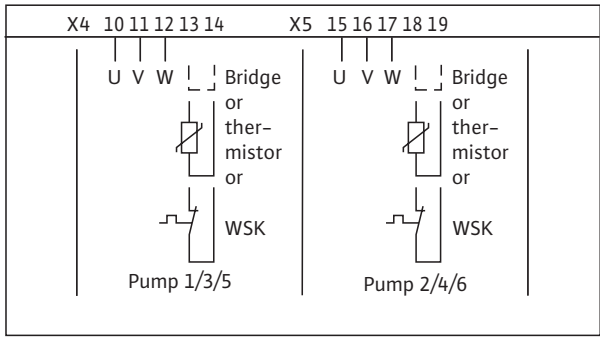
Temperature sensor	Number of pumps	WA				SE			
		W	H	D	Weight	W	H	D	Weight
		[mm]			[kg]	[mm]			[kg]
PT 100	1 – 2	400	400	200	12.5	360	380	120	5.0
PT 100	3 – 4	400	400	200	12.5	360	380	120	5.0
KTY	1 – 2	400	400	200	13.0	360	380	120	5.5
KTY	3 – 4	400	400	200	13.0	360	380	120	5.5

Terminal Diagrams Wilo-CRn, Wilo-CR

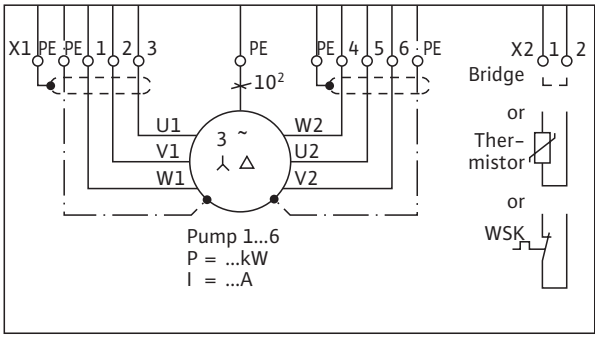
Terminal diagram, CR System base board



Terminal diagram drives CR System ($P_2 \leq 4$ kW)

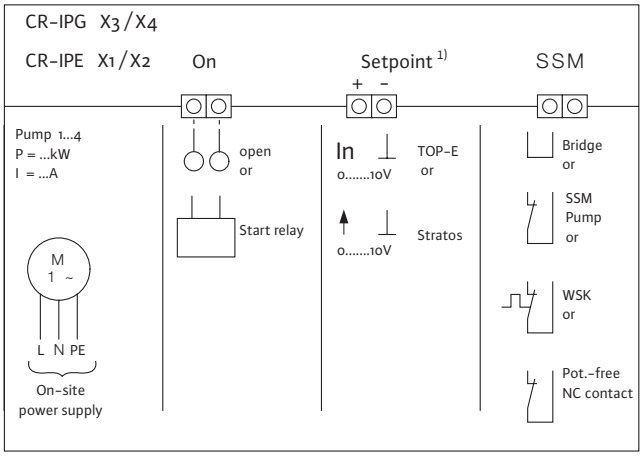


Terminal diagram drives CR System ($P_2 \geq 5.5$ kW)



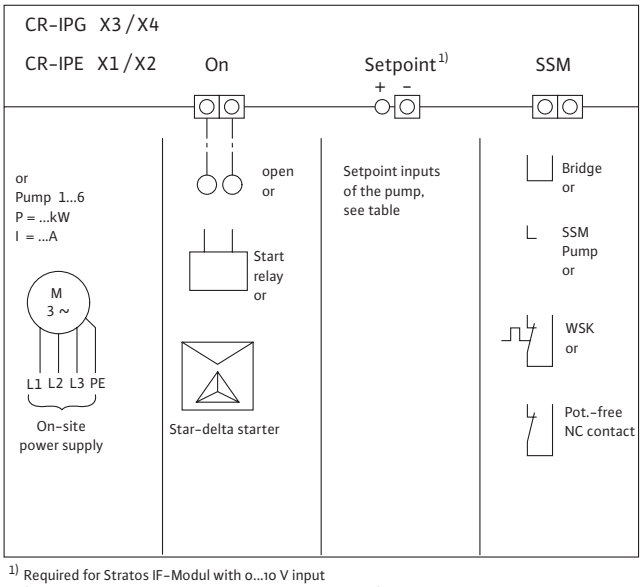
Terminal Diagrams Wilo-CRn, Wilo-CR

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 diagram expansion board CRn System (for pump drives 3~400 V)



1) Required for Stratos IF-Modul with 0...10 V input
(IF-Modul Stratos SBM, Stratos Ext. Min, Stratos Ext. Aus)

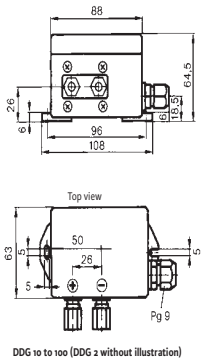
Terminal Diagrams Wilo-CRn, Wilo-CR

Wilo-CRn-System, allocation of setpoint outlets: 1. at the control device CRn / 2. at the pump to be regulated

Pump type	Analogue control signal	1. Setpoint outlets CRn:	
		+	-
		2nd Setpoint inputs pump:	
IL-E...BF R1 (starting with date of manufacture 08 / 2002, up to 02 / 2003)	0 – 10 V	2	4 GND
IL-E...BF R1 (starting with date of manufacture 08 / 2002, up to 02 / 2003)	0 – 20 mA	2	4 GND
IL-E...BF R1 (starting with date of manufacture 03 / 2003)	0 – 10 V	2	7 GND
IL-E...BF R1 (starting with date of manufacture 03 / 2003)	0 – 20 mA	2	7 GND
IL-E... R1 (starting with date of manufacture 01 / 2003)	0 – 10 V	1 (0 – 10 V)	2 (GND)
IL-E... R1 (starting with date of manufacture 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),
Fixing sundries provided by customer

Wall-mounted signal transmitter installation for differential pressure-sensitive stepless speed control.
With built-in pressure-surge throttlers, 2 DIN 3862, 6 mm diameter. cutting-ring unions, 5 m connection cable to the switchgear[1] (3 x 0.75 mm²), 2 pcs. angle cutting-ring unions R $^1/_8$x ø 6 mm.

> Connection data

Maximum supply voltage:	15 – 30 VDC
Current output:	4 – 20 mA
Maximum load resistance:	500 Ω

Pressure measuring ranges:[2] [3]

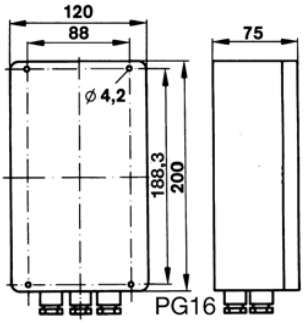
DDG 2:	0 to 0.2 bar
DDG 10:	0 to 1.0 bar
DDG 20:	0 to 2.0 bar
DDG 40:	0 to 4.0 bar
DDG 60:	0 to 6.0 bar
DDG 100:	0 to 10.0 bar

> Technical data

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 up to +40 °C

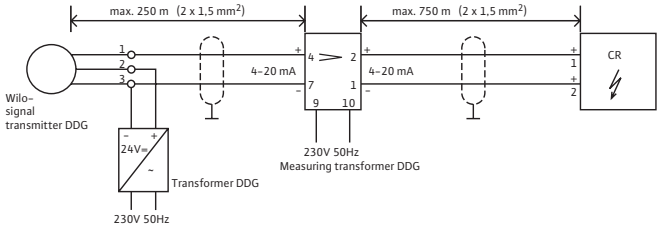
1) Greater distances to be extended by customer
up to 25 m: 3 x 0.75 mm², shielded
up to 250 m: 3 x 1.5 mm², shielded
2) Other pressure measuring ranges on request
3) Selection of pressure measuring range to suit pump performance point

DDG impulse amplifier



(Dimensions in mm),
Fixing sundries provided by customer

Terminal diagram



Wall-mounted impulse amplifier (measuring transducer) installation for amplifying signals from the Wilo-DDG signal transmitter for cable lengths in excess of 250 m.
Delivery including DDG power supply unit.

> Connection data

Operating voltage:	230 V / 50 Hz
Current input / output:	0 – 20 mA
Maximum fuse size:	10 A
Maximum input resistance:	50 Ω
Maximum load resistance:	≤ 600 Ω

> Technical Data

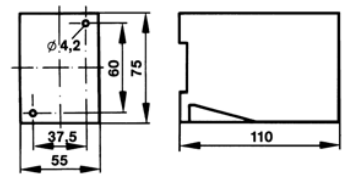
Maximum power consumption:	5 VA
Protection class:	IP 54
Ambient temp.:	0 °C up to +40 °C

> Signal cables:

Input:	2 x 1.5 mm², 250 m max. length, shielded
Output:	2 x 1.5 mm², 750 m maximum length, shielded

Signal Transmitters and Accessories

DDG impulse selector



Impulse selector (evaluator) for control-panel installation (rail mounting) for signal selection for two to four DDG measuring points.

> Connection data

Operating voltage:	230 V / 50 Hz
Current input (2 to 4 x):	0 – 20 mA
Current output:	0 – 20 mA
Maximum fuse size:	10 A
Maximum input resistance:	50 Ω
Maximum load resistance:	≤ 1000 Ω

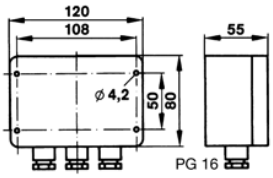
> Technical Data

Maximum power consumption:	8 VA
Protection class:	IP 00
Ambient temp.:	0 °C up to +40 °C

> Signal cable

Per input:	2 x 1.5 mm², 250 m max. length, shielded
Per output:	2 x 1.5 mm², 750 m maximum length, shielded

DDG power supply unit



Fixing sundries provided by customer

Wall-mounted power supply unit installation for supplying power to the DDG signal transmitter in conjunction with the DDG impulse selector.

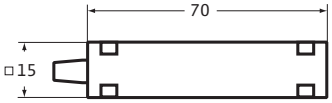
> Connection data

Operating voltage:	230 V / 50 Hz
Output voltage:	24 V DC
Output current:	0 – 20 mA

> Technical Data

Protection class:	IP 54
Ambient temp.:	0 °C up to +40 °C

TSG signal transmitter



Pipe-attached contact temperature sensor.
Included in scope of delivery with KTY 10 temperature board.
With 2 pcs. spring fasteners for attachment to pipes up to DN 100,
1 tube thermolube,
5 m connection cable to the switchgear[1)]
(2 x 0.75 mm², shielded).

> Connection data

KTY 10 PTC thermistor

- at +25 °C:	2 kΩ
- at +90 °C:	3.09 kΩ
Maximum current:	2 mA

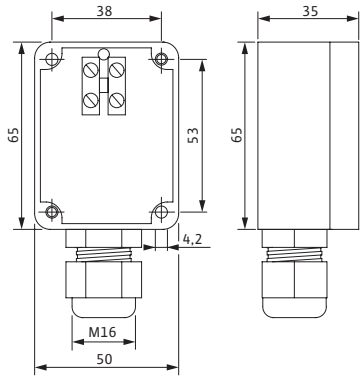
> Technical Data

Protection class:	IP 43
Temperature range:	0 °C to +150 °C

[1)] Greater distances to be extended by customer
up to 25 m: 3 x 0.75 mm², shielded
up to 100 m: 3 x 1.50 mm², shielded
up to 250 m: 3 x 2.50 mm², shielded

Signal Transmitters and Accessories

Outdoor temperature sensor KTY / PT 100



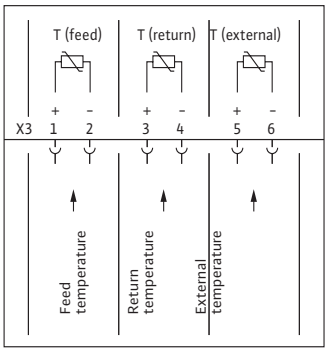
Transmitter for wall mounting for outdoor temperature indication.

> Required accessory:
- Connection line (onsite)
  up to 25 m: 3 x 0.75 mm², shielded
  up to 100 m: 3 x 1.50 mm², shielded
  up to 250 m: 3 x 2.50 mm², 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-System switchgear series for utilisation of the control modes:
- Differential temperature control (ΔT)
- Feed / return temperature control (±T)
- Differential pressure – temperature-superimposed (Δp-T)

> Design

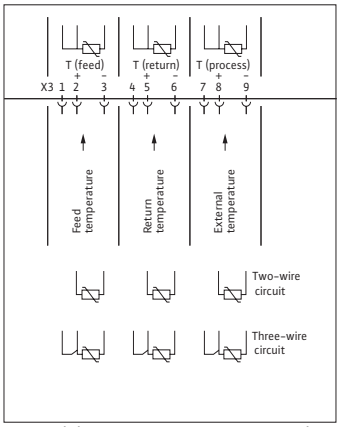
3 analogue inputs for TSG temperature sensors:
- Feed temperature (+T)
- Return temperature (-T)
- Temperature reference value (T)

Fixation material, CAN bus cable and 2 pcs. TSG temperature signal transmitters are included in the scope of delivery.

> Technical Data

Measuring range:	±T: - 20 ... +150°C ΔT: ≥ 10 K
Resolution:	10 bits
Accuracy:	0.2% of upper limit + transmitter tolerance
Ambient temperature:	0 °C up to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approximately 0.5 kg

PT 100 temperature board



Terminal diagram, PT 100 temperature board

Additional board for upgrading Wilo-CR-System switchgear series for utilisation of the control modes:
- Differential temperature control (ΔT)
- Feed / return temperature control (±T)
- Differential pressure – temperature-superimposed (Δp-T)

> Design

3 Analogue inputs for PT temperature sensors 100 in 2- / 3- and 4-conductor technology to be provided onsite by the customer:
- Feed temperature (+T)
- Return temperature (-T)
- Temperature reference value (T)

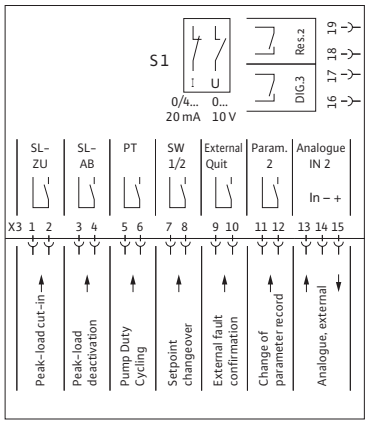
Fixing sundries and CAN-bus cable are included in the scope of delivery.

> Technical Data

Measuring range:	±T: - 20 ... +150°C ΔT: ≥5 K
Accuracy:	± 2 K (referred to standard values as per DIN IEC 751) + transmitter tolerance
Ambient temperature:	0 °C up to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approximately 0.5 kg

Signal Transmitters and Accessories

DDC board



Terminal diagram, DDC board

Additional board for upgrading Wilo-CR-System switchgear series for remote control by external monitoring units (e.g. BA or DDC substation).

> Design

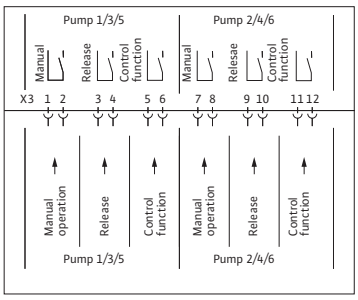
1 analogue input for external manipulated variable (speed adjustment during DDC operation)
8 digital inputs for connecting external potential-free pushbuttons for
- Peak-load cut-in
- Peak-load deactivation
- Pump duty cycling
- Setpoint switchover
- Confirmation of the collective fault signal
- Parameter-record switchover
- Control input 0 / 2 -10 V or 0 / 4 – 20 mA
- Signal input DIG 3

Fixing sundries and CAN-bus cable are included in the scope of delivery.

> Technical Data

Analog input:	manipulated variable
Measuring range:	0 – 10 V, 0 / 4 – 20 mA (≙ minimum- maximum speed)
Input resistance:	10 kΩ or 50 Ω
Resolution:	10 bits
Accuracy:	0.2% of the 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 mm²
Ambient temp.:	0 °C up to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approximately 0.5 kg

Control board



Terminal diagram, control board

Additional board for upgrading Wilo-CR-System switchgear series for Manual – 0 – Automatic operating-mode selection for maximum 2 pumps (e.g.: 5-pump system will require 3 pcs. control boards). Switchover for each pump individually by potential-free control switches provided by customer.

> Function

Manual – 0 – Automatic switchover by a potential-free two-way make contact with central "Off" position for each pump, provided by the customer.
Operating mode:
- Manual: pump in mains operation
- 0: Pump off
- Automatic: Pump on standby for automatically controlled operation

Connection for customer-provided repair switches with auxiliary contact:
- closed: pump enabled
- open: pump disabled

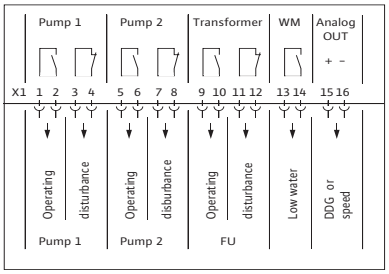
Fixing sundries and CAN-bus cable are included in the scope of delivery.

> Technical Data

Selector switch:	P1 / P2, P3 / P4, P5 / P6
Control inputs:	2 x Repair switches (On / Off for each pump) 4 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-section:	1.5 mm²
Ambient temp.:	0 °C up to +40 °C
Dimensions:	100 mm x 120 mm
Weight:	approximately 0.5 kg

Signal Transmitters and Accessories

Signal board 1 – 2



Terminal diagram, signal board 1 – 2

Additional board for upgrading Wilo-CR-System switchgear series for individual run / single fault signals for single and twin-head pump systems.

> Function

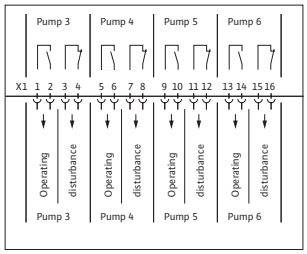
- Potential-free signal contacts for operation (NO contact) and fault (NC contact) of: pump 1, pump 2, frequency converter
- Signalling the digital inputs DIG2 or DIG3, e.g. frost (heating) or low water (pressure boosting)
- Analogue output for actual speed value or actual-value transmitter (can be preselected)

Fixing sundries and CAN-bus cable are included in the scope of delivery.

> Technical Data

Analog output:	Actual value
Measuring range:	0 – 10 V, 0 / 4 – 20 mA (rotational speed or transmitter)
Input resistance:	10 kΩ or 50 Ω
Resolution:	10 bits
Accuracy:	0.2% of upper limit + transmitter tolerance
Signalling contacts:	
Switching capacity:	maximum 250 VAC / 2 A minimum 12 VDC / 10 mA
Maximum cable length:	100 m
Terminal cross-sections:	1.5 mm²
Ambient temp.:	0 °C up to +40 °C
Dimensions:	120 mm x 120 mm
Weight:	approximately 0.5 kg

Signal board 3 – 6



Terminal diagram, signal board 3 – 6

Additional board for upgrading Wilo-CR-System series switchgears for individual run / single fault signals for three- to six-pump systems (signalling board 1 – 2 also required).

> Function

- Potential-free signalling contacts for operation
- (normally open contact) and malfunction (normally closed contact) of: pump 3, pump 4, pump 5, pump 6

Fixing sundries and CAN-bus cable are included in the scope of delivery.

> Technical Data

Signalling contacts:	
Switching capacity:	maximum 250 VAC / 2 A minimum 12 VDC / 10 mA
Terminal cross-sections:	1.5 mm²
Ambient temp.:	0 °C up to +40 °C
Dimensions:	120 mm x 120 mm
Weight:	approximately 0.5 kg

Pump Management Systems Wilo-Control

Contents

Pump Management Systems Wilo-Control

Series overview

Operating and service unit
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 kinds of pumps and IEC standards motors

Interface converter modules
Wilo-IF-Modul PLR

- retrofittable 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 converters or
  - company-specific coupling modules
- twin-head pump management with communication capability (time-, load- and fault-sensitive)

Wilo-IF-Modul LON

- retrofittable 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
  - LONTALK protocol
  - LONMARK conformity
- twin-head pump management with communication capability (time-, load- and fault-sensitive)

Series overview

Building Automation BA / Control Technology
Series: Wilo-Control AnaCon

- Analogue interface converter for the universal connection of communication-capable Wilo pumps with serial, digital PLR interface to onsite monitoring units as per VDI 3814.

Series: Wilo-Control DigiCon

- Digital interface converter for the universal connection of communication-capable Wilo pumps with serial digital PLR interface to onsite monitoring units with digital RS 485 interface.

Series: Wilo-Control DigiCon-A (manual operation panel)

- Manual operation level for Wilo-Control DigiCon for expanded communication-capable Wilo pumps with serial digital PLR interface to onsite operating levels in accordance with VDI 3814. The Wilo-Control DigiCon-A manual operation level allows the superordinate control of pumps connected to the Wilo-Control DigiCon interface converter.

Planning Guide

Building automation (BA)

Automatically controlled processes have become vitally important in advanced building services technology. This particularly applies to all building and mechanical services in the areas of:

- Heating systems
- Cooling systems
- Ventilation systems
- Heat pump installations
- Combined heat and power plants
- Water Supply
- Drainage, sewage disposal

The BA has the task of controlling the dependencies between the different trades involved in the technical building equipment (TGA). It is in particular the 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 indispensable for operations in the TGA that utilise high power consumption. Operational reliability and economic efficiency of pumps and pump systems are guaranteed to the greatest possible extent by central availability and monitoring of these pumps and pump systems.

Due to the rapid technical advances made in the areas of electrical engineering / electronics, potential-free contacts and analogue unit signals are being successively superseded by bus systems.

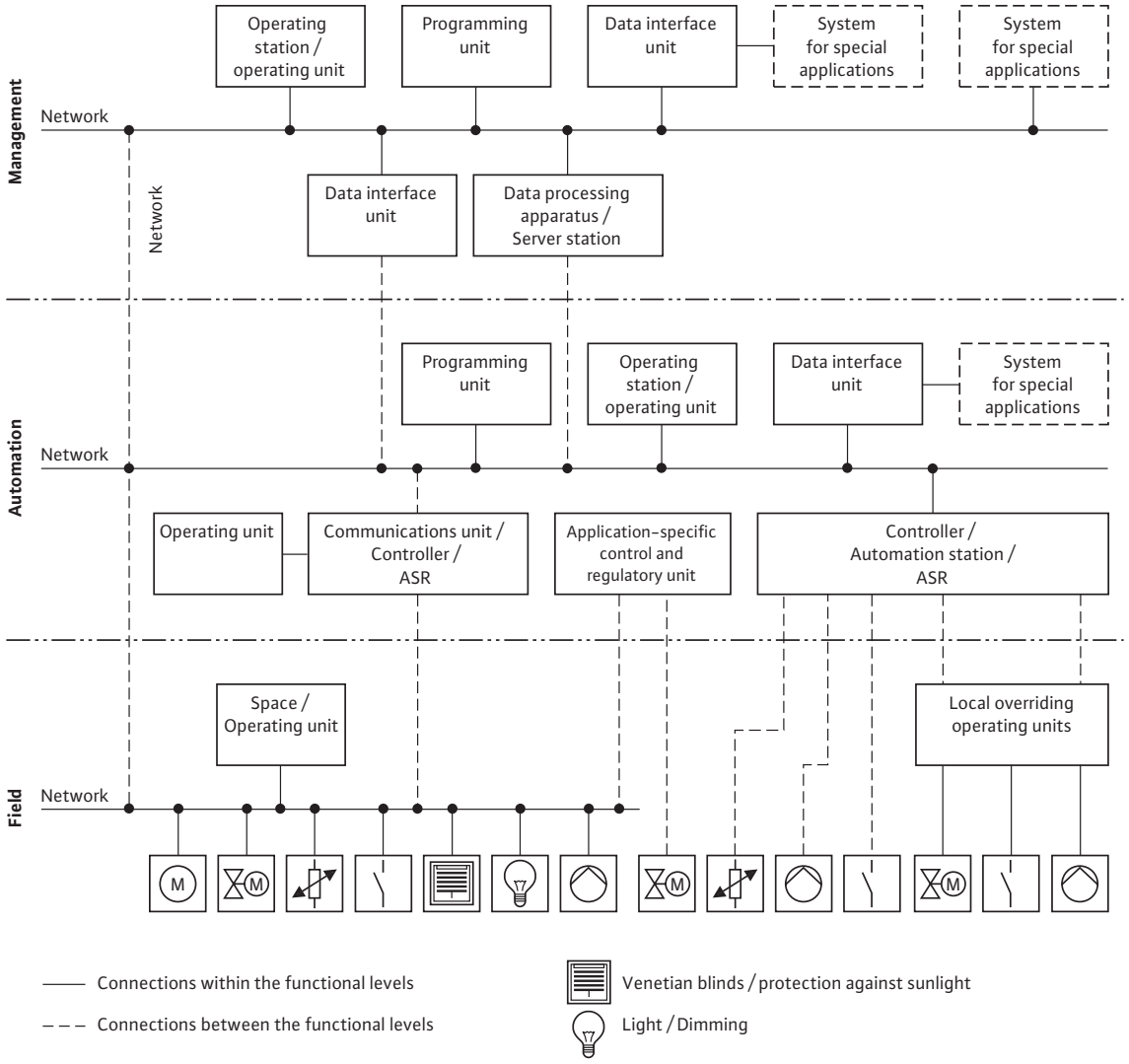


Fig.: Building automation – schematic diagram

Planning Guide

Integration in BA

Different communications connections, depending on the kind and extent of a BA system, are required to communicate with signals, commands or data exchange.
In Germany, design and functions of BA systems are precisely defined in standard specification VDI 3814. The scope of communication is crucial in determining whether potential-free contacts and analogue signals (2 control cables are required for each kind of information) or intelligent bus systems (all data via a bus line) are used for data transmission.
Wilo pumps as well as their optional accessories are equipped with control terminals and respective internal relays enabling communication facilities in line with VDI 3814 requirements.

Principle of operation:

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	Control input "Overriding Off"	Signalling relay	
		SBM	SSM
Off [1]		0	0
On	closed	1	0
	open	0	0
On; Pump faulty	closed	0	1
	open	0	1

0 = relay inactive SBM = collective run signal
1 = relay active SSM = collective fault signal
[1] Mains system voltage "Off" = total breakdown of electronics system

It is also possible to effect external control functions such as Overriding Off and Overriding Min. by means of customer-provided potential-free contacts,
offering the following combinations:
- Overriding Off:
  - Stratos / Stratos-Z / Stratos-D / Stratos-ZD with IF-Moduls
  - 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-Moduls
- Overriding Off, Overriding Max and Overriding Min:
  - Stratos / Stratos-Z / Stratos-D / Stratos-ZD with IF-Moduls Stratos PLR and analogue interface converter
  - TOP-E / -ED with IF-Moduls PLR and Wilo-Control AnaCon
  - VeroLine-IP-E / VeroTwin-DP-E with Wilo-Control AnaCon
  - CronoLine-IL-E / CronoTwin-DL-E with IF-Moduls PLR and Wilo-Control AnaCon

In addition to these functions the new pumps with communication capabilities feature the option of logging an extensive number of physical actual data. The latest sensor technology records hydraulic and electrical pump data and makes them available via a PLR or LON serial digital interface of the BA. All this information can be exchanged between a pump with communication capability (accessory modules required) and another BA unit via a 2-lead cable.
Pumps with communication capability are:
- Stratos / Stratos-Z / Stratos-D with IF-Moduls
- TOP-E / -ED with IF-Moduls
- CronoLine-IL-E / CronoTwin-DL-E with IF-Moduls
- VeroLine-IP-E / VeroTwin-DP-E

Systems integration

The demands made of communication capabilities and functionality are guided through ever more complex hierarchies of building automation as a result of the rising demands made of mechanical services equipment (TGA – also referred to as technical building equipment) 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 needs at the automation level. In order to lower 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 communications" and "distributed intelligence".
The Wilo-Control automation and monitoring system offers:
- Monitoring and control in accordance with VDI 3814 with
  - potential-free contacts
  - analogue signals
- Serial digital **Interface PLR** (Wilo-specific hardware and protocol) of pumps with communication capability is star-connected via a 2-lead cable to a Wilo interface converter or a company-specific coupling module (I / O modules). This connection permits transmission links of up to 200 m. Additional advantages are:
  - locking protection
  - immunity to interference
  - small cross-sections (0.75 mm²)
  - shielded cable not required
  - ECM-protected at both ends
  - galvanically isolated
  - interference-voltage-proof up to 250 VAC
- Serial bus-compatible **Interface RS 485** (standard hardware, Wilo-specific protocol) with digital interface converter for communication with digital monitoring units. The data protocol is to be co-ordinated with respective BA manufacturer.
- Serial bus-compatible **Interface LON** with LONTALK protocol and transceiver type FTT10A for connecting electronically controlled LON-compatible Wilo pumps with infrared interfaces to LONWORKS networks. The LONWORKS technology offers installation advantages such as:
  - locking protection
  - immunity to interference
  - small cross-sections (0.75 mm²)
  - shielded cable not required
  - ECM-protected at both ends
  - galvanically isolated
  - interference-voltage-proof up to 250 VAC
  - freely selectable topology.

Planning Guide

LON is an open, non-manufacturer-specific system which enables open, intersectional communication between different components and systems. It thus offers advantages to planner, installer and operator, such as:

- Intersectional trade integration
- Non-manufacturer-specific
- Creation of functional added values
- Avoidance of installation and planning errors thanks to a standardised data interface (prerequisite: no changing transfer media)
- Reduction of installation expenditure in comparison with stand-alone systems
- Reduced investment costs through multiple utilisation of sensors
- No expensive gateway solutions are required for data communication between stand-alone systems
- Flexibility in the event of modifications and retrofitting
- Reduced operating costs thanks 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 building-services systems
- LONWORKS provides for 2 directions of communication:
- Vertical communication between components on the field level and automation stations on the automation level
- Horizontal communication between components at the field level

It is horizontal communication in particular which allows the set-up of decentralised structures which operate without higher-level automation stations. It has thus become possible to realise previously expensive control tasks with significantly lower installation expenditure; 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 undertake control tasks. In parallel fashion, the pump can send electrical and hydraulic operating data for statistical conditioning and if necessary fault and run / process signals to the higher-level control room and receive higher-level commands from this control room.

Communication takes place with the standardised LONTALK protocol and utilises the firmly defined network variables of the LONMARK "Pump Controller Object for HVAC Applications" functional profiles.

Operating-data management by BA

Data management by BA systems allows the logging and recording of cyclical and eventful data. For example:

- 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 reports
- Fault reports with date, time and cause

The multitude of the information and functions listed allows specific energy and maintenance management and thus contributes to reducing costs.

It is thus feasible, by relating the performance and work data to the measured heating load, to assess overall plant efficiencies and performance data.

Series description Wilo-IR-Monitor

Wilo-IR-Monitor

Fig.:Wilo-IR-Monitor; Operating and service unit for pump monitoring

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 / reception range	maximum 8 m
Display	50 x 50 mm, with switch-on backlighting
Voltage supply	2 pc. Mignon alkali battery cells 1.5 V size AA (included in the scope of delivery)
Operating duration	approximately 24 hrs. when on and illuminated
Data buffer	EE-Prom
Emitted interference	EN 61000-6-3
Immunity to interference	EN 61000-6-2

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 Wilo-IR-Monitor serves to remotely monitor the numerous pump functions by wireless control. All operating steps and status reports are clearly graphically displayed.

Functional features of the IR-Monitor are closely linked with the attributes of the high-efficiency and / or energy-saving pumps.

Operation of the IR-Monitor corresponds to that of the pump itself, i.e. Modification and confirmation of the values that have been newly adjusted is carried out by rotating and pressing the red operating button (one-button operation).

The functional capacity has mainly been tailored for the use by contractors and service personnel.

Design

Shock resistant 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.

Automatic interchange linkup

The information exchange between the IR-Monitor and the pump is wireless by infrared light. An automatic interchange built-up will, on congested plant layouts (e.g. a number of pumps installed closely side-by-side), avoid the simultaneous activation of different pumps and will thus establish a correct data exchange between the selected pump and the IR-Monitor. Manual coding of the individual pumps is not required.

Data memory

Operating data logged immediately prior to a fault event will be recorded in the pump and be made further use of for data analysis with the IR-Monitor.

Statistical functions

The hydraulic performance (volumetric flow) of the relevant pump can be viewed with the IR-Monitor in a statistical histogram.
The load profile of the hydraulic plant will thus become perceptible over the range of a defined operating period.
A non-fading data memory (EE-Prom) is available for the buffering of statistical and preset values

Battery monitoring

Battery condition is subject to constant check. A warning light will be displayed to indicate fading capacity.

Series description Wilo-IR-Monitor

Main menu

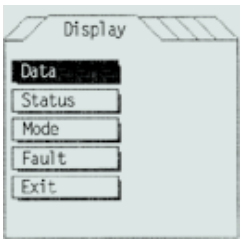
The main menu of the IR-Monitor is divided into 6 function menus:

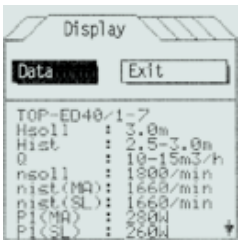
Menu 1: "Communication"

This menu initiates the automatic linkup between the IR-Monitor and the pump.
Selective activation of individual pumps within a set of pumps ≤ 1000 Ω is also possible here.

Menu 2: "Display"

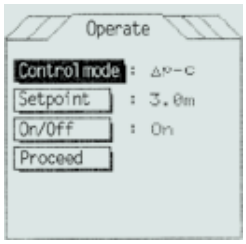
Here it is possible to read system data, e.g. actual electrical and hydraulic values, operating status, operating mode, fault reports.
For correct interpretation, the display always distinguishes clearly between "Single-" and "Twin-head pump".

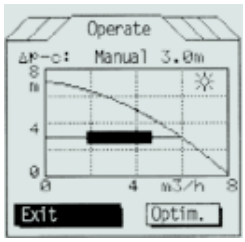




Menu 3: "Operate"

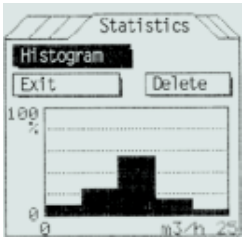
In this menu, data can be both displayed (current setpoint value) and changed, e.g. control mode, setpoint value, pump ON / OFF, disabling the manual operating level at the pump (pump ON / OFF, Ext. Aus and SSM remaining active).





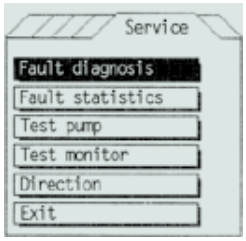
Menu 4: "Statistics"

So that operating periods can be analysed, this menu offers clearly definable histograms of hydraulic performance (volumetric flow Q), thus giving an appreciation of the system load conditions over a definable operating period. It also records hours-run and operating data.



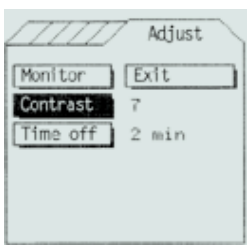
Menu 5: "Service"

In the service menu the user is given the open of fault diagnosis, fault statistics, function-testing the pump, the IR-Monitor and the serial digital interface, as well as direction-of-rotation check and frequency measurement of the rotating field.
The latter two checks 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 adapt the IR-Monitor to suit individual requirements.



Function overview Wilo-IP-E / IL-E and DP-E / DL-E with Wilo-IF-Moduls

Wilo-VeroLine-IP-E / CronoLine-IL-E

- Integrated electronic performance control for operation at constant / variable differential pressure
  - simplifies pump configuration
  - duty point-adjustable
  - reduces noise and saves electricity
- Integrated full motor protection
- Retrofittable IF-Modul for function expansion

Wilo-VeroTwin-DP-E / CronoTwin-DL-E

- Integrated electronic performance control for operation at constant / variable differential pressure
  - simplifies pump configuration
  - duty point-adjustable
  - reduces noise and saves electricity
- Integrated full motor protection
- Twin-head pump switchover valve
- Retrofittable IF-Modul for function expansion

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 functions				
Pump ON / OFF	•	•	•	•
Setting control mode (Δp-c, Δp-v, manual control mode)	•	•	•	•
Setting setpoint differential-pressure value	•	•	•	•
Setting speed (manual setting)	•	•	•	•
Automatic functions				
Stepless performance control Δp-c	•	•	•	•
Stepless performance control Δp-v	•	•	•	•
Full motor protection with fault trip	•	•	•	•
External control functions				
Control input Overriding Off	•	•	•	•
Control input 0 – 10 V (remote speed adjustment)	•	•	•	•

• = available, – = not available

Function overview Wilo-IP-E / IL-E and DP-E / DL-E with Wilo-IF-Moduls

Function table Wilo-IP-E / IL-E and DP-E / DL-E (Continued)

Function:	VeroLine-IP-E	CronoLine-IL-E	VeroTwin-DP-E	CronoTwin-DL-E
Signalling and display functions				
Collective fault signal	•	•	•	•
Collective run signal	•	•	•	•
Fault light	•	•	•	•
IR communication indicator light	•	•	•	•
Fault code	•	•	•	•
LC display for indicating pump data	•	•	•	•
Data exchange				
Infrared interface for wireless data exchange with the Wilo-IR-Monitor operating and service unit	•	•	•	•
PLR serial digital 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 LONWORKS network	• 3)	• 3)	• 3)	• 4)
Twin-head pump management (2 x single-head or 1 x twin-head pump)				
Main / standby operation (automatic. fault-actuated switchover / time-sensitive pump duty cycling)	•	• 2) 4) 5)	•	• 2) 4)
Duty / assist mode (peak-load cut-in and out)	•	• 2) 4) 5)	•	• 2) 4)

• = available, – = not available

1) with 1 pc. IF-Modul PLR
2) with 2 pc. IF-Moduls PLR / PLR
3) with 1 pc. IF-Modul LON
4) with 2 pc. IF-Moduls LON / PLR
5) Twin-head pump management with 2 single-head pumps only possible if the equivalent twin-head pump is also listed in the Wilo catalogue

Wilo-IF-Moduls for Single-Head Pumps

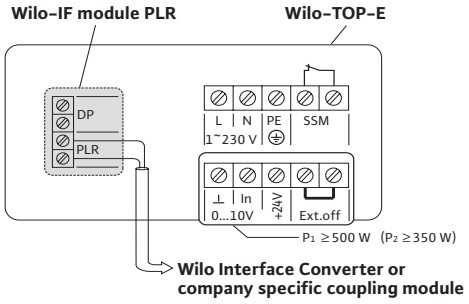
1 x Wilo-IF-Modul PLR

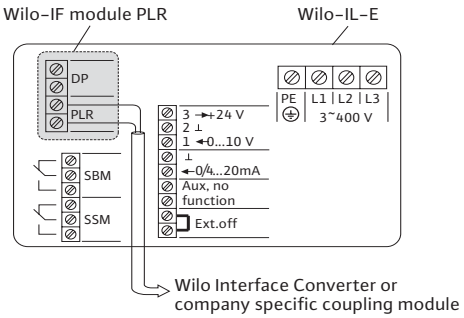
Plug-in module for single-head pumps of the series Wilo-TOP-E and Wilo-VeroLine-IP-E / CronoLine-IL-E with infrared interface

> Additional functions

- Serial digital **PLR interface** for connection to BA building automation via
  - Wilo interface converters or
  - company-specific coupling modules
- Transfer of the following data items as control commands to the pump:
  - Control mode Δp-c
  - Setpoint Delivery head / Speed
  - Pump ON / OFF
  - setback mode
- Transfer of the following data items as signals from the pump:
  - Actual value, delivery head
  - Actual value, volumetric flow
  - Actual value, power consumption
  - Actual value, power output
  - Actual value, motor current
  - Operating hours
  - Actual value, speed
  - Detailed fault reports
  - Status reports
- **DP twin-head pump interface** for integrated dual pump management of 2 x single- or 1 x twin-head pump (see Wilo-IF-Moduls for twin-head pumps)

Terminal diagrams





Wilo-IF-Moduls for Single-Head Pumps

1 x Wilo-IF-Modul LON

Plug-in module for LON-compatible single-head pumps of the series Wilo-TOP-E and Wilo-VeroLine-IP-E / CronoLine-IL-E 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 reports
  - Fault signals
- **DP twin-head pump interface** for integrated dual pump management of 2 x single- or 1 x twin-head pump (see Wilo-IF-Moduls for twin-head 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”

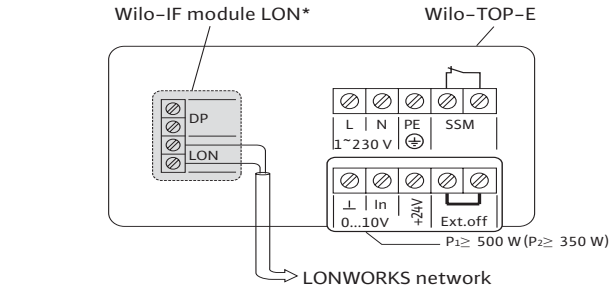
> Delivery status

The LON IF-Modul LON is supplied as “Application unconfigured” in line with LONMark Application Layer Interoperability Guidelines.

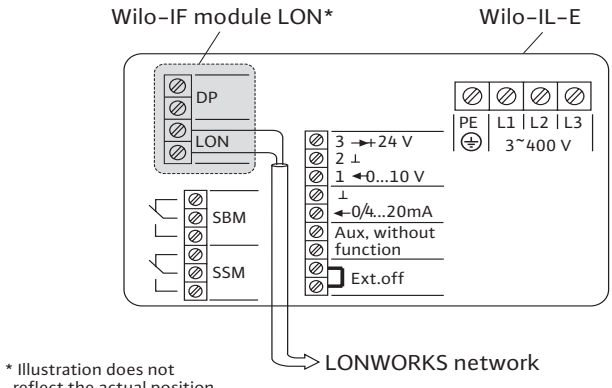
> Documentation

You will find the following documentation on our homepage at **www.wilo.de** (- Planning, – Data Records / CAD):
LONMark Functional Profile “Pump Controller Object for HVAC Applications”
- Download Application over Network: *.NXE / *.APB
- External Interface Files: *.XIF / *.XFB
- Device Resource Files: *.ENU / *.FMT / *.FPT / *.TYP

Terminal diagram



* Illustration does not reflect the actual position of the terminals



* Illustration does not reflect the actual position of the terminals

Wilo-IF-Moduls for Twin-Head Pumps

2 x Wilo-IF module PLR

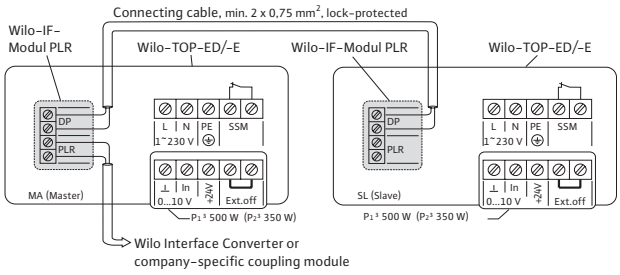
Plug-in Modules for twin-head pumps of the series Wilo-TOP-ED and Wilo-TOP-E (2 pc.) and Wilo-CronoTwin-DL-E and CronoLine-IL-E (2 pcs.) with infrared interface

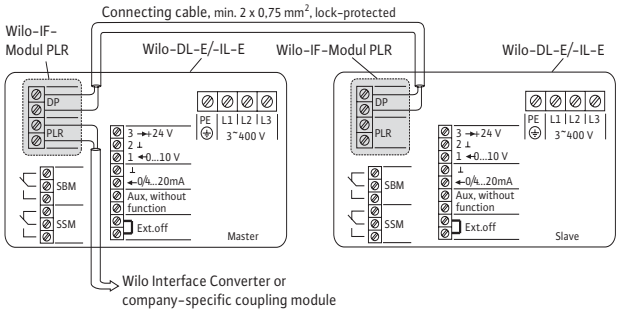
> Additional functions

- Serial digital **PLR interface** for connection to BA building automation via
  - Wilo interface converters or
  - company-specific coupling modules
- Transfer of the following data items as control commands to the pump:
  - Control mode
  - Setpoint Delivery head / Speed
  - Pump ON / OFF
  - Setback mode
- Transfer of the following data items as signals from the pump:
  - Actual value, delivery head
  - Actual value, volumetric flow
  - Actual value, power consumption
  - Actual value, power output
  - Actual value, motor current
  - Operating hours
  - Actual value, speed
  - Detailed fault reports
  - Status reports
- **Twin-head pump interface DP** for possible integration of twin-head pump management of 1x twin-head or 2x single-head pumps, optionally with the following functions:
  - Main / standby operation
    for automatic fault-actuated switchover to the standby pump and automatic pump duty cycling after 24 hrs. running time
  - Duty / assist mode
    for efficiency-optimised On / Off control of the peak-load pump and automatic fault-actuated switchover to the standby pump

- Included in the IF-Modul PLR scope of delivery for TOP-ED / -E:
  2-core connecting cable, 670 mm long
- Included with IF-Modul PLR scope of delivery for DL-E / IL-E:
  2-core connecting cable, 1800 mm long

Terminal diagrams





Wilo-IF-Moduls for Twin-Head Pumps

Wilo-IF-Moduls 1 x LON and 1 x PLR

Plug-in modules for LON-compatible twin-head pumps of the series Wilo-TOP-ED and Wilo-TOP-E (2 pcs.) and Wilo-CronoTwin-DL-E and CronoLine-IL-E (2 pcs.) with infrared interfaces.
For twin-head pump management a PLR module is required in addition to the LON function module.
The functions of the "LON" module are applicable to the entire twin-head pump.

> Additional functions

- Serial digital **LON interface** for connection to LONWORKS networks. In the LONWORKS network, data items are transmitted for the twin-head pump as a complete single 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 reports
  - Fault signals
- **Twin-head pump interface DP** for possible integration of twin-head pump management of 1x twin-head or 2x single-head pumps, optionally with the following functions:
  - Main / standby operation for automatic fault-actuated switchover to the standby pump and automatic pump duty cycling after 24 hrs. running time
  - Duty / assist mode for efficiency-optimised On / Off control of the peak-load pump and automatic fault-actuated switchover to the standby pump
- Included in the IF-Modul PLR scope of delivery for TOP-ED / -E: 2-core connecting cable, 670 mm long
- Included with IF-Modul 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"

> Delivery status

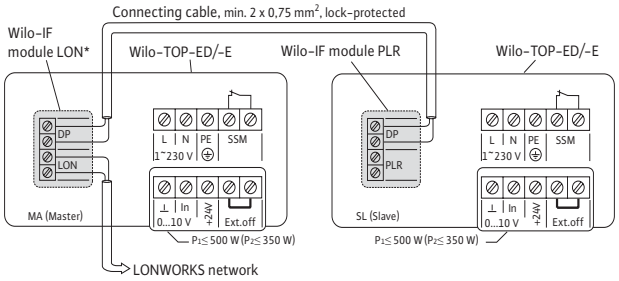
The LON IF-Modul LON is supplied as "Application unconfigured" in line with LONMark Application Layer Interoperability Guidelines.

> Documentation

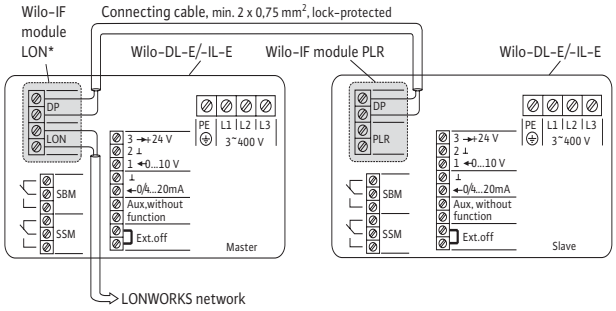
You will find the following documentation on our homepage at **www.wilo.de** (– Planning, – Data Records / CAD): LONMark Functional Profile "Pump Controller Object for HVAC Applications"

- Download Application over Network: *.NXE / *.APB
- External Interface Files: *.XIF / *.XFB
- Device Resource Files: *.ENU / *.FMT / *.FPT / *.TYP

Terminal diagrams



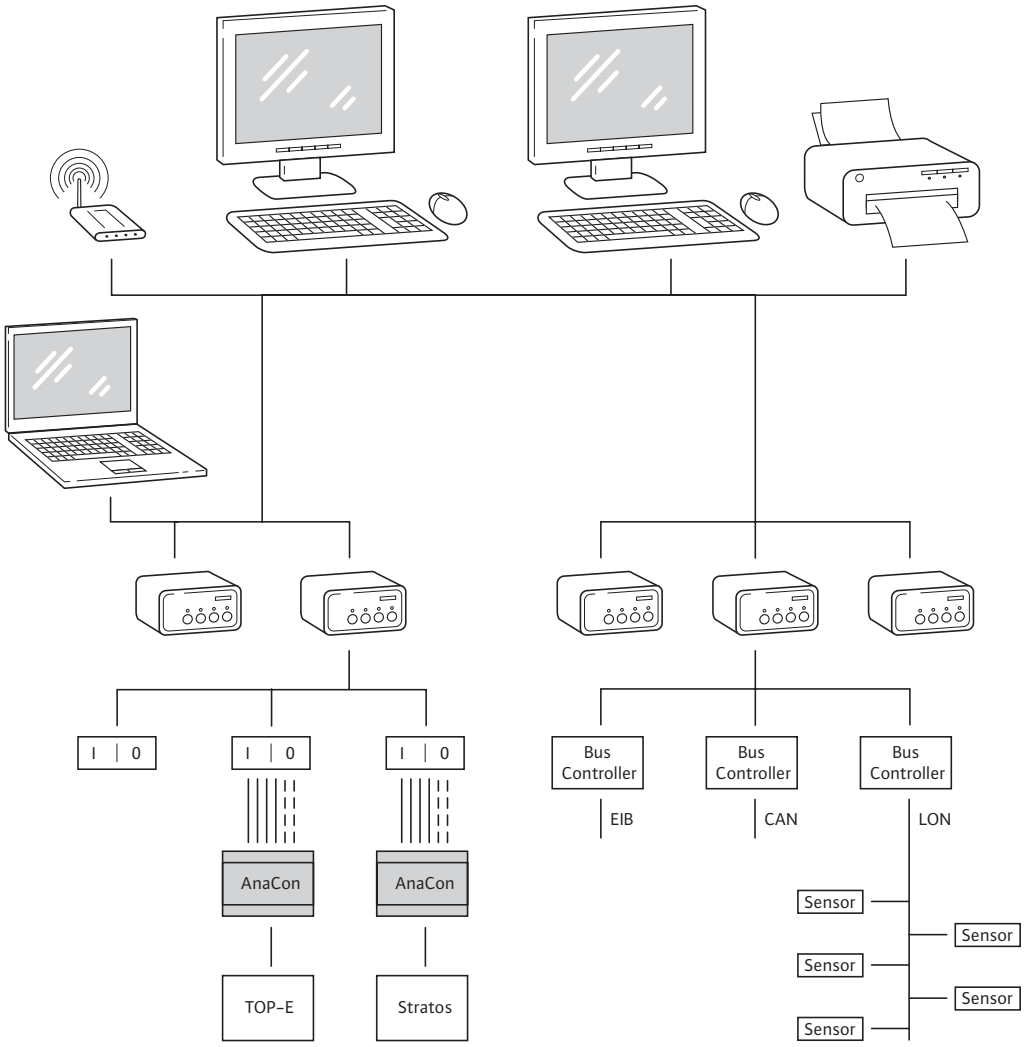
* Illustration does not reflect the actual position of the terminals



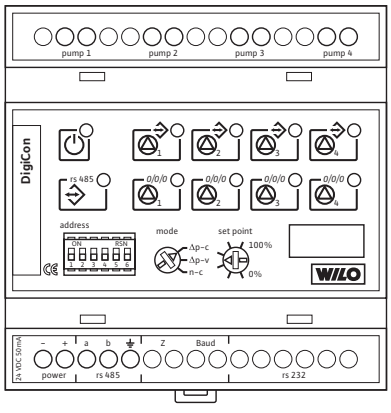
* Illustration does not reflect the actual position of the terminals

Wilo-Control AnaCon

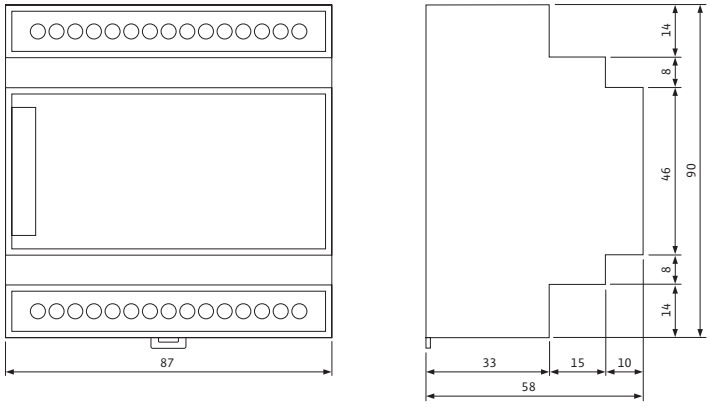
Wilo-Control AnaCon



Front view



Dimension drawing



Wilo-Control AnaCon

Wilo-Control AnaCon

The interface converter Wilo-Control AnaCon is suitable for the universal linkage of communications-compatible pumps with the PLR interface to be found at onsite control and monitoring units with conventional input / output channels. It is installed on a top-hat rail (DIN EN 50 022-35) 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 twin-head pump of the following Wilo series is linked to the BA by means of the Wilo-Control AnaCon interface converter:

- TOP-E / -ED (with IF-Modul PLR)
- Stratos / -D / -Z / -ZD (with IF-Modul Stratos PLR)
- VeroLine-IP-E / -DP-E
- CronoLine-IL-E / -DL-E (with IF-Modul PLR)

Bidirectional communication between the pumps and the monitoring unit (BA) makes possible remote control of:

- Pump Off
- Control mode On
- Maximum speed
- Minimum speed (setback mode)
- Setpoint for differential pressure or speed (control input Analogue In 0 – 10 V)

Bidirectional communication between the pumps and the monitoring unit (BA) makes possible remote query of:

- Collective fault signal
- Individual run signal MA or individual pump
- Individual run signal SL (twin-head pump only)

In addition to remote control and remote query, the Wilo-Control AnaCon interface converter also makes possible 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
- Enablement of the control input Analogue In 0 – 10 V

The Wilo-Control AnaCon interface converter is equipped with LEDs for:

- AnaCon operational state
- Communication with the pump
- Communication with interface RS 485
- Collective fault signal
- Individual run signal MA or individual pump
- Individual run signal SL (twin-head pump only)

Technical Data

• Contact load
- Collective fault signal (potential-free changeover contact): maximum 250 VAC, 1 A
- Individual run signal MA (potential-free NO contact) maximum 250 VAC, 1 A
- Individual run signal SL (potential-free NO contact) maximum 250 VAC, 1 A
- Potential-free NO contact for function “Pump Off”: 24 VDC, 2.4 mA
- Potential-free NO contact for function “Control mode On”:24 VDC, 2.4 mA
- Potential-free NO contact for function “Maximum speed”:24 VDC, 2.4 mA
- Potential-free NO contact for function “Minimum speed”: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
- Immunity to interference: DIN EN 61000-6-2

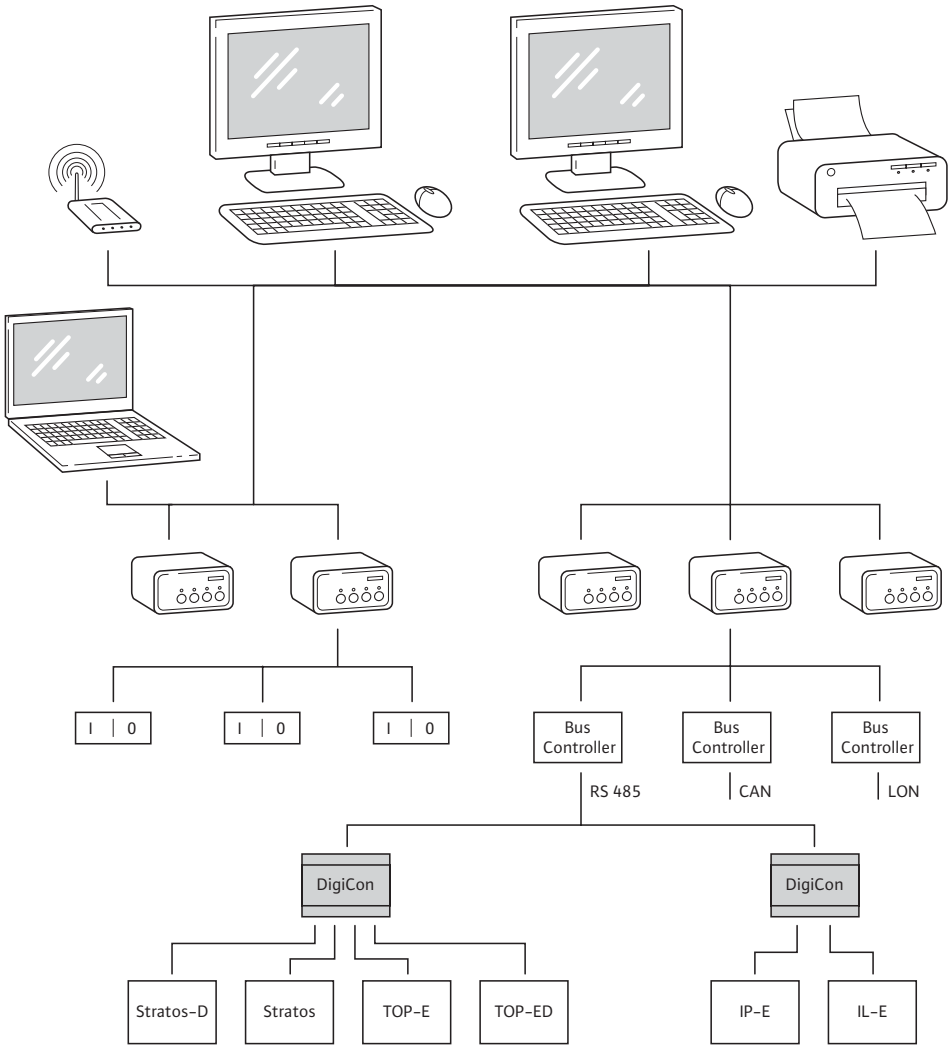
• Control input Analogue In 0 – 10 V
- Input resistance: >200 kΩ
- Input protection: maximum + / - 48 VDC

• Interface PLR
- 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: 200m

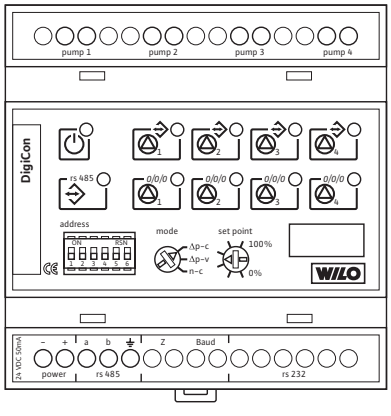
Manual operation of the pump by means of the red knob is not possible if the pump is connected to the AnaCon.
A temporary disruption of the interface connection to electronically controlled pumps with IR interface is possible with the IR-Monitor. The operation can then be controlled with the IR-Monitor. Interface communication is automatically restored after the IR connection is disconnected.

Wilo-Control DigiCon

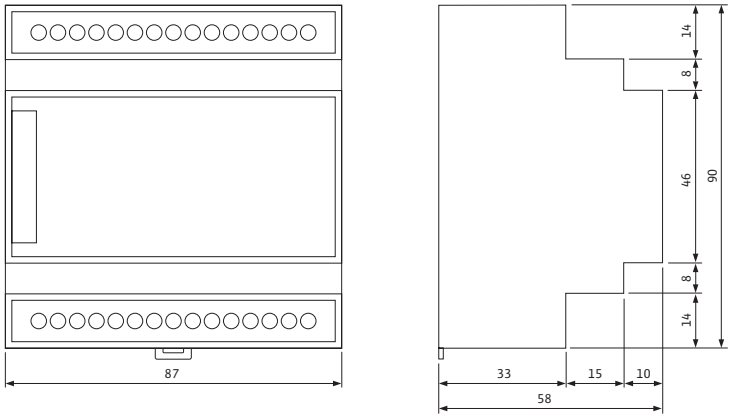
Wilo-Control DigiCon



Front view



Dimension drawing



Wilo-Control DigiCon

Wilo-Control DigiCon

The Wilo-Control DigiCon interface converter is suitable for the universal linkage of communications-compatible pumps with the PLR interface to be found at onsite control and monitoring units that have the RS 485 digital serial interface. It is installed on a top-hat rail (DIN EN50 022-35) 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 PLR serial digital interface into a bus-compatible RS 485 serial digital interface.

A maximum of 4 single or twin-head pumps of the following Wilo series can be linked to the BA by means of the Wilo-Control DigiCon interface converter:

- TOP-E / -ED (with IF-Modul PLR)
- Stratos / -D / -Z / -ZD (with IF-Modul Stratos PLR)
- VeroLine-IP-E (with IF-Modul PLR)
- VeroTwin-DP-E (with IF-Modul PLR)
- CronoLine-IL-E (with IF-Modul PLR)
- CronoTwin-DL-E (with IF-Modul PLR)

The bidirectional communication between the pumps and the monitoring unit (BA) makes it possible to select between the following types of regulation and control units:

- Δp-c for constant differential pressure
- Δp-v for variable differential pressure
- Δp-T for temperature-prompted differential pressure
- n-c for constant speed

Bidirectional communication between the pumps and the monitoring unit (BA) makes possible remote control of:

- Pump Off
- Pump in control mode ON
- Maximum speed
- Minimum speed (setback mode)
- Setpoint for the preselected type of regulation or control

Bidirectional communication between the pumps and the monitoring unit (BA) makes possible remote query of:

- Current operating mode
- Collective fault signal
- Detailed fault signal
- Individual run signal MA or individual pump
- Individual run signal SL (twin-head pump only)

as well as the following operating parameters of the pumps:

- Actual delivery head and current volumetric flow
- Motor current
- Power consumption
- Operating hours
- Cumulative power consumption
- Speed
- Pumped liquid temperature (only TOP-E / -ED and Stratos / -D / -Z / -ZD)

In addition to remote control and remote query, the Wilo-Control DigiCon interface converter also makes possible 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:

- Operational state DigiCon
- Communication with the pump
- Communication with interface RS 485

With the interface RS 485, a maximum of 64 Wilo-Control DigiCon interface converters can be switched in series.

Technical Data

• Supply voltage
- Operating voltage: 24 VDC ± 25 %
- Current consumption: 70 mA
- Terminal cross-section: 1.5 mm²

• Electromagnetic compatibility
- Emitted interference: DIN EN 61000-6-3
- Immunity to interference: DIN EN 61000-6-2

• Interface PLR
- 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: 200m
- Cable type: e.g. J-Y(St)Y 2x2x0.8
- Terminal cross-section: 1.5 mm²

• Interface RS 485

Bus-compatible interface with hardware in accordance with the RS 485 standard and the Wilo-specific protocol. The protocol is to be co-ordinated with 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 mm²

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 communications between the pumps and a conventional PC.

Manual operation of the pump by means of the red knob is not possible if the pump is connected to the Wilo-Control DigiCon.

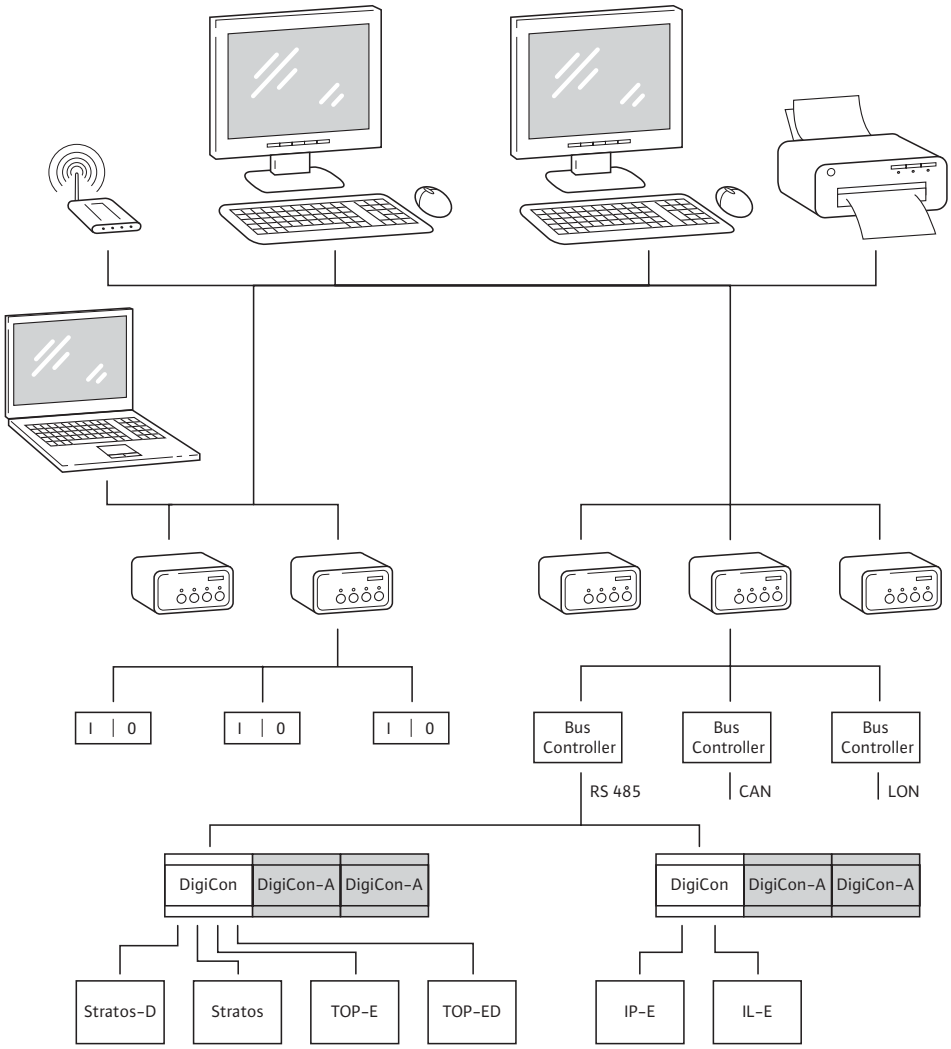
A temporary disruption of the interface connection to electronically controlled pumps with IR interface is possible with the IR-Monitor. The operation can then be controlled with the IR-Monitor. Interface communication is automatically restored after the IR connection is disconnected.

Accessories

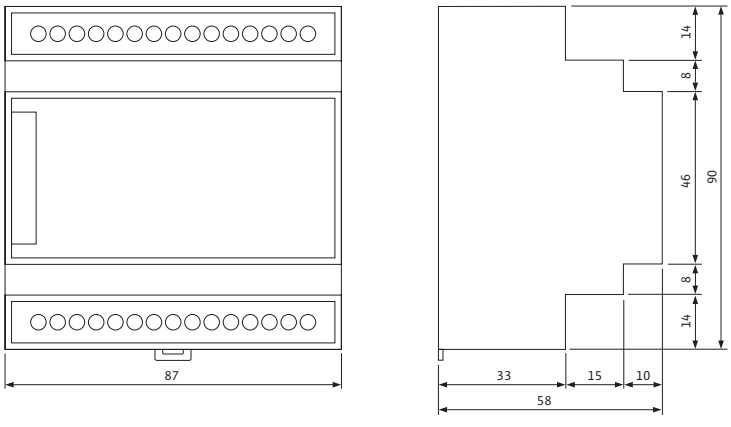
Manual operation level Wilo-Control DigiCon-A for a maximum of 2 pumps

Wilo-Control DigiCon-A

Wilo-Control DigiCon-A



Dimension drawing



Wilo-Control DigiCon-A

Wilo-Control DigiCon-A
The Wilo-Control DigiCon-A manual operation level allows priority control of pumps connected to the Wilo-Control DigiCon interface converter.
The manual operation level is installed on a top-hat rail (DIN EN 50 022-35) and is contacted via a lateral plug system using the Wilo-Control DigiCon interface converter. 2 manual operation levels for the superimposed control of a maximum of 4 single or twin-head pumps can be connected to a Wilo-Control DigiCon.
The Wilo-Control DigiCon-A manual operation level enables priority remote control via potential-free control contacts and an analogue signal for simultaneous bus communications of:
- Pump Off
- Pump in control mode ON
- Maximum speed
- Minimum speed (setback mode)
- Setpoint for differential pressure or speed (control input Analogue In 0 – 10 V)

The manual operation level Wilo-Control DigiCon-A enables remote querying via potential-free signalling contacts for simultaneous bus communications of:
- Collective fault signal
- Individual run signal MA or individual pump
- Individual run signal SL (twin-head pump only)

In addition to remote control and remote querying, the Wilo-Control DigiCon-A manual operation level also makes it possible to have
- Enablement of the control input Analogue In 0 – 10 V

The Wilo-Control DigiCon-A manual operation level is equipped with LEDs for:
- Operational state DigiCon-A
- Collective fault signal (for each pump)
- Individual run signal MA or individual pump (for each pump)
- Individual run signal SL (twin-head pump only) (for each pump)

Technical Data
- Contact load
- Collective fault signal (potential-free changeover contact): maximum 250 VAC, 1 A
- Individual run signal MA (potential-free NO contact) maximum 250 VAC, 1 A
- Individual run signal SL (potential-free NO contact) maximum 250 VAC, 1 A
- Potential-free NO contact for function “Pump Off”: 24 VDC, 2.4 mA
- Potential-free NO contact for function “Control mode On”: 24 VDC, 2.4 mA
- Potential-free NO contact for function “Maximum speed”: 24 VDC, 2.4 mA
- Potential-free NO contact for function “Minimum speed”: 24 VDC, 2.4 mA

- Supply voltage
- Operating voltage: The manual operation level DigiCon-A is provided with current by the lateral DigiCon plug system.
- Current consumption: 40 mA

- Electromagnetic compatibility
- Emitted interference: DIN EN 61000-6-3
- Immunity to interference: DIN EN 61000-6-2

- Control input Analogue In 0 – 10 V
- Input resistance: >200 kΩ
- Input protection: maximum + / - 48 VDC

- Interface PLR
- 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: 200 m

Manual operation of the pump by means of the red knob 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. The operation can then be controlled with the IR-Monitor. Interface communication is automatically restored after the IR connection is disconnected.

Pumpen Intelligenz.

Worldwide the name Wilo is synonymous with the tradition of first class German engineering. Our pumps and pump systems for heating, air conditioning, cooling, water supply and sewage are used in all areas of public life: in commercial buildings, communal facilities, industry as well as in private homes. In close cooperation with our customers, we have over the decades further developed our know-how from pumps and beyond to system competence. This know-how is the basis for solutions which are geared towards meeting the special needs of our customers: that is what we call Pumpen Intelligenz.

WILO

Pumpen Intelligenz.

WILO

Pumpen Intelligenz.

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