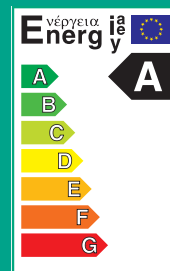


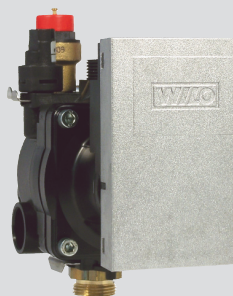
Catalogue

# OEM High Efficiency Circulation Pumps

Glandless Pumps  
and Accessories



**ErP  
READY  
2015** APPLIES TO  
EUROPEAN  
DIRECTIVE  
FOR ENERGY  
RELATED  
PRODUCTS



Version 11.01

# General notes

## Abbreviations and Introduction

| Abbreviation                     | Meaning  |
|----------------------------------|--|
| 1~                               | 1-phase current  |
| $\Delta p$                       | Differential pressure  |
| $\Delta p-c$                     | Control mode for constant differential pressure  |
| $\Delta p-v$                     | Control mode for variable differential pressure  |
| EM                               | Single-phase motor, 1~   |
| EnEV                             | German Energy Conservation Legislation   |
| ErP                              | Stands for energy-related products. ErP Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products. Formerly the "Ecodesign Directive" of Energy using Products (EuP Directive 2005/32/EC) . |
| ECM technology                   | Electronically commutated motor with new wet rotor encapsulation, newly developed glandless drive concept for high-efficiency pumps  |
| °dH                              | Degree of German water hardness; replaced by the SI unit mmol/l; conversion 1 °dH = 0.1783 mmol/l  |
| H                                | Delivery head  |
| Cataphoretic coating             | Cataphoretic coating (electrophoretically deposited paint, EDP): paintwork with high adhesive strength for long-lasting corrosion protection   |
| P <sub>1</sub>                   | Power consumption (power supplied from the network)  |
| P <sub>2</sub> (P <sub>N</sub> ) | Nominal motor power  |
| PN                               | Pressure class in bar (e.g. PN10 = suitable up to 10 bar)  |
| PWM                              | Pulse-width modulation. PWM signal for external activation of functions  |
| Q (=V̇)                          | Volume flow  |
| SBM                              | Run signal or collective run signal  |
| SSM                              | Fault signal or collective fault signal  |
| Control input, 0 - 10 V          | Analogue input for external control  |
| TrinkwV 2001                     | German Drinking Water Ordinance of 2001 (valid from 01.01.2003)  |
| VDI 2035                         | VDI guideline for preventing damage in hot-water heating installations   |

### Introduction

As the first high-efficiency pump in the world, the Wilo-Stratos defined energy efficiency class A for stand-alone circulators, thereby setting a new standard. Wilo extended this product technology towards new pump ranges especially for requirements of the OEM industry. The product ranges Wilo-Stratos PICO OEM, Wilo Stratos TEC, Wilo-Stratos PARA are the new generations of high-efficiency pumps especially designed in line with the demands of OEM industry regarding hydraulic performance, scope of functionality, space restrictions and costs. The scope of all pump ranges is precisely tailored to meet the individual requirements of the market and customers and have the following advantages:

- Concentrating on the essentials
- Energy efficiency class A
- Maximum efficiency thanks to ECM technology
- Up to 80% energy savings compared with uncontrolled circulators
- Meet all the new requirements of the ErP directive (2009/125/EC)
- For heating, solar, geothermal energy systems and cooling
- Intelligent design
- Optimal performance in the smallest space
- High starting torque for reliable starting
- Prevention of flow noise
- Quick and safe installation thanks to a standard delivery with cable or plug for an easy electrical connection
- Simple operation and convenient setting of the pump via external control signals or the Red Button technology
- Cast iron pump housing with cataphoretic (KTL) coating for the prevention of corrosion from condensation formation
- Large range of composite housings for heating applications

### Energy efficiency class

In the context of the Kyoto Agreement, European governments in particular are pursuing the goal of drastically reducing CO<sub>2</sub> emissions. Energy labelling, particularly for high-consumption household devices such as washing machines and refrigerators, is prescribed as an important control element for providing the end consumer with an aid for making decisions in favour of energy-saving appliances. Due to the fact that heating circulation pumps are among the biggest individual electricity consumers in household use because of their long running times, leading European heating pump manufacturers have voluntarily declared in 2005 their intention of henceforth attaching energy labels to their stand alone heating pumps. This makes it possible for users and end consumers to recognise, on the basis of an already familiar classification system, whether a heating circulation pump in use is particularly energy-efficient. The classification of the energy efficiency of heating pumps is carried out by means of a technical measuring procedure which is described in the Europump "Industry Commitment – To improve the energy performance of stand-alone circulators" from January 2005.

The label used for stand alone circulating pumps is comparable to the one used for household appliances, A is the best possible and G is the worst possible of the energy classes. A comparison of hydraulically similar pumps with different energy classifications reveals that there is a difference of approximately 22% in terms of energy consumption between two sequentially numbered energy classes. Accordingly, an energy class A pump requires on average only around 33% of the electrical energy consumed by a class D pump. Wilo-Stratos PICO OEM, Wilo-Stratos TEC and Wilo-Stratos PARA use the same highly efficient motor technology with energy efficiency class "A". The pumps equipped with a red button (Stand alone Circulators) which allows to adjust a >p-v curve are allowed to be labelled with the energy label A.

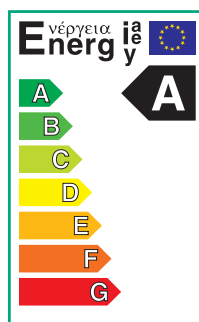


Fig.: Energy label for heating circulation pumps, Example: Energy class A

### Energy saving potential in the European Union for 2030

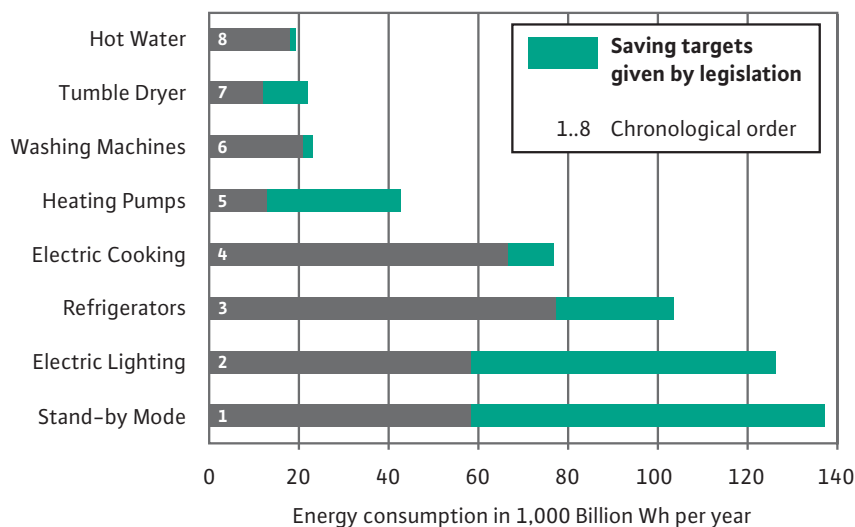


Fig.: Energy saving potentials EU

# General notes

## Energy-related Products (ErP) Directive

### Energy-related Products (ErP) Directive (2009/125/EC Directive)

Following the Kyoto Protocol from Dec 1997, the European Commission has set up measures to achieve a 20% reduction on both energy consumption and CO<sub>2</sub>-emission until 2020, based on the data from 1990. One of these measures is the ErP Directive. Conformity with the derived EU regulations will be governed through mandatory CE Marking.

In Nov 2009 the original "Eco-design Directive" of Energy using Products (EuP, 2005/32/EC Directive) has been modified and became the Energy related Product (ErP) Directive. It now covers also measures on products as windows.

The earlier defined Commission Regulation (EC) No 641/2009 on circulators with a rated power output between 1 W and 2500 W stays unchanged and is based on these Directives.

It will come into effect in two main steps: From **1 January 2013**, regardless **stand-alone circulators**, with the exception of those specifically designed for primary circuits of thermal solar systems and of heat pumps, shall have an energy efficiency index (EEI) of not more than 0.27. From **1 August 2015**, stand-alone circulators and **circulators integrated in products** shall have an energy efficiency index (EEI) of not more than 0.23. Products means an appliance that generates and/or transfers heat. Examples can be

- Hydronic heating and secondary cooling circuits
- Boilers
- Heat pumps
- Combined heat and power stations
- Solar thermal systems
- District heating house stations
- Assembly kits for radiator or under floor heating systems
- Secondary hydronic cooling distribution and heat recovery circuits
- DHW system boiler

From **1 January 2020**, as well all replacement circulators for identical circulators integrated in products before August 2015 shall have an energy efficiency index (EEI) of not more than 0.23

After these dates Wilo is not allowed any more to bring circulators not fulfilling these EEI values into the market.

The prEN 16297-1 ... -3 describes how to measure the EEI. The measurement procedure for integrated circulators takes into account various integrated functions available in the many customized hydraulic solutions.

**Circulators NOT affected by new legislation** 'Drinking water circulators', except with regard to information requirements of Annex I, point 2(4). 'Drinking water circulator' means a circulator specifically designed to be used in the recirculation of drinking water as defined in Council Directive 98/83/EC.

**Wilo high efficiency circulator pumps of the Stratos range already meet all the new requirements of the ErP Directive even for 2015.**

### Electronic performance control

Heating pumps are, due to their high annual operating hours, among the largest power-consuming appliances in buildings.

After the compressor in heat pumps and in other systems of OEM applications, the circulation pump is the biggest consumer of electrical power and is therefore the major efficiency factor for the entire application.

Automatic pump performance control helps drastically to reduce power consumption in heating pumps. Compared to standard pumps, high-efficiency pumps can even save up to 80% electricity costs.

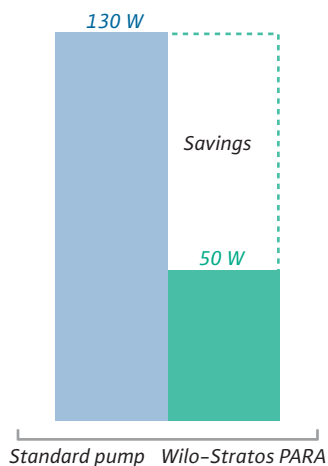
All operating states, in particular in the partial load range that is typical for heating systems, can be optimised hydraulically by means of automatic pump performance control.

A further significant effect connected with the prevention of a rise in pump pressure is the avoidance of flow noise in thermostatic valves.



### High-efficiency pumps

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



### ECM technology

The new ECM technology is the basis for the outstanding efficiency of the Wilo-Stratos OEM series PICO OEM/TEC/PARA.

It includes:

#### EC motor

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

### Comparison of the motor components for comparable pump hydraulics



Wilo-TOP-S with AC motor



Wilo-Stratos PARA with EC motor

This has the following benefits:

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

### Wet rotor encapsulation

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

- due to the size of the necessary gap between stator and rotor,
  - and due to the magnetic resistance of the selected can material.
- The improvement in terms of efficiency of the Wilo-Stratos pump here is the result of:
- Reduction of the air gap and
  - Application of an innovative can material with smaller losses to the magnetic flux between stator and rotor.

### Motor protection

The standard integrated protection device reliably protects the Wilo-Stratos PICO OEM, Wilo-Stratos TEC and Wilo-Stratos PARA, in all settings, against excess temperature, low/excess voltage, excess current, blocking as well as dry running.

This has the following advantage:

No external motor protection switch is required. The connecting instructions of the local electricity supply companies are to be observed.

### Minimum intake pressure for the prevention of cavitation

To prevent cavitation (vapour bubble formation within the pump), it is necessary to maintain a sufficiently high over pressure (suction head) at the pump suction port in relation to the vapour pressure of the fluid being pumped.

The minimum suction heads are listed in the respective tables for all glandless pumps.

For higher altitudes than 300 m above sea level: add 0,1 m head/100 m height increase.

These minimum heads must be respectively increased when handling fluids of higher temperatures or lower densities, higher resistances at the circulator suction side and in regions of lower atmospheric pressures.

### Pump curves

All pump curves included in the catalogue apply to the pumping of water (kinematic viscosity = 1 mm<sup>2</sup>/s). If fluids of different density and/or viscosity are pumped (e.g. water-glycol mixtures), the hydraulic values of the pump and the pipe system will deviate. It is recommended that the data is only measured after a minimum of 24h running-in.

### Minimum volume flow

Larger pumps require a minimum flow rate to ensure trouble-free operation. Operating against a closed slide valve, volume flow  $Q = 0 \text{ m}^3/\text{h}$ , can lead to overheating inside the pump.

# General notes

## High-efficiency pumps

### Standards/directives

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

### Quality and safety mark



For pump types:

Wilo-Stratos PICO OEM  
Wilo-Stratos TEC  
Wilo-Stratos PARA

### Notes on installation and operation

#### Installation

##### Installation inside a building

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

##### Installation outside a building (outdoor installation)

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

- Wilo-Stratos PICO OEM
- Wilo-Stratos TEC
- Wilo-Stratos PARA

The following conditions must be complied with:

- Installation of the pump in a sump (e.g. light sump, ring sump) with cover or in a cabinet/housing for protection against the weather
- Avoidance of direct sunlight on the pump
- Protection of the pump against rain. Dripping water from above is allowed as long as the pump is installed in an appropriate installation position.
- In order to ensure that waste heat is dissipated, the motor and the electronics must be ventilated at all times.
- The minimum ambient temperature may neither fall below the freezing point of the medium nor be lower than  $-20^{\circ}\text{C}$ .
- Fluid and ambient temperatures may not exceed or fall below the admissible values.

#### Condensation water

All standard pumps for cold water applications down to  $-10^{\circ}\text{C}$  (Stratos PICO OEM/TEC not for temperatures  $< 0^{\circ}\text{C}$ ) are fully condensation-proof. The grey cast iron pump housing of the following series

- Wilo-Stratos PICO OEM
- Wilo-Stratos TEC
- Wilo-Stratos PARA

is equipped with a special coating (cataphoretic coating) for a subsequent surface finishing.

The benefits of this coating are:

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

### Intermittent operation

The series

- Wilo-Stratos PICO OEM
  - Wilo-Stratos TEC
  - Wilo-Stratos PARA
- can also be used for intermittent (ON/OFF) operation.

The maximum admissible number of switchings during the service life of the pump is 300000 times (80000 operating hours) at a minimum time period of 5 s between two switchings.

### Connections

#### Screw-end pumps

Screw-end pumps are equipped with connecting threads in accordance with DIN EN ISO 228, Part 1. Seals are on request in the scope of delivery.

Wilo recommends the use of flat gaskets type EPDM 70 shores for cast iron, bronze or composite pump housings.

#### Electrical connection

- All Wilo pumps are made for a voltage of 230 V (tolerance  $+10\%/-15\%$ ).
- All Wilo pumps made after 1 January 1995 have been labelled with the CE marking in accordance with relevant EU Directives.
- When pumps are used in systems with fluid temperatures above  $90^{\circ}\text{C}$ , a suitably heat-resistant connecting pipe must be used.

### Service life, wear and tear

The pumps and their components for OEM applications described hereafter are designed for 60000 operating hours for the Stratos PICO OEM and Stratos TEC/6 series and 80000 operating hours for Stratos TEC/7 and Stratos PARA pumps.

Pumps or parts of pumps are subject to wear in accordance with state-of-the-art technology (DIN 31051/DIN-EN 13306). This wear may vary depending on operating parameters (temperature, pressure, speed, water conditions) and the installation/usage situation and may result in the malfunction or failure at different times of the aforementioned products/components, including their electrical/electronic circuitry.

Wearing parts are all components subject to rotary or dynamic stress, including electronic components under tension, in particular:

- Seals (including mechanical seals), seal rings
- Bearings and shafts
- Impellers and pump components
- Relays
- Electronic circuits, semiconductor components, etc.

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

### Pump replacement

No spare parts are available for OEM pumps.

In the event of damage, the complete pump needs to be replaced.

### Wilo – General Terms of Delivery and Service

The latest version of our General Terms of Delivery and Service can be found on the Internet at

[www.wilo.com/agb](http://www.wilo.com/agb)

### Wilo-Stratos PARA/-Z



The Wilo-Stratos PARA is a Wilo high-efficiency pump series in glandless construction which can be used both for heating circuits and for cooling circuits in all OEM applications and it offers the following advantages:

#### Special features/product benefits

- Energy efficiency class A
- Maximum efficiency thanks to ECM technology
- Up to 80% electricity savings compared to old uncontrolled heating pumps
- High starting torque for reliable start-up
- Can be used in hot water heating systems of all kinds, geothermal and solar thermal systems, closed cooling circuits, industrial circulation systems in the temperature range of  $-10\text{ °C}$  to  $+95\text{ °C}$  ( $+110\text{ °C}$ )
- Prevention of flow noise
- Reliability and comfort during installation and operation
- Functions adapted specially to the demands of the OEM market and space-saving design.
- Optimum performance also in tight installation situations.
- Delivery as standard with a cable for an easy electrical connection
- Convenient setting of the pump via external control signals or the Red-Button technology
- Cathodically coated (KTL) cast iron pump housing to prevent corrosion when condensation occurs

#### Heating application

The Wilo-Stratos PARA pumps are specially designed for the use in higher ambient temperatures which may occur in OEM systems in heating applications due their space-reduced construction.

#### Thermal insulation for heating

To avoid heat losses via the pump housing, the single pump series Wilo-Stratos PARA / Stratos PARA-Z come optionally with a thermal insulation shell. The PP material used, foamed polypropylene, has the following properties:

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

#### Cooling application

Condensation takes place on cold surfaces if the fluid temperature is lower than the ambient air temperature. The Wilo-Stratos PARA can also be used in such conditions. They are constructed in a way that damage to electrical parts caused by condensation water is prevented.

#### Thermal insulation for cooling

If the Wilo-Stratos PARA pumps are used at low temperatures in geo-thermal or cooling applications, the insulation must not cover the drain labyrinth between the pump housing/motor. Only then can any condensate having possibly accumulated in the motor drain off freely through the condensate drain openings in the motor housing.

The diffusion-proof Wilo-ClimaForm insulation available as accessory for the Wilo-Stratos PARA series for the purpose of insulating pump housings in cold water applications ensures this automatically due to its specific design.

Wilo-ClimaForm:

- Water vapour diffusion resistance  $> 7000$
- Normally flammable, according to DIN 4102-B2
- Part 1 quality-monitored as per DIN 18200

#### Corrosion-proof pump design

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

#### Sanitary hot water application

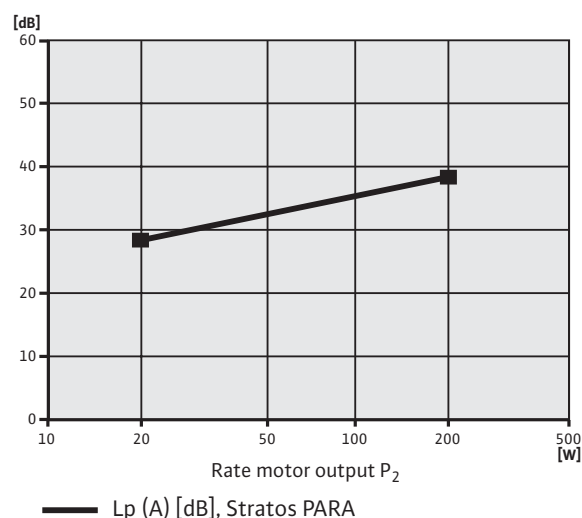
##### (Wilo-Stratos PARA-Z)

Pumps which are utilised in sanitary hot water circulation systems are subject to specific requirements that are fulfilled by the Wilo-Stratos PARA-Z series:

- Fluids are potable water and water for food companies according to TrinkwV 2001. Possible deposits of lime were considered in the design so that a total carbonate hardness of  $20\text{ °d}$  at a max. fluid temperature of  $+80\text{ °C}$  is permitted.
- All plastic parts that come into contact with the pumped liquid comply with KTW recommendations.

#### Sound pressure level

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





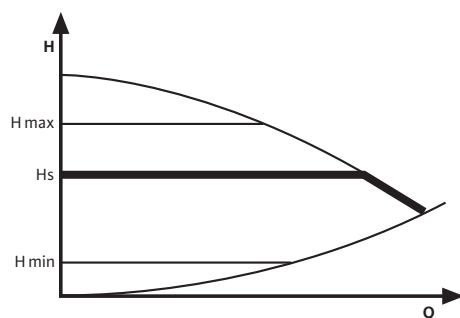
### Wilo-Stratos PARA/-Z

#### Electronic performance control

##### Available control modes

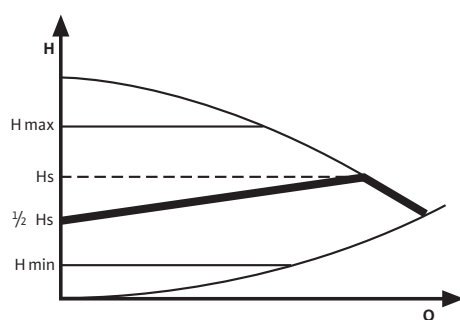
##### Control mode $\Delta p$ -c:

In the  $\Delta p$ -c control mode, the electronic module keeps the differential pressure generated by the pump constant at the set differential pressure setpoint  $H_s$  over the permissible volume flow range.



##### Control mode $\Delta p$ -v:

In the  $\Delta p$ -v control mode, the electronic module changes the differential pressure setpoint to be maintained by the pump in linear fashion between  $H_s$  and  $\frac{1}{2} H_s$ . The differential pressure setpoint value  $H$  varies with the volume flow  $Q$ .



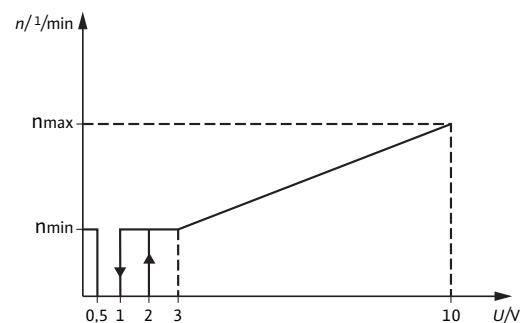
#### External control functions: ext. in

##### Control input "0-10 V" (Analogue In)

The actual/setpoint level assessment required for control is referred to a remote controller. The remote controller sends an analogue signal (0 – 10 V) as an actuating variable to the Wilo-Stratos PARA.

##### Analogue In 0-10V

##### with cable break detection



0.5 V < U < 1 V: Pump stops

1 V < U < 3 V: Pump runs at minimum speed (operation)

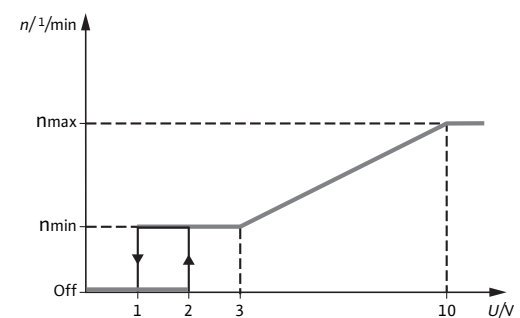
2 V < U < 3 V: Pump runs at minimum speed (start-up)

3 V < U < 10 V: Speed varies between  $n_{min}$  and  $n_{max}$  (linear)

U < 0.5 V: Cable break detection, the pump runs at minimum speed (emergency operation)

##### Analogue In 0-10V

##### without cable break detection



U < 1 V: Pump stops

1 V < U < 3 V: Pump runs at minimum speed (operation)

2 V < U < 3 V: Pump runs at minimum speed (start-up)

3 V < U < 10 V: Speed varies between  $n_{min}$  and  $n_{max}$  (linear)

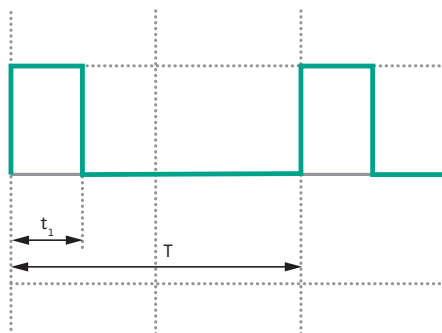


### Wilo-Stratos PARA/-Z

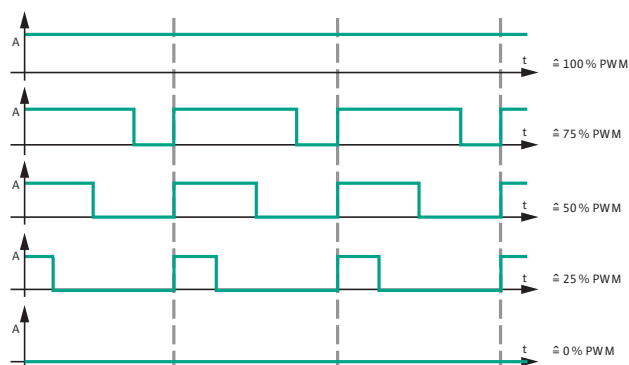
#### External control via a PWM signal

The actual/setpoint level assessment required for control is referred to a remote controller. The remote controller sends a PWM signal as an actuating variable to the Wilo-Stratos PARA.

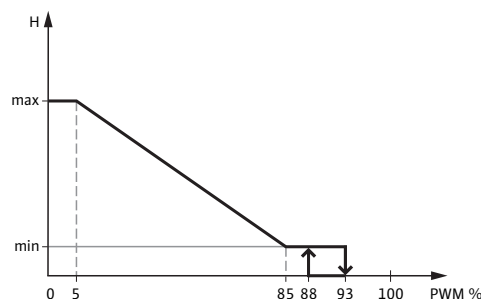
The PWM signal generator gives a periodic order of pulses to the pump (the duty cycle), according to DIN IEC 60469-1. The actuating variable is determined by the ratio between pulse duration and the pulse period. The duty cycle is defined as a ratio without dimension, with a value of 0 ... 1 % or 0 ... 100 %. This is explained in the following with ideal pulses which form a rectangular wave.



$$t_1 / T = 0,25 = 25\%$$



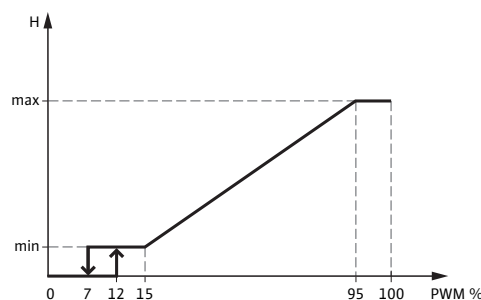
#### PWM signal logic 1 (heating):



##### PWM Input signal [%]

- <5 Pump runs at maximum speed
- 5–85 Pump speed decreases linearly from maximum to minimum
- 85–93 Pump runs at minimum speed (operation)
- 85–88 Pump runs at minimum speed (start-up)
- 93–100 Pump stops (Standby)

#### PWM signal logic 2 (solar):



##### PWM Input signal [%]

- 0–7 Pump stops (Standby)
- 7–15 Pump runs at minimum speed (operation)
- 12–15 Pump runs at minimum speed (start-up)
- 15–95 Pump speed decreases linearly from maximum to minimum
- >95 Pump runs at maximum speed

Signal frequency: 100 Hz–5000 Hz (1000 Hz nominal)

Signal amplitude: 5V–15V (min. power 5mA)

Signal polarity: both

# Planning guide

## High-efficiency pumps

### Wilo-Stratos PARA/-Z

#### Manual control panel

##### Control button

The control mode and the differential pressure setpoint at  $\Delta p$ -c for constant differential pressure and at  $\Delta p$ -v for variable differential pressure can be set with the control button. The important basic functions can be set easily and safely, directly at the pump.

Depending on customer wishes, a pre-setting of the control mode/setpoint can be done at the factory.



Local setting of the constant differential pressure setpoint at  $\Delta p$ -c at the pump



Local setting of the variable differential pressure setpoint at  $\Delta p$ -v at the pump



Power adjustment with a remote controller via a 0-10 V signal

#### Electrical connection

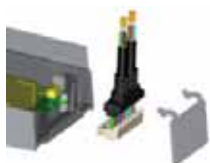
To ensure a safe and easy electrical connection, the Wilo-Stratos PARA pumps are equipped with a mains cable or, depending on the available functions, with a mains and control cable as standard.



The cable is firmly connected to the pump with a Wilo plug for Stratos PARA/-Z... 1-8; 1-11; 1-12.



Inseparable cable connection with Wilo-Stratos PARA.../ 1-5; 1-7; 1-11,5:



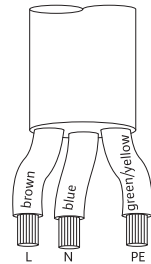
The cable plug is directly fixed at the electronic board.

#### Mains connection

##### 3-core cable

For mains power supply 1~230 V/50 Hz

black/brown: L1, 1~230V/50Hz  
blue: Neutral N  
yellow/green: Earth conductor

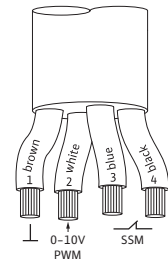


#### Control cables

##### 4-core cable

For connecting the analogue interfaces 0-10V or PWM as well as for assigning the collective fault and run signal contacts.

Core no. 1 (brown): 0-10 V, GND or PWM, GND  
Core no. 2 (white): 0-10 V or PWM signal  
Core no. 3 (blue): SSM contact (NC contact) or SBM contact (NO contact)  
Core no. 4 (black): SSM contact (NC contact) or SBM contact (NO contact)

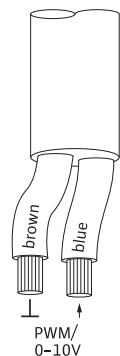


#### Control cables

##### 2-core cable

For connecting the analogue interfaces 0-10V or PWM

Core no. 1 (brown): PWM signal, 0-10 V or GND  
Core no. 2 (white): GND or PWM signal, 0-10 V

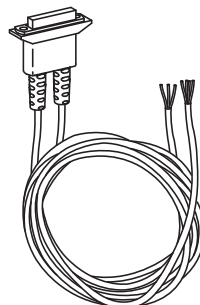


### Wilo-Stratos PARA/-Z

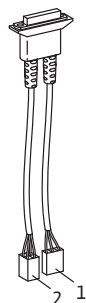
#### Available cable versions

| Pump type                      |  |  |
|--------------------------------|--|--|
|                                | Stratos PARA /1-5<br>Stratos PARA /1-7<br>Stratos PARA /1-11,5 | Stratos PARA /1-8<br>Stratos PARA /1-11<br>Stratos PARA /1-12<br>Stratos PARA Z /1-8<br>Stratos PARA Z /1-11<br>Stratos PARA Z /1-12 |
| Mains cable                    |  |  |
| Standard                       | - 1.5 m with end splices                                       | - 1.5 m with end splices   |
| Optional                       | - 2.2 m cable with end splices                                 | - 2.2 m cable with end splices   |
|                                | - 3.2 m cable with end splices                                 | - 3.2 m cable with end splices   |
|                                | - 0.1 m with Wilo OEM plug                                     | - 0.1 m with Wilo OEM plug   |
|                                | - According to customer specification                          | - According to customer specification  |
| Mains and 2-core control cable |  |  |
| Standard                       | - 1.5 m with end splices                                       | -  |
| Optional                       | - According to customer specification                          | - According to customer specification  |
| Mains and 4-core control cable |  |  |
| Standard                       | - 1.5 m with end splices                                       | - 1.5 m with end splices   |
| Optional                       | - 2.2 m cable with end splices                                 | - 2.2 m cable with end splices   |
|                                | - 3.2 m cable with end splices                                 | - 3.2 m cable with end splices   |
|                                | - 0.2 m with Wilo OEM-plug                                     | - 0.2 m with Wilo OEM-plug   |
|                                | - According to customer specification                          | - According to customer specification  |

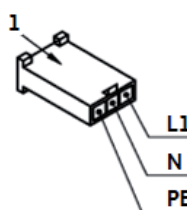
#### Standard mains and control cable with end splices



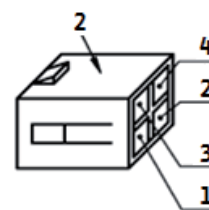
#### Mains and control cable with Wilo OEM plug



Pos. 1: Mains plug with female connector  
Pos. 2: 4-pole control plug with pins



Assignment:  
L1: brown  
N: blue  
PE: yellow/green



Assignment:  
1: blue  
2: white  
3: black  
4: brown

#### Collective fault signal, SSM

A collective fault signal is available as potential-free contact, designed as NC contact in accordance with VDI 3814.

Contact load:

- Permitted minimum: 12 V DC, 10 mA,
- Permitted maximum: 250 V AC, 1 A.

The contact is closed under the following conditions:

- The pump is without current
- There is no fault
- Total failure of the control module

The contact is open under the following conditions:

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

# Planning guide

## High-efficiency pumps

### Possible combination of functions and equipment

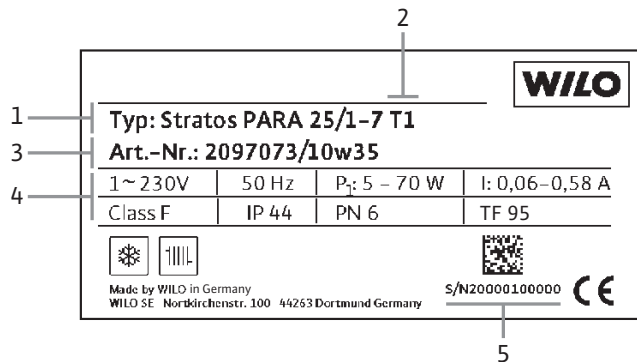
|  | Type no. of equipment/function combination |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |
|--|--|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|  | T1   | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 | T13 | T14 | T15 | T16 | T17 | T18 | T19 | T20 |
| <b>Operating modes</b>   |  |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |
| Control mode (n=constant)  | •  | •  | –  | •  | •  | √  | √  | √  | √  | √   | √   | √   | √   | √   | √   | •   | •   | √   | √   | √   |
| Δp-c for constant differential pressure  | •  | •  | •  | •  | •  | –  | –  | –  | –  | –   | –   | –   | –   | –   | –   | •   | •   | –   | –   | –   |
| Δp-v for variable differential pressure  | •  | •  | •  | •  | •  | –  | –  | –  | –  | –   | –   | –   | –   | –   | –   | •   | •   | –   | –   | –   |
| <b>External control functions</b>  |  |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |
| Control input "Analogue In 0 ... 10 V" with cable break function (remote speed adjustment)       | •  | –  | –  | •  | –  | √  | √  | –  | –  | –   | –   | –   | –   | –   | –   | •   | –   | √   | –   | –   |
| Control input "Analogue In 0 ... 10 V" without cable break function (remote setpoint adjustment) | –  | •  | –  | –  | •  | –  | –  | √  | √  | –   | –   | –   | –   | –   | –   | –   | •   | –   | √   | –   |
| Control input PWM 1  | –  | –  | –  | –  | –  | –  | –  | –  | –  | √   | –   | √   | –   | √   | –   | –   | –   | –   | –   | √   |
| Control input PWM 2  | –  | –  | –  | –  | –  | –  | –  | –  | –  | –   | √   | –   | √   | –   | √   | –   | –   | –   | –   | –   |
| <b>Signal and display functions</b>  |  |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |
| Collective fault signal (potential-free NC contact)  | •  | •  | –  | –  | –  | √  | –  | √  | –  | –   | –   | √   | √   | –   | –   | –   | –   | –   | –   | –   |
| Individual run signal (potential-free NO contact)  | –  | –  | –  | •  | •  | –  | √  | –  | √  | –   | –   | –   | –   | √   | √   | –   | –   | –   | –   | –   |
| <b>Equipment/scope of delivery</b>   |  |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |
| Red button   | •  | •  | •  | •  | •  | –  | –  | –  | –  | –   | –   | –   | –   | –   | –   | •   | •   | –   | –   | –   |
| Including power cable  | •  | •  | •  | •  | •  | √  | √  | √  | √  | √   | √   | √   | √   | √   | √   | •   | •   | √   | √   | √   |
| 4-wire cable for 0–10 V/ PWM and SSM/SBM   | •  | •  | –  | •  | •  | √  | √  | √  | √  | –   | –   | √   | √   | √   | √   | –   | –   | –   | –   | –   |
| 2-wire cable for PWM/ 0–10 V   | –  | –  | –  | –  | –  | –  | –  | –  | –  | √   | √   | –   | –   | –   | –   | •   | •   | √   | √   | –   |

• = available for all pump types

√ = available for Wilo-Stratos PARA ...1–5, ...1–7, ...1–11,5

### Wilo-Stratos PARA/-Z

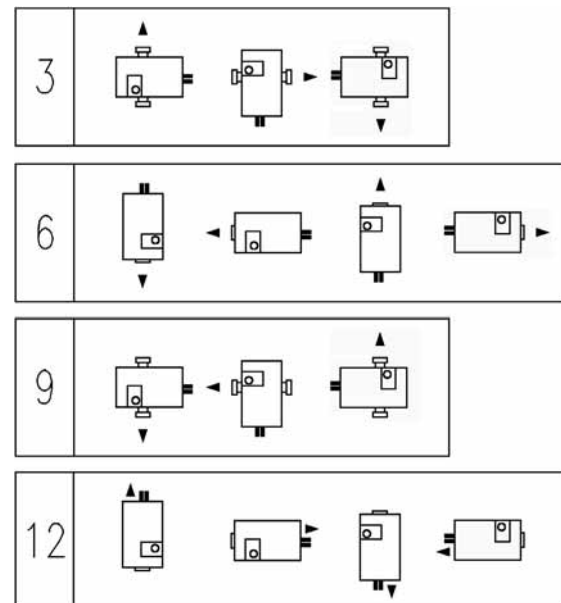
#### Designation, name plate of the Wilo-Stratos PARA/-Z series



- 1 Pump type
- 2 Type no. of equipment/functions combination
- 3 Article numbers/production date (year/week)
- 4 Voltage/frequency/power consumption/electricity/insulation class/protection class IP/operating pressure PN/max. fluid temperature
- 5 Code and serial number

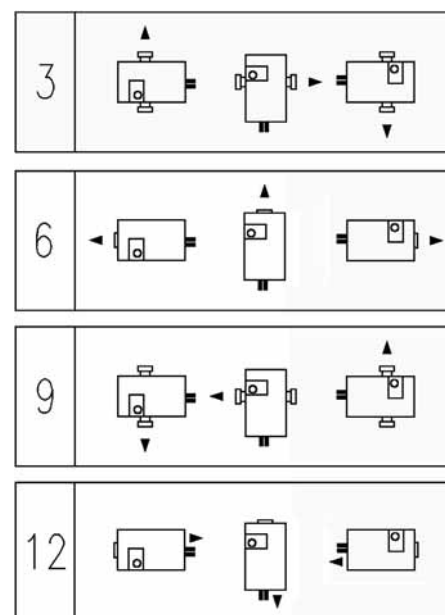
#### Permitted installation positions

##### Wilo-Stratos PARA 1-5/1-7/1-11,5



3, 6, 9 and 12 o'clock are the module positions for the indicated direction of flow at the pump housing.

##### Wilo-Stratos PARA/-Z 1-8/1-11/1-12



3, 6, 9 and 12 o'clock are the module positions for the indicated direction of flow at the pump housing.

## Heating and cooling



### Equipment/function

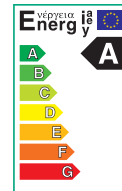
|  | Wilo-Stratos PARA...                                  |   |   |  |  |
|--|---|---|---|--|--|
|  | 15/1-5<br>20/1-5<br>25/1-5<br>30/1-5                  | 15/1-7<br>20/1-7<br>25/1-7<br>30/1-7                  | 25/1-8<br>30/1-8                                      | 25/1-11<br>30/1-11                                     | 25/1-12<br>30/1-12                                     |
| <b>Operating modes</b>   |   |   |   |  |  |
| Control mode (n=constant)  | via Analog In<br>0-10 V or PWM                        | via Analog In<br>0-10 V or PWM                        | via Analog In<br>0-10 V                               | via Analog In<br>0-10 V                                | via Analog In<br>0-10 V                                |
| $\Delta p$ -c for constant differential pressure   | (H <sub>min.</sub> = 1 m,<br>H <sub>max.</sub> = 5 m) | (H <sub>min.</sub> = 1 m,<br>H <sub>max.</sub> = 7 m) | (H <sub>min.</sub> = 1 m,<br>H <sub>max.</sub> = 7 m) | (H <sub>min.</sub> = 2 m,<br>H <sub>max.</sub> = 10 m) | (H <sub>min.</sub> = 2 m,<br>H <sub>max.</sub> = 11 m) |
| $\Delta p$ -v for variable differential pressure   | (H <sub>min.</sub> = 1 m,<br>H <sub>max.</sub> = 5 m) | (H <sub>min.</sub> = 2 m,<br>H <sub>max.</sub> = 6 m) | (H <sub>min.</sub> = 2 m,<br>H <sub>max.</sub> = 7 m) | (H <sub>min.</sub> = 4 m,<br>H <sub>max.</sub> = 10 m) | (H <sub>min.</sub> = 4 m,<br>H <sub>max.</sub> = 10 m) |
| <b>Manual functions</b>  |   |   |   |  |  |
| Operating mode setting   | •   | •   | •   | •  | •  |
| Differential-pressure setpoint setting   | •   | •   | •   | •  | •  |
| <b>Automatic functions</b>   |   |   |   |  |  |
| Infinitely variable power adjustment depending on the operating mode                             | •   | •   | •   | •  | •  |
| Deblocking function  | •   | •   | •   | •  | •  |
| Soft start   | •   | •   | •   | •  | •  |
| Full motor protection with integrated trip electronics   | •   | •   | •   | •  | •  |
| Air venting routine  | –   | –   | –   | –  | –  |
| <b>External control functions</b>  |   |   |   |  |  |
| Control input "Analogue In 0 ... 10 V" with cable break function (remote speed adjustment)       | on request*   | on request*   | on request*   | on request*  | on request*  |
| Control input "Analogue In 0 ... 10 V" without cable break function (remote setpoint adjustment) | on request  | on request  | on request  | on request   | on request   |
| Control input PWM  | on request  | on request  | –   | –  | –  |
| <b>Signal and display functions</b>  |   |   |   |  |  |
| Collective fault signal (potential-free NC contact)  | •   | •   | •   | •  | •  |
| Individual run signal (potential-free NO contact)  | on request  | on request  | –   | –  | on request   |
| <b>Equipment/scope of delivery</b>   |   |   |   |  |  |
| Red button   | •   | •   | •   | •  | •  |
| Version without red button (=external control)   | •   | •   | –   | –  | –  |
| Wrench attachment point on pump body   | •   | •   | •   | •  | •  |
| Including power cable  | •   | •   | •   | •  | •  |
| Including power plug   | –   | –   | –   | –  | –  |
| Including control cable  | on request  | on request  | on request  | on request   | on request   |
| Including seals for threaded connection (loose)  | on request  | on request  | on request  | on request   | on request   |
| Including installation and operating instructions  | on request  | on request  | on request  | on request   | on request   |
| Including thermal insulation   | on request  | on request  | on request  | on request   | on request   |
| Incl. KlimaForm for cooling  | on request  | on request  | on request  | on request   | on request   |
| Individual packaging   | •   | •   | •   | •  | •  |
| Collective packaging   | on request 196<br>pumps/box                           | on request 196<br>pumps/box                           | on request 108<br>pumps/box                           | on request 108<br>pumps/box                            | on request 72<br>pumps/box                             |

• = available, – = not available

\* see table "Possible combinations of functions and equipment"



### Series description Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5



#### Design

Glandless circulation pump with threaded connection.  
EC motor with automatic power adjustment.  
Standard delivery with cable for an easy electrical connection

#### Application

Hot-water heating systems of all kinds, closed cooling circuits, industrial circulation systems, circulation in solar thermal and geothermal systems.

#### Type key

|                        |  |
|------------------------|--|
| Example:               | <b>Wilo-Stratos PARA 25/1-5 T1</b>                   |
| <b>Stratos</b>         | Electronically controlled high-efficiency pump       |
| <b>PARA</b>            | Pump range adapted to requirements of the OEM market |
| <b>25/</b>             | Nominal connection diameter                          |
| <b>1-5</b>             | Nominal delivery head range [m]                      |
| <b>T1</b>              | Type key for combinations of function and equipment  |
| <b>12 h</b>            | Position of electronic module, special version       |
| <b>(not specified)</b> | Position of electronic module 6h, standard version   |

#### Options

- External control via 0-10V or PWM
- Control mode  $\Delta p$ -c (constant),  $\Delta p$ -v (variable)
- Control mode selection and differential pressure setpoint setting for  $\Delta p$ -c,  $\Delta p$ -v via operating button
- Special version without operating button
- All possible combinations of functions and equipment are available
- Version with cable according to customer specification
- Version with short overall length of 130 mm
- Delivery in collective packaging (196 pumps/package)
- Delivery with thermal insulation
- Cold insulation shell ClimaForm as accessories

#### Technical data

##### Approved fluids (other fluids on request)

|   |   |
|---|---|
| Heating water (in accordance with VDI 2035)   | • |
| Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked) | • |

##### Power

|                    |                       |
|--------------------|-----------------------|
| Max. delivery head | 5 m                   |
| Max. volume flow   | 3.2 m <sup>3</sup> /h |

##### Permitted field of application

|  |   |
|--|---|
| Temperature range for applications in HVAC systems at max. ambient temperature | of 25°C = -10 to 95°C<br>of 40°C = -10 to 95°C<br>of 45°C = -10 to 95°C<br>of 50°C = -10 to 90°C<br>of 55°C = -10 to 80°C<br>of 60°C = -10 to 70°C<br>of 65°C = -10 to 60°C |
|--|---|

|                         |       |
|-------------------------|-------|
| Maximum static pressure | 6 bar |
|-------------------------|-------|

##### Electrical connection

|                  |                   |
|------------------|-------------------|
| Mains connection | 1~230 V, 50/60 Hz |
|------------------|-------------------|

##### Motor/electronics

|                               |                     |
|-------------------------------|---------------------|
| Electromagnetic compatibility | EN 61800-3          |
| Emitted interference          | EN 61000-6-3        |
| Interference resistance       | EN 61000-6-2        |
| Speed control                 | Frequency converter |
| Protection class              | IP 44               |
| Insulation class              | F                   |

##### Minimum suction head at suction port for avoiding cavitation at water pumping temperature

|                                      |                 |
|--------------------------------------|-----------------|
| Minimum suction head at 50/95/110 °C | 0.5 / 4.5 / - m |
|--------------------------------------|-----------------|

• = available, - = not available

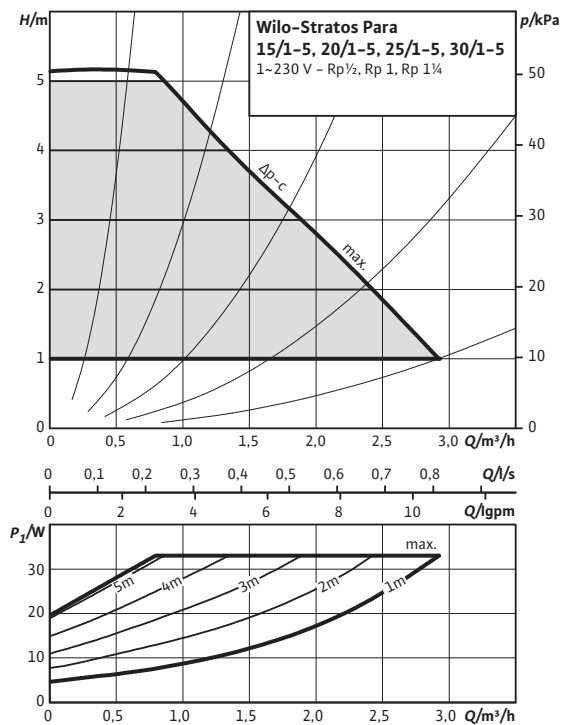
# Heating and cooling

## High-efficiency pumps

### Pump curves Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5

#### Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5

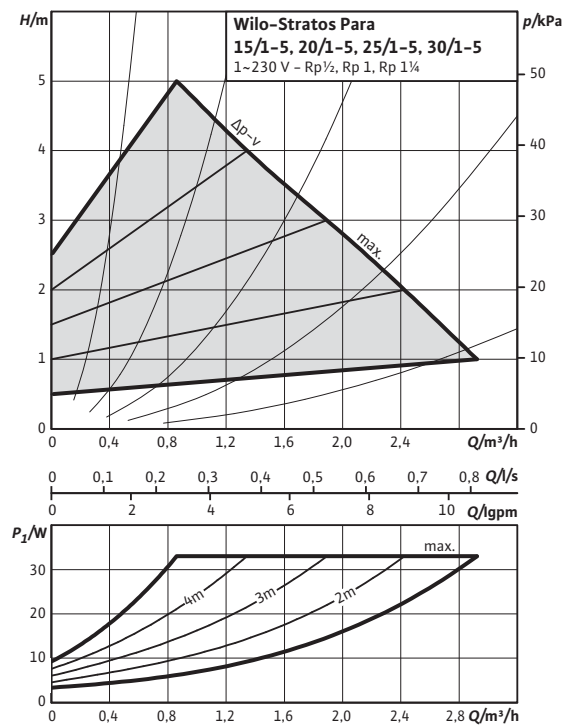
##### $\Delta p$ -c (constant)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5

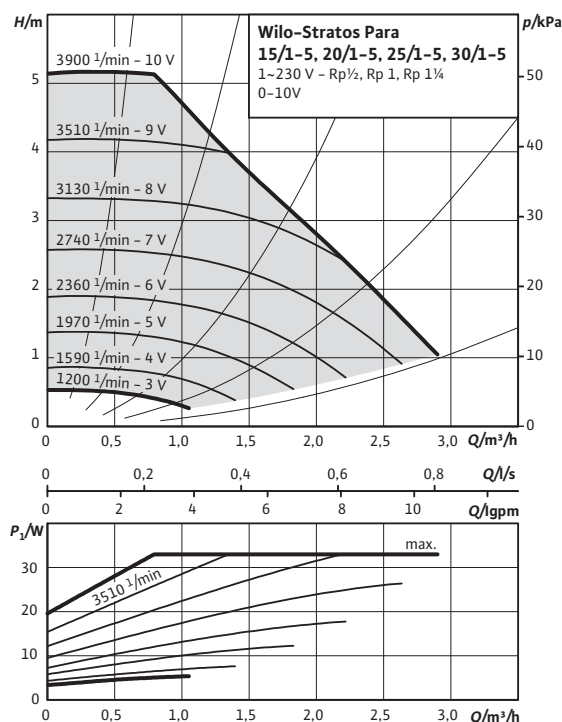
##### $\Delta p$ -v (variable)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5

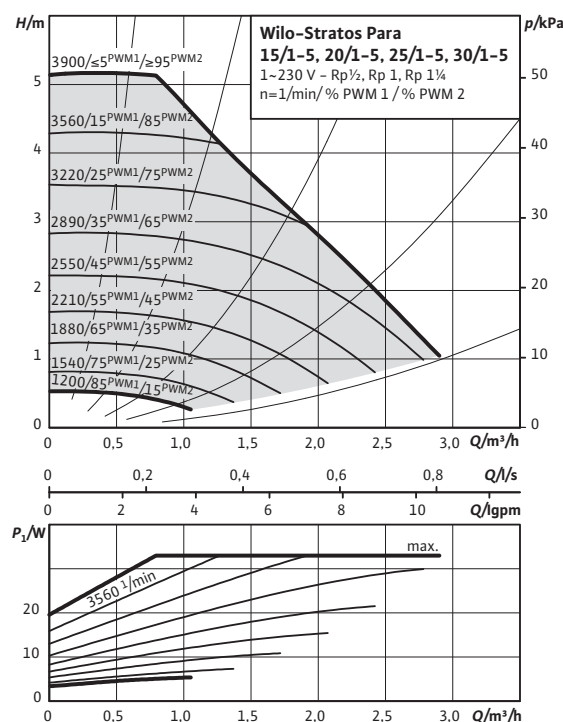
##### External control mode via Analog-In 0-10 V



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5

##### External control via PWM



Tolerances of each curve according to EN 1151-1:2006

### Dimensions, motor data Wilo-Stratos PARA 15/1-5, 20/1-5, 25/1-5, 30/1-5

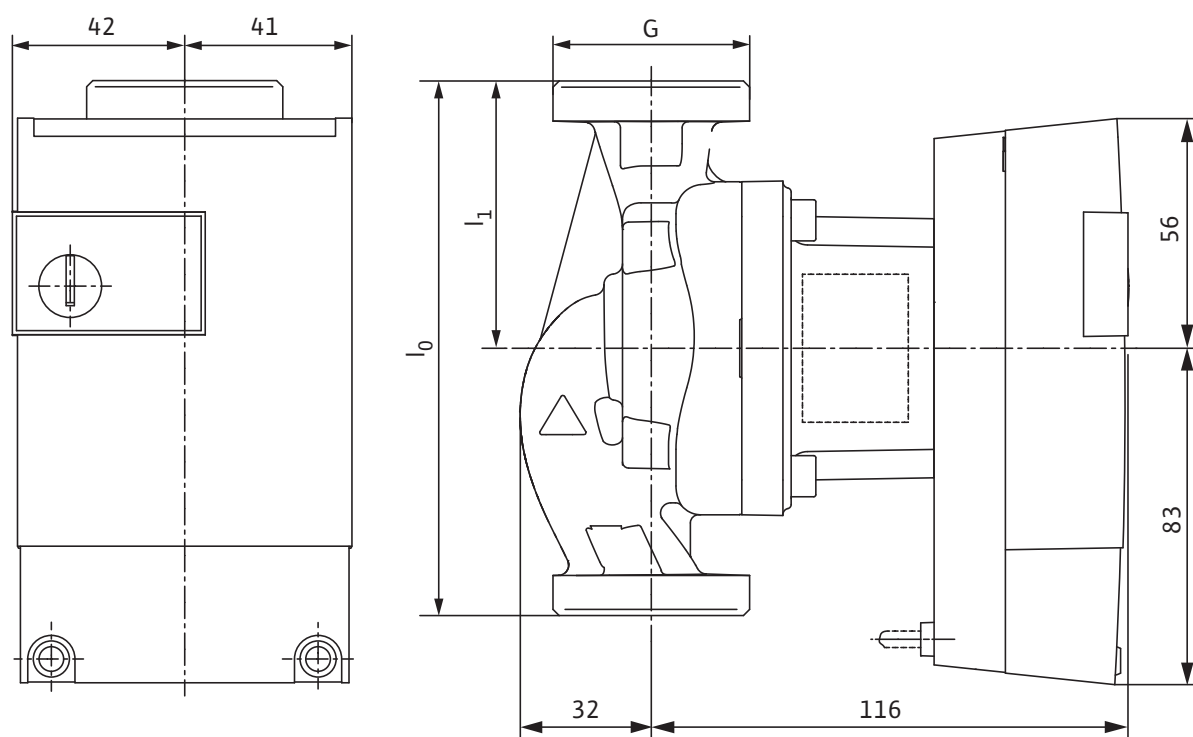
#### Motor data

| Wilo-Stratos PARA... | Nominal motor power | Speed       | Power consumption 1~230 V | Current at 1~230V | Motor protection |
|----------------------|---------------------|-------------|---------------------------|-------------------|------------------|
|                      | $P_2$               | $n$         | $P_1$                     | $I$               | –                |
|                      | W                   | rpm         | W                         | A                 | –                |
| .../1-5              | 30                  | 1200 – 3900 | 5–33                      | 0.06 – 0.29       | integrated       |

#### Materials

| Wilo-Stratos PARA... | Pump housing                | Impeller                         | Pump shaft                | Bearing                   |
|----------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|
| .../1-5              | Grey cast iron (EN-GJL-200) | Plastic (PPE), trade name: Noryl | Stainless steel (X46Cr13) | Carbon, metal impregnated |

#### Dimension drawing



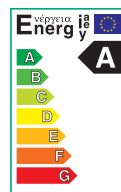
#### Dimensions, weights

| Wilo-Stratos PARA... | Threaded pipe union | Thread | Overall length | Dimensions | Weight approx. |
|----------------------|---------------------|--------|----------------|------------|----------------|
|                      | –                   |        | $l_0$          | $l_1$      | $m$            |
|                      | –                   |        | mm             |            | kg             |
| 15/1-5               | Rp ½                | G 1    | 130            | 65         | 2.2            |
| 20/1-5               | Rp ¾                | G 1¼   | 130            | 65         | 2.2            |
| 25/1-5               | Rp 1                | G 1½   | 180            | 90         | 2.5            |
| 25/1-5               | Rp 1                | G 1½   | 130            | 65         | 2.2            |
| 30/1-5               | Rp 1¼               | G 2    | 180            | 90         | 2.5            |
| 30/1-5               | Rp 1¼               | G 2    | 130            | 65         | 2.5            |

# Heating and cooling

## High-efficiency pumps

### Series description Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7



#### Design

Glandless circulation pump with threaded connection.  
EC motor with automatic power adjustment.  
Standard delivery with cable for an easy electrical connection

#### Application

Hot-water heating systems of all kinds, closed cooling circuits, industrial circulation systems, circulation in solar thermal and geothermal systems.

#### Type key

|                        |  |
|------------------------|--|
| Example:               | <b>Wilo-Stratos PARA 25/1-7 T1</b>                   |
| <b>Stratos</b>         | Electronically controlled high-efficiency pump       |
| <b>PARA</b>            | Pump range adapted to requirements of the OEM market |
| <b>25/</b>             | Nominal connection diameter                          |
| <b>1-7</b>             | Nominal delivery head range [m]                      |
| <b>T1</b>              | Type key for combinations of function and equipment  |
| <b>12 h</b>            | Position of electronic module, special version       |
| <b>(not specified)</b> | Position of electronic module 6h, standard version   |

#### Options

- External control via 0–10V or PWM
- Control mode  $\Delta p$ -c (constant),  $\Delta p$ -v (variable)
- Control mode selection and differential pressure setpoint setting for  $\Delta p$ -c,  $\Delta p$ -v via operating button
- Special version without operating button
- All possible combinations of functions and equipment are available
- Version with cable according to customer specification
- Version with short overall length of 130 mm
- Delivery in collective packaging (196 pumps/package)
- Delivery with thermal insulation
- Cold insulation shell ClimaForm as accessories

#### Technical data

##### Approved fluids (other fluids on request)

|   |   |
|---|---|
| Heating water (in accordance with VDI 2035)   | • |
| Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked) | • |

##### Power

|                    |                       |
|--------------------|-----------------------|
| Max. delivery head | 7 m                   |
| Max. volume flow   | 4.5 m <sup>3</sup> /h |

##### Permitted field of application

|  |                       |
|--|-----------------------|
| Temperature range for applications in HVAC systems at max. ambient temperature | of 25°C = -10 to 95°C |
|  | of 40°C = -10 to 95°C |
|  | of 45°C = -10 to 95°C |
|  | of 50°C = -10 to 90°C |
|  | of 55°C = -10 to 80°C |
|  | of 60°C = -10 to 70°C |
| Maximum static pressure  | 6 bar                 |

##### Electrical connection

|                  |                   |
|------------------|-------------------|
| Mains connection | 1~230 V, 50/60 Hz |
|------------------|-------------------|

##### Motor/electronics

|                               |                     |
|-------------------------------|---------------------|
| Electromagnetic compatibility | EN 61800-3          |
| Emitted interference          | EN 61000-6-3        |
| Interference resistance       | EN 61000-6-2        |
| Speed control                 | Frequency converter |
| Protection class              | IP 44               |
| Insulation class              | F                   |

##### Minimum suction head at suction port for avoiding cavitation at water pumping temperature

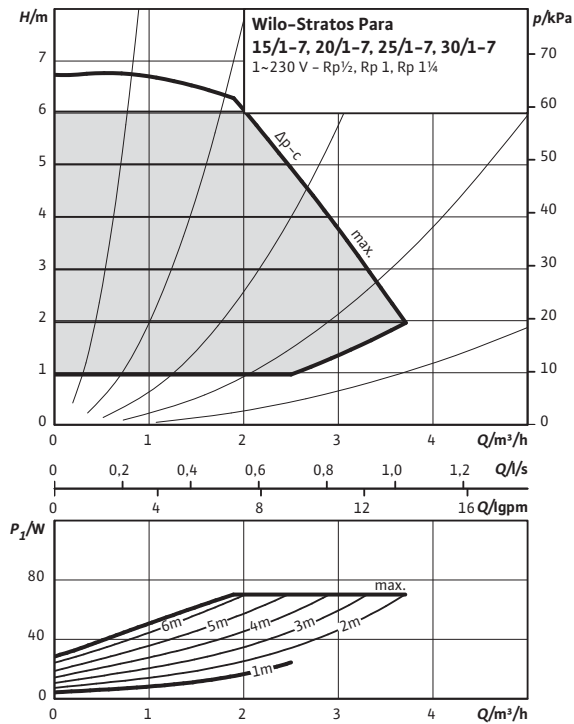
|  |                 |
|--|-----------------|
| Minimum suction head at 50 / 95 / 110 °C | 0.5 / 4.5 / - m |
|--|-----------------|

• = available, - = not available

### Pump curves Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7

#### Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7

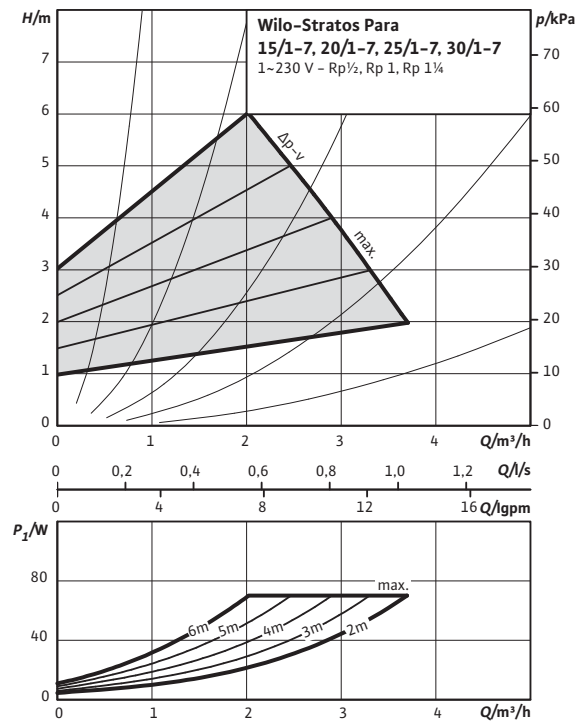
##### $\Delta p$ -c (constant)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7

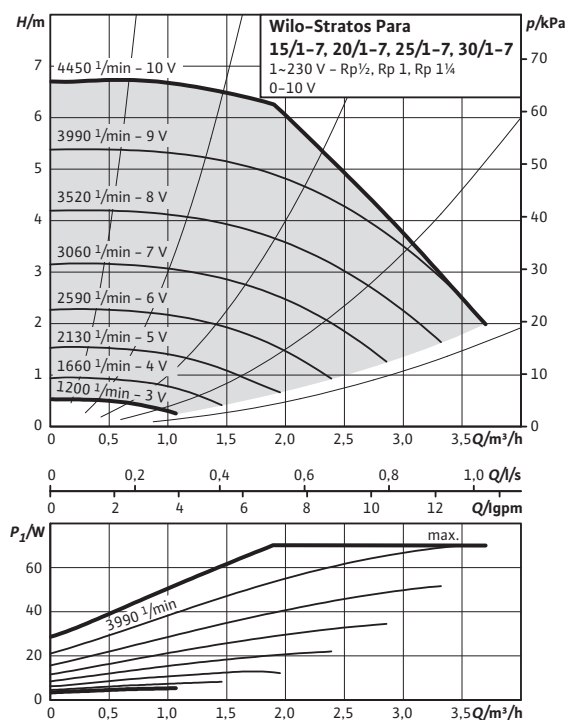
##### $\Delta p$ -v (variable)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7

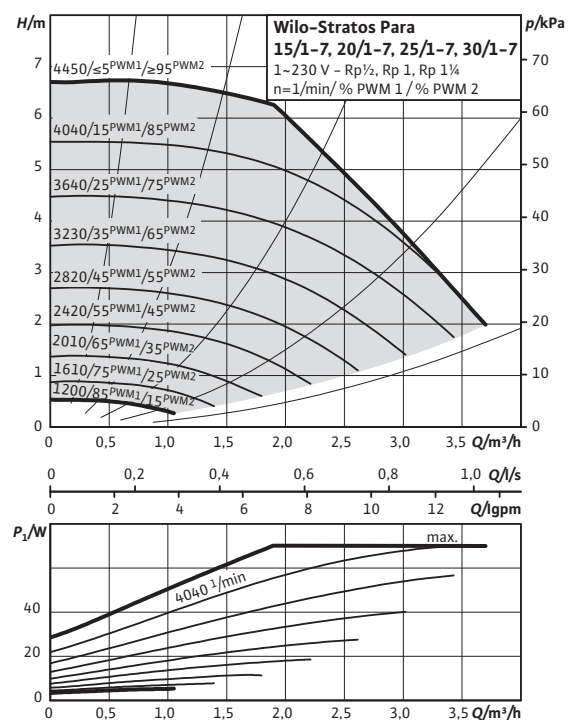
##### External control mode via Analog-In 0-10 V



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7

##### External control via PWM



Tolerances of each curve according to EN 1151-1:2006

# Heating and cooling

## High-efficiency pumps

### Dimensions, motor data Wilo-Stratos PARA 15/1-7, 20/1-7, 25/1-7, 30/1-7

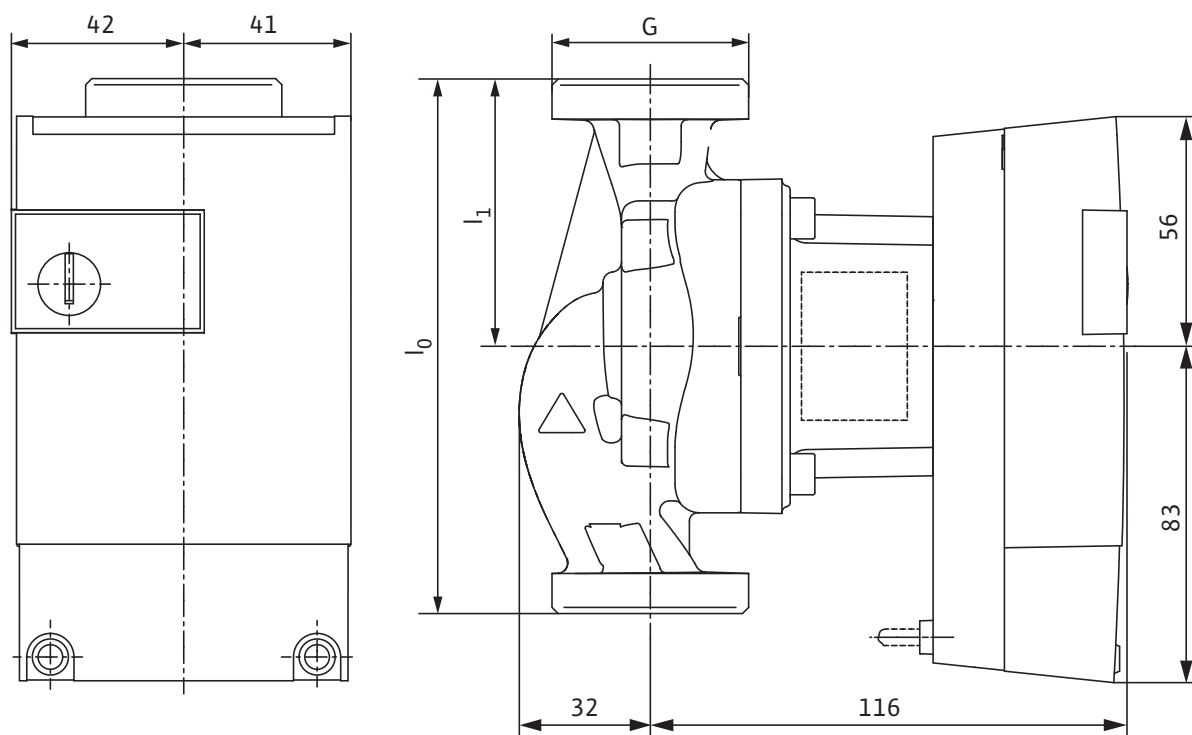
#### Motor data

| Wilo-Stratos PARA... | Nominal motor power | Speed       | Power consumption 1~230 V | Current at 1~230V | Motor protection |
|----------------------|---------------------|-------------|---------------------------|-------------------|------------------|
|                      | $P_2$               | $n$         | $P_1$                     | $I$               | –                |
|                      | W                   | rpm         | W                         | A                 | –                |
| .../1-7              | 50                  | 1200 – 4450 | 5–70                      | 0.06 – 0.58       | integrated       |

#### Materials

| Wilo-Stratos PARA... | Pump housing                | Impeller                         | Pump shaft                | Bearing                   |
|----------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|
| .../1-7              | Grey cast iron (EN-GJL-200) | Plastic (PPE), trade name: Noryl | Stainless steel (X46Cr13) | Carbon, metal impregnated |

#### Dimension drawing



#### Dimensions, weights

| Wilo-Stratos PARA... | Threaded pipe union | Thread | Overall length | Dimensions | Weight approx. |
|----------------------|---------------------|--------|----------------|------------|----------------|
|                      | –                   |        | $l_0$          | $l_1$      | $m$            |
|                      | –                   |        | mm             |            | kg             |
| 15/1-7               | Rp ½                | G 1    | 130            | 65         | 2.2            |
| 20/1-7               | Rp ¾                | G 1¼   | 130            | 65         | 2.2            |
| 25/1-7               | Rp 1                | G 1½   | 180            | 90         | 2.5            |
| 25/1-7               | Rp 1                | G 1½   | 130            | 65         | 2.2            |
| 30/1-7               | Rp 1¼               | G 2    | 180            | 90         | 2.5            |
| 30/1-7               | Rp 1¼               | G 2    | 130            | 65         | 2.5            |

### Series description Wilo-Stratos PARA 25/1-8, 30/1-8



#### Design

Glandless circulation pump with threaded connection.  
EC motor with automatic power adjustment.  
Standard delivery with cable for an easy electrical connection

#### Application

Hot-water heating systems of all kinds, closed cooling circuits, industrial circulation systems, circulation in solar thermal and geothermal systems.

#### Type key

|                        |  |
|------------------------|--|
| Example:               | <b>Wilo-Stratos PARA 25/1-8 T1</b>                   |
| <b>Stratos</b>         | Electronically controlled high-efficiency pump       |
| <b>PARA</b>            | Pump range adapted to requirements of the OEM market |
| <b>25/</b>             | Nominal connection diameter                          |
| <b>1-8</b>             | Nominal delivery head range [m]                      |
| <b>T1</b>              | Type key for combinations of function and equipment  |
| <b>12 h</b>            | Position of electronic module, special version       |
| <b>(not specified)</b> | Position of electronic module 6h, standard version   |

#### Options

- External control via 0-10V
- Control mode  $\Delta p$ -c (constant),  $\Delta p$ -v (variable)
- Control mode selection and differential pressure setpoint setting for  $\Delta p$ -c,  $\Delta p$ -v via operating button
- Further combinations of functions and equipment are available: T1-T5, T16, T17
- Version with cable according to customer specification
- Delivery in collective packaging (108 pumps/package)
- Delivery with thermal insulation
- Cold insulation shell ClimaForm as accessories

#### Technical data

##### Approved fluids (other fluids on request)

|   |   |
|---|---|
| Heating water (in accordance with VDI 2035)   | • |
| Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked) | • |

##### Power

|                    |                       |
|--------------------|-----------------------|
| Max. delivery head | 8 m                   |
| Max. volume flow   | 8.0 m <sup>3</sup> /h |

##### Permitted field of application

|  |  |
|--|--|
| Temperature range for applications in HVAC systems at max. ambient temperature | of 25°C = -10 to 110°C<br>of 40°C = -10 to 90°C<br>of 45°C = -10 to 80°C<br>of 50°C = -10 to 70°C<br>of 55°C = -10 to 60°C<br>of 60°C = -10 to 50°C<br>of 65°C = -10 to 40°C |
| Maximum static pressure  | 10 bar   |

##### Electrical connection

|                  |                   |
|------------------|-------------------|
| Mains connection | 1~230 V, 50/60 Hz |
|------------------|-------------------|

##### Motor/electronics

|                               |                     |
|-------------------------------|---------------------|
| Electromagnetic compatibility | EN 61800-3          |
| Emitted interference          | EN 61000-6-3        |
| Interference resistance       | EN 61000-6-2        |
| Speed control                 | Frequency converter |
| Protection class              | IP X4D              |
| Insulation class              | F                   |

##### Minimum suction head at suction port for avoiding cavitation at water pumping temperature

|                                      |           |
|--------------------------------------|-----------|
| Minimum suction head at 50/95/110 °C | 3/10/16 m |
|--------------------------------------|-----------|

• = available, - = not available



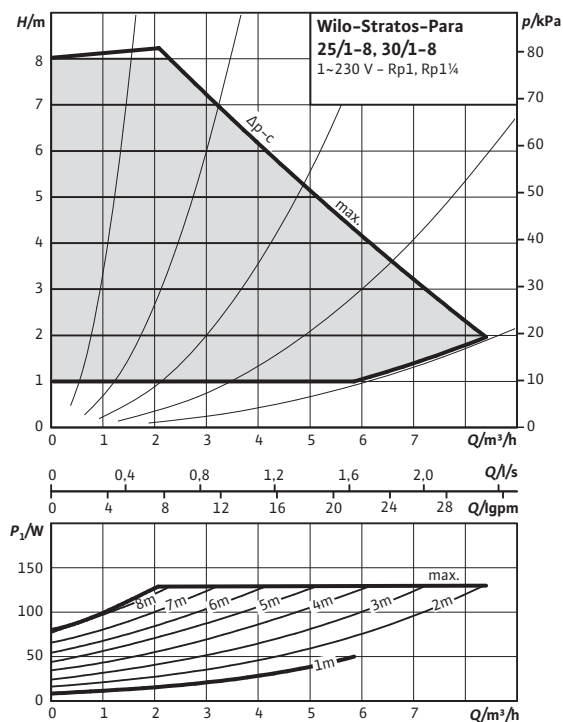
# Heating and cooling

## High-efficiency pumps

### Pump curves Wilo-Stratos PARA 25/1-8, 30/1-8

#### Wilo-Stratos PARA 25/1-8, 30/1-8

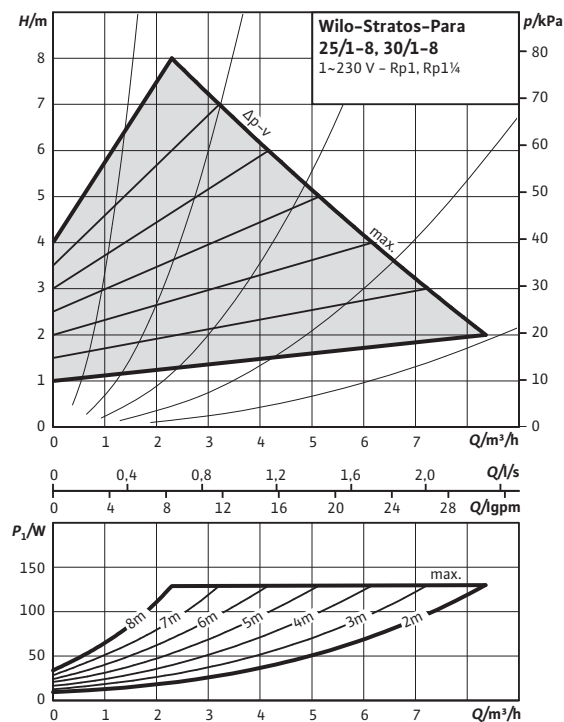
##### $\Delta p$ -c (constant)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 25/1-8, 30/1-8

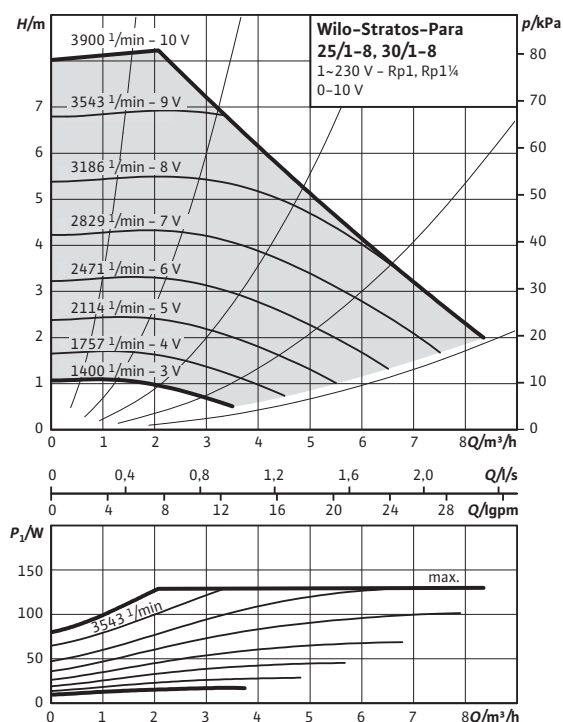
##### $\Delta p$ -v (variable)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 25/1-8, 30/1-8

##### External control mode via Analog-In 0-10 V



Tolerances of each curve according to EN 1151-1:2006

### Dimensions, motor data Wilo-Stratos PARA 25/1-8, 30/1-8

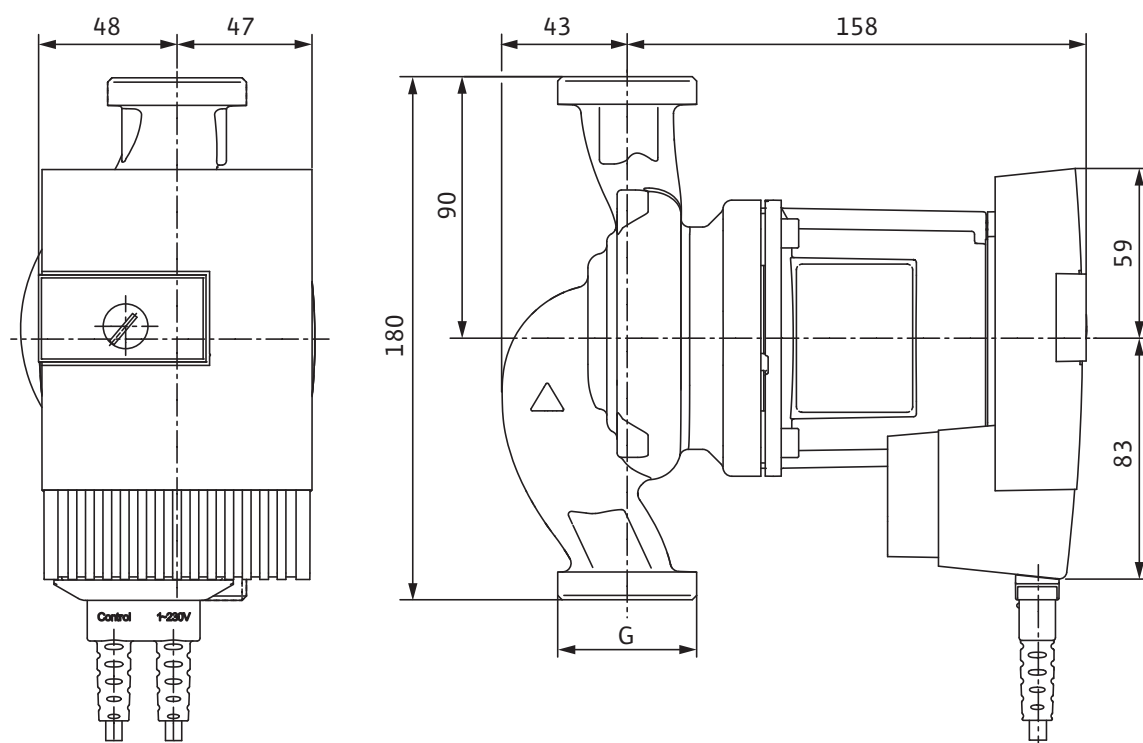
#### Motor data

| Wilo-Stratos PARA... | Nominal motor power | Speed       | Power consumption 1~230 V | Current at 1~230V | Motor protection |
|----------------------|---------------------|-------------|---------------------------|-------------------|------------------|
|                      | $P_2$               | $n$         | $P_1$                     | $I$               | –                |
|                      | W                   | rpm         | W                         | A                 | –                |
| .../1-8              | 100                 | 1400 – 3900 | 8–130                     | 0.07 – 0.95       | integrated       |

#### Materials

| Wilo-Stratos PARA... | Pump housing                | Impeller               | Pump shaft                | Bearing                   |
|----------------------|-----------------------------|------------------------|---------------------------|---------------------------|
| .../1-8              | Grey cast iron (EN-GJL-200) | Plastic (PPS – 40% GF) | Stainless steel (X46Cr13) | Carbon, metal impregnated |

#### Dimension drawing



#### Dimensions, weights

| Wilo-Stratos PARA... | Threaded pipe union | Thread | Weight approx. |
|----------------------|---------------------|--------|----------------|
|                      | –                   | –      | m              |
|                      | –                   | –      | kg             |
| 25/1-8               | Rp 1                | G 1½   | 4.7            |
| 30/1-8               | Rp 1¼               | G 2    | 4.7            |

# Heating and cooling

## High-efficiency pumps

### Series description Wilo-Stratos PARA 25/1-11, 30/1-11



#### Design

Glandless circulation pump with threaded connection.  
EC motor with automatic power adjustment.  
Standard delivery with cable for an easy electrical connection

#### Application

Hot-water heating systems of all kinds, closed cooling circuits, industrial circulation systems, circulation in solar thermal and geothermal systems.

#### Type key

|                        |  |
|------------------------|--|
| Example:               | <b>Wilo-Stratos PARA 25/1-11 T1</b>                  |
| <b>Stratos</b>         | Electronically controlled high-efficiency pump       |
| <b>PARA</b>            | Pump range adapted to requirements of the OEM market |
| <b>25/</b>             | Nominal connection diameter                          |
| <b>1-11</b>            | Nominal delivery head range [m]                      |
| <b>T1</b>              | Type key for combinations of function and equipment  |
| <b>12 h</b>            | Position of electronic module, special version       |
| <b>(not specified)</b> | Position of electronic module 6h, standard version   |

#### Options

- External control via 0-10V
- Control mode  $\Delta p$ -c (constant),  $\Delta p$ -v (variable)
- Control mode selection and differential pressure setpoint setting for  $\Delta p$ -c,  $\Delta p$ -v via operating button
- Further combinations of functions and equipment are available: T1-T5, T16, T17
- Version with cable according to customer specification
- Version with short overall length of 130 mm
- Delivery in collective packaging (108 pumps/packaging)
- Delivery with thermal insulation
- Cold insulation shell ClimaForm as accessories

#### Technical data

##### Approved fluids (other fluids on request)

|   |   |
|---|---|
| Heating water (in accordance with VDI 2035)   | • |
| Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked) | • |

##### Power

|                    |                       |
|--------------------|-----------------------|
| Max. delivery head | 11 m                  |
| Max. volume flow   | 4.5 m <sup>3</sup> /h |

##### Permitted field of application

|  |  |
|--|--|
| Temperature range for applications in HVAC systems at max. ambient temperature | of 25°C = -10 to 110°C<br>of 40°C = -10 to 90°C<br>of 45°C = -10 to 80°C<br>of 50°C = -10 to 70°C<br>of 55°C = -10 to 60°C<br>of 60°C = -10 to 50°C<br>of 65°C = -10 to 40°C |
| Maximum static pressure  | 10 bar   |

##### Electrical connection

|                  |                   |
|------------------|-------------------|
| Mains connection | 1~230 V, 50/60 Hz |
|------------------|-------------------|

##### Motor/electronics

|                               |                     |
|-------------------------------|---------------------|
| Electromagnetic compatibility | EN 61800-3          |
| Emitted interference          | EN 61000-6-3        |
| Interference resistance       | EN 61000-6-2        |
| Speed control                 | Frequency converter |
| Protection class              | IP X4D              |
| Insulation class              | F                   |

##### Minimum suction head at suction port for avoiding cavitation at water pumping temperature

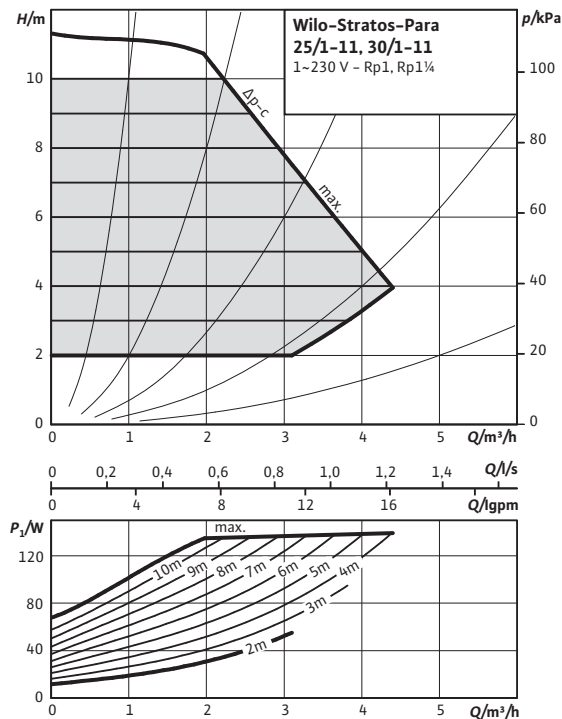
|                                      |           |
|--------------------------------------|-----------|
| Minimum suction head at 50/95/110 °C | 3/10/16 m |
|--------------------------------------|-----------|

• = available, - = not available

### Pump curves Wilo-Stratos PARA 25/1-11, 30/1-11

#### Wilo-Stratos PARA 25/1-11, 30/1-11

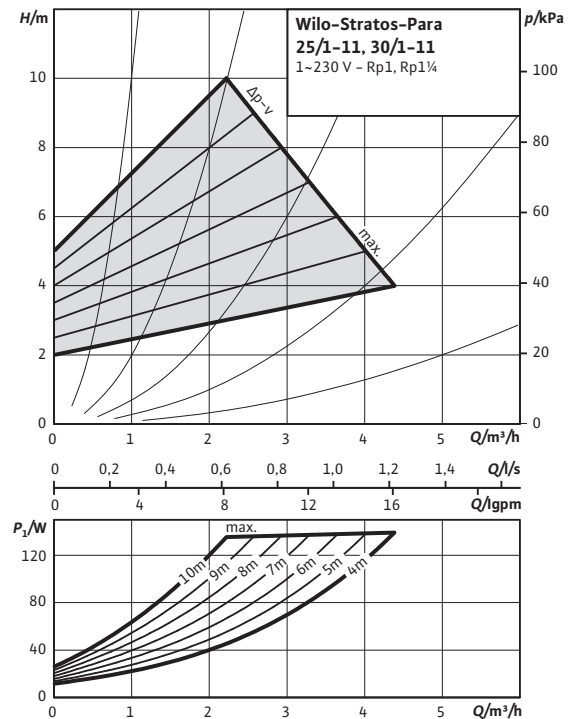
##### $\Delta p$ -c (constant)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 25/1-11, 30/1-11

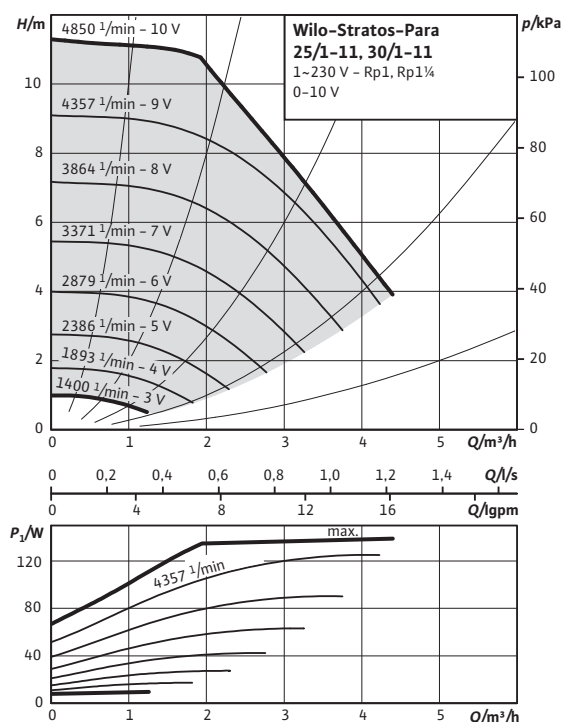
##### $\Delta p$ -v (variable)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 25/1-11, 30/1-11

##### External control mode via Analog-In 0-10 V



Tolerances of each curve according to EN 1151-1:2006

# Heating and cooling

## High-efficiency pumps

### Dimensions, motor data Wilo-Stratos PARA 25/1-11, 30/1-11

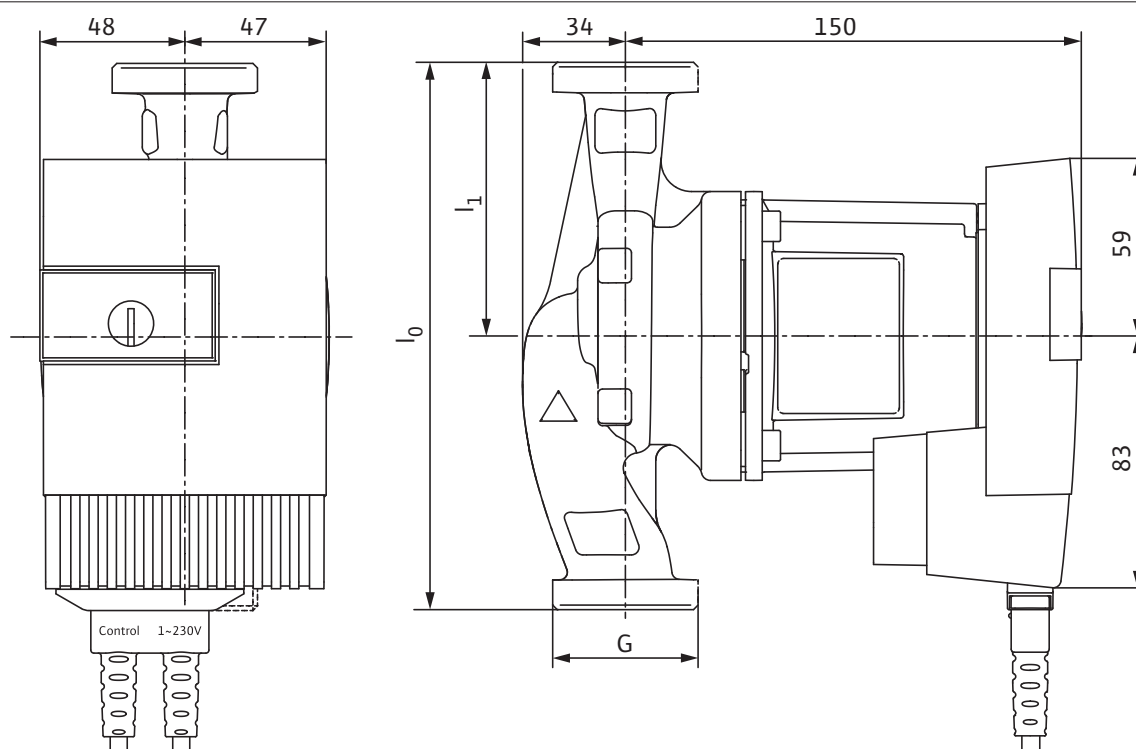
#### Motor data

| Wilo-Stratos PARA... | Nominal motor power | Speed       | Power consumption 1~230 V | Current at 1~230V | Motor protection |
|----------------------|---------------------|-------------|---------------------------|-------------------|------------------|
|                      | $P_2$               | $n$         | $P_1$                     | $I$               | –                |
|                      | W                   | rpm         | W                         | A                 | –                |
| .../1-11             | 105                 | 1400 – 4850 | 8–140                     | 0.07 – 1.05       | integrated       |

#### Materials

| Wilo-Stratos PARA... | Pump housing                | Impeller                         | Pump shaft                | Bearing                   |
|----------------------|-----------------------------|----------------------------------|---------------------------|---------------------------|
| .../1-11             | Grey cast iron (EN-GJL-200) | Plastic (PPE), trade name: Noryl | Stainless steel (X46Cr13) | Carbon, metal impregnated |

#### Dimension drawing



#### Dimensions, weights

| Wilo-Stratos PARA... | Threaded pipe union | Thread | Overall length | Dimensions | Weight approx. |
|----------------------|---------------------|--------|----------------|------------|----------------|
|                      | –                   |        | $l_0$          | $l_1$      | $m$            |
|                      | –                   |        |                | mm         | kg             |
| 25/1-11              | Rp 1                | G 1½   | 180            | 90         | 4.3            |
| 25/1-11              | Rp 1                | G 1½   | 130            | 65         | 4.3            |
| 30/1-11              | Rp 1¼               | G 2    | 180            | 90         | 4.3            |

### Series description Wilo-Stratos PARA 25/1-12, 30/1-12



#### Design

Glandless circulation pump with threaded connection.  
EC motor with automatic power adjustment.  
Standard delivery with cable for an easy electrical connection

#### Application

Hot-water heating systems of all kinds, closed cooling circuits, industrial circulation systems, circulation in solar thermal and geothermal systems.

#### Type key

|                        |  |
|------------------------|--|
| Example:               | <b>Wilo-Stratos PARA 25/1-12 T1</b>                  |
| <b>Stratos</b>         | Electronically controlled high-efficiency pump       |
| <b>PARA</b>            | Pump range adapted to requirements of the OEM market |
| <b>25/</b>             | Nominal connection diameter                          |
| <b>1-12</b>            | Nominal delivery head range [m]                      |
| <b>T1</b>              | Type key for combinations of function and equipment  |
| <b>12 h</b>            | Position of electronic module, special version       |
| <b>(not specified)</b> | Position of electronic module 6h, standard version   |

#### Options

- External control via 0-10V
- Control mode  $\Delta p$ -c (constant),  $\Delta p$ -v (variable)
- Control mode selection and differential pressure setpoint setting for  $\Delta p$ -c,  $\Delta p$ -v via operating button
- Further combinations of functions and equipment are available: T1-T5, T16, T17
- Version with cable according to customer specification
- Delivery in collective packaging (72 pumps/packaging)
- Delivery with thermal insulation
- Cold insulation shell ClimaForm as accessories

#### Technical data

##### Approved fluids (other fluids on request)

|   |   |
|---|---|
| Heating water (in accordance with VDI 2035)   | • |
| Water-glycol mixtures (max. 1:1; above 20% admixture, the pumping data must be checked) | • |

##### Power

|                    |                        |
|--------------------|------------------------|
| Max. delivery head | 12 m                   |
| Max. volume flow   | 10.0 m <sup>3</sup> /h |

##### Permitted field of application

|  |  |
|--|--|
| Temperature range for applications in HVAC systems at max. ambient temperature | of 25°C = -10 to 110°C<br>of 40°C = -10 to 90°C<br>of 45°C = -10 to 80°C<br>of 50°C = -10 to 65°C<br>of 55°C = -10 to 50°C<br>of 60°C = -10 to 35°C<br>of 65°C = -10 to 20°C |
| Maximum static pressure  | 10 bar   |

##### Electrical connection

|                  |                   |
|------------------|-------------------|
| Mains connection | 1~230 V, 50/60 Hz |
|------------------|-------------------|

##### Motor/electronics

|                               |                     |
|-------------------------------|---------------------|
| Electromagnetic compatibility | EN 61800-3          |
| Emitted interference          | EN 61000-6-3        |
| Interference resistance       | EN 61000-6-2        |
| Speed control                 | Frequency converter |
| Protection class              | IP X4D              |
| Insulation class              | F                   |

##### Minimum suction head at suction port for avoiding cavitation at water pumping temperature

|                                      |           |
|--------------------------------------|-----------|
| Minimum suction head at 50/95/110 °C | 3/10/16 m |
|--------------------------------------|-----------|

• = available, - = not available

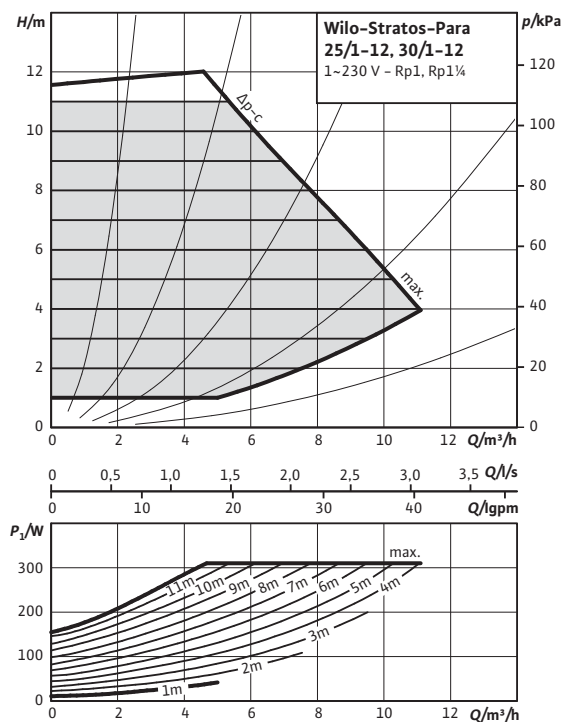
# Heating and cooling

## High-efficiency pumps

### Pump curves Wilo-Stratos PARA 25/1-12, 30/1-12

#### Wilo-Stratos PARA 25/1-12, 30/1-12

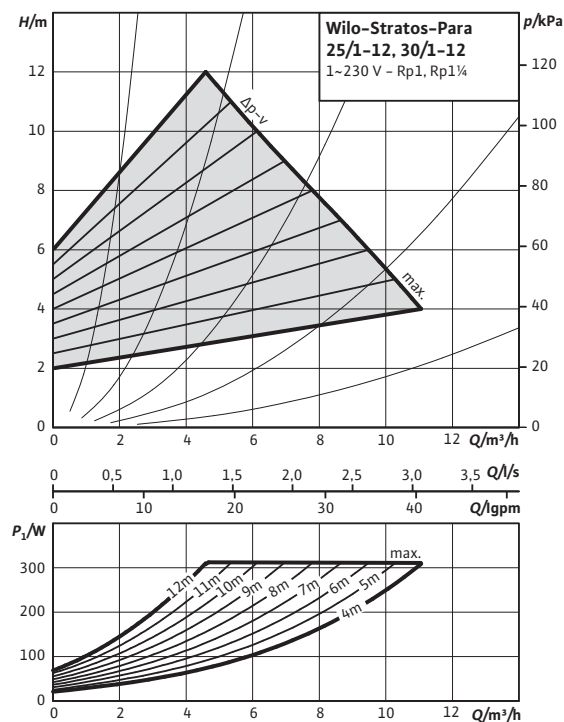
##### $\Delta p$ -c (constant)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 25/1-12, 30/1-12

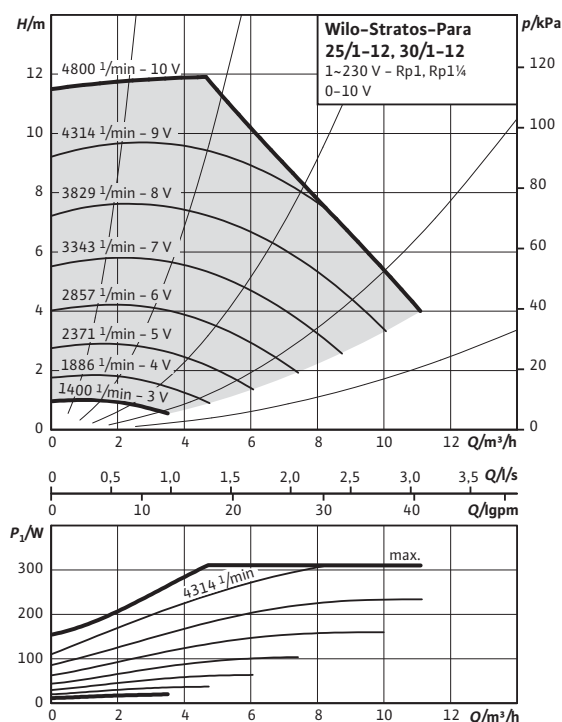
##### $\Delta p$ -v (variable)



Tolerances of each curve according to EN 1151-1:2006

#### Wilo-Stratos PARA 25/1-12, 30/1-12

##### External control mode via Analog-In 0-10 V



Tolerances of each curve according to EN 1151-1:2006



### Dimensions, motor data Wilo-Stratos PARA 25/1-12, 30/1-12

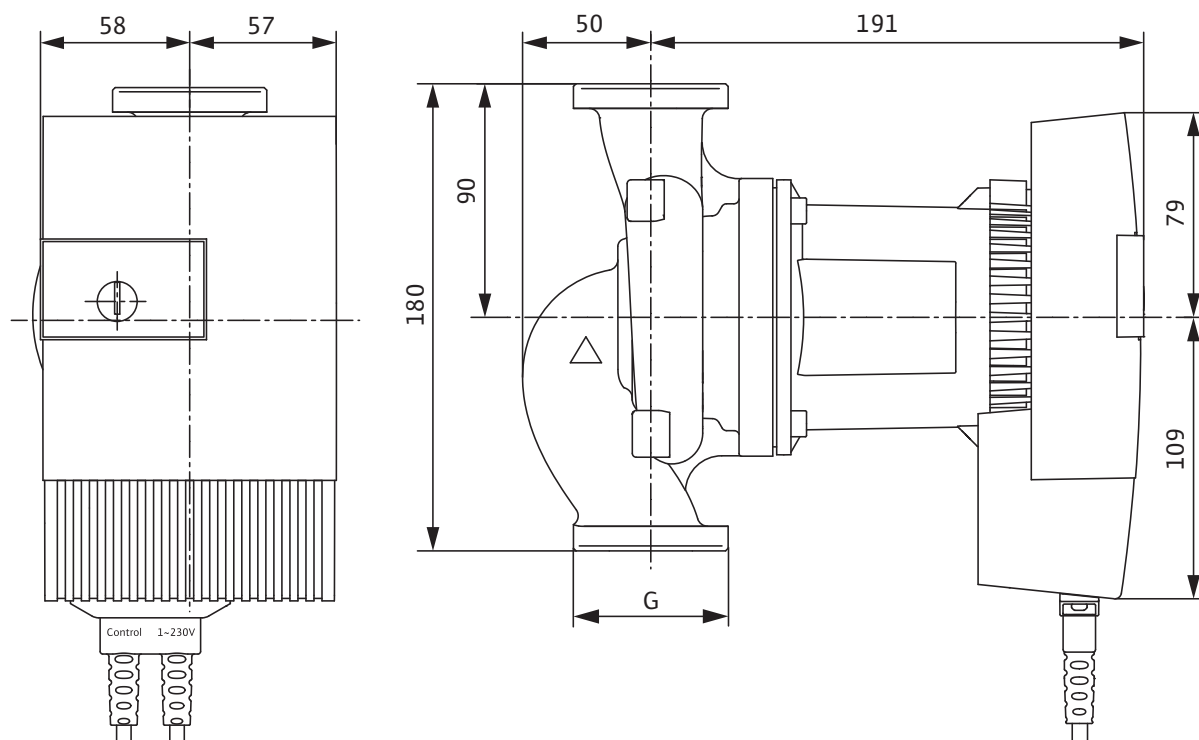
#### Motor data

| Wilo-Stratos PARA... | Nominal motor power | Speed       | Power consumption 1~230 V | Current at 1~230V | Motor protection |
|----------------------|---------------------|-------------|---------------------------|-------------------|------------------|
|                      | $P_2$               | $n$         | $P_1$                     | $I$               | –                |
|                      | W                   | rpm         | W                         | A                 | –                |
| .../1-12             | 200                 | 1400 – 4800 | 16–310                    | 0.16 – 1.37       | integrated       |

#### Materials

| Wilo-Stratos PARA... | Pump housing                | Impeller               | Pump shaft                | Bearing                   |
|----------------------|-----------------------------|------------------------|---------------------------|---------------------------|
| .../1-12             | Grey cast iron (EN-GJL-200) | Plastic (PPS – 40% GF) | Stainless steel (X46Cr13) | Carbon, metal impregnated |

#### Dimension drawing



#### Dimensions, weights

| Wilo-Stratos PARA... | Threaded pipe union | Thread | Weight approx. |
|----------------------|---------------------|--------|----------------|
|                      | –                   | –      | m              |
|                      | –                   | –      | kg             |
| 25/1-12              | Rp 1                | G 1½   | 6.2            |
| 30/1-12              | Rp 1¼               | G 2    | 6.2            |

## Accessories



### Wilo-ClimaForm, Wilo thermal insulation shells

#### Wilo thermal insulation shells



##### > User benefits

- Reduces the heat losses of the pump by up to 85 % (depending on the electrical power  $P_1$ )
- Reduces the overall energy consumption of the heating system
- Saves energy costs
- Resistant to moisture, salts, many acids, most greases and solvents
- Ensures even temperature distribution at the pump
- Protects the pump from outside moisture
- Groundwater-neutral, propellant-free, formaldehyde-free
- 100 % recyclable
- Fire resistance classification B2

##### > Suitable for pumps of the series:

Stratos PARA /1-5; 130 mm, 180 mm  
Stratos PARA /1-7; 130 mm, 180 mm  
Stratos PARA /1-11; 180 mm  
Stratos PARA /1-8; 180 mm  
Stratos PARA /1-12 ; 180 mm  
Stratos PARA Z/1-11; 180 mm  
Stratos PARA Z/1-8; 180 mm  
Stratos PARA Z/1-12; 180 mm

#### Wilo-ClimaForm



##### > Wilo-ClimaForm

Diffusion-proof insulation of pump housings in cold water applications (material: Armacell system).

##### Suitable for pumps of the series:

Stratos PARA /1-11; 180 mm  
Stratos PARA /1-8; 180 mm  
Stratos PARA /1-12 ; 180 mm  
Stratos PARA Z/1-11; 180 mm  
Stratos PARA Z/1-8; 180 mm  
Stratos PARA Z/1-12; 180 mm

For avoiding condensation formation on the surface of the pump housing and consequential damage caused by drips and corrosion on the pump housing and on the rest of the system.

##### > Scope of delivery

Low-temperature insulation shell including Armaflex band for form-fitting sealing between insulation and motor flange, installation instructions and packaging. The processing materials required for the Armacell system (e.g. special cleaners, AF adhesive, UV protective coating) are to be provided by the customer.

##### > Application benefits and field of application

- Industrially prefabricated low-temperature insulation shell for the fast insulation of pump housings and secure connection with onsite diffusion-proof pipe insulation manufactured by Armacell GmbH.
- Permitted temperature range of the fluid:  $-10\text{ }^{\circ}\text{C}$  to  $+105\text{ }^{\circ}\text{C}$
- Simple contours and surfaces facilitate the application of any onsite surface coatings (e.g. coat of paint for UV protection, sheet metal application for impact protection)
- Smoother transition to ongoing pipe insulation: Pipe unions/counter flanges are enclosed by the insulation
- Dimensionally precise adjustment to the housing geometry reduces the hollow space between insulation and the pump housing and thus the inclusion of air and moisture
- The flexible elastomer insulation material can be cut and re-glued in situations where access for installation is difficult



*Pumpen Intelligenz.*

Wilo Intec  
50 av. Casella  
F-18700 Aubigny sur Nère  
T +33 2 48 81 62 62  
F +33 2 48 58 20 29  
[information@wilointec.com](mailto:information@wilointec.com)  
[www.wilointec.com](http://www.wilointec.com)

**Sales & Marketing Director**

Vincent Fleurier  
Tel: +33 2 48 81 62 74  
Fax: +33 2 48 58 20 29  
[vincent.fleurier@wilointec.com](mailto:vincent.fleurier@wilointec.com)

**Sales Administration Manager**

Véronique Martin  
Tel: +33 2 48 81 62 75  
Fax: +33 2 48 58 20 29  
[veronique.martin@wilointec.com](mailto:veronique.martin@wilointec.com)

**Sales Manager France & Spain**

Robert Carre  
Tel: +33 2 48 81 62 72  
Fax: +33 2 48 58 20 29  
[robert.carre@wilointec.com](mailto:robert.carre@wilointec.com)

**Sales Manager Italy**

Dario Frazza  
Tel: +39 335 762 6181  
Fax: +39 059 286 0855  
[dario.frazza@wilointec.com](mailto:dario.frazza@wilointec.com)

**Sales Coordinator Subsidiaries**

Gilles Moulin  
Tel: +33 2 48 81 62 25  
Fax: +33 2 48 58 20 29  
[gilles.moulin@wilointec.com](mailto:gilles.moulin@wilointec.com)

**Sales Manager Germany**

Thomas Merscheim  
Tel: +49 172 352 3933  
Fax: +49 231 410 2578  
[thomas.merscheim@wilo.com](mailto:thomas.merscheim@wilo.com)

**Sales Manager UK**

Kevin Padmore  
Tel: +44 776 801 8879  
Fax: +44 128 373 2380  
[kevin.padmore@wilointec.com](mailto:kevin.padmore@wilointec.com)

**Sales Manager Benelux**

Ronald Rijkhoff  
Tel: +31 653 126 749  
Fax: +31 251 215 214  
[ronald.rijkhoff@wilo.nl](mailto:ronald.rijkhoff@wilo.nl)