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*Catalogue Building Services September 2015*

# OEM High Efficiency Circulation Pumps

Glandless Pumps and Accessories



# General notes

## Abbreviations and Introduction

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

### 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-Yonos PARA, Wilo-Yonos PARA High Flow and 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
- 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-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, 2009/125/EC) Directive. It now covers also measures on products as windows.

The earlier defined Commission Regulation (EC) No 641/2009 amended by (EU) No 622/2012 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:

Since **1 January 2013**, glandless **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.

Since **1 August 2015**, stand-alone circulators and **circulators integrated in products** have to meet 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 European 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.



### 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 heating 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.

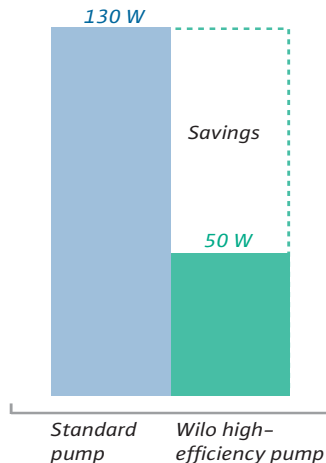
\* The energy Efficiency Index (EEI) is a specific parameter to qualify the performance of circulators in terms of efficiency. The EEI takes the capacity of the circulator into account to adapt its operative condition with a maintained high efficiency level.

# General notes

## High-efficiency pumps

### 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-OEM series Yonos PARA and Stratos 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.

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/Yonos 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-Yonos PARA 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 inlet pressure for the prevention of cavitation

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

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

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.

### Standards/directives

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

### Quality and safety mark



For pump types:

Wilo-Yonos PARA  
Wilo-Yonos PARA High Flow  
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-Yonos PARA / Yonos PARA High Flow
  - 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.
  - Fluid and ambient temperatures may not exceed or fall below the admissible values.

##### Condensation water

All standard pumps for cold water applications down to  $-10^{\circ}\text{C}$  are fully condensation-proof. The grey cast iron pump housing of the following series

- Wilo-Yonos PARA / Yonos PARA High Flow
  - 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-Yonos PARA / Yonos PARA High Flow
  - Wilo-Stratos PARA
- can also be used for intermittent (ON/OFF) operation.

The maximum admissible number of switchings during the life time 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  $+10\%/-15\%$ ).
- It is not recommended to use WILO high efficiency pumps in combination with a Triac control for ON / OFF switching. Relay control should be used here.
- 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.

##### Life time, wear and tear

The pumps and their components for OEM applications described hereafter are designed for 80000 operating hours.

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.

##### Safety information

###### Faults of electronic devices due to electromagnetic fields

Electromagnetic fields are created during the operation of pumps with frequency converter. Interference of electronic devices may be the result. The result may be a device malfunction, which can result in damage to the health or even death, e.g. of persons carrying implanted active or passive medical devices.

Therefore, during operation the presence of any persons e.g. with cardiac pacemakers in the vicinity of the unit/pump should be prohibited. With magnetic or electronic data media, the loss of data is possible.

###### WARNING! Danger due to strong magnetic field!

Inside the machine there is always a strong magnetic field that can cause injury and damage to property in the event of incorrect dismantling.

- It is only permitted to have the rotor removed from the motor housing by qualified personnel! There is a crushing hazard! When pulling the rotor out of the motor, it may be suddenly pulled back into its initial position by the strong magnetic field. If the unit consisting of impeller, bearing shield and rotor is pulled out of the motor, persons with medical aids, such as cardiac pacemakers, insulin pumps, hearing aids, implants or similar are at risk. Death, severe injury and damage to property may be the result. For such persons, a professional medical assessment is always necessary. Electronic devices may be impaired functionally or damaged by the strong magnetic field of the rotor. If the rotor is outside the motor, magnetic objects may be attracted very suddenly. That can result in injury and damage to property.

In assembled condition, the rotor's magnetic field is guided in the motor's iron core. There is therefore no harmful magnetic field outside the machine.

##### 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/en/legal](http://www.wilo.com/en/legal)

## Wilo-Yonos PARA



The Wilo-Yonos PARA is the latest high-efficiency pump series which is specially designed in order to fulfill the special demands of the OEM industry. The Wilo-Yonos PARA sets the standard for energy-saving solutions required for integrated hydraulic systems. Equipped with a self controlled Red button or externally PWM control, the Wilo-Yonos PARA is the perfect choice for a one-to-one replacement of most existing electronic pumps. This series is available in various cast iron and composite pump housings and is thus highly versatile. At the leading edge of technology, the Wilo-Yonos PARA provides best-in-class performances: it has a three times higher starting torque than most comparable heating pumps and fulfils highest mechanical, electrical and hydraulic requirements.

### Special features/product benefits

- "Best in class" High Efficiency pump of the market due to ECM technology
- Up to 80% electricity savings compared to previous uncontrolled range of heating pumps
- Self controlled pump (Red button) or externally controlled (PWM signal)
- Unique LED user interface gives information about the pump functioning
- High starting torque for reliable start-up
- Hot water heating systems of all kinds, in the temperature range of 0 °C to +95 °C (110 °C for ST version)
- Designed for easy integration due to compact design
- Inrush current peak less than 3A
- Self protecting modes of electronic motor
- Preventing flow noises
- Stand-by consumption less than 1 W
- Functions adapted specially to the demands of the OEM market
- Standard delivery with power cable and signal cable
- Cathodically coated (KTL) cast iron pump housing to prevent corrosion when condensation occurs, or OEM composite pump housing

### Heating application

In nearly all circulation systems, correctly sized controlled glandless pumps ensure adequate heat supply at all times at significantly reduced energy costs, while at the same time preventing noise generation.

### Sanitary hot water application (Wilo-Yonos PARA-Z)

Pumps which are utilised in sanitary hot water circulation systems are subject to specific requirements that are fulfilled by the Wilo-Yonos 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°d at a max. fluid temperature of +80 °C is permitted.
- All plastic parts that come into contact with the pumped liquid comply with KTW recommendations.

## Electronic performance control

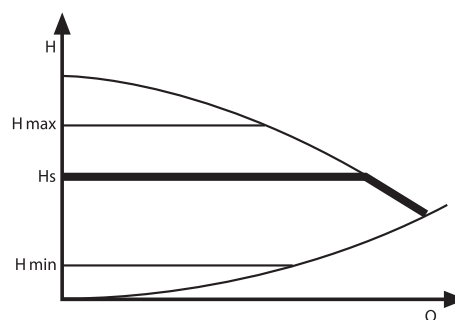
### Self controlled model with Red button (Type RKA/RKC)

- RKA: Red Knob for  $\Delta p-v$  Air venting and  $\Delta p-c$
- RKC: Red Knob for  $\Delta p-v$  and Constant speed

### Available control modes

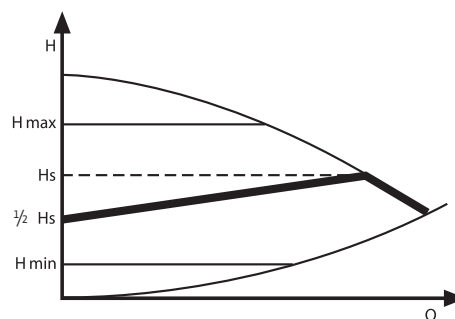
#### Control mode $\Delta p-c$ :

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  $Q$ .



### Venting routine

The integrated venting routine supports a bleeding of the overall heating system. After a manual setting, the routine runs for 10 minutes alternating at low and high speed of the pump. At the end of the process, the pump switches automatically to a pre-set speed. After that, the desired control mode can be set at the red button.

### Constant speed I, II, III

In this operating mode the pump is not self regulating its speed. The pump is operating constantly with a fixed speed in pre-set position.

### Manual control panel

#### Control button

The control mode and the differential pressure setpoint at  $\Delta p-c$  for constant differential pressure,  $\Delta p-v$  for variable differential pressure and pre-setting the constant speed can be set easily and safely, di-

## Wilo-Yonos PARA

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

### RKA type



### RKA

- Local setting of the constant differential pressure set-point at  $\Delta p-c$  on the right side
- Local setting of the variable differential pressure set-point at  $\Delta p-v$  on the left side
- Medium position for activating the venting function

### RKC type

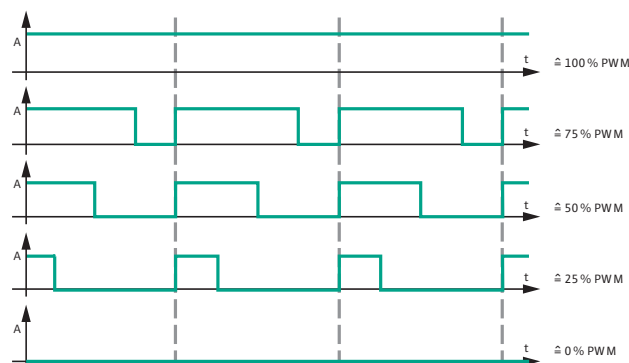
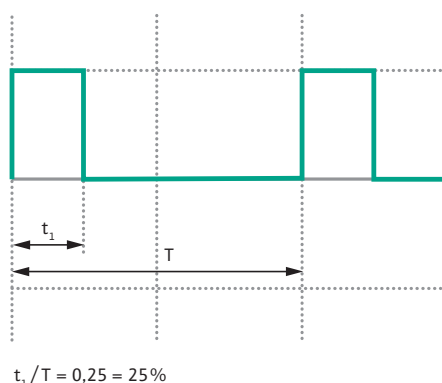


### RKC

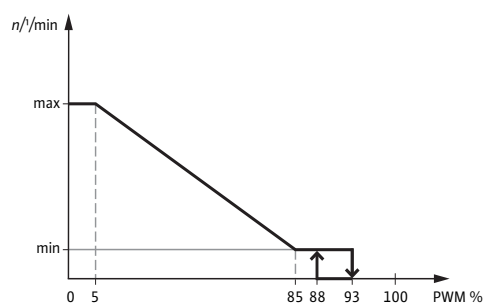
- Local setting of the variable differential pressure set-point at  $\Delta p-v$  on the left side
- A fixed constant speed is set on the right side. In this operating mode the pump is not self regulating its speed.
- Medium position for minimum speed

### 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-Yonos 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.



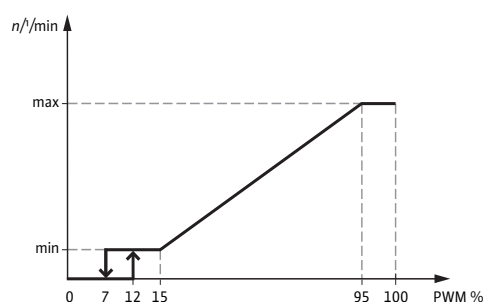
### PWM signal logic 1 (heating):



### 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 [%]

- < 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 increases linearly from minimum to maximum
- > 95 Pump runs at maximum speed

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

Signal amplitude: Minimum 3.6 V at 3 mA

up to 24 V for 7.5 mA absorbed by the pump interface

Signal polarity: none

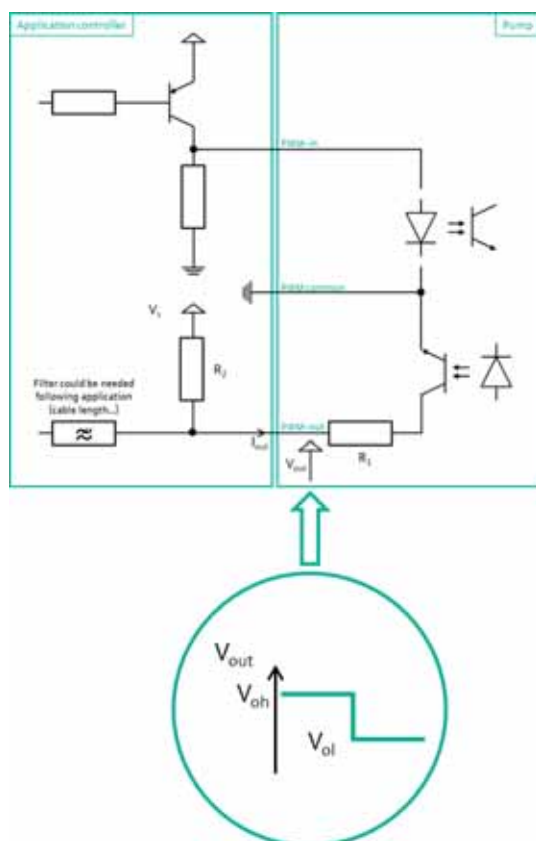
# Planning guide

## Wilo-Yonos PARA

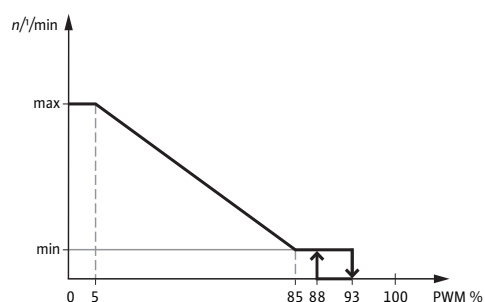
### iPWM interface



iPWM stands for intelligent (bidirectional/two ways communication) Pulse-width modulation. PWM signal for external activation of functions and returned signal flow



### iPWM signal logic 1 (heating) (%):



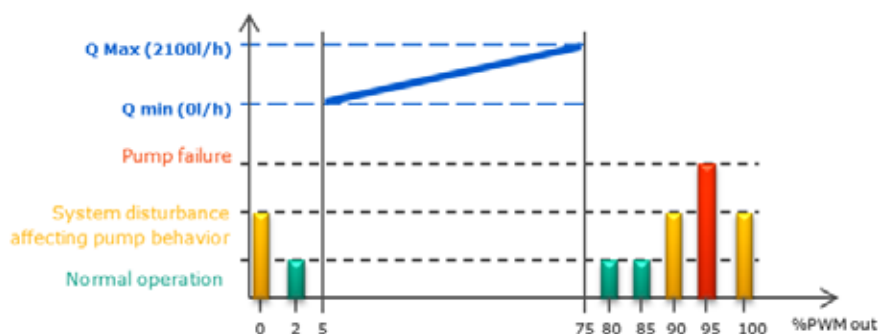
### PWM input signal [%]

- < 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-in	
Signal frequency:	100 Hz–5000 Hz (1000 Hz nominal)
Signal amplitude:	Minimum 3.6V at 3 mA Up to 24V for 7.5 mA absorbed by the pump interface
PWM-out	
Vs	$3V \leq V_s \leq 24V$
R2	$(V_s - 0.2) / I_{out} - R1$
R2C C=filter capacitor	$\leq \frac{1}{1000 \times \ln(0.3) \times 75}$ for rise time impact < 0.1%
Signal frequency:	75Hz +/- 2Hz
R1	470W +/- 5%
Vol =Vout low	<1V for Iout<1mA

## Wilo-Yonos PARA

iPWM signal logic 1 (heating) [%]:



% PWM-out	Status	Potential causes
0	Pump output iPWM interface damaged	iPWM interface in short circuit
2	Stand-by, pump is ready to run	/
5-75	Pump is running normally, flow information is supplied	/
80	Abnormal running mode Pump is running but not at optimal performance	- Undervoltage 160/170-194V - Self thermal protecting mode
85	Abnormal function mode Pump has stopped but is still functional	- Undervoltage <160/170V - Overvoltage - Unexpected external flow
90	Abnormal function mode Pump has stopped but is still functional	- Failure on another component than pump - Debris in the installation - Bad temperature setup
95	The pump has stopped due to permanent failure	- Pump blocked - Electronic module out of order
100	Problem of iPWM connection	iPWM interface in open circuit

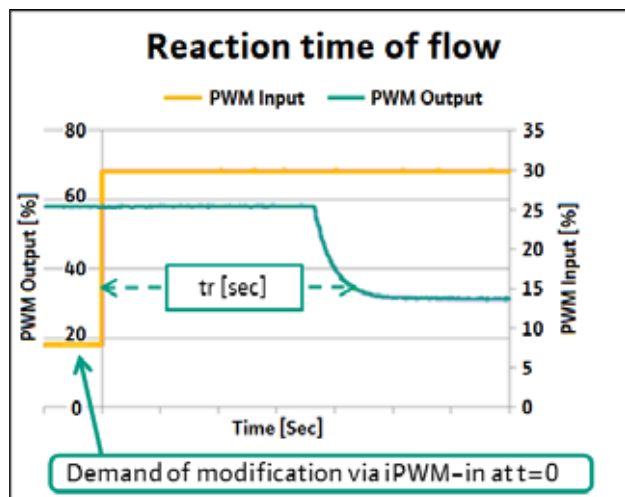
### iPWM-out accuracy

Heating circuit	Accuracy on measurement (valid for rotation speed > 2000 RPM)	Resolution on iPWM output (additional to accuracy)
for $Q \leq 1400 \text{ L/h}$	$\pm 140 \text{ L/h}^*$	10 L/h
for $Q > 1400 \text{ L/h}$	$\pm 20\%^*$	10 L/h

\* the accuracy is depending on the pump housing and the medium. A temperature correction factor is available on demand.

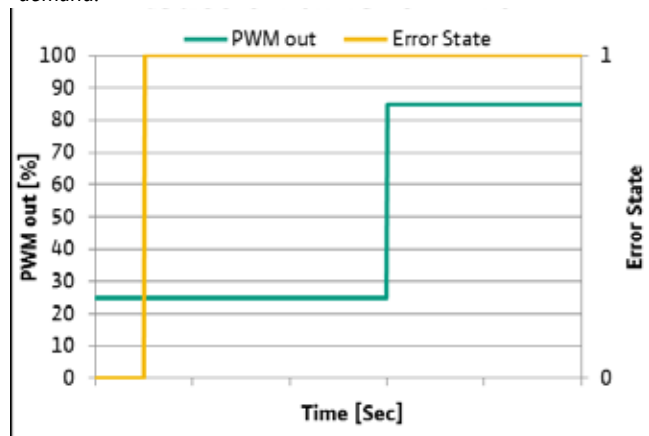
## Wilo-Yonos PARA

### iPWM-out reaction time



Failure	Reaction time 'tr' [sec]
Undervoltage	<2
Blocked rotor	<5
Flow adjustment (90% of targeted flow)	<5

If the controller adjusts iPWM-in with a higher frequency than the "reaction time", the flow adjustment sent by iPWM-out may not be updated. However the rotation speed will change according to the demand.



### Electrical connection

To ensure a safe and easy electrical connection, the Wilo-Yonos PARA pumps are equipped with an integrated Molex 3-way connector and depending on the available functions, with a control cable.

### Mains connection

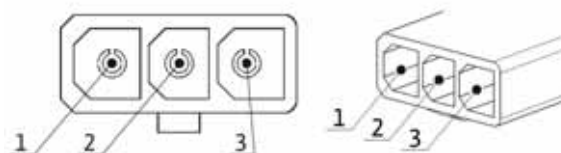
For mains power supply 1~230 V/50 Hz

### Yonos PARA with integrated Molex 3-way connector

PWM version



Red Knob version



- 1) L1, 1~230 V/50 Hz
- 2) Neutral N
- 3) Earth conductor

The mating plug to the OEM-plug can be ordered with one of the following suppliers. (Wilo does not assume any liability for the products supplied by these manufacturers):

LTE ([www.lte.it](http://www.lte.it))

FACON ([www.facon.it](http://www.facon.it))

### Cables

#### Standard

Overmoulded cable with brass end splices

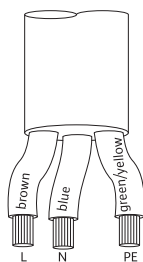


## Wilo-Yonos PARA

### Available mains cables

Standard	1 m, 3-core cable with end splices
Optional	0.5 m, 3-core cable with end splices 1.5 m, 3-core cable with end splices 2.0 m, 3-core cable with end splices according to customer specifications

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

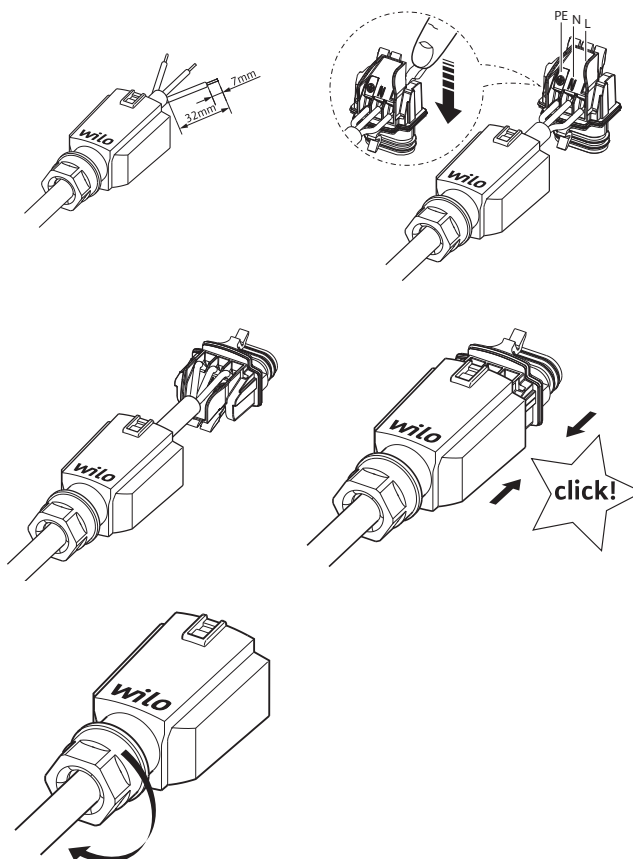


### Optional: short cables with specific connector

- Volex cable, IEC 60320-C6 (cable length ca. 300 mm)
- 3 way / Molex cable (cable length ca. 200 mm)
- WS8 cable + WS8 connector (cable length ca. 200 mm)

### Optional: Wilo Connector

No tools are required to connect the mains cable to the Wilo-Connector:

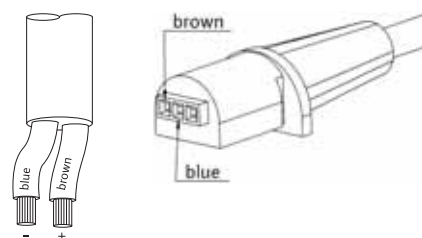


### PWM Control cables 2-core cable



For connecting the analogue PWM interface  
PWM signal cables supplied without a connector have dual polarity.

Core + (brown)  
Core - (blue)



# Planning guide

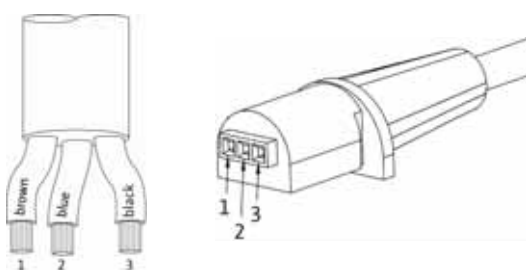
## Wilo-Yonos PARA

### Available control cables

Standard	1 m, 2-core cable with end splices
Optional	0.5 m, 2-core cable with end splices 1.5 m, 2-core cable with end splices 2.0 m, 2-core cable with end splices according to customer specifications

### 3-core cable

For connecting the analogue iPWM interface  
PWM signal cables supplied without a connector have dual polarity.



Core no. 1 (brown)	PWM input (from controller)
Core no. 2 (blue or grey)	PWM common
Core no. 3 (black)	PWM output (from the pump)

### Available control cables

Standard	1 m, 3-core cable with end splices
Optional	0.5 m, 3-core cable with end splices 1.5 m, 3-core cable with end splices 2.0 m, 3-core cable with end splices according to customer specifications

The mating plug to the OEM-plug can be ordered with one of the following suppliers. (Wilo does not assume any liability for the products supplied by these manufacturers):

LTE ([www.lte.it](http://www.lte.it))

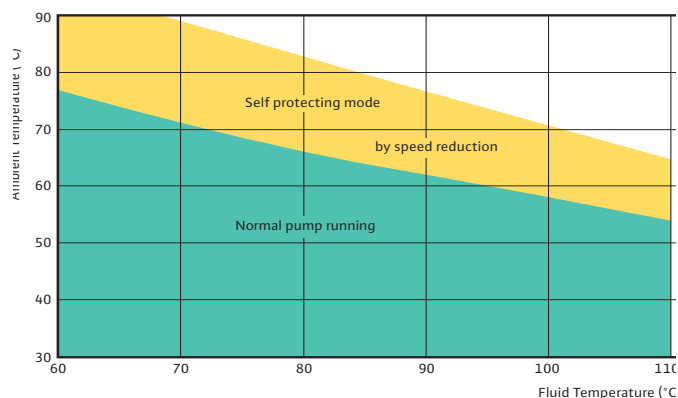
FACON ([www.facon.it](http://www.facon.it))

### Note:

To ensure interference resistance, the total length of the PWM control cable must not exceed 3 m.

### Permissible temperature range

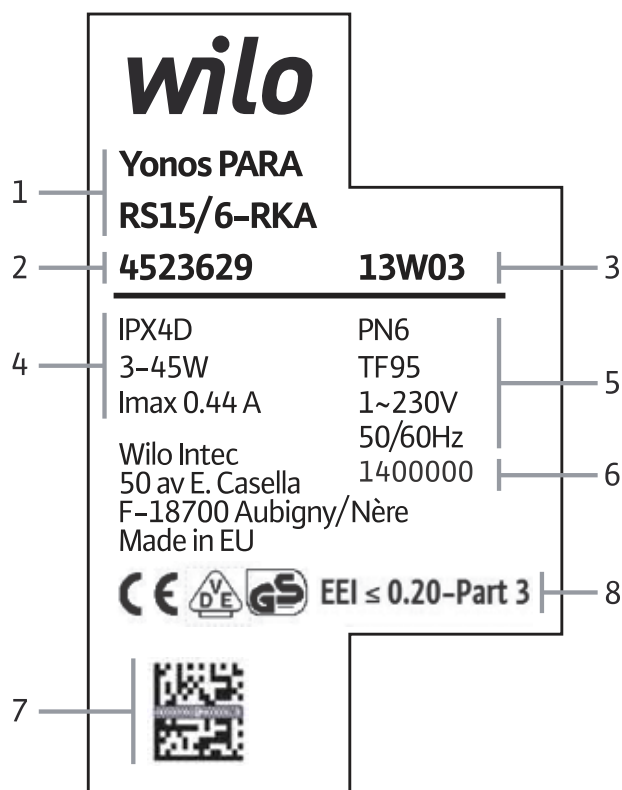
The Wilo-Yonos PARA range is equipped with a self protecting mode: In the event of too high temperature, outside the permissible temperature range, the electronics reduces automatically the power consumption until normal operating conditions return.



Example: at a fluid temperature of 90 °C and at an ambient temperature of 62 °C, the delivery head can decrease by 0.5 m depending on the pressure losses of the system.

## Wilo-Yonos PARA

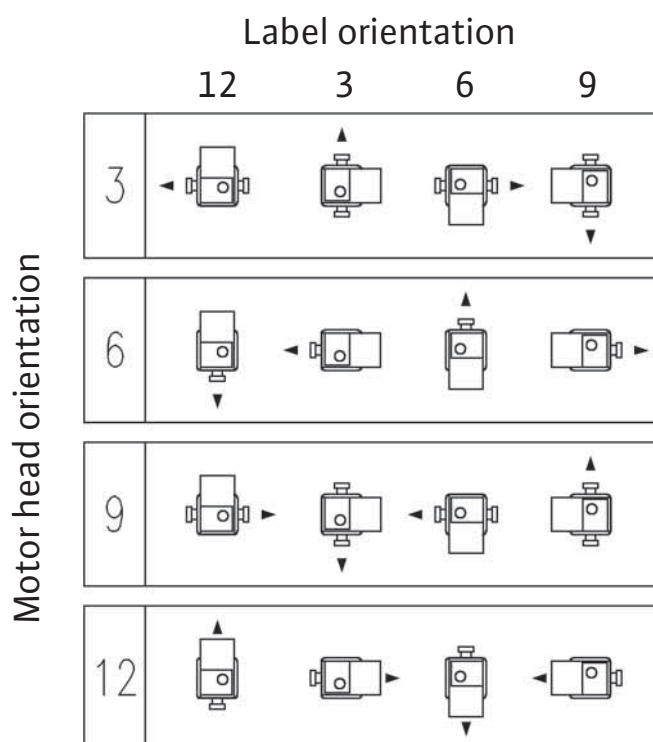
### Designation, name plate of the Wilo-Yonos PARA series



- 1 Pump type
- 2 Article number
- 3 Production date (year/week)
- 4 Protection class IP/Power consumption/Electricity
- 5 Operating pressure/max. Fluidtemperature/Voltage/Frequency
- 6 Wilo Label number
- 7 Code and serial number
- 8 Energy efficiency index (EEI)  
The benchmark of the most efficient circulator is  
EEI ≤ 0.20, part 3

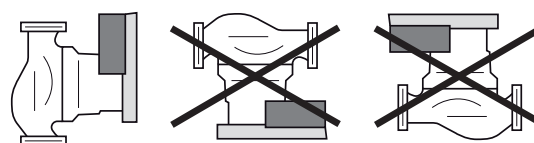
### Permitted installation positions

#### Wilo-Yonos PARA



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

### Impermissible installation positions



### Horizontal position

Max deviation in both directions: 7° degree

### Transport and interim storage

Immediately after receiving check the product for damage in transit.

### Transport conditions

The device must not be exposed to temperatures outside the range of -40 °C up to +85 °C. The transport conditions must be applied max. three months.

### Storage conditions

The device must not be exposed to temperatures outside the range 0 °C up to +40 °C. The storage time can be up to two years. The re-maining water, in case of customer production tests, cannot lead to frost damages.

## Wilo-Yonos PARA High Flow



The Wilo-Yonos PARA High Flow is the latest Wilo high-efficiency pump series in glandless construction which can be used both for

- Hot-water heating systems of all kinds
- Closed cooling circuits
- Circulation in solar thermal and geothermal systems in all OEM applications and it offers the following advantages:

### Field of application

The series Wilo-Yonos PARA High Flow is used as high-efficiency pump in circulation systems for heating, ventilation and air-conditioning applications in commercial and residential buildings:

- Large residential buildings
- Apartment buildings
- Residential complexes
- Hospitals
- Schools
- Administrative office buildings
- Real estate developments

### Product advantages and USP (unique selling propositions)

- Automatic adjustment of pump output to continuously varying load conditions of the hydraulic system
- Prevention of flow noise
- Use in heating and air-conditioning applications from  $-20^{\circ}\text{C}$  to  $+110^{\circ}\text{C}$  medium temperature.
- Maximum efficiency thanks to ECM technology
- LED display for the indication of nominal delivery head and fault codes
- Control range from 0.5m set delivery head
- Preselectable control modes for optimum load adjustment  $\Delta p\text{-c}$  (differential pressure constant),  $\Delta p\text{-v}$  (differential pressure variable)
- Preselectable constant speed mode (3 predefined fixed speed curves)
- Quick and convenient electrical connection with Wilo-Connector
- Collective fault signal on all types for assuring system availability
- Simple installation due to PN 6/PN 10 combination flanges (with DN 40 to DN 65)
- Pump housing with cathaphoretic coating for preventing corrosion due to condensation formation
- Safety and comfort during installation and operation
- Integrated motor protection
- Variable installation positions

### Heating application

In nearly all circulation systems, correctly sized controlled glandless pumps ensure adequate heat supply at all times at significantly reduced energy costs, while at the same time preventing noise generation.

### Thermal insulation for heating

In order to prevent heating loss through the pump housing, the single pumps of the series Wilo-Yonos PARA High Flow are available with a thermal insulation shell as accessory.

The PP material used, foamed polypropylene, has the following properties:

- Environmental compatibility: easy to recycle
- Thermal resistance: up to  $120^{\circ}\text{C}$
- Flammability: Class B2 in accordance with DIN 4102 (normal flammability)

Normally flammable materials are permitted for use in heated rooms in Germany in accordance with fire prevention regulations as long as a minimum clearance of 20 cm is maintained between them and the fireplace.

### Air-conditioning/cooling application

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

### Isolation for air-conditioning/cooling

If the pump housing is given diffusion-proof insulation onsite, the insulation may not cover the drain labyrinth between pump housing and motor. That ensures that any condensate having possibly accumulated in the motor can drain off freely through the condensate drain openings in the motor housing.

### Corrosion-proof pump design

Corrosion-proof designs are required for e.g. cooling ceilings or ceiling heating panels. For these applications, the pump housing is coated.

### ECM technology

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

### 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.

- 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-Yonos PARA High Flow 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.

### Automatic power control

The volume flow pumped through a circulation pump depends on the thermal output/cooling output requirement of the system being supplied.

This requirement varies according to:

- Climatic changes
- User behaviour
- External heat influence
- Influence of hydraulic control devices, etc.

## Wilo-Yonos PARA High Flow

The circulation pump designed for maximum load conditions is adapted to the relevant system operating status by means of a continuous comparison of the setpoint and the actual value. This automatic control constantly adapts the pump output and thus also the power consumption to the actual demand.

### Automatic venting

The rotor space is ventilated automatically by the filter and flow channel system.

This has the following benefits:

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

### Motor protection

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

- No external motor protection switch is required.
- If, in the case of replacement, there is a motor protection switch in the electrical installation that cannot be bridged, then it is to be set to the maximum current specified on the name plate.

### Features of the user interface (HMI)

- LED 7 segments display for the indication of the delivery head and error messages
- Red button
- Simple selection of the operating mode  $\Delta p-v$ ,  $\Delta p-c$
- Output of a collective fault signal
- Fault signal light
- Standard plug for all sizes

### Signal and display functions

- Collective fault signal (potential-free contact) for the connection of building automation
- Fault signal light (a red light in the case of an interference)

### Manual operation level

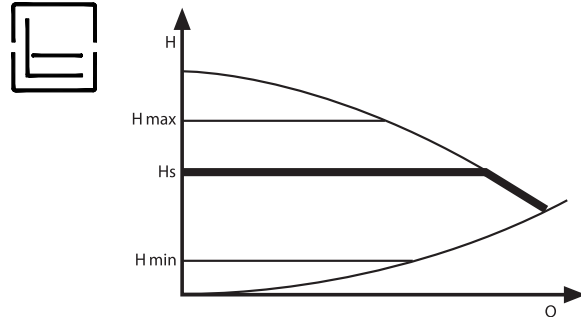
#### Operating button

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

### Control modes

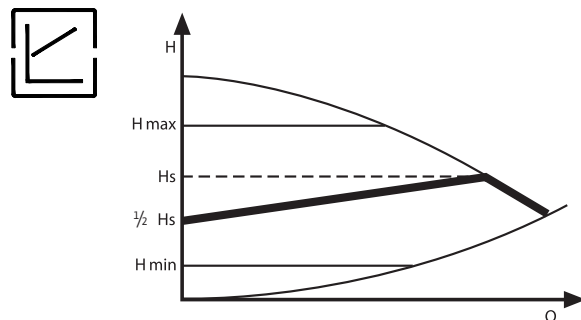
#### Control mode $\Delta p-c$ :

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.



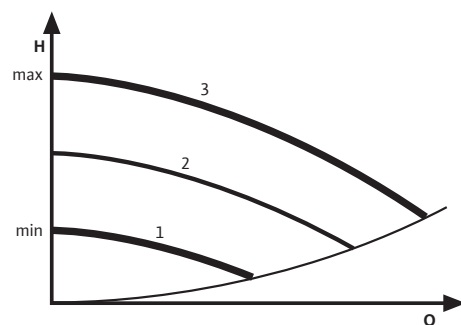
#### Control mode $\Delta p-v$ :

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  $Q$ .



#### Control mode $n$ -constant (constant speed)

In the constant speed mode the pump is set on one of the predefined fixed speeds (C1, C2, C3)



### 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







# Heating and cooling

## High-efficiency pumps

### Series overview

#### Series: Wilo-Yonos PARA



##### > Application

Hot-water heating systems of all kinds, cooling applications.  
Circulation in heating systems in the medium temperature range of  
-10 °C to +95 °C with short peaks of 110 °C

##### > Special features/product advantages

- Red Knob technology or PWM controlled
- iPWM controlled
- Unique LED user interface
- Self-protecting modes
- Designed for optimised integration
- Self controlled pump (Red Knob) or externally controlled (PWM signal)

##### > Additional information

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### Series overview

#### Series: Wilo-Yonos PARA RSTG

New!



##### > Application

Hot-water heating systems of all kinds, cooling, solar and geothermal applications. Circulation in heating systems in the medium temperature range of  $-20\text{ }^{\circ}\text{C}$  to  $+110\text{ }^{\circ}\text{C}$

##### > Special features/product advantages

- One product for all applications
- Red Knob technology or PWM controlled
- Unique LED user interface
- Self-protecting modes
- Designed for optimised integration
- Self controlled pump (Red Knob)

##### > Additional information

- Yonos PARA RSTG 15/7.5, 25/7.5, 30/7.5 .....

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#### Series: Wilo-Yonos PARA High Flow

New!



##### > Application

Hot-water heating systems of all kinds, closed cooling circuits, industrial circulation systems, circulation in solar thermal and geothermal systems. Circulation in heating systems in the medium temperature range of  $-20\text{ }^{\circ}\text{C}$  to  $+110\text{ }^{\circ}\text{C}$

##### > Special features/product advantages

- THE AC replacement solution
- LED display for the indication of set delivery head and error messages
- Simple adjustment when replacing an uncontrolled standard pump
- Quick and convenient electrical connection with Wilo plug
- System availability ensured via collective fault signal
- Pump housing with cataphoretic coating for the prevention of corrosion

##### > Additional information

- Yonos PARA HF 25/7, 30/7 .....
- Yonos PARA HF 25/10, 30/10 .....
- Yonos PARA HF 25/12, 30/12 .....

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#### Series: Wilo-Stratos PARA



##### > Application

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

##### > Special features/product advantages

- Application in the medium temperature range of  $-10\text{ }^{\circ}\text{C}$  to  $+110\text{ }^{\circ}\text{C}$
- Electronic performance control via external control signals 0-10V or PWM
- Convenient setting of the operation mode via Red Button technology
- Manual differential-pressure setpoint setting with the operating mode  $\Delta p\text{-c}$  and  $\Delta p\text{-v}$ .
- Standard delivery with cable for an easy electrical connection

##### > Additional information

- Stratos PARA 25/1-8, 30/1-8 .....
- Stratos PARA 15/1-9, 20/1-9, 25/1-9, 30/1-9 .....
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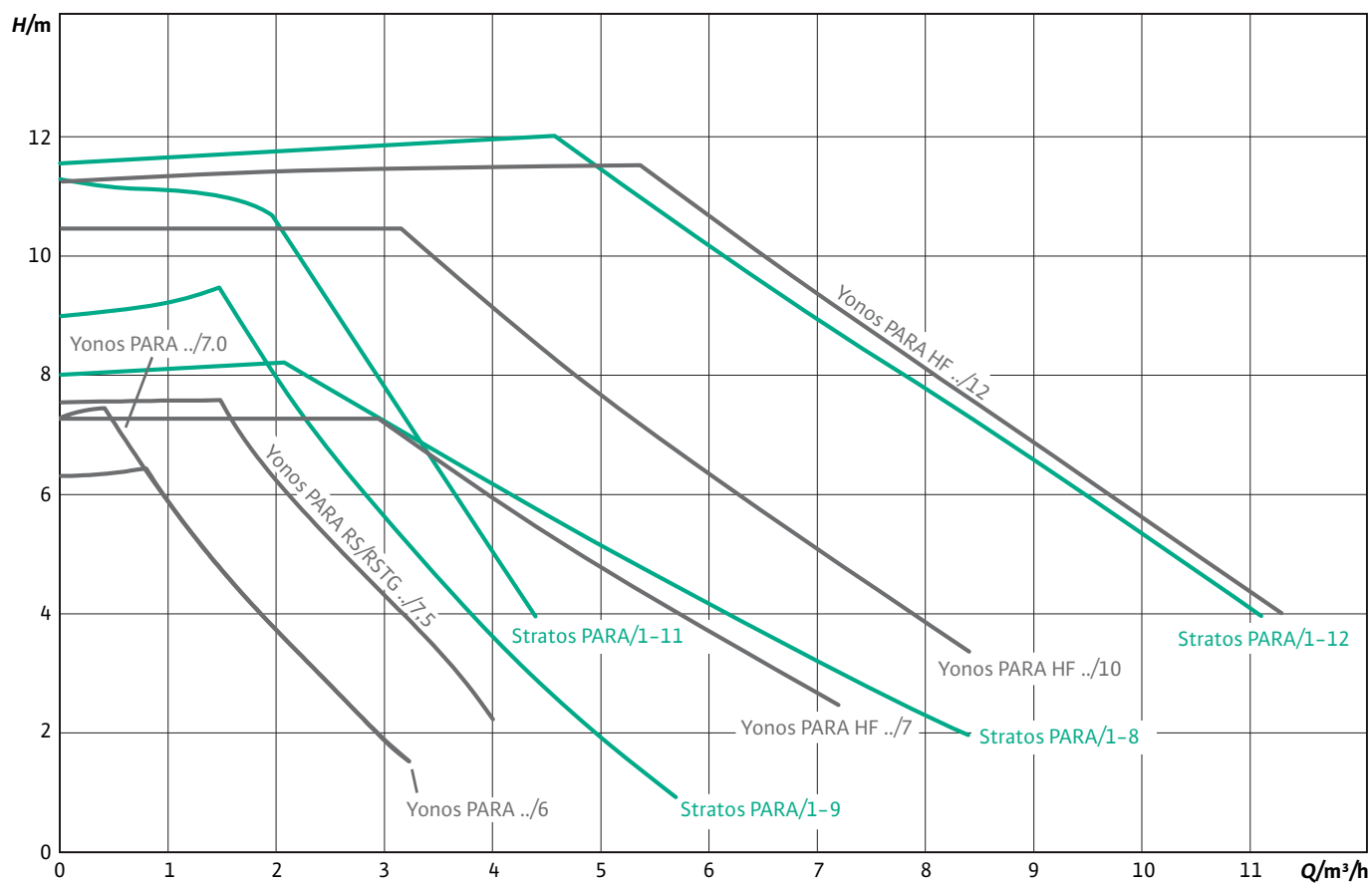
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# Heating and cooling

## High-efficiency pumps

### Series overview

#### Hydraulic operational areas



All curves conform with EN 16297

### Equipment/function

	Wilo-Yonos PARA...			
	15/6 RKA/RKC 25/6 RKA/RKC 30/6 RKA/RKC	15/7.0 RKA/RKC 25/7.0 RKA/RKC 30/7.0 RKA/RKC	15/7.5 RKA/RKC 25/7.5 RKA/RKC 30/7.5 RKA/RKC	15/7.0 (7.5) PWM1 25/7.0 (7.5) PWM1 30/7.0 (7.5) PWM1
<b>Operating modes</b>				
Manual control mode (n=constant)	• (RKC)	• (RKC)	• (RKC)	• via PWM
$\Delta p$ -c for constant differential pressure	• (RKA); ( $H_{min.} = 0,5$ m, $H_{max.} = 6$ m)	• (RKA); ( $H_{min.} = 0,5$ m, $H_{max.} = 7$ m)	• (RKA); ( $H_{min.} = 0,5$ m, $H_{max.} = 7,5$ m)	–
$\Delta p$ -v for variable differential pressure	• ( $H_{min.} = 0,5$ m, $H_{max.} = 6$ m)	• ( $H_{min.} = 0,5$ m, $H_{max.} = 7$ m)	• ( $H_{min.} = 0,5$ m, $H_{max.} = 7,5$ 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	–	–	–	–
Venting routine	• (RKA)	• (RKA)	• (RKA)	–
<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	–	–	–	•
<b>Signal and display functions</b>				
Collective fault signal (potential-free NC contact)	–	–	–	–
<b>Equipment/scope of delivery</b>				
Red button	•	•	•	–
Version without red button (=external control)	–	–	–	•
Wrench attachment point on pump body	–	–	–	–
Including power cable	on request	•	•	•
Including power plug	on request	on request	on request	–
Including control cable	–	–	–	on request
Including seals for threaded connection	on request	on request	on request	on request
Including installation and operating instructions	on request	on request	on request	on request
Including thermal insulation	on request	on request	on request	on request
Incl. Cooling-Shell for cooling	–	–	–	–
Individual packaging	on request	on request	on request	on request
Collective packaging	•	•	•	•

• = available, – = not available

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

# Heating and cooling

## High-efficiency pumps

### Equipment/function

	Yonos PARA RSTG	Yonos PARA High Flow		
	15/7.5 25/7.5 30/7.5	25/7 30/7	25/10 30/10	25/12 30/12
<b>Operating modes</b>				
Manual control mode (n=constant)	• RKC/PWM	•	•	•
$\Delta p$ -c for constant differential pressure	-	• ( $H_{min.} = 0.5$ m, $H_{max.} = 7$ m)	• ( $H_{min.} = 0.5$ m, $H_{max.} = 10$ m)	• ( $H_{min.} = 0.5$ m, $H_{max.} = 12$ m)
$\Delta p$ -v for variable differential pressure	• ( $H_{min.} = 0.5$ m, $H_{max.} = 7.5$ m)	• ( $H_{min.} = 0.5$ m, $H_{max.} = 7$ m)	• ( $H_{min.} = 0.5$ m, $H_{max.} = 10$ m)	• ( $H_{min.} = 0.5$ m, $H_{max.} = 12$ 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	-	•	•	•
Venting routine	•	-	-	-
<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	•	-	-	-
<b>Signal and display functions</b>				
Collective fault signal (potential-free NC contact)	-	•	•	•
<b>Equipment/scope of delivery</b>				
Red button	•	•	•	•
Version without red button (=external control)	-	-	-	-
Wrench attachment point on pump body	-	•	•	•
Including power cable	on request	on request	on request	on request
Including power plug	on request	on request	on request	on request
Including control cable	-	-	-	-
Including seals for threaded connection	on request	on request	on request	on request
Including installation and operating instructions	on request	on request	on request	on request
Including thermal insulation	on request	on request	on request	on request
Incl. Cooling-Shell for cooling	-	-	-	-
Individual packaging	•	•	•	•
Collective packaging	•	•	•	•

• = available, - = not available

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

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### Equipment/function

	Wilo-Stratos PARA...			
	25/1-8 30/1-8	15/1-9 20/1-9 25/1-9 30/1-9	25/1-11 30/1-11	25/1-12 30/1-12
<b>Operating modes</b>				
Manual control mode (n=constant)	• via Analog In 0-10 V or PWM	• via Analog In 0-10 V or PWM	• via Analog In 0-10 V or PWM	• via Analog In 0-10 V or PWM
$\Delta p$ -c for constant differential pressure	• ( $H_{min.} = 1$ m, $H_{max.} = 7$ m)	• ( $H_{min.} = 1$ m, $H_{max.} = 9$ m)	• ( $H_{min.} = 2$ m, $H_{max.} = 10$ m)	• ( $H_{min.} = 2$ m, $H_{max.} = 11$ m)
$\Delta p$ -v for variable differential pressure	• ( $H_{min.} = 2$ m, $H_{max.} = 8$ m)	• ( $H_{min.} = 2$ m, $H_{max.} = 9$ m)	• ( $H_{min.} = 4$ m, $H_{max.} = 11$ m)	• ( $H_{min.} = 4$ m, $H_{max.} = 12$ 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	•	•	•	•
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*
Control input "Analogue In 0 ... 10 V" without cable break function (remote setpoint adjustment)	on request*	on request*	on request*	on request*
Control input PWM	on request*	on request*	on request*	on request*
<b>Signal and display functions</b>				
Collective fault signal (potential-free NC contact)	•	•	•	•
<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
Including seals for threaded connection	on request	on request	on request	on request
Including installation and operating instructions	on request	on request	on request	on request
Including thermal insulation	on request	on request	on request	on request
Incl. Cooling-Shell for cooling	on request	on request	on request	on request
Individual packaging	•	•	•	•
Collective packaging	on request 108 pumps/box	on request 196 pumps/box	on request 108 pumps/box	on request 72 pumps/box

• = available, – = not available

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



# Heating and cooling

## High-efficiency pumps

### Series description Wilo-Yonos PARA .../6



#### Design

Glandless circulation pump with a cast iron pump housing and threaded connection or with specific composite pump housing. EC-motor with automatic power adjustment and self-protecting modes. Operation by Red Knob technology or remote control via external PWM signal. Equipped with LED user interface.

#### Application

Hot-water heating systems of all kinds, cooling applications

#### Type key

Example: **Yonos PARA RS 15/6 RKA C 130 12**

**Yonos** Electronically controlled high-efficiency pump  
**PARA** pump range adapted to requirements of the OEM market  
**RS** Heating inline cast iron pump housing  
**RS** Standard cast iron pump housing  
**RSB** Cast iron axial pump housing  
**RS KU** Composite inline pump housing  
**KSL** Composite OEM pump housing  
**RSL KU** Composite inline pump housing with venting  
**MSL** Composite OEM pump housing  
**NFSL** Composite OEM pump housing  
**HU15** Hydraulic unit  
**HU25** Hydraulic unit  
**BSL** Composite OEM pump housing anticlockwise rotation  
**HPS** Composite OEM pump housing  
**TWP** Composite three way OEM pump housing  
**15/** Nominal diameter:  
**12** threading ¾"  
**15** threading 1"  
**20** threading 1 ¼"  
**25** threading 1 ½"  
**30** threading 2"  
**6** Nominal delivery head range [m]  
**RKA** The pump is controlled by Red Knob technology:  
**RKA** =  $\Delta p-v / \Delta p-c$   
or  
**RKC** =  $\Delta p-v / \text{constant speed I, II, III}$   
or  
**PWM1** = the pump is controlled by an external system via PWM1 or iPWM1 signal

**C** Integrated Molex 3-way connector  
**130** Pump housing length: 110 mm, 130 mm or 180 mm  
**12** Electronic box orientation

#### 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

Energy efficiency index (EEI) ≤ 0.20  
Max. delivery head 6.2 m  
Max. volume flow 3.3 m³/h

##### Permitted field of application

Temperature range at max. ambient temperature  
of 58°C = 0 to 100°C  
of 62°C = 0 to 90°C  
of 66°C = 0 to 80°C  
of 71°C = 0 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  
EN 61000-6-4  
Interference resistance EN 61000-6-2  
EN 61000-6-1  
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°C 0.5 / 4.5 m

• = available, - = not available

### Dimensions, motor data Wilo-Yonos PARA RS 15/6, 25/6, 30/6 Red Knob

Front view



Rear view

Overall length 110 mm



Rear view

Overall length 130 mm



Rear view

Overall length 180 mm



#### Motor data

Wilo-Yonos PARA...	Speed	Power consumption 1~230 V	Current at 1~230V	Motor protection
	$n$	$P_1$	$I$	—
	rpm	W	A	—
RS .../6 RKA/RKC	800 - 4300	3-45	0.03 - 0.44	integrated

#### Materials

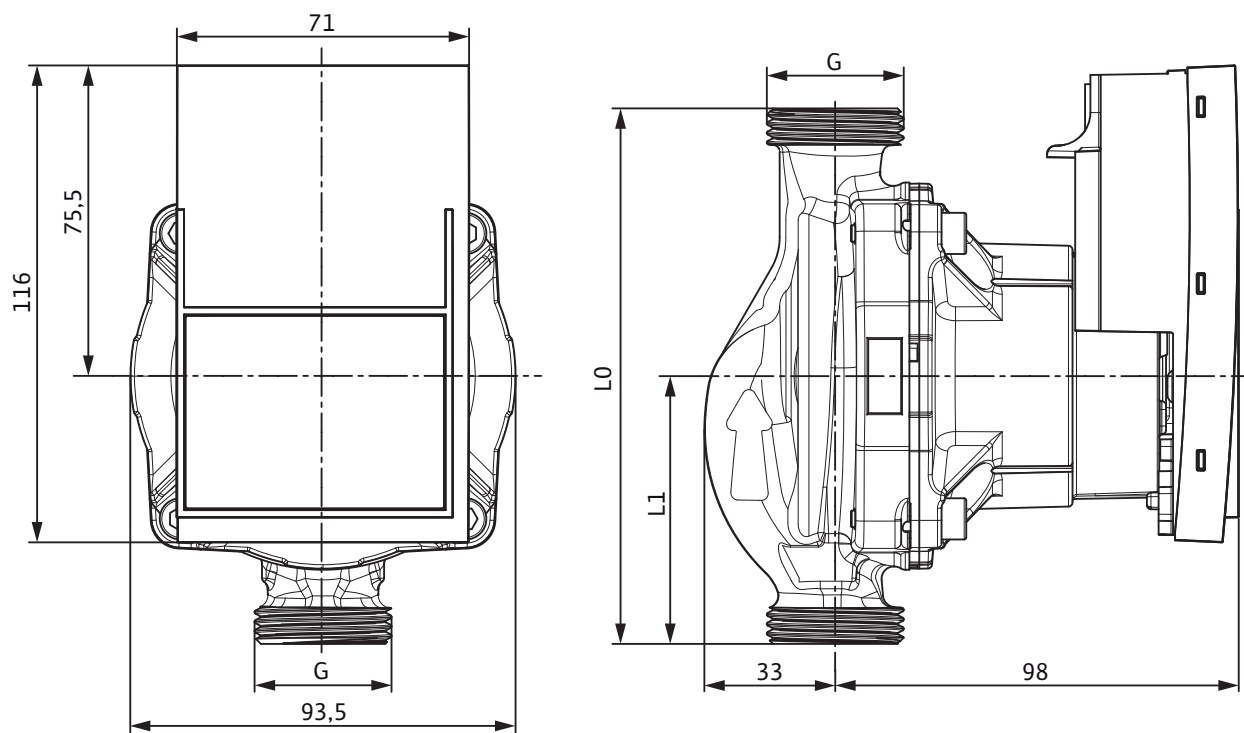
Wilo-Yonos PARA...	Pump housing	Impeller	Pump shaft	Bearing
RS .../6 RKA/RKC	Cast iron with cataphoresis treatment	PP composite with GF 40%	Stainless steel	Carbon, metal impregnated

# Heating and cooling

## High-efficiency pumps

### Dimensions, motor data Wilo-Yonos PARA RS 15/6, 25/6, 30/6 Red Knob

#### Dimension drawing



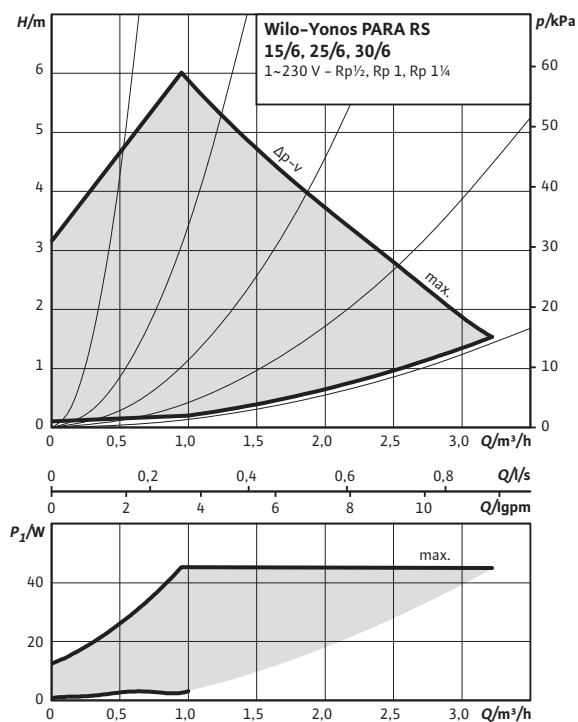
#### Dimensions, weights

Wilo-Yonos PARA...	Threaded pipe union	Thread	Overall length	Dimensions	Weight approx.
	—		$l_0$	$L1$	$m$
	—		mm		kg
RS 15/6 RKA/RKC	Rp ½	G 1	110	55	1.6
RS 15/6 RKA/RKC	Rp ½	G 1	130	65	1.7
RS 25/6 RKA/RKC	Rp 1	G 1½	130	65	1.8
RS 25/6 RKA/RKC	Rp 1	G 1½	180	90	1.9
RS 30/6 RKA/RKC	Rp 1¼	G 2	180	90	2.1

### Pump curves Wilo-Yonos PARA RS 15/6, 25/6, 30/6 Red Knob

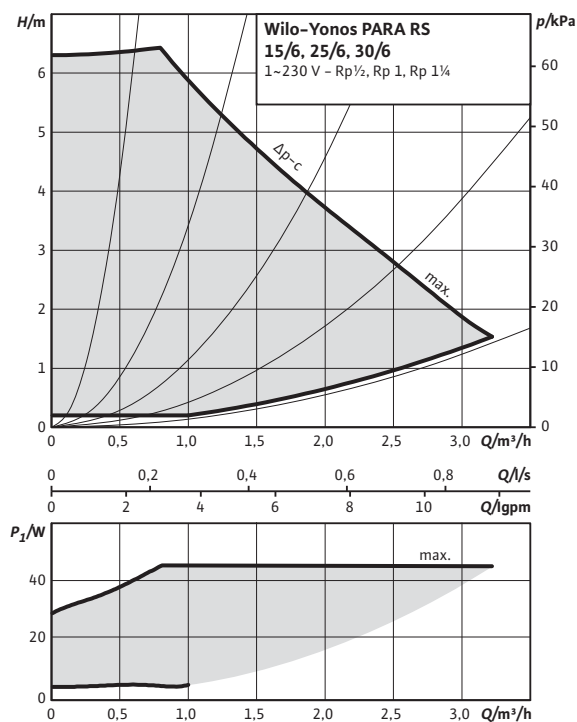
#### Wilo-Yonos PARA RS 15/6, 25/6, 30/6

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



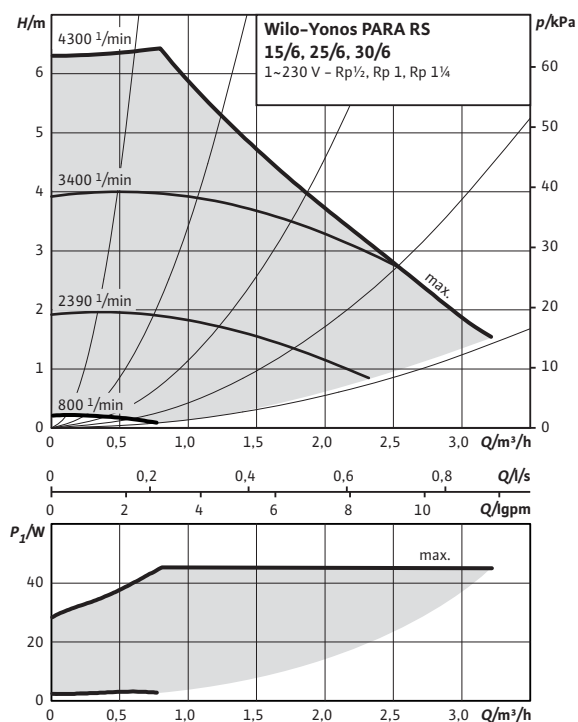
#### Wilo-Yonos PARA RS 15/6, 25/6, 30/6

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



#### Wilo-Yonos PARA RS 15/6, 25/6, 30/6

##### Constant speed I, II, III



# Heating and cooling

## High-efficiency pumps

### Dimensions, motor data Wilo-Yonos PARA RSB 15/6 Red Knob

Front view



Rear view



#### Motor data

Wilo-Yonos PARA...	Speed	Power consumption 1~230 V	Current at 1~230V	Motor protection
	$n$	$P_1$	$I$	—
	rpm	W	A	—
RSB 15/6 RKC	800 - 4300	3-45	0.03 - 0.44	integrated

#### Materials

Wilo-Yonos PARA...	Pump housing	Impeller	Pump shaft	Bearing
RSB 15/6 RKC	Cast iron with cathaphoresis treatment	PP composite with GF 40%	Stainless steel	Carbon, metal impregnated

### Series description Wilo-Yonos PARA Z .../7.0 Red Knob, PWM2



#### Design

Glandless circulation pump with a brass pump housing and threaded connection. EC motor with automatic power adjustment and self-protecting modes.

Operation by Red Knob technology or remote control via external PWM signal. Equipped with LED user interface.

#### Application

Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds.

#### Type key

Example:	<b>Yonos PARA Z15/7.0 RKC C 130 12</b>
<b>Yonos</b>	Electronically controlled high-efficiency pump
<b>PARA</b>	Pump range adapted to requirements of the OEM market
<b>Z</b>	Pump for sanitary hot water circulation systems, with brass pump housing
<b>15/</b>	Nominal diameter: <b>15</b> threading 1" <b>25</b> threading 1 1/2"
<b>7.0</b>	Nominal delivery head range [m]
<b>RKC</b>	The pump is controlled by Red Knob technology: <b>RKC</b> = $\Delta p - v$ / constant speed I, II, III or <b>PWM2</b> = the pump is controlled by an external system via PWM2 signal
<b>C</b>	Integrated Molex 3-way connector
<b>130</b>	Pump housing length: 130 mm or 180 mm
<b>12</b>	Electronic box orientation

#### Technical data

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

Water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)

##### Power

Max. delivery head	7 m
Max. volume flow	2.5 m <sup>3</sup> /h

##### Permitted field of application

Temperature range at max. ambient temperature	of 62°C = 0 to 90°C of 66°C = 0 to 80°C of 71°C = 0 to 70°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 EN 61000-6-4
Interference resistance	EN 61000-6-2 EN 61000-6-1
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 °C	0.5 / 4.5
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• = available, - = not available



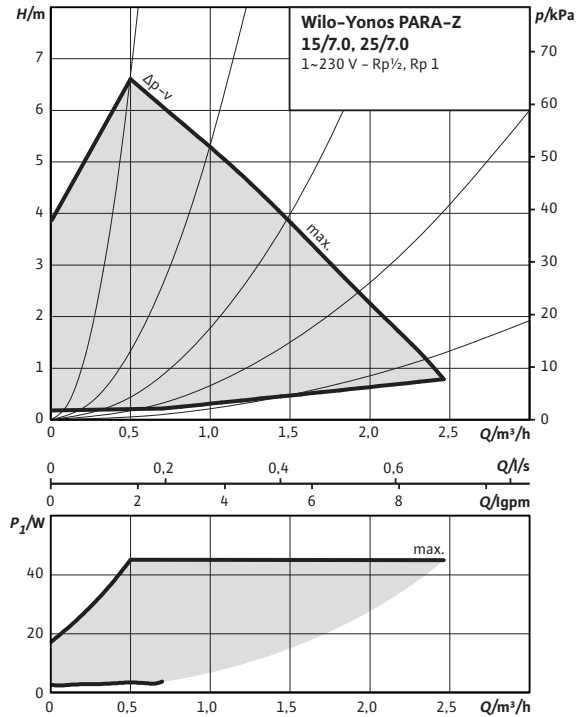
# Sanitary hot water circulation

## High-efficiency pumps

### Pump curves Wilo-Yonos PARA Z .../7.0 Red Knob, PWM2

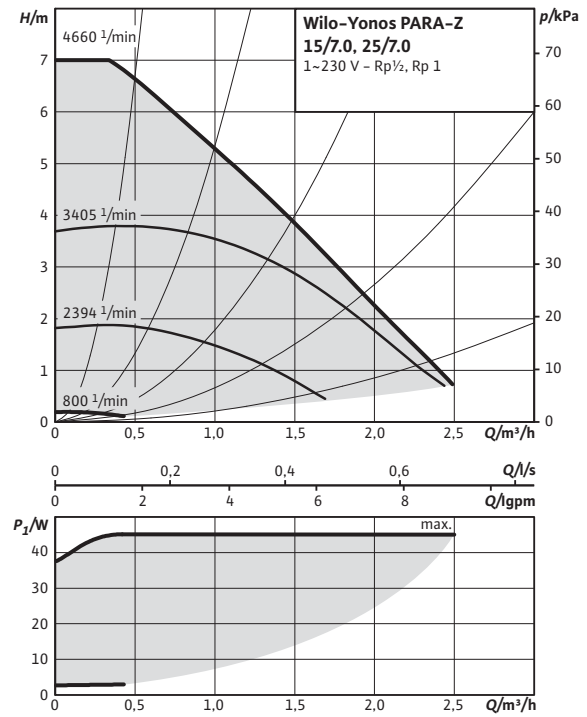
#### Wilo-Yonos PARA Z 15/7.0, 25/7.0

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



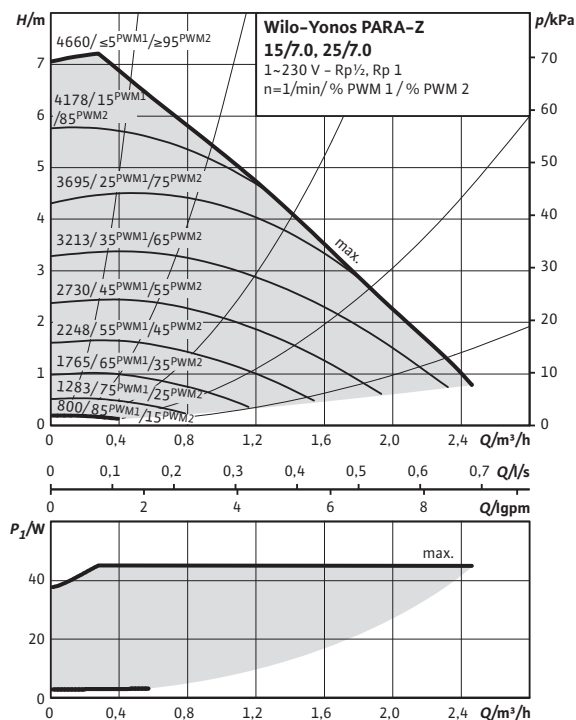
#### Wilo-Yonos PARA Z 15/7.0, 25/7.0

##### Constant speed I, II, III



#### Wilo-Yonos PARA Z 15/7.0, 25/7.0

##### External control via PWM2



### Dimensions, motor data Wilo-Yonos PARA Z .../7.0 Red Knob, PWM2

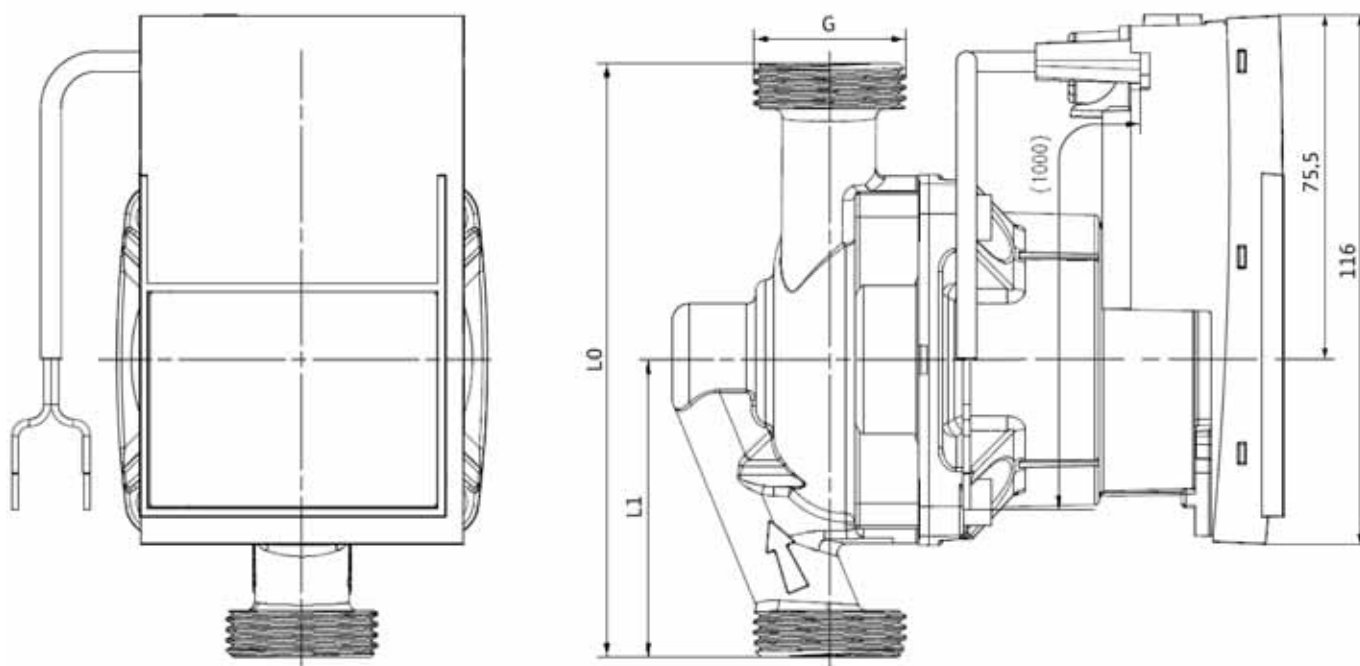
#### Motor data

Wilo-Yonos PARA Z...	Speed	Power consumption 1~230 V	Current at 1~230V	Motor protection
	$n$	$P_1$	$I$	—
	rpm	W	A	—
.../7.0 RKC/PWM2	800 - 4660	3-45	0.03 - 0.44	integrated

#### Materials

Wilo-Yonos PARA Z...	Pump housing	Impeller	Pump shaft	Bearing
.../7.0 RKC/PWM2	Brass forged	PP composite with GF 40%	Stainless steel	Carbon, synthetic resin impregnated

#### Dimension drawing



#### Dimensions, weights

Wilo-Yonos PARA Z...	Threaded pipe union	Thread	Overall length	Dimensions	Weight approx.
	—		$l_0$	$L1$	$m$
	—		mm		kg
15/7.0 RKC/PWM2	Rp ½	G 1	130	65	1.6
25/7.0 RKC/PWM2	Rp 1	G 1½	180	90	1.9

# Sanitary hot water circulation

## High-efficiency pumps

### Series description Wilo-Stratos PARA-Z 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

Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds.

#### Type key

Example:	<b>Wilo-Stratos PARA-Z 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>Z</b>	Pump for sanitary hot water circulation systems
<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 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
- Delivery in collective (108 pumps/packaging)
- Delivery with thermal insulation
- Cold insulation Cooling-Shell as accessories

#### Technical data

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

Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)

##### Power

Energy efficiency index (EEI)	$\leq 0.23$
Max. delivery head	8 m
Max. volume flow	8.0 m <sup>3</sup> /h

##### Permitted field of application

Temperature range at max. ambient temperature	of 25°C = -10 to 110°C of 40°C = -10 to 90°C of 45°C = -10 to 80°C of 50°C = -10 to 70°C of 55°C = -10 to 60°C of 60°C = -10 to 50°C of 65°C = -10 to 40°C
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature	of 40°C = 0 to 80°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

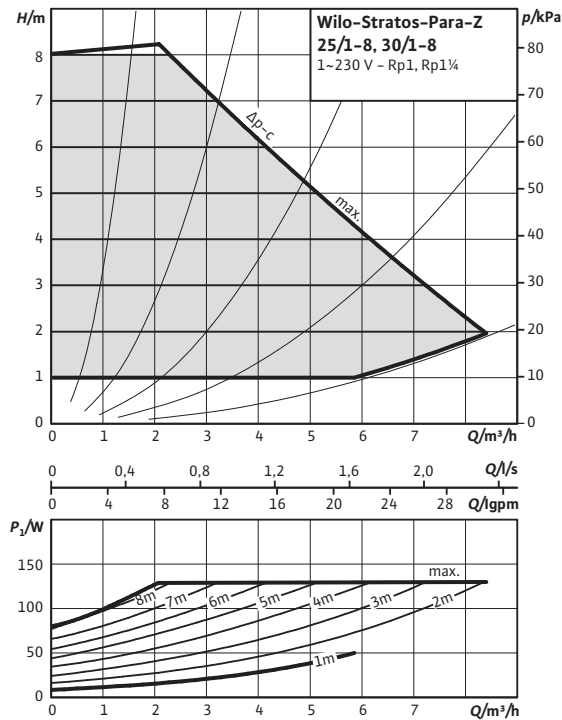
Minimum suction head at 50 / 95 / 110 °C	3 / 10 / 16 m
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• = available, - = not available

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

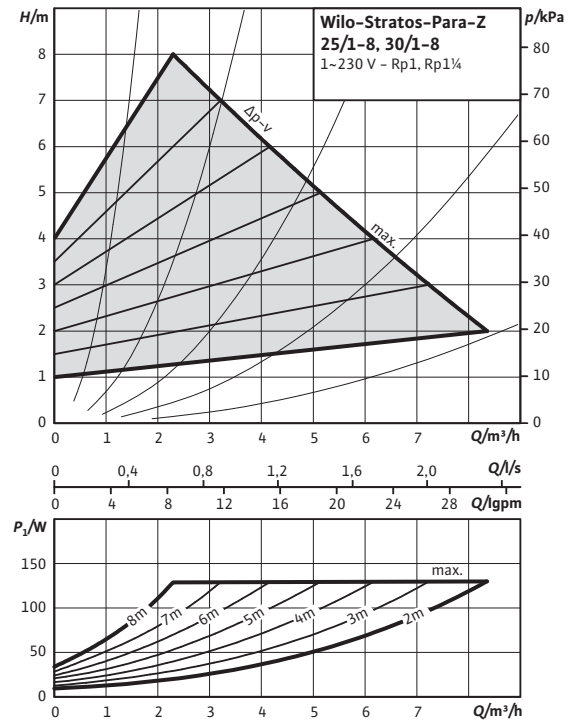
#### Wilo-Stratos PARA-Z 25/1-8, 30/1-8

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



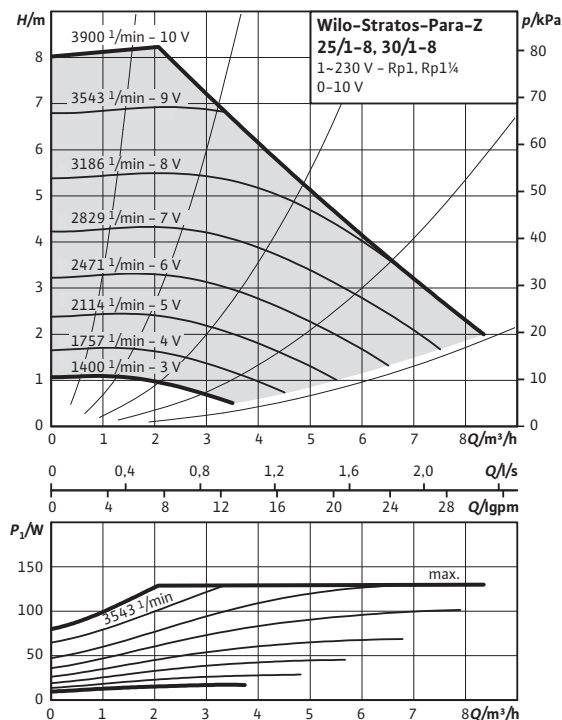
#### Wilo-Stratos PARA-Z 25/1-8, 30/1-8

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



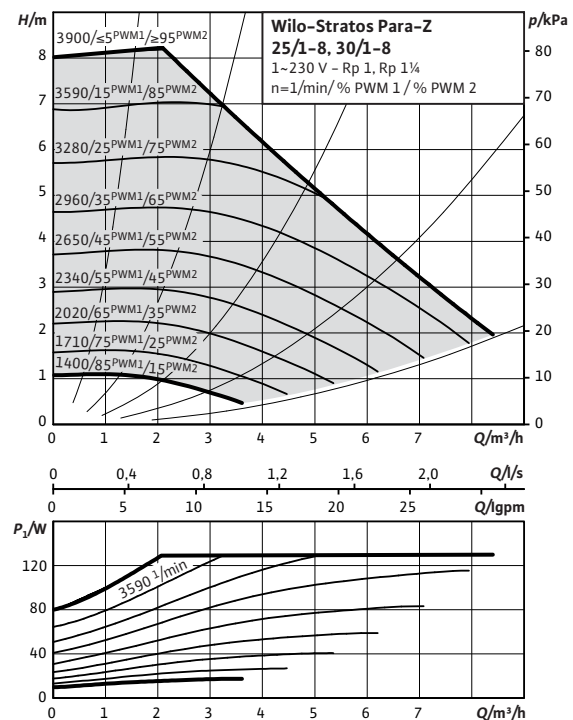
#### Wilo-Stratos PARA-Z 25/1-8, 30/1-8

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



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

##### External control via PWM



# Sanitary hot water circulation

## High-efficiency pumps

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

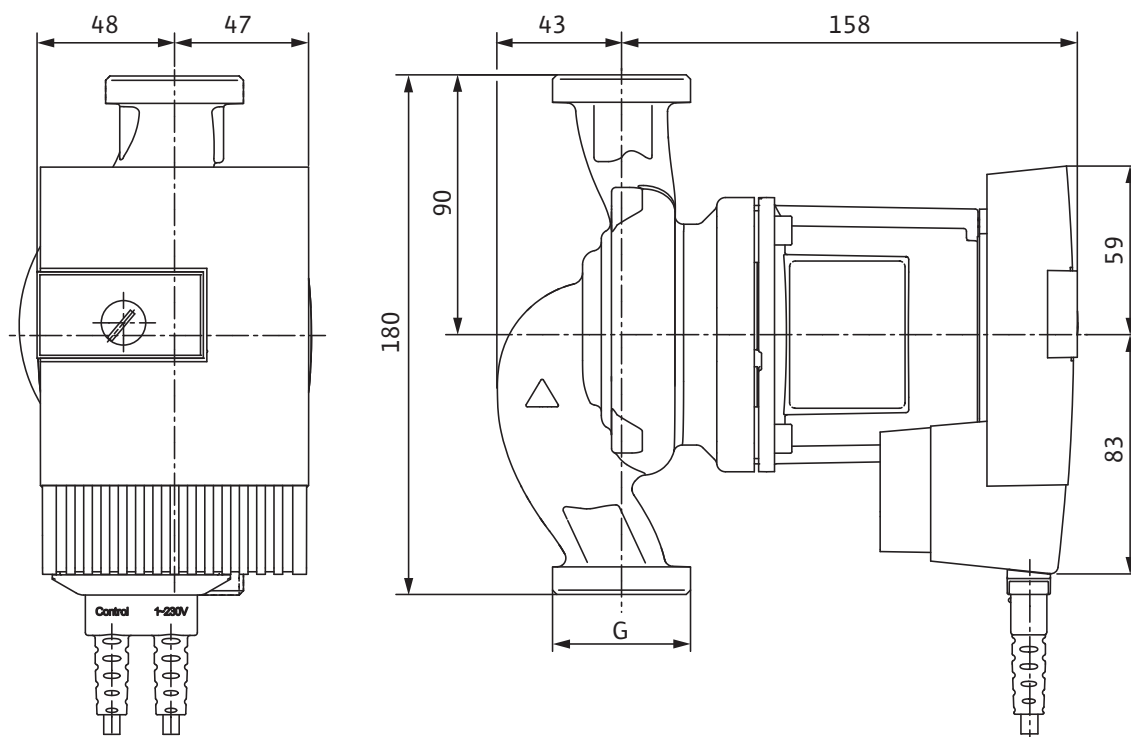
#### Motor data

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

#### Materials

Wilo-Stratos PARA-Z...	Pump housing	Impeller	Pump shaft	Bearing
.../1-8	Red brass (CC 499K) according to DIN 50930-6 in accordance with Drinking Water Ordinance	Plastic (PPS – 40% GF)	Stainless steel (X39CrMo17-1)	Carbon, synthetic resin impregnated

#### Dimension drawing



#### Dimensions, weights

Wilo-Stratos PARA-Z...	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

### Series description Wilo-Stratos PARA-Z 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

Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds.

#### Type key

Example:	<b>Wilo-Stratos PARA-Z 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>Z</b>	Pump for sanitary hot water circulation systems
<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 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
- Delivery in collective (108 pumps/packaging)
- Delivery with thermal insulation
- Cold insulation Cooling-Shell as accessories

#### Technical data

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

Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)

##### Power

Energy efficiency index (EEI)	$\leq 0.23$
Max. delivery head	11 m
Max. volume flow	4.5 m <sup>3</sup> /h

##### Permitted field of application

Temperature range at max. ambient temperature	of 25°C = -10 to 110°C of 40°C = -10 to 90°C of 45°C = -10 to 80°C of 50°C = -10 to 70°C of 55°C = -10 to 60°C of 60°C = -10 to 50°C of 65°C = -10 to 40°C
Temperature range for applications in secondary hot water circulation systems at max. ambient temperature	of 40°C = 0 to 80°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
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• = available, - = not available

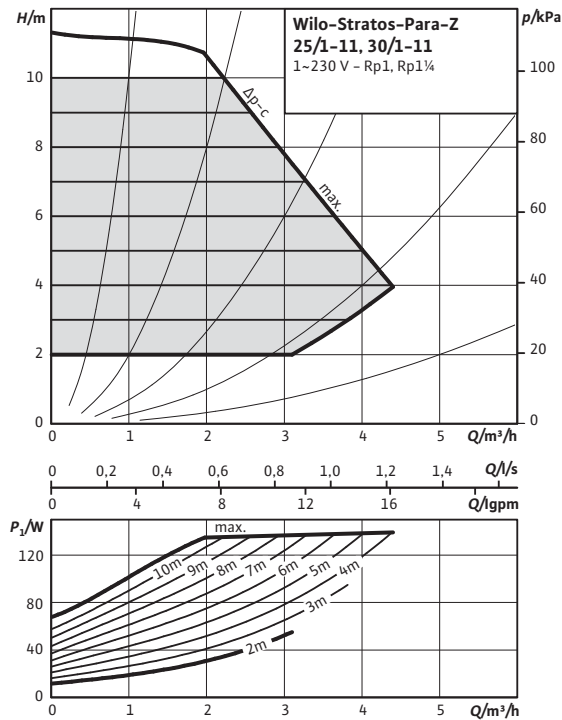
# Sanitary hot water circulation

## High-efficiency pumps

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

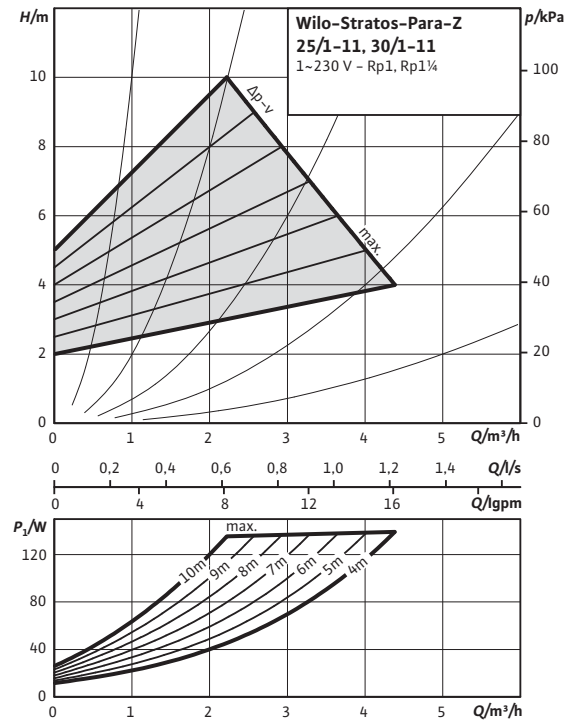
#### Wilo-Stratos PARA-Z 25/1-11, 30/1-11

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



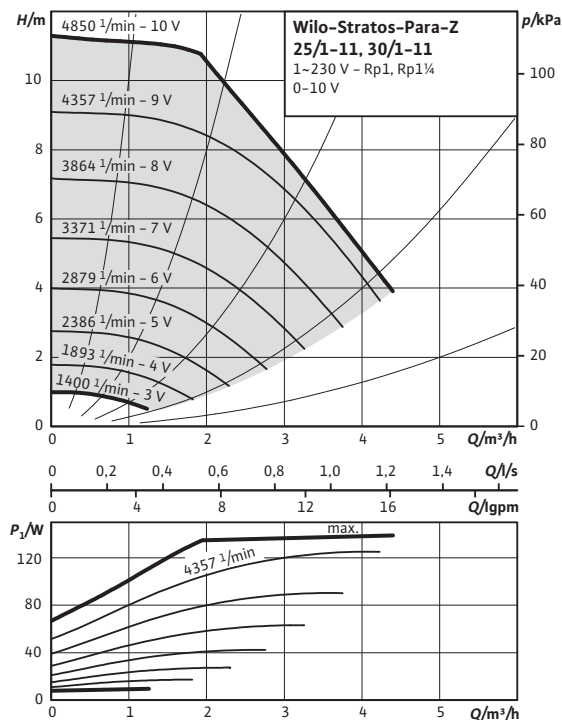
#### Wilo-Stratos PARA-Z 25/1-11, 30/1-11

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



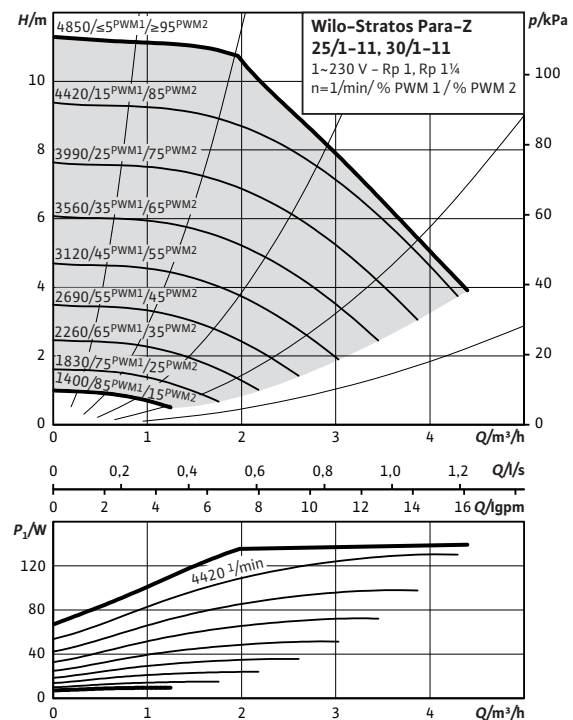
#### Wilo-Stratos PARA-Z 25/1-11, 30/1-11

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



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

##### External control via PWM



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

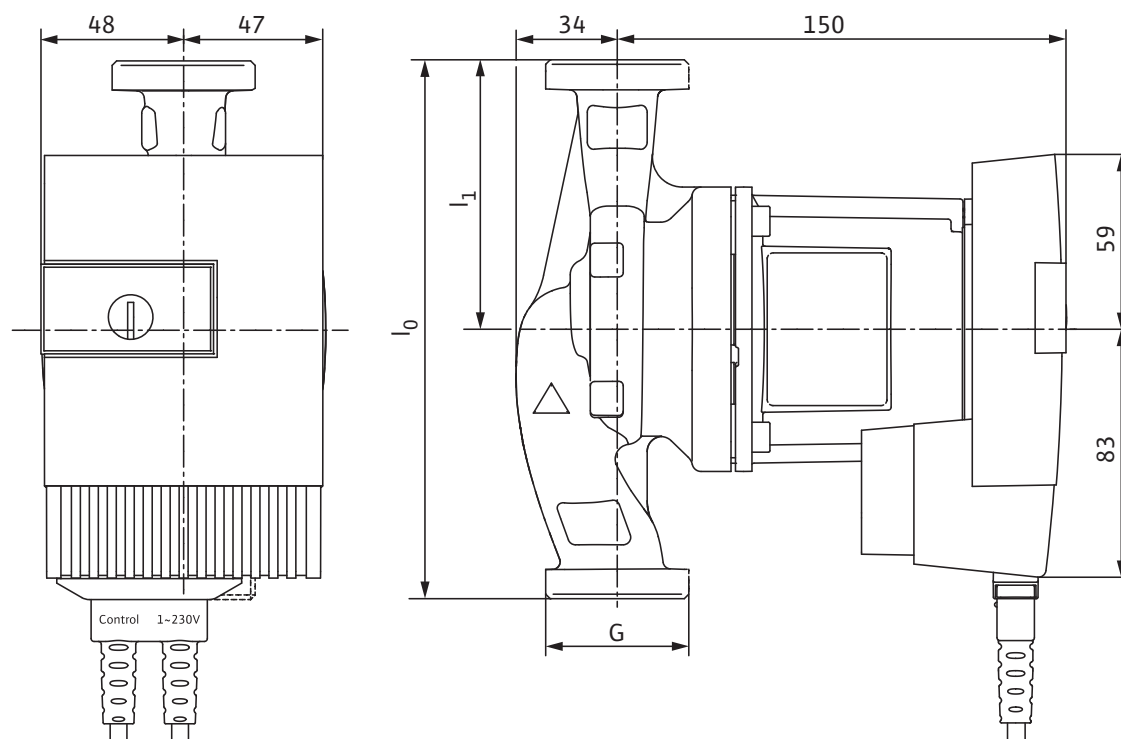
## Motor data

Wilo-Stratos PARA-Z...	Speed	Power consumption 1~230 V	Current at 1~230V	Motor protection
	$n$	$P_1$	$I$	—
	rpm	W	A	—
.../1-11	1400 - 4850	8-140	0.07 - 1.05	integrated

## Materials

Wilo-Stratos PARA-Z...	Pump housing	Impeller	Pump shaft	Bearing
.../1-11	Red brass (CC 499K) according to DIN 50930-6 in accordance with Drinking Water Ordinance	Plastic (PPS – 40% GF)	Stainless steel (X39CrMo17-1)	Carbon, synthetic resin impregnated

## Dimension drawing



## Dimensions, weights

Wilo-Stratos PARA-Z...	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
30/1-11	Rp 1¼	G 2	180	90	4.3



# Sanitary hot water circulation

## High-efficiency pumps

### Series description Wilo-Stratos PARA-Z 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

Secondary hot water circulation systems of all kinds, hot-water heating systems of all kinds.

#### Type key

Example:	<b>Wilo-Stratos PARA-Z 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>Z</b>	Pump for sanitary hot water circulation systems
<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 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
- Delivery in collective (108 pumps/package)
- Delivery with thermal insulation
- Cold insulation Cooling-Shell as accessories

#### Technical data

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

Potable water and water for food-processing companies in accordance with TrinkwV 2001 (drinking water ordinance)

•

##### Power

Energy efficiency index (EEI)  $\leq 0.23$

Max. delivery head 12 m

Max. volume flow 10.0 m<sup>3</sup>/h

##### Permitted field of application

Temperature range at max. ambient temperature

of 25°C = -10 to 110°C  
of 40°C = -10 to 90°C  
of 45°C = -10 to 80°C  
of 50°C = -10 to 65°C  
of 55°C = -10 to 50°C  
of 60°C = -10 to 35°C  
of 65°C = -10 to 20°C

Temperature range for applications in secondary hot water circulation systems at max. ambient temperature

of 40°C = 0 to 80°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

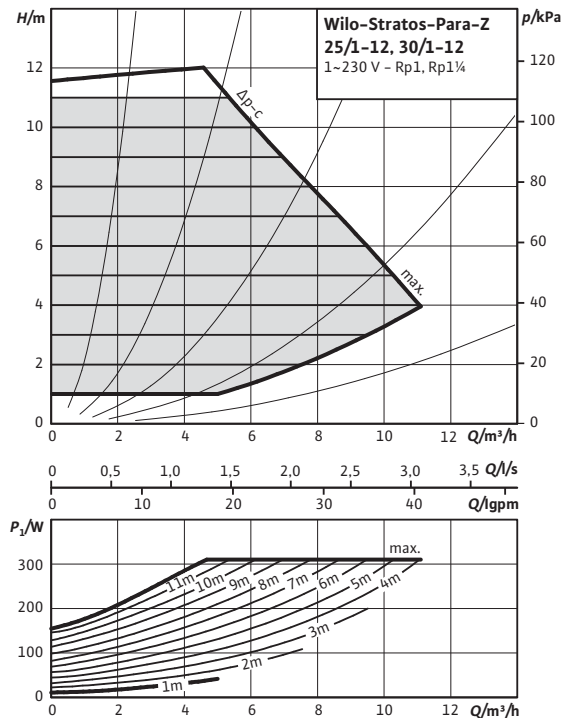
Minimum suction head at 50 / 95 / 110 °C 3 / 10 / 16 m

• = available, - = not available

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

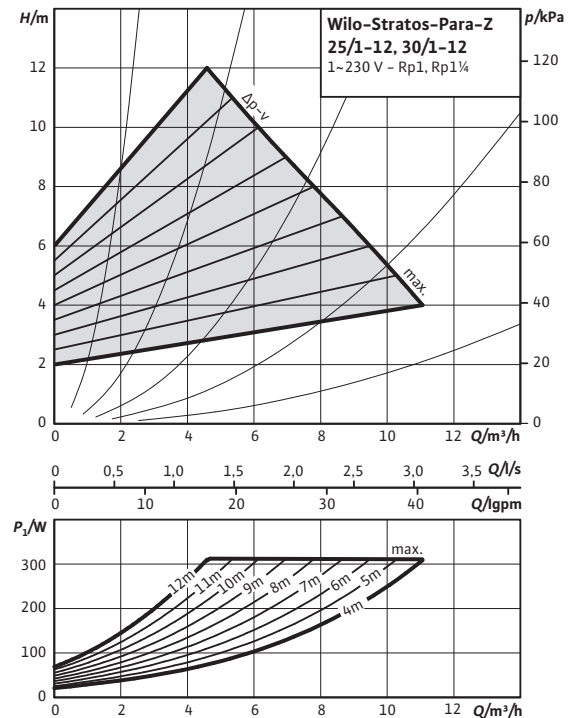
#### Wilo-Stratos PARA-Z 25/1-12, 30/1-12

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



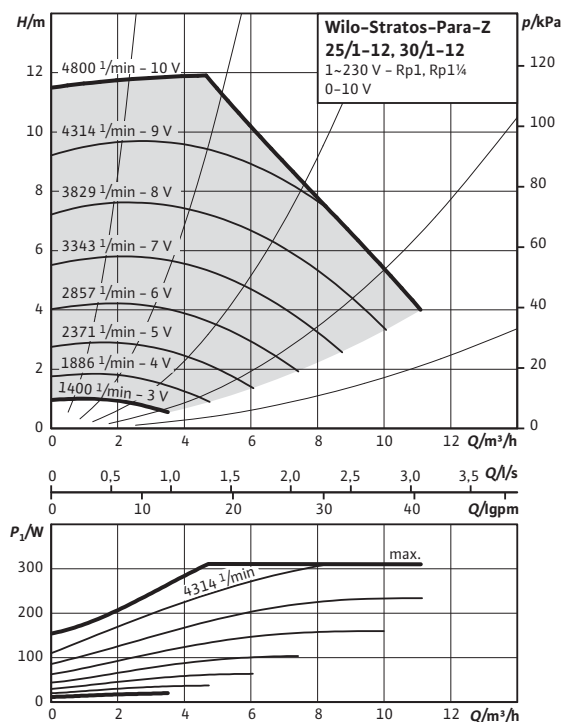
#### Wilo-Stratos PARA-Z 25/1-12, 30/1-12

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



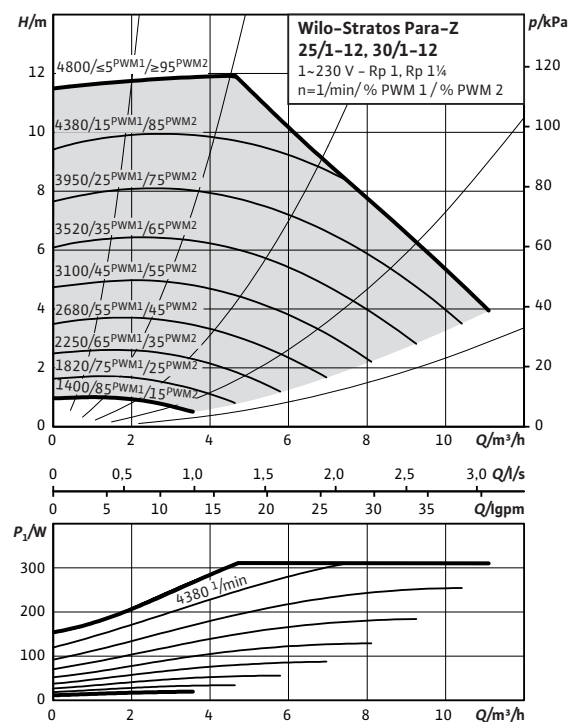
#### Wilo-Stratos PARA-Z 25/1-12, 30/1-12

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



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

##### External control via PWM



# Sanitary hot water circulation

## High-efficiency pumps

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

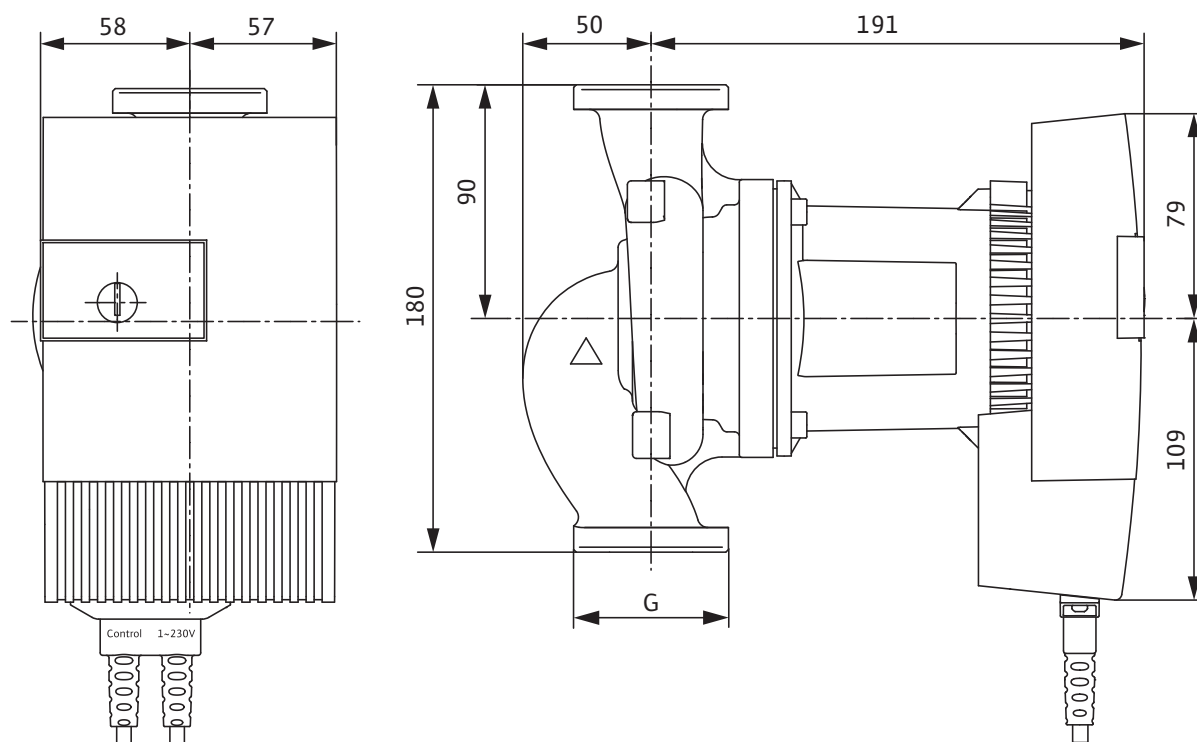
#### Motor data

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

#### Materials

Wilo-Stratos PARA-Z...	Pump housing	Impeller	Pump shaft	Bearing
.../1-12	Red brass (CC 499K) according to DIN 50930-6 in accordance with Drinking Water Ordinance	Plastic (PPS – 40% GF)	Stainless steel (X39CrMo17-1)	Carbon, synthetic resin impregnated

#### Dimension drawing



#### Dimensions, weights

Wilo-Stratos PARA-Z...	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



### Wilo-Cooling-Shell, 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:

Yonos PARA .../6; 130 mm, 180 mm  
 Yonos PARA .../7.0; 130 mm, 180 mm  
 Yonos PARA .../7.5; 130mm, 180mm  
 Yonos PARA High Flow .../7; 180 mm  
 Yonos PARA High Flow .../10; 180 mm  
 Yonos PARA High Flow .../12; 180 mm  
 Stratos PARA /1-9; 130 mm, 180 mm  
 Stratos PARA /1-8; 180 mm  
 Stratos PARA /1-11; 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-Cooling-Shell



##### > Wilo-Cooling-Shell

Diffusion-proof insulation of pump housings in cold water applications.

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

Yonos PARA .../6; 130 mm, 180 mm  
 Yonos PARA .../7.0; 130 mm, 180 mm  
 Yonos PARA .../7.5; 130 mm, 180 mm

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

Stratos PARA /1-8; 180 mm  
 Stratos PARA /1-9; 180 mm  
 Stratos PARA /1-11; 180 mm  
 Stratos PARA /1-12 ; 180 mm  
 Stratos PARA Z/1-8; 180 mm  
 Stratos PARA Z/1-11; 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.

##### > 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.
- Permitted temperature range of the fluid: -10 °C to +105 °C
- Simple contours and surfaces facilitate the application of any onsite surface coatings (e.g. coat of paint for UV protection, sheet metal application for impact protection)
- Smoother transition to ongoing pipe insulation: Pipe unions/counter flanges are enclosed by the insulation
- Dimensionally precise adjustment to the housing geometry reduces the hollow space between insulation and the pump housing and thus the inclusion of air and moisture
- The flexible elastomer insulation material can be cut and re-glued in situations where access for installation is difficult







Subject to change without prior notice.

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