

### / Function

The solar module is employed in the primary circuits of solar systems to manage the thermodynamic cycle of the heat-transfer fluid between the solar panels and the hot water storage tank. The TAS003 module is also equipped with electronic controllers which, through a sophisticated monitoring system and safety functions, ensures the total protection of the system during its operation. The insulation shell was created to accommodate the electronic controllers S303 and S305.



### / Product range

| Art.          | Size | Circulator                                 | Circulator control signal |     | PWM signal cable | Code           |
|---------------|------|--------------------------------------------|---------------------------|-----|------------------|----------------|
|               |      |                                            | ON/OFF                    | PWM |                  |                |
| TAS003+S303 • | 3/4" | Wilo ST 20/6                               | √                         | X   | X                | TAS003AE05S303 |
| TAS003+S303   | 3/4" | Taco ES2 15-70                             | √                         | X   | X                | TAS003S166S303 |
| TAS003+S303   | 3/4" | Wilo Para ST 15/6<br>ELECTRONIC CIRCULATOR | √                         | X   | X                | TAS003S165S303 |
| TAS003+S303   | 3/4" | Hefei Xinhua GPA 20-7.5 III                | √                         | √   | NOT INCLUDED*    | TAS003S167S303 |
| TAS003+S303   | 3/4" | Wilo Para STG 15-130/8-<br>75/12           | √                         | √   | NOT INCLUDED*    | TAS003S168S303 |
| TAS003+S305 • | 3/4" | Wilo ST 20/6                               | √                         | X   | X                | TAS003AE05S305 |
| TAS003+S305   | 3/4" | Taco ES2 15-70                             | √                         | X   | X                | TAS003S166S305 |
| TAS003+S305   | 3/4" | Wilo Para ST 15/6<br>ELECTRONIC CIRCULATOR | √                         | √   | X                | TAS003S165S305 |
| TAS003+S305   | 3/4" | Hefei Xinhua GPA 20-7.5 III                | √                         | √   | NOT INCLUDED*    | TAS003S167S305 |
| TAS003+S305   | 3/4" | Wilo Para STG 15-130/8-<br>75/12           | √                         | √   | NOT INCLUDED*    | TAS003S168S305 |

• Products equipped with circulators "Wilo ST 20/6" are intended for sale in non-EU countries.

\*To be purchased separately in case of connection with electronic controller with PWM signal.

## / Technical specifications

### PERFORMANCE

|                                         |                                      |
|-----------------------------------------|--------------------------------------|
| Fluids used:                            | Water and glycol solutions           |
| Maximum percentage of glycol:           | See circulator specifications page 5 |
| Maximum operating pressure:             | 10 bar                               |
| Calibration of safety valve:            | 6 bar                                |
| Temperature of the heat transfer fluid: | See circulator specifications page 5 |
| Safety valve temperature range:         | +160°C                               |
| Minimum pressure on the intake side:    | See circulator specifications page 5 |
| Opening check valves minimum pressure:  | $\Delta p$ : 2Kpa (200 mm c.a.)      |
| Manometer scale:                        | 0 ÷ 10 bar                           |
| Thermometers scale:                     | 0 ÷ 160°C                            |

### CONNECTIONS

|                                         |         |
|-----------------------------------------|---------|
| System connections:                     | G3/4" M |
| Safety valve connections :              | G1/2" F |
| Connection with expansion tank:         | G3/4" M |
| Filling/emptying connections with hose: | Ø13 mm  |

### MATERIALI

|                                                        |                                      |
|--------------------------------------------------------|--------------------------------------|
| Brass components:                                      | Brass CW617N - EN 12165              |
| Seals:                                                 | PTFE                                 |
| Sealing elements:                                      | EPDM Perox                           |
| Flat seals:                                            | See circulator specifications page 5 |
| Insulation shell:                                      | PPE                                  |
| Conductivity of insulation shell $\lambda(\Delta T)$ : | 0.041 (W/mK)                         |

### / Principle of operation

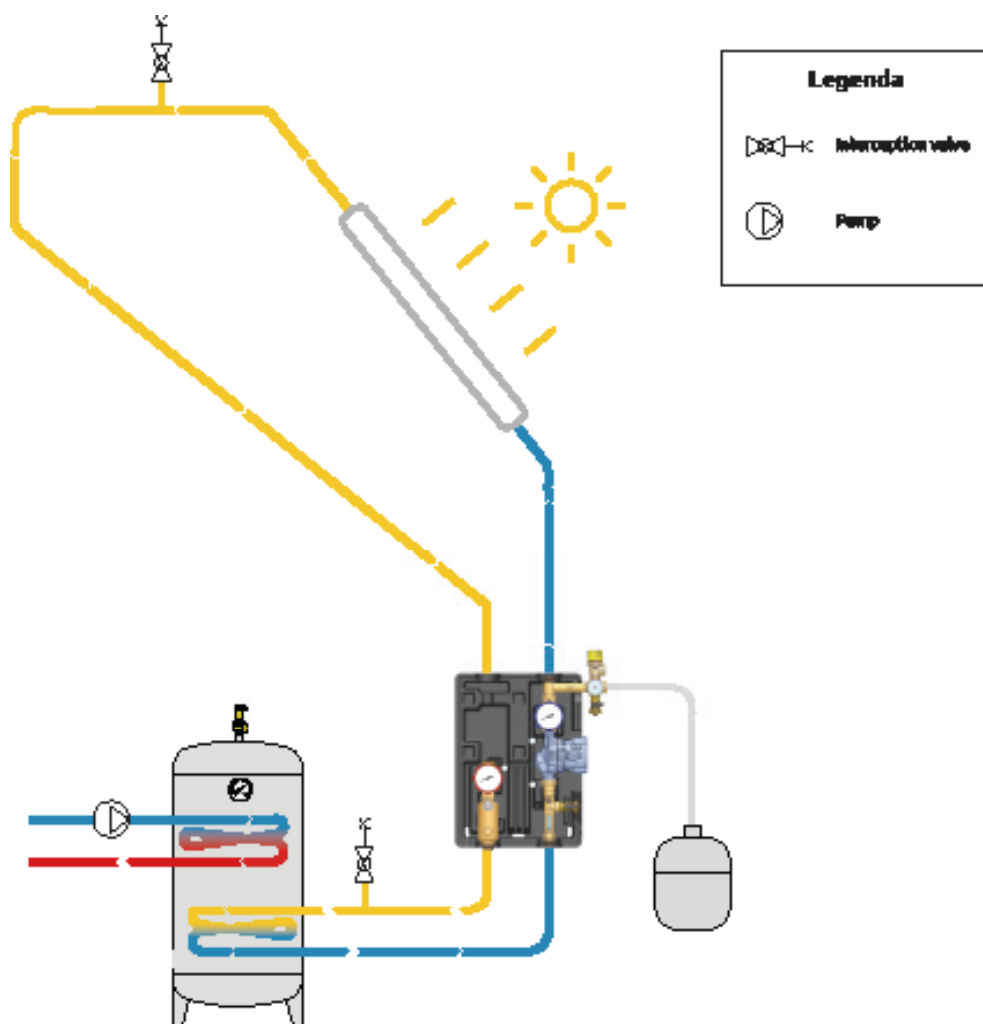
Icma solar module TAS003 is employed in the primary circuits of solar systems to manage the thermodynamic cycle of the heat-transfer fluid between the solar panels and the hot water storage tank.

In thermal solar panels the solar radiation increases the heat-transfer fluid temperature and therefore its thermal power.

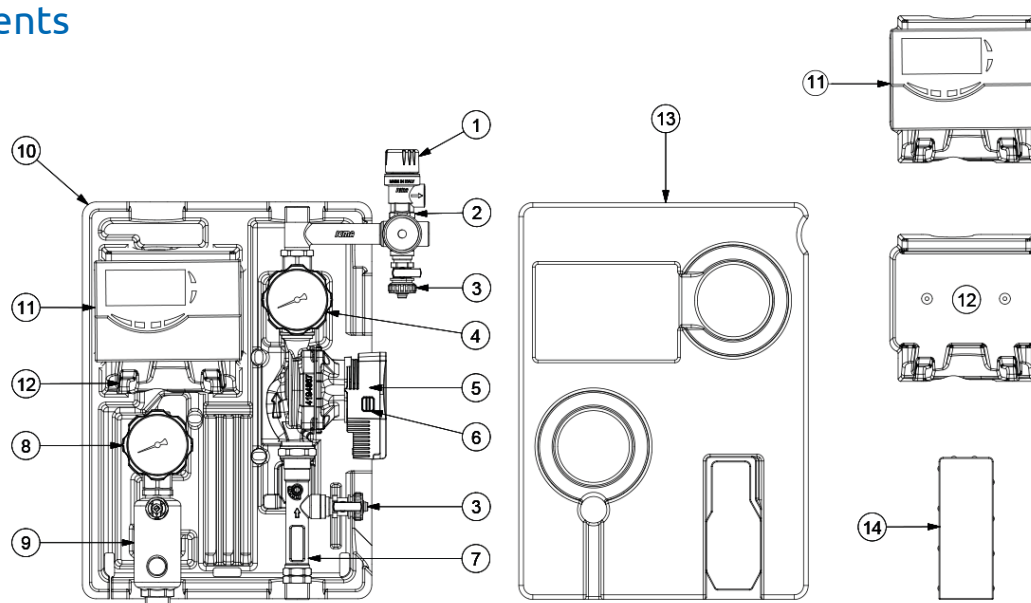
In the storage tank, instead, the heat-transfer fluid carries through a heat exchanger most of its heat to the water in the tank.

The hot water in the tank will be then used for space heating or domestic use.

The solar module manage this process and is equipped with a circulator pump having proper performances (flow and head) as well as several regulation and control devices that run the operation of the circuit.



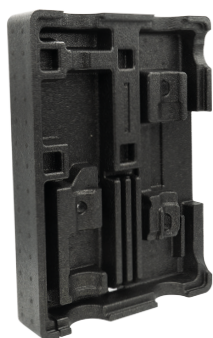
### / Components



**Tab. 1**

1. Safety valve for solar energy systems
2. Instrument holder connection with manometer
3. Taps for filling, emptying and washing the system
4. Shut off valve with thermometer and built-in check valve
5. Circulator
6. Pump connector
7. Flowmeter
8. Shut off valve with thermometer and built-in check valve
9. Deaerator
10. Preformed insulating base
11. Electronic controller S303/S305
12. Hose connection
13. Preformed insulating cover
14. Inspection compartment insert

### / Housing components



Base **CTA66S003AE6601**



Lid **CTA06S003AE66**



Control unit holder  
**CTA57S003AE66**

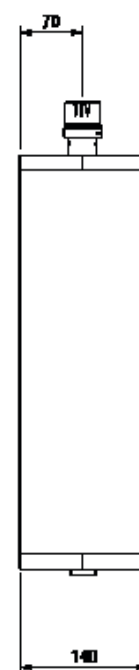
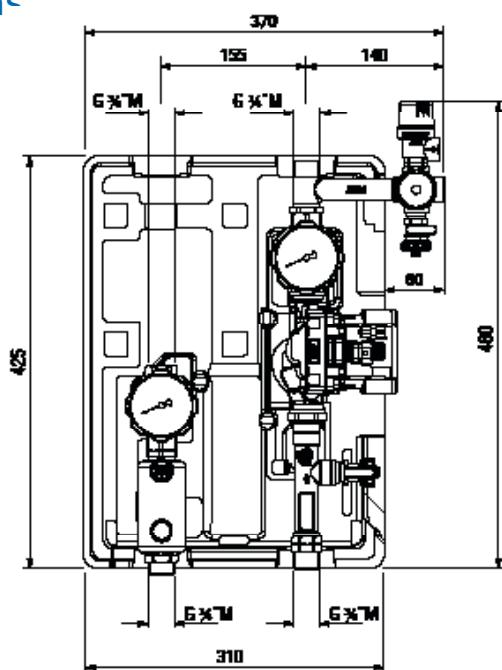


Insert **CTA05S003AE66**



Label **C03S001AE20RT**

### / Dimensione



Tab. 2

### / Technical specifications

The solar module receive a signal from the external controller which, having at least two temperature sensors (one is positioned on the panel outlet pipe and the other is an immersion sensor in the boiler), constantly reads the temperature difference and keeps it within the established range, which normally varies between 5 and 8 °C. If the  $\Delta t$  between the panel and the boiler is found to be over the established set point, the controller starts up the pump on the module to provide the lacking thermal load. If, on the other hand, the  $\Delta t$  is narrower than the one set, the internal pump will be disabled.

For further clarification about the electronic controller functioning, consult the technical documentation about art. S303 and S305.

### / Circulators range

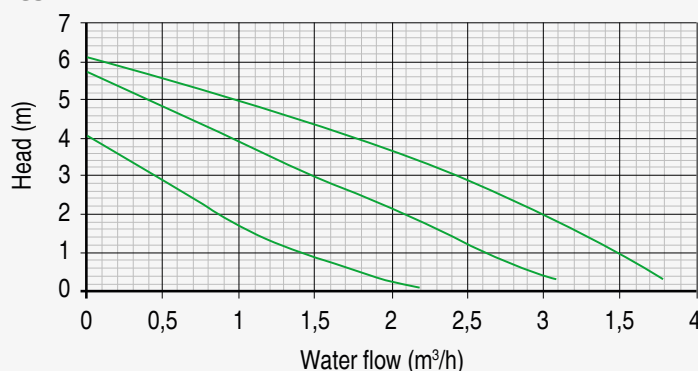
#### Art. S160 - Synchronous circulation pump with 3 speeds



#### Technical specifications

|                                      |                            |
|--------------------------------------|----------------------------|
| Brand:                               | Wilo                       |
| Model:                               | Solar ST20/6               |
| Centre to centre distance            | 130 mm.                    |
| Connections:                         | G1" M                      |
| Flat seals:                          | Cellulosic fibers with NBR |
| Electrical power supply:             | 230 V - 50/60 Hz           |
| Operating temperature:               | 2 ÷ 110°C                  |
| Max temperature:                     | 140°C for short periods    |
| Max operating pressure:              | 10 bar                     |
| Protection level:                    | IP44                       |
| Energy class (EEI):                  | C                          |
| Maximum percentage of glycol:        | 50%                        |
| Minimum pressure on the intake side: | 0,049 bar                  |

#### HYDRAULIC CHARACTERISTICS



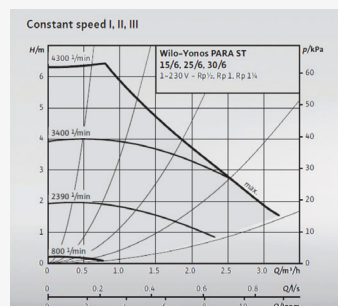
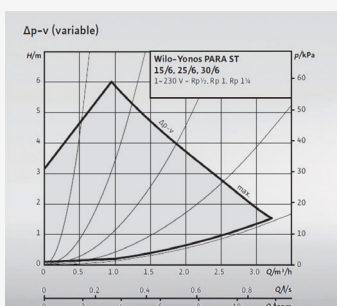
### Art. S165 - Circulator with 3 constant curves, $\Delta P$ variable



#### Technical specifications

|                                      |                            |
|--------------------------------------|----------------------------|
| Brand:                               | Wilo                       |
| Model:                               | Para 15-6                  |
| Centre to centre distance            | 130 mm.                    |
| Connections:                         | G1" M                      |
| Flat seals:                          | Cellulosic fibers with NBR |
| Electrical power supply:             | 230 V - 50/60 Hz           |
| Operating temperature:               |                            |
| • Ambient temperature = 58°C         | 2 ÷ 100°C                  |
| • Ambient temperature = 62°C         | 2 ÷ 90°C                   |
| • Ambient temperature = 66°C         | 2 ÷ 80°C                   |
| • Ambient temperature = 71°C         | 2 ÷ 70°C                   |
| Max operating pressure:              | 10 bar                     |
| Protection level:                    | IPX4D                      |
| Energy class (EEI):                  | ≤0.20                      |
| Maximum percentage of glycol:        | 50%                        |
| Minimum pressure on the intake side: |                            |
| • T=85°C                             | 0,049 bar                  |
| • T=90°C                             | 0,270 bar                  |

#### HYDRAULIC CHARACTERISTICS



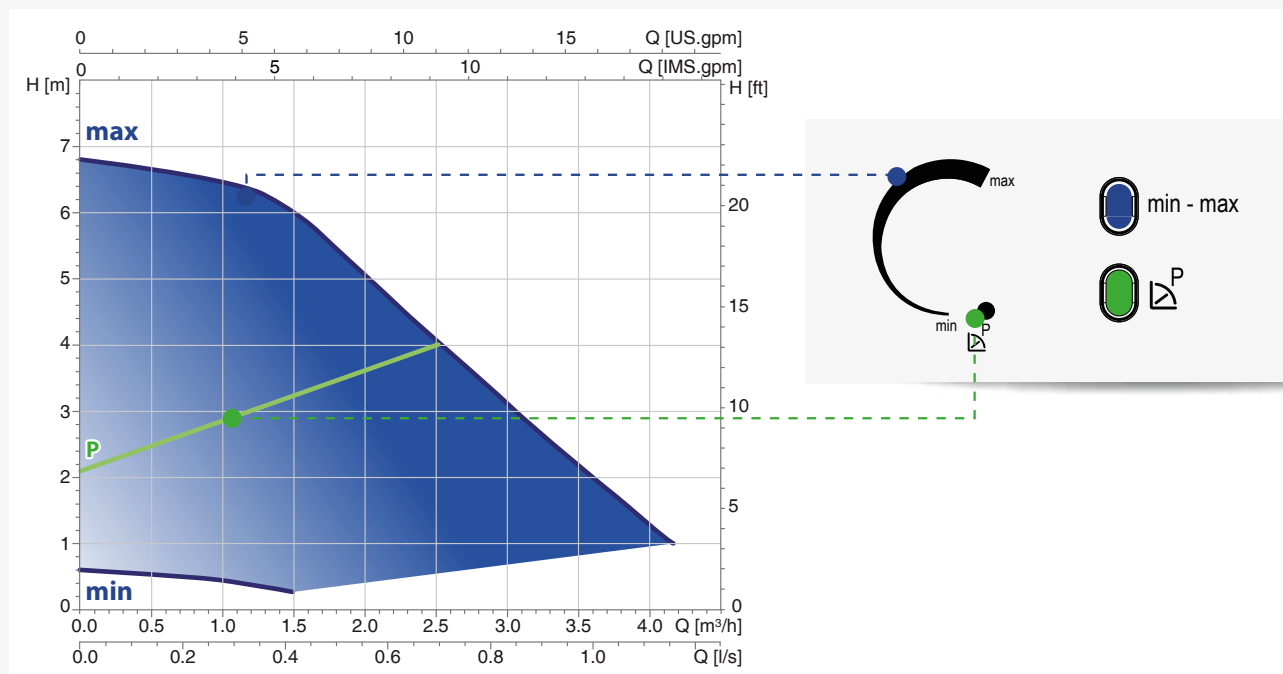
### Art. S166 - Circulator with 1 proportional-pressure curve - min-max mode – Fixed speed



#### Technical specifications

|                                      |                            |
|--------------------------------------|----------------------------|
| Brand:                               | Taco                       |
| Model:                               | ES2 solar 15-70            |
| Centre to centre distance            | 130 mm.                    |
| Connections:                         | G1" M                      |
| Flat seals:                          | Cellulosic fibers with NBR |
| Electrical power supply:             | 230 V - 50/60 Hz           |
| Operating temperature:               |                            |
| • Ambient temperature = 30°C         | 30 ÷ 110°C                 |
| • Ambient temperature = 35°C         | 35 ÷ 90°C                  |
| • Ambient temperature = 40°C         | 40 ÷ 70°C                  |
| Max operating pressure:              | 10 bar                     |
| Protection level:                    | IP44                       |
| Energy class (EEL):                  | ≤0.21                      |
| Maximum percentage of glycol:        | 50%                        |
| Minimum pressure on the intake side: |                            |
| • T=85°C                             | 0,049 bar                  |
| • T=90°C                             | 0,270 bar                  |
| • T=110°C                            | 1,080 bar                  |

#### HYDRAULIC CHARACTERISTICS





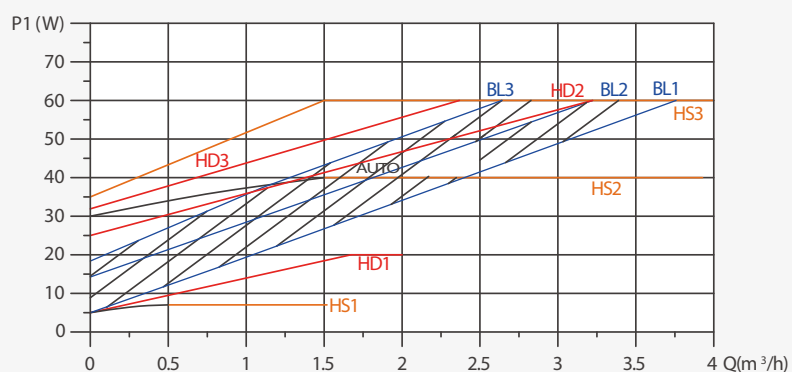
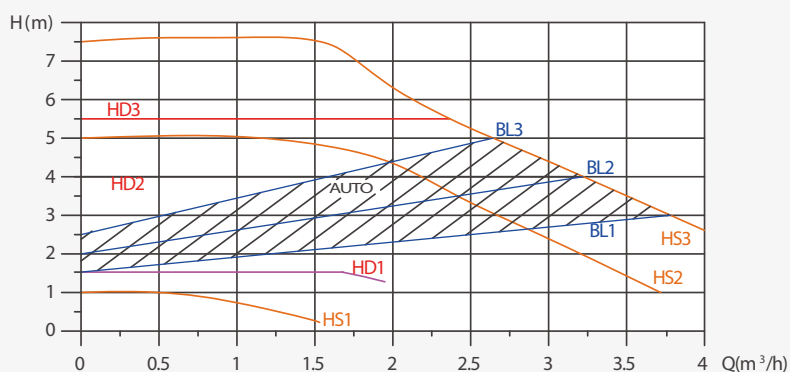
### Art. S167 - Circulator with 3 constant curves, 3 PWM curves



#### Technical specifications

|                                      |                            |
|--------------------------------------|----------------------------|
| Brand:                               | Hefei Xinhu                |
| Model:                               | GPA 20-7.5 III             |
| Centre to centre distance            | 130 mm.                    |
| Connections:                         | G1" M                      |
| Flat seals:                          | EPDM                       |
| Electrical power supply:             | 230 V - 50/60 Hz           |
| Operating temperature:               |                            |
| • Ambient temperature = 30°C         | 30 ÷ 110°C                 |
| • Ambient temperature = 50°C         | 50 ÷ 110°C                 |
| • Ambient temperature = 70°C         | 70 ÷ 100°C                 |
| Max operating pressure               | 10 bar                     |
| Protection level:                    | IP44                       |
| Energy class (EEI):                  | ≤0.20                      |
| PWM signal connector code:           | C65S1670153 (NOT INCLUDED) |
| Maximum percentage of glycol:        | 50%                        |
| Minimum pressure on the intake side: |                            |
| • T=75°C                             | 0,05 bar                   |
| • T=90°C                             | 0,5 bar                    |
| • T=110°C                            | 1,08 bar                   |

#### HYDRAULIC CHARACTERISTICS



### Art. S168 – Circulator with 3 constant curves, variable $\Delta P$ – 2 PWM curves



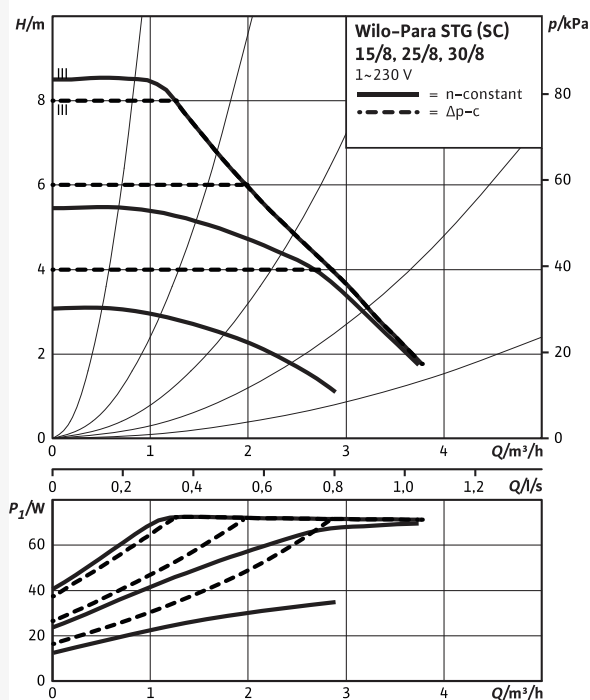
#### Technical specifications

|                                                               |                            |
|---------------------------------------------------------------|----------------------------|
| Brand:                                                        | Wilo                       |
| Model:                                                        | Para STG 15-130/8-75/12    |
| Centre-to-centre distance between connections:                | 130 mm.                    |
| Connections:                                                  | G1" M                      |
| Flat seals:                                                   | EPDM                       |
| Power supply:                                                 | 230 V - 50/60 Hz           |
| Permissible temperature range at maximum ambient temperature: |                            |
| • Ambient temperature = 30°C                                  | da +2°C a +110°C           |
| • Ambient temperature = 50°C                                  | da +2°C a +103°C           |
| • Ambient temperature = 67°C                                  | da +2°C a +60°C            |
| Maximum operating pressure:                                   | 10 bar                     |
| Degree of protection:                                         | IPX4D                      |
| Energy efficiency class (EEI):                                | ≤0.21                      |
| PWM signal cable code:                                        | C64S1680153 (NOT INCLUDED) |
| Maximum glycol percentage:                                    | 50%                        |
| Minimum pressure at the suction inlet:                        |                            |
| • T=50°C                                                      | 0,05 bar                   |
| • T=95°C                                                      | 0,45 bar                   |

#### HYDRAULIC CHARACTERISTICS

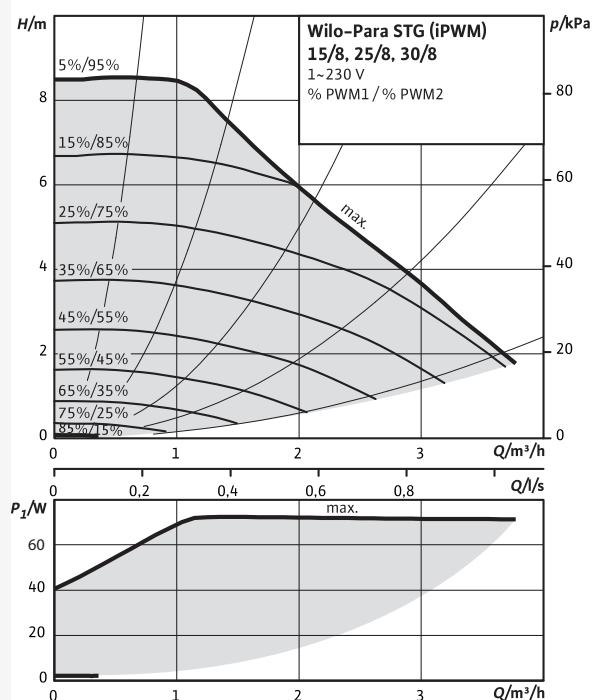
##### Pump curve

Wilo-Para STG (SC) 15/8, 25/8, 30/8



##### Pump curve

Wilo-Para STG (iPWM) 15/8, 25/8, 30/8



### / Flow meter

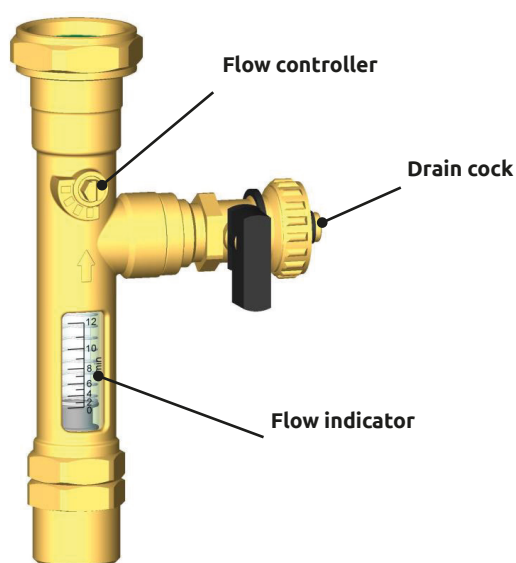
The flowmeter 7 (Table1-page 4) is an instrument to measure the flow of the heat-transfer fluid circulating in the system.

It is possible to read in real time the value of the flow in the circuit with the flow indicator (Pict.3). This device is equipped with a glass having a graduated rate of flow scale, with a calibration spring and with a movable indicator that varies its position according to the flow inside the glass. The flow rate reading are explained the paragraph below.

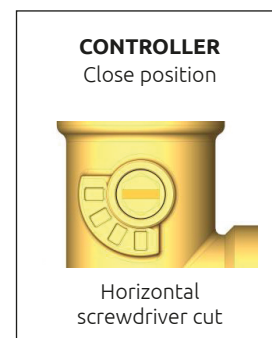
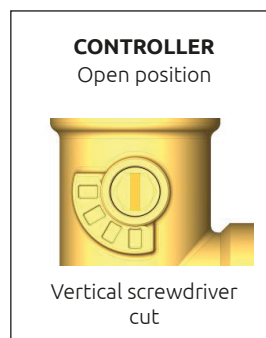
The flow meter is also equipped with a manual flow regulator, adjustable with a screwdriver.

For proper operation, the flow meter must be installed in a vertical position.

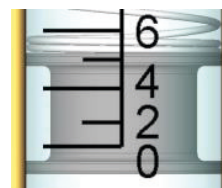
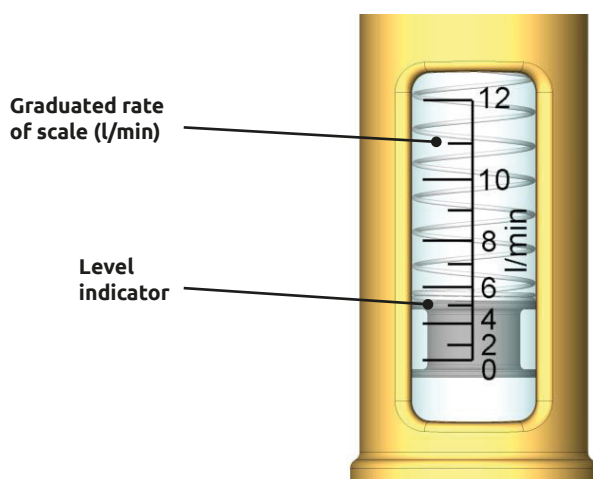
The scale range is 0-12 l/min.



Pict. 3



### / Flow rate reading



← Example of reading: 5 l/min

Pict. 4

### / Safety

Read assembly and operating instructions carefully before starting up the system in order to prevent accidents and damage to the system caused by improper use. Remember that your rights under the warranty will be forfeited if you make any changes to the system or tamper with it during assembly and construction without authorisation. In addition, you must follow the requirements of the regulations listed below:

### / Operating conditions

The limits on operating values specified must not be exceeded under any circumstances. Safe operation is guaranteed if you comply with the general conditions and limits on operating valves described in this information sheet.

### / Safety standards for assembly and inspection

Assembly and inspection operations must always be performed by qualified, authorised personnel familiar with the instructions contained herein. Make sure the system is shut down before performing any work on it.

### / Electrical connections

Electrical connections must be made by qualified personnel. Connecting cables must be positioned in the cavity provided for the purpose in the insulating shell so as to avoid contact with the body of the pump motor and with pipes.

Check that the power supply voltage is as specified on the plate before turning on the pump. All connections must be made as required by law.

### / Maintenance

Maintenance work must always be performed by qualified, authorised personnel familiar with the instructions contained herein. Make sure the system is shut down before performing any work on it. When replacing the pump, turn the on/off valve, return connection 4 (Table 1-page 3) and flow control valve 7 (Table 1-page 3) to the off position.



**WARNING!** Depending on operating conditions in the pump and the system, the surface temperature could be very high. Touching the pump directly comports a risk of burning!