MCCS 745

Anti-condensing recycling pump unit with thermostatic control

Employment:

The anti-condensing pump unit allows to connect directly the solid fuel heating source to the heating system or to the buffer tank without any additional device.
As a matter of fact the pump unit includes into a compact and nice insulation box the circulating pump, the anti-condensing thermostatic valve, the on/off natural circulation clapet valve, the isolating valves and thermometers.
It automatically adjusts the return water temperature to the heating source to the selected setting value of the thermostat.

The device keeps the heating source at a high temperature level (always higher than the condensation one) in every possible condition of use, so avoiding deposits both into the boiler and into the chimney flue, in this way improving the efficiency and the life of it. Therefore also corrosion problems of the heating source or dangerous fires of the chimney are avoided.

Technical features:

Anti-condensing recycling and distribution pump unit with thermostatic control of the return temperature to the solid fuel heating sources.
Cast brass body CB753S. Yellow brass execution.

- Asynchronous Wilo Star RS/7 circulating pump or synchronous high efficiency Wilo Yonos Para RS/7-RKC circulating pump with progressive speed control.
- Maximum working pressure: 10 bar with Wilo Star RS/7 circulating pump or 6 bar with Wilo Yonos Para RS/7-RKC circulating pump.
- Maximum temperature: 100°C.
- Setting temperature: 45°C, 55°C, 60°C and 72°C.
- Natural circulation clapet valve: with external control, it can be set on or off according to the type of installation.
- Temperature thermometers: 0-120°C.

Nominal opening temperature: setting temperature + 10 K.
Available external connections: 1" and 1"1/4 female, 28 mm for copper pipe.

FIELD OF UTILIZATION:
For a maximum usable power up to:
100 kW (at Δt 30 K) with asynchronous circulating pump Wilo Star RS/7.
80 kW (at Δt 30 K) with synchronous circulating pump Wilo Yonos RS/7-RKC.

Available calibration temperatures:
45 = 45 °C
55 = 55 °C
60 = 60 °C
72 = 72 °C

Asynchronous circulating pumps (only for non-EU markets):
Wilo Star RS/7 **(W7)**

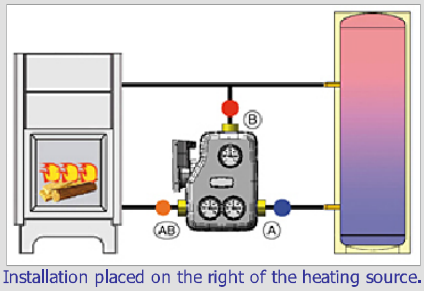
Synchronous circulating pumps:
Wilo Yonos Para RS/7-RKC **(C7)**

Installation:

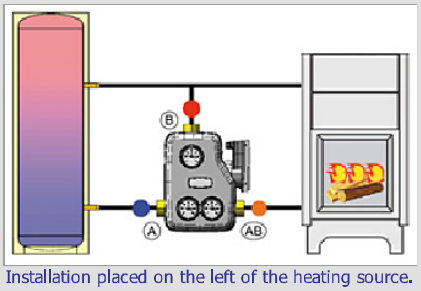
The anti-condensing recycling pump unit can be placed on both sides of the heating source, following these directions:

- On the return pipe to the boiler in mixing mode, following the flow directions shown on the body.
- In vertical position (horizontal circulating pump axis) to allow the hydraulic working of the natural circulation clapet valve.

In order to optimize the anti-condensing control, we recommend the installation of the component on the return way to the boiler.



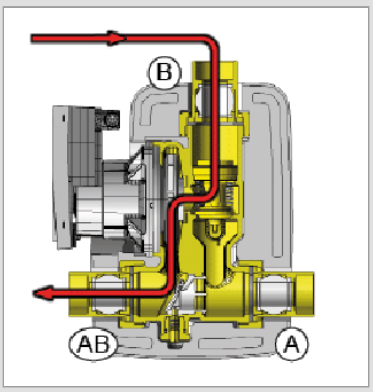
Installation placed on the right of the heating source.



Installation placed on the left of the heating source.

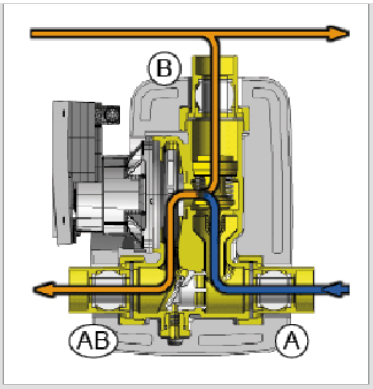
Working mode:

The schemes shown below represent the different working phases of the anti-condensing pump unit.
Please note that: the pictures have to be considered just as an indication and they have no completeness pretention.



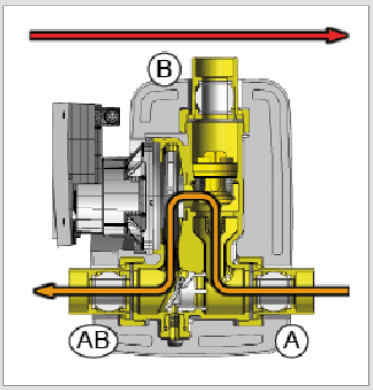
(1) Starting of the installation (boiler warming up)

After the starting of the boiler, the thermic valve is fully closed towards the user's return (**gate A**) and this condition remains until the fluid, warmed up by the heating source, gets the opening temperature of the thermic valve (corresponding to the setting value, f.i. 55°C). During this step the fluid sent by the boiler fully recycles through the by-pass (**gate B**) and the boiler temperature rises very quickly.



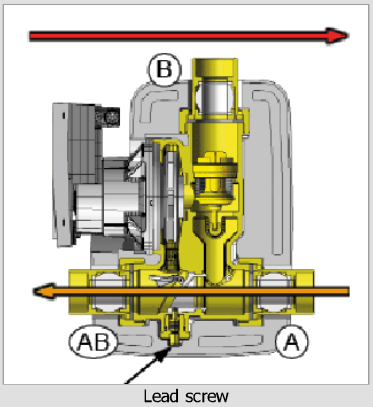
(2) Loading of the installation (tank warming up)

At the achievement of the opening temperature (f.i. 55°C) the users' return way (**gate A**) proportionally starts to open, meanwhile the by-pass (**gate B**) is going to be closed. The boiler temperature slowly rises giving energy to the user, but in any case the return temperature will not decrease anymore below the setting temperature (f.i. 55°C).



(3) Working installation

Starting from the condition of point 2, the supply temperature progressively rises up to the full opening of the thermic valve (**gate A**) and up to the corresponding shutting of by-pass (**gate B**). This happens at about 10 K more than the opening or setting temperature (therefore in the example in hand, at about 65°C). Now the installation is on working and the supply fluid temperature can rise up to the set value.



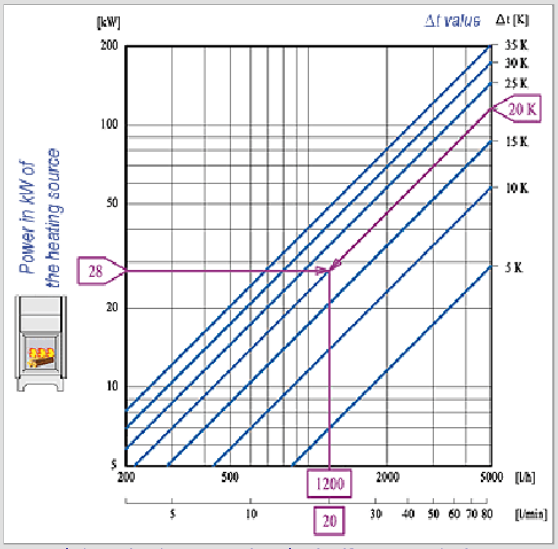
Lead screw

(4) Natural circulation

The natural circulation of fluid through the clapet valve starts as soon as the circulating pump stops and the remaining energy of the heating source is transferred to the water tank.
This function starts as a security device, when the pump stops due to blackout or failure, so avoiding that the temperature of the heating source can reach high levels of danger.
To turn on the natural circulation function please turn the control screw anti-clockwise.
You can lock the clapet valve any time, turning the screw clockwise (this operation has to be done when the pump is working).

Example of selection of the most suitable circulating pump

The following example shows the method to select the circulating pump more suitable to the installation et its performances.



Click on the drawing to download pdf version in high-res

In order to select the pump more suitable to the installation requirements you must take into account the project features: power of the heating source and Δt value.
To show a relistic example, we take into account the following starting values:

- Heating source power: **28 kW**
- Δt value: **20 K**
- Preferencial use of **Yonos Para RS/7** circulating pump

The side diagram shows that the flow rate of **1200 l/h** is a consequence of these choises.

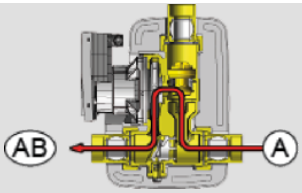
In the diagram of the circulating pumps, at the bottom of the page, it is possible to cross geometrically this flow rate value with the curve of the sected speed. In correspondance with this crossing it is possible to read on the scale on the left side the lifting power developped by the pump in these conditions.
The Yonos Para RS/7 pump develops a 4,8 mH_2O lifting power.
In the specific case of our example, if this lifting power is not enough for the installation needs, a higher speed of the same pump should be selected or a Star RS/7 pump should be used (up to 5,7 mH_2O in this example).

Hydraulic performances

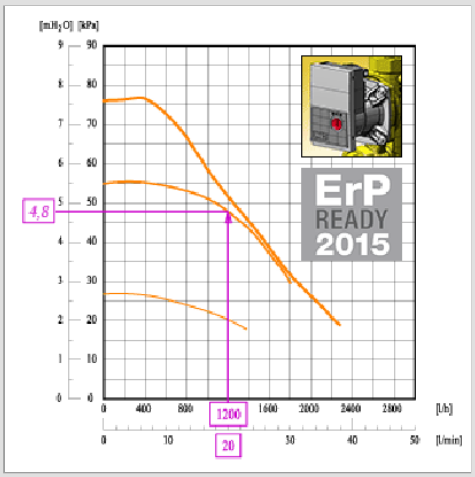
The hydraulic performances of the pump unit (A towards AB) have been tested at Wilo laboratories on final sample made of STL.

Wilo Yonos Para RS/7-RKC | **Wilo Star RS/7**

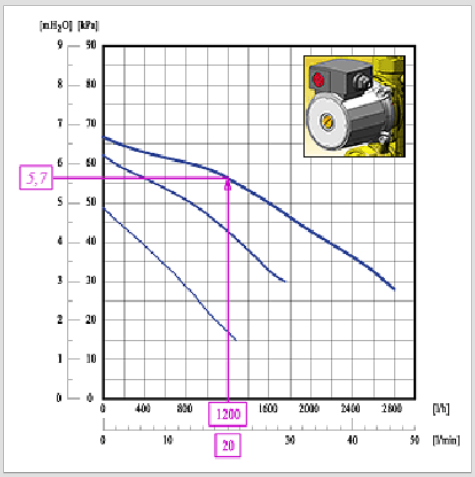
Maximum speed



Medium speed
Minimum speed



Wilo Yonos Para RS/7-RKC
Consumption: 3-45 W

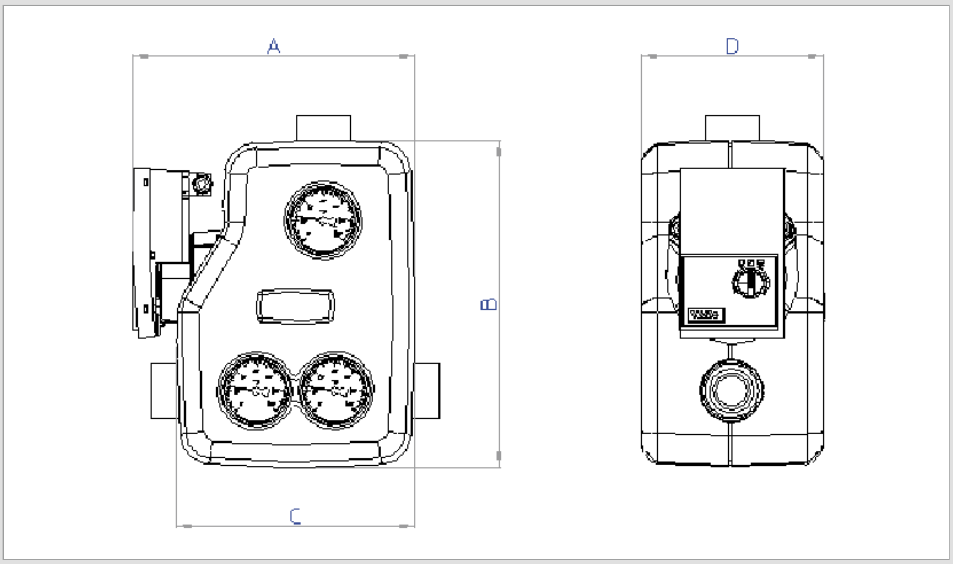


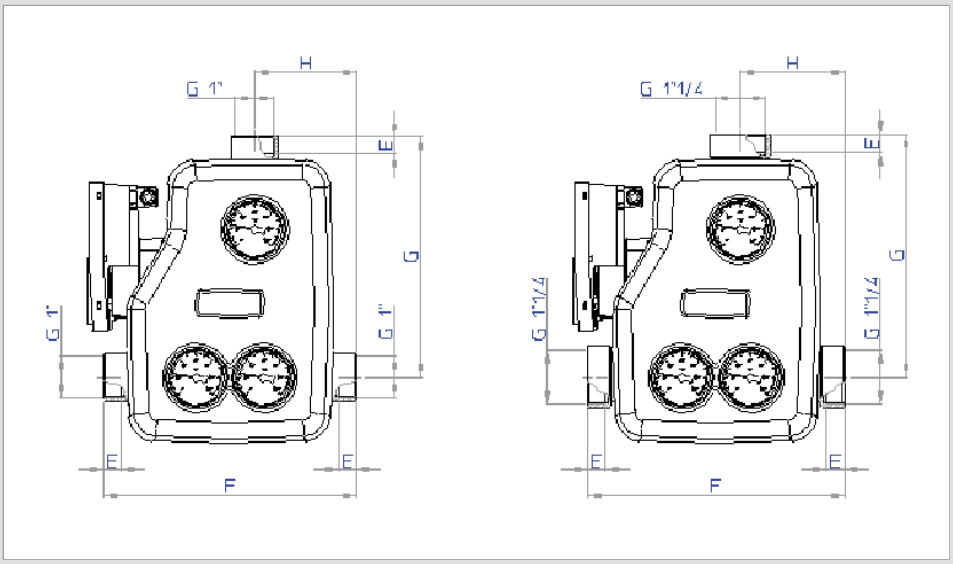
Wilo Star RS/7
Consumption: 62-132 W

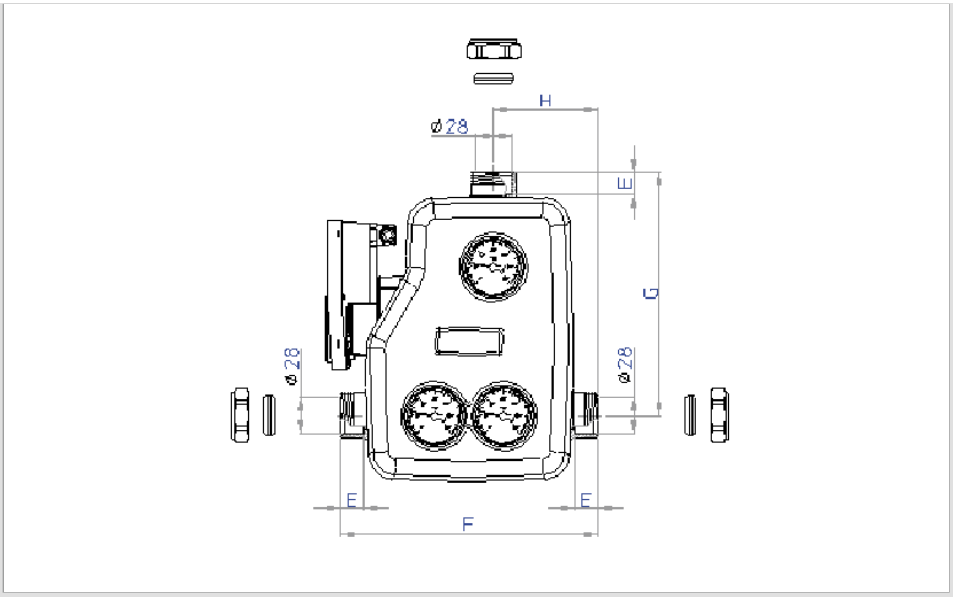
These performances are substantially the same even in case of recycling flow (B towards AB).
Click on the drawings to download pdf version in high-res

Test reports in pdf format, made directly by the Wilo laboratory are available:
they gather the results of performance analysis and verification of noise.

Dimensional specifications:







Specifications	Dimensions		
	1"	1"1/4	28 mm
A (with W7 circ. pump)	202	202	202
A (with C7 circ. pump)	192	192	192
B	221,5	221,5	221,5
C	162	162	162
D	124	124	124
E	13	14	18
F	196	200	200
G	187	189	189
H	79	81	81
Weight [g] (with W7 circ. pump)	3.800	3.850	3.850
Weight [g] (with C7 circ. pump)	3.700	3.750	3.750

Code **1”**: **204MCCS-xx-(W7/C7)**
Code **1”1/4**: **205MCCS-xx-(W7/C7)**
Code **28 mm**: **228MCCS-xx-(W7/C7)**

Code composition: the suffix “xx” shows the setting temperature of the thermic valve;
example: **204MCCS-55-W7** (setting temperature 55°C)