

# ***TERMOVAR LOADING UNIT***

## ***MOUNTING AND OPERATING INSTRUCTIONS***



**Sizes Rp 25 – Rp 32 – 28 mm**



**With EPP Insulation**



**With Backflow Preventer**



**Without Backflow Preventer**

## GENERALLY

TERMOVAR is an automatic loading unit for solid-fuel boiler/storage tank installations. The loading unit ensures a minimum return-water temperature into the heating boiler, which increases the boiler efficiency, prevents tarring and considerably prolongs the lifetime of the heating boiler.

TERMOVAR eliminates the risk of destructive thermal shock caused by surges of cold return water and renders a more effective burning. The heating boiler reaches the right working temperature quickly. In the end phase of the firing an automatic balancing valve closes the by-pass loop. This results a maximum cooling of the boiler and the storage tank is fully filled with hot water.

TERMOVAR automatically allows self-circulation as soon as the fire has gone out so that the rest of the heat in boiler is transferred into the storage tank. It also allows self-circulation in case of power failure.

## MAIN PARTS

1. Thermally operated loading valve
2. Automatic balancing valve
3. Backflow preventer (Model S without)
4. Circulation pump
5. Three thermometers
6. Three ball valves
7. Insulation EPP (optional Order No. 4919)

## TECHNICAL DATA

Voltage	230 VAC 50 Hz
Power consumption	Pump speed I 45 W, Pump speed II 75 W, Pump speed III 110 W
Max. boiler capacity	80 kW
Max. operating temperature	110°C
Max. operating pressure	1,0 MPa (10 bar)
Thermostatic elements	Opening temperatures 45°C, 55°C, 61°C, 72°C or 80°C, fixed
Circulation pump	Grundfos UPS 15-60 CIL
Sizes	Rp1", Rp1¼" or 28 mm compression fittings
Body	Cast iron
Dimensions	210 x 210 x 110 mm
Weight	5,0 kg

## DIMENSIONING

Pipe dimensioning between heating boiler and storage tank:

TERMOVAR 25 for heating boilers up to 60 kW: DN 25 steel pipe or DN 28 copper pipe

TERMOVAR 28 for heating boilers up to 60 kW: DN 28 copper pipe

TERMOVAR 32 for heating boilers up to 80 kW: DN 32 steel pipe or DN 35 copper pipe

### **IMBOLD COM SRL**

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## **MOUNTING**

The valve unit is mounted upright either on the right or left hand side of the heating boiler. After pipework the thermometers are pressed onto the front side of the unit.

When starting a new heating installation a very common problem is air in the pipe system. For a trouble free system the pipework has to be made without air pockets. If this is not possible the system must be fitted with air vents.

The circulation pump should be started at the same time as the firing. The pump also must be stopped soon after the fire has gone out so that the remaining hot water in the boiler can self-circulate to the storage tank. Several boilers have factory installed thermostats for pump control. If not, a flue gas thermostat (ACASO Art.-Nr. 7100) must be used.

## **Self-circulation**

For self-circulation the supply pipe should be connected to the top of the storage tank and the return pipe to the bottom. Self-circulation is obtained as soon as the fire and the circulating pump have stopped. The remaining hot water will now self-circulate to the storage tank.

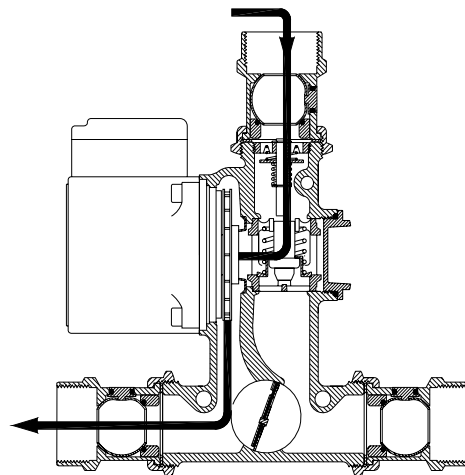
## **Service**

TERMOVAR is normally servicefree. The valve unit has three ball valves. All parts can be changed without draining the system.

## **FUNCTION**

### **1. Heat up phase**

The circulation pump should be controlled by a thermostat that measures flue-gas temperature. The pump will start when the boiler is fired up and stop when it has ceased to fire. The boiler water is circulating to the loading unit and back while the temperature of the boiler is rising.



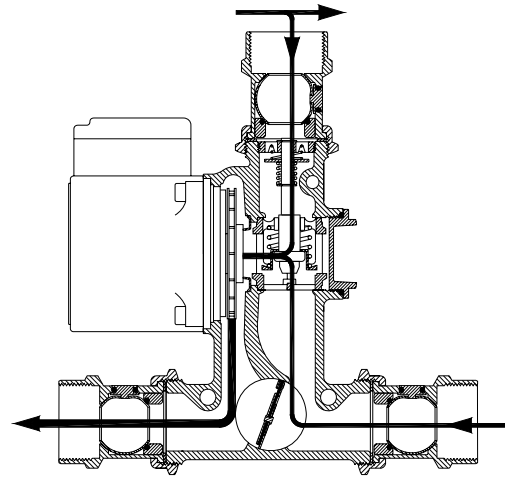
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## 2. Loading phase

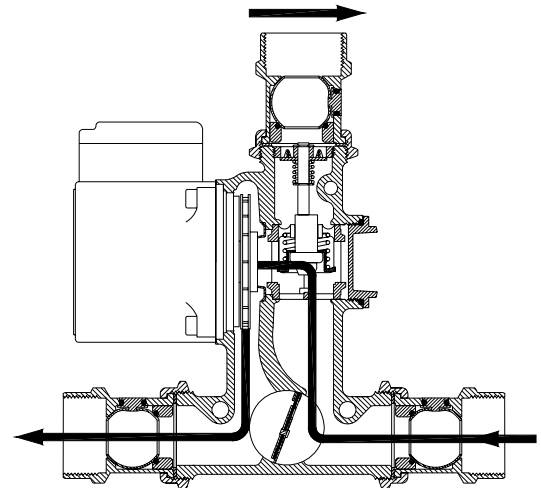
The thermostic element in the loading unit is affected by the temperature of the water flowing from the boiler to the loading unit. The element starts to open and allows return water from the storage tank to be mixed with supply water before it returns back to the boiler. The temperature of the mixed water determines the working position of the thermostatic element. An automatic balancing valve in the loading unit regulates the internal flow of the supply water from the boiler.

When the temperature rises the element starts to close the balancing valve. This causes a higher flow of return water into the boiler. When the thermostatic element is fully open the balancing valve is closed and the entire capacity of the pump is used for cooling the boiler and loading the storage tank.



## 3. End phase

The thermostat element is fully open. The balancing valve is closed. This results a maximum cooling of the heating boiler and the storage tank is fully filled with supply water.



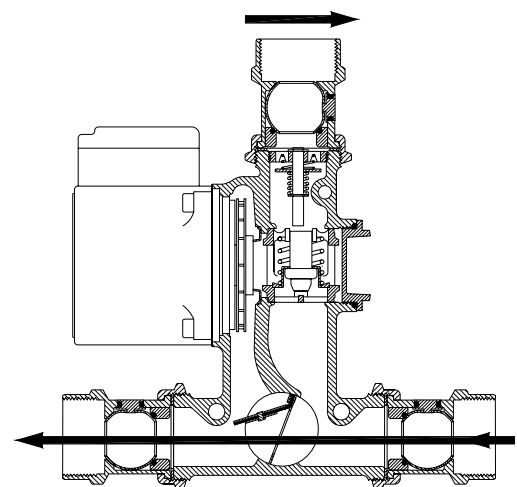
## 4. Self-circulation

Self-circulation is obtained as soon as the fire and the circulating pump have stopped. The remaining hot water will self-circulate to the storage tank.

When the storage tank is warmer than the boiler a backflow preventer stops the self-circulation from tank to boiler.

In case of power or pump failure the backflow preventer will open automatically for self-circulation.

Model S is delivered without backflow preventer.

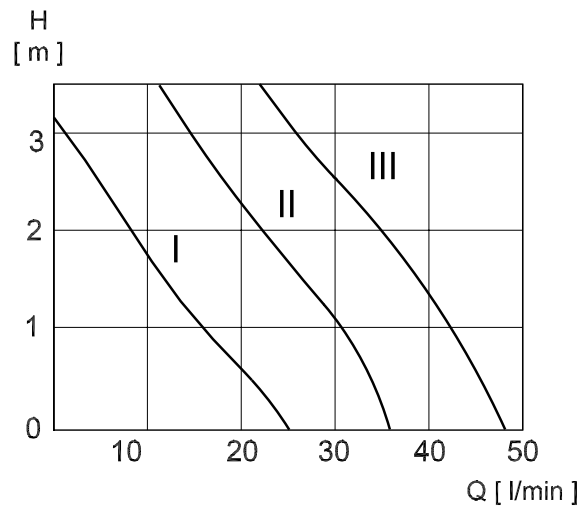


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### **CIRCULATING PUMP**

TERMOVAR loading unit has a Grundfos UPS 15-60 CIL circulating pump. Flow and capacity according to the diagram below. Pump speed III is recommended. In a normal installation with pump speed III the flow will be 40 – 46 l/m.



### **THERMOSTATIC ELEMENTS**

Every thermostatic element has a code on the copper body.

Code on element	Opening temperature	Fully open
9311	45°C	60°C
8749	55°C	67°C
8743	61°C	73°C
8719	72°C	84°C
1456	80°C	92°C

### **REPLACING THE THERMOSTATIC ELEMENT**

- Turn off the pump
- Close the three ball valves
- Open the cover No. 22 opposite the pump
- Take out the element housing and the spring

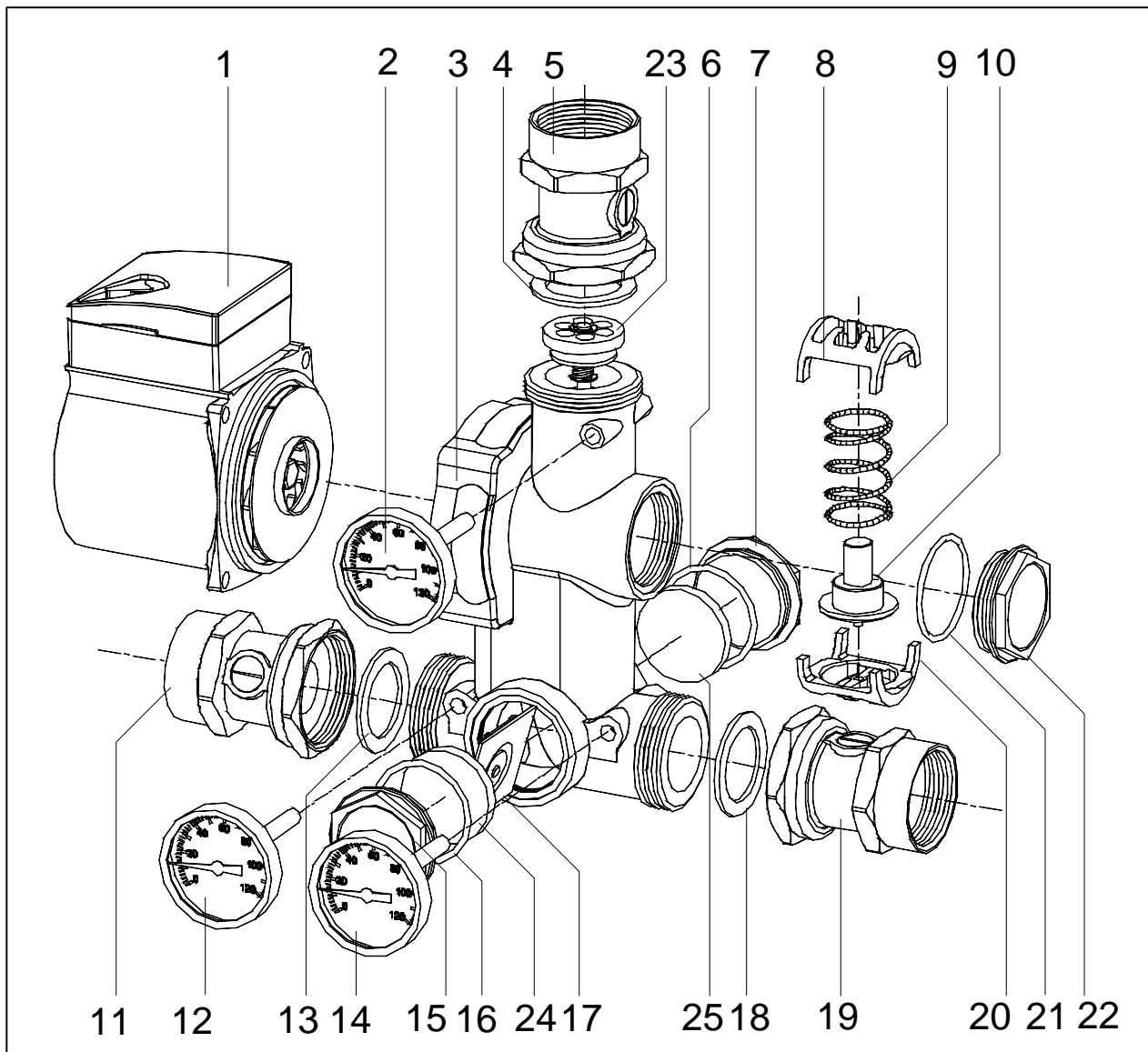
After replacing the element open the three ball valves and start the pump.  
**IMPORTANT!** Check that there is no air in the system.

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## SPARE PARTS



Part No.	Art.No	Part	Part No.	Art.No	Part
1	4899	Grundfos pump UPS 15 – 60 CIL	6, 16, 21	4919	O-ring EPDM Ø 36,2mm x 3mm
2, 12, 14	4902	Thermometer 51 x 7 mm	7, 15, 22	4908	Cover G 1¼"
3	4945	TERMOVAR body 45°C	8, 9, 20	4885	Element housing with spring
3	4955	TERMOVAR body 55°C	10	4911	Element code 9311 45°C
3	4961	TERMOVAR body 61°C	10	4912	Element code 8749 55°C
3	4972	TERMOVAR body 72°C	10	4913	Element code 8743 61°C
3	4980	TERMOVAR body 80°C	10	4914	Element code 8719 72°C
4, 13, 18	4918	Sealing 44 x 32 x 2 mm	10	4915	Element code 1456 80°C
5, 11, 19	4904	Ball valve Rp 1½" x 28 mm	17	4916	Backflow preventer (Model S without)
5, 11, 19	4905	Ball valve Rp 1½" x 1"	23	--	Balancing valve (included in part 3)
5, 11, 19	4906	Ball valve Rp 1½" x 1¼"	24, 25	--	Sealing Ø 40mm x 5mm (for part 4916)

