–weishaupt–

manual

Mounting and operating instructions

Circulation station WHI circuload 9 #1
Circulation station WHI circuload 9 #2

83288702 · 1/2014-02

1 Information for the user

These installation and operation instructions form part of the device and must be stored at the place of use.

Carefully read these instructions before installation and commissioning.

1.1 User guidance

1.1.1 Symbols

 DANGER	Immediate danger of high risk. Non-observance will result in serious injuries or death.
 WARNING	Danger of medium risk. Non-observance can lead to environmental damage, severe physical injuries or death.
 CAUTION	Danger of low risk. Non-observance may result in property damage or slight to moderate injuries.
NOTICE	Important information.

1.1.2 Target group

This installation and operation manual is addressed to operators and qualified skilled personnel. It must be observed by anyone working on the machine.

Work on the machine may only be performed by persons that have received the required training or instruction.

Persons with restricted physical, sensory or mental abilities may work on the machine if supervised or instructed by an authorized person.

Children may not play with the machine.

1.2 Warranty and liability

Warranty and liability claims for personal and material damage are void if they are due to one or several of the following causes:
Use of the machine contrary to its designated use,
Non-observance of the installation and operation instructions,
Operation of the machine with non-operational safety or protective devices,
Continued use despite the presence of a defect,
Improper assembly, commissioning, operation and maintenance of the machine,
Unauthorised modification of the machine,
Installation of additional components that were not tested together with the machine,
Repairs carried out incorrectly,
Failure to use Weishaupt original parts,
Defects in the supply lines,
Force majeure.

2 Safety

2.1 Designated use

The circulation station must only be installed in heating stations between the buffer tank and the domestic water circuit. Due to its construction, it must only be installed and operated in a vertical position. The technical limit values specified in this instruction must be considered.

Use only original accessories in connection with the circulation station.

Using the station contrary to its designated use will invalidate all liability claims.

The wrapping materials are made of recyclable materials that can be recycled by standard recycling operations.

2.2 Safety instructions

The following must be observed during installation and commissioning:

- Relevant local and national regulations
- Accident prevention regulations of the employers' liability insurance association
- Instructions and safety instructions mentioned in these instructions

 CAUTION	**Risk of burns!** The valves and fittings and the pumps can become heated up to more than 95 °C during operation. ➢ The insulation shell must remain closed during operation.
NOTICE	**Material damage due to mineral oils!** Mineral oil products cause permanent damage in the material, resulting in its sealing characteristics getting lost. We cannot be held liable for damage caused by seals damaged in this way, and nor will we give warranty replacement for such parts. ➢ It is imperative to prevent the EPDM from making contact with substances containing mineral oils. ➢ Use a silicone- or polyalkylene-based lubricant free of mineral oil such as Unisilikon L250L and Syntheso Glep 1 from Klüber or a silicone spray.
NOTICE	**Malfunctions!** ➢ The circulation station must be integrated into the potential equalisation of the electrical installation. If this is not guaranteed by the connected pipework then establish a correct potential equalisation connection to the main potential connection.

2.3 Safety measures

Immediately eliminate safety-relevant defects and replace safety-relevant components when they have reached the end of their service life due to their construction.

2.4 Electrical connection

When performing any work on live parts:
Observe the accident prevention regulations BGV A3 and local regulations,
Use tools according to EN 60900.

2.5 Structural modifications

Conversion measures are only allowed after prior approval in writing by the Max Weishaupt GmbH.
Additional components may only be installed if they were not tested together with the machine. Use only Weishaupt original parts.

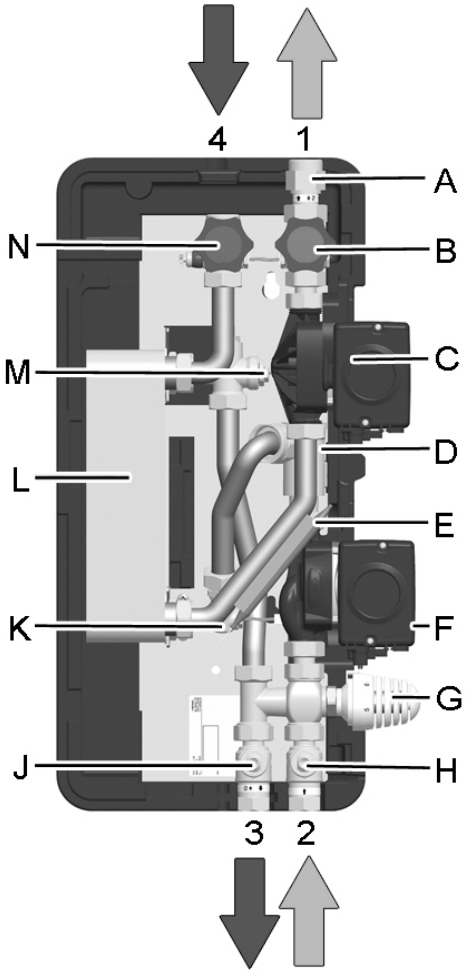
2.6 Disposal

Dispose of the materials used properly and in an environmentally compatible manner. In doing so, observe local regulations.

3 Product description

The circulation station is a pre-assembled group of valves and fittings checked for leaks for transferring the heat between the buffer tank and domestic water circuit.
It contains a preset controller as well as important fittings for operating the system:

- Ball valves in the primary circuit
- Piston valves in the secondary circuit
- Pre-assembled controller
- Temperature sensors at the circulation inlet, the circulation outlet and on the heating return
- FlowRotor with Hall sensor and temperature sensor on the heating supply (only WHI circuload 9 #2)
- Lockable primary pump
- Vent plug on the heat exchanger
- Thermal mixing valve for limiting the circulation temperature



Connections

1	Secondary side: circulation outlet
2	Primary side: supply from buffer tank
3	Primary side: return to buffer tank
4	Secondary side: circulation inlet

Equipment

A	Check valve
B	Piston valve with temperature sensor (circulation outlet)
C	Secondary pump
D	FlowRotor with Hall sensor (only WHI circuload 9 #2)
E	Strap-on sensor for thermostat controller
F	Primary pump
G	Thermostat controller
H	Ball valve
J	Ball valve with check valve
K	Temperature sensor (only WHI circuload 9 #2)
L	Heat exchanger
M	Temperature sensor
N	Piston valve with temperature sensor (circulation inlet)

3.1 Function

The WHI circuload 9 circulation stations are used in domestic water networks in order to cover the loss of heat of the circulation line from a heat storage device using a heat exchanger.
WHI circuload modules are integrated into the domestic water system parallel to the WHI freshaqua or WHI load modules. The direct supply of the modules with hot water from the buffer tank guarantees an energy and cost-optimised operation of the circulation system.
The return line of the circuload modules can be integrated into the buffer tank / tanks independent of the return line of the WHI freshaqua or WHI load modules. A mixture of hot and cold water is therefore reduced to a minimum so that the degree of utilisation of the entire system improves compared with systems without separate circulation module.

The WHI circuload 9 #2 module is also equipped with a heat flow meter in the heating circuit in order to allow for a simple balancing of the energy required.

3.2 Technical data of the circulation stations

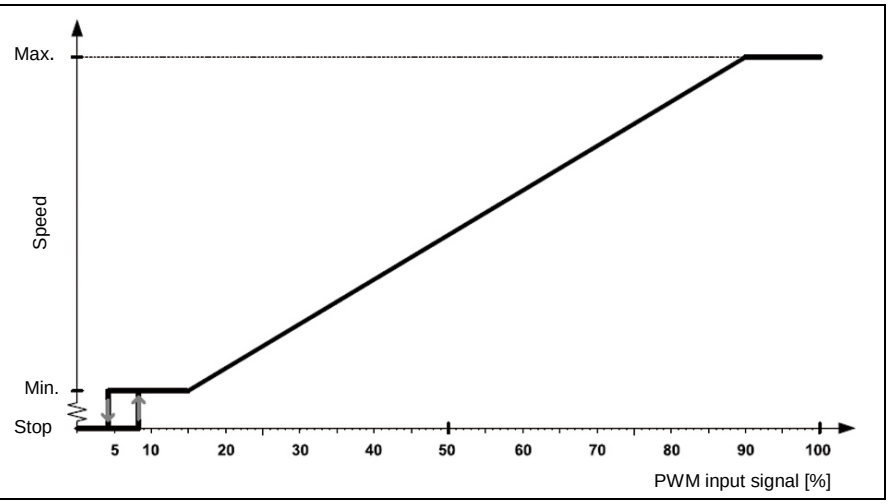
Dimensions	WHI circuload 9 #1	WHI circuload 9 #2
Total height	645 mm	
Total width	358 mm	
Total depth	255 mm	
Centre distance, top	81 mm	
Centre distance, bottom	50 mm	
Primary pipe connection (storage tank circuit)	G ¾" female thread	
Secondary pipe connection (WHI circuload)	G 1" male thread, flat sealing	
Operating data		
Max. admissible pressure	primary: 6 bars, secondary: 10 bars	
Operating temperature	2 – 95 °C	
Max. power Q_{max}	9 kW at $Flow_{prim.}$ 65° / $DHW_{sec.}$ 60°	
Flow rate at Q_{max}	primary: 900 l/h, secondary: 1550 l/h	
Operating temperature sensors	-25 °C to +120 °C	
Equipment		
Primary pump	High-efficiency pump with PWM control, 3-70 W	
Secondary pump	High-efficiency pump with PWM control, 3-70 W	
Heat exchanger	30 plates	
Flow rate sensor	/	Primary: FlowRotor, measuring range: 2-50 l/min, 55 pulses/litre
Temperature sensor	primary: 1 x NTC 5K, secondary: 2 x NTC 5K	primary / secondary: 2 x NTC 5K each
Check valve (in the ball valve)	primary: 1 x 200 mm wc, can be opened secondary: 1 x 200 mm wc	
Material		
Valves and fittings	Brass	
Seals: O-ring	EPDM	
Flat sealing	AFM 34, free of asbestos	
Check valves	Hostaform	
Pipes	1.4401 (AISI 316)	
Insulation	EPP, λ = 0.038 W/(m K), fire class B2	
Heat exchanger	Plates + connecting pieces: 1.4401 (AISI 316) Solder: 99.99% pure copper	
Admissible medium	primary: heating water according to VDI 2035 / Ö-Norm H 5195-1 secondary: domestic water with max. chloride content: <80 ppm	

3.3 Technical Data Pumps

	Grundfos UPM2 15-75 LowFlow	Grundfos UPM2 15-75 CIL
Length	130 mm	
Connections	1" male thread	
Protection class	IP 44	
Max. pressure	1.0 MPa (= 10 bars)	
Max. temperature	95 °C TF 95	
I (1/1)	0.04-0.52 A	
P1	3-70 W	
Use in		
WHI circuload 9 #1	Prim	Sec
WHI circuload 9 #2	Prim	Sec
Prim = Primary side (accumulator circuit) / Sec = Secondary side (circulation)		

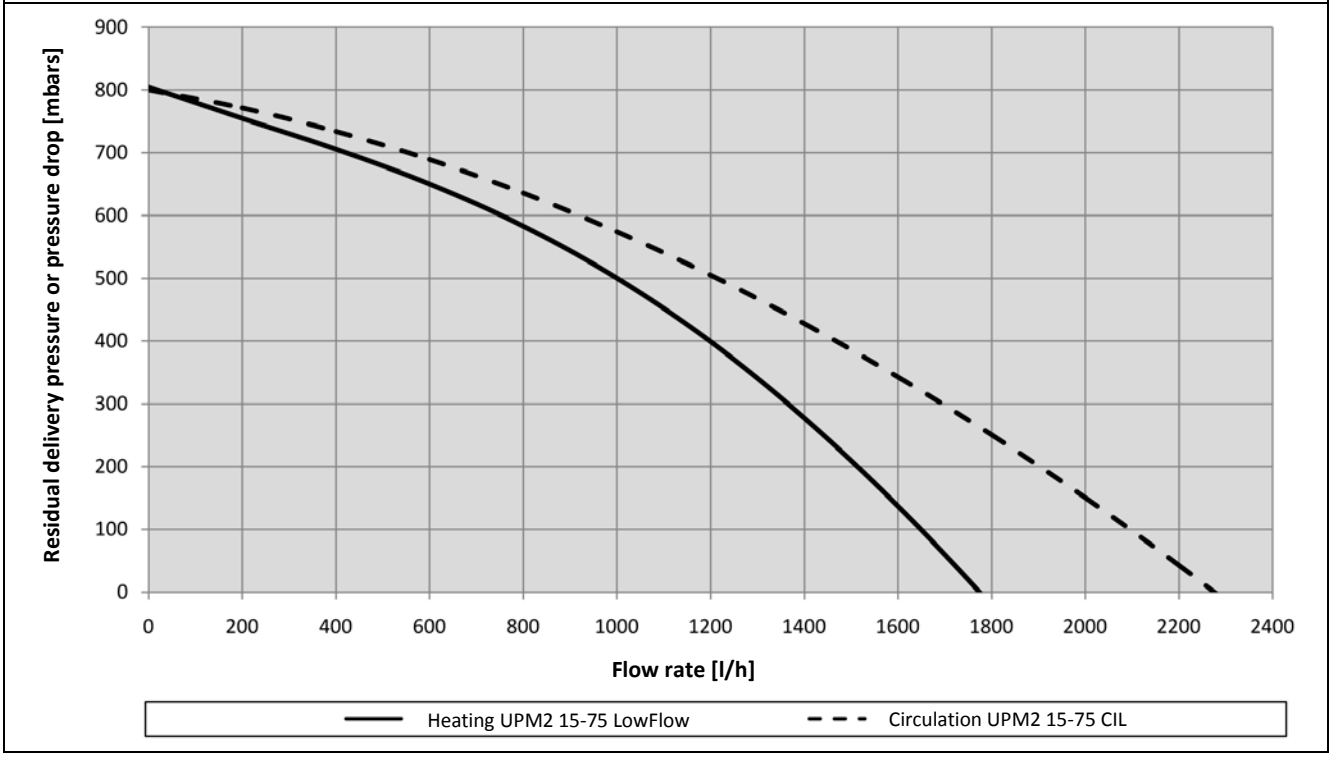
3.4 PWM input signal (solar profile)

PWM input signal [%]	Pump status
< 6	Standby
6-8	Hysteresis
9-15	Min. speed
16-90	Linear increase in speed from rpm min. to rpm max.
91-100	Max. speed



3.5 Hydraulilc performance data

WHI circuload 9 #1 or WHI circuload 9 #2

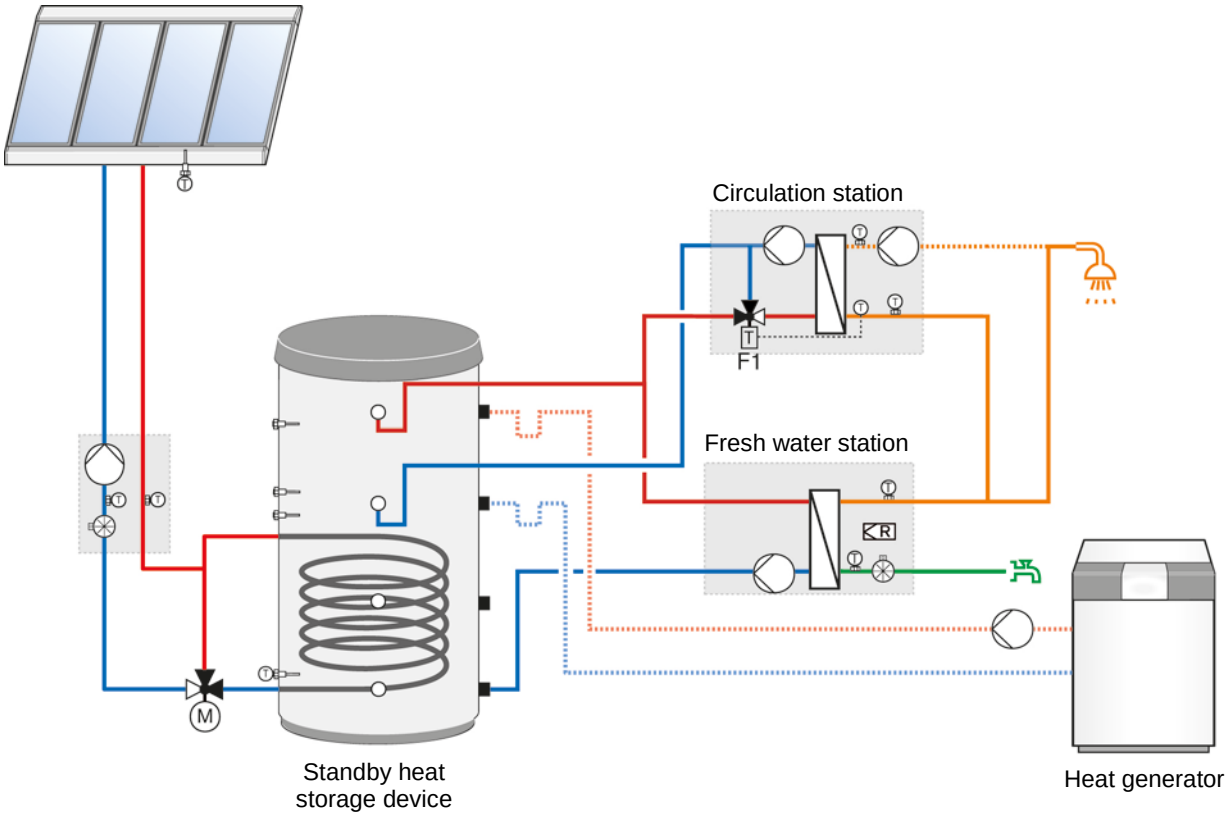


4 Dimensioning and Planning

The WHI circuload is a circulation station that heats the domestic water according to the continuous flow heater principle.

For the perfect function of the circulation station, the system must fulfil certain requirements. Take a little time for the planning before the assembly.

Assembly example 1: circulation station from standby buffer

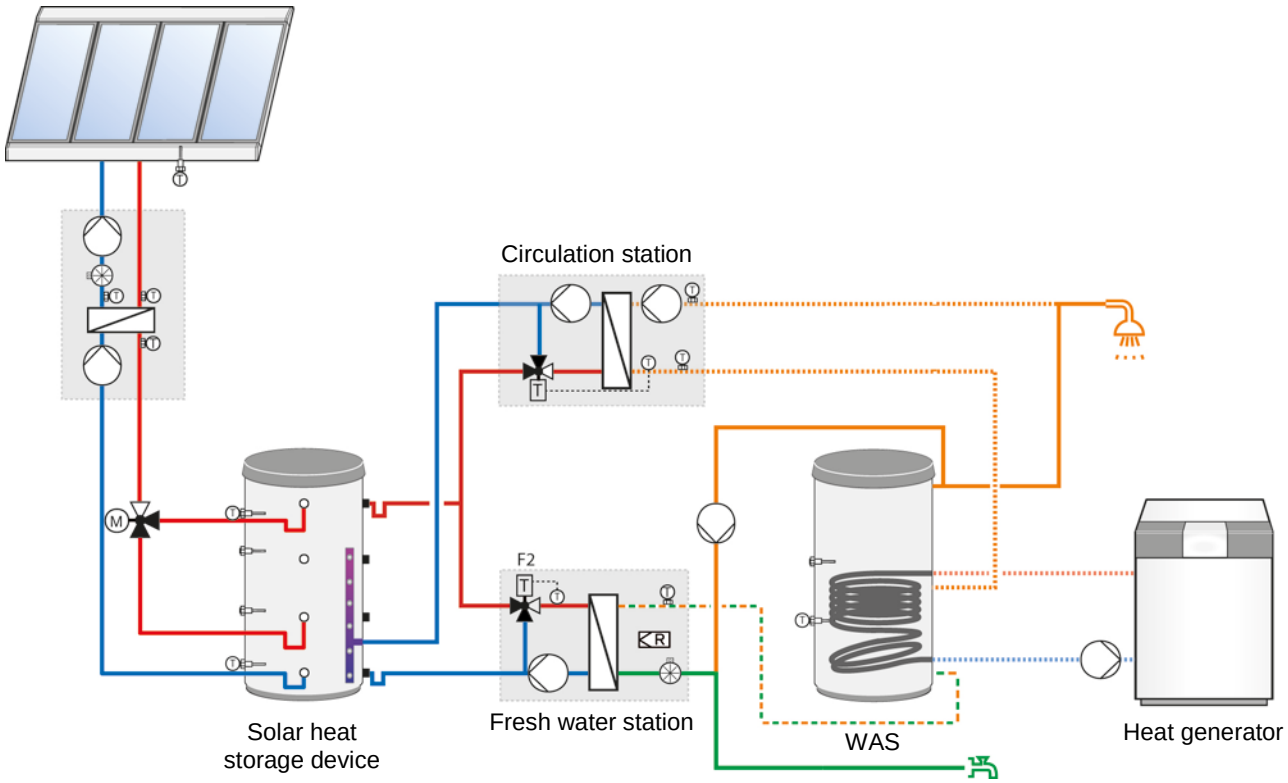


When using the WHI circuload in combination with a standby buffer, hydraulic version 38 must be set in the controller.

Please note:
Due to their construction, the WHI circuload modules reduce the precipitation of scale in the heat exchanger. For systems with a high total domestic water hardness and/or high temperatures, a water treatment is recommended, in order to prevent scale formation.

4 Dimensioning and Planning

Assembly example 2: circulation station from pre-heat buffer

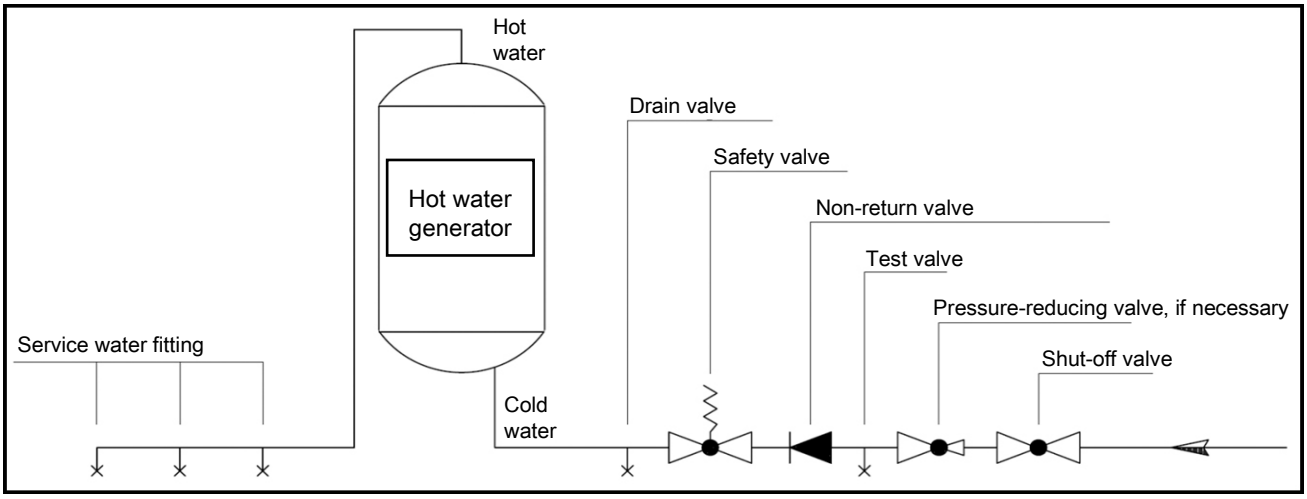


The circulation stations are preset in the factory for using the pre-heat buffer (hydraulic version 39 on the controller).

You can obtain further information on this in the enclosed controller manual or the planning documents for large solar systems.

5 Installation

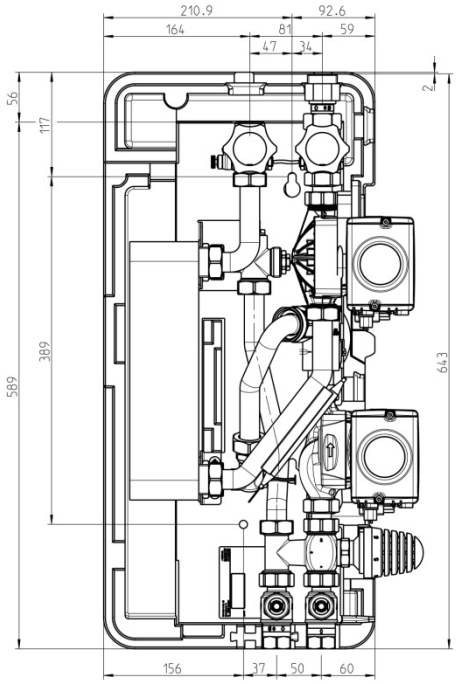
The domestic water connection must be carried out according to the relevant standards (e.g., DIN 1988)!



NOTICE	**Material damage!** ➢ The safety valve integrated into the station does not replace the safety equipment of the domestic water connection according to DIN 1988. ➢ The safety valve merely protects the station from excess pressures when maintenance is required.

5.1 Assembly

NOTICE	**Material damage!** ➢ In order to avoid damaging the system, the installation site must be dry, structurally safe and frost-free. ➢ Furthermore, access to the closed-loop control and safety equipment must be guaranteed at all times during operation! ➢ If tapping points are connected to the same network as the circulation station, in which pressure surges are possible (e.g., flushing valves, washing machines or dishwashers), we recommend the installation of water hammer dampers near the device causing the pressure surges.
 WARNING	**Risk to life and limb due to electric shock!** ➢ Prior to performing electrical work on the controller, de-energise the system. For more information, see enclosed installation and operation instructions of the station controller. ➢ Connect the circulation station to the power supply system (230 V, 50 Hz) only after completing all installation tasks, filling and flushing. This avoids an unintentional start of the motors.

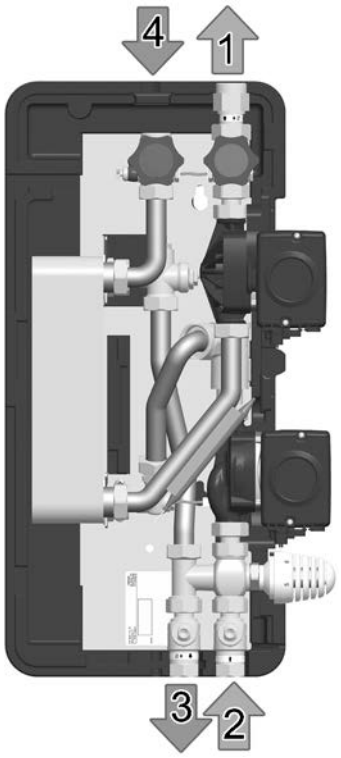


1. Determine the installation location of the circulation station near to the buffer tank. With longer connecting lines, the transfer capacity is reduced due to higher pressure losses.
2. Transfer the dimensions for the drill holes onto the wall.
3. Drill holes and insert the enclosed wall plugs. Make sure that the ground has sufficient load-carrying capacity.
4. Screw in the top screw into the plug until about 40 mm protrudes from the wall.
5. Pull off the front shell.
6. Hang the circulation station on the screws and insert the screws at the bottom. Tighten the screws so that the insulation on the sides rest against the wall.

5.2 Connection

Pipe the circulation station with the system according to the diagram below.

Pipe gap from the wall (secondary) = 107 mm



Pipe gap from the wall (primary) = 67 mm

1 **Secondary side**:
circulation outlet
connection 1" male thread, flat sealing

2 **Primary side:**
supply from buffer tank,
¾" female thread,
piping
minimum DN 20, 22 x 1 mm,
recommended DN 25, 28 x 1.5 mm

3 **Primary side:**
return to buffer tank,
¾" female thread,
piping
minimum DN 20, 22 x 1 mm,
recommended DN 25, 28 x 1.5 mm

4 **Secondary side**:
circulation inlet
connection 1" male thread, flat sealing

5.3 Controller connection

WARNING

Risk to life and limb due to electric shock!

- Prior to performing electrical work on the controller, de-energise the system.

  For more information, see enclosed installation and operation instructions of the station controller.
- Connect the circulation station to the power supply system (230 V, 50 Hz) only after completing all installation work, filling and flushing.
  This avoids an unintentional start of the motors.

The circulation station is pre-wired in the factory.

5.4 Electrical connection of the solar controller WRSol2.1

Terminal	Acronym	Description	Execution
L/N	230V	Mains connection 230 V	on site
1/N	PZWP	Primary circuit pump	prewired
2/N	PZW	Secondary circuit pump	prewired
11/⊥	TZW	Secondary circuit return sensor	prewired
12/⊥	TZWA	Secondary circuit flow sensor	prewired
16/⊥ *	TO1	Heat source temperature	on site
17/⊥	PWM2	PWM control signal for secondary pump	prewired
18/⊥	PWM1	PWM control signal for primary pump	prewired
19/⊥	TPR	Primary circuit return sensor	prewired
20/⊥ **	TPV	Primary circuit flow sensor	prewired
21/25/⊥ **	V1	Volume pulse input collector loop	prewired

* required when using the WHI circuload in combination with a pre-heat buffer (hydraulic version 39).

** only with WHI circuload 9 #2

6 Operation

A detailed description of the operation of the controller can be found in the enclosed controller manual.

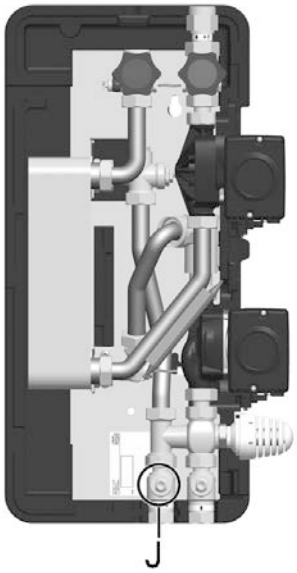
Solar controller WRSol 2.1 pre-settings

- Hydraulic version 39
- eBUS address 3
- Heat flow meter option (with WHI circuload 9 #2)
- Pulse rate 55 pulses/litre (with WHI circuload 9 #2)

7 Commissioning

Observe the following safety instructions regarding the commissioning of the station:

NOTICE	**Note!** Open the valves in the lines and in the module **slowly** in order to avoid pressure surges.



Check valve operation

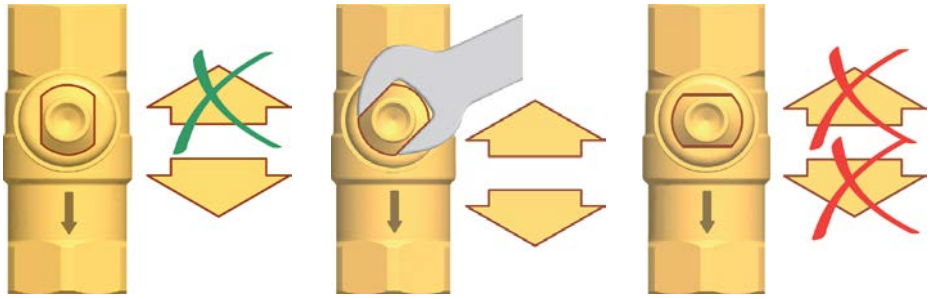
The primary circuit is equipped with a check valve in ball valve (J) in order to prevent undesired gravity circulation.

The check valve must be opened for venting and flushing the system.
For this purpose turn ball valve (J) to position **45°**. The check valve is not in operation.

All ball valves and valves must be opened **completely** for operating the system (position **0°**).

Ball valve with integrated check valve

(Normal direction of flow in the picture: downstream)

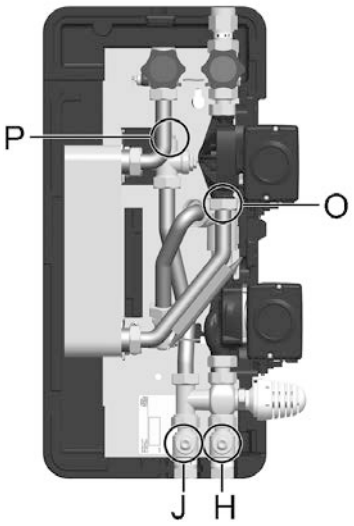


0°	45°	90°
Check valve in operation, **flow in flow direction only.**	Check valve not in operation, **flow in both directions.**	Ball valve closed, **no flow**.

To actuate the ball valve, a handle is included in the delivery.

7.1 Filling the primary circuit

WARNING	**Risk of scalding from hot water!** The system is under pressure. When opening the manual air vent, water up to 90 °C may escape at the manual air vent that could lead to personal injury. ➢ Open the manual air vent slowly and at a safe distance.



With (partially) filled tank

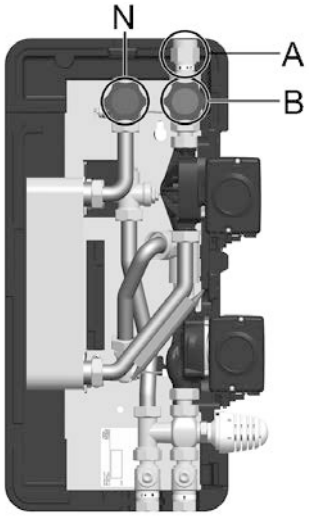
During the filling and flushing of the circulation station, air can be vented using the manual air vents (O) and (P).

1. Open ball valves (H) and (J) slowly by turning them to the **45°** position.
2. Carefully open the manual air vents (O) and (P) using a square key and allow the air to escape.
3. Close manual air vents (O) and (P).
4. After venting, check the operating pressure of the primary circuit and, where necessary, increase the pressure.
5. Open ball valves (H) and (J) completely by turning them to the **0°** position.

7.2 Commissioning the controller

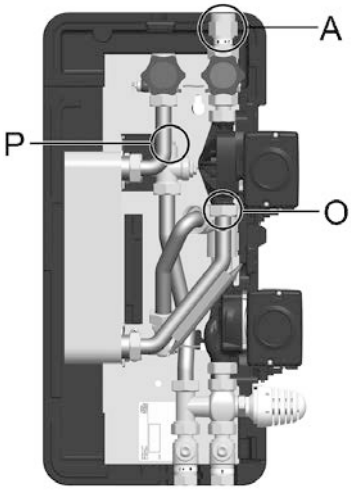
WARNING	**Risk to life and limb due to electric shock!** ➢ Check whether the sensors and pumps have been connected to the controller and the controller housing is closed. Do not apply voltage to the controller before that.

A detailed description of the commissioning of the controller can be found in the enclosed controller manual.



1. Makes sure that the circulation station is integrated correctly into the potential equalisation of the system.
2. Slowly open the piston valves on the secondary side (B) and (N).
3. Connect the circulation station to the power supply system (230 V, 50 Hz). The circulation station is pre-set in the factory for operation in combination with a pre-heat buffer (hydraulic version 39). The pre-setting must be adapted according to the system depending on the application.
4. Carefully open and close the venting device on the check valve (A).
5. Select the manual mode for the secondary pump in the selection menu of the controller (see controller manual).
   Switch on the PWM signal of the secondary pump ("100 %").
6. Allow the secondary pump to run for 3 minutes.
7. During this time, vent the circulation station several times on the vent plug of the check valve (A).
8. When you no longer hear any air noises, switch off the secondary pump.

7.3 Venting the circulation station



1. Allow the primary and secondary pumps to run for several minutes in manual mode.
2. Vent the primary side carefully via the manual air vents (O) ans (P).
3. Vent the secondary side carefully via the vent valve on the check valve (A).
4. After venting, check the operating pressure of the tank and, where necessary, increase the pressure.
5. Set the controller to automatic mode.
6. Check the station for leaks and set the desired temperature on the controller (see following chapter).
7. The circulation station is now ready for operation.

7.4 Setting the temperature

The desired (maximum) circulation temperature can be set on the thermostat controller.

 WARNING	**Risk of scalding from hot water!** ➢ In order to prevent scalding at the tap, the maximum hot water temperature should not exceed 60 °C.

The thermostat controller is infinitely variable. When delivered, a flow temperature of approx. 60 °C is pre-set. If, for example, the temperature at the circulation outlet is too high, the supply temperature can be regulated down on the thermostat controller.

The following table gives an overview of the thermostat controller setting range:

Setting range on the thermostat controller	Circulation temperature
5	~50 °C
6	~60 °C
7	~70 °C

7.5 Setting the pump revolution speed

In order to increase the energy efficiency of the circulation station, the revolution speed of the pumps must be adapted to the system-specific conditions (pressure drop in the pipework). See the controller manual as to how the revolution speed is adapted in the controller.

8 Maintenance

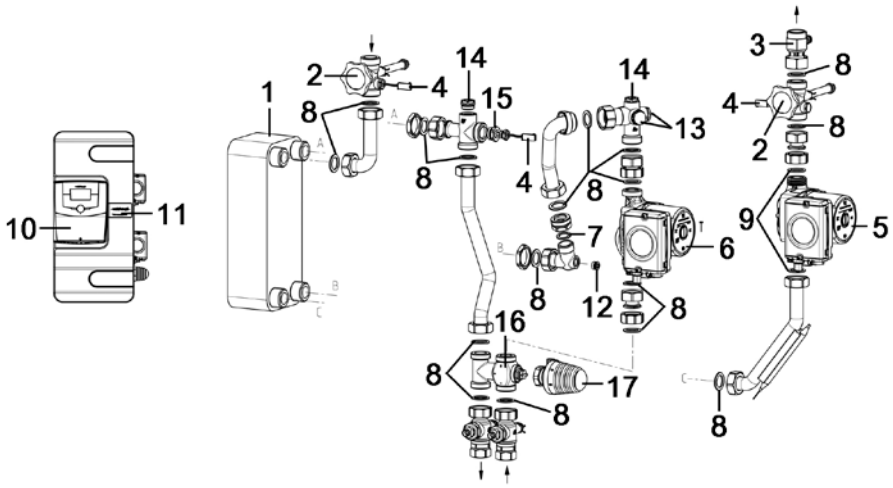
The WHI circuload modules are low in maintenance. However, as part of the annual inspection of the domestic water system, the following items should be checked/observed:

- Check all connections for leaks
- Check the safety equipment
- Perform a functional check and check the setting parameters
- Plausibility check of the control parameters and nominal values
- Check the heat exchanger for dirt and functioning

We recommend concluding a maintenance agreement.

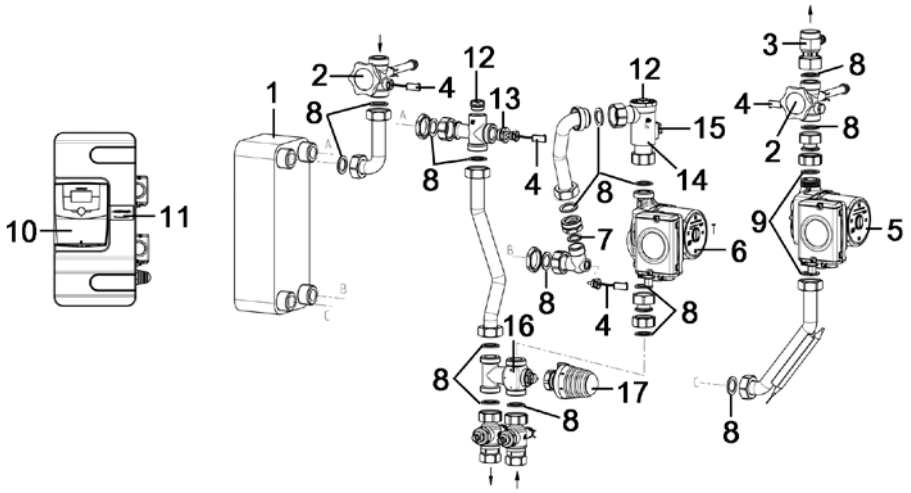
9 Spare parts

9.1 Spare parts list WHI circuload 9 #1 (40900015152)



Position number	Spare part	-w-Part number
1	Plate heat exchanger Swep IC10T/30	40900015387
2	Piston valve DN 20 G1A with drain	40900015092
3	Non return valve DN 20 G1Fl.xG1A	40900015227
4	Temperature sensor NTC 5K G¼A	40900015027
5	Circulation pump UPM2 15-75 CIL	601856
6	Circulation pump UPM2 15-75 LowFlow	601852
7	Seal 17 x 24 x 2 (¾") AFM34	48002002857
8	Seal 21 x 30 x 2 (1") AFM34	48002002847
9	Seal 21 x 30 x 2 (1") EPDM 90	40900015167
10	Solar controller WRSol 2.1 V2.0	660327
11	Name plate WHI circuload 9 #1	40900015407
12	Closing plug with O ring G¼A	40900015107
13	Cover screw G½A	40900015257
14	Bleed plug G½A	40900015277
15	Reducing piece G½A x G¼I	40900015267
16	Three way valve DN 20 Kvs 5.0 G1A / PN16	40900015367
17	Thermostatic head for three way valve 40-70 °C, white, M30x1.5	40900015377
Not shown in drawing	Seal 36 x 49 x 2 (1¾") AFM34	40900015397
	Thermo handle -weishaupt-	48002003132
	Temperature sensor NTC 5K ZTF 222.2	660228
	Plug fuse connection cable PWM	48002002627
	Connection cable 2500 mm for Hall sensor	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable temperature sensor 2500 mm	40900015037
	Outlet valve with O ring G¼A	40900015097

9.2 Spare parts list WHI circuload 9 #2 (40900015162)



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9	Seal 21 x 30 x 2 (1") EPDM 90	40900015167
10	Solar controller WRSol 2.1 V2.0	660327
11	Name plate WHI circuload 9 #2	40900015417
12	Bleed plug G½A	40900015277
13	Reducing piece G½A x G¼I	40900015267
14	FlowRotor DN 25 90 degrees, impulse meter 2-50 l/min	40900015572
15	Hall sensor with LED connection cable	48002002867
16	Three way valve DN 20 Kvs 5.0 G1A / PN16	40900015367
17	Thermostatic head for three way valve 40-70 °C, white, M30x1.5	40900015377
Not shown in drawing	Seal 36 x 49 x 2 (1¾") AFM34	40900015397
	Thermo handle -weishaupt-	48002003132
	Closing plug with O ring G¼A	40900015107
	Temperature sensor NTC 5K ZTF 222.2	660228
	Plug fuse connection cable PWM	48002002627
	Connection cable 2500 mm for Hall sensor	48002003127
	Connection cable PWM 2500 mm long	48002002617
	Pump cable 3 x 0.75 2500 mm long	48002002607
	Plug cable temperature sensor 2500 mm	40900015037
	Outlet valve with O ring G¼A	40900015097

10 Commissioning log

System operator				
System site				
Serial numbers:				
WHI load-E 90 #1				
WHI load-E 125 #1				
Controller				
Software version				
Primary pipeline	⌀ =	mm	l =	m
Secondary pipeline	⌀ =	mm	l =	m
Other installations	☐			

Have both circuits been correctly flushed and vented? (No air sounds in the pump)	☐	Vented
Are all shut-off fittings open in the cold water and storage lines?	☐	Open
Is there a minimum pressure of 1.5 bars available on the primary side?	☐	Checked
Is there a minimum pressure of 2.5 bars available on the secondary side?	☐	Checked
Is a fault message shown on the display?	☐	No message

Setting of the thermal mixing valve: _____

Installation company	Date, Signature

Max Weishaupt GmbH ▪ ·88475 Schwendi

Weishaupt close by? Addresses, telephone numbers etc. can be found at www.weishaupt.de

The complete program: Reliable technology and prompt, professional service

W Burners **up to 570 kW**

The compact burners, proven millions of time sover, are economical and reliable. Available as gas, oil and dual fuel burners for domestic and commercial applications.
The purflam®burner version with special mixing head gives almost soot-free combustion of oil with greatly reduced NO_x emissions.

monarch®WM Burners and Industrial Burners **up to 11,700 kW**

These legendary industrial burners are durableand versatile.
Numerous variations of oil, gas and dual fuel burners meet a wide range of applications and capacity requirements.

WK Burners **up to 28,000 kW**

These industrial burners of modular construction are adaptable, robust and powerful.
Even on the toughest industrial applications these oil, gas and dual fuel burners operate reliably.

multiflam® Burners **up to 17,000 kW**

This innovative Weishaupt technology for medium and large burners provides minimum emission values at capacities up to 17 MW.
The burners with the patented mixing head are available for oil, gas and dual fuel operation.

MCR Technology / Building Automation from Neuberger

From control panels to complete building management systems - at Weishaupt you can find the entire spectrum of modern control technology. Future orientated, economical and flexible.

Service

Weishaupt customers can be assured that specialist knowledge and tools are available whenever they are needed. Our service engineers are fully qualified and have extensive product knowledge, be it for burners, heat pumps, condensing boilers or solar collectors.

Wall-hung condensing boilers for oil and gas **up to 240 kW**

The wall-hung condensing boilers WTC-GW and WTC-OW have been developed to meet the highest demands in ease of operation and efficiency.
Modulating operation means these units operate quietly and economically.

Floor standing condensing boiler for oil and gas **up to 1,200 kW**

The floor-standing boilers WTC-GB and WTC-OB are efficient, low in emissions and versatile. Higher capacities are achieved by cascading up to four gas-fired condensing boilers.

Solar systems

The stylish flat-plate collectors are the ideal complement for any Weishaupt heating system. They are suitable for solar water heating and for combined heating support.
With versions for on-roof, in-roof and flat roof installations, solar energy can be utilised on almost any roof.

Water heaters / energy storage tanks

This attractive program for domestic water heating includes classic water heaters, solar storage tanks, heat pump storage tanks and energy storage tanks.

Heat pumps **up to 130 kW**

The heat pump range offers solutions for the utilisation of heat from the air, the soil or ground water.
Some systems are also suitable for cooling buildings.

Geothermal probe drilling

With its daughter company, BauGrund Süd, Weishaupt also offers geothermal probe and well drilling. With the experience of more than 10,000 systems and more than 2 million meters of drilling, BauGrund Süd offers a comprehensive service program.