–weishaupt–

manual

Mounting and operating instructions

Loading station WHI load-E 90 #1

83289902 · 1/2020-05

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 authorised 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 loading station must only be installed as a transfer station between the heating circuit 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 loading 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 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 loading station must be integrated into the potential equalisation of the electrical installation. If this is not guaranteed by the connected pipework, a proper potential equalisation connection to the main potential connection must be established.

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 tested together with the machine.
Use only Weishaupt original parts.

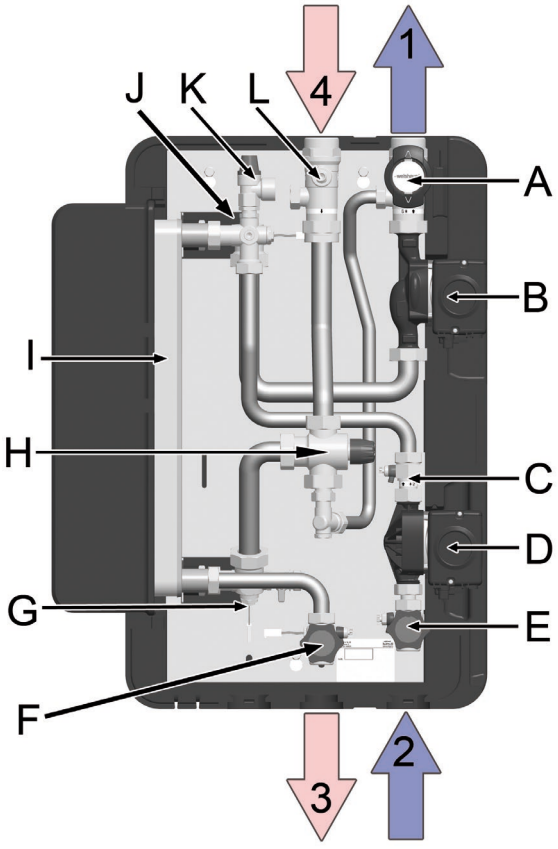
2.6 Disposal

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

3 Product description

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

- Ball valves in the primary circuit
- Piston valves in the secondary circuit
- Safety valve in the secondary circuit
- Thermal mixing valve in the primary circuit
- Pre-assembled controller
- Temperature sensor at the hot domestic water outlet
- Temperature sensor on the heating supply and heating return
- Fill and drain valve for draining the heat exchanger
- Vent plug for venting the heat exchanger



Connections

1	Primary side: return to heat storage device
2	Secondary side: cold water inlet
3	Secondary side: hot water outlet
4	Primary side: supply from heat storage device

Equipment

A	Ball valve with check valve
B	Primary pump
C	Non return valve with drain valve
D	Secondary pump
E	Piston valve with drain valve
F	Piston valve with drain valve and temperature sensor
G	Fill and drain valve and temperature sensor
H	Thermal mixing valve 20 - 70 °C
I	Plate heat exchanger
J	Vent valve (primary circuit)
K	Safety valve (secondary circuit)
L	Ball valve

3.1 Function

The WHI load-E loading stations are used to transfer the heat between a storage device in the heating circuit and a domestic water tank.

The integrated plate heat exchanger allows a high transfer capacity.
This also allows the energy to be transferred from the storage device into a domestic water tank at a low temperature level.

The integrated closed-loop control controls the setting of the pump revolution speeds.

3.2 Technical Data Loading Stations

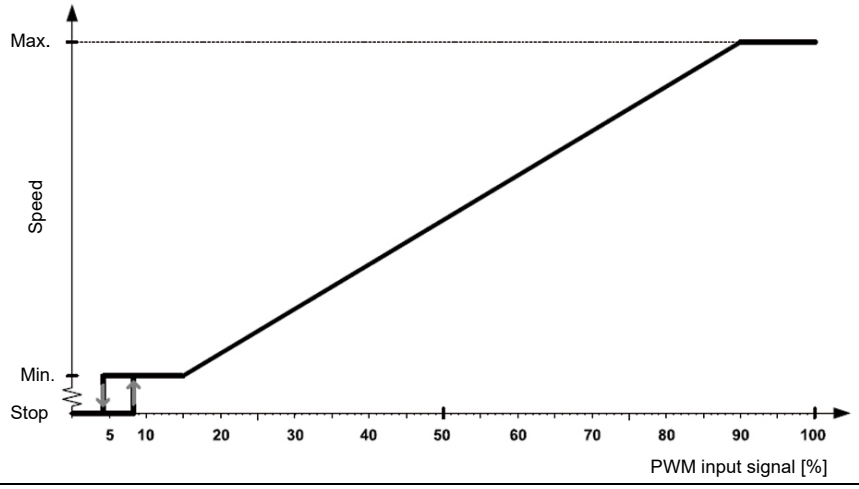
Dimensions	WHI load-E 90 #1
Height (with insulation)	795 mm
Width (with insulation)	602 mm
Depth (with insulation)	298 mm
Centre distance, top	120 mm
Centre distance, bottom	120 mm
Primary pipe connection (heating circuit)	1½" male thread, flat sealing
Secondary pipe connection (domestic water circuit)	1" male thread, flat sealing
Safety valve outlet:	G ¾" female thread
Operating data	
Max. admissible pressure	primary: 6 bars, secondary: 10 bars
Operating temperature	2 – 95 °C
Max. power Q_{max}	90 kW at $Flow_{prim.}$ 65° / $DHW_{sec.}$ 60° / $DCW_{sec.}$ 10°
Flow rate at Q_{max}	primary: 1900 l/h, secondary: 1550 l/h
Operating temperature sensors	-25 °C to +120 °C
Equipment	
Safety valve	secondary: 10 bars, suitable for domestic water
Primary pump	High-efficiency pump with PWM control, 3-70 W
Secondary pump	High-efficiency pump with PWM control, 3-70 W
Heat exchanger	40 plates
Temperature sensors	primary: 2 x NTC 5K, secondary: 1 x NTC 5K
Check valve (in the ball valve)	primary: 1 x 200 mm wc
Material	
Valves and fittings	Brass
Seals: O-ring	EPDM
Flat sealing	AFM-34/2, free of asbestos
Check valve	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 25-75 LowFlow	Grundfos UPM2 15-75 CIL
Length	180 mm	130 mm
Connections	1½" male thread	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 load-E 90 #1	Prim	Sec
Prim = Primary side (heating circuit) Sec = Secondary side (domestic water circuit)		

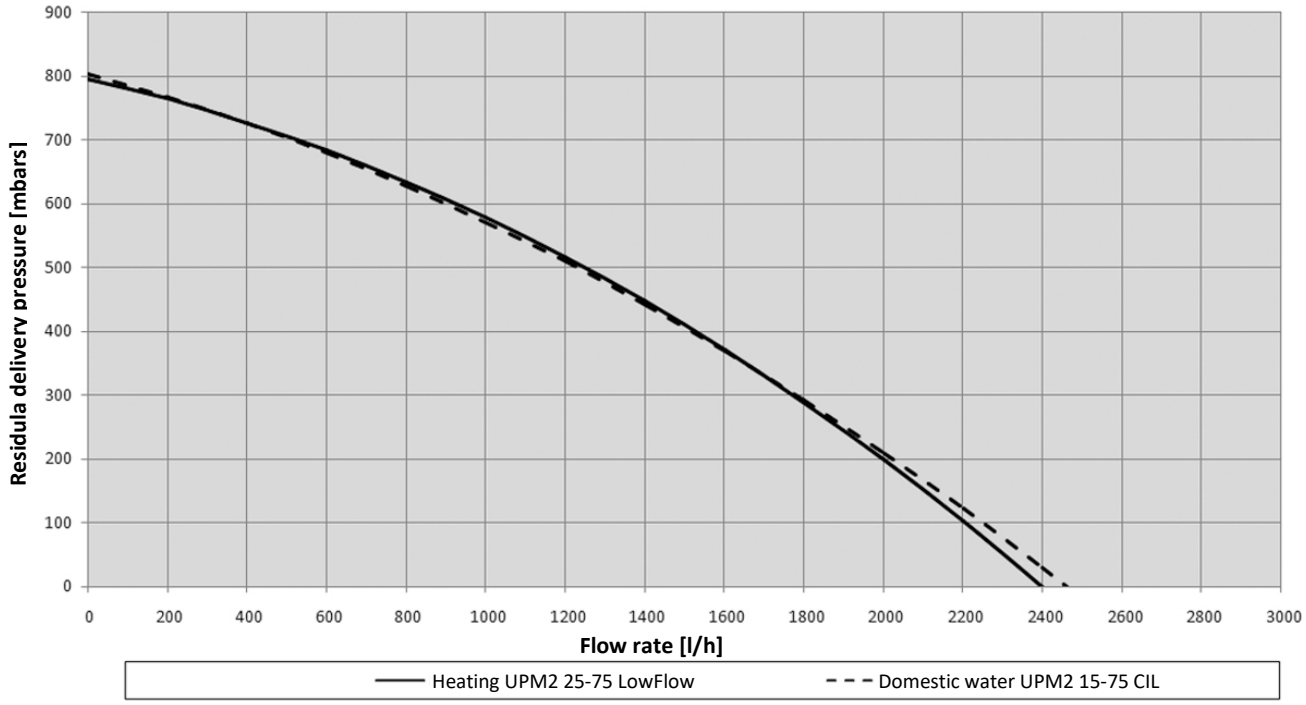
3.4 PWM input signal (solar profile)

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 load-E 90 #1



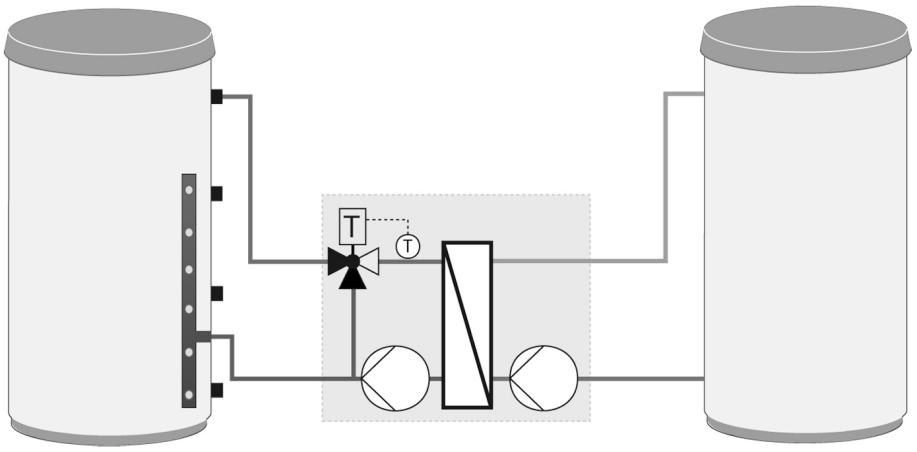
4 Dimensioning and Planning

The WHI load-E is a loading station for transferring the heat between the storage device in the heating circuit and the domestic water tank.

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

The WHI load-E allows two different control strategies. A detailed description of the control strategies can be found in the enclosed controller manual.

Assembly example



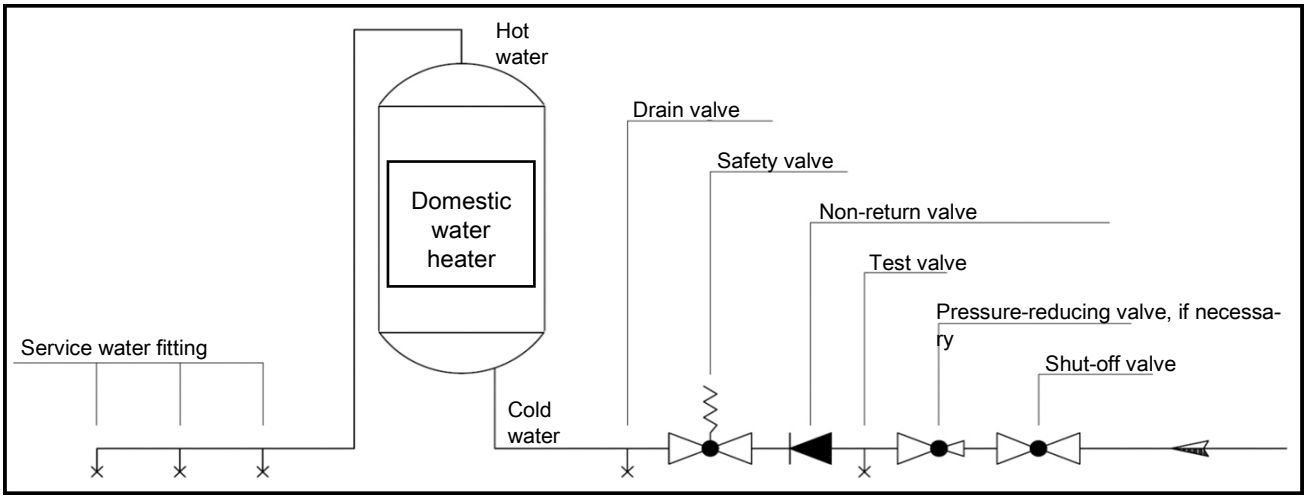
Storage device | WHI load-E | Domestic water heater

Please note:

Due to their construction, the WHI load-E 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.

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!

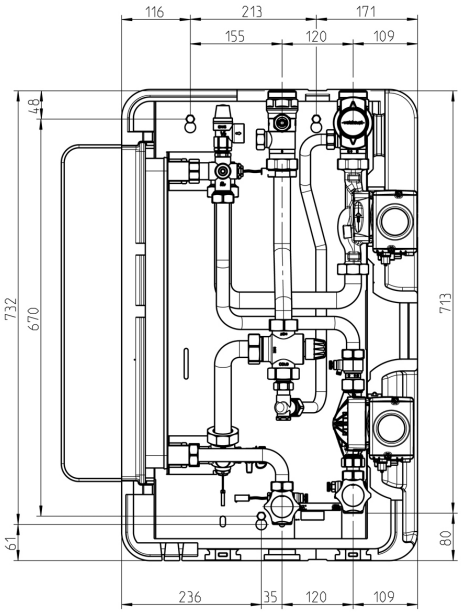
- In order to avoid damaging the system, the installation site must be dry, structurally safe and frost-free.
- Furthermore, access to the closed-loop control and safety equipment must be guaranteed at all times during operation!
- If tapping points are connected to the same network as the loading station, 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 loading 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.

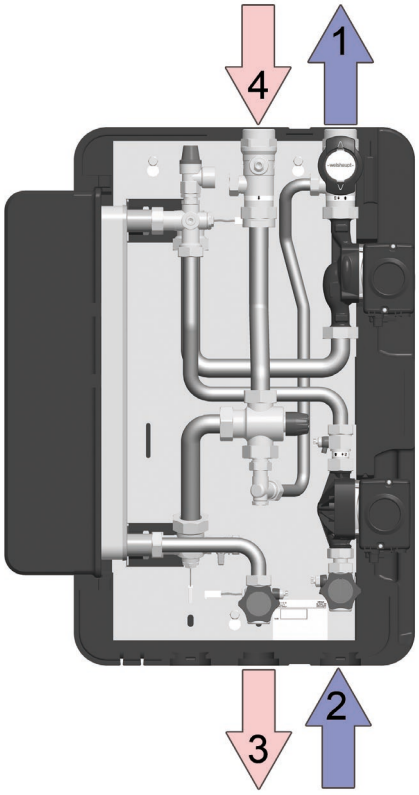


1. Determine the installation site of the loading station near the boiler. With longer connecting lines, the transfer output is reduced due to the higher pressure loss.
2. For assembly, a drilling pattern can be used as mounting aid. It is available at the station.
3. Transfer the dimensions for the drill holes onto the wall.
4. Drill the holes and insert the enclosed wall plugs. Make sure that the ground has sufficient load-carrying capacity.
5. Screw the screws into the plug until they protrude about 40 mm from the wall.
6. Remove the station from the packaging.
7. Pull off the front shell.
8. Hang the loading station on the screws.
   Tighten the screws so that the insulation on the sides rests against the wall.

5.2 Connection

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

Pipe gap from the wall (primary) = 95 mm



Pipe gap from the wall (secondary) = 167 mm

1 Primary side: return to heat generator

Connection WHI load-E 90 #1: 1½" male thread, flat sealing

Piping:

WHI load-E 90 #1: min. DN 25, 28 x 1.5 mm

2 Secondary side: cold water inlet

Connection WHI load-E 90 #1: 1" male thread, flat sealing

3 Secondary side: hot water outlet

Connection WHI load-E 90 #1: 1" male thread, flat sealing

4 Primary side: supply from heat generator

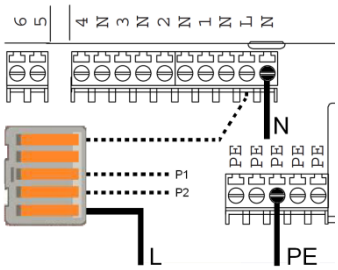
Connection WHI load-E 90 #1: 1½" male thread, flat sealing

Piping:

WHI load-E 90 #1: min. DN 25, 28 x 1.5 mm

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 loading 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. ➢ The plug-in pump lines are permanently supplied with a mains voltage of 230 V and cannot be switched off via the controller.



1. Connect the neutral conductor (N) and the protective earth (PE) using the screw terminals shown in the controller manual and in the figure opposite.
2. Connect the outer conductor (L) to the bus bar in the controller housing.
   To do so, lift the lower lever and clamp the line pressing the lever down.
   Next check whether the line is firmly clamped.
3. The bus bar has already been connected to the screw terminal (L) of the controller and the pump lines for constant power supply. Due to the high power consumption of the pumps, the latter are not supplied with 230 V via relays, but permanently connected to the mains supply.
   The speed control (0-100%) of the pumps is effected via the PWM control signal.

5.4 Electrical connection of the solar controller WRSol2.1

Terminal	Acronym	Description	Execution
L/N	230V	Mains connection 230V	on site
L/N	PWP	Primary circuit pump	prewired
L/N	PWS	Secondary circuit pump	prewired
12/⊥	TSV	Secondary circuit flow sensor	prewired
13/⊥	TU2	Temperature, tank bottom	on site
14/⊥	TO2	Temperature, tank top	on site
16/⊥	TO1	Temperature, storage device top	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

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 40
- eBUS address 4

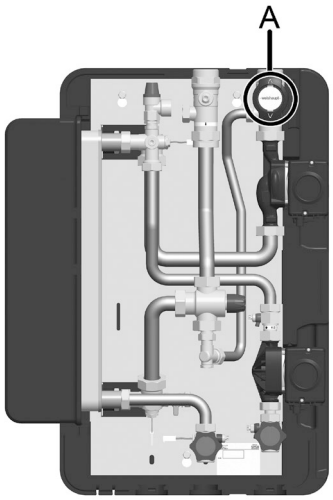
7 Commissioning

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

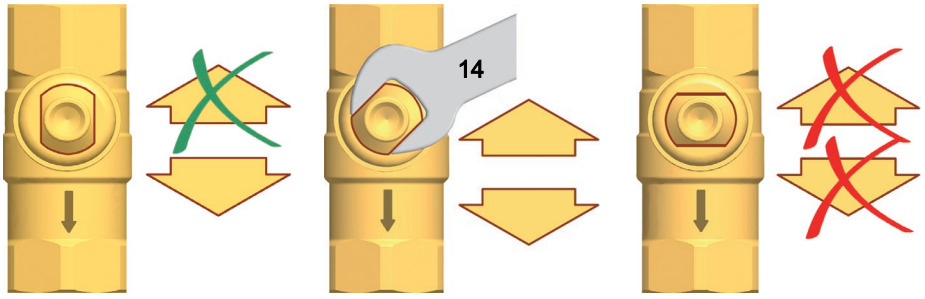
The ball valve (A) in the primary circuit is equipped with a check valve in order to prevent undesired gravity circulation.

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

All ball valves and valves must be open **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.

Thermal mixing valve

When delivered, the thermal mixing valve is open. Before filling the primary circuit, the thermal mixing valve must be closed by turning it 4 times. After filling, the thermal mixing valve must be opened again by turning 2 times. When turning for the 2nd time, the range set is equivalent to approx. 65 °C flow temperature.

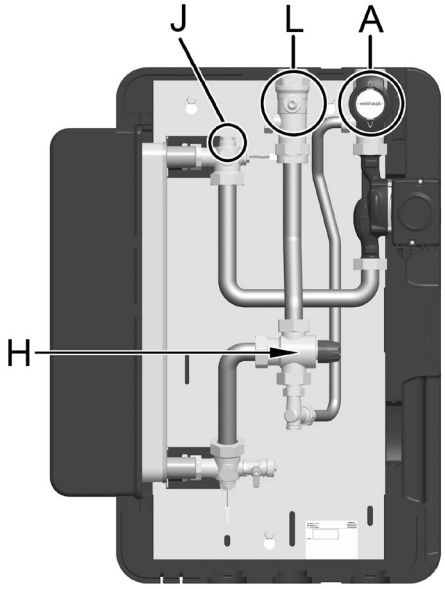
7.1 Filling the primary circuit

WARNING

Risk of scalding from hot water!

The system is under pressure. When opening the vent valve, water up to 90 °C may escape at the vent valve that could lead to personal injury.

➢ Open the vent valve slowly and at a safe distance.



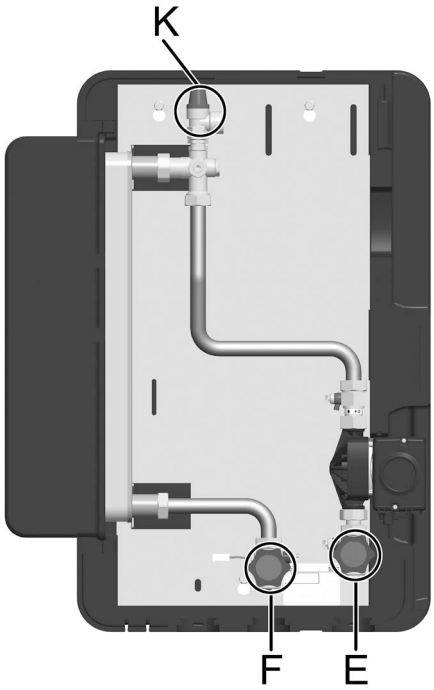
Primary circuit

With (partially) filled system on the primary side

1. Close the thermal mixing valve (H) by turning it 4 times.
2. Open ball valve (L) slowly by turning it to the **0°** position.
3. Using the fill fittings installed on-site, fill the system on the primary side until it has reached an operating pressure of approx. 1.5 bars*.
   Use heating water according to VDI 2035 / Ö-Norm H 5195-1.
4. Actuate vent valve (J) carefully and allow the air to escape.
   Where necessary, fill the system if the pressure drops.
5. Close vent valve (J).
6. Close ball valve (L) slowly by turning it to the **90°** position.
7. Open ball valve (A) slowly by turning it to the **45°** position.
8. Actuate vent valve (J) carefully and allow the air to escape.
   Where necessary, fill the system if the pressure drops.
9. Close vent valve (J).
10. After venting, check the operating pressure of the system on the primary side and, where necessary, increase the pressure.
11. Open ball valves (A) and (L) completely by turning them to the **0°** position.
12. Turn the thermostat valve (H) 2 revolutions to open it. The range set is equivalent to a flow temperature of approx. 65 °C.

*1.5 bars in the primary circuit = recommended minimum value
Decisive factors for the pressure are also the design-related system pressures and the heating system components!

7.2 Filling the secondary circuit



Secondary circuit

With (partially) filled tank

1. Open the piston valves completely (E and F).
2. Carefully open safety valve (K) to vent the system.
3. This completes the filling of the system.

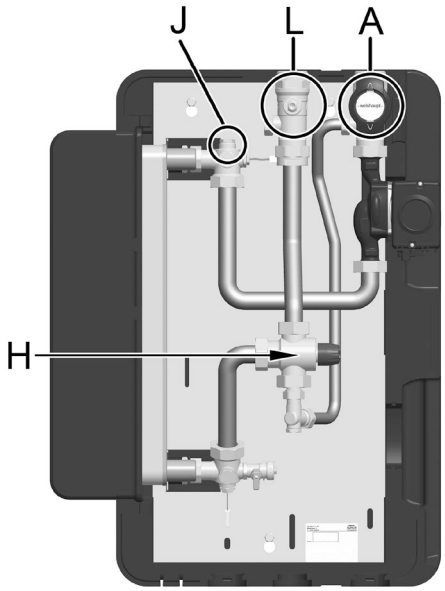
7.3 Commissioning the controller

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.

-



With (partially) filled tank

1. Make sure that the loading station has been integrated correctly into the potential equalisation of the system.
2. Make sure that the correct connection of the sensors installed on-site is established (see controller manual).
3. Connect the loading station to the power supply system (230 V, 50 Hz).
4. Select the manual mode in the selection menu of the controller. Switch on the PWM signal of the primary pump ("100 %").
5. Allow the pump to run for a few minutes to vent the loading station.
6. If you can still hear air noises after that, carefully actuate the vent valve (J) while the pump is still running and allow the air to escape.
7. Check the position of thermal mixing valve (H).
   If necessary, close and open thermal mixing valve (H) several times and allow air to escape.
8. If you cannot hear air noises anymore, switch the pump again to automatic mode.
9. In order to vent the secondary circuit, repeat steps 4. - 8. in the secondary circuit.
10. Check the station for leaks and set the desired domestic hot water temperature on the controller (see following section).
11. The WHI load-E 90 #1 loading station is now ready for operation.

7.4 Setting the temperature

The desired (maximum) domestic hot water temperature can be set on the controller. A detailed description of the operation of the controller can be found in the enclosed controller manual.

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.

NOTICE

Malfunctions!

- If the thermal mixing valve is set too cold, the hot water temperature set on the controller cannot be reached!

8 Maintenance

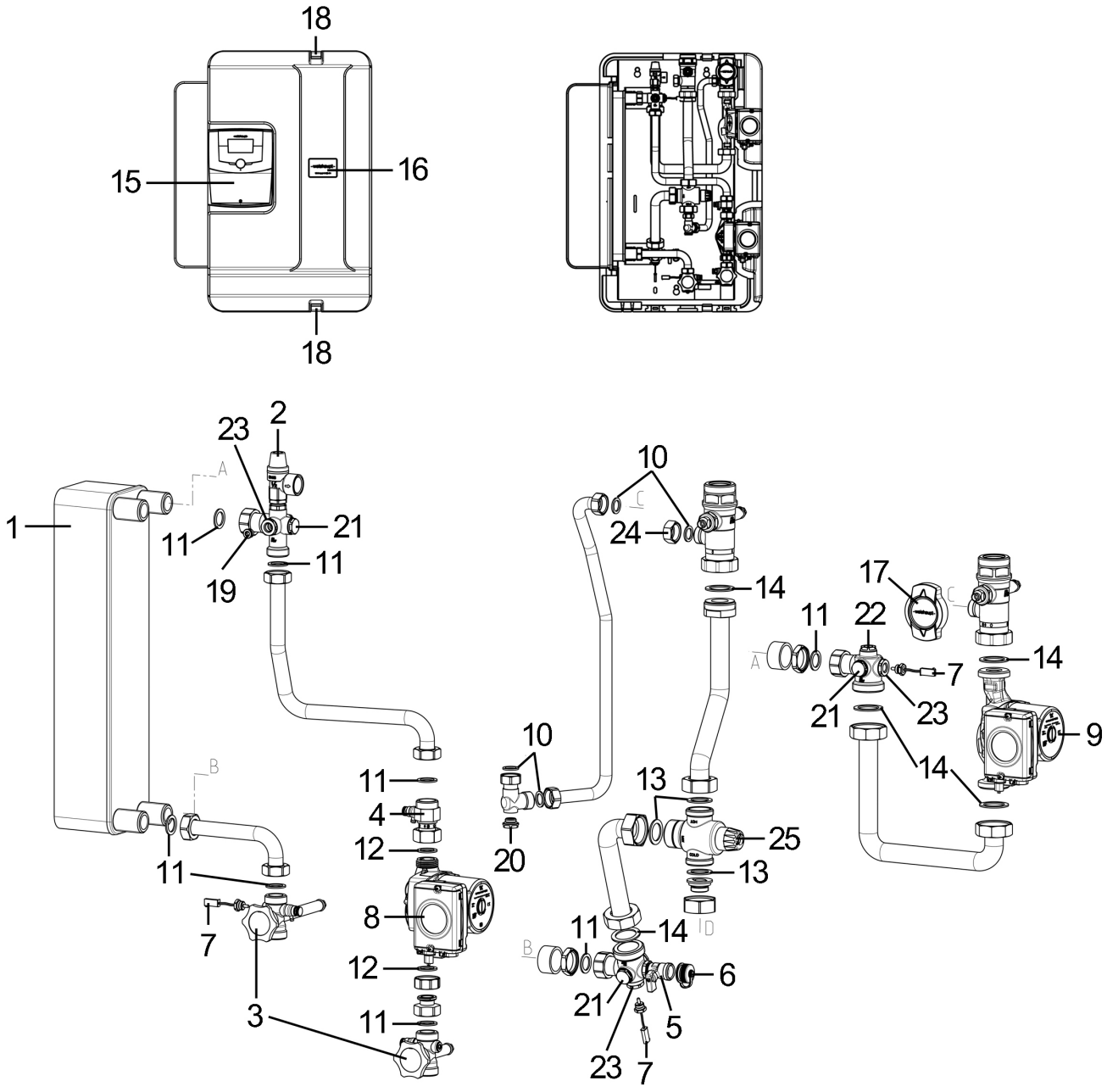
The WHI load-E modules are low in maintenance. However, as part of the annual inspection of the domestic water system, the following items should be checked/observed:

- 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 load-E 90 #1 (40900015202)



Position number	Spare part	-w-Part number
1	Plate heat exchanger Swep IC25T/40	40900015067
2	Safety valve ½" 10 bars	40900015057
3	Piston valve DN 20 G1A with drain	40900015092
4	Non-return valve DN 20 G1Fl.xG1A	40900015227
5	Inlet and outlet valve G ½ with hexagonal nut	48002002667
6	Cap for inlet and outlet valve	48002002677
7	Temperature sensor NTC 5K G¼A	40900015027
8	Circulation pump UPM2 15-75 CIL	40900019342
9	Circulation pump UPM2 25-75 LowFlow	40900019352
10	Seal 17 x 24 x 2 (¾") AFM-34/2	40900021107
11	Seal 21 x 30 x 2 (1") AFM-34/2	40900021117
12	Seal 21 x 30 x 2 (1") EPDM 90	40900015167
13	Seal 27 x 38 x 2 (1¼") AFM-34/2	40900021137
14	Seal 32 x 44 x 2 (1½") AFM-34/2	40900021147
15	Solar controller WRSol 2.1 V2.0	660327
16	Name plate WHI load-E 90 #1	40900015287
17	Thermo handle -weishaupt-	48002003132
18	Retaining clip heat insulation	40900015247
19	Closing plug with O ring G¼A	40900015107
20	Cover screw G⅜A	40900015217
21	Cover screw G½A	40900015257
22	Bleed plug G½A	40900015277
23	Reducing piece G½A x G¼I	40900015267
24	End cap G¾	40900015237
25	Thermostatic mixer valve MT52 DN 25	669499
Not shown in drawing	Temperature sensor NTC 5K ZTF 222.2	660228
	Connection cable 2500 mm for Hallsensor	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 Accessories

10.1 Sampling valve

Sampling valve (-w-item no. 40900015017) on WHI load-E optionally available as accessory:
Inflammable valves for germ-free sampling of water samples according to German Drinking Water Ordinance.
Mounted laterally on the piston valves.

10.2 Flow meter

Flow meter (-w-item no. 40900015502) for WHI load optionally available as accessory:
Conversion kit for recording the heat flow (in the primary circuit) in combination with the station controller.

11 Commissioning log

System operator				
System site				
Serial numbers:				
WHI load-E 90 #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

12 Notes

12 Notes

12 Notes

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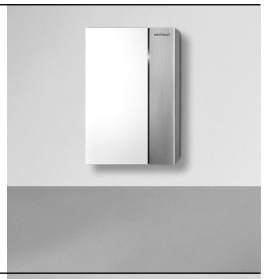
Even on the toughest industrial applications these oil, gas and dual fuel burners operate reliably.

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.

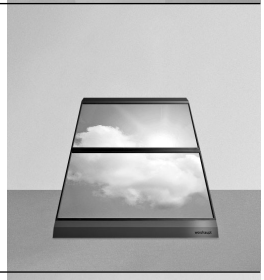


Wall-hung condensing boilers for gas **up to 240 kW**

The wall-hung condensing boilers WTC-GW 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 boilers for oil and gas **up to 1,200 kW**

The floor-standing condensing boilers WTC-GB (up to 300 kW) and WTC-OB (up to 45 kW) are efficient, low in pollutants and versatile in use.
Even the largest capacities can be covered by cascading up to four gas 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

The diverse program of potable water and energy storage for various heat sources includes storage volumes of 70 to 3,000 litres. In order to minimize storage losses, potable water cylinders from 140 to 500 litres are available with highly efficient insulation using vacuum insulation panels.

Heat pumps **up to 180 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.

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