



Manual for Installation, Operation and Maintenance of Internal heat pump units.

Models
WSL141, WSL142

The manual must be handed over to the end user after installation.



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Manual for installation, use and maintenance ř Hydro module WSL141, WSL142,

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1. Important information

The manual describes the process of installation and maintenance of the device. The installation and maintenance can only be performed by qualified personnel. Read the manual carefully before the installation, this way you will be informed about the intended use, functionality and process of handling the device.

- ▶ The manual has to be handed over to the end user after installation.
- ▶ In case the product is given for use to a third person, the manual has to be handed over to them as well.

1.1 Symbols



These symbols mark various risks for the user or the device.

DANGER: Risk of situations which can lead to serious physical injuries.

WARNING: Risk of situations which can lead to minor physical injuries.

CAUTION: Risk of situations which can lead to damage or malfunction of the device.



This symbol marks information for the user.

NOTE: A notice holding important information regarding requirements of the manufacturer and the device.

Definitions

- ▶ An informed person is a person who reads this manual.
- ▶ A qualified person has a certificate of expert qualifications.
- ▶ An authorised commission contractor is trained by the manufacturer and authorised to perform commission.
- ▶ The authorised technician is trained and authorised by the manufacturer to perform maintenance and servicing of the device.
- ▶ The user uses the device according to its use.
- ▶ The installer is a person professionally trained for performing hardware and/or electric installation work and mounting of the device.

Incorrect use of the device can lead to damage to the device, property or injury to the user. To reduce risk, the manual points out important information with the use of symbols.

1.2 General



NOTE

Read the instructions for operation and installation before installation.



NOTE

Any remaking or replacement of original components of the device voids the manufacturer's guarantee for safe and functional operation. The manufacturer is not responsible for the consequences and will not acknowledge claims for damages in these cases of undesignated and incorrect use of the device. The user is solely responsible for injuries and damages on the device itself or on other objects resulting from undesignated and incorrect use of the device.



NOTE

The installation of the device has to be performed in accordance with the manual; otherwise the manufacturer does not acknowledge the warranty.



NOTE

High pressure in heating system can cause that safety valve leak water. Make sure the drainage pipe is open to atmospheric pressure.



CAUTION

A yearly inspection of the safety valve is necessary to ensure its proper operation; when performing it, remove lime deposits and make sure the safety valve is not blocked.



NOTE

The device with the mark WSL142 has a 200 litre DHW installed.



CAUTION

The drainage hole of the safety valve must be directed downwards. Make sure it does not freeze.



DANGER

Failure to comply with the manual and good practise while connecting the device to the power supply can lead to serious injury or death.



WARNING

Connecting the device to the power source can only be performed by a qualified installer.

1.3 Safety warnings and instructions



DANGER

It is prohibited to move, shift, clean or service the device while in operation.



WARNING

It is prohibited to play with the device. Children are not allowed to clean the device without supervision.



WARNING

The device can be operated independently only by informed persons who are familiar with the safe operation of the device and understand possible hazards of its operation. Children older than 8 and people with reduced physical and mental capacities and with lack of experience and knowledge can only operate the device under the supervision of an informed person.



WARNING

Before installation and any further adjustments to the device it is necessary to consider the manual for safe use and maintenance.



WARNING

The installation has to be performed in accordance with national regulations on electrical installations and with the instructions of the manufacturer. It has to be performed by a professionally trained person.



WARNING

It has to be made sure that the device does not endanger anybody. Access to the device has to be denied to children and persons who are not informed about the operation of the device.



WARNING

The device must never be cleaned with cleaning agents containing sand, soda, acid or chlorides because these might damage the surface of the device.



WARNING

The device contains fluorinated greenhouse gas. This is why tampering with the device is only allowed to persons authorised for working with the refrigerant as defined by the national legislation in force. While performing works on the device, it is necessary to prevent the refrigerant to leak into the atmosphere.



WARNING

It is necessary to consider all technical data and instructions in this manual as well as all warnings and notes during planning, design, installation and use of the device.



WARNING

Electrical installations have to be inspected in accordance with regulations on the requirements for low voltage electrical installations in buildings by a qualified installer.

**DANGER**

Connecting the device's power cable must be performed by a qualified electrician. The device must not be live during the procedure.

**WARNING**

In case the power cable of the device is damaged, it has to be replaced. The replacement can only be performed by the installer and/or authorised maintenance worker.

**WARNING**

Before opening the device, disconnect all electrical circuits and make sure the device is not live.

**CAUTION**

Putting any kinds of items on or next to the device is prohibited.

**CAUTION**

The device must not be placed in a room where it cannot be removed. Later walling or setting up of other obstacles next to the device is forbidden.

**CAUTION**

In three-phase versions of the device it is necessary to ensure the correct arrangement of phases when connecting the device to the power supply.

**CAUTION**

For the correct operation of the device, the electrical distributor has to provide electricity of adequate quality (SIST EN 50160). In normal conditions this is within $\pm 10\%$ of the rated voltage. The data about the state of the electrical grid may be acquired from the electrical distributor.

**CAUTION**

Connecting the device to the electric grid has to be performed in accordance with the standards. The device has to be connected to the electric grid via the power supply cut-off which is installed into the electrical installation under the regulations in force.

1.4 Obligations of the manufacturer

The manufacturer guarantees that the device is in accordance with current European directives and standards. The device is marked with the mark CE and it has all the necessary documentation.

We reserve the right to make changes to the manual without prior notice.

As manufacturer we do not take responsibility for the consequences arising from:

- ▶ Non-compliance with the manual for the device.
- ▶ Incorrect and/or inadequate maintenance of the device.
- ▶ Non-compliance with the manual for the installation of the device.

1.5 Obligations of the installer during installation

The installer is responsible for installing the device in accordance with the following requirements:

- ▶ To thoroughly study the instructions for use and installation accompanying the device before installation.
- ▶ To install the device in accordance with the instructions and national legislation, policies and standards in force.

1.6 Obligations of the authorised contractor for commissioning at first commission.



CAUTION

The first commissioning can only be performed by a contractor appointed by the manufacturer in accordance with the instructions for commissioning.

The contractor is responsible for commissioning the device in accordance with the following requirements:

- ▶ Performs the first commission and with the installer of others section of heating system eliminates all eventual irregularities found at the commission.
- ▶ To train the user for operating the device and settings.
- ▶ Alerts the user to regularly maintain the device for keeping the device functioning properly throughout its entire lifespan.
- ▶ Gives the user all the documentation accompanying the device.

1.7 Obligations of the user

For ensuring unobstructed and effective operation of the device the user has to follow the following instructions:

For ensuring unobstructed and effective operation of the device the user has to follow the following instructions:

- ▶ To thoroughly study the instructions for use and installation accompanying the device before use.
- ▶ To have a qualified and authorised installer perform the installation of the device.
- ▶ To have a contractor for commissions perform the commission.
- ▶ Allow the authorised contractor for commissioning or ask him to thoroughly explain the functioning and how to operate the device.
- ▶ Ensure regular yearly inspections and maintenance of the device by the authorised maintenance worker.
- ▶ Store this manual in an appropriate dry place close to the device.

1.8 Factory testing

For ensuring the high quality standard every device is tested in production for the following:

- ▶ Tightness of the cooling cycle,
- ▶ Water-tightness
- ▶ Electrical safety and
- ▶ Functionality.

2. Transport and installation of the device



WARNING

Valves, safety elements and pipes must be checked, calculated and determined by the system or hardware installations contractor.



WARNING

Before connecting the device, it is necessary to rinse the pipe system thoroughly and remove impurities (solid particles, oils, greases ...).
Use suitable detergents if necessary.



NOTE

The device must be connected via closing valves.

2.1 Transport



CAUTION

- ▶ The device must be transported with transport devices.
- ▶ Secure the device during transport to prevent damage.

2.2 Installation of the device



CAUTION

Appropriate transport equipment must be used for installing the device. Safety regulations and good practise have to be applied.

2.3 Storage and warehousing of the device

The device has to be stored in a dry and clean place. The allowed storage temperature is between 10 °C and 45 °C, for a short period (up to 24h) also up to 50 °C.

3. Delivery

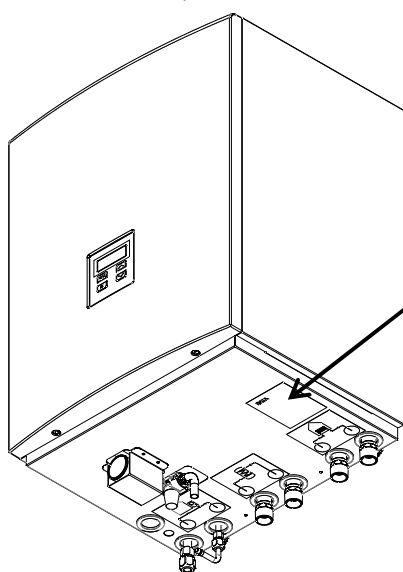
3.1 Internal unit

- ▶ Temperature sensor of sanitary water (Pt 1000).
- ▶ Temperature sensor of 2. mixing-heating circuit (Pt 1000).
- ▶ Temperature sensor of external temperature
- ▶ Installation instructions.
- ▶ Instructions for use.

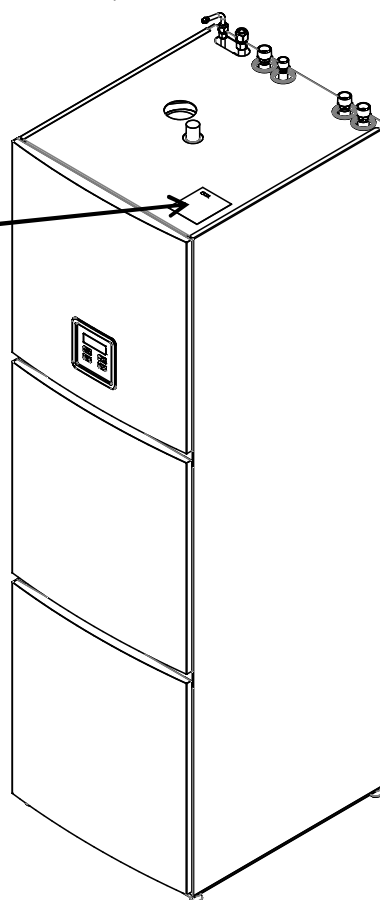
3.1.1 Hydro module SPLIT

- ▶ Hydro module

WSL141,



- ▶ Hydro module with integrated 200 litres domestic hot water cylinder WSL142,



DATA LABEL

3.2 External device

The external unit is installed depending on the design of the heating system:

See Manual for Installation, Use and Maintenance for **air–water heat pump**

- ▶ WSLHP7 & WSLHP11

3.3 Recycling of packaging and heat pumps at end of life.

- ▶ Sort the package according to cardboard, wood and foil and dispose of it in appropriate containers.
- ▶ After the lifespan of the device ends it has to be disposed of in accordance with the legislation on waste electrical and electronic devices and devices which contains fluorinated greenhouse gas.

Refrigerant

The device has to be connected to the external unit holding the HFC refrigerant which is a fluorinated greenhouse gas. You have to prevent leakage of the gas into the atmosphere. During a maintenance procedure or removal of the device it has to be made sure that the gas is removed in accordance with the current regulations for the use of substances harmful to the ozone and fluorinated greenhouse gasses.

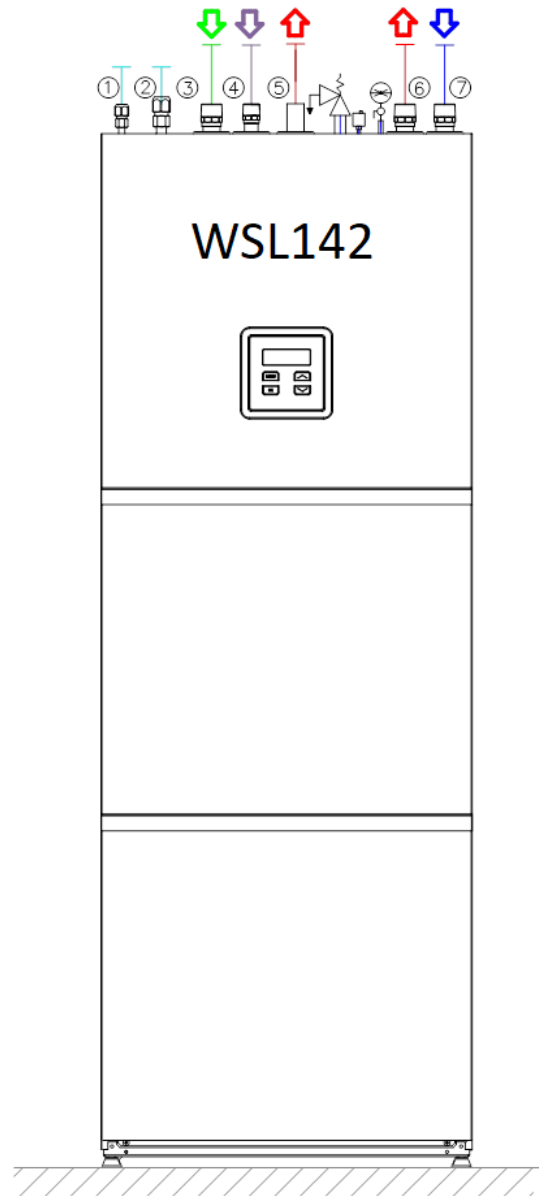
4. Installation of the device

4.1 General

The device is installed according to capacity



WSL141	
1	Refrigerant line - for gas
2	Refrigerant line - for liquids
3	Cold sanitary water
4	Hot sanitary water
5	Return line system
6	Supply pipe system



WSL142	
1	Refrigerant line - for liquids
2	Refrigerant line - for gas
3	Cold sanitary water
4	Circulation of sanitary water
5	Hot sanitary water
6	Supply pipe system
7	Return line system

4.2 Location of the device



NOTE

It is obligatory to consider the minimal clearance from obstacles for ensuring unobstructed access for maintenance and service.



NOTE

The location of the device has to be accessible with manual transport devices to ensure undisturbed delivery of replacement parts and equipment for maintenance and servicing. The operator is charged costs connected with hiring special equipment for installing the device, servicing and maintenance separately, these costs are not subject of the warranty.



NOTE

When you install the device into the building, make sure that you build in a water drain which will serve as a water drain in case of spillage.

4.2.1 Minimal clearance from the device



CAUTION

The device must not be installed under pipelines because there is a possibility of condensate forming. Ingress of water condensate can cause disturbances in the operation.

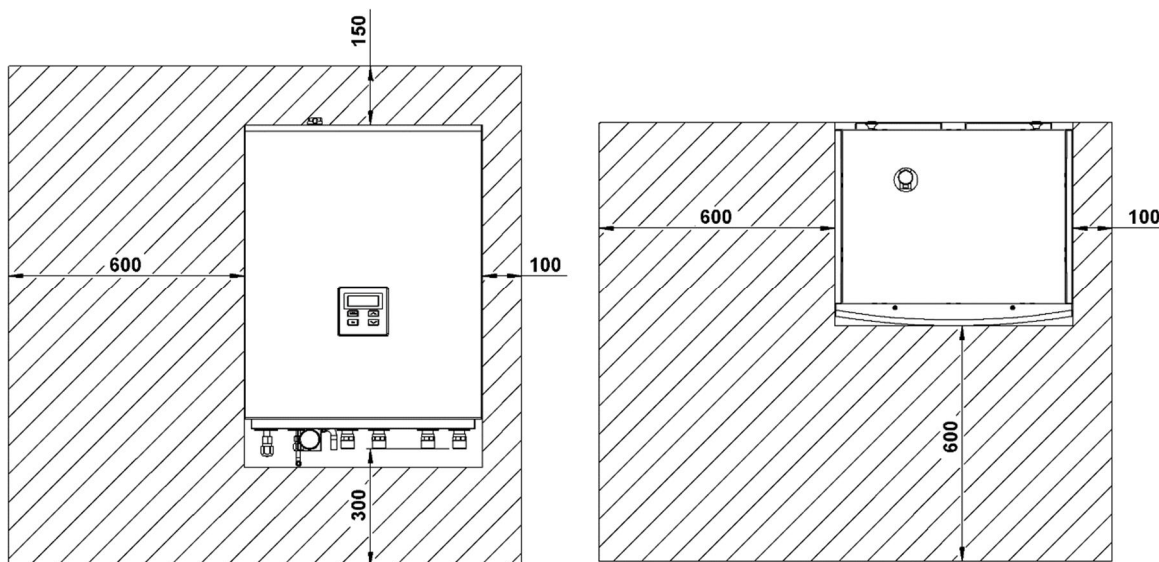


NOTE

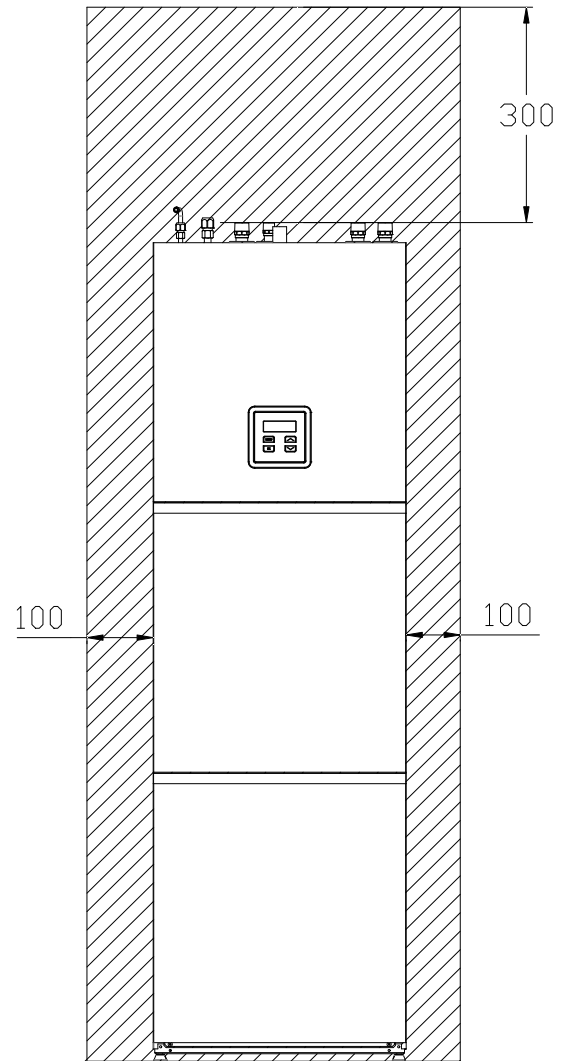
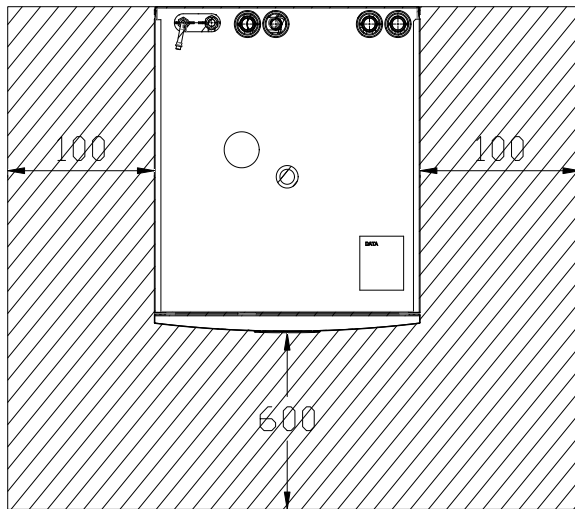
The location of the internal device must be dry and in the temperature range between +10 °C and 40 °C.

Minimal clearances of the external device from walls for seamless operation, maintenance and servicing.

WSL141 Clearances



WSL142 Clearances



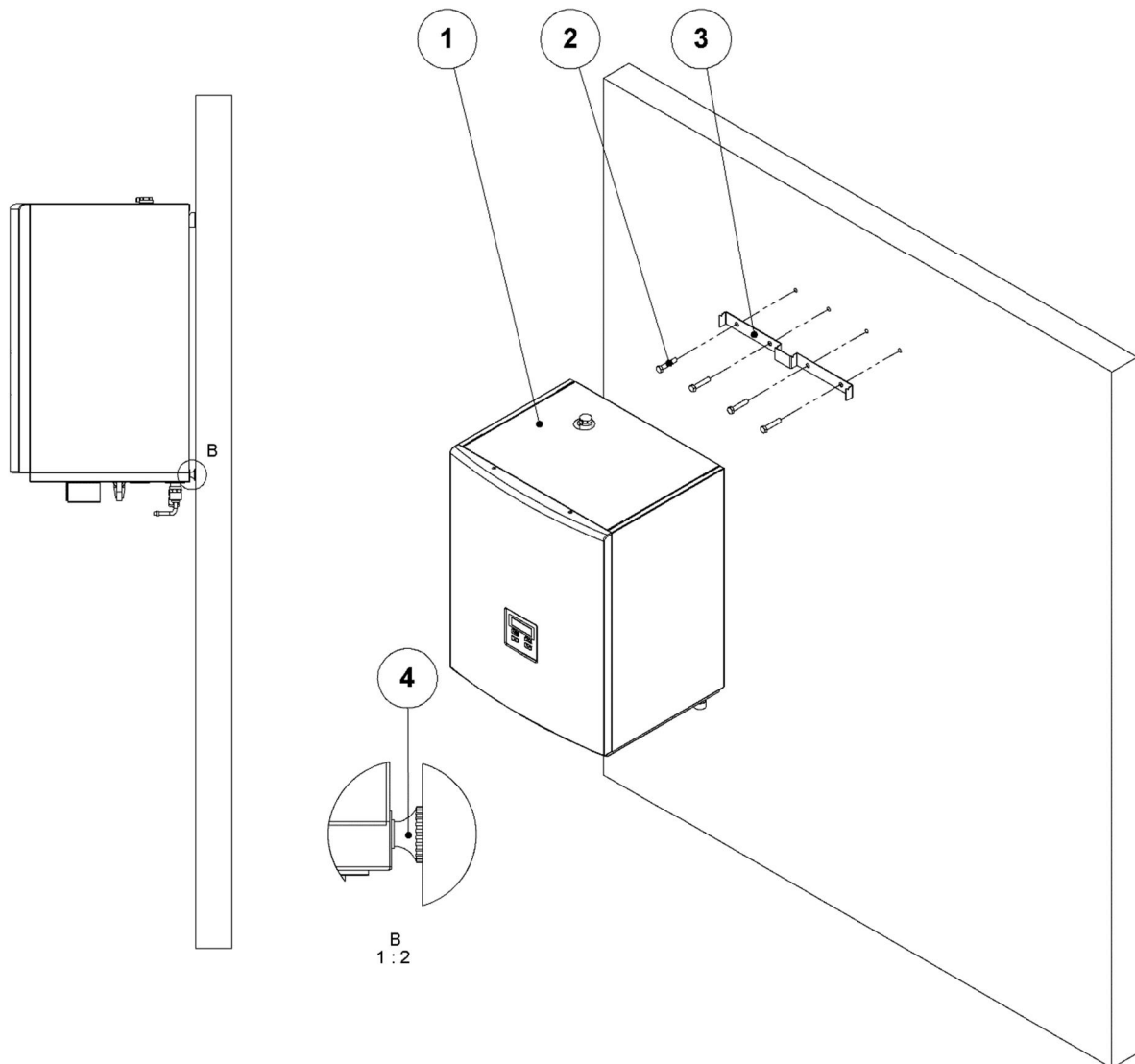
4.2.2 Wall mounting

In the case of WSL141,



CAUTION

- ▶ The wall and screw fittings must hold the weight of the device. See technical information.
- ▶ The device must be levelled

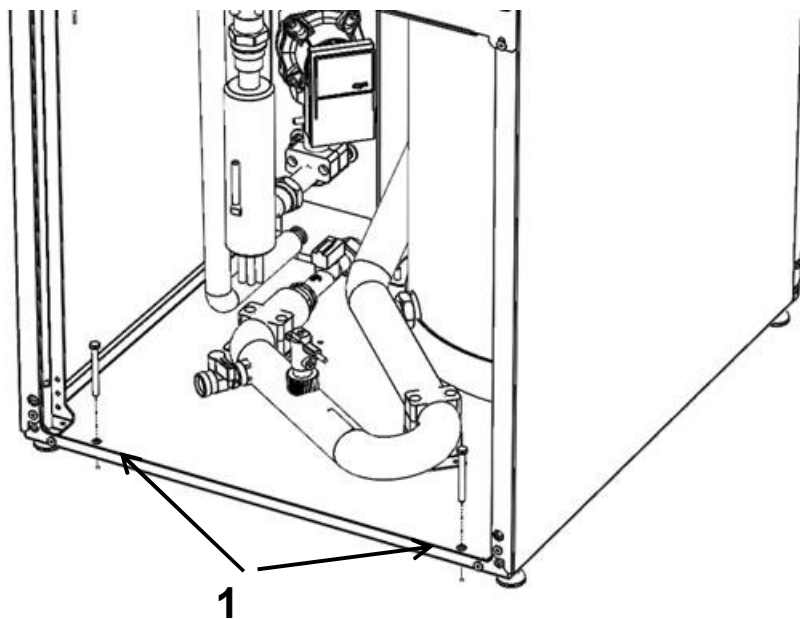


1	Hydro module	3	Wall mount
2	Screws (accessories)	4	Levelling screw

4.2.3 Attachment of the indoor unit

**CAUTION**

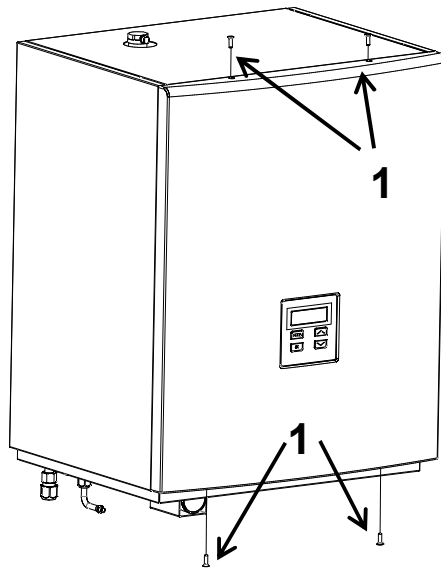
The indoor unit has to be screwed to the base (the screws are not part of the delivery).



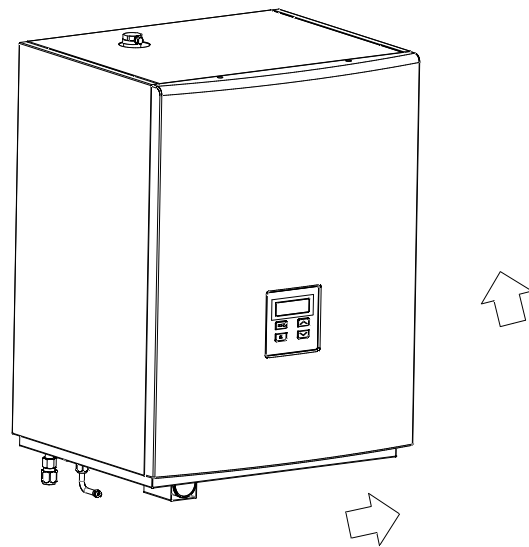
1	Screws holes 10 for attaching the indoor unit.
---	--

4.2.4 Removal of front cover

Removal of side WSL141,

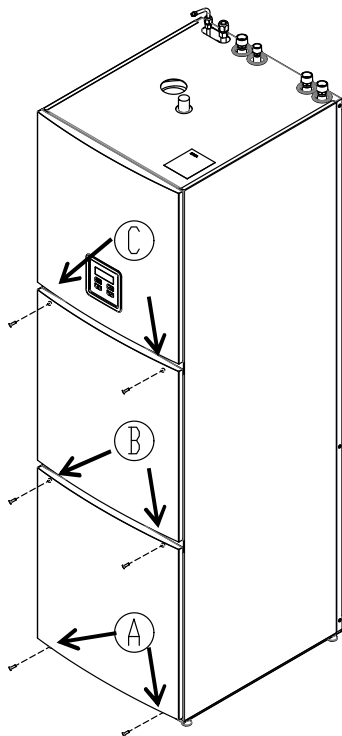


Unscrew 4 screws of the (1) side

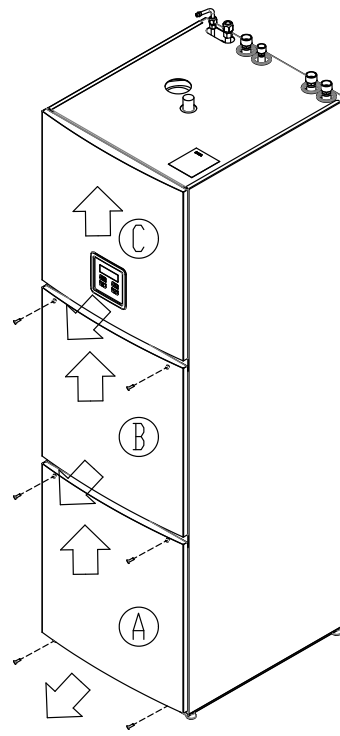


Open the cover lid towards yourself and push upward

Removal of side WSL142,



First unscrew 2 screws of the lid (A).



Open the lid (A) towards yourself and push upward. After this repeat the procedure for each lid.

4.3 Connection with the external device

The connection between the internal and external device is performed via refrigerant pipes.



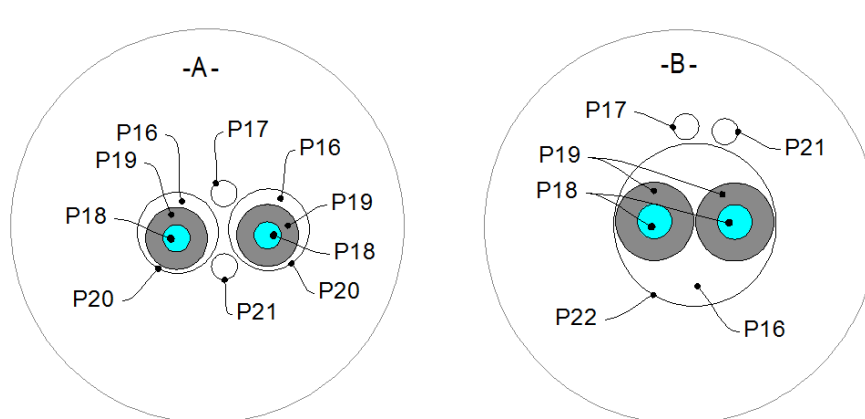
CAUTION

The pipeline and electrical cables have to be protected with heat and waterproof insulation in a protective pipe. This prevents the pipe connections soaking in cases of high groundwater or rainwater and with it intensive draining of heat into its surroundings.

4.3.1 Refrigeration connection - Gas and liquid connection

The pipe connection between the external and internal device can be made by laying the pipes in two ways:

- ▶ A inside two separate ribbed protective pipes,
- ▶ B in one joint ribbed protective pipe.



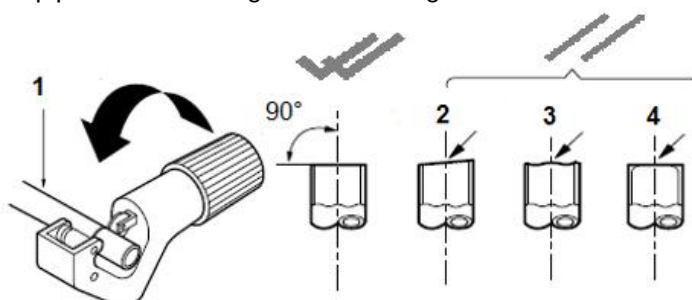
A		B	
P16	Fill with waterproof polyurethane foam	P20	Ribbed protective pipe min. 75
P17	Protective pipe for external sensors and communication cable	P21	The ribbed protective pipe for the power cable depends on the dimension of the supply cable
P18	Copper pipe Cu	P22	Ribbed protective pipe min. 150
P19	Insulation min. 13 mm.		

Preparation of the refrigeration pipe

Prepare the refrigeration pipe in steps. Unsuitably made joints are one of the main reasons for leakage, the joints must thus be made thoroughly and in accordance with the listed steps.

STEP 1: Cutting the pipe

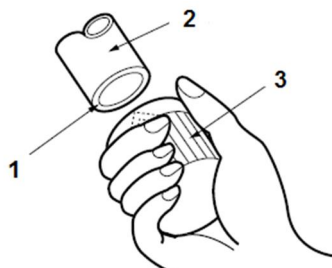
- ▶ Use a pipe cutter which does not produce chips to cut the pipe.
- ▶ Determine the distance between the outdoor and indoor device.
- ▶ Cut the pipe to appropriate length, and connect the internal and external device.
- ▶ Make sure that the pipe after soldering / screw driving not be tense.



- | | | | |
|---|-------------|---|--------|
| 1 | Copper pipe | 3 | Uneven |
| 2 | Inclined | 4 | Rough |

STEP 2: Removal of chips

- ▶ Remove all chips from the part where the pipe was cut.
- ▶ Hold the pipe downward during cleaning so that the chips do not fall into the pipe.

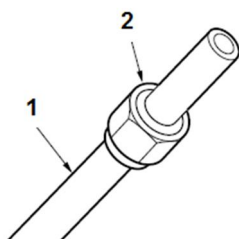


- | | |
|----|---------------------------|
| 1. | Copper pipe |
| 2. | Copper pipe held downward |
| 3. | Beveler |

In the case of WSL141, WSL142

STEP 3: Inserting the screw nut

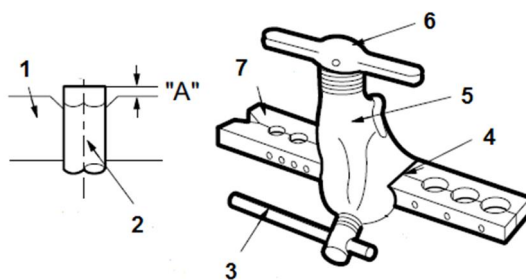
- ▶ Remove the screw nut from the pipe in outdoor unit.
- ▶ Insert the screw nut into the pipe which has been cleaned.



- | | |
|----|-------------|
| 1. | Copper pipe |
| 2. | Screw nut |

STEP 4: Edging

- ▶ The edging has to be performed with tools for edging as shown:



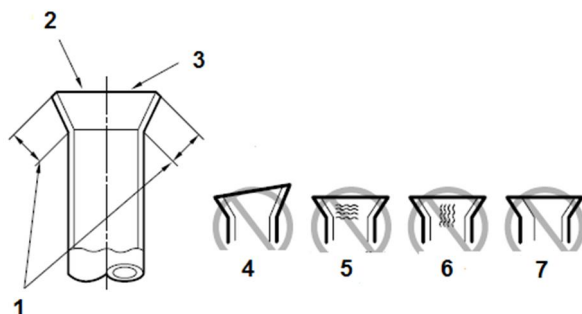
- | | | | |
|---|-------------|---|---------|
| 1 | Holder | 4 | Cone |
| 2 | Copper pipe | 5 | Bracket |
| 3 | Fitting | 6 | Handle |
| | | 7 | Holder |

- ▶ Mount the copper pipe firmly into the tool for edging. Consider the dimensions listed in the table below.

External diameter		"A"
[mm]	[inch]	[mm]
9.52	3/8	1.5 ~ 1.7
15.88	5/8	1.6 ~ 1.8

STEP 5: Testing

- ▶ Compare the edging of the pipe with the picture below.
- ▶ In the case of damaged edging, cut the part off and repeat the edging procedure.



- | | | | |
|---|---|---|-------------------|
| 1 | Circular edging of the pipe of the same length. | 4 | Inclined edge |
| 2 | Circularly smooth edge | 5 | Uneven surface |
| 3 | Interior edge and surface without scratches | 6 | Cracked / rough |
| | | 7 | Unequal thickness |

Connecting the pipe-refrigerant connection on the interior device

STEP 1: Determine the direction of the pipe connection

- ▶ Connect the connecting pipes to the device from below (wall unit of HM). In the case of the HM model with integrated boiler, make the connection from above.

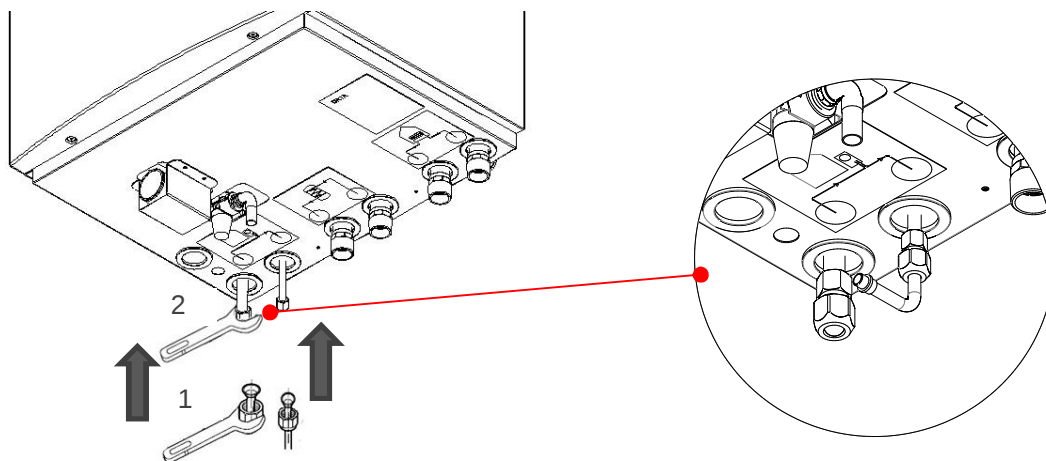
In the case of WSL141 and HM142 S1

STEP 2: Pipe connection

- ▶ Remove the side (see chapter 4.2.3)
- ▶ Align the end of the connection pipe with the middle of the pipe from indoor unit and then tighten the screw nut by hand.
- ▶ Tighten the screw nut with a torque wrench until it clicks.

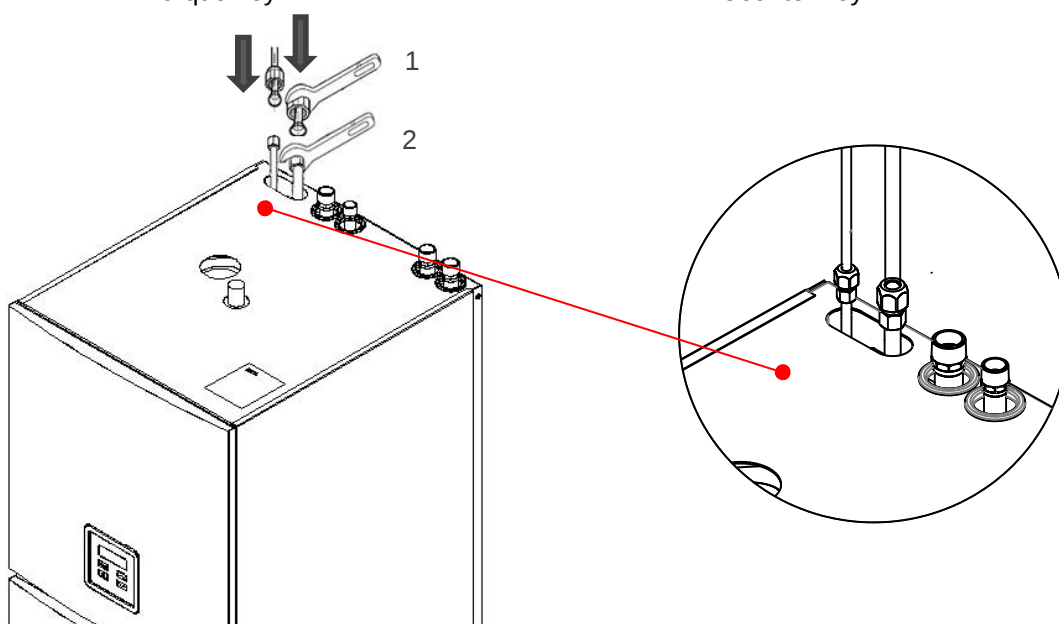
Prescribed torques for tightening:

External diameter		Torque
[mm]	[inch]	[Nm]
9.52	3/8	34 ñ 42
15.88	5/8	65 ñ 81



1 Torque key

2 Counter key



1 Torque key

2 Counter key

4.4 Hydraulic connection



WARNING

The design engineer has to check, calculate and determine the correct circulation pumps type, valves, safety elements and connecting pipes of the heating system.



WARNING

Before connecting the device, it is necessary to rinse the pipe system thoroughly and remove impurities (solid particles, oils, greases ...).
Use suitable detergents if necessary.



CAUTION

In case of compact HM, the ball valve with exhaust has to be installed on the liquid pipes. The place of installation has to be on the lowest point between the outdoor and indoor unit.

4.4.1 DHW system

The hydraulic connection has to be installed in accordance with the national and local regulations for connecting buffer tanks for DHW in force. The room the device is installed in must have a drain on the floor installed below the level of the device in case of water leakage. The following picture shows the correct hydraulic connection of the device.



CAUTION

Because different materials are used on the pipe installation, all connections on the device (cold and hot water, circulation, heat conductor) have to be galvanically isolated; otherwise corrosion of connections can occur on the inner side of the buffer tank for DHW. We recommend placing galvanic isolators made of red brass the length of at least twice the diameter of the pipe on the connections.



CAUTION

The buffer tank for DHW is intended for storing drinking water, this is why the water has to be in accordance with the national regulations on drinking water in force; otherwise, damage to the device and a termination of the warranty can arise.



CAUTION

The cold DHW connection of the device must be fitted with a safety valve with the rated pressure of 0.6 MPa (6 bar).



NOTE

The cold DHW connection must be fitted with an expansion vessel suitable for drinking water. The selection and installation must be in accordance with the standard DIN 4807 T5.



CAUTION

For proper operation of expansion vessel, a suitable setting of the vessels operating pressure must be made. The pressure is set in regards to the pressure in the DHW system. The setting needs to be checked every 12 months.

Setting the pressure for the expansion vessel for DHW

Expansion vessel for DHW is factory filled to a precharge pressure p_0 with dry nitrogen. The pressure must be set depending on the settings of the pressure reducing valve on the DHW supply to the building.

The pressure in the expansion vessel must be set according to the following formula:

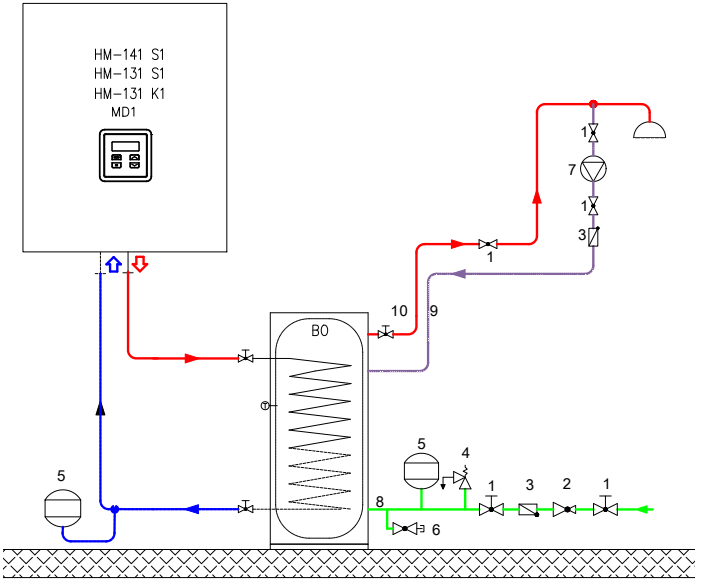
$$p_{\text{exp}} = p_{\text{red}} + 0,02 \text{ MPa}$$

$$(p_{\text{exp}} = p_{\text{red}} + 0,2 \text{ bar})$$

p_0 ñ pressure in the expansion vessel

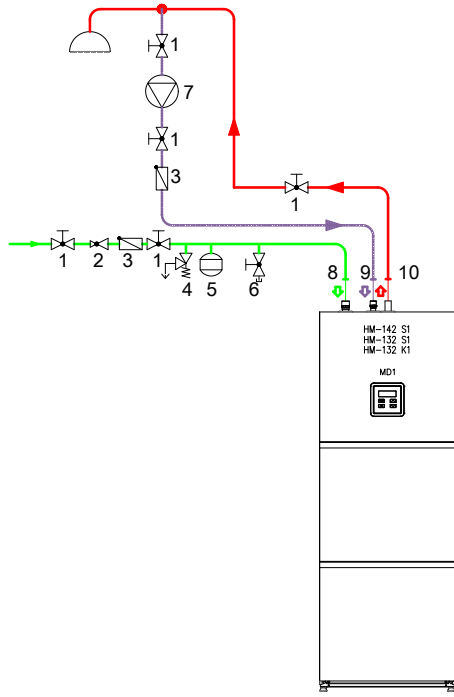
p_{rv} ñ setting of the pressure reducing valve

In the case of WSL141,

1 Ball valve 2 Pressure reducing valve 3 Check valve 4 Safety valve 5 Expansion vessel 6 Charging pipe 7 Circulation pump 8 Cold sanitary water 9 Cold circulation water 10 Warm sanitary water			
Adjusting the safety valve [MPa (bar)]		0,6 (6,0)	
System pressure [MPa (bar)]	0,3 (3,0)	0,35 (3,5)	0,4 (4,0)
Volume of the DHW [l]	Expansion vessel [l]*		
200	5	8	12
300	15	19	26

* The actual size of the expansion vessel has to be defined by the installer/design engineer according to the extent of the system the device will be installed in.

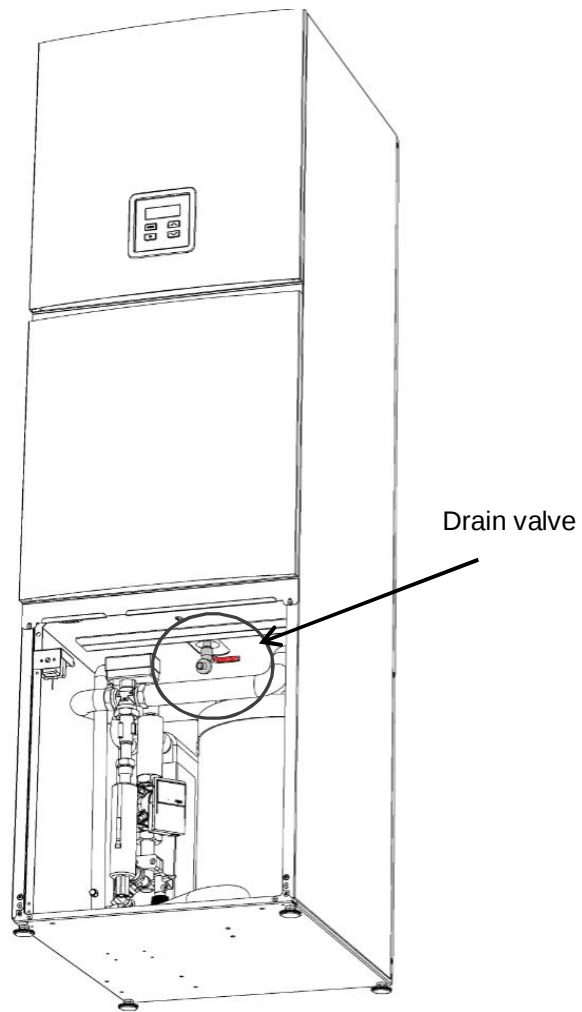
In the case of WSL142,

1 Ball valve 2 Pressure reducing valve 3 Check valve 4 Safety valve 5 Expansion vessel 6 Charging pipe 7 Circulation pump 8 Cold sanitary water 9 Cold circulation water 10 Warm sanitary water			
Adjusting the safety valve [MPa (bar)]	0,6 (6,0)		
System pressure [MPa (bar)]	0,3 (3,0)	0,35 (3,5)	0,4 (4,0)
Volume of the DHW [l]	Expansion vessel [l]*		
200	5	8	12

* The actual size of the expansion vessel has to be defined by the installer/design engineer according to the extent of the system the device will be installed in.

DHW tank drain

The drain valve at the bottom of the buffer tank is the most suitable in case the buffer tank for DHW has to be emptied. Attach a hose to the drain valve and attach its end to the drain.



4.4.2 Heating system

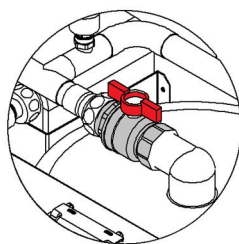
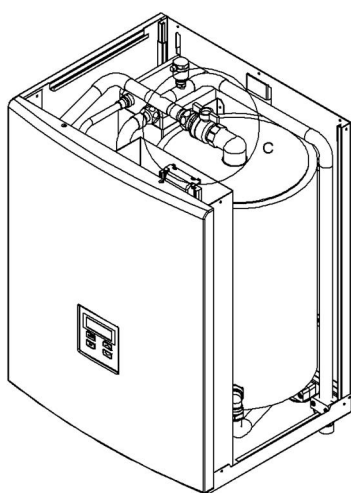
For unobstructed and safe operation it is important to have a heat accumulator with a minimal volume of 40 l (integrated in the). The accumulator is needed for hydraulic balancing, ensuring unobstructed flow and defrosting. A larger accumulator ensures a more balanced temperature of heating and more comfort.



NOTE

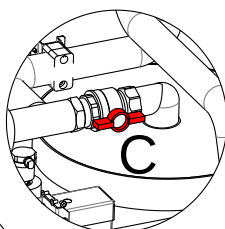
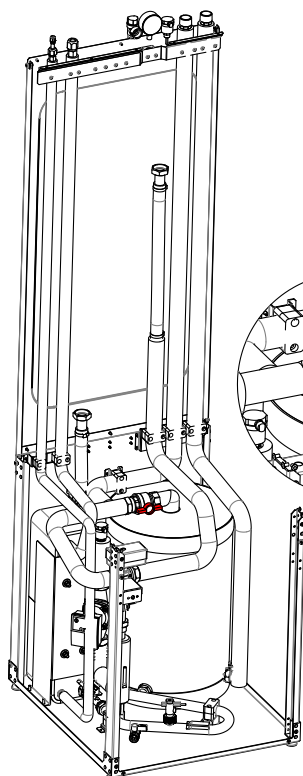
When installing an additional larger heat accumulator, it is necessary to close the ball valve in the indoor unit. The location of the ball valve is indicated on the picture below.

In the case of WSL141,



C	Ball valve
---	------------

In the case of WSL142,



C	Ball valve
---	------------

4.4.3 The scheme of the heating system

Below you can find an example of the basic hydraulic scheme of the heating system for the wall model of the hydro module and the model with an integrated boiler. For other circuits see **The Hydraulic Circuit Diagram Catalogue**.



CAUTION

The supply pipe of each heating cycle must be fitted with an abutment safety thermostat connected sequentially with the circulation pump to safeguard against the inflow of a medium of excessive temperature.

ELEMENTS	CONNECTING TERMINALS	MARK	CHARACTERISTICS
		COMB E,F	Connection to various types of heat pumps
TSV			Warm sanitary water
HSV			Cold sanitary water
BO			Boiler for sanitary water
PLC			Processing unit
PST			Pipe safety thermostat
KT-1			Room temperature corrector WSL KT-1(can be used in all heating cycles)
WSL KT-2			Room temperature corrector WSL KT-2 (can be used in all heating cycles)
TS			Connector on PLC
	Q1-Q12		Digital outputs of regulation ~ 230 V (input/output module MD1 and MD2)
	A1-A8		Analogue input (input/output module MD1 and MD2)
	D1-D9		Digital input (input/output module MD1 and MD2)
MD1			Basic input/output module 1
T1			Thermostat of heating cycle 1
T2			Thermostat of heating cycle 2
OC1			Circulation pump of heating cycle 1
OC2			Circulation pump of heating cycle 2
MV2			Mixing valve of heating cycle 2
OGK-1			Heating cycle 1
OGK-2			Heating cycle 2
MD2			Expansion input/output module 2
T3			Thermostat of heating cycle 3
T4			Thermostat of heating cycle 4
OC3			Circulation pump of heating cycle 3
OC4			Circulation pump of heating cycle 4
MV3			Mixing valve of heating cycle 3
MV4			Mixing valve of heating cycle 4
OGK-3			Heating cycle 3
OGK-4			Heating cycle 4
MARK	CHARACTERISTICS	MARK	CHARACTERISTICS
	Ball valve		Manometer
	Circulation pump		Temperature sensor
	Ball valve with exhaust		Thermometer
	Drain valve with plug		Consumer of heat / coolness
	Cleaning piece		Automatic vent
	Expansion vessel		3-way switching valve with EM drive
	Safety valve		3-way mixing valve with EM drive
	Non-return valve		Supply pipe
	Magnetic separator of impurities		Return line

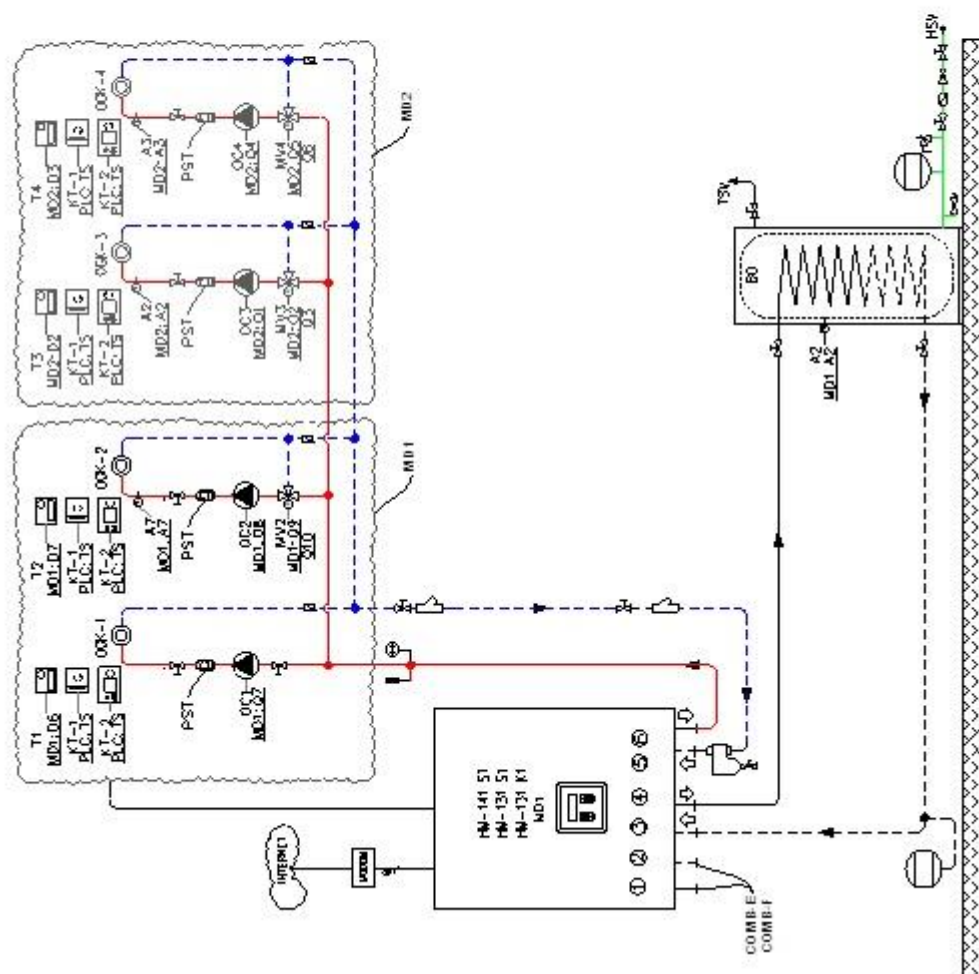
	Pipe safety thermostat		
---	------------------------	--	--

The scheme of the heating system of the wall model of the interior device.

The elements on the scheme are marked in the following manner:

Legend of reading:

- OC1** → Mark of the element
MD1:Q7 → Mark of the connecting terminal on the input/output module - MD
 Mark of the input/output module

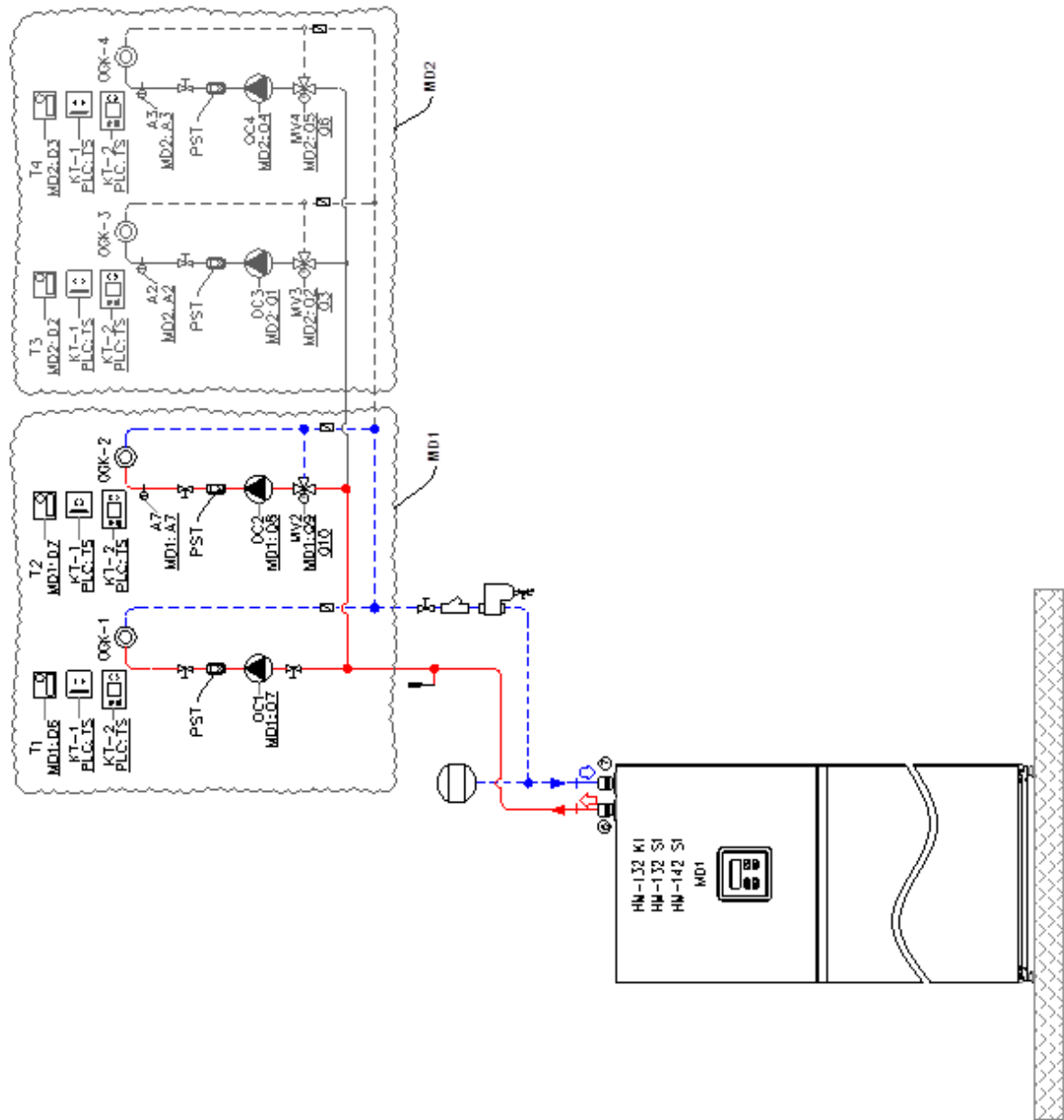


ELEMENTS	CONNECTING TERMINALS	MARK	CHARACTERISTICS
HM			Hydro module
		1	Refrigerant (freon) line - gas SPLIT model
		1	Return line (COMPACT model)
		2	Refrigerant (freon) line - liquid SPLIT model
		2	Supply pipe (COMPACT model)
		3	Return line cold sanitary water
		4	Supply pipe hot sanitary water
		5	Return line system (applies to the heating regime)
		6	Supply pipe system (applies to the heating regime)

Scheme of the heating system in hydro modules with an integrated boiler

The elements on the scheme are marked in the following manner:

- Legend of reading:**
- OC1 → Mark of the element
 - MD1:Q7 → Mark of the connecting terminal on the input/output module - MD
 - Mark of the input/output module



ELEMENTS	CONNECTING TERMINALS	MARK	CHARACTERISTICS
HM			Hydro module with integrated boiler
		6	Return line system (applies to the heating regime)
		7	Supply pipe system (applies to the heating regime)

4.4.4 Charging of the heating system



WARNING

Thorough venting of the system has to be ensured. Otherwise, malfunctions in operation may occur.



CAUTION

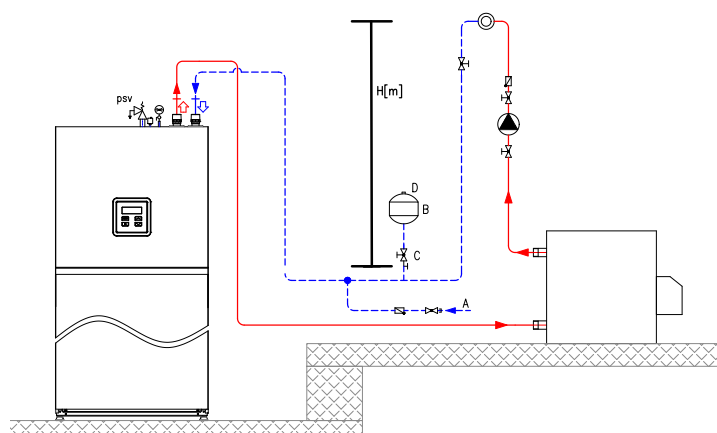
An expansion vessel of suitable dimensions must be fitted to the heating system. The expansion vessel must be dimensioned in accordance with standard EN 12828.



CAUTION

For normal operation of the expansion vessel, it is necessary to perform proper adjustments of the tank's working pressure. The settings have to be checked every 12 months.

The pressure settings of the expansion vessel and filling the heating system



A - Filling the system.

B - Expansion vessel.

C - Ball valve with exhaust.

D - Air filling valve.

H - Height of the heating system.

p_{sv} - Pressure of the safety valve.



CAUTION

Consider the maximal operational pressure of the vessel.



NOTE

Unsuitable pre-load of the expansion vessel with the pressure p_0 is the reason for incorrect operation of the heating system.



NOTE

The dimensions of the expansion vessel must be in accordance with standard EN 12828.

Setting the pressure for the expansion vessel p_0

- ▶ Before filling the system with water, check and set the pressure p_0 . The expansion vessel is factory set to the pressure specified on the standard label. For correct operation of the system, set the pressure p_0 according to the equation below. The filling must not exceed the maximal operational pressure specified on the serial label of the expansion vessel.
- ▶ Calculate the p_0 pressure value with the help of the equation:

$$p_0 [\text{MPa}] = \frac{H [\text{m}]}{10} + 0,02 [\text{MPa}],$$

$$(p_0 [\text{bar}] = \frac{H [\text{m}]}{10} + 0,2 [\text{bar}]).$$



CAUTION

If the calculation shows a pressure lower than 0,1 MPa (1 bar), set the pressure of the expansion vessel to 0,1 MPa (1 bar).

P_0 [MPa (Bar)] ñ pressure in the expansion vessel,

$p_{0\text{min}}$ [MPa (Bar)] ñ minimal allowed pressure of the heating system,

$p_{0\text{max}}$ [MPa (Bar)] ñ maximal allowed pressure of the heating system,

H [m] ñ Height of the heating system.

- ▶ Set the amount of pressure in the expansion vessel by releasing or supplementing dry nitrogen.
- ▶ Record the new value of the pressure p_0 on the serial label.
- ▶ Open the ball valve of the expansion vessel carefully, open the vents and close the drain.

Filling the heating system

- ▶ Use the filling valve to fill the system with water of suitable quality (with anti-corrosion additives, etc.) to the pressure p_F .

$$p_F [\text{MPa}] = p_0 [\text{MPa}] + 0,03 [\text{MPa}],$$

$$(p_F [\text{bar}] = p_0 [\text{bar}] + 0,3 [\text{bar}])$$

Filling the system to the final pressure

- ▶ The final pressure of the system is determined by heating the system to the maximal heating temperature (thermal degassing).
- ▶ Turn off the circulation pumps, open the vents and vent the system.
- ▶ Fill the system up to the final pressure which is 0,05 MPa (0,5 bar) lower than the venting pressure of the safety valve.

$$p_E [\text{MPa}] \leq p_{sv} [\text{MPa}] - 0,05 [\text{MPa}],$$

$$(p_E [\text{bar}] \leq p_{sv} [\text{bar}] - 0,5 [\text{bar}])$$

p_E ñ the final pressure of the system,

p_{sv} ñ the pressure of the safety valve.

4.4.5 Preparing the heating hydraulic system - secondary

Prepare the system according to one of the recommended hydraulic schemes (**Catalogue of Hydraulic Wiring Diagrams**) which is specified by the manufacturer of the device. This is the only way to ensure reliable and effective operation of the device. After connecting the device to the heating system, it is necessary to examine all circulating pumps and electric motor valves if they function correctly.

The device must be connected to the heating system via rubber compensator or flexible pipes. The latter must not be under tension in final position, this would decrease the devices noise and vibration protection. In extreme cases this can also lead to damage to the device.

Quality of heating water

Maximal allowed content of individual substances in the heating water and the influence of these on the heat exchanger are presented in the table below. It is not allowed to use heating water which contains any substance in concentrations which cause corrosion in the heating system (influence 0-1). It is also not allowed to use heating water which contains two or more substances in concentrations which could cause corrosion in the heating system (influence 0-2).

TYPE OF PRESENT SUBSTANCE	UNIT	CONCENTRATION	INFLUENCE TO THE HEAT CONDUCTOR
Organic sediment	mg / L		0
Ammonia NH ₃	mg / L	< 2	+
		1 to 20	0
		> 20	-
Chloride	mg / L	< 300	+
		> 300	0
Allowed water hardness	°dH	5 ÷ 10	
Electrical conductivity	µS / cm	< 10	0
		10 to 500	+
		> 500	-
Iron (Fe) removed	mg / L	< 0.2	+
		> 0.2	0
Free carbonic acid	mg / L	< 5	+
		5 to 20	0
		> 20	-
Manganese (Mn) removed	mg / L	< 0.1	+
		> 0.1	0
Nitrates (NO ₃) removed	mg / L	< 100	+
		> 100	0
pH value	mg / L	< 7.5	0
		7.5 to 9	+
		> 9	0
Oxygen	mg / L	< 2	+
		> 2	0
Hydrogen sulphide (H ₂ S)	mg / L	< 0.05	+
		> 0.05	-
HCO ₃ ⁻ / SO ₄ ²⁻	mg / L	> 1	+
		< 1	0
Hydrogen carbonate	mg / L	< 70	0
		70 to 300	+
		> 300	0
Aluminium (Al) removed	mg / L	< 0.2	+
		> 0.2	0
Sulphates	mg / L	< 70	+
		70 to 300	0
		> 300	-
Sulphite (SO ₃)	mg / L	< 1	+
Chlorine (gas) (Cl ₂)	mg / L	< 1	+
		1 to 5	0
		> 5	-

Table: Influence of various aggressive substances in the heating water on the stability of stainless copper welded plate transmitters. (+ = no influence, 0 = danger of corrosion, - = corrosion - use not permitted).



CAUTION

The heating system has to be filled with water with the hardness between 5 °dH and 10 °dH. Malfunctions of the device because of water hardness are not covered by the warranty.

The quality of the water used in the heating system is very important. The water from the water supply is mostly not suitable for use in the heating system. To ensure adequate water hardness you must built the water softener into the system.

The heating systems must not be filled with dirty or corrosive water. The heating water must be prepared by adding anti-corrosion and anti-biological agents as well as agents against algae.



CAUTION

The water used for heating DHW via the built-in heat exchanger in the buffer tank for DHW has to be in accordance with the requirements of standard VDI 2035 and must not contain microorganisms. The heating system has to be filled with soft water which has been added anti-corrosion and antibacterial agents for preventing corrosion. Before filling the heating system has to be cleaned of all impurities.

The heating system has to be thoroughly vented. You must prevent air, including diffusion air entering the device.



NOTE

To prevent damage to the components of the hydraulic system, we recommend the additional installation of SpiroVent RV2 air (micro-bubble) venting system.

The presence of micro bubbles in the system eventually forms larger bubbles which in time can cause corrosion of the system, system component malfunction and operation disturbance.

In new systems, the impurities are a consequence of welding, soldering, dirty pipes (oil, grease), etc. In case the impurities start accumulating in the device this can worsen the flow and heat transfer, in worst cases also freezing of water in the heat exchanger and consequently the destruction of the device.



WARNING

To protect the device from intake and accumulation of dirt in the heat exchanger you must install the strainer on the return line, before entry into the device.



WARNING

A galvanic disconnection between individual elements of the heating system (i.e. boiler, container ...) is obligatory.

In the case of using grey steel pipes in the heating system, it is necessary to degrease them (the interior of the pipe) before connecting them to the heat pump.

4.5 Electrical connection

Connect the external device to the mains according to the instructions described in this chapter.



CAUTION

Connecting the device to the electrical network has to be performed in accordance with the standards for connecting devices into the electrical network. The device has to be connected to the electrical network via the power supply cut-off which is installed into the electrical installation under the regulations in force.



DANGER

The final electrical connection can only be performed by the person authorised by the manufacturer to ensure the correct and efficient operation of the device.

IT IS STRICTLY PROHIBITED FOR UNAUTHORISED PERSONS TO TAMPER WITH THE ELECTRICAL CONNECTION OF THE DEVICE.



DANGER

The device must be connected to the mains, which has a built-in RCD residual-current device, switch type A.



CAUTION

The device must be connected to the mains with a cable with an appropriate **diameter**. The electrician defines the diameter of the cable according to the **installation method, distance** of the device from the main electrical cabinet and the **power** of the device.



CAUTION

The cable must be routed through the cord anchorage installed before the connecting terminals in the indoor unit. Make sure the cable connected in the indoor unit is relieved from strain.



CAUTION

The total electrical power of the devices which are directly connected to the regulation must not exceed 500 W. Otherwise it is necessary to ensure separate power to the external devices and to connect only the control elements to the regulation.



WARNING

Pay attention to the characteristics of the inputs and outputs. Incorrect connection can lead to damage to the device.



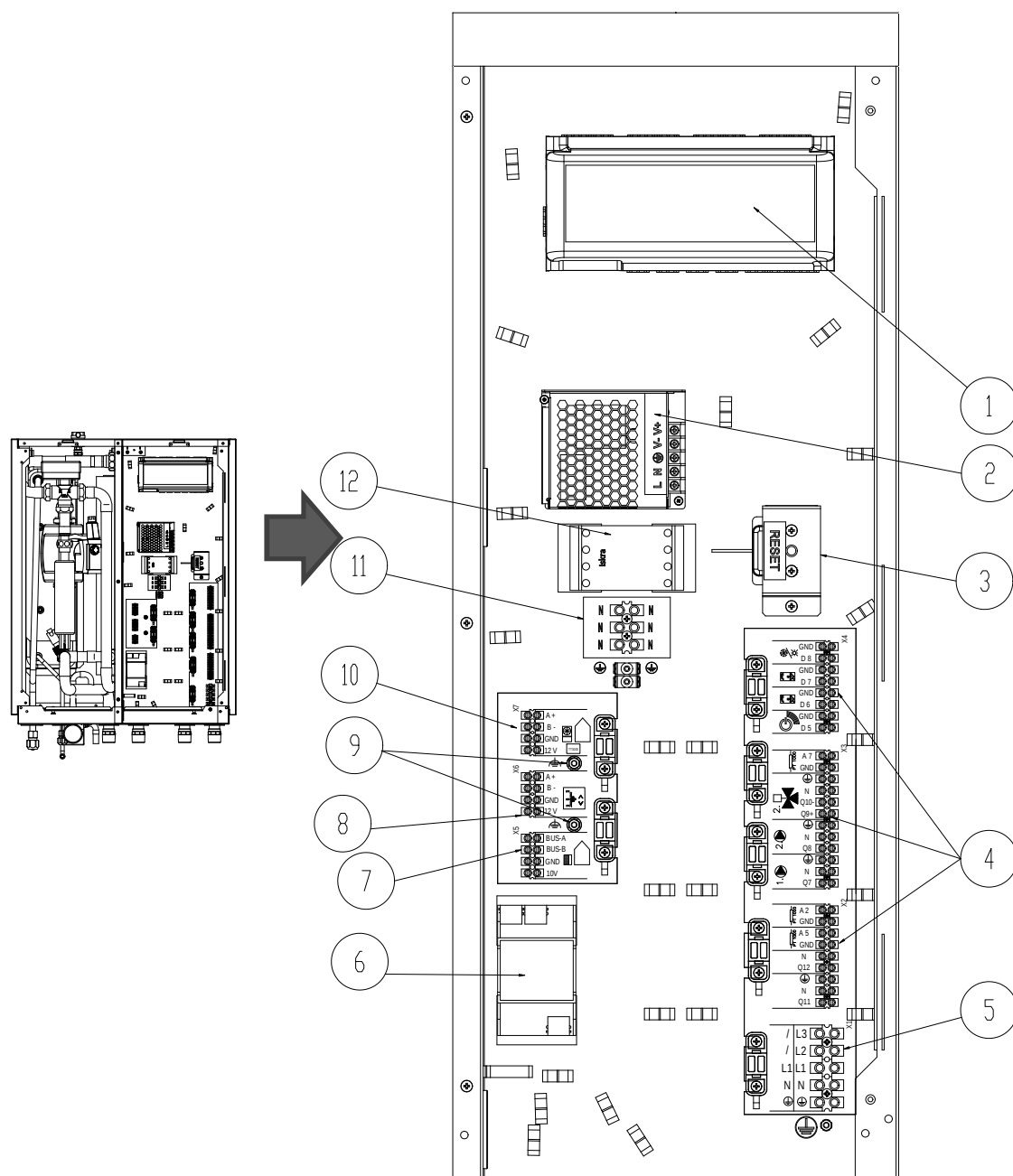
CAUTION

You can not put the communication cable (in accordance with good engineering practices and regulations) together with power cables.

4.5.1 Removal of the control unit lid

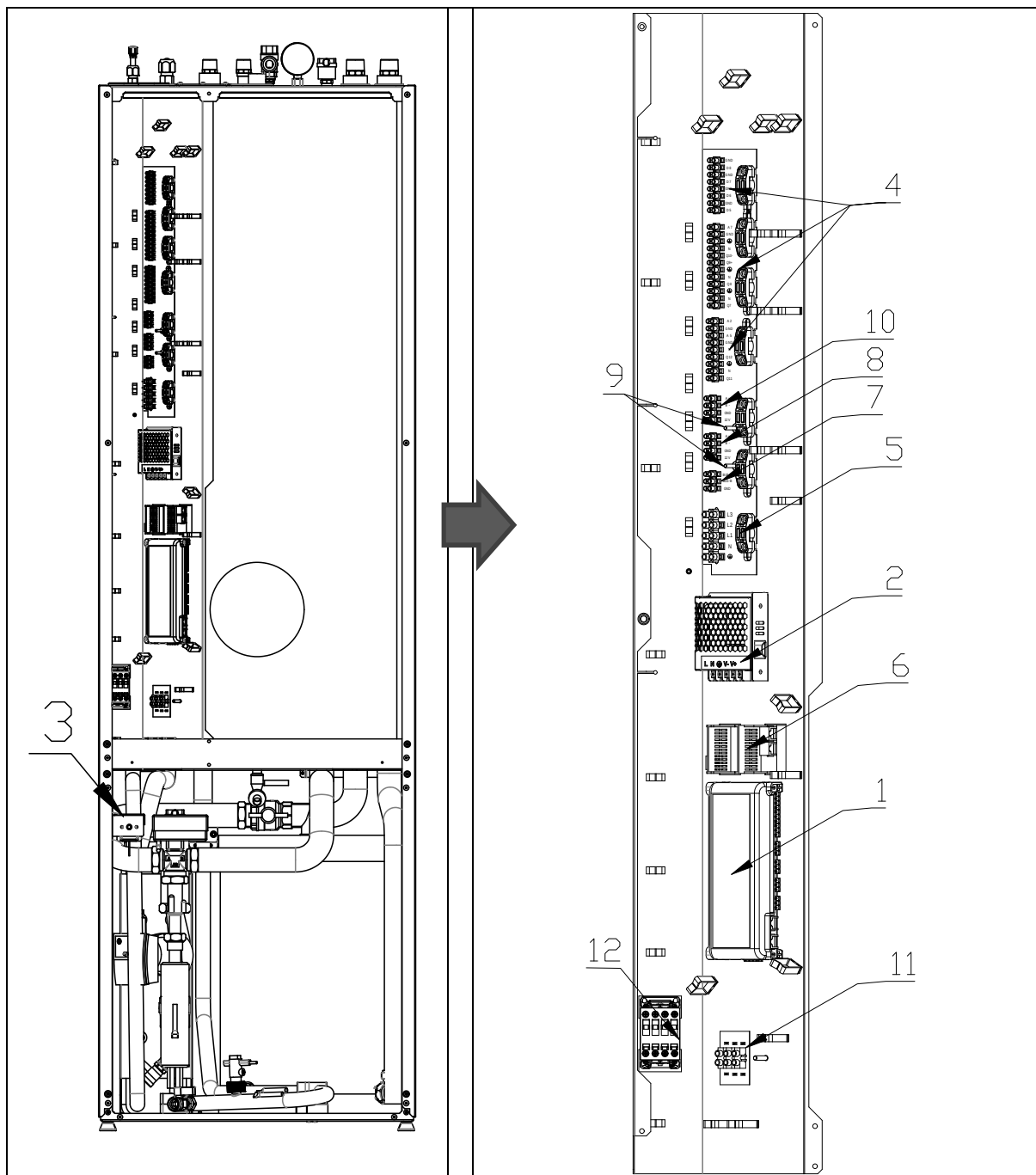
See chapter 4.2.3.

4.5.2 Description of elements in electrical closet In the case of WSL141



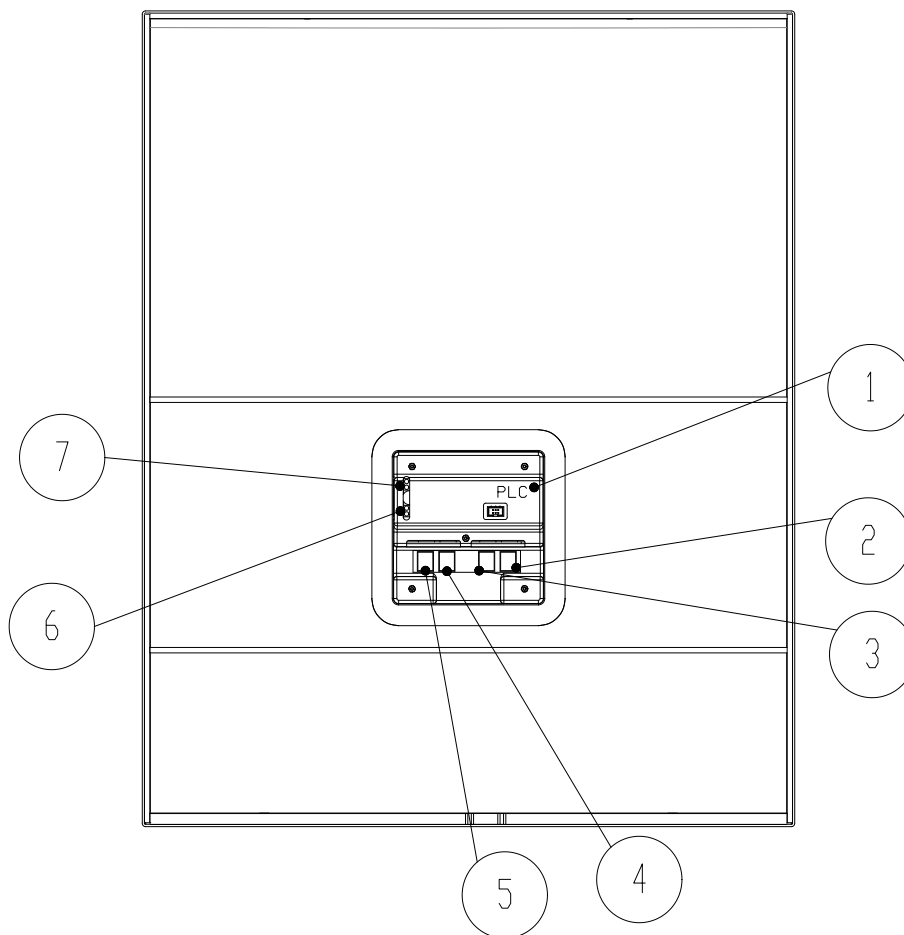
1	Input/output module MD1	7	Communication with the external WPLV device
2	Power supply ~ 230 V / 12 V	8	Connecting terminals room temperature corrector KT-1(2)
3	RESET button (Thermal protection of the electrical heater).	9	Place of grounding the plated (braided) communication cable
4	Connecting terminals of external devices	10	Communication with the external WPL device and internal expansion unit TT3003.
5	Connecting terminals of the power line	11	Connecting terminals neutral conductor
6	WEB module	12	Electrical contactor

In the case of WSL142



1	Input/output module MD1	7	Communication with the external WPLV device
2	Power supply ~ 230 V / 12 V	8	Connecting terminals room temperature corrector KT-1(2)
3	RESET button (Thermal protection of the electrical heater).	9	Place of grounding the plated (braided) communication cable
4	Connecting terminals of external devices	10	Communication with the external WPL device and internal expansion unit TT3003.
5	Connecting terminals of the power line	11	Connecting terminals neutral conductor
6	WEB module	12	Electrical contactor

Display - process module



1	Process module PLC	5	WM - connection with the WEB module (factory made).
2	TE2 - connection with the input/output module (factory made).	6	RQ2 - connection for resetting the alarm (factory made).
3	TS - connection of the room corrector KT-1(2)	7	RQ1 - connection of the signal for reporting an alarm (optional).
4	TEX - MODBUS communication with the control system of the building (BMS). In case of an external WPLV device, communication with module Gateway PI485.		

4.5.3 Schematic display of the control system - TT3000



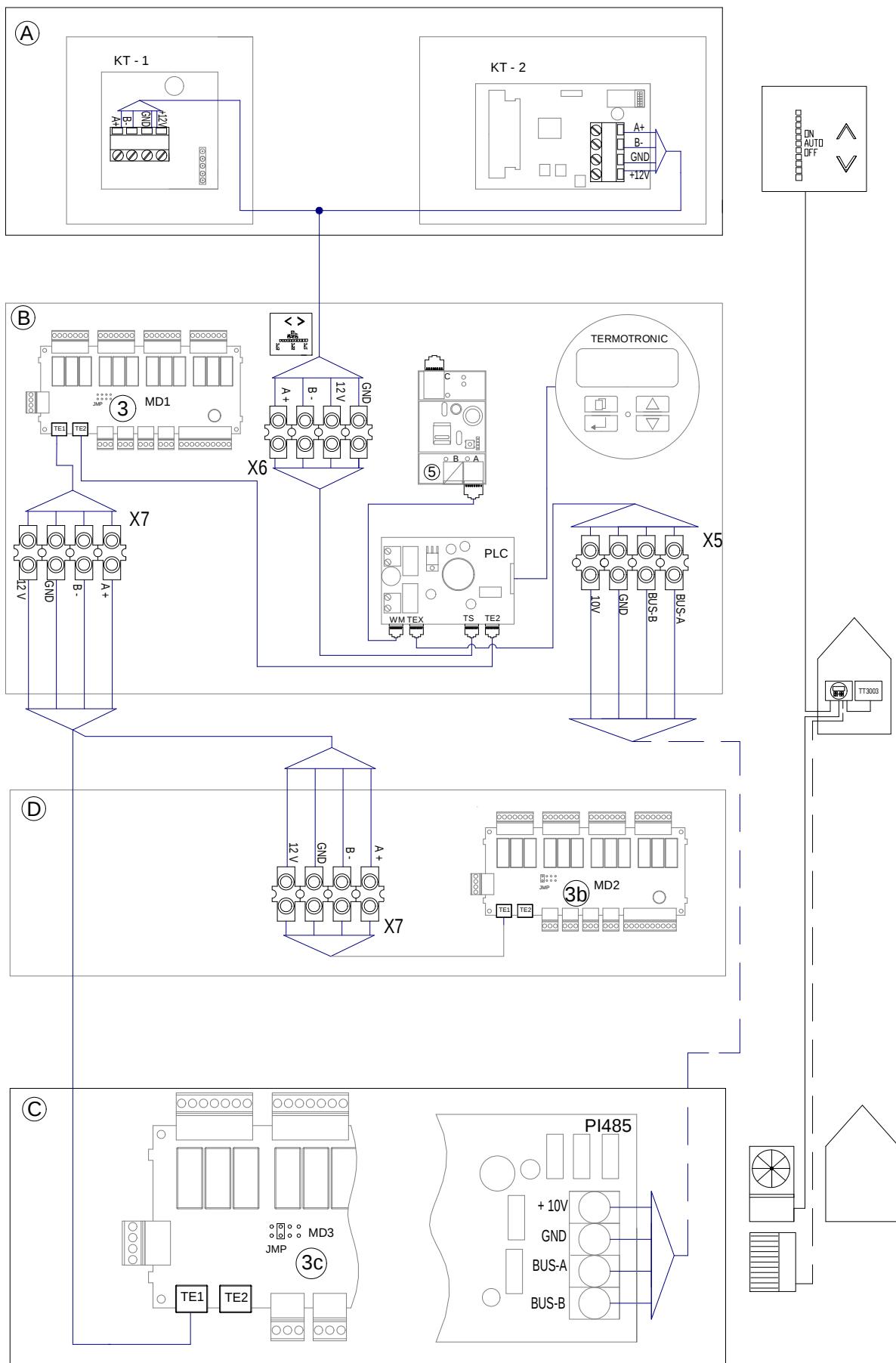
CAUTION

Connect the internal control unit TT3000 with the external device with a plated cable the plating (braiding) of which has to be grounded on the envisioned spot ( functional earthing).

In the case of WSL141 and HM142

Proper functioning requires a connection between the terminal terminal **X5** on the internal unit and connecting terminals **Bus_A [+/ Bus_B [-] / GND and +10 V** on the **Gateway PI485** module on the external device.

ELEMENTS MARK	CONNECTING TERMINALS	CHARACTERISTICS
A		Room corrector KT-1(2)
KT-1		Room temperature corrector WSL KT-1(optional)
	A +, B-	Communication
	GND, 12 V	Power supply
WSL KT-2		Room temperature corrector WSL KT-2 (optional)
	A +, B-	Communication
	GND, 12 V	Power supply
B		Internal control unit TT3000
3		Basic input/output module MD1
	TE1	Communication with I/O module MD3 and/or MD2
	TE2	Communication with the control electronics of the PLC screen module
JMP		Set-up of bridges (without)
X7		Connecting terminal for communication with MD3 module and/or expansion module MD2
	A +, B-	Communication
	GND, 12 V	Power supply
X6		Connecting terminal for the spatial correctors(optional)
	A +, B-	Communication
	GND, 12 V	Power supply
X5		Connecting terminal for communication with external modul Gateway PI485 in WPLV device
	BUS-A, BUS-B	Communication
	GND, +10 V	Power supply
5		Web module
	TW MODBUS	Communication with PLC
	TX MODUBUS	Not in use
	Ethernet	Internet (Ethernet) connection
PLC		Process module
	WM	Communication with Web module
	TEX	MODBUS communication with the control system of the building (BMS). In case of an external WPLV device, communication with module Gateway PI485.
	TS	Communication with the room temperature corrector
	TE2	Communication with the basic I/O module MD1
D		Expansion wall unit TT3000
3b		Expansion input/output module MD2
	TE1	Communication with the basic I/O module MD1
	TE2	Not in use
JMP		Set-up of bridges (in first position)
X7		Connecting terminal for communication with I/O module MD1
	A +, B-	Communication
	GND, 12 V	Power supply
C		External input/output module MD3 in the WPL device, Gateway PI485 in the WPLV device
3c		External input/output module MD3 in the WPL device
	TE1	Communication with the basic I/O module MD1
	TE2	Not in use
JMP		Set-up of bridge (in second position)
PI485		External module Gateway PI485 in the WPLV device
	BUS-A , BUS-B	Communication with the control electronics of the PLC screen module
	GND	Power supply
	+ 10 V	Power supply



4.5.4 Connecting the internal control unit ñ TT3000



DANGER

Connecting the device to the power source can only be performed by a qualified installer in a **voltage-free** state!

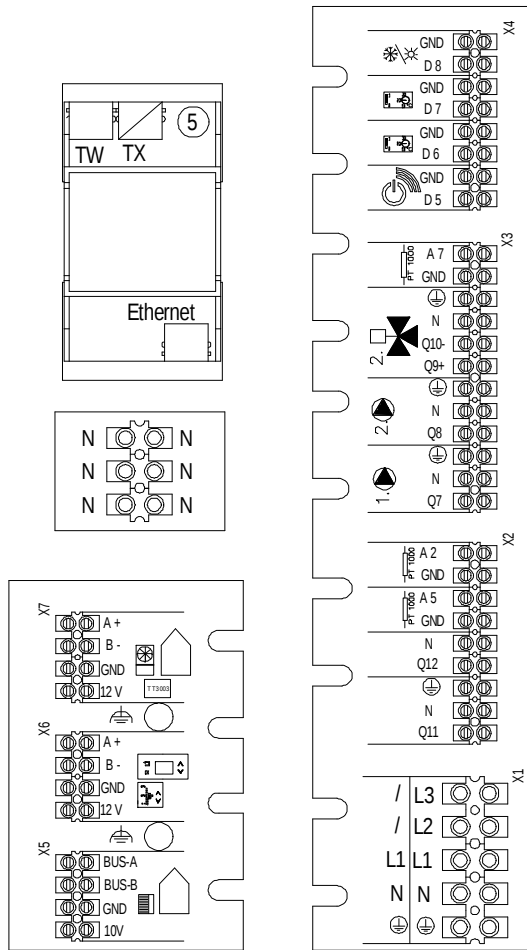
As part of connecting the internal control unit to the **connecting terminals X1...X7**, connect the following cables:

- ▶ **Power cable.**
- ▶ **Communication cable for the external device.**
- ▶ **Temperature sensor of external temperature (only in the case of the external device WSLHP7and WSLHP11 S1).**

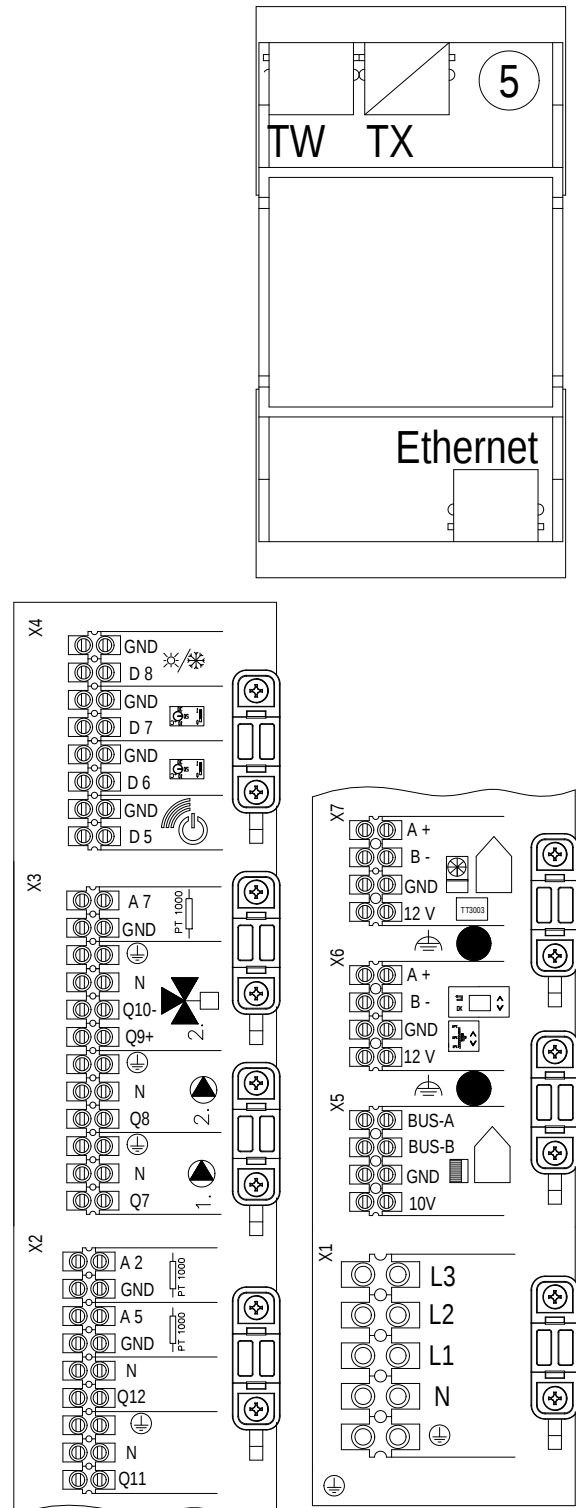
Legend of cable connections to the connecting terminals:

MARK	CONNECTING TERMINALS	DIMENSIONS OF CABLE	CHARACTERISTICS
X1	L1, L2, L3, N,		Power cable
X2	A5, GND	2 x 0.75 mm ²	Temperature sensor of external temperature (only connected in the case of the device WSLHP7and WSLHP11 S1),
	A2, GND	3 x 0.75 mm ²	Temperature sensor for sanitary water (connected only in the case of WSL141, WSL-131-1, WSL-131-11)
	Q12, N,	2 x 0.75 mm ²	Additional external source
	Q11, N,	3 x 0.75 mm ²	Cooling valve
X3	Q7, N,	3 x 0.75 mm ²	Circulation pump of heating cycle 1 (optional)
	Q8, N,	3 x 0.75 mm ²	Circulation pump of heating cycle 2 (optional)
	Q10-, Q9+, N	3 x 0.75 mm ²	Mixing valve of heating cycle 2 (optional)
	A7, GND	2 x 0.75 mm ²	Temperature sensor of mixing-heating cycle 2 (optional)
X4	D8, GND	2 x 0.75 mm ²	Switch for heating/cooling (optional)
	D7, GND	2 x 0.75 mm ²	Thermostat of mixing cycle 2 (optional)
	D6, GND	2 x 0.75 mm ²	Thermostat of mixing cycle 1 (optional)
	D5, GND	2 x 0.75 mm ²	Remote on/off (optional)
X5	BUS ñ A, BUS ñ B, GND, +10 V	4 x 0.75 mm ²	Communication of the external control unit in the WPLV device
X6	A+, B-, 12 V, GND	4 x 0.75 mm ²	Communication spatial corrector (optional)
X7	A+, B-, 12 V, GND	4 x 0.75 mm ²	Communication of the external control unit in the WPL device and/or internal expansion unit TT3003
5		UTP	Web modul
	TW MODBUS	UTP	Communication with PLC
	TX MODBUS	/	Not in use
	Ethernet	UTP	Internet connection

► WSL141,



► WSL142,



4.5.5 Cable routing

In order to ensure tightness of the cable routing follow the below instructions:

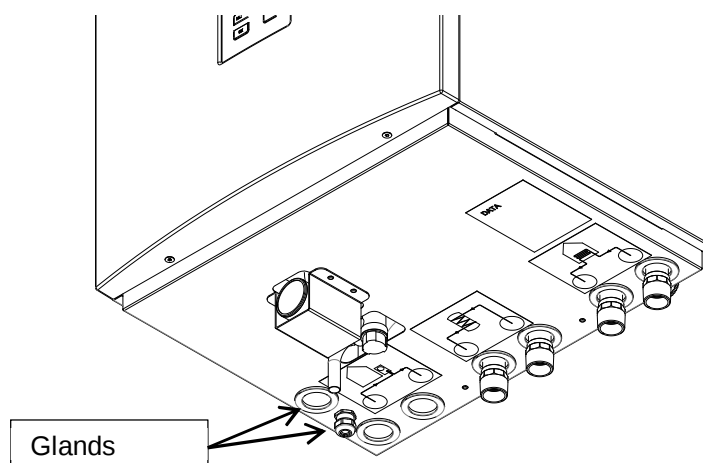
1. Make a small hole in the thin rubber membrane for each cable.
2. Push the cable through making sure the membrane isn't damaged and that the membrane tightly wraps the cable.
3. Pull the cable back for approximately 5 mm to make a positive seal.

In the case of WSL141,



CAUTION

Make sure that all the cables are fed through the cable glands at the bottom of the unit. In that way you will ensure the tightness of the device.

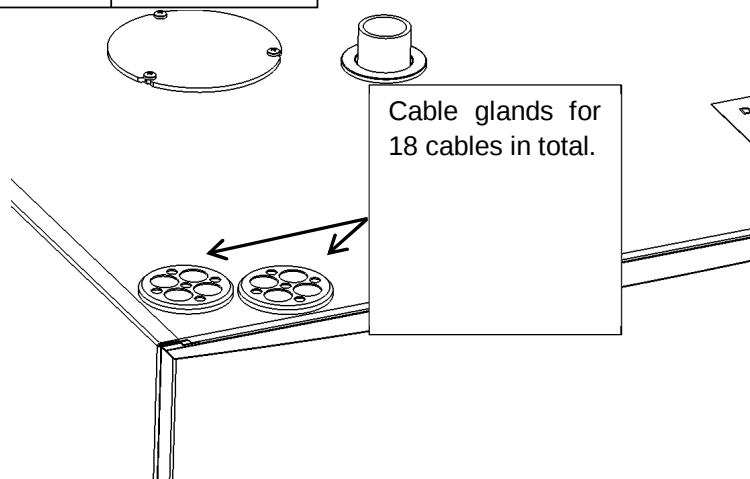
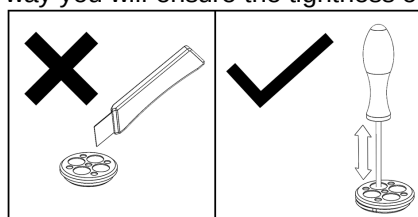


In the case of WSL142,



CAUTION

Make sure that all the cables are fed through the cable glands at the top of the unit. In that way you will ensure the tightness of the device.



4.5.6 Connection of power cable



DANGER

Connecting the device to the power source can only be performed by a qualified installer in a **voltage-free** state!



CAUTION

The supply and communication cables have to be laid into the device and electrical cabinet through separate cable glands and cord anchorage, which are installed before the cable terminals. This way we ensure the cable is relieved from strain and the electrical cabinet is protected from water penetration.



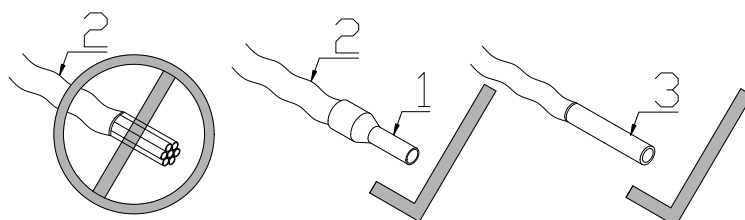
CAUTION

Wrong dimensioning of the power cable or too weak terminal fuses of the device could lead to an overload of the safety elements on the power grid of the building which could lead to overheating of the electrical installation. Follow the requirements listed in this manual.



CAUTION

In case of connecting the multi-wire flexible cable to the connecting terminal, it always has to have an end sleeve at the end.



1 End sleeve

3 Massive single-wire cable

2 Multi-wire flexible cable

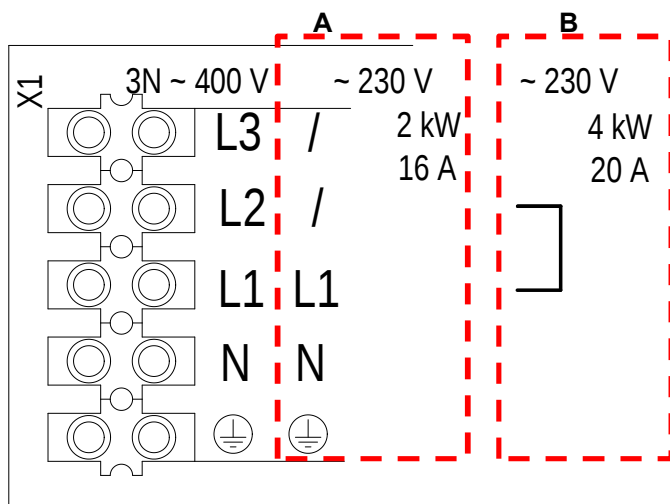
- ▶ To connect to connecting terminals of the device, use cables with crimped end sleeves or a massive single-wire cable.

The dimensions of the power cables are listed in the chapter under technical information **Error! Reference source not found..**

The device comes with an electrical heater 3 x 2 kW. The power supply is connected according to your needs:

a) ~ 230 V / 50 Hz on the connecting terminals **L1, N and PE**,

Connecting terminals of the supply cable



~ 230 V / 50 Hz

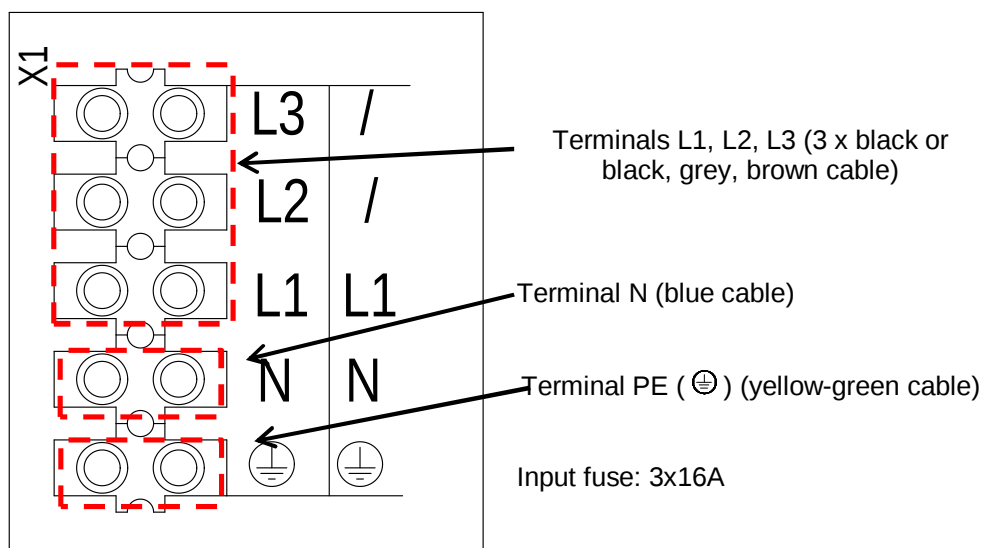
For connecting the **2 kW** heater, connect the connecting terminals in section A to **L1, N and PE** (⊕). Input fuse: **16 A**.

For connecting the **4 kW** heater, connect the connecting terminals in section B to **L1, N and PE** (⊕). It is also necessary to connect the bridge from **L1** to **/**. Input fuse: **20 A**.

Terminal PE (⊕) (yellow-green cable), terminal N (blue cable), terminals L1 (black or grey or brown cable).

b) **3N ~ 400V / 50 Hz on the connecting terminals L1, L2, L3, N and PE (⊕).**

Connecting terminals of the supply cable



4.5.7 Connecting terminals of the communication cable

The communication cable is intended for the communication between the control unit TT3000 and external device. For the dimensions of the communication cable, see technical data **Error! Reference source not found.**

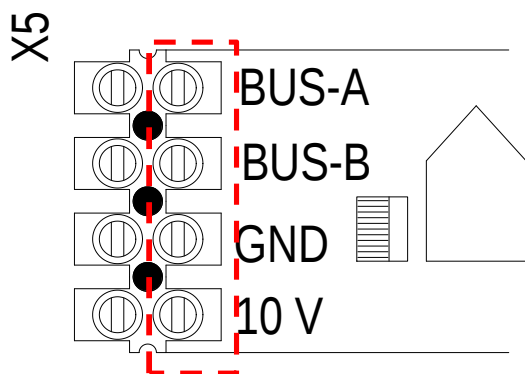


CAUTION

It is important to correctly connect the connecting terminals X5 and X7.

In the case of WSL141 and WSL142

The communication cable connects the external device to the terminal terminal **X5** on the internal device. It is necessary to connect the terminals **BUS-A, BUS-B, GND and 10 V**.



DANGER

The communication connection is considered as a low-voltage connection. The type of the communication cable must be H05VV-F 4 x 0.75mm² (IEC 60227-53) or similar.

In the case of a prefabricated FTP cable, connect cable **1, 2** to **BUS – A**, **2, 3** to **BUS – B** and **GND** to **7, 8**.

4.5.8 Ethernet connecting terminal

Use an Ethernet connection terminal to connect your device to the Home.Cloud application. Use the communication cable to connect the "Ethernet" connector to the network router and activate it. To register the device in the Home.Cloud, see the instructions **Instructions for connecting the device to the cloud**.

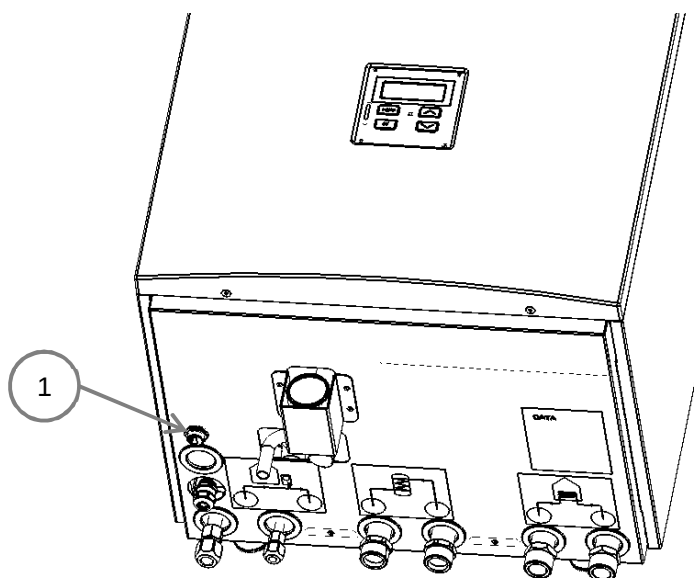


NOTE

Use the RJ-45 gold-plated connector and crimp it with a certified tool on the 5e UTP cable. The connection between the connector and the router must be made according to T 568 - A standard.

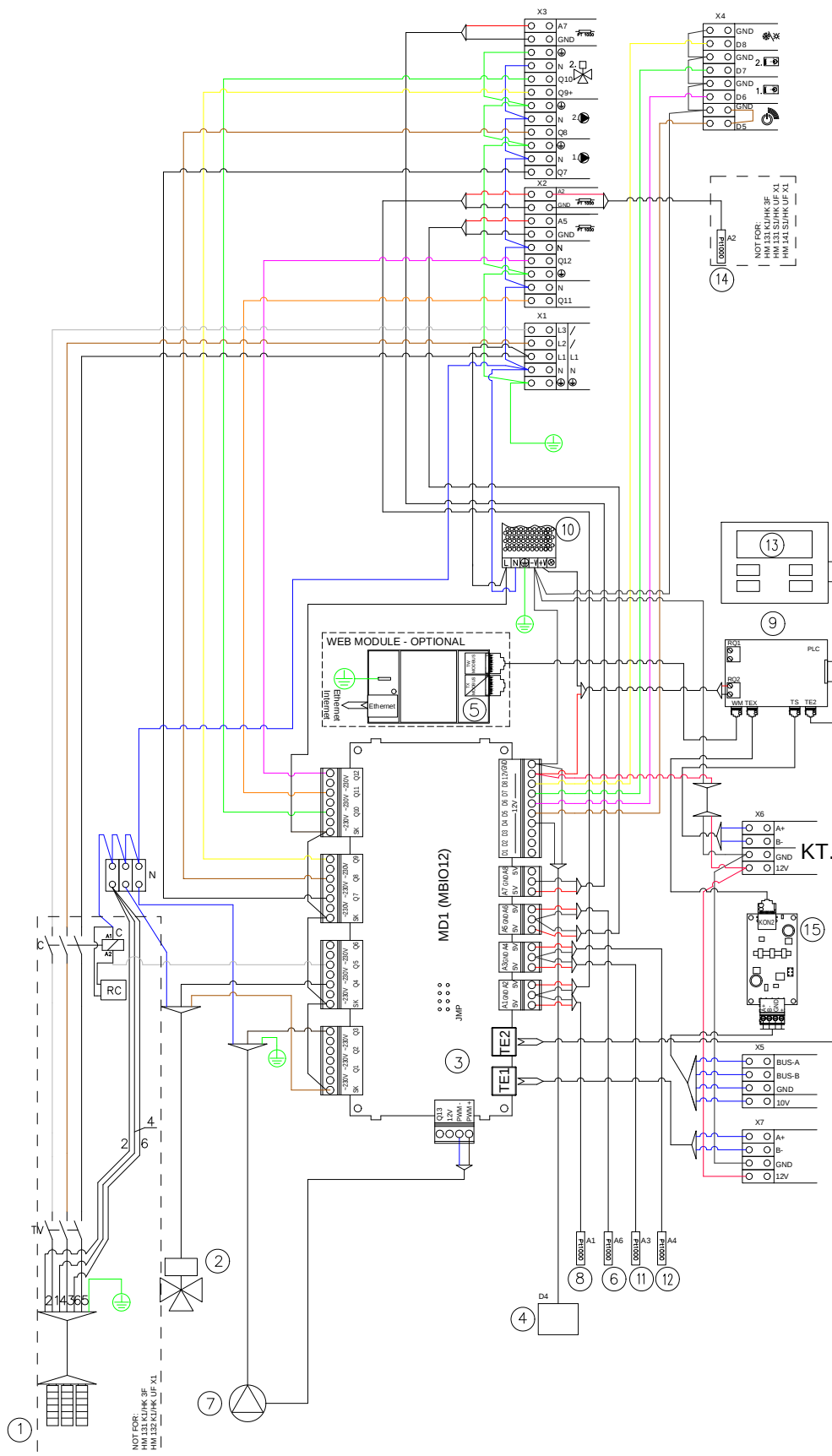
Place of Ethernet terminal

In case of WSL141



1 Ethernet terminal

4.5.9 Electrical scheme

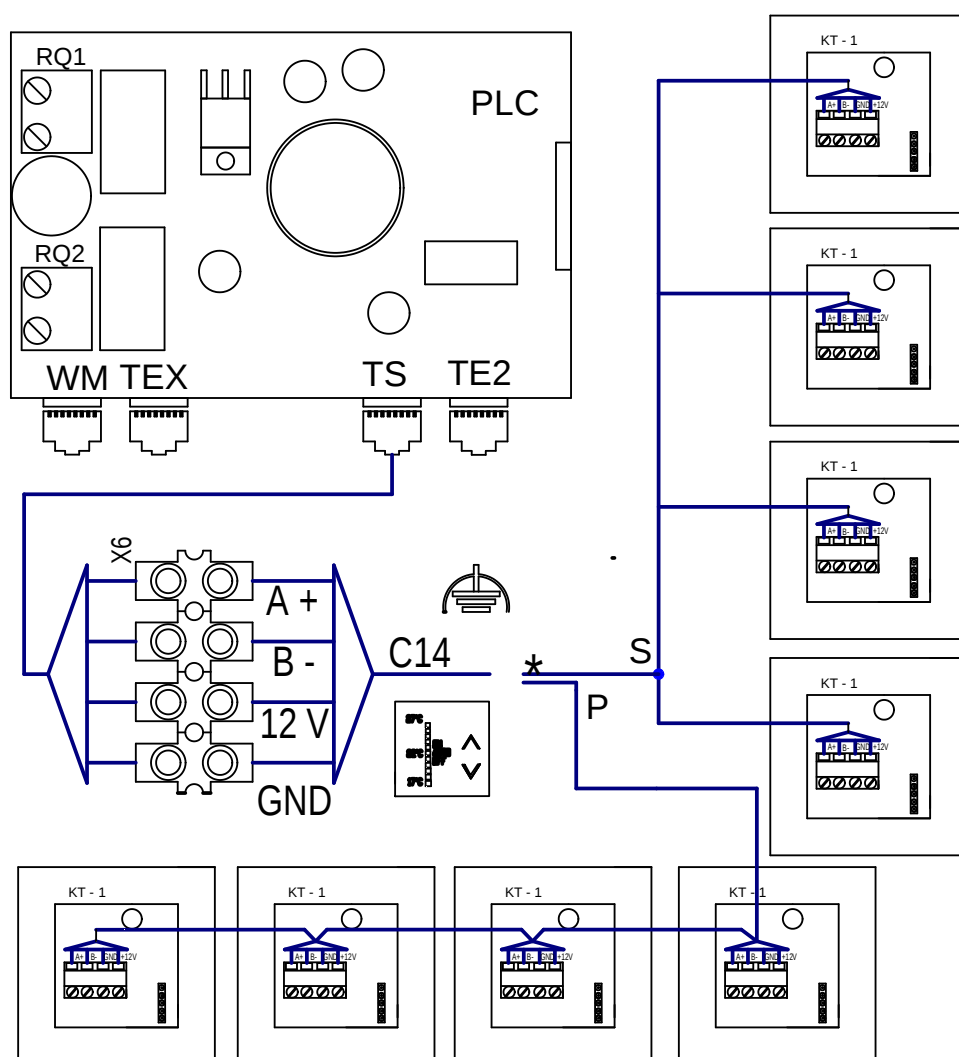


ELEMENT	CONNECTING TERMINALS	MARK	CHARACTERISTICS
		X1	Power cable
	L1, L2, L3, N, 		
	WPLV	X5	Communication with the external control unit in the WPLV device
	BUS - A		
	BUS - B		
	GND		
	/		
	WPL	X7	Communication with the external control unit in the WPL device and/or internal expansion wall unit TT3003
	A+ , B- 12 V, GND		
		X2	Temperature sensor for external temperature
	A5, GND		It is connected only in the case of the device WSLHP7 and WSLHP11
		X2	Temperature sensor of sanitary water
	A2, GND		Connected only in the case of WSL141,
		X2	Cooling valve
	Q11, N		
		X2	Additional external source
	Q12, N, PE		
		X3	Circulation pump of heating cycle 1 (optional)
	Q7, N, PE		
		X3	Circulation pump of heating cycle 2 (optional)
	Q8, N, PE		
		X3	Mixing valve of heating cycle 2 (optional)
	N, Q9+, Q10-		
		X3	Temperature sensor of mixing-heating cycle 2 (optional)
	A7, GND		
		X4	Switch heating/cooling and/or PV signal (optional)
	D8, GND		
		X4	Thermostat of mixing cycle 2 (optional)
	D7, GND		
		X4	Thermostat of mixing cycle 1 (optional)
	D6, GND		
		X4	Remote on/off (optional)
	D5, GND		
		X6	Communication room temperature corrector (optional)
	A+, B-, 12 V, GND		
5			Web module
	A		Communication with PLC
	B		Not in use
	C		Internet connection
3		MD1	Basic input/output module MD1
PS	D4		Flow switch
M 4.1	Q4		Switching valve for sanitary water
M3	Q3		Main circulation pump
S1	A1		Temperature sensor of the return line
S3	A3		Temperature sensor of the entry of the refrigerant into the condenser
S4	A4		Temperature sensor of the exit of the refrigerant from the condenser
S6	A6		Temperature sensor of the supply pipe
		10	Power supply ~ 230 V / 12 V
PLC			Process module
		WM	Communication with the Web module
		TEX	MODBUS communication with the control system of the building (BMS)
		TS	Communication with the room corrector
		TE2	Communication with the basic module MD1
		RQ1	ALARM dry contact
		RQ2	RESET dry contact
1			
C			Electrical contactor of the electrical heater
EG			Flow electrical heater
TV			Thermal protection of the electrical heater

ELEMENT	TERMINAL BLOCK	DESCRIPTION
X1	L1, L2, L3, N, PE	Power cable
X2	A5, GND	Temperature sensor for external temperature. It is connected only in the case of the device WSLHP7 and WSLHP11
	Q11, N	Cooling valve
	Q12, N, PE	Additional external source
X3	Q7, N, PE	Circulation pump of heating cycle 1 (optional)
	Q8, N, PE	Circulation pump of heating cycle 2 (optional)
	N, Q9+, Q10-	Mixing valve of heating cycle 2 (optional)
	A7, GND	Temperature sensor of mixing-heating cycle 2 (optional)
X4	D8, GND	Switch heating/cooling and/or PV signal (optional)
	D7, GND	Thermostat of heating cycle 2 (optional)
	D6, GND	Thermostat of heating cycle 1 (optional)
	D5, GND	Remote on/off (optional)
X5	BUS-A, BUS-B, GND, +10V	Communication with the ODU
X6	A+, B-, 12 V, GND	Communication spatial corrector (optional)
X7	A+, B-, 12 V, GND	Communication with expansion unit TT3003
1		Flow electrical heater.
2		Three way valve for switching between heating and DHW
3		Basic input/output module MD1
4	D4	Flow switch
5		Web module (OPTIONAL)
	TW Modbus	Communication with PLC
	TX Modbus	Not in use
	Ethernet	Internet connection
6	A6	Temperature sensor of the supply pipe
7	Q3	Main circulation pump
8	A1	Temperature sensor of the return line
9		Process module - PLC
	WM	Communication with the Web module
	TEX	MODBUS communication with the ODU.
	TS	Communication with the spatial corrector
	TE2	Communication with the basic module MD1
	RQ1	ALARM dry contact
	RQ2	RESET dry contact
10		Power supply ~ 230 V / 12 V
	L	Phase 230 V; 50 Hz
	N	Neutral 230 V; 50 Hz
		Protective earth
	V-	GND
	V+	12 V dc
11	A3	Temperature sensor refrigerant pipe ñ condenser inlet. It is connected only in the case of the device WSLHP7and WSLHP11)
12	A4	Temperature sensor refrigerant pipe ñ condenser outlet. It is connected only in the case of the device WSLHP7and WSLHP11)
13		Membrane Keyboard
14	A2	Temperature sensor of sanitary water. Connected only in the case of WSL141,
C		Electrical contactor of the electrical heater
TV		Thermal protection of the electrical heater
RC		RC Filter.

4.6 Connection of the spatial corrector WSL KT-1 and WSL KT-2

Room temperature corrector WSL KT-1(2) is connected according to the circuit diagram below. It is necessary to ensure the correct connection of the plated cable to the connecting terminal X6.



ELEMENTS	CONNECTING TERMINALS	MARK	CHARACTERISTICS
KT-1(2)			Room temperature corrector KT-1(2) (optional)
	A +, B-		Communication
	+ 12 V, GND		Power supply
PLC			Grounding of the plated cable (Functional earthing)
	RQ1		ALARM dry contact
	RQ2		RESET dry contact
	WM		Communication with web module
	TEX		MODBUS communication with the control system of the building (BMS) or outdoor unit PI485 Gateway
	TS		Communication with the room corrector
X6	TE2		Communication with the basic module MD1
			Connecting terminal of the spatial corrector
		C14	Plated cable
		*	Choice of connecting a parallel or a serial connection on X6
		P	Parallel connection
		S	Serial connection

5. Commissioning of the device



CAUTION

Before the commission it is necessary all the required tasks and inspections from the tasks for commission.

After professional installation, the authorised contractor has to perform the commissioning of the device.



CAUTION

The commission can only be performed by a person authorised by the manufacturer! If the commission is performed by an unauthorised person, the warranty is not recognised.

Management of the device must be performed in accordance with current instructions for use.

6. Care and maintenance

The device must be visually inspected once a year. The electrical and hardware installation of the device have to be inspected. In the case of detected irregularities, contact the authorised technician.



CAUTION

The servicing and maintenance of the device can only be performed by a person authorised by the manufacturer. In case of a malfunction, first contact the installer who installed the device.

6.1 Cleaning the water filter



NOTE

Cleaning of water filters on the return into the device is advised to be performed at least once yearly.



CAUTION

A blocked water purifying component and magnetic filter can lead to a malfunction of the device or incorrect functioning of the device. In case the display displays a warning of flow malfunction (⚠Caution, flow!⚠).

6.2 Monitoring the pressure in the heating system



NOTE

Periodically, once yearly, check the water temperature in the heating system.



NOTE

In case the pressure falls (i.e. Leakage of the system) the display displays a warning of flow malfunction (⚠Caution, flow!⚠).

6.3 Cleaning of the heat conductors

6.3.1 Cleaning of the heating system (water section)

Residue of grease and sealants in pipes can pollute the condenser of the device up to a point where cleaning is necessary. In this case the authorised person should perform the cleaning with a solution (up to 5 % of phosphorous acid) which should be heated to room temperature. The condenser has to be completely disconnected from the heating system and rinsed with diluted phosphorous acid in the opposite direction of normal flow.

After cleaning, the condenser has to be rinsed thoroughly with an agent neutralising the acid detergent so as to prevent the contamination of the heating system.



WARNING

Acid detergents should be used carefully, instructions of the manufacturer and environmental regulations must be followed. The cleaning can only be performed by a qualified person.

If any doubts about using the detergents arise, consult with the manufacturer of the detergent.

6.4 Disturbances in the operation

In case of a malfunction during the operation of the device the display of the internal unit TERMOTRONIC displays 'Caution, malfunction'

Find the malfunction in the manual. For error correction, call the installer who performed the installation of the device.

6.4.1 Reset of the thermal protection of the electrical heater

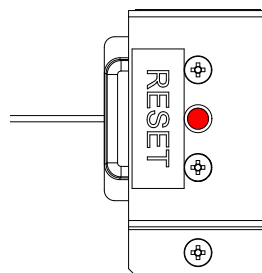
The thermal protection of the electrical heater is an additional safeguard protecting the device in the following cases:

- ▶ The electrical contactor which turns on the electrical flow heater can be permanently short-circuited.
- ▶ At commission, air is in the system; this causes heating without heat extraction.

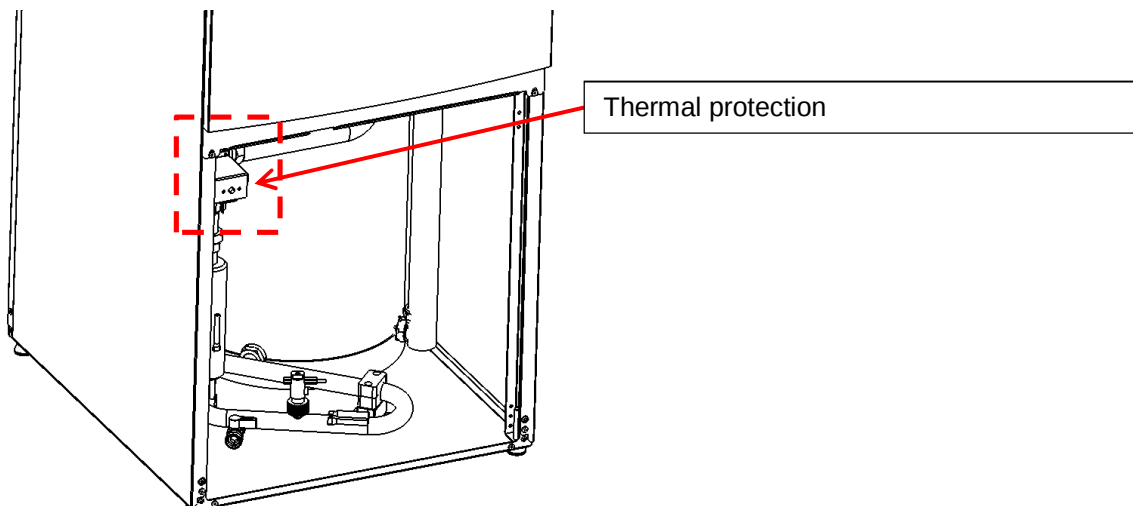
The easiest way to determine whether the thermal protection of the electrical heater is turned off is to turn on the operation of the auxiliary source on the TERMOTRONIC control unit. Determine if you can feel by hand the difference between the supply line and the return line. The electrical heater works if the supply line is warmer. How to activate the auxiliary source is explained in the manual.

In case the electrical heater does not work because of one of the aforementioned reasons, the safety has to be reset after the problem is resolved. You do this by pressing the **RESET** button shown on the scheme.

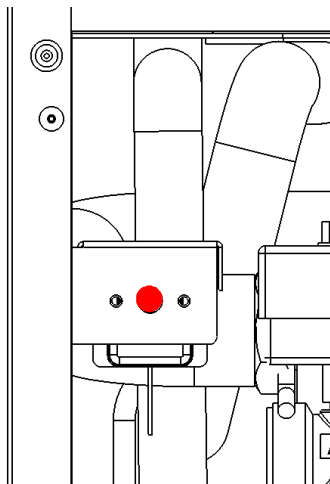
In the case of WSL141



In the case of WSL142



Reset the safety thermostat by pressing the red button until you hear a "CLICK"



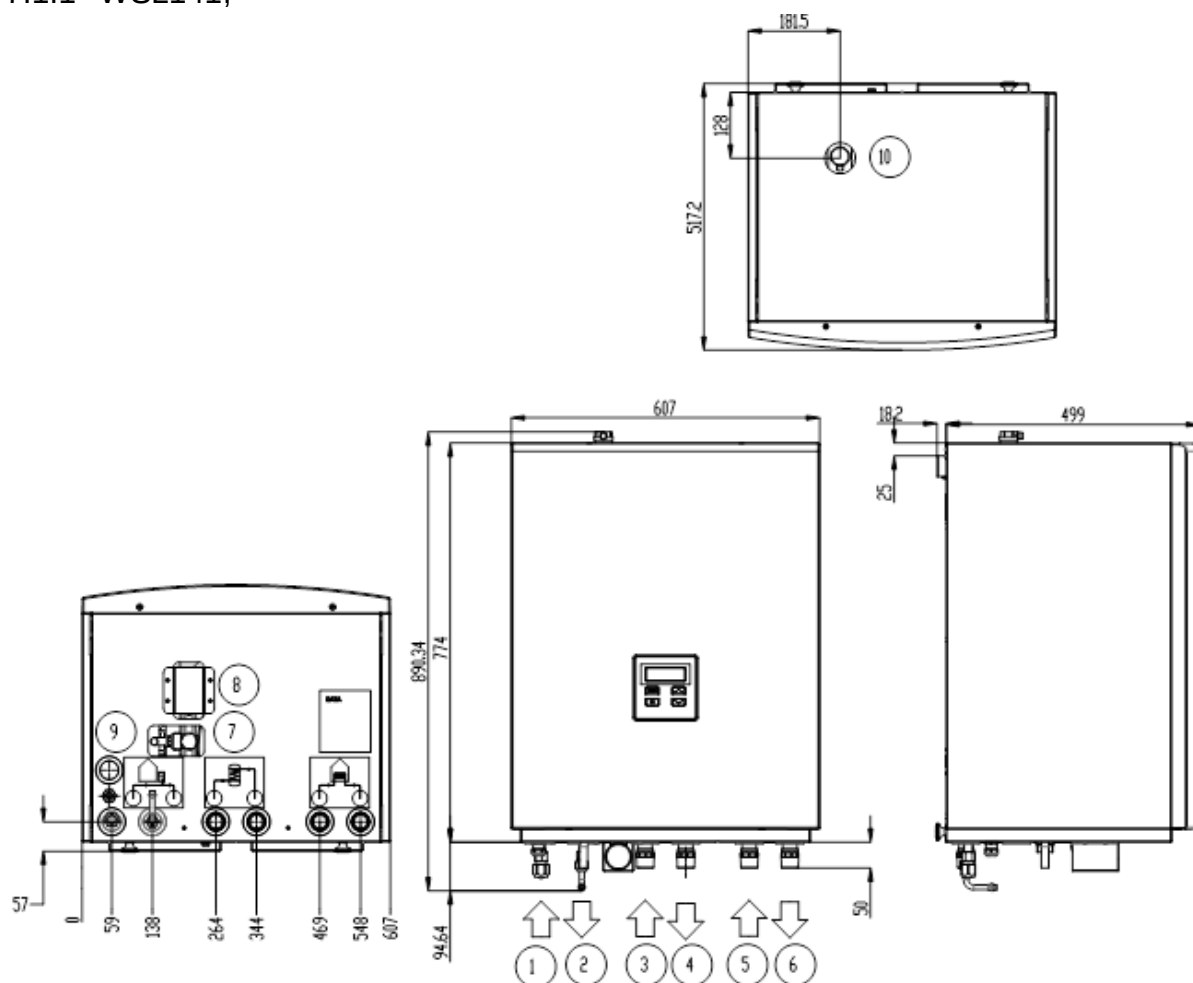
NOTE

Resetting the device can only be performed by installers, authorised contractors for commission or authorised maintenance worker in a voltage-free state.

7. Technical data

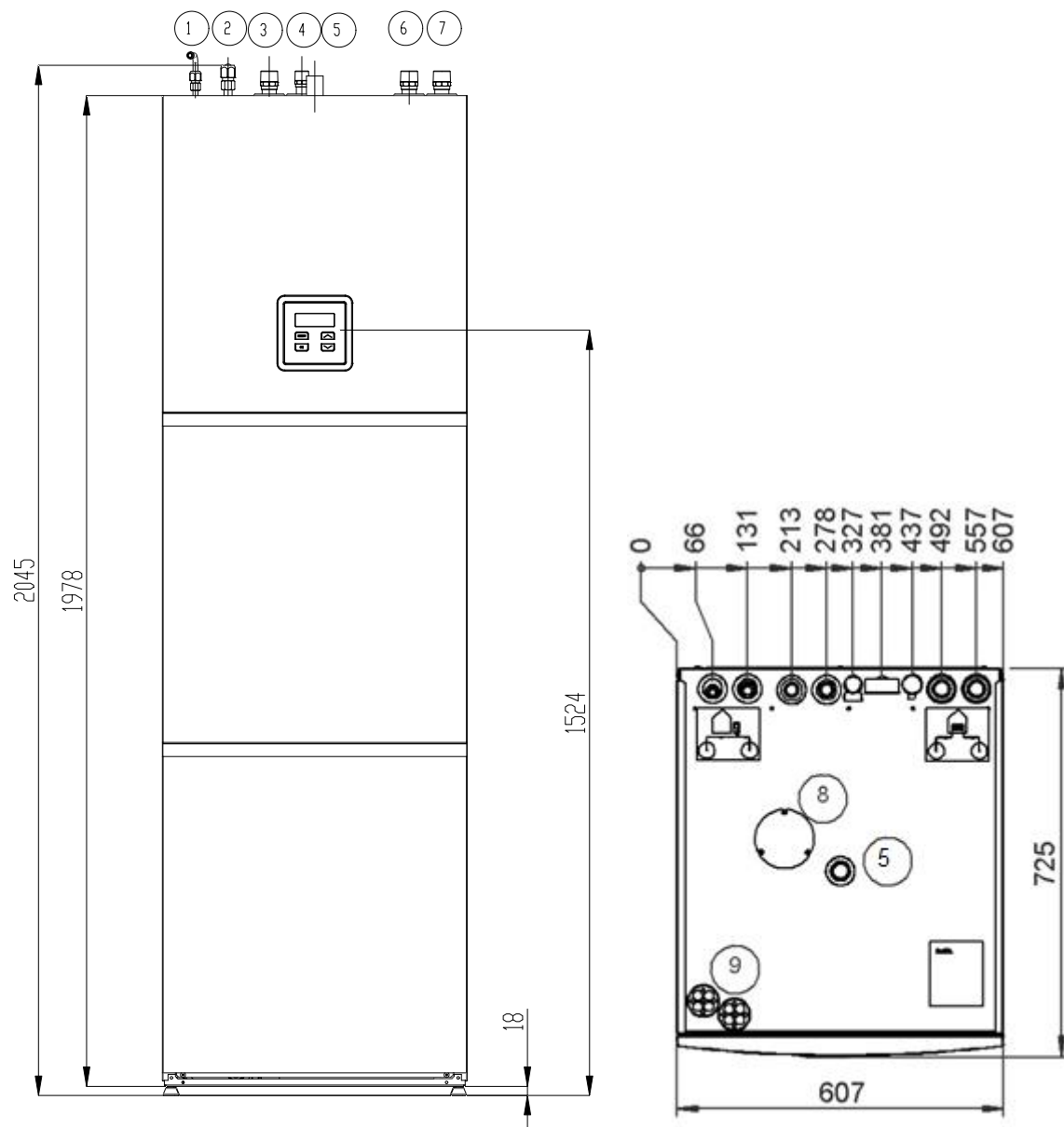
7.1 Dimensions of the device

7.1.1 WSL141,



WSL 141	
1	Refrigerant line - for gas
2	Refrigerant line - for liquids
3	Cold sanitary water
4	Hot sanitary water
5	Return line system
6	Supply pipe system
7	Safety valve
8	Manometer
9	Duct for electrical connection
10	Vent

7.1.2 WSL142,



WSL142 WITH INTEGRATED BOILER	
1	Refrigerant (freon) line - for liquids
2	Refrigerant (freon) line - for gas
3	Cold sanitary water
4	Circulation of sanitary water
5	Hot sanitary water
6	Supply pipe system
7	Mg anode
8	Return line system
9	Cable glands

7.1.3 Technical data WSL141

Hydro module		WSL141	
Device		WSLHP7	WSLHP11
Version			
Controller		TT3000 (MD1)	
Device placement		Interior, wall	
Electrical data			
Single phase connection of internal unit ⁵⁾			
Frequency	Hz	50	
Rated voltage	V	~ 230	
Max. operational current	A	11,8	
Max. electrical power	kW	2,6	
Z _{max} ¹⁴⁾	=	/	
Fuses ¹²⁾	A	1 x C16	
Electrical power cable ⁴⁾	mm ²	3 x 2,5	
Electrical boiler		1 x 2 kW ~ 230 V	
Three phase connection of internal unit ⁵⁾			
Frequency	Hz	50	
Rated voltage	V	3N ~ 400	
Max. operational current	A	11,8	
Max. electrical power	kW	6,6	
Fuses ¹²⁾	A	3 x C16	
Electrical power cable ⁴⁾	mm ²	5 x 2,5	
Electrical boiler		3 x 2 kW ~ 230 V	
Cooling system			
Max. operational pressure	MPa	5,0 (50 bar)	
Pipe connection, pipe for liquids		3/8"	
Pipe connection, pipe for gas		5/8"	
Primary side (heat source) – air			
Heating and cooling			
Range of operation ñ min. / max. air temperature	°C	Depending on the external air ñ water unit	
Secondary side (heat sink) – water			
Min. / Max. pressure in the system	Mpa	0,1 / 0,3 (1,0 / 3,0 bar)	
Recommended dimensions of pipes of the device ⁷⁾	DN	25	
Heating			
Rated voltage ⁶⁾	m ³ / h	1,0	1,4
Pressure drop at rated voltage	kPa	14	12
Range of operation ñ min. / max. water temperature	°C	25 / 58	
Cooling			
Range of operation ñ min. / max. water temperature	°C	7 / 25	
Pipe connections for the water connection			
Supply pipe system		R1" (ext. u.)	
Return line system		R1" (ext. u.)	
Pipe connections for the DHW connection			
DHW ñ hot water connection		R1" (ext. u.)	
DHW ñ cold water connection		R1" (ext. u.)	
Volume			
DHW Tank	l	/	
Buffer tank	l	40	
Dimensions and mass – transport			
Dimensions (W x H x D)	mm	990 x 894 x 680	
Mass	kg	81	
Dimensions and mass – neto			
Dimensions (W x H x D)	mm	607 x 774 x 499	
Mass	kg	73	
Noise			
Level of sound power	dB (A)	35	
Level of sound pressure at a distance of 1 m	dB (A)	27	
Communication			
Connection between ext. and inter. unit		Cable H05VV-F 4 x 0,75 mm ² (IEC 60227-53) or similar	
Connection to BMS		/	
Connection to the internet ⁸⁾		UTP 5ea cable - connection RJ45 - Ethernet	
Miscellaneous			

Protection class		
Internal unit		IPX1

7.1.4 Technical data WSL 142

Hydro module		WSL142	
Device		WSLHP7	WSLHP11
Version			
Controller		TT3000 (MD1)	
Device placement		Interior, wall	
aElectrical data			
1f connection of internal unit ⁵⁾			
Frequency	Hz	50	
Rated voltage	V	~ 230	
Max. operational current	A	11,8	
Max. electrical power	Kw	2,6	
Z _{max} ¹⁴⁾	=	/	
Fuses ¹²⁾	A	1 x C16	
Electrical power cable ⁴⁾	mm ²	3 x 2,5	
Electrical boiler		1 x 2 KW ~ 230 V	
3f connection of internal unit ⁵⁾			
Frequency	Hz	50	
Rated voltage	V	230V	
Max. operational current	A	11,8	
Max. electrical power	kW	6,6	
Fuses ¹²⁾	A	3 x C16	
Electrical power cable ⁴⁾	mm ²	5 x 2,5	
Electrical boiler		3 x 2 kW ~ 230 V	
Cooling system			
Max. operational pressure	MPa	5,0 (50 bar)	
Pipe connections of the refrigerant (freon) line			
Pipe connection, pipe for liquids		3/8"	
Pipe connection, pipe for gas		5/8"	
Primary side (heat source) - air			
Heating and cooling			
Range of operation - min. / max. air temperature	°C	Depending on the external air - water unit	
Secondary side (heat sink) - water			
Min. / Max. pressure in the system	MPa	0,1 / 0,3 (1,0 / 3,0 bar)	
Recommended dimensions of pipes of the device ⁷⁾	DN	25	
Heating			
Rated voltage ⁶⁾	m ³ / h	1,0	1,4
Pressure drop at rated voltage	kPa	14	12
Range of operation - min. / max. water temperature	°C	25 / 58	
Cooling			
Range of operation - min. / max. water temperature	°C	7 / 25	
Pipe connections for the water connection			
Supply pipe system		R1" (ext. u.)	
Return line system		R1" (ext. u.).)	
Pipe connections for the DHW connection			
DHW ñ hot water connection		R1½(ext. u.)	
DHW ñ cold water connection		R3/4½(ext. u.)	
DHW ñ circulation		R3/4½(ext. u.)	
Volume			
DHW Tank	l	200	
Buffer tank	l	40	
Dimensions and mass – transport			
Dimensions (W x H x D)	mm	640 x 2170 x 780	
Mass	kg	245	
Dimensions and mass – net			
Dimensions (W x H x D)	mm	607 x 2045 x 725	
Mass	kg	235	

Noise		
Level of sound power	dB (A)	35
Level of sound pressure at a distance of 1 m	dB (A)	27
Communication		
Connection between ext. and inter. unit		Cable H05VV-F 4 x 0,75 mm ² (IEC 60227-53) or similar
Connection to BMS		/
Connection to the internet ⁸⁾		UTP 5e cable - connection RJ45 - Ethernet
Miscellaneous		
Protection class		
Internal unit		IPX1

1) /

2) /

3) /

4) With the cable we have taken into account laying B2 from the table A.52.4 ñ IEC 60364-5-52. The cable in the installation pipe is fixed to the wall. The dimensions of the electrical cables must always be checked or determined by the designing engineer of electrical installations.

5) Total maximal load (circulation pumps, electronic valves ...) which can be connected to or powered by the internal unit, must not exceed 500 W. Bigger consumers (i.e. Pumps) should have their own supply.

6) The circulation pump must be dimensioned in such a way that it ensures rated flow through the heat pump.

7) This applies to pipe connections of suitable dimensions and total distance of up to 20 m. Pipe dimensions and types of pumps must always be verified or determined by the designing engineer of electrical installations. Circulation pumps must be dimensioned to ensure rated voltage (see table) through the heat pump.

8) Connection to the internet is not necessary for the operation of the device but it is necessary for remote control through the Home Cloud service. It is also advisable for faster troubleshooting of the device's operation.

9) /

10) /

11) /

12) The size of the fuse depends on the choice of the connection power of the electrical heater.

13) /

14) When connecting a 4 kW electric heaters in single-phase power supply system it is necessary to obtain a guarantee or consult with the operator of the distribution network that the impedance of the network is less than the max. Thus, the device will operate within acceptable limits of interference.

7.2 Noise

Noise is any kind of sound which causes a disturbance, interferes with a person's work and causes harm to health and well-being. Individuals can have different reactions to the same noise at different occasions. The perception of sound also depends on the current mood of an individual.

Every device which operates with fluctuation is a source of sound. The spread of sound or noise is also affected by walls and other obstacles in the vicinity of the device. This is why the correct choice of location of the device is very important.

Sound emissions of the device into the surroundings are described by physical quantities such as sound power and sound pressure. Both physical quantities are specified in the dimensionless unit decibel (dB).

Sound power level of (L)

Sound power level is the energy of sound which the device emits into the environment per second. It is a quantity which is used for the basic comparison of various sound sources and for determining whether the machine or device complies with the regulations and standards for noise radiation. Sound power depends on the environment in which the source is located.

The reference sound power is 10^{-12} W.

Example: The sound power of human breathing is 10^{-11} W or 10 dB.

The sound power of whispering is 10^{-10} W or 20 dB.

The sound pressure level (p)

The sound pressure level is the changing pressure of sound waves which a sound produces. Sound pressure is detected or heard as volume. It depends on the environment where the source is located and the distance of the listener to the source of the sound.

The standard reference sound pressure in the air is 20 μ Pa (10^{-6} Pa). This is the sound auditory threshold at the sound frequency of 1 kHz.

Example: The sound pressure of normal human speech at a distance of 1 m ranges from 2 to 20 mPa (10^{-3} Pa) or from 40 to 60 dB.

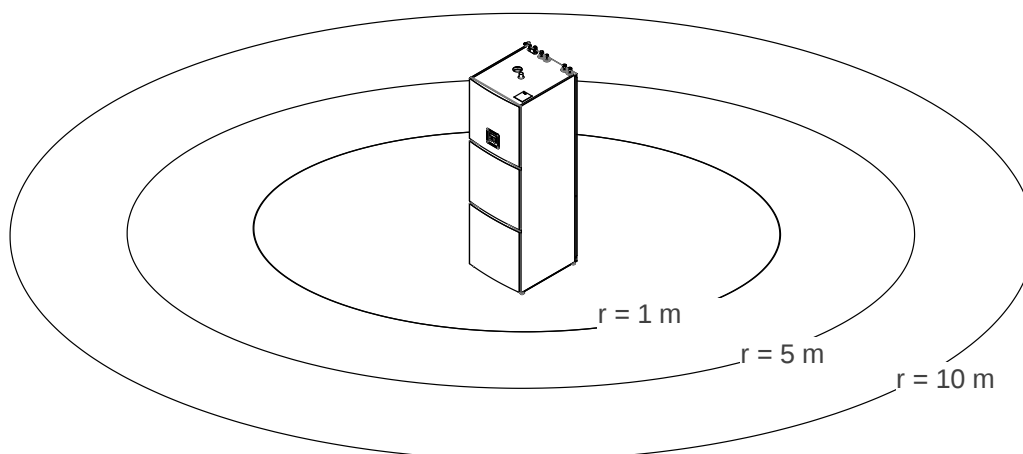
Decibel (dB, dB(A))

A decibel is the unit without dimension with which we express the ratio between the changing quantity and the fixed reference. Among others it is also used for measuring the intensity of sound or sound energy. It is calculated on a logarithmic scale which means that if the ratio increases by 3 dB, the sound energy doubles, if it increases by 10 dB, the sound energy increases by a factor of 10 and if it increases by 20 dB, the sound energy increases by a factor of 100, etc.

Example:

The Sound pressure level of the device is measured in a free sound field at three different distances. For precise data on the sound pressure of your device see technical data

Noise		
Power level of sound of the device	dB (A)	57
Sound pressure level at a distance of 1 m	dB (A)	49
Sound pressure level at a distance of 5 m	dB (A)	43
Sound pressure level at a distance of 10 m	dB (A)	29



The source of sound of the device	Power level of sound [dB]	Noise
A pocket watch in the bedroom	20	Very quiet
Air conditioning in an office	40	quiet
Heating heat pump	57	Loud
Normal speech	60	Loud
Gas burner	75	Very loud
Traffic, loud radio	80	Very loud
Plane motor	140	Painful

Product supplied by

Waterford Stanley Ltd.

Unit 401-403 , IDA Industrial Estate,

Cork Road, Waterford.

Tel : 00353 51 302300

E mail: service@waterfordstanley.com

Website : www.waterfordstanley.com

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