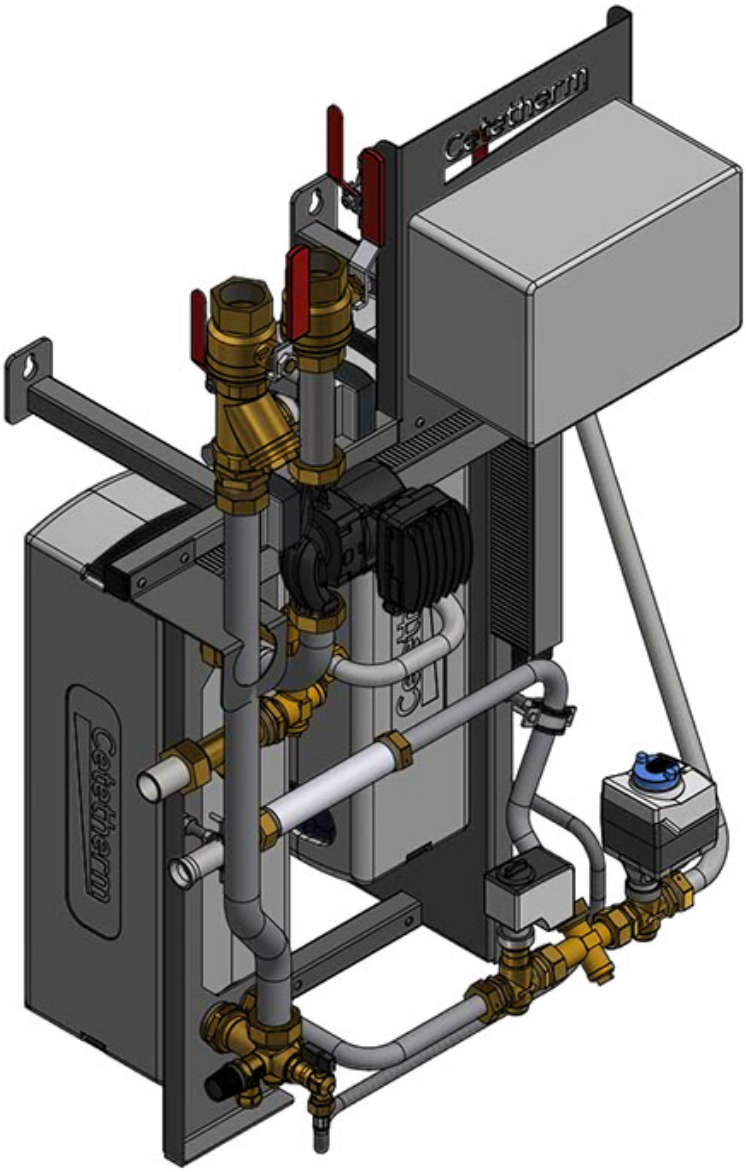
Cetetherm

Installation, service and operating instruction Cetetherm Midi Wall SR144

Heating and domestic hot water substation for apartment houses (10-30 apts.)



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For additional online information and manual:

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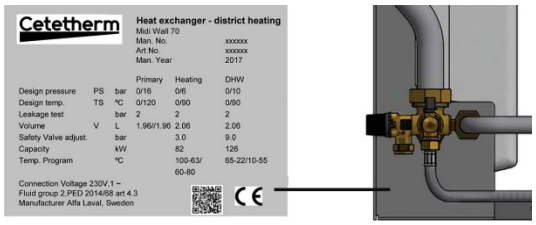

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Cetetherm can without further notice make changes and improvements to the content in this manual if it is necessary due to printing mistakes, wrong information or changes in the hardware or software.

All these types of changes will be included in future release of the manual.

Contents

1 General

Cetetherm Midi Wall is a complete, ready-to-install heating network substation for heating and hot water. It is designed for buildings with a primary connection to a heating network. Cetetherm has years of experience in heating network technology and has developed Midi Wall with well-planned pipe work and with all components easily accessible for inspection and possible future servicing.

1.1 Comfort

Midi Wall has fully automatic temperature control for heating and hot water. The heating controlled in relation to outdoor temperature and/or desired room temperature.
The hot water is controlled and maintained at the desired temperature.

1.2 Installation

Well planned pipe work and readymade electrical wiring make installation very simple. A pre-programmed controller and plug-and-socket connection provide further simplification, so that the substation can be started without delay. Midi Wall is designed to hang on the wall.

Before installation this manual must be read.

1.3 Long-term security

All components are adjusted together and undergo thorough function testing in accordance with ISO 9001:2015 quality assurance system. For future servicing requirements, all components are easily accessible and individually replaceable.

1.4 CE-marking

Midi Wall is CE-marked to certify that the substation conforms to international safety regulations. To maintain the validity of the CE marking, only identical replacement parts must be used.

1.5 Information about the document

All pictures in this document are general images.
Mid Wall is available in different models and levels of equipment.

1.6 General warnings

	The installation work must be carried out by an authorized installation contractor. Before the system is taken into operation, it must be pressure tested in accordance with relevant regulations.
	The temperature and the pressure of the district heating water are very high. Only qualified technicians can work with the district heating substation. Incorrect operation may cause serious personal injury and result in damage to the building.
	If the hot water temperature is set too high, people may be scalded. If the hot water temperature is set too low, unwanted bacteriological growth may occur in the hot water system. This can result in serious personal injury.
	Parts of the Midi Wall may get very hot and should not be touched.
	Before the substation is connected to the electrical supply, make sure that the secondary heating system is topped up with water. Starting up the system without water will damage the circulation pump.
	The substation comes prepared with an electrical plug to be connected to the main supply. The strain relief clips of the cable must be fitted to avoid damage. If necessary, the plug-and-socket connection can be replaced with a permanent installation with an all-pole isolated switch. This must be carried out by a duly qualified electrician.
	When starting up the district heating substation: To avoid the risk of scalding, make sure that no-one draws any hot water until the hot water temperature has been adjusted.
	Start district heating circulation by first opening the valve in the **district heating supply** and then **return** lines, to avoid pollutions in the system. Open the valves slowly to avoid pressure surges. Do the same way with the heating circuit, first open the valve for **heating supply** then **return**.
	Do not shut of the electrical supply to the operator control panel. This will damage the circulation pump, valves, actuators etc.
	The heating station should be placed in a locked space, non-accessible for unauthorized personnel.

2 Operating instructions

2.1 Operation

The temperature and pressure of the incoming heating network water from the culvert network are very high. For this reason, only the heat from this water is used. The heating network water does not enter the heating and hot water systems of the building.

The heat from the heating network water is transferred to the heating and hot water systems of the building in the heat exchangers. The heat is transferred through thin plates of acid-resistant stainless steel which keep the heating network water separate from the systems in the building.

Midi Wall has automatic temperature control for heating and hot water. The heating circuit is controlled in relation to outdoor temperature and/or desired room temperature by means of a controller and temperature sensor. When no heat is needed, the circulation pump in the heating circuit stops automatically, but is started regularly to make sure that it does not seize up during long idle periods. The hot water temperature is controlled by a temperature control system which is set to about 55 ºC.

After adjustment, the Midi Wall operates completely automatically. However, in hard water areas it is advisable to be attentive and to remedy any faults in good time if the temperature of the hot water is too high; otherwise the risk of lime deposits in the heat exchanger may increase.

2.2 Safety equipment/inspection

- Daily inspection to check for leaks from pipes or components.
- Weekly inspection to make sure that the operation of the heating and hot water control systems is stable and that the temperature does not fluctuate. Temperature hunting causes unnecessary wear of valves, actuators and heat exchangers.
- Every three months check the safety valves and the pressure in the heating system.

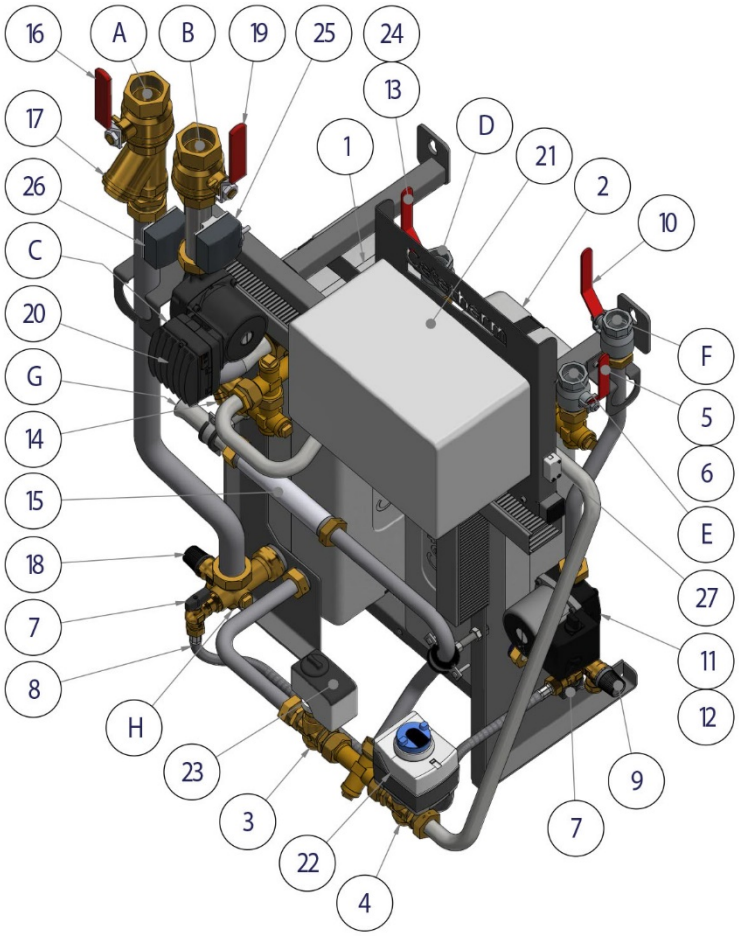
To check the operation of a safety valve, turn its wheel/knob until water escapes from the valve, then close the wheel/knob quickly. Occasionally a safety valve may open automatically to release excess pressure. After a safety valve has been open it is important that it closes properly and does not drip.

Hot water temperature in apartments or one family houses can be set to about 55°C. If the temperature is set too high, there is a risk of scalding. Setting the hot water temperature too low may result in unwanted bacteriological growth in the hot water system.

For setting and (if necessary) fine adjustment of the heating and hot water temperatures,
see chapter *5 User instruction operator control panel RVD144*.

The heating system is topped up via the topping up valve. Be sure to close the valve when the correct pressure is reached. The water used to top up the system contains oxygen and may cause corrosion in the system. For this reason, the system should be topped up as seldom as possible, at most once a year.

3 Product overview, flowchart and measure sketch



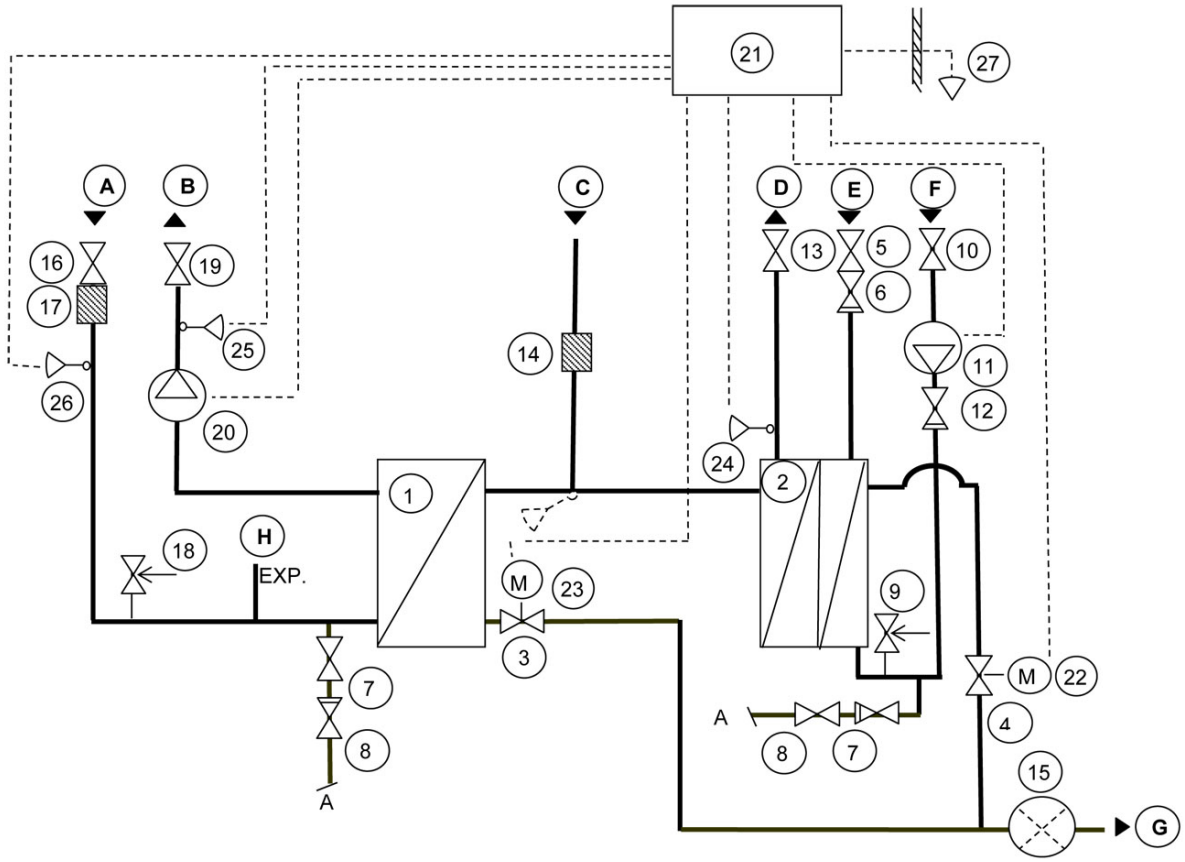
Picture 1

1.	Heat exchanger, heating
2.	Heat exchanger, DHW
3.	Control valve, heating
4.	Control valve, DHW
5.	Shutoff valve, cold water
6.	Check valve, cold water
7.	Filling valve
8.	Hose
9.	Safety valve, cold water
10.	Shutoff valve, DHWC
11.	Pump, DHWC
12.	Non-return valve, DHWC
13.	Shutoff valve, DHW
14.	Strainer, primary in
15.	Dummy, heat meter
16.	Shutoff valve, heating return
17.	Strainer, heating return
18.	Safety valve, heating

19.	Shutoff valve, heat supply
20.	Pump, heating
21.	Control centre *
22.	Actuator, DHW *
23.	Actuator, heating *
24.	Temperature sensor, DHW *
25.	Temperature sensor, heating supply *
26.	Temperature sensor, heating return *
27.	Temperature sensor, outdoor *
A.	Heating return
B.	Heating supply
C.	District heating supply
D.	DHW
E.	CW
F.	DHWC
G.	District heating return
H.	Connection expansion vessel

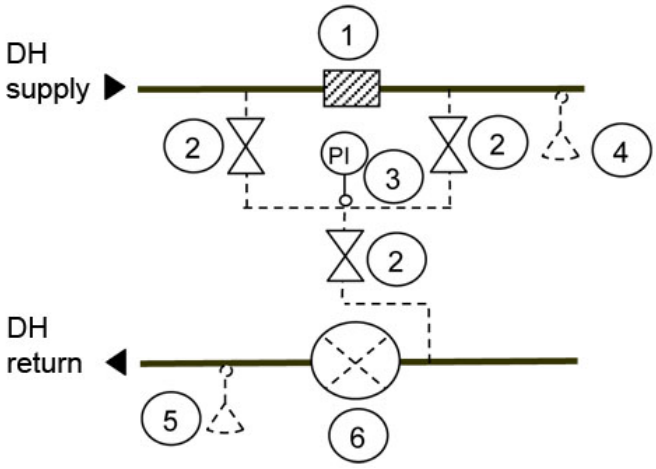
*) included depending on model

3.1 Schematic diagram, main components



Picture 2

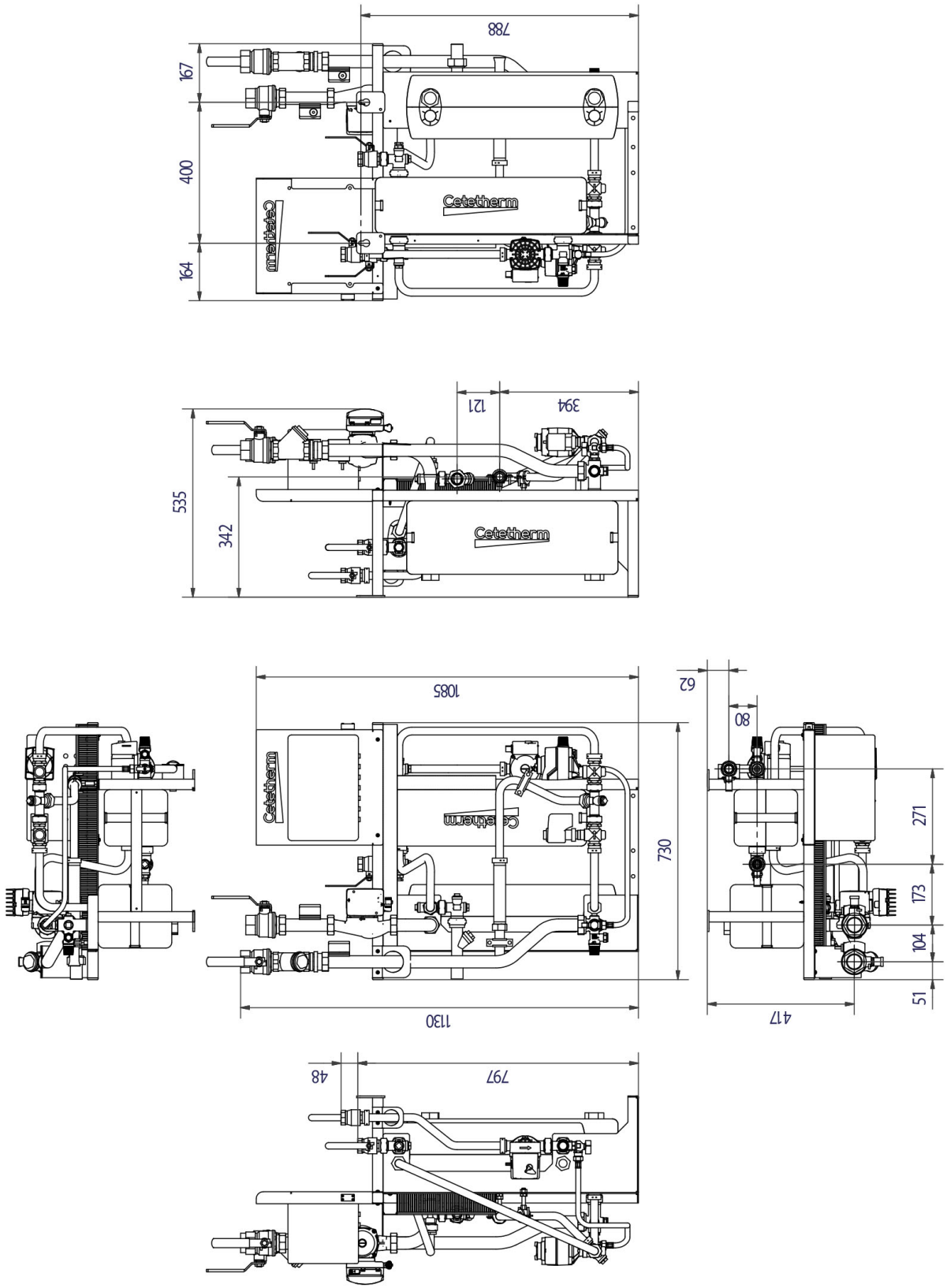
3.2 Option 3-point HB metering



Picture 3

1.	Welded strainer
2.	Shut off valves
3.	Manometer clock
4.	Sensor pocket energy meter primary in
5.	Sensor pocket energy meter primary out
6.	Flanged dummy 260mm energy meter

3.3 Measure sketch Midi Wall SR144



Picture 4

4 Installation

NOTE: If a joining must be loosened and then re-installed, for example when installing the substation or when replacing a strainer unit, the joining gaskets should be exchanged to prevent leaks.

4.1 Unpacking

- Remove the transport packaging and check that the product has not been damaged in transit and that the consignment agrees with the specifications.
- When lifting the unit, take care not to apply stress to pipes and heat exchangers as this may weaken them. Lift the unit in the frame; avoid lifting the unit by holding the heat exchangers. Use pallet lift where applicable, if using back straps these should be attached to the substructure of the substation.

NOTE: Risk of injury lifting heavy objects.

4.2 Preparation

- Choose a suitable installation area in accordance with official regulations.
  The system may generate sounds during operation caused by pumps, regulators systems, flows etc. This should be taken into consideration during installation of the unit, so that possible operational sounds affect the surroundings as little as possible. This means that the system should be installed on well-insulated walls, such as outer walls or on concrete walls.
- Check the applicable regulations of the district heating supplier. The available differential pressure should be at least 100 kPa and at most 600 kPa. Where the differential pressure is higher, a differential pressure controller should be added to the installation.
- Flush heating and hot water systems.

4.3 Mounting

- Mount the substation on a wall with screws and bolts suitable for mounting wall material and substation weight. The distance between floor and screw bracket should be 1420 mm. Note that distance between screws are 400 mm. Mount the floor support on the central, use the middle mounting hole. Raise the central and mount it on the wall.
- Place the substation so that connections, adjustment equipment and safety valves are easily accessible.
- Mount the shutoff valves on district heating supply and return. Shutoff valves are not supplied.
- Connect the pipe works to the connection points, see *4.8 Connection overview.*
- When executing hot work on or close by the substation, all incendiary components should be demounted and removed.
- Take rules and instructions regarding hot work into account.
- Connecting pipes shall be suspended so that their weight does not stress the unit.
- Connecting pipes within and connecting to the units system shall be insulated according to standards and regulations.
- Drainage pipes from safety valves must be taken to floor gully.
- Energy meters must be installed at a prepared location, replacing a gauge block, or following the instructions of the energy supplier.

NOTE; the connection pipe between the valves is just for draining.

- Retighten all connections, including those made at the factory. If connections need retightening after the installation has been taken into service, the system should be depressurised before retightening. **If the system is not depressurised before retightening, gaskets will be damaged.**
- Required expansion volume shall be installed and provided with adequate pre-charge before starting up.

- Remount plugs in drain valves after possible draining of circuit.
- Mount the outdoor temperature sensor on the north side of the building, 2 meters above the ground, or higher. For installation of the outdoor temperature sensor, see *8.2. Installation of outdoor temperature sensor*.

4.4 Mounting the options

- If the substation is connected to a system sensitive to high temperature or to a low temperature system, for example floor heating, a safety thermostat must be mounted and activated before start up. See chapter *13.1 Safety thermostat*.
- If the substation shall be provided with a 3-point HB metering, see mountings instructions *13.2 3-point or 2+1-point HB metering*.
- If the substation shall be provided with a floor stand, see mounting instructions *13.3 Mounting floor stand*.

4.5 Adjustments and settings for start up

- Open incoming cold-water supply and fill the service water and heating circuits, bleeding off any trapped air.
- Check the operation and opening pressures of the safety valves.
- Adjust the hot water temperature by having a hot water tap open at normal flow rate for a time. Measure the temperature at the draw-off point with a thermometer. The temperature should be approximately 55°C. It takes about 20 seconds to get stable tap water temperature. See troubleshooting chart for adjusting hot water temperature.

NOTE: Make sure that no cold water is mixed with hot water while making this adjustment.

- Start the heating circulation pump at the strongest flow setting during some minutes. The pressure should be at least 100 kPa during winter and at least 600 kPA during summer.
- Set the pump capacity of the heating circulation pump according to chapter *9 Pump settings and pump capacity.* Use the lowest setting that manages the heating demand for best electrical efficiency.
- Make any necessary adjustment of the heating curve of the control and regulating equipment.
- Information about the controller can be found in this document.
- Set time, date and hot water temperature on the adjustment centre.
- The property owner must be informed on how to operate, adjust and maintain the unit. It is overly important to inform about the safety systems and the risks associated with the high pressure and temperature of the district heating systems water supply.

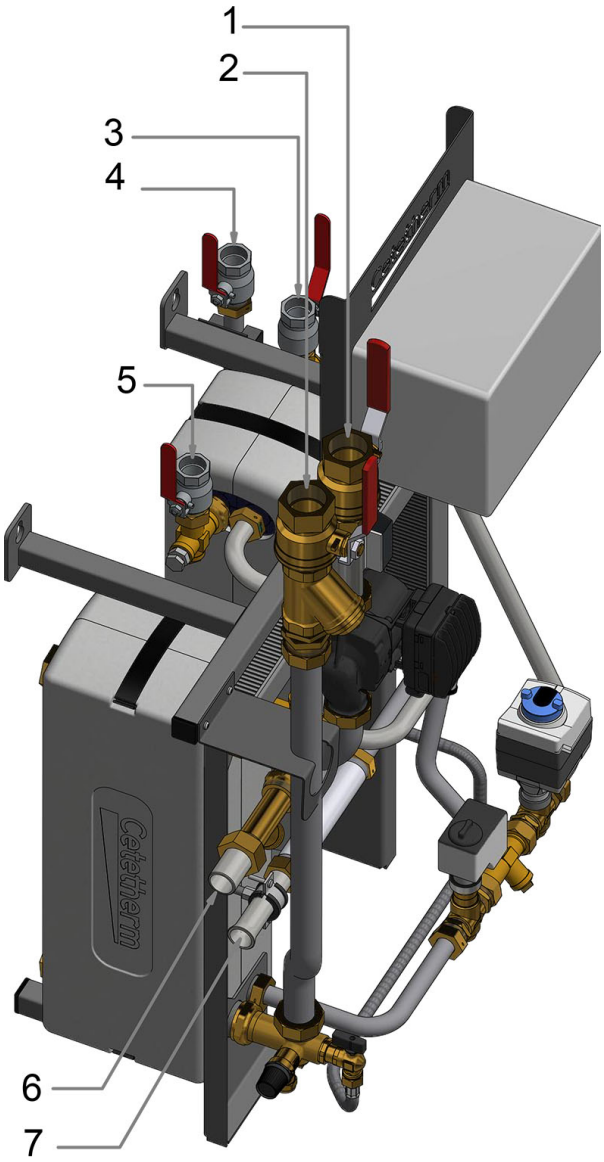
4.6 Dismantlement

When the time comes for the substation to be dismantled and scrapped it must be disposed of in the correct manner in accordance with local or national regulations.

4.7 Commissioning advice

The controller has been set at the factory. If any function needs tuning, values can be changed with reference to this manual for parameter setting. Initially, the commissioning process should be carried out with the factory settings. The parameter settings need tuning only if the district heat terminal does not function accordingly.

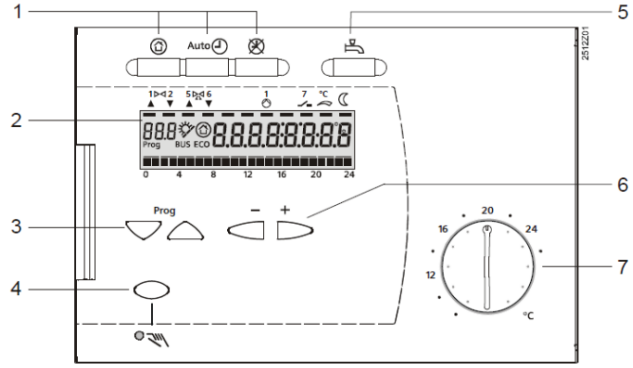
4.8 Connection overview



Picture 5

1.	Heat Supply G1 1/4"	5.	DHW G1”
2.	Heat Return G1 1/4”	6.	DH Supply DN25, weld
3.	CW G1”	7.	DH Return DN25, weld
4.	VVC G1”		

5 User instruction operator control panel RVD144



Picture 6

1. Operating mode buttons
2. Display (LCD)
3. Buttons for selecting operating lines
4. Button for manual operation ON/OFF
5. Button for d.h.w. heating ON/OFF
6. Buttons for making readjustments of values
7. Adjusting knob for nominal room temperature set point

5.1 Choosing operating modes

The following operating mode buttons are available:

- 3 buttons for selecting the heating circuit´s operating mode
- 1 button for d.h.w. heating

The required operating mode is activated by pressing the respective button. Each of the buttons contains an LED that will light to indicate the currently active operating mode.

Stand-by

- Heating operation OFF
- Frost protection is ensured

Automatic operation

- Automatic heating operation, changeover between nominal and reduced temperature according to the time program
- ECO function with needs oriented connection and disconnection of the heating system as a function of the outdoor temperature and the building's heat storage capacity. ECO-saving automatic closes the control valve and stops the heating pump. The pump is run regularly.
- Frost protection is ensured

Continuous operation

- Heating operation with no time program
- Heating to the room temperature adjusted with the setting knob
- Frost protection is ensured
- ECO-saving automatic is not active and the heating pump runs continuously.

D.h.w. heating ON/OFF

- ON (button lit):
  D.h.w. is heated independently of the heating circuit’s operating mode and control

- OFF (button dark):
  No d.h.w. heating; circulating pump switches off, frost protection is ensured

5.2 Manual operation

Manual operation is activated by pressing a button. It is indicated by an LED. At the same time, the LEDs in the operating mode buttons extinguish. Manual operation is quit by pressing the same button again or by pressing any of the operating mode buttons.

Manual operation

- No operating mode
- Heating circuit pump and d.h.w. pums are running.
- The control valve in the primary circuit can be manually operated with the setting buttons, or with the handle on the valve

The control valve for domestic hot water should **NEVER** be operated by hand.

5.3 Set point knob for adjusting the room temperature

The knob is used to make manual adjustments of the nominal room temperature set point.
Its scale gives the room temperature in °C.
Turning the knob produces a parallel displacement of the heating curve, the room temperature will increase or decrease according to the room temperature scale on the adjusting knob.

5.4 Information on the LCD display

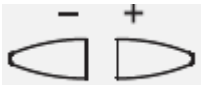
If the bar is alight under	Explanation
	Heating is maintained at normal set point temperature (preset on adjusting knob)
	Heating is maintained at lowered temperature

The display shows	Explanation
	Heating is maintained at freezing protection temperature
ECO	No heating is needed. Pump stop activated
⌐ or ⌙	A limit function is active
	Hot water with solar
BUS	The controller is connected to ModBus

5.5 Buttons for settings and adjustment

The entry or readjustment of all setting parameters, activation of optional functions and reading of actual values and states is made according to the operating line principle. An operating line with its number is assigned to each parameter, actual value and function that can be selected.
One pair of buttons is used to select an operating line and one pair to readjust the display.

5.5.1 Buttons

Buttons	Procedure	Effect
Line selection buttons	Press 	Selects the next lower or higher operating line
Setting buttons	Press 	Decreases or increases the displayed value

The set value will be adopted

- when selecting the next operating line, that is, by pressing a line selection button  or  , or
- by pressing an operating mode button

If entry of --.- or --:-- is required, setting button  or  must be pressed until the required display appears. Then, the display shows constantly --.- or --:-- .

5.5.2 Block skip function

The operating lines are grouped as blocks. To select an individual operating line in a block as quickly as possible, the other lines can be skipped. This is made by using two button combinations:

Procedure	Effect
Keep  **depressed and press**  **or**  **.**	Selects the next higher or lower block

5.6 Setting the temperatures in the heating system

1. Use the setting knob for the required temperature set point.
   The setting will be active:
   - On automatic operation during the heating periods that have been entered the heating program
   - Constantly on continuous operation
2. Use the buttons to set other temperatures and the required control curve as follows:

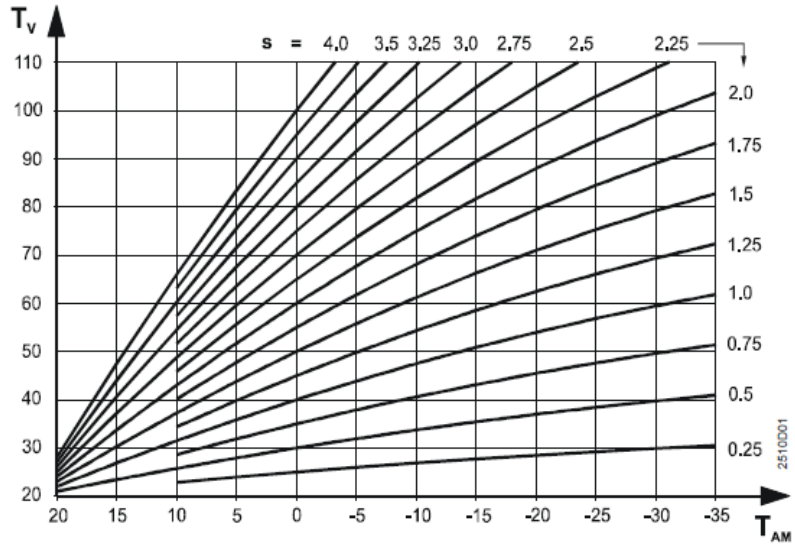
Line	*Function, parameter*	*Unit*	*Factory setting*	*Range*
1	Current nominal room temperature set point	Display function		
2	Reduced room temperature set point	°C	18	variable*
3	Frost protection/holiday mode set point	°C	8	8…variable*
5	Heating curve slope		1,25	0,25…4,0

* variable setting

5.7 Setting the DHW set point temperature

Line	*Function, parameter*	*Unit*	*Factory setting*	*Range*
41	DHW normal set point	°C	55	50°C - 65°C

5.8 Heating Curve



Picture 7

S	Slope
TAM	Composite outside temperature
TV	Supply temperature

Set the correct heating curve based on the supply temperature and Composite Outside Temperature (COT).

Picture 5 shows examples of different heating curves that can be set and adjusted according to COT and the supply temperature.
It is possible to choose at curve that lies between the default heating curves.

Default value is 1.25 for the heating curve, this fits most new houses.

Adjust the slope of the heating curve on the program line 05.

The graph for heating curves is specific to the building and must be adjusted individually during the first heating season.

NOTE! For a house with under floor heating, the value in the graph should be around 0.5. Always check with the under-floor heating supplier.

With weather-compensated supply temperature, the supply temperature set point follows the heating curve.

5.9 Adjusting the heat curve/room temperature

Mainly in mild weather*:*

Use the adjusting knob to adjust the room temperature .

Mainly in cold weather:

Adjust the slope of the heating curve on the program line 05:

- The room temperature is too high: Lower the slope by about 0.5.
- The room temperature is too low: Increase the slope by about 0.5.

Mainly at night:

Adjust the temperature for lowered set point on the program line 02.

Wait two days after every room temperature adjustment to allow the control system to stabilize.

5.10 Setting the clock and date

Line	*Function, parameter*	*Unit*	*Factory setting*
13	Time of day	hh:mm	(00:00...23:59)
14	Weekday	d	Display function
15	Date	dd.MM	(01.01...31.12)
16	Year	yyyy	(2009...2099)

5.11 Setting or changing the heat program

The heating program is set on line 6 and the heating periods are set on line 7-12.

The heating program can be for the whole week or individual for each weekday. The heating program can have up to three heating periods per day.

First enter the times for the entire week and then change weekdays 6 and 7 as required.

The settings are sorted and overlapping heating periods combined.
When setting --:-- for the start or the end, the heating period will be inactive.

Line	*Function, parameter*	*Unit*	*Factory setting (range)*
6	Weekday for entering the heating program	1…7, 1-7 1= Monday 2= Tuesday 1-7= entire week	Current weekday (1...7/1-7)
7	Heating period 1 start	hh:mm	06:00 (--:--/00:00...24:00)
8	Heating period 1 end	hh:mm	22:00 (--:--/00:00...24:00)
9	Heating period 2 start	hh:mm	--:-- (--:--/00:00...24:00)
10	Heating period 2 end	hh:mm	--:-- (--:--/00:00...24:00)
11	Heating period 3 start	hh:mm	--:-- (--:--/00:00...24:00)
12	Heating period 3 end	hh:mm	--:-- (--:--/00:00...24:00)

5.12 Reading of temperatures, actual value

Line	*Function, parameter*	*Unit*
24	Room temperature	°C
25	Outside temperature	°C
26	D.h.w. temperature	°C
27	Flow temperature heating circuit	°C

6 Settings on the heating engineer's level

6.1 Level settings and access rights

The operating lines are assigned to different levels. Assignment and access are as follows:

Level	Operating line	Access
End-user	1 … 50	Press  or  , then select the operating lines
Heating engineer	51 … 222	Press  or  for 3 seconds, then select the operating lines
Locking function (entry of code)	226.... 251	1. Press  and  together for 6 seconds. 2. The display shows ***Cod 00000.*** 3. The code is comprised of 5 buttons:  , must be pressed in this order. 4. Select the operating lines Information about the code of OEM versions is provided by the Siemens sales offices.

When changing to the next lower setting level, all settings of the higher setting levels remain active.

6.2 Plant configuration

Press  and  simultaneously for 3 seconds, thus activating the Heating engineer's level for setting the plant-related variables. The plant type is looked to 4.
The End-user level remains activated.

Line	*Function, parameter*	*Unit*	*Factory setting*	*Range*
51	Plant type		4	Pre-set, cannot be changed
52	Space heating present		1	
53	Universal sensor		0	
54	Flow switch		0	No flow switch installed
56	Pump kick		1	0 = inactive 1 = active
57	Winter-/summertime changeover	dd.MM	25.03	01.01. …31.12
58	Summer-/wintertime changeover	dd.MM	25.10	01.01. …31.12

6.2.1 Pump kick

The pump kick function is activated for 30 seconds every Friday morning at 10:00.
The pump kick is always activated.
The pump kick function can be activated or deactivated on operating line 56. It is recommended that the pump kick function is activated.

6.2.2 Changing between summer and winter time

The change from wintertime to summertime, and vice versa, is made automatically. The relevant changeover dates can be entered on operating lines 57 and 58.

The entry to be made is the earliest possible changeover date. The weekday on which changeover occurs is always a Sunday
Example:
If the start of summertime is specified as "The last Sunday in March", the earliest possible changeover date is March 25. In that case, the date to be entered on operating line 57 is 25.03.

If no summer-/wintertime changeover is required, the 2 dates are to be set so that they coincide.

6.3 Spaceheating

Line	*Function, parameter*	*Unit*	*Factory setting*	*Range*
61	Heating limit (ECO)		-3K	ECO- inactive
62	Building structure		1	0/1
63	Quick setback with room sensor		0	0...15
69	Heat gains	K	0	-2...+4
70	Room temperature influence (gain factor		10	0...20
71	Parallel displacement of heating curve	K	0.0	-4,5...+4,5
72	Overrun time heating circuit pump	min	4	0...40
74	Max. limitation of room temperature	K	------	- - - / 0,5…4

6.4 Actuator heating circuit

Line	*Function, parameter*	*Unit*	*Factory setting*	*If floor heating*
91	Actuator running time, heating circuit	S	150	
92	P-band, heating circuit	K	35	
93	Integral action time, heating circuit	S	150	
95	Maximum limitation of the flow temperature	°C	80	45
96	Minimum limitation of the flow temperature	°C	---	

6.5 D.h.w. heating

Line	*Function, parameter*	*Unit*	*Factory setting*
106	D.h.w. priority		4, parallel
111	Actuator Y5 opening time, d.h.w. mixing valve	S	10
112	Actuator Y5 closing time, d.h.w. mixing valve	S	10
113	P-band d.h.w. control	K	65
114	Integral action time d.h.w. control	s	12
115	Derivative action time d.h.w. control	s	40
117	Max. d.h.w. temperature set point	°C	65
124	Load limit when flow switch is actuated	%	20

6.6 Test and display

The block ”Test and display” contains 3 operating lines that are specifically suited for the function check:

- on operating line 141, all actual values of the sensors can be called up
- on operating line 142, all output relays can be energized, one by one
- on operating lines 49 and 149, all parameters can be reset to their factory settings.

Line	*Function, parameter*	*Factory setting*
141	Sensor test	0 (0...9)
142	Relay test	0
143	Display of active limitations	Display function
146	Contact status at terminal H5	Display function
149	Reset of operating lines on the heating engineer level	
150	Software version	Display function

6.6.1 Sensor test

All acquired temperature values can be displayed on operating line 141.
Check that the values are realistic.

Code	*Sensor or unit*
0	Outside sensor (B9)
1	Flow sensor (B1)
2	D.h.w. sensor (B3)
3	Not used
4	Not used
5	Radiator return sensor (B71)

Faults in the measuring circuits are indicated as follows:
– – – = open-circuit or no sensor connected
o o o = short-circuit

6.6.2 Relay test

All relays can be manually energized on operating line 142, enabling their states to be checked:

NOTE: Always close the main shutoff valve.

Depending on the valves status when the relay test starts, line 3 must be done before line 2 and line 7 before line 6.

Code	*Response or current status*	*Comment*
0	Normal operation (no test)	
1	All relay contacts de-energized	
2	Relay Y1 energized	Radiator valve opens, rotates clockwise.
3	Relay Y2 energized	Radiator valve closes, rotates counter clockwise
4	Relay Q1 energized	Radiator pump starts.
5	Relay Q3/Y7 energized	Not used
6	Relay Y5 energized	Hot water valve opens, rotates clockwise.
7	Relay Y6 energized	Hot water valve closes, rotates counter clockwise.
0	Normal operation (no test)	

End the relay test by selecting one of the options:

- select another operating line
- press one of the operating mode buttons
- automatically after 8 minutes.

6.6.3 Resetting the heating engineer level

By selecting operating line 149, all operating lines of the heating engineer level are reset to their default values. This applies to operating lines 61 through 66 and 70 through 123.

1. Select operating line 149.
2. Keep buttons  and  depressed until the display changes. A flashing 0 on the display is the normal state.
3. If 1 appears, the controller has retrieved the factory settings.

The configuration of the plant (operating lines 51 through 55) and operating line 67 through 69 are not changed by resetting the parameters.

6.6.4 Software version

The software version can be displayed on operating line 150.

6.7 Reset end-user level

If operating line 49 is set to 1, all the current settings on the end-user level operating lines 2…23 are cleared. In that case, the factory settings will be used again.

1. Select operating line 49.
2. Keep buttons  and  depressed until the display changes. A flashing 0 on the display is the normal status.
3. If 1 appears, the controller has retrieved the factory settings.

6.8 ModBus communication

RVD144 can communicate with ModBus/RTU (RS485). For more information about ModBus contact Siemens.

7 Troubleshooting

7.1 Standard values and fault indication for RVD144

Line	*Function, parameter*	*Factory setting (range)*
49	Reset of operating lines on the end-user level	
50	Display of faults	Display function

7.2 Fault codes on the RVD144

Faults in the measuring circuits detected by the controller appear on the display as ***Er*** (Error) and on operating line 50, accompanied by an error code:

Error code	*Cause*	*Tips when fault*
10	Fault outside sensor	check that the outside sensor is mounted
30	Fault flow sensor	
40	Fault return sensor on the primary side	
42	Fault return sensor on the secondary side	check line 53, sensor heating return
50	Fault d.h.w sensor / storage tank sensor 1	
61	Fault room unit	
62	Device with wrong PPS identification connected	
86	Short-circuit on the room unit bus (PPS)	

Perform test of sensor inlet socket according to *5.6.1 Sensor test.*

7.2.1 Fault in heating control system

Fault in the heating control system indicates with  .

If the heating control system does not perform satisfactorily, press the button  (manual operation; the lamp will light up). The heat supplied through the control valve can now be adjusted manually using the  buttons. Then get in touch with your service technician to have the fault corrected

8 Electrical installation

8.1 General

The wiring in Midi Wall conforms to the applicable rules for CE marking and has undergone electrical safety testing and function testing. For permanent installation, the substation must be connected to an all-pole isolated switch. This must be done by a duly qualified electrician.

The substation must be connected to a grounded power outlet.

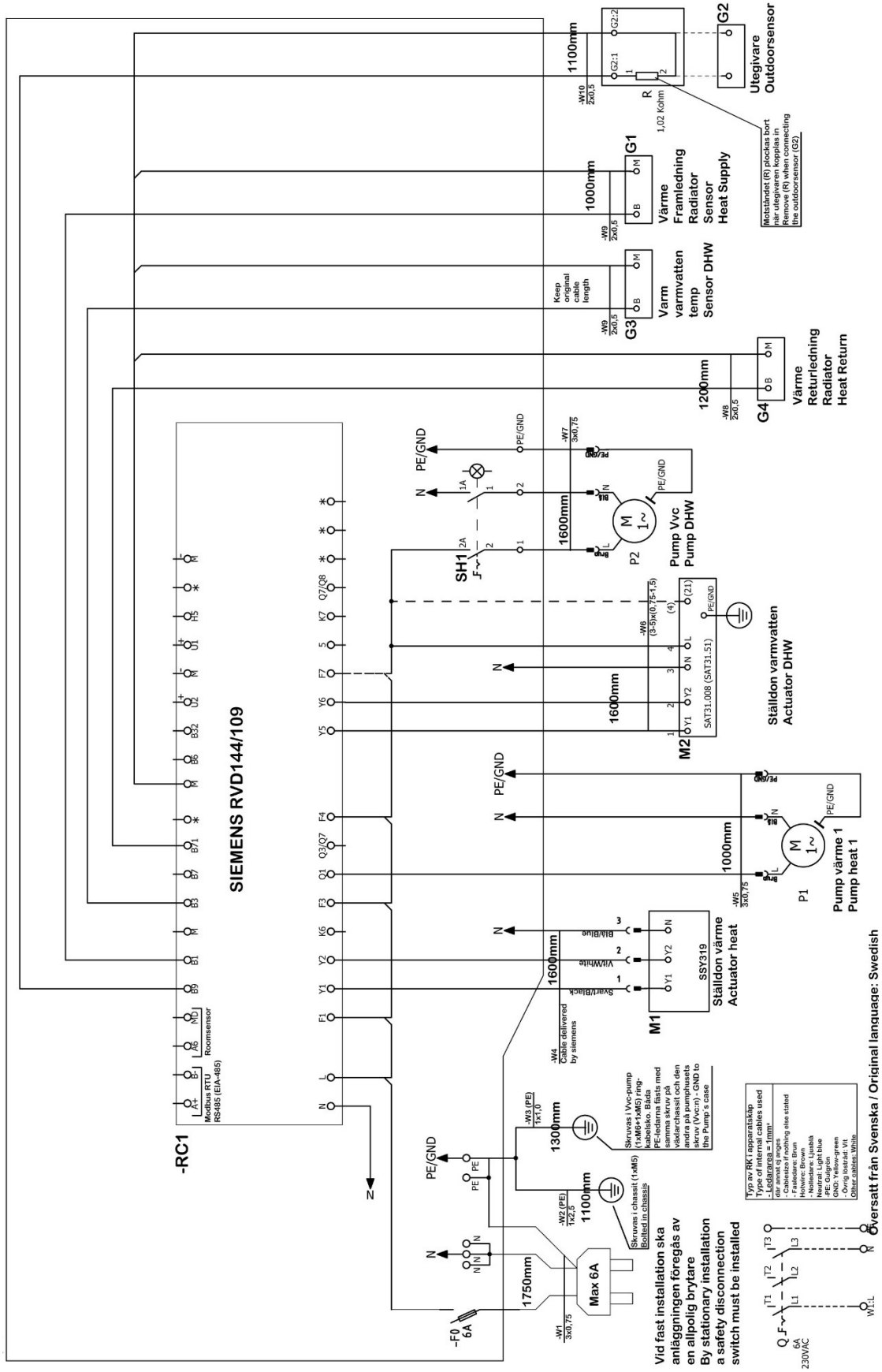
8.2 Installation of outdoor temperature sensor

Connect the outdoor temperature sensor to a terminal strip in accordance with the electrical diagram, if there is a resistor, remove it.

The resistor simulates an outdoor temperature of 0°C.
If using a cable with two conductor areas of 0.75mm^2 the maximum cable length is 80 meters.

Picture 8

8.3 Electrical circuit diagram EU



Picture 9

9 Pump settings and pump capacity

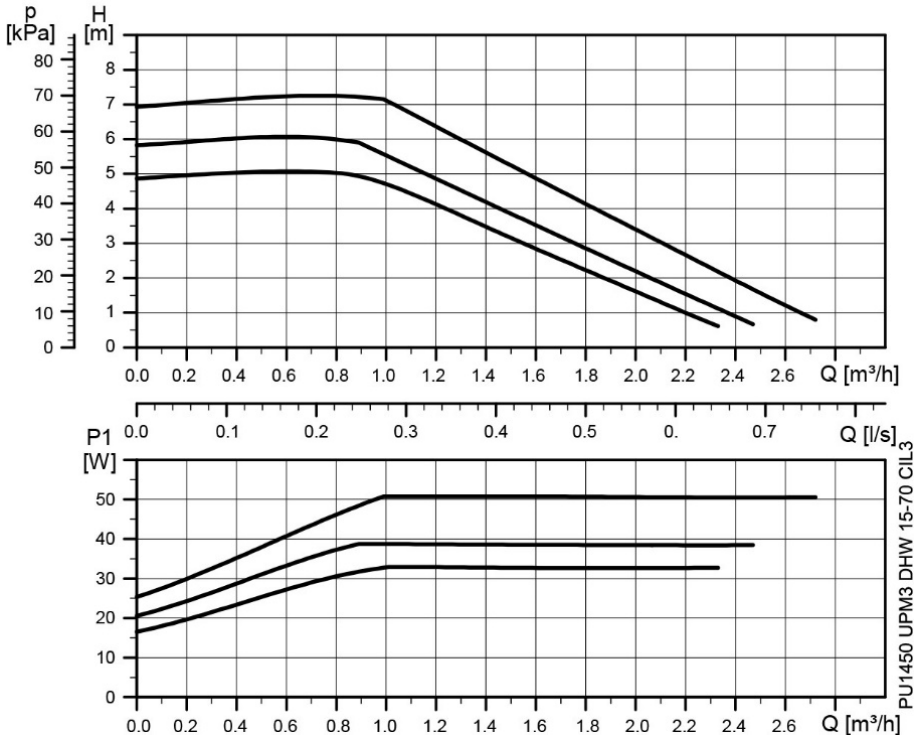
9.1 General

Mini Wall is equipped with two circulation pumps, one for the hot water circulation, DHWC-pump, and one for the heating circuit.

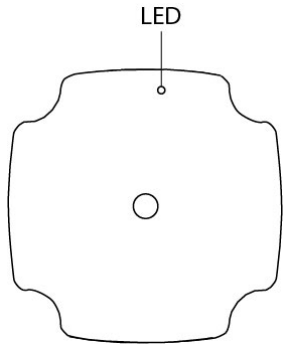
The DHWC pump is a speed-controlled, high-efficiency pump.

The circulation pump for heating circuit is a pressure-controlled pump. The pump for heating circuit is available in two different models.

9.2 DHWC pump Grundfos UPM3 DHW 15–70 CIL3, capacity



Picture 10

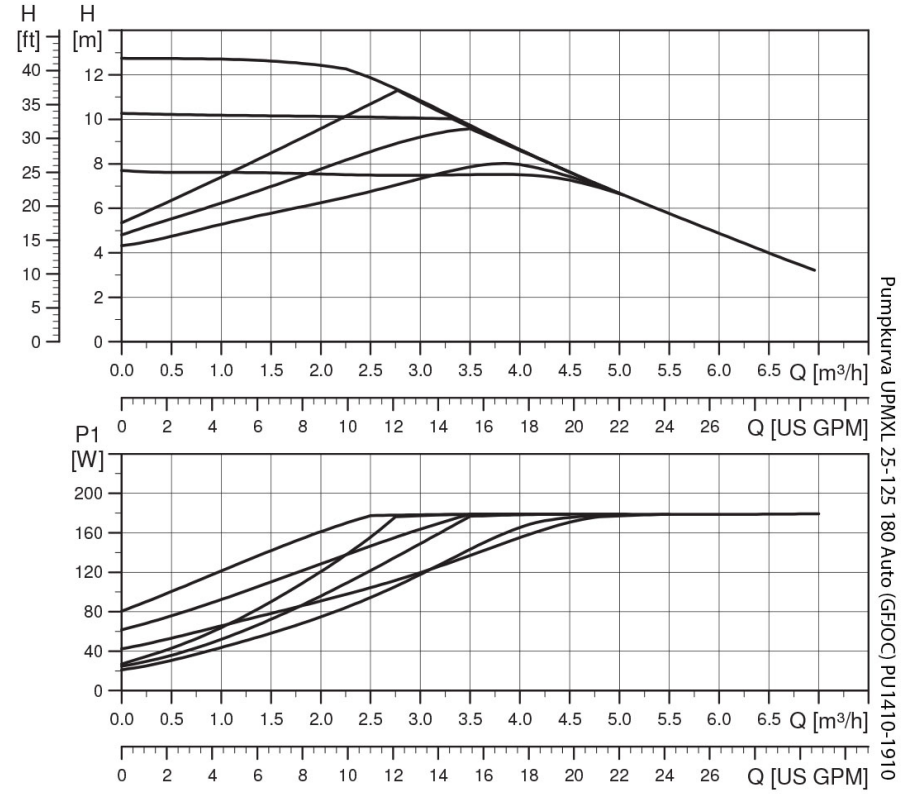


Picture 11

	Green LED	Red LED
No external control	●	
External control	●[1]	
Alarm		●

1) 12 flashes per second

9.3 Heating circuit pump Grundfos UPMXL 25-125 180 Auto, settings and capacity



Picture 12

Settings	MAX.H_{nom}
CP1	7,5 m
CP2	10 m
CP3	12,5 m
PP1	8 m
PP2	9,5 m
PP3	11 m

The heating pump is internally controlled via digital pulse-width modulation.
The user interface allows to select between six control curves in two control modes:

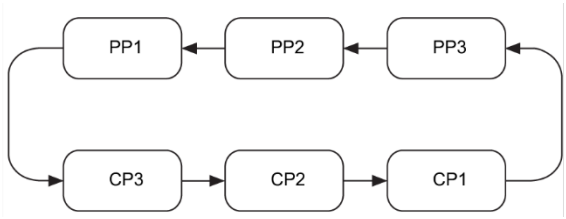
- three proportional pressure curves (PP)
- three constant pressure/power curves (CP).

The pump is factory preset to Proportional pressure curve, PP2.

Flashing fast III II I	PP1
Flashing fast III II I	**PP2**
Flashing fast III II I	PP3
Flashing slow III II I	CP1
Flashing slow III II I	CP2
Flashing slow III II I	CP3

Picture 13, LED indication of the curve setting

9.3.1 Changing pump curve setting



Picture 14, Serial curve setting

1. Push the button for two seconds
   Pump goes to setting mode - LED starts flashing.
2. With each push, the setting changes:
   LED 1-2-3 are permanently on, and then the control curve and mode is changed.
3. Flashing mode:
   - Fast: Proportional pressure
   - Slow: Constant pressure/power
4. After ten seconds not pushing the button:
   - Setting is adapted.
   - Pump returns to operating mode
5. LED 1 or 2 or 3 is permanently on.
   - Pump is running with the selected curve and mode.

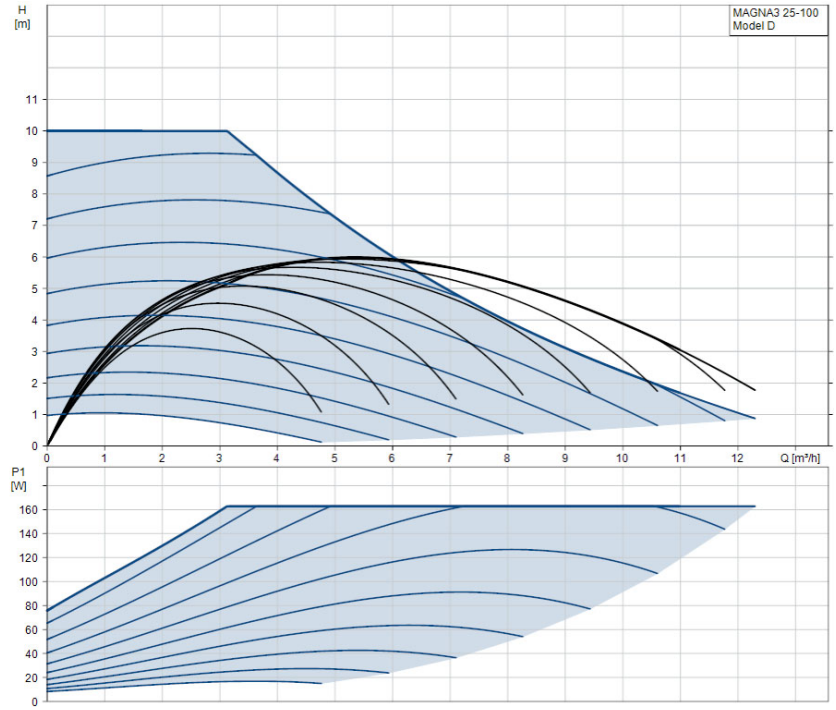
9.4 Heating circuit pump Grundfos Magna3 25–100, settings and capacity

The pumps have been factory-set to AUTOADAPT without automatic night setback.

AUTO$_{ADAPT}$ (factory set)

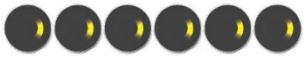
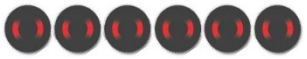
- Recommend control mode for most heating systems.
- Automatically adjusts the pump to actual system characteristics.
- Ensures minimum energy consumption and a low noise level.
- Reduced operating costs and increased comfort.

9.4.1 Heating circuit pump Grundfos Magna3 25-100, capacity



Picture 15

9.4.2 Grundfos Eye operating indications

Grundfos Eye	Indication	Cause
	No lights are on.	The power is off. The pump is not running.
	Two opposite green indicator lights running in the direction of rotation of the pump.	The power is on. The pump is running
	Two opposite green indicator lights are permanently on.	The power is on. The pump is not running.
	One yellow indicator light running in the direction of rotation of the pump.	Warning. The pump is running.
	One yellow indicator light is permanently on.	Warning. The pump has stopped.
	Two opposite red indicator lights flashing simultaneously.	Alarm. The pump has stopped.
	One green indicator light in the middle is permanently on in addition to another indication.	Remote-controlled.

10 Service instructions

To avoid the risk of scalding, make sure that no-one draws any water while servicing the substation.

Grey marked service actions must be carried out by an authorized service technician.

NOTE: Make sure that the Midi Wall substation has been correctly installed.

10.1 Tap water, service instructions

10.1.1 Tap water too cold

Reason	Action
District heating supply too low	**Check the primary inlet temperature** The temperature can be checked by means of the energy meter, minimum 65ºC, or at the district heating medium supply. The tap water temperature can be monitored on the control panel display line 26.
District heating strainer clogged	See *12.1 Cleaning the district heating strainer*.
Hot water valve and actuator does not work	See *11.1 Check the function of the hot water valve and actuator*.

10.1.2 Tap water too warm

Reason	Action
Hot water valve and actuator does not work	**See** *11.1 Check the function of the hot water valve and actuator*.

10.1.3 Hot water temperature unstable

Reason	Action
Pending differential pressure	**Check available differential pressure and the primary inlet temperature** The temperature can be checked by means of the energy meter, minimum 65ºC, or at the district heating medium supply.
Faulting settings for drain hot water	**Check pre-set parameters on control panel display** Check set value for drain hot water, see *5.12 Reading of temperatures, actual value*.
DHWC pump is not running	**Check that the electrical power is on**
	See *11.3 Check DHWC pump*.
District heating strainer clogged	**See** *12.1 Cleaning the district heating strainer*.

10.1.4 Noise in the DHWC system

Reason	Action
The DHWC pump capacity set too high	**Reduce the pump capacity** Reduce the pump capacity by selecting a lower setting on the pump when needed.
Air in the DHWC pump	**Vent the DHWC pump** Set the pump to speed III. Loosen the pump motor end nut to and let it stay opened until the air in the pump is released. When the pump has been vented, i.e. when the noise has ceased, set the pump according to the recommendations.
The DHWC pump motor or pump component damaged	**Change pump components or the complete DHWC pump** If it becomes necessary to change the driving side of the pump, it can be dismantled without removing the whole pump. **See** *12.3 Change the complete DHWC pump or pump components*.

10.2 Heating system, service instruction

10.2.1 Heating system temperature too high or too low

Reason	Action
Heating supply temperature sensor and outdoor temperature sensor does not work	**Check the heating supply temperature sensor and outdoor temperature sensor for correct placement and function**. This is checked on the control panel display operation line 25 and 27, see *5.12 Reading of temperatures, actual value* Sensor test can be executed according to *6.6.1 Sensor test.*
The heating control equipment may need to be adjusted	**Check and adjust the heating curve** See instruction *5.6 Setting the temperatures in the heating system* and change the heating curve with operating line 5.
Heating circuit strainer clogged	**See** *12.2 Clean the heating circuit strainer*.
Heating valve and/or actuator does not work	**See** *11.2 Check the function of the heating actuator and valve*.

10.2.2 No heating

Reason	Action
Circulation pump not running	**Check that the electrical power is on**
Air pockets in the substation or in the heating circuit	**Check the circulation pump** If the pump fails to start after stopping, start the pump at the highest setting.
	Check pre-set heating parameters on the control panel display Check the heating program, operating line 6-12, also check line 57-58 to see if summer or winter program is set.
	Vent the pump The pump is self-venting. Possible remaining air in the pump may cause noise. This noise ceases after a few minutes run time.
Heating supply temperature sensor and outdoor temperature sensor does not work	**Check the heating supply temperature sensor and outdoor temperature sensor for correct placement and function**. This is checked on the control panel display operation line 25 and 27, see *5.12 Reading of temperatures, actual value* Sensor test can be executed according to *6.6.1 Sensor test*.
Loss of function in the heating control unit.	**See** *11.4 Run the pump manually*
Heating circuit strainer clogged	**See** *12.2 Clean the heating circuit strainer.*

10.2.3 Noise in the radiator system

Reason	Action
The heating pump capacity set too high	**Reduce the pump capacity** Reduce the pump capacity by selecting a lower setting on the pump when needed.
Air in the heating pump	**Vent the pump** The pump is self-venting. Possible remaining air in the pump may cause noise. This noise ceases after a few minutes run time.
The heating pump motor or pump component damaged	**Change pump components or the complete pump** If it is necessary to change the driving side of the pump, it can be dismantled without removing the entire pump. **See** *12.4 Change the complete heating pump or pump components*.

10.2.4 Heating temperature unstable

Reason	Action
Pending differential pressure	**Check available differential pressure and the primary inlet temperature** The temperature can be checked by means of the energy meter, minimum 65ºC, or at the district heating medium supply.
Heating supply temperature sensor and outdoor temperature sensor does not work	**Check the heating supply temperature sensor and outdoor temperature sensor for correct placement and function**. This is checked on the control panel display operation line 25 and 27, see *5.12 Reading of temperatures, actual value* Sensor test can be executed according to *6.6.1 Sensor test*.
District heating strainer clogged	**See** *12.1 Cleaning the district heating strainer*.

10.2.5 Heating system often needs topping up

Reason	Action
Leaks in the substation or in the system	**Check the substation and the system for leaks** Leaks from the substation or the heating system causes pressure drops. Repair any leaks on the substation.
The heating system safety valve is leaking or does not work	**Check the heating system safety valve** Check that the safety valve is not leaking and that it works properly. Check the safety valves' function by turning the wheel/knob until water runs out of the valve's waste pipe and then close the valve quickly.
The expansion vessel cannot handle the systems volume changes	**See** *11.5 Check the volume take-up and pressure equalizing of the expansion vessel***.**

11 Service actions for the installer

11.1 Check the function of the hot water valve and actuator

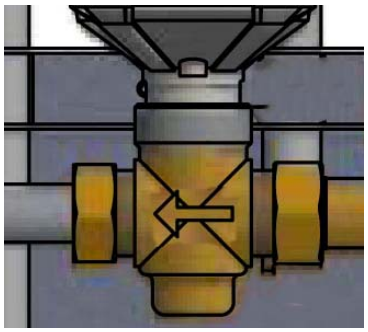
⚠	Service actions must be carried out by an authorized service technician.
⚠	Close the shutoff valves for the **DH supply** and **DH return** together with the **cold** and **hot wate**r. Relieve the pressure in the circuit.
⚠	After finishing repair, open the shutoff valves. Start with primary supply and then the return lines, to avoid pollutions in the system. Open the valves slowly to avoid pressure surges.

1. Disconnect the power supply to the substation.
2. Close the shut-off valves.
3. Unscrew the tap water actuator from the control valve.

Picture 16

4. Carefully press the valve's spindle with a tool and check the valve's travel and spring back.

   NOTE! The valve may be very hot!
5. Turn the handle on the actuator; a small dip should move in and out. If the dip does not move the actuator is damaged and requires replacing.
6. Mount the actuator on the valve.
7. Connect the power supply to the substation.
8. Open the shutoff valves.



Picture 17

11.2 Check the function of the heating actuator and valve

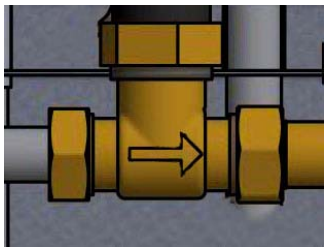
Service actions must be carried out by an authorized service technician.

Disconnect the electrical power supply to the controller, before manoeuvring the actuator by hand.

1. Actuator function is checked through a relay and sensor test; see *6.6.1 Sensor test* and *6.6.2 Relay test.*
2. Check the flow rate at the energy meter during break in of the valve.
   If the system is lacking an energy meter, disconnect the heating actuator from the valve.
3. Turn the actuator handle to position 0. This will make it easier to mount the actuator.

Picture 18

4. Carefully press the valve spindle with a tool and check the valve´s travel and spring back.
   NOTE: The valve may be very hot!



Picture 19

11.3 Check DHWC pump

If the pump fails to start after stopping, try to start it at the highest setting.

Service actions must be carried out by an authorized service technician.

Disconnect the power supply to the pump by pulling off the connecter before carrying out this service.
If the pump is powered when you use a screwdriver to assist the pump to start, the screwdriver may be wrenched out of your hand when the pump starts.

1. If the pump does not start, try starting it by removing the pump motor end nut and helping the pump with the aid of a screwdriver in the notch on the engine shaft.
2. Use a short screwdriver. If the pump is difficult to access, disconnect the heating actuator.
3. Connect the power supply to the pump and try to start again.

Picture 20

11.4 Run the pump manually

	Service actions must be carried out by an authorized service technician.
	Disconnect the electrical power supply to the controller, before manoeuvring the actuator by hand.

If necessary, the pump and actuator can be run manually.

1. Disconnecting the electrical power to the substation.
2. Disconnect the electrical plug for the pump.
3. Connect the replacement cable (option) to the pump.
4. Manually open the heating valve by turning the actuator handle clockwise.
   Open the valve enough to supply the property with heating.
5. Connect the electrical power to the substation.

NOTE! This is a temporary solution until the control unit problem is solved.

11.5 Check the volume take-up and pressure equalizing of the expansion vessel

Check the expansion vessel for possible leakage.

The cause may be that the expansion vessel cannot manage the volume changes on the heating side.
See *12.10 Change the expansion vessel*.

Alternatively, the system´s total volume of water may be too high, i.e. the volume changes are too large for the expansion vessel. If so, add extra expansion volume.

12 Maintenance and repairs

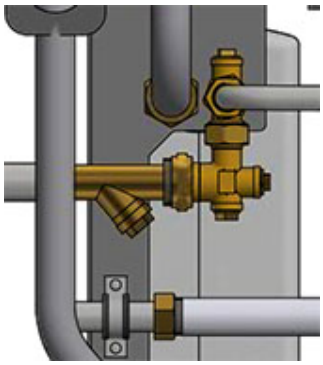
When carrying out repairs, please contact your local service partner.

⚠	Before starting out repairs always close the correct shutoff valves.
⚠	When dismounting a component there will be water coming out, hot and under pressure.

12.1 Cleaning the district heating strainer

⚠	Service actions must be carried out by an authorized service technician.
⚠	The temperature and the pressure of the district heating water are very high. Only qualified technicians can work with the district heating substation. Incorrect operation may cause serious personal injury and result in damage to the building.
⚠	Before starting out repairs close the **DH supply** and **DH return** shutoff valves.
⚠	After finishing repair, open the shutoff valves. Start with **DH supply** and then the **return** line, to avoid pollutions in the system. Open the valves slowly to avoid pressure surges.

1. Disconnect the power supply to the substation.
2. Close the shut-off valves.
3. Use a wrench and release the strainer holder and remove the cartridge.
4. Clean the strainer in water and refit the cartridge. Screw the strainer holder with a momentum of 10-20 Nm.
5. Open the shutoff valves and connect the power supply to the substation.

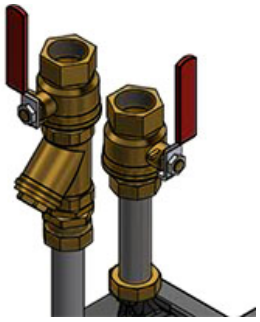


Picture 21

12.2 Clean the heating circuit strainer

⚠	Service actions must be carried out by an authorized service technician.
⚠	Before starting out repairs, close the shutoff valves **DH supply**, **DH return**, **heating supply and heating return**. Release the pressure using the heating circuit safety valve.
⚠	After finishing repair, fill up the heating circuit and vent. Then open the shutoff valves, start with **heat return** and then **supply**, after that open **DH supply** and then the **return** line, to avoid pollutions in the system. Open the valves slowly to avoid pressure surges.

1. Disconnect the power supply to the substation.
2. Close the shut-off valves.
3. Use a wrench and release the strainer holder and remove the cartridge.
4. Clean the strainer in water and refit the cartridge. Screw the strainer holder with a momentum of 10-20 Nm.
5. Fill up the heating circuit using the toping up valve, vent the heating circuit.
6. Open the shutoff valves and connect the power supply to the substation.



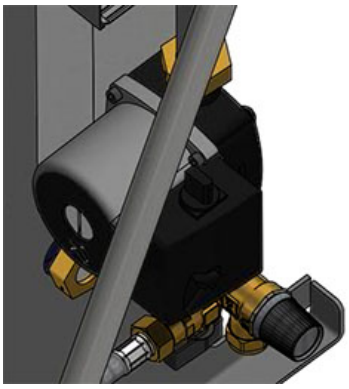
Picture 22

12.3 Change the complete DHWC pump or pump components

⚠	Maintenance and repairs must be carried out by an authorized service technician.
⚠	Before starting out repairs, close the shutoff valves **DH supply**, **DH return**, **cold-water** and **hot water**. Note the setting of the balancing valve (option), then close it. Release the pressure using the DHWC safety valve.
⚠	After finishing repair, fill up the hot water circuit and vent. Open the shutoff valves, start with **DH Supply** and then **DH return,** to avoid pollutions in the system. Open the valves slowly to avoid pressure surges.
⚠	Check the DHWC circulation.

Change the complete pump or just the pump motor.

1. Disconnect the power supply to the substation, disconnect the power cable to the pump.
2. Close the shut-off valves and the balancing valve (option).
3. Choose alternative a or b.
   a) When changing the complete pump, release the brass nuts with a wrench and replace the pump.
   Connect the pump cable.
   b) Only changing the motor, release it by unscrewing four socket head cap screws and replace the motor.
   Connect the pump cable.
4. Open the shut-off valves cold-water and hot water.
5. Open and adjust the balancing valve (option).
6. Vent the circuit by opening a hot water tap.
7. Connect the power supply to the substation.
8. Open the shutoff valves DH Supply and then DH return.



Picture 23

12.4 Change the complete heating pump or pump components

⚠	Maintenance and repairs must be carried out by an authorized service technician.
⚠	Before starting out repairs, close all shutoff valves Release the pressure using the heating safety valve.
⚠	After finishing repair, fill up the **heating circuit** and vent. Open the shutoff valves, start with **heating return** and then **heating supply**, then **DH Supply** and **DH return,** to avoid pollutions in the system. Open the valves slowly to avoid pressure surges.

Change the complete pump or just the pump head.

1. Disconnect the power supply to the substation and the pump.
2. Close the shut-off valves.
3. Choose alternative a or b.
   a) <u>When changing the complete pump</u>, release the brass nuts with a wrench and replace the pump.
   Connect the pump cable.
   b) <u>Only changing the pump head</u>
   Loosen the screw in the clamp that holds the pump head and pump housing together.
   Mount a new pump head, fit and tighten the screw that holds the clamp to 8 Nm ± 1 Nm.
   NOTE! Do not retighten the screw if condensed water is dripping from the clamp.
4. Fill up the heating circuit using the top up valves. Vent the heating circuit.
5. Open the shut-off valves and connect the power supply to the substation.

Picture 24

12.5 Change the heating actuator

⚠	Maintenance work must be carried out by an authorized service technician.
⚠	Disconnecting the power feed to the pump and the substation.

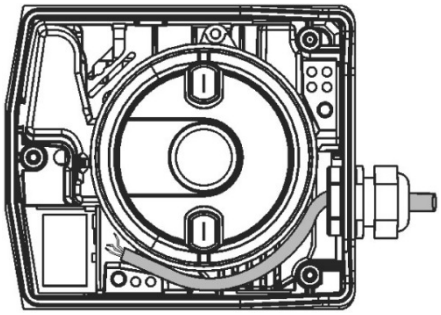
1. Turn the actuator handle to position 0. This will make it easier to dismount and mount the actuator.
2. Detach the actuator power supply.
3. Unscrew the actuator from the valve.
4. Mount a new actuator and reattach the power supply.

Picture 25

12.6 Change the hot water actuator

⚠	Maintenance work must be carried out by an authorized service technician.
⚠	Disconnecting the power feed to the pump and the substation.

1. Turn the actuator handle to position 0. This will make it easier to mount the actuator.
2. Remove the lid by loosening the four screws detach the actuator power supply.
3. Unscrew actuator from the valve.
4. Mount a new actuator and reattach the power supply.

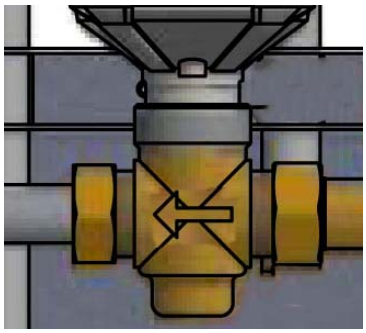


Picture 26

12.7 Change the heating or hot water valve

⚠	Maintenance work must be carried out by an authorized service technician.
⚠	Disconnecting the power feed to the pump and the substation.
⚠	Before starting out repairs always close the **primary supply** and **return** shutoff valves and drain the system. After finishing repair, open the shutoff valves. Start with primary supply and then the return lines, to avoid pollutions in the system. Open the valves slowly to avoid pressure surges. Do the same on the heating side open first heat **return** and then **supply**. Fill up the system, start the pump and vent.

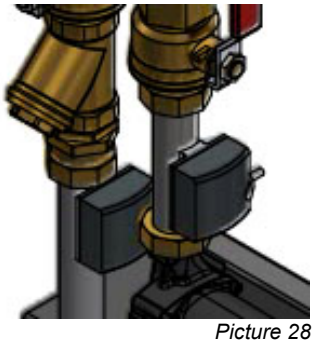
1. Turn the actuator handle to position 0. This will make it easier to mount the actuator.
2. Unscrew the actuator from the control valve.
3. Use a wrench to remove the control valve.
   Note the arrow direction on the valve.
4. Mount a new valve; **take special with care the arrow direction**.
5. Reattach the actuator.



Picture 27

12.8 Change the temperature sensor heating supply/return

1. Carefully lift the sensor cover with a screwdriver and unscrew the connecting wires in attached to the wire terminal.
2. Loose the band the holds the sensor to the pipe. Replace with a new sensor.



Picture 28

12.9 Change the outdoor temperature sensor

1. Disconnect the electrical power supply.
2. Remove the lid by loosening the four screws.
3. Unscrew the cables.
4. Loosen the cable fitting.
5. Install a new outdoor temperature sensor.

Picture 29

12.10 Change the expansion vessel

⚠	Maintenance work must be carried out by an authorized service technician.
⚠	Disconnecting the power feed to the pump and the substation.

1. Close the shutoff valves for the radiator supply and return.
2. Replace the expansion vessel.

13 Options

The mounting instructions are described for a new installation. If the kits are supposed to be installed on an already installed subsystem, you will have to release the water pressure and disconnect the electrical power supply before starting. The installation must be carried out by a fully qualified electrician.

13.1 Safety thermostat

Heating systems sensitive to high temperatures for example under-floor heating must be equipped with a safety thermostat. If the heating system is not equipped with the thermostat, the under-floor heating system and floors in general might get damaged.

13.1.1 Installing the safety thermostat

1. First disconnect the substation electrical power supply cable. Disconnect the electrical plug on the circulation pump.
2. Attach the safety thermostat electrical box on the mounting plate.
3. Connect the new power supply cable from the electrical box to the circulation pump.
4. Reconnect the existing power supply cable to the connection on the electrical box.
5. Attach the thermostat to the pipe for heating supply.
6. Set the correct maximum temperature value for the thermostat.
7. Attach all electrical wires with the necessary number of straps. It is important not to attach electrical wires on primary heating pipes and sharp edges

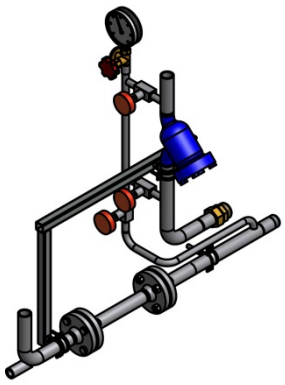
Picture 30

Setting the control panel must be adapted to the floor heating system. For concerned parameters and recommended settings for floor heating, see *5.8 Heating Curve* and *6.4 Actuator heating circuit*.

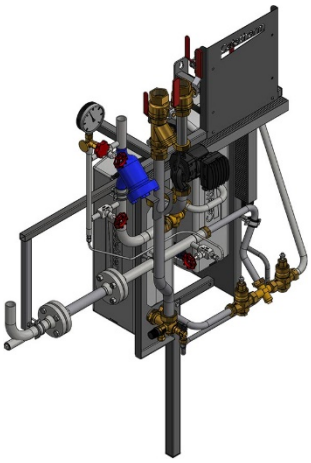
13.2 3-point or 2+1-point HB metering

Mounting the 3-point HB metering:

1. Shut the closing valves for primary inlet and return.
2. Unscrew the nut preceding the energy meter and remove energy meter and pipe.
3. Unscrew the nut following primary inlet and remove the strainer and welding end.
4. Thread the metering profile into the frame´s.
5. Screw the metering and the central together.
6. Open the shut-off valves, first primary inlet then primary return.



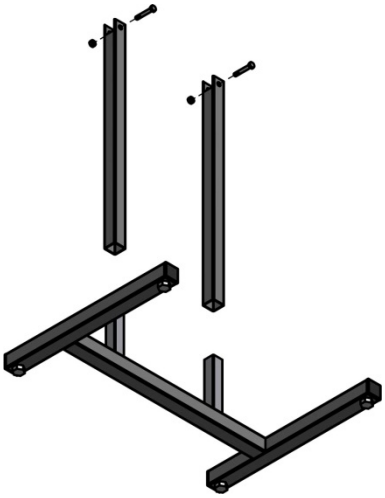
Picture 31



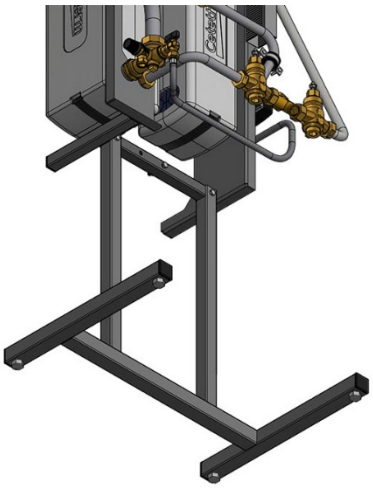
Picture 32

13.3 Mounting floor stand

1. Mount two floor supports to the central. Use the outer mounting holes.
2. Mount the floor stand feet on the floor support.
3. Raise the central against a wall.
4. We recommend that the central is mounted to the wall.
   The distance between floor and screw bracket should be 1330 mm. Note that distance between screws are 400 mm.



Picture 33



Picture 34

13.4 Balancing valve DHWC

Set the valve to a specific pressure drop according to:

1. Close the valve fully (*Picture 35*).
2. Open the valve the correct numbers of turns (*Picture 36*).
1. See the diagram (*Picture 37*) for numbers of turns. In this example 2,3 turns.
2. Using a 3 mm Allen key, turn the inner spindle clockwise until stop.
3. The valve is now set.

To check the setting: Close the valve, the indicator shows 0.0. Open it to the stop position. The indicator then shows the set value, in this case 2.3 (*Picture 36*).

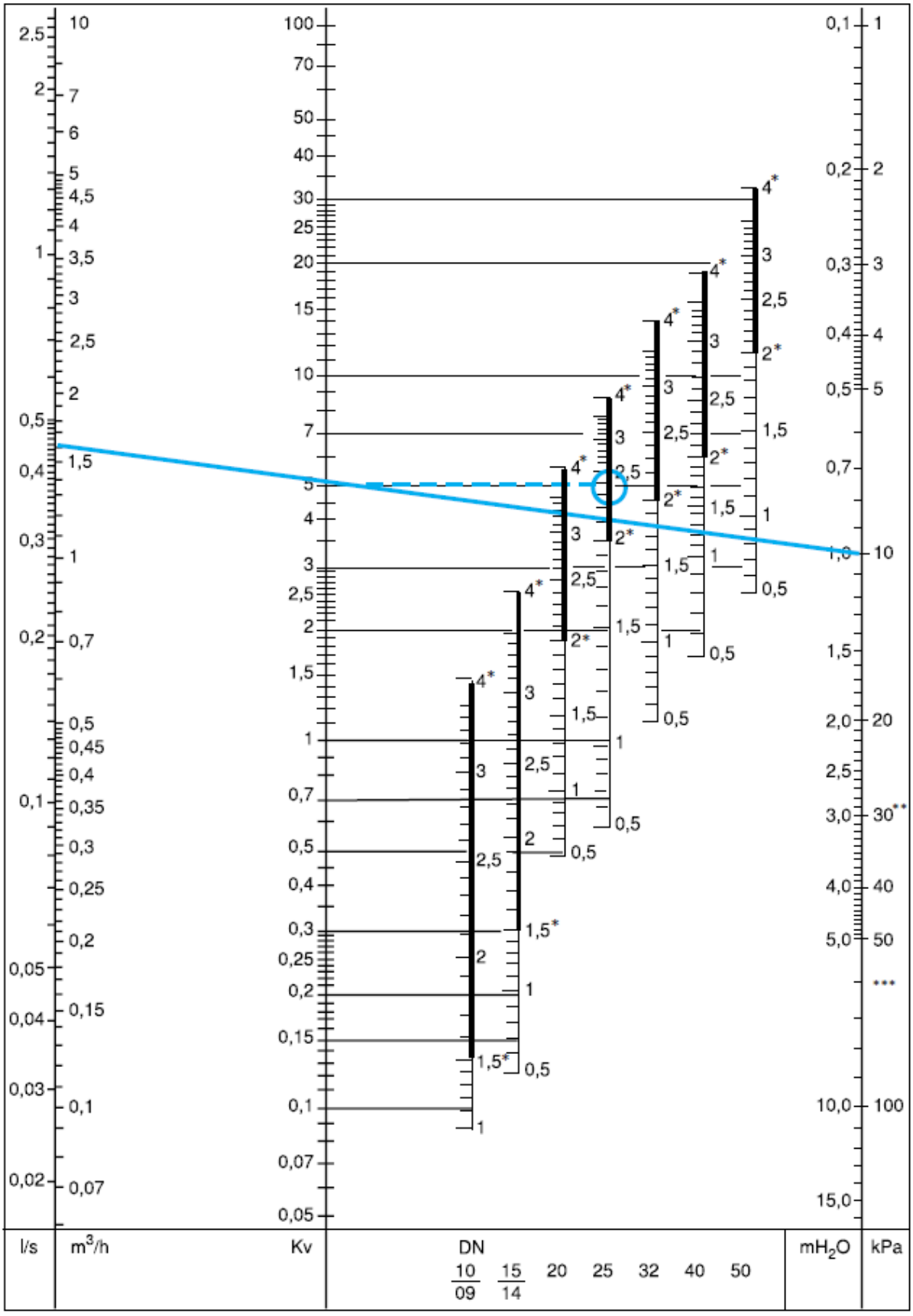
The diagram shows the pressure drop for different settings and flow rates.

Four turns correspond to fully opened valve (*Picture 37*). Opening it further will not increase the capacity.

Picture 35

Picture 36

Picture 37



Picture 38

*) recommended area

**) 25 dB (A)

***) 35 dB (A)

14 Operation data and capacity

14.1 Operation data Midi Wall 70

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	90°C	90°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	1,957/1,957 L	2,06 L	2,06 L

CB60-40L

Temperature program (°C) Heating	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
100-63/60-80 (62,6)	70	60	40	1*19L	1*20L	0,47	2,0	0,85	5,2
100-63/60-80	**82**	**60**	**40**	**1*19L**	**1*20L**	**0,55**	**2,8**	**1,00**	**7,0**
100-53/50-70	118	60	40	1*19L	1*20L	0,63	3,6	1,43	14,0
100-48/45-60 (46,2)	91,3	60	40	1*19L	1*20L	0,42	1,7	1,48	15,0
100-43/40-60 (42,5)	**121,5**	**60**	**40**	**1*19L**	**1*20L**	**0,53**	**2,6**	**1,47**	**15,0**
100-43/40-70	67,5	60	40	1*19L	1*20L	0,30	0,9	0,54	2,3
100-43/40-80	26	60	40	1*19L	1*20L	0,11	0,2	0,16	0,2
100-36/33-40 (33,08)	42	60	40	1*19L	1*20L	0,16	0,3	1,45	15,0

CB60-40L:2

Temperature program (°C) DHW	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
80-23/10-60 (19,1)	157	60	40	1*10 1*9	2*10 L	0,62	23,0	0,75	29,9
80-23/10-60 (16,1)	113	60	40	1*10+1*9	2*10 L	0,34	7,8	0,44	11,1
80-23/10-55 (16,2)	141	60	40	1*10+1*9	2*10 L	0,53	17,5	0,75	30,2
80-23/10-55 (13,9)	102	60	40	1*10 +1*9	2*10 L	0,30	6,1	0,44	11,2
70-25/10-55 (19,8)	**141**	**60**	**40**	**1*10 1*9**	**2*10 L**	**0,67**	**27,2**	**0,75**	**29,9**
70-25/10-55(16,7)	102	60	40	1*10 +1*9	2*10 L	0,37	9,0	0,44	11,1
70-22/10-55 (19,75)	**141**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,67**	**27,1**	**0,75**	**29,9**
70-22/10-55 (16,65)	102	60	40	1*10+1*9	2*10 L	0,37	9,0	0,44	11,1
65-22/10-55	**126**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,70**	**29,3**	**0,66**	**24,1**
65-22/10-55 (19,3)	102	60	40	1*10+1*9	2*10 L	0,43	12,0	0,44	11,0

14.2 Operation data Midi Wall 100

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	90°C	90°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	2,472/1,957 L	2,575 L	2,06 L

CB60-50L

Temperature program (°C) Heating	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
100-63/60-80	**105**	**60**	**50**	**1*24 L**	**1*25 L**	**0,71**	**3,3**	**1,28**	**7,8**
100-53/50-70 (52,95)	147,6	60	50	1*24 L	1*25 L	0,78	4,0	1,79	15,0
100-48/45-60 (46,1)	110,1	60	50	1*24 L	1*25 L	0,51	1,8	1,78	15,0
100-43/40-60 (42,3)	**146,4**	**60**	**50**	**1*24 L**	**1*25 L**	**0,63**	**1,8**	**1,77**	**15,0**
100-43/40-70	87,1	60	50	1*24 L	1*25 L	0,38	1,0	0,70	2,6
100-43/40-80	33,9	60	50	1*24 L	1*25 L	0,15	0,2	0,20	0,3
100-36/33-40 (33,1)	50,8	60	50	1*24 L	1*25 L	0,19	0,3	1,75	15,0
100-33/30-60	109	60	50	1*24 L	1*25 L	0,41	1,2	0,88	4,1

CB60-40L:2

Temperature program (°C) DHW	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
80-23/10-60 (19,1)	157	60	40	1*10 1*9	2*10 L	0,62	23,0	0,75	29,9
80-23/10-60 (17,1)	113	60	40	1*10+1*9	2*10 L	0,43	11,8	0,54	16,2
80-23/10-55 (16,2)	141	60	40	1*10+1*9	2*10 L	0,53	17,5	0,75	30,2
80-23/10-55 (14,65)	102	60	40	1*10 +1*9	2*10 L	0,37	9,1	0,54	16,4
70-25/10-55 (19,8)	**141**	**60**	**40**	**1*10 1*9**	**2*10 L**	**0,67**	**27,2**	**0,75**	**29,9**
70-25/10-55(17,7)	102	60	40	1*10 +1*9	2*10 L	0,47	13,7	0,54	16,3
70-22/10-55 (19,75)	**141**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,67**	**27,1**	**0,75**	**29,9**
70-22/10-55 (17,7)	102	60	40	1*10+1*9	2*10 L	0,47	13,7	0,54	16,3
65-22/10-55	**126**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,70**	**29,3**	**0,66**	**24,1**
65-22/10-55 (20,55)	102	60	40	1*10+1*9	2*10 L	0,55	18,4	0,54	16,1

14.3 Operation data Midi Wall 130

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	90°C	90°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	2,987/1,957 L	3,090 L	2,06 L

CB60-60L

Temperature program (°C) Heating	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
100-63/60-80	**128,5**	**60**	**60**	**1*29 L**	**1*30 L**	**0,86**	**3,9**	**1,57**	**8,7**
100-53/50-70 (52,75)	169,6	60	60	1*29 L	1*30 L	0,89	4,2	2,06	15,0
100-48/45-60 (46)	126,6	60	60	1*29 L	1*30 L	0,58	1,9	2,05	15,0
100-43/40-60 (42,15)	**168,4**	**60**	**60**	**1*29 L**	**1*30 L**	**0,73**	**2,8**	**2,04**	**15,0**
100-43/40-70	106,3	60	60	1*29 L	1*30 L	0,47	1,2	0,86	2,9
100-43/40-80	41,5	60	60	1*29 L	1*30 L	0,18	0,2	0,25	0,3
100-36/33-40 (33,06)	58,47	60	60	1*29 L	1*30 L	0,22	0,3	2,01	15,0
100-33/30-60	133	60	60	1*29 L	1*30 L	0,50	1,4	1,07	4,5

CB60-40L:2

Temperature program (°C) DHW	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
80-23/10-60 (19,1)	157	60	40	1*10 1*9	2*10 L	0,62	23,0	0,75	29,9
80-23/10-60 (18,1)	134	60	40	1*10+1*9	2*10 L	0,52	16,6	0,64	22,3
80-23/10-55 (16,2)	141	60	40	1*10+1*9	2*10 L	0,53	17,5	0,75	30,2
80-23/10-55 (15,35)	121	60	40	1*10 +1*9	2*10 L	0,45	12,7	0,64	22,5
70-25/10-55 (19,8)	**141**	**60**	**40**	**1*10 1*9**	**2*10 L**	**0,67**	**27,2**	**0,75**	**29,9**
70-25/10-55(18,7)	**121**	**60**	**40**	1*10 +1*9	2*10 L	**0,56**	**19,4**	**0,64**	**22,3**
70-22/10-55 (19,75)	**141**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,67**	**27,1**	**0,75**	**29,9**
70-22/10-55 (18,7)	**121**	**60**	**40**	1*10+1*9	2*10 L	**0,56**	**19,4**	**0,64**	**22,3**
65-22/10-55	**126**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,70**	**29,3**	**0,66**	**24,1**
65-22/10-55 (21,7)	**121**	**60**	**40**	1*10+1*9	2*10 L	**0,67**	**26,5**	**0,64**	**22,1**

14.4 Operation data Midi Wall 160

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	90°C	90°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	4,1/1,957 L	4,1 L	2,06 L

CB60-80L

Temperature program (°C) Heating	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
100-63/60-80	**162**	**60**	**80**	**1*39L**	**1*40L**	**1,09**	**2,7**	**1,97**	**8,7**
100-63/60-80 (62,8)	160	60	80	1*39L	1*40L	1,07	2,7	1,95	8,5
100-58/55-75	162	60	80	1*39L	1*40L	0,96	2,2	1,97	8,8
100-58/55-75 (57,2)	160	60	80	1*39L	1*40L	0,93	2,1	1,95	14,9
100-53/50-70 (51,9)	164	60	80	1*39L	1*40L	0,86	1,8	1,98	8,9
100-53/50-70 (51,9)	160	60	80	1*39L	1*40L	0,83	1,7	1,94	8,6
100-48/45-60 (45,6)	122	60	80	1*39L	1*40L	0,58	0,9	1,97	8,9
100-43/40-60 (41,4)	**163**	**60**	**80**	**1*39L**	**1*40L**	**0,71**	**1,2**	**1,97**	**9,0**
100-43/40-60 (41,4)	160	60	80	1*39L	1*40L	0,68	1,1	1,93	8,7
100-43/40-70	144	60	80	1*39L	1*40L	0,63	1,0	1,16	3,3
100-43/40-80	56	60	80	1*39L	1*40L	0,24	0,2	0,34	0,3
100-36/33-40 (33,0)	57	60	80	1*39L	1*40L	0,22	0,2	1,96	9,1
100-33/30-60	133	60	60	1*29 L	1*30 L	0,50	1,4	1,07	4,5

CB60-40L:2

Temperature program (°C) DHW	**Capacity** kW	**CB** type	**Plates** no	**Plates** primary	**Plates** secondary	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
80-23/10-60 (19,1)	157	60	40	1*10 1*9	2*10 L	0,62	23,0	0,75	29,9
80-23/10-60 (18,1)	134	60	40	1*10+1*9	2*10 L	0,52	16,6	0,64	22,3
80-23/10-55 (16,2)	141	60	40	1*10+1*9	2*10 L	0,53	17,5	0,75	30,2
80-23/10-55 (15,35)	121	60	40	1*10 +1*9	2*10 L	0,45	12,7	0,64	22,5
70-25/10-55 (19,8)	**141**	**60**	**40**	**1*10 1*9**	**2*10 L**	**0,67**	**27,2**	**0,75**	**29,9**
70-25/10-55(18,7)	**121**	**60**	**40**	1*10 +1*9	2*10 L	**0,56**	**19,4**	**0,64**	**22,3**
70-22/10-55 (19,75)	**141**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,67**	**27,1**	**0,75**	**29,9**
70-22/10-55 (18,7)	**121**	**60**	**40**	1*10+1*9	2*10 L	**0,56**	**19,4**	**0,64**	**22,3**
65-22/10-55	**126**	**60**	**40**	**1*10+1*9**	**2*10 L**	**0,70**	**29,3**	**0,66**	**24,1**
65-22/10-55 (21,7)	**121**	**60**	**40**	1*10+1*9	2*10 L	**0,67**	**26,5**	**0,64**	**22,1**

14.5 Technical data

Electrical data:	230V 50Hz 1-phase, 290-315W
Noise level:	<70dB(A), 1,6 m above floor level, 1 m from source
Main measurements:	730x510x1115 mm (WxDxH)
Weight:	65-85 kg

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