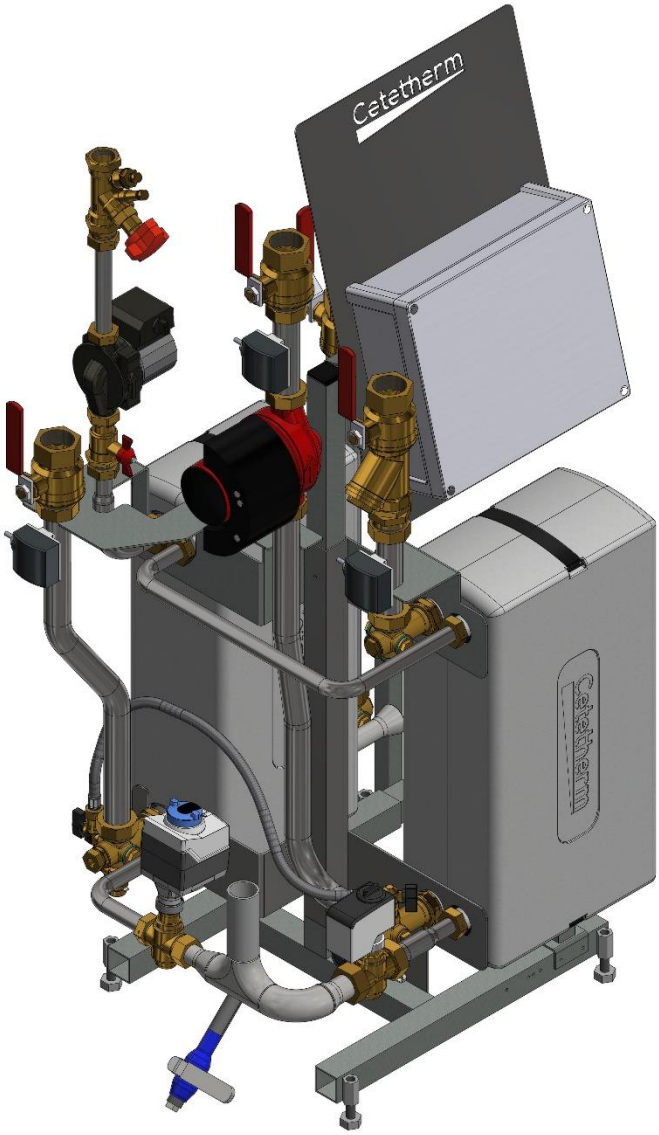
Cetetherm

Installation, service and operating instruction Cetetherm Midi Compact SR144 DHWC

Heating and domestic hot water substation for apartment houses (10-50 apts.)



For additional on-line information, latest version of this manual please scan the qr-code or use the link:
https://www.cetetherm.com/midicompact

QR-code:

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

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1 General

Cetetherm Midi Compact 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 Compact with well-planned pipe work and with all components easily accessible for inspection and possible future servicing.

1.1 Comfort

Midi Compact has fully-automatic temperature control for heating and hot water. The heating is controlled in relation to desired room temperature. The hot water is controlled and maintained at the desired temperature.

1.2 Installation

Before installation this manual must be read.

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. The Midi Compact is designed to be placed on the floor.

1.3 Long-term security

All the plates and pipes in the heat exchanger are made of acid-resistant stainless steel for long life. 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 Compact 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.
Midi Compact 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 duly 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 Compact 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 isolate 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 return** then **supply**.
	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 completely separated from the systems in the building.

Midi Compact has automatic temperature control for heating and hot water. The heating circuit is controlled in relation to outdoor temperature (option) 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 Compact 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 until water escapes from the waste pipe of the valve, then close the wheel 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.

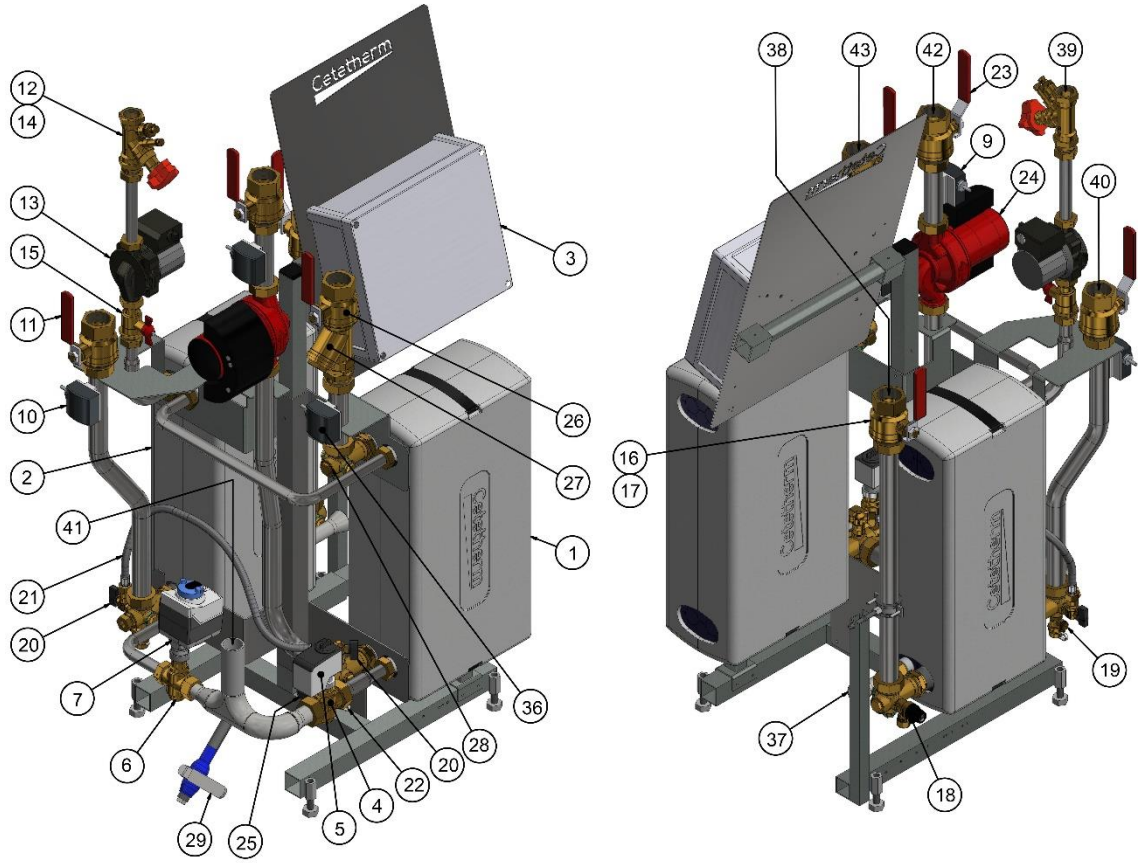
For setting and (if necessary) fine adjustment of the heating and hot water temperatures,
see chapter *5 User instruction operator control panel* .

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

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

3 Product overview

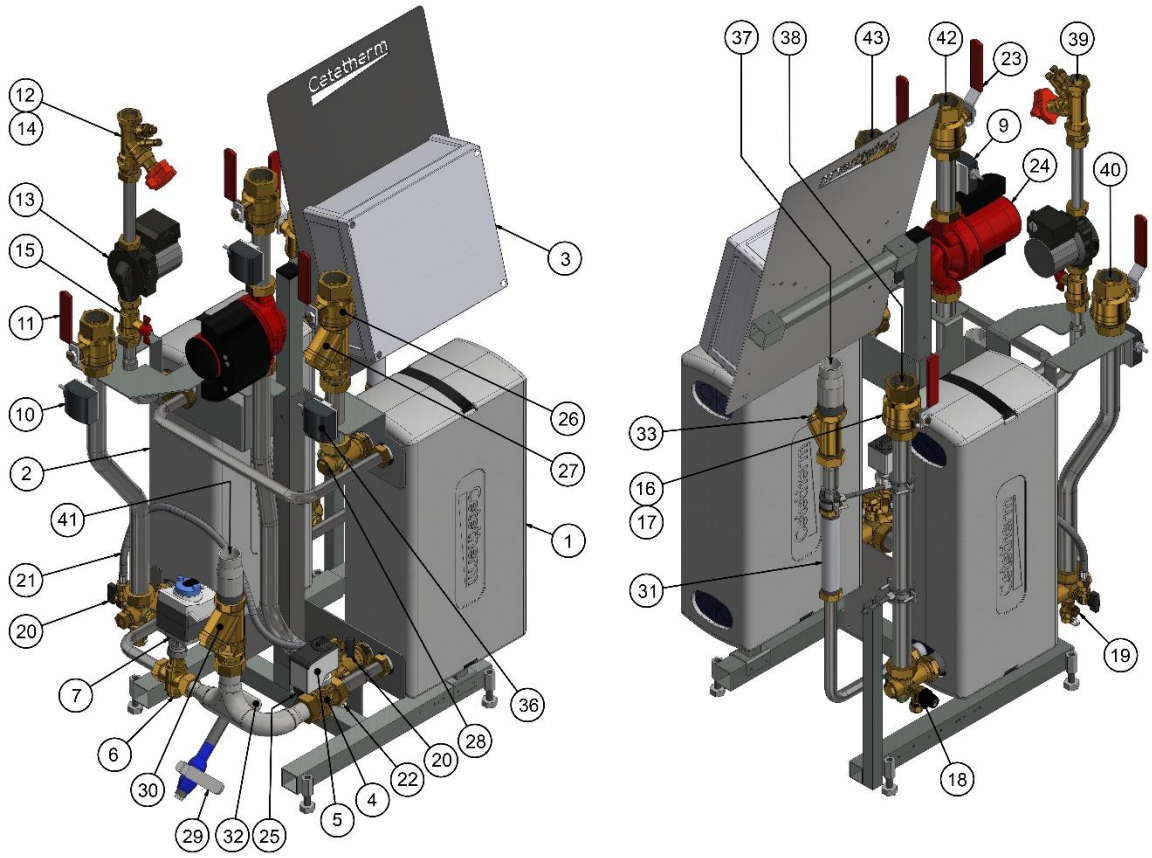
3.1 Midi Compact SR144



Picture 1

1	Heat exchanger heat	20	Topping up X2
2	Heat exchanger DHW	21	Hose
3	Control center	22	Draining valve, heat supply
4	Control valve, heating	23	Shut off valve, heat supply
5	Actuator, heating	24	Pump, heating
6	Control valve, DHW	25	Safety valve, heating
7	Actuator, DHW	26	Shut off valve, heat return
8	Temp.sensor, outdoor (not in picture)	27	Strainer, heat return
9	Temp.sensor, heating Supply	28	Connection, expansion vessel
10	Temp.sensor, DHW Supply	29	Draining valve, DH-Supply
11	Shut off valve, DHW	36	Temp.sensor heating return
12	Balancing valve, DHWC	37	DH Return
13	Pump, DHWC	38	CW
14	None return valve, DHWC	39	DHWC
15	Shut off valve, DHWC	40	DHW
16	Shut off valve, CW	41	DH supply
17	None return valve, CW	42	Heat Supply
18	Safety valve, CW	43	Heat Return
19	Draining valve, DH-Supply		

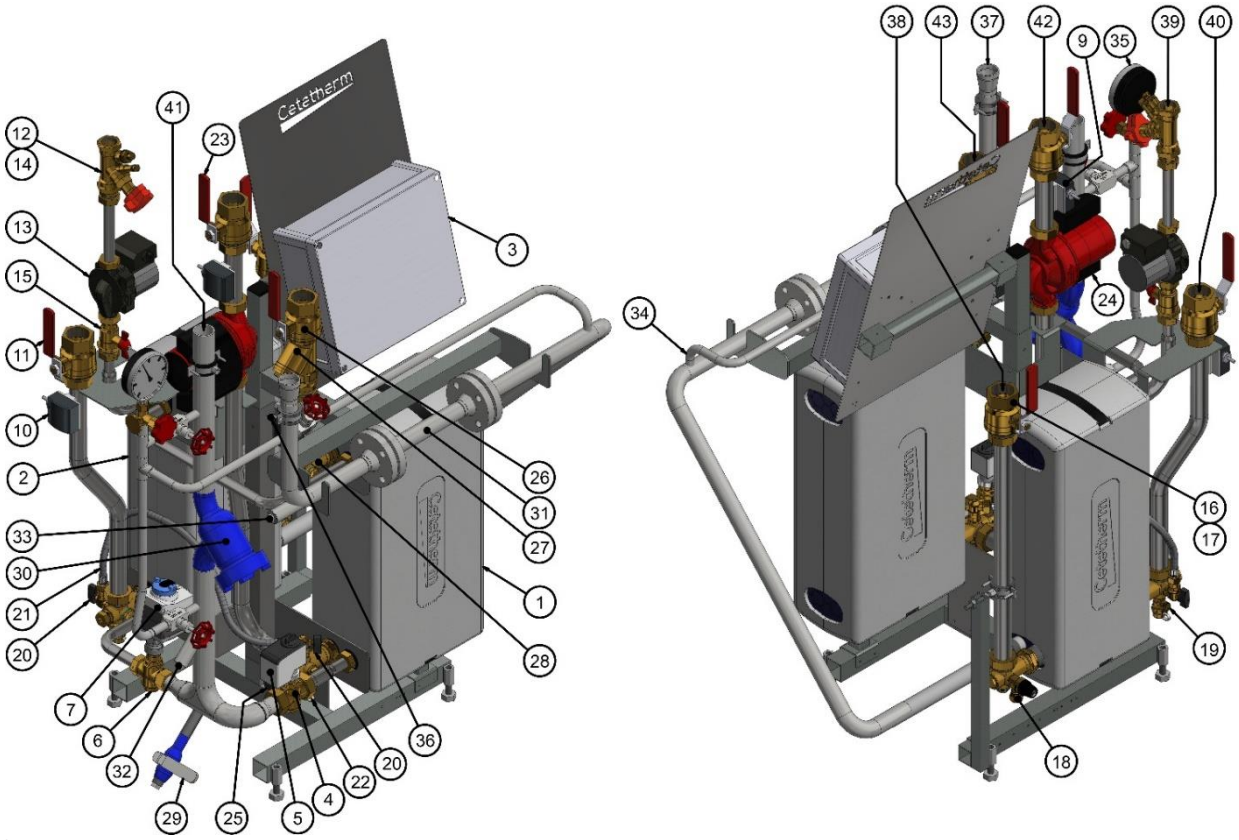
3.2 Midi Compact SR144 with vertical metering



Picture 2

1	Heat exchanger heat	22	Draining valve, heat supply
2	Heat exchanger DHW	23	Shut off valve, heat supply
3	Control center	24	Pump, heating
4	Control valve, heating	25	Safety valve, heating
5	Actuator, heating	26	Shut off valve, heat return
6	Control valve, DHW	27	Strainer, heat return
7	Actuator, DHW	28	Connection, expansion vessel
8	Temp.sensor, outdoor (not in picture)	29	Draining valve, DH-Supply
9	Temp.sensor, heating Supply	30	Strainer, DH-Supply
10	Temp.sensor, DHW Supply	31	Heat meter dummy
11	Shut off valve, DHW	32	Connection energy meter sensor primary supply
12	Balancing valve, DHWC	33	Connection energy meter sensor primary return
13	Pump, DHWC	36	Temp.sensor heating return
14	None return valve, DHWC	37	DH Return
15	Shut off valve, DHWC	38	CW
16	Shut off valve, CW	39	DHWC
17	None return valve, CW	40	DHW
18	Safety valve, CW	41	DH supply
19	Draining valve, DH-Supply	42	Heat Supply
20	Topping up x2	43	Heat Return
21	Hose		

3.3 Midi Compact SR144 with horizontal metering



Picture 3

1	Heat exchanger heat	23	Shut off valve, heat supply
2	Heat exchanger DHW	24	Pump, heating
3	Control center	25	Safety valve, heating
4	Control valve, heating	26	Shut off valve, heat return
5	Actuator, heating	27	Strainer, heat return
6	Control valve, DHW	28	Connection, expansion vessel
7	Actuator, DHW	29	Draining valve, DH-Supply
8	Temp.sensor, outdoor (not in picture)	30	Strainer, DH-Supply
9	Temp.sensor, heating Supply	31	Heat meter dummy
10	Temp.sensor, DHW Supply	32	Connection energy meter sensor primary supply
11	Shut off valve, DHW	33	Connection energy meter sensor primary return
12	Balancing valve, DHWC	34	Connection 3-point HB metering
13	Pump, DHWC	35	Pressure gauge connection
14	None return valve, DHWC	36	Temp.sensor heating return
15	Shut off valve, DHWC	37	DH Return
16	Shut off valve, CW	38	CW
17	None return valve, CW	39	DHWC
18	Safety valve, CW	40	DHW
19	Draining valve, DH-Supply	41	DH supply
20	Topping up x2	42	Heat Supply
21	Hose	43	Heat Return
22	Draining valve, heat supply		

4 Installation

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.
- 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

- 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 *4.7-4.9*.
- 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.
- All 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 a floor gully.
- Energy meters must be installed at a prepared location, replacing a gauge block, or following the instructions of the energy supplier.
- 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 start 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.*

4.4 Adjustments and settings for start up

- Open up 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, *11.1.1 Tap water temperature too low*. **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 1000 kPa during winter and at least 600kPA during summer.
- Set the pump capacity of the heating circulation pump and the DHWC-pump according to chapter *10 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 center.
- 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.

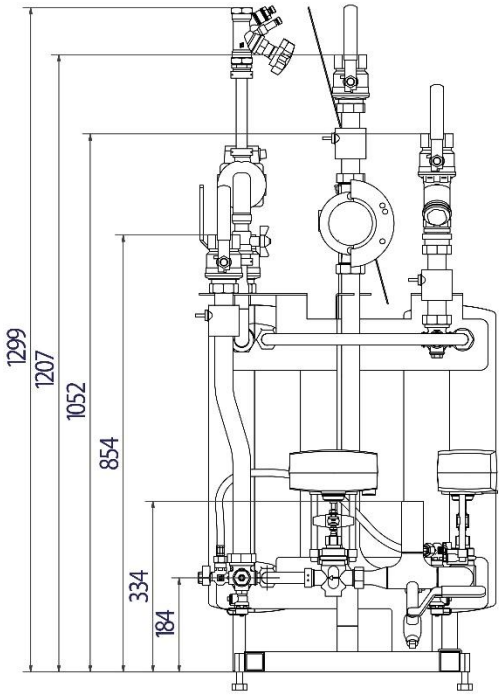
4.5 Dismantlement

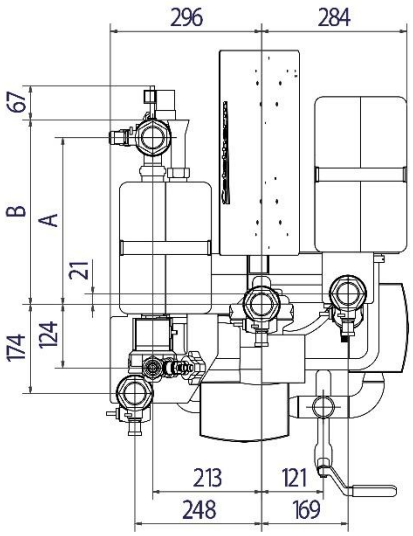
When the time comes for the substation to be dismantled and scrapped it must be disposed of in the correct manner in accordance with local or national regulations.

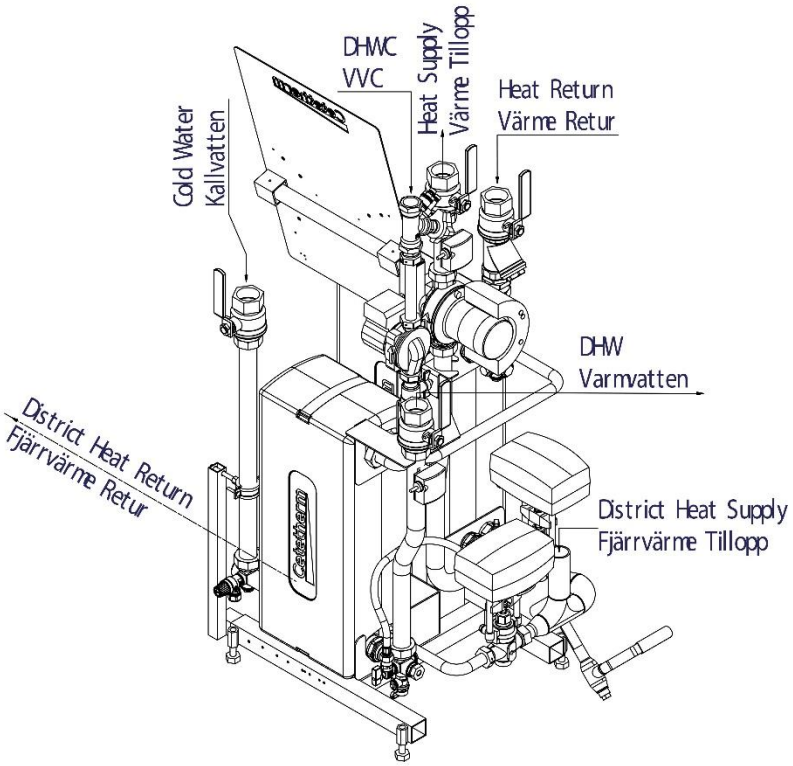
4.6 Commissioning advice

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.

4.7 Measure sketch Midi Compact



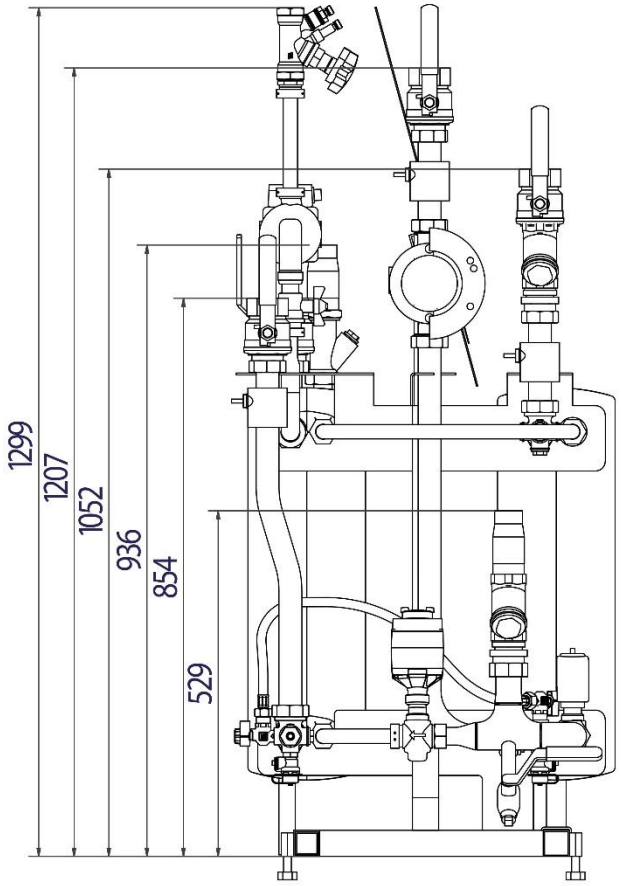


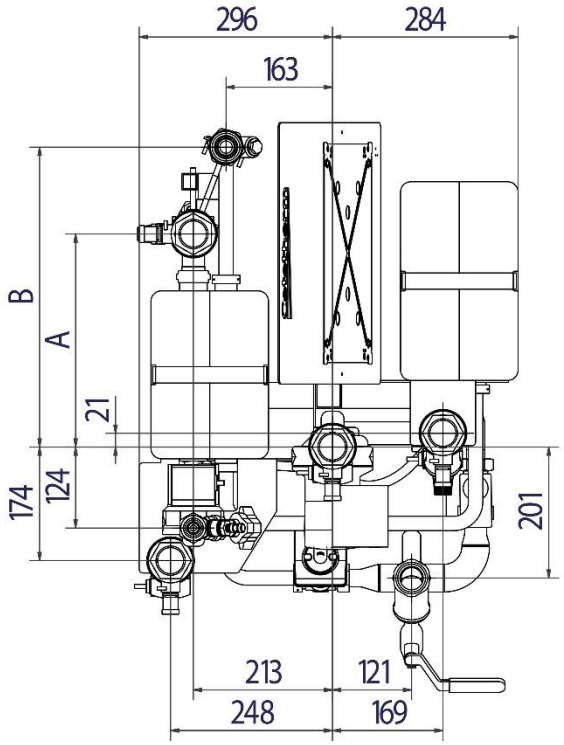


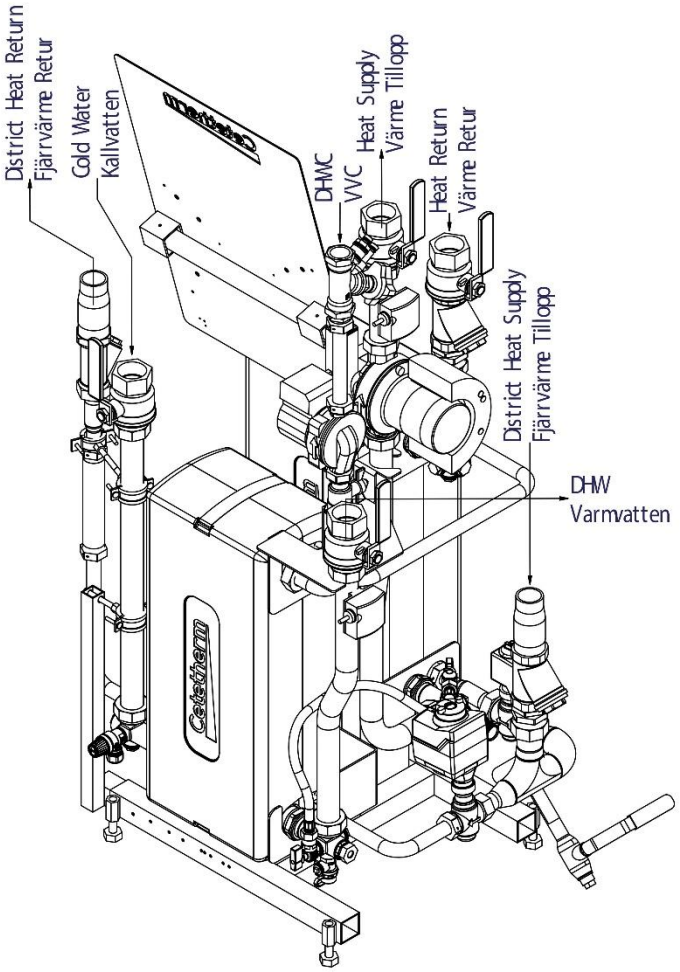
Length Table		
Type	A	B
80/100	222.6	253.5
160	241.4	272.3
200	269.6	300.5

Picture 4

4.8 Measure sketch Midi Compact with vertical metering



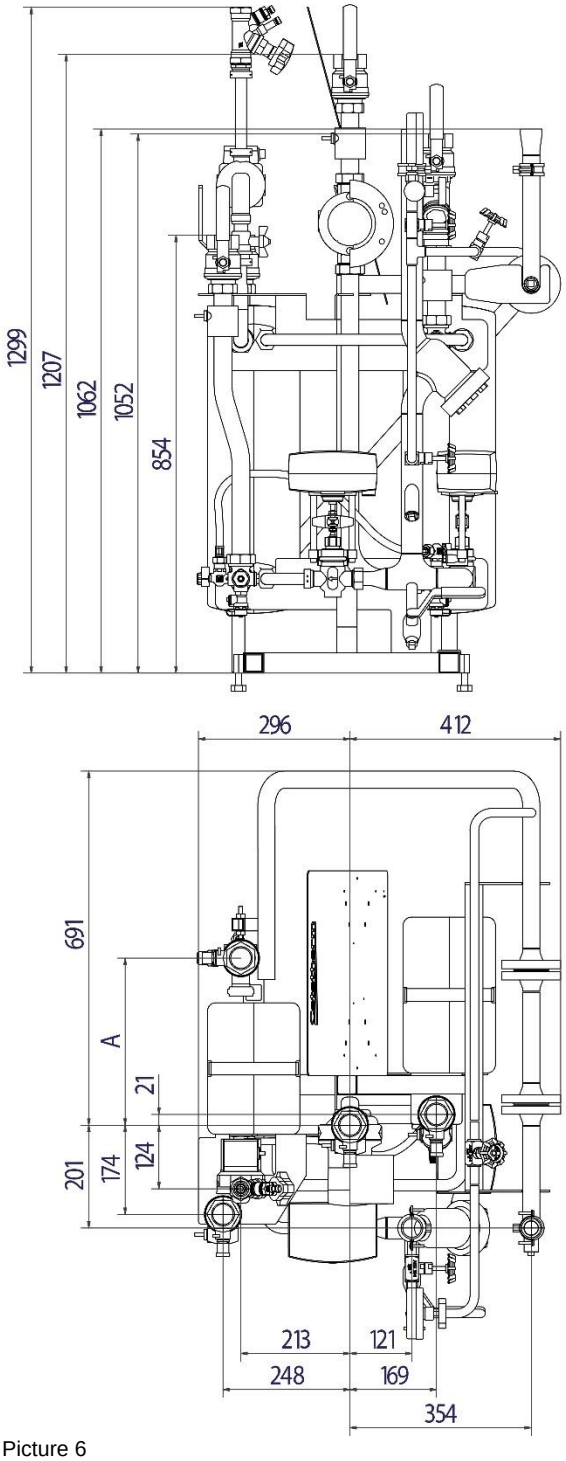


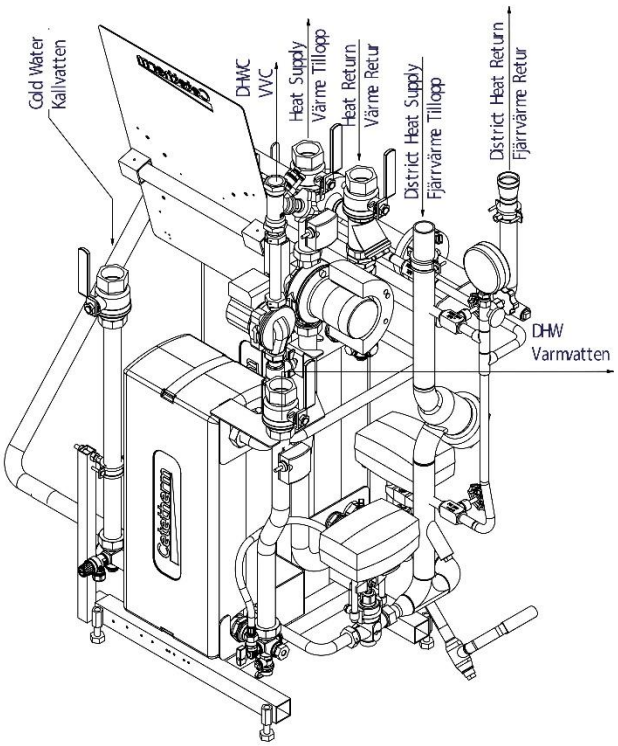


Length Table		
Type	A	B
80/100	223	398
160	242	417
200	270	445

Picture 5

4.9 Measure sketch Midi Compact with horizontal metering

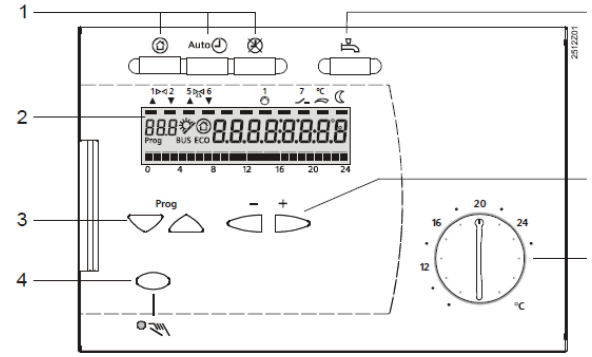




Length Table	
Type	A
80/100	223
160	242
200	270

Picture 6

5 User instruction operator control panel RVD144



Picture 7

1. Operating mode buttons
2. Display (LCD)
3. Buttons for selecting operating lines
4. Button for manual operation ON / OFF
5. Button for DHW heating ON / OFF
6. Buttons for making readjustments of values
7. Setting 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. pump 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

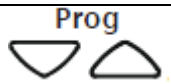
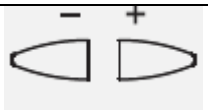
If the bar is alight under	Explanation
°C	Heating is maintained at normal set point temperature (preset on adjusting knob)
	Heating is maintained at lowered temperature

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 a 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 into the heating program
   – Constantly on continuous operation
2. Use the buttons to set other temperatures and the required control curve as follows:

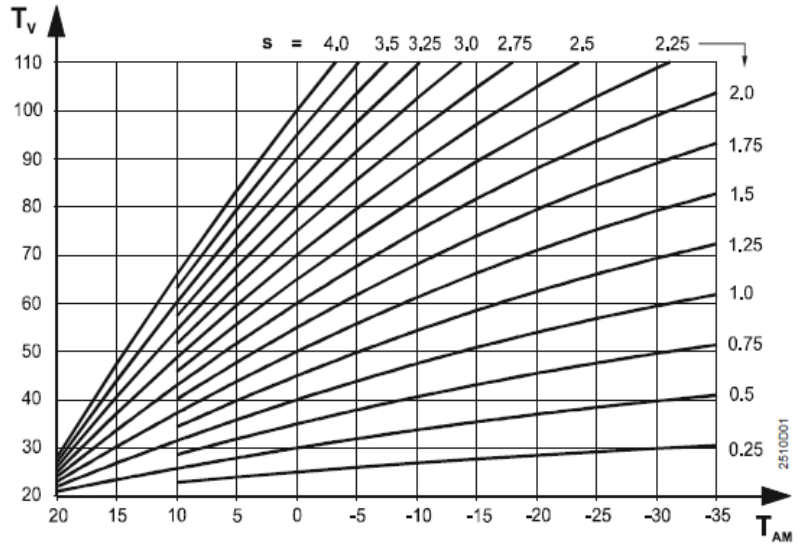
Line	*Function, parameter*	*Unit*	*Factory setting*	*Range*
1	Current nominal room temperature set point		Display function	
2	Reduced room temperature set point	°C	18	variable*
3	Frost protection/holiday mode set point	°C	8	8…variable*
5	Heating curve slope		1,25	0,25…4,0

* 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 8

S	Slope
TAM	Composite outside temperature
TV	Flow temperature

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

Picture 8 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 heating 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 :

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

5.10 Set and change heating 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 be set to 3 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 negated.

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

5.11 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)

5.12 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 locked to 4.
The End-user level remains activated.

Line	*Function, parameter*	*Unit*	*Factory setting*	*Range*
51	Plant type		4	Preset, 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)		------	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	90	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 lines 49 and 149, all parameters can be reset to their factory settings.
- 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.

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 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.

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 *0*

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

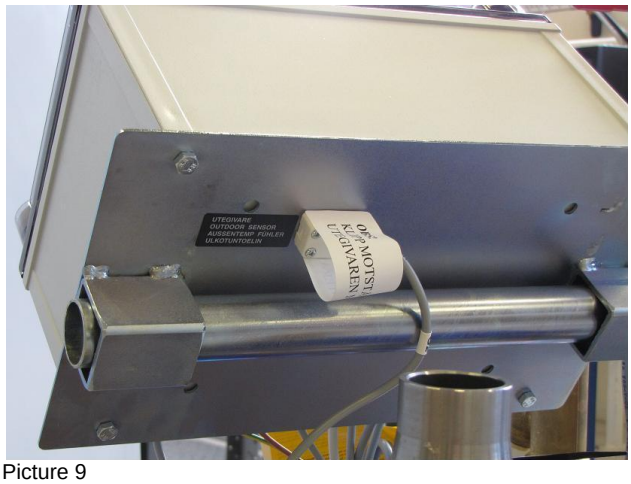
8.1 General

The electrical wirings in Midi Compact conform to the applicable rules for CE marking and have undergone electrical safety testing and function testing. For permanent installation the substation must be connected to an all-pole isolator switch. This must be done by a duly qualified electrician.

The substation must be connected to a grounded power outlet.

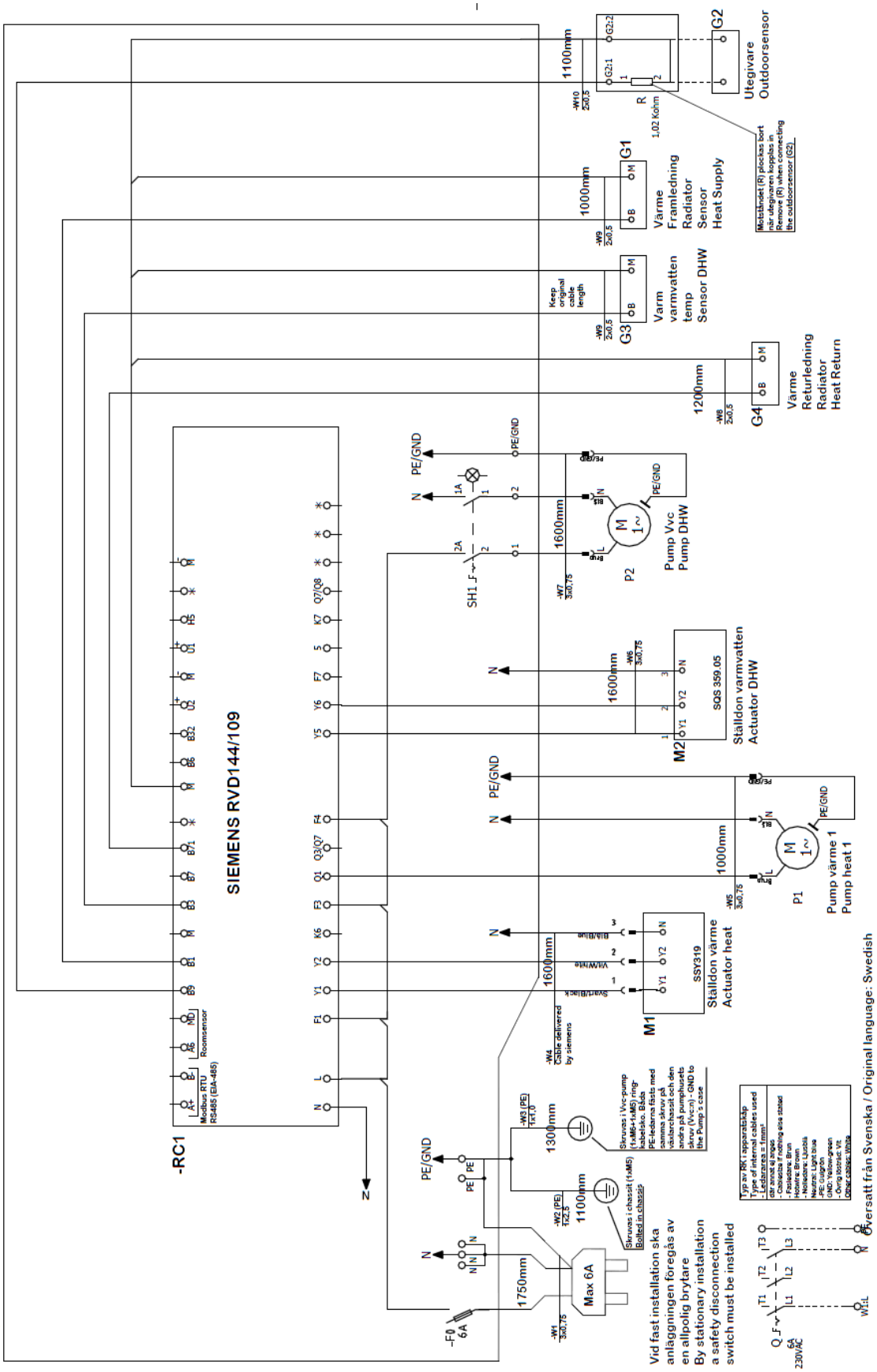
8.2 Installation of outdoor temperature sensor

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.
With a conductor area of 0.6 mm^2 the maximum cable length is 50 meters.



Picture 9

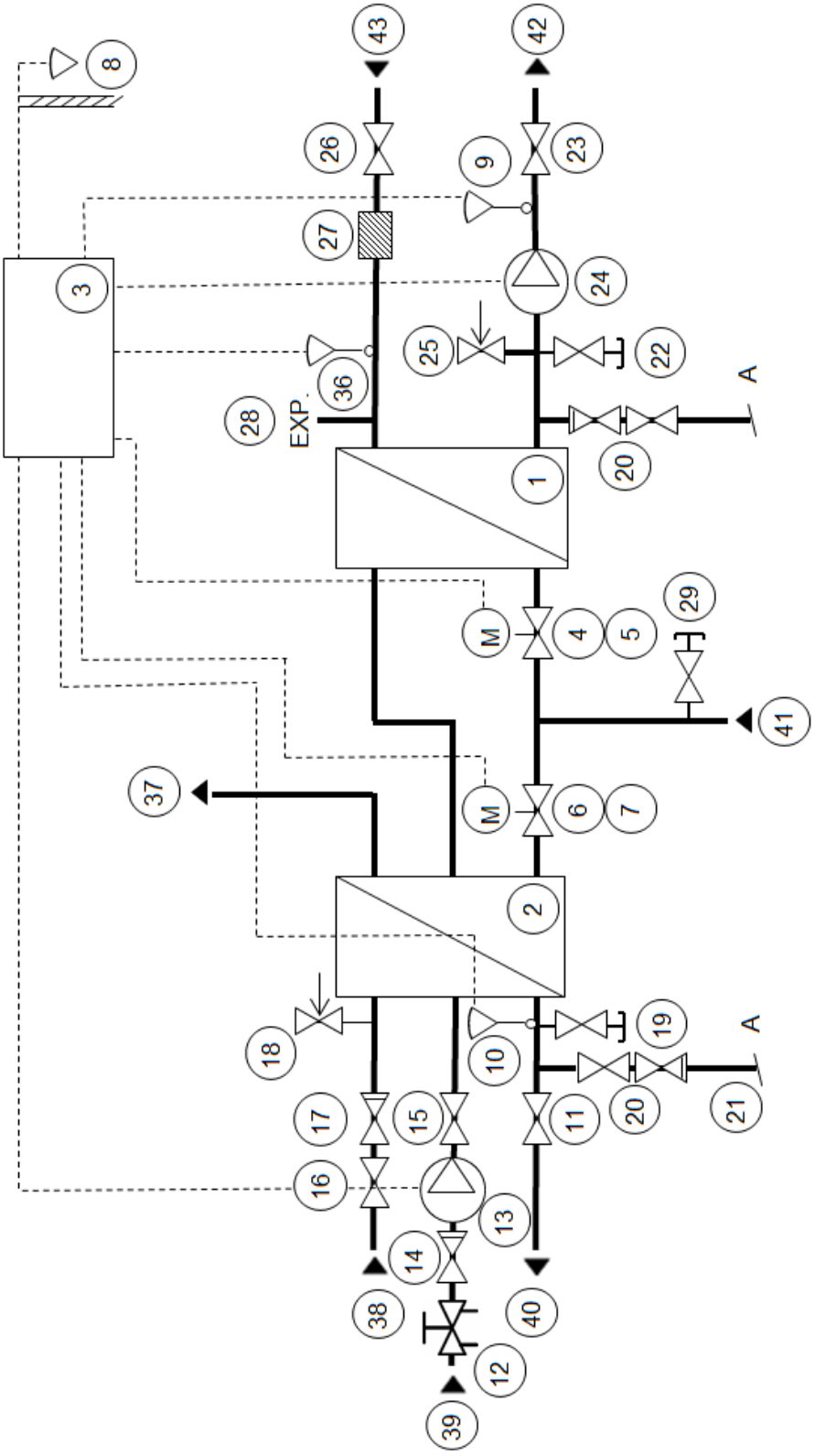
8.3 Electrical circuit diagram EU



Picture 10

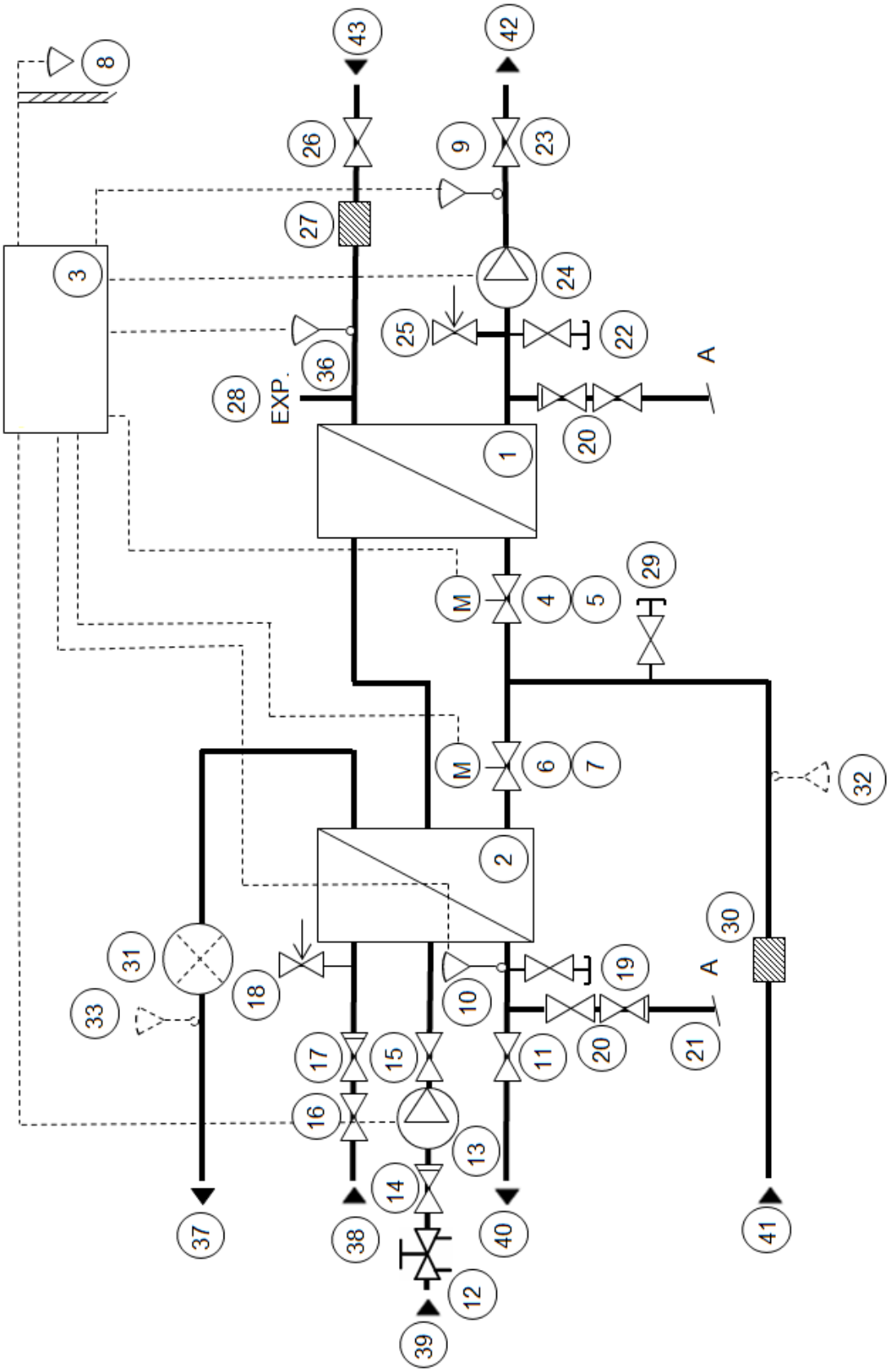
9 Schematic diagram, main components

9.1 Midi Compact



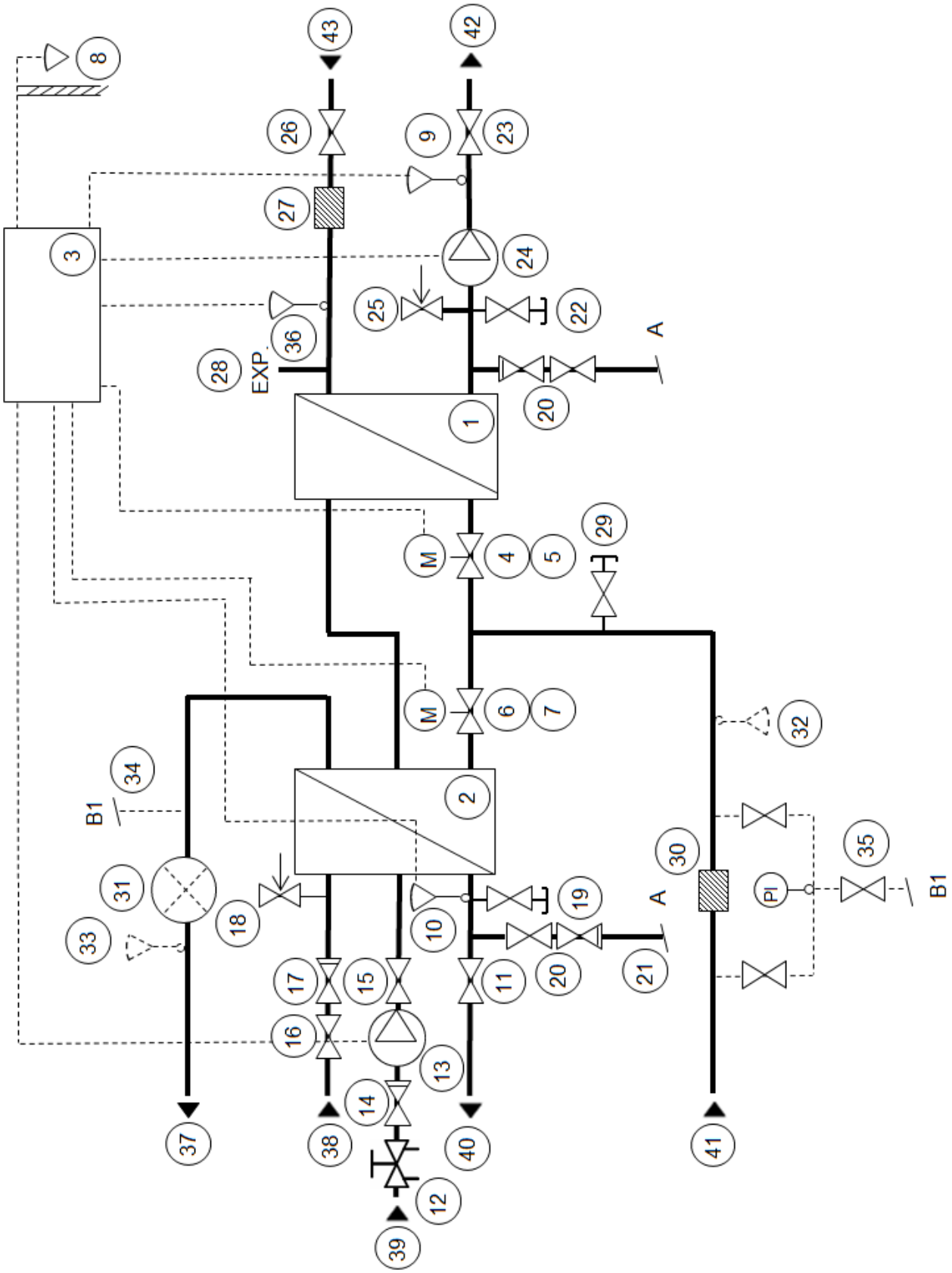
Picture 11

9.2 Midi Compact with vertical metering



Picture 12

9.3 Midi Compact with horizontal metering



Picture 13

10 Pump settings and pump capacity

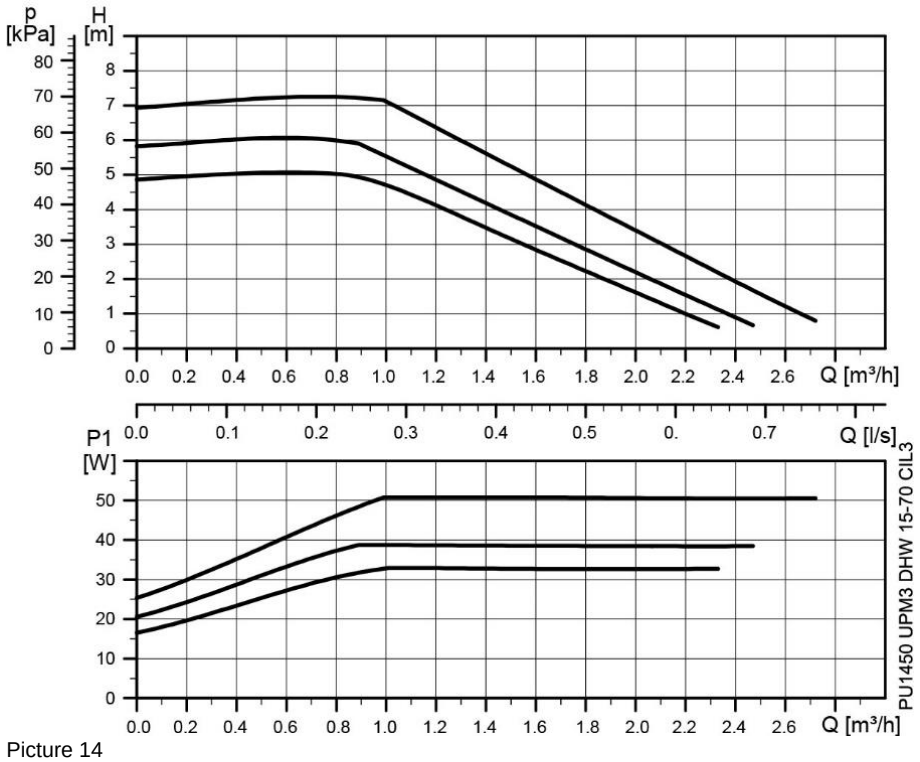
10.1 General

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

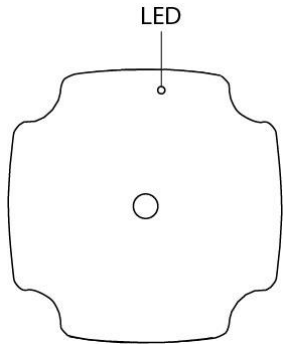
The DHWC pump is a speed-controlled, high-efficiency pump-

The circulation pump for heating circuit is a pressure-controlled pump.

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



Picture 14



Picture 15

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

1) 12 flashes per second

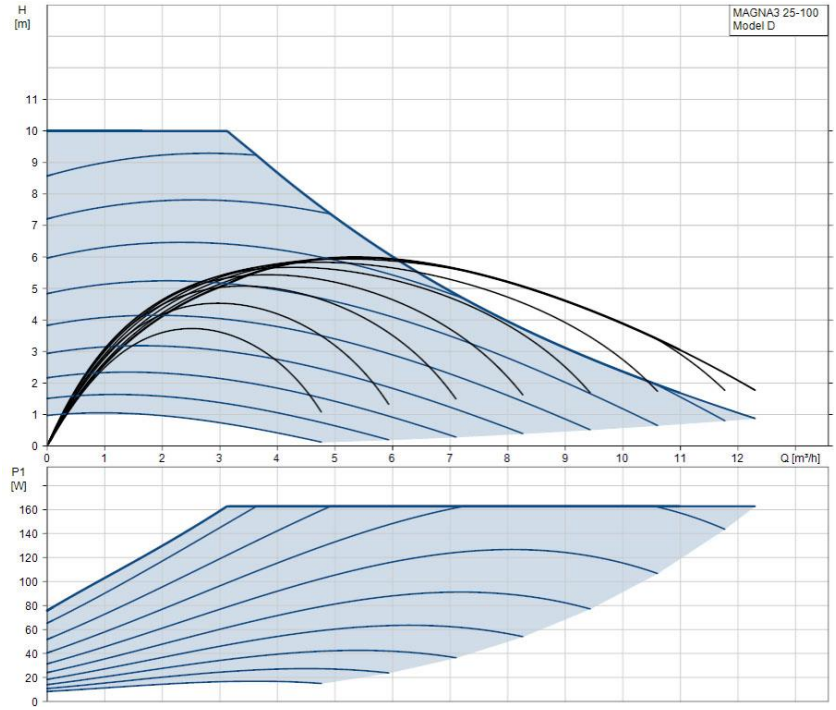
10.3 Heating circuit pump Grundfos Magna3 25–100, settings and capacity

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.

10.3.1 Heating circuit pump Grundfos Magna3 25-100, capacity



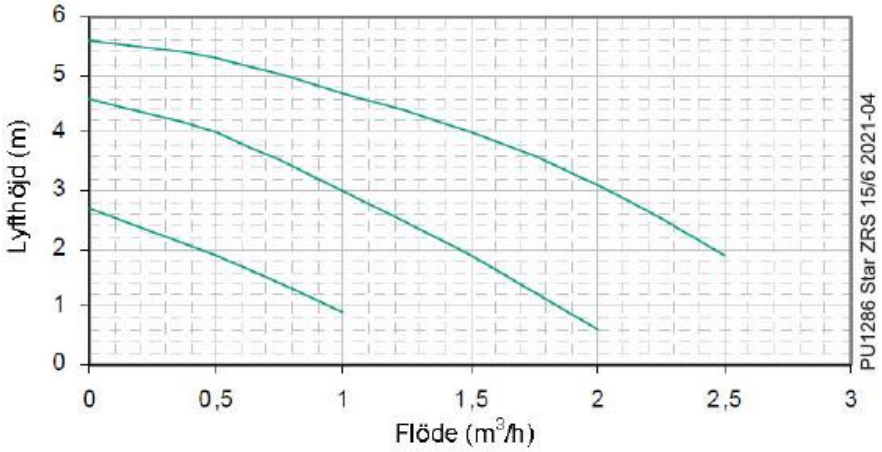
Picture 16

10.3.2 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.

10.4 DHWC pump StarZRS 15/6 Co, settings and capacity

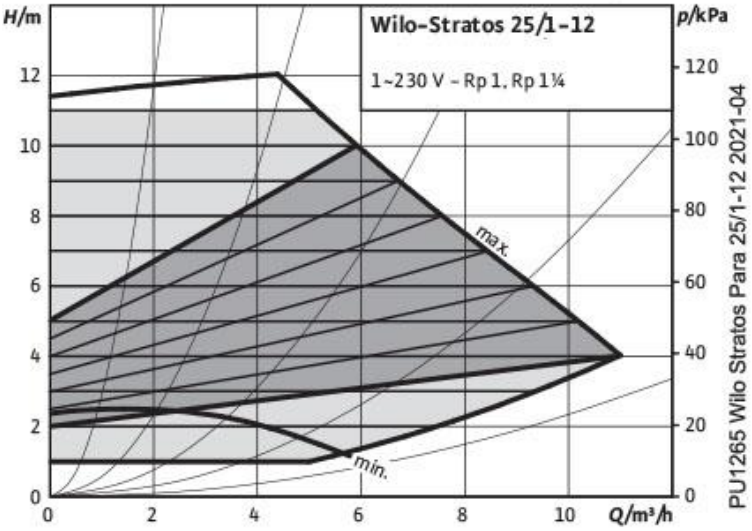
This pump is only available for Midi Compact 200kW.



Picture 17

10.5 Heating circuit pump Wilo Stratos 25/1-12

This pump is only available for Midi Compact 200kW.



Picture 18

11 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 substation has been correctly installed.

11.1 Service instructions, tap water

11.1.1 Tap water temperature too low

Reason	Action
District heating supply too low	**Check the primary inlet temperature** The temperature can be checked by means of the energy meter (min 65º C) or at the district heating medium supply. The tap water temperature can be monitored on the control panel display line 26.
Handle on control valve incorrectly positioned	**Adjust the handle on the control valve** Adjust the tap water temperature by turning the handle clockwise for increased and anti-clockwise for decrease temperature. Turn the handle until the desired temperature is reached (55º C approx.). The stabilisation time for the hot water temperature is about 20 seconds.
District heating strainer clogged	**See** *13.1 Cleaning the district heating strainer.*
Hot water valve and/or actuator does not work	**See** *12.1 Check the function of the hot water valve and actuator*.

11.1.2 Tap water temperature too high

Reason	Action
Handle on control valve incorrectly positioned	**Adjust the handle on the control valve** Adjust the tap water temperature by turning the handle clockwise for increased and anti-clockwise for decrease temperature. Turn the handle until the desired temperature is reached (55º C approx.). The stabilisation time for the hot water temperature is about 20 seconds.
Hot water valve and/or actuator does not work	**See** *12.1 Check the function of the hot water valve and actuator*.

11.1.3 Hot water temperature unstable

Reason	Action
Alternating pressure on primary side	**Check available differential pressure and temperature at the district heating medium supply**. The temperature can be checked by means of the energy meter, minimum 65ºC, or at the district heating medium supply.
The control equipment may need to be adjusted	**Check the hot water settings** See *5.12 Reading of temperatures, actual value* and *5.7 Setting the DHW set point temperature*.
District heating filter clogged	**See** *13.1 Cleaning the district heating strainer*.
DHWC pump is not running	**Check that the electrical power is on**
	See *12.3 Check DHWC pump.*

11.1.4 Noise in the DHWC system

Reason	Action
The pump capacity is set too high	**Reduce the pump capacity** Reduce the level by choosing a lower output setting on the pump. The lowest setting is the most economical.
Air in the pump	**Vent the 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 pump motor or pump component damaged	**See** *13.3 Change the complete DHWC pump or pump components*.

11.2 Service instructions, heating system

11.2.1 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 are correctly sited and working** To confirm that; check line 27 and line 25 on the operator control panel, see *5.12 Reading of temperatures, actual value*. Check that the specified temperatures are reasonable. If needed a sensor test, see *6.6.1 Sensor test* ,can be done.
The heating control equipment may need to be adjusted	**Check and adjust the heating curve** See *5.6 Setting the temperatures in the heating system* and change the heating curve with operating line 5.
Heating circuit filter clogged	**See** *13.2 Clean the heating circuit strainer.*
Heating valve and/or actuator does not work	**See** *12.2 Check the function of the heating actuator and valve*.

11.2.2 No heating

Reason	Action
Circulation pump not running	**Check that the electrical power is on**
	Check the circulation pump If the pump fails to start after stopping, try to start it at the highest setting.
	Check the heating parameters in operator control panel Check the heating parameters, line 6-12. Also, check line 57-58 if the operator control panel is set to summer-winter changeover program.
Air pockets in the substation or in the heating circuit	**Bleed the heating pump** The pump is self-venting. 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 are correctly sited and working** To confirm that; check line 27 and line 25 on the operator control panel, see *5.12 Reading of temperatures, actual value*. Check that the specified temperatures are reasonable. If needed a sensor test, see *6.6.1 Sensor test* ,can be done
Loss of function in the heating control unit.	**See** *12.4 Run the pump manually*.
Heating circuit filter clogged	**See** *13.2 Clean the heating circuit strainer*.

11.2.3 Noise in the radiator system

Reason	Action
The pump capacity set too high	**Reduce the pump capacity** Reduce the level by choosing a lower output setting on the pump.
Air in the DHWC pump	**Vent the pump** The pump is self-venting. Air in the pump may cause noise. This noise ceases after a few minutes run time.
The pump motor or pump component damaged	**See** *.13.4 Change the complete heating pump or pump components*.

11.2.4 Heating temperature unstable

Reason	Action
Alternating pressure on primary side	**Check available differential pressure and temperature at the district heating medium supply** 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 are correctly sited and working** To confirm that; check line 27 and line 25 on the operator control panel, see *5.12 Reading of temperatures, actual value*. Check that the specified temperatures are reasonable. If needed a sensor test, see *6.6.1 Sensor test* ,can be done
District heating strainer is clogged	**See** *13.2 Clean the heating circuit strainer*.

11.2.5 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 cause pressure drop. Contact your service technician if finding any leaks.
The heating system safety valve is leaking or does not work	**Check the heating system safety valve** Check that the heating system safety valve is not leaking and that it works properly. Check the 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 changes in the system	**See** *12.5 Check the volume take-up and pressure equalizing of the expansion vessel.*

12 Service actions for the installer

12.1 Check the function of the hot water valve and actuator

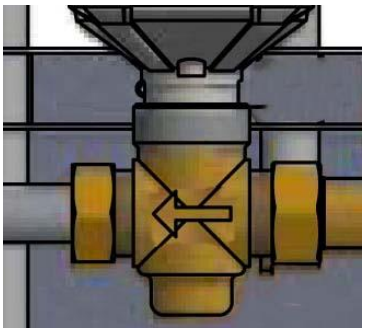
	Service actions must be carried out by an authorized service technician.
	Close the shutoff valves for the **DH supply** and **DH return** together with the **cold** and **hot wate**r. Relieve the pressure in the circuit.
	After finishing repair, open the shutoff valves. Start with primary supply and 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 19

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 20

12.2 Check the function of the heating actuator and valve

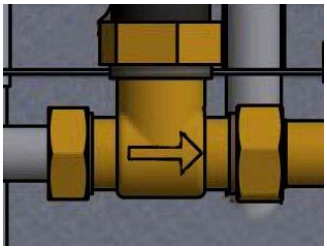
⚠	Service actions must be carried out by an authorized service technician.
⚠	Disconnect the electrical power supply to the controller, before manoeuvring the actuator by hand.

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 21

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 22

12.3 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 23

12.4 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.

12.5 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.
The expansion vessel may have to be replaced. See *13.10 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.

13 Maintenance and repairs

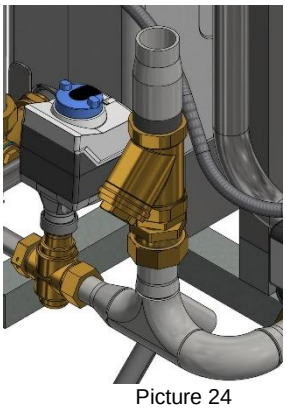
When carrying out repairs, please contact your local service partner.

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

13.1 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.

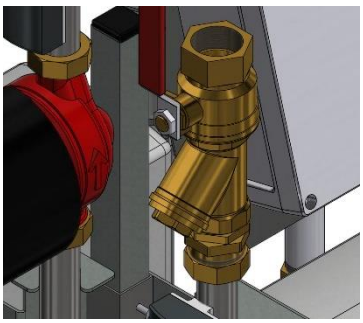


Picture 24

13.2 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.



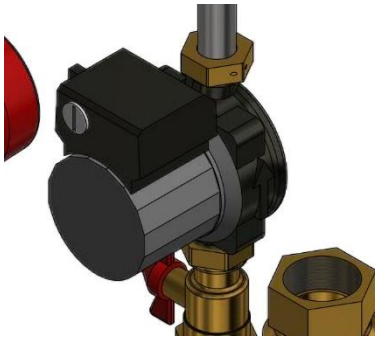
Picture 25

13.3 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, 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.
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 motor</u>, 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.



Picture 26

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.

13.4 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 27

13.5 Change the heating actuator

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

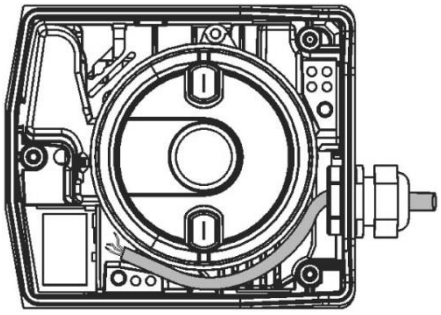
1. Turn the actuator handle to position 0. This will make it easier to dismount and mount the actuator.
2. Detach the actuator power supply.
3. Unscrew the actuator from the valve.
4. Mount a new actuator and reattach the power supply.

Picture 28

13.6 Change the hot water actuator

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

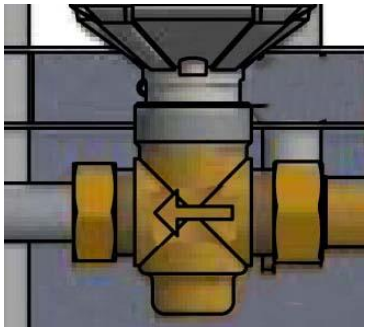
1. Turn the actuator handle to position 0. This will make it easier to mount the actuator.
2. Remove the lid by loosening the four screws detach the actuator power supply.
3. Unscrew actuator from the valve.
4. Mount a new actuator and reattach the power supply.


Picture 29

13.7 Change the heating or hot water valve

⚠	Maintenance work must be carried out by an authorized service technician.
⚠	Disconnect the power supply 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.

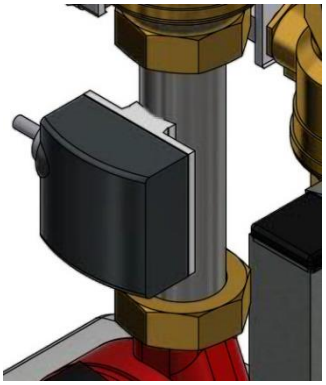
1. Turn the actuator handle to position 0. This will make it easier to mount the actuator.
2. Unscrew the actuator from the control valve.
3. Use a wrench to remove the control valve.
   Note the arrow direction on the valve.
4. Mount a new valve; **take special with care the arrow direction**.
5. Reattach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



Picture 30

13.8 Change the temperature sensor heating supply and 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 31

13.9 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 32

13.10 Change the expansion vessel

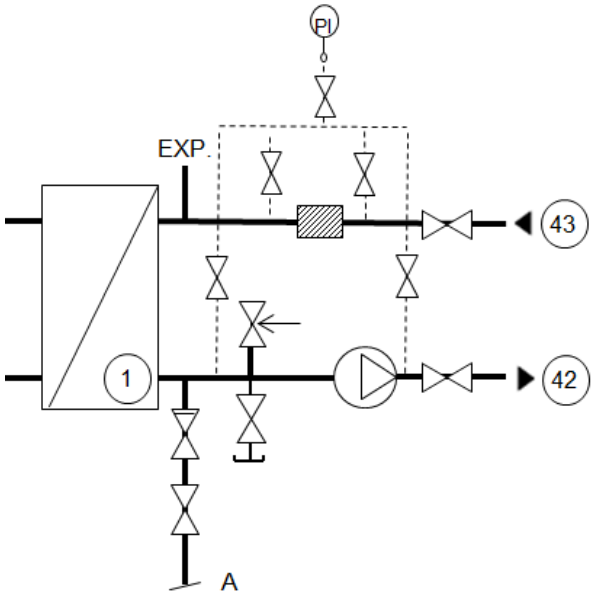
⚠	Maintenance work must be carried out by an authorized service technician.
⚠	Disconnect the power supply to the pump and the substation.

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

14 Options

14.1 4-point HB metering

Measure before and after filter, together with before and after pump.



Picture 33

15 Operation data and capacity

15.1 Operation data Midi Compact 80

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	100°C	100°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	2,1/1,85 L	2,1 L	1,75 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	**82**	**60**	**40**	**1*19L**	**1*20L**	**0,55**	**2,3**	**1,00**	**6,7**
100-63/60-80 (62,9)	80	60	40	1*19L	1*20L	0,54	2,2	0,97	6,4
100-58/55-75	101	60	40	1*19L	1*20L	0,60	2,7	1,23	10,1
100-58/55-75 (57,4)	80	60	40	1*19L	1*20L	0,47	1,7	0,97	6,5
100-53/50-70	118	60	40	1*19L	1*20L	0,63	2,9	1,43	13,6
100-53/50-70 (52)	80	60	40	1*19L	1*20L	0,42	1,4	0,97	6,6
100-48/45-60 (46,2)	93	60	40	1*19L	1*20L	0,43	1,5	1,50	15,1
100-48/45-60 (46)	80	60	40	1*19L	1*20L	0,37	1,1	1,29	11,4
100-43/40-60 (42,5)	**123**	**60**	**40**	**1*19L**	**1*20L**	**0,53**	**2,2**	**1,49**	**14,9**
100-43/40-60 (41,5)	80	60	40	1*19L	1*20L	0,34	1,0	0,97	6,7
100-43/40-70	67	60	40	1*19L	1*20L	0,29	0,7	0,54	2,2
100-43/40-80	26	60	40	1*19L	1*20L	0,11	0,1	0,16	0,2
100-36/33-40 (33,1)	42	60	40	1*19L	1*20L	0,16	0,3	1,45	14,6
100-33/30-60	85	60	40	1*19L	1*20L	0,32	0,8	0,68	3,5

CB60-36L 2V

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 (19,2)	140	60	36	1*9L+1*8L	2*9 L	0,61	19,9	0,67	32,8
80-23/10-60 (16,8)	94	60	36	1*9L+1*8L	2*9 L	0,41	8,9	0,45	15,7
80-23/10-55 (16,3)	126	60	36	1*9L+1*8L	2*9 L	0,55	15,1	0,67	33,1
80-23/10-55 (14,5)	85	60	36	1*9L+1*8L	2*9 L	0,37	6,9	0,45	15,8
70-25/10-55 (19,9)	**126**	**60**	**36**	**1*9L+1*8L**	**2*9 L**	**0,69**	**23,5**	**0,67**	**32,8**
70-25/10-55 (17,5)	85	60	36	1*9L+1*8L	2*9 L	0,46	10,3	0,45	15,7
70-22/10-55 (19,9)	126	60	36	1*9L+1*8L	2*9 L	0,64	23,5	0,67	32,8
70-22/10-55 (17,5)	85	60	36	1*9L+1*8L	2*9 L	0,43	10,3	0,45	15,7
65-22/10-55	**111**	**60**	**36**	**1*9L+1*8L**	**2*9 L**	**0,63**	**24,5**	**0,59**	**25,7**
65-22/10-55 (20,2)	85	60	36	1*9L+1*8L	2*9 L	0,48	13,8	0,45	15,6

15.2 Operation data Midi Compact 100

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	100°C	100°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	2,6/1,85 L	2,6 L	1,75 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**	**2,5**	**1,28**	**7,5**
100-63/60-80 (62,9)	100	60	50	1*24 L	1*25 L	0,67	2,2	1,22	6,8
100-58/55-75	130	60	50	1*24 L	1*25 L	0,77	2,9	1,58	11,2
100-58/55-75 (57,3)	100	60	50	1*24 L	1*25 L	0,58	1,7	1,22	6,9
100-53/50-70 (53)	151	60	50	1*24 L	1*25 L	0,80	3,2	1,83	15,0
100-53/50-70 (51,9)	100	60	50	1*24 L	1*25 L	0,52	1,4	1,21	6,9
100-48/45-60 (46,1)	112	60	50	1*24 L	1*25 L	0,52	1,4	1,81	14,8
100-48/45-60 (46,0)	100	60	50	1*24 L	1*25 L	0,46	1,1	1,62	12,0
100-43/40-60 (42,4)	**150**	**60**	**50**	**1*24 L**	**1*25 L**	**0,65**	**2,2**	**1,81**	**15,0**
100-43/40-60 (41,5)	100	60	50	1*24 L	1*25 L	0,43	1,0	1,21	7,0
100-43/40-70	87	60	50	1*24 L	1*25 L	0,38	0,8	0,70	2,5
100-43/40-80	33	60	50	1*24 L	1*25 L	0,14	0,1	0,20	0,3
100-36/33-40 (33,1)	52	60	50	1*24 L	1*25 L	0,19	0,3	1,79	15,0
100-33/30-60	109	60	50	1*24 L	1*25 L	0,41	0,9	0,88	3,9
100-33/30-60 (32,8)	100	60	50	1*24 L	1*25 L	0,37	0,8	0,80	3,3

CB60-36L 2V

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 (19,2)	140	60	36	1*9L+1*8L	2*9 L	0,61	19,9	0,67	32,8
80-23/10-60 (18,0)	115	60	36	1*9L+1*8L	2*9 L	0,50	13,3	0,55	22,7
80-23/10-55 (16,3)	126	60	36	1*9L+1*8L	2*9 L	0,55	15,1	0,67	33,1
80-23/10-55 (15,3)	104	60	36	1*9L+1*8L	2*9 L	0,45	10,2	0,55	23,0
70-25/10-55 (19,9)	126	60	36	1*9L+1*8L	2*9 L	0,69	23,5	0,67	32,8
70-25/10-55 (18,6)	104	60	36	1*9L+1*8L	2*9 L	0,56	15,6	0,55	22,7
70-22/10-55 (19,9)	**126**	**60**	**36**	**1*9L+1*8L**	**2*9 L**	**0,64**	**23,5**	**0,67**	**32,8**
70-22/10-55 (18,6)	104	60	36	1*9L+1*8L	2*9 L	0,53	15,5	0,55	22,7
65-22/10-55	**111**	**60**	**36**	**1*9L+1*8L**	**2*9 L**	**0,63**	**24,5**	**0,59**	**25,7**
65-22/10-55 (21,5)	104	60	36	1*9L+1*8L	2*9 L	0,59	21,1	0,55	22,6

15.3 Operation data Midi Compact 160

	Primary side	Heating	DHW
Design pressure PS	16 Bar	16 bar	10 Bar
Design temperature TS	120°C	100°C	100°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	4,1/2,27 L	4,1 L	2,16 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	181	60	80	1*39L	1*40L	0,67	1,1	1,45	5,1

CB60-44L 2V

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)	174	60	44	2*12L	1*12L+1*13L	0,75	20,5	0,83	33,2
80-23/10-60 (18,0)	146	60	44	2*12L	1*12L+1*13L	0,63	14,5	0,70	24,2
80-23/10-55 (16,1)	154	60	44	2*12L	1*12L+1*13L	0,67	15,2	0,82	32,8
80-23/10-55 (15,4)	132	60	44	2*12L	1*12L+1*13L	0,57	11,1	0,70	24,4
70-25/10-55 (19,8)	156	60	44	2*12L	1*12L+1*13L	0,85	24,2	0,83	33,2
70-25/10-55 (18,7)	132	60	44	2*12L	1*12L+1*13L	0,72	17,0	0,70	24,2
70-22/10-55 (19,8)	156	60	44	2*12L	1*12L+1*13L	0,80	24,2	0,83	33,2
70-22/10-55 (18,7)	132	60	44	2*12L	1*12L+1*13L	0,67	17,0	0,70	24,2
65-22/10-55	139	60	44	2*12L	1*12L+1*13L	0,79	26,0	0,74	26,6
65-22/10-55 (21,6)	132	60	44	2*12L	1*12L+1*13L	0,75	21,6	0,70	24,0

15.4 Operation data Midi Compact 200

	Primary side	Heating	DHW
Design pressure PS	16 Bar	6 bar	10 Bar
Design temperature TS	120°C	100°C	100°C
Relief pressure safety-valve	-	3 Bar	9 Bar
Volume Heat exchanger, L	5,2/2,88 L	5,2 L	2,78 L

CB60-100L

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 (62,9)	**209**	**60**	**100**	**1*49L**	**1*50L**	**1,41**	**3,5**	**2,55**	**11,3**
100-63/60-80 (62,8)	200	60	100	1*49L	1*50L	1,34	3,2	2,44	10,3
100-58/55-75 (57,3)	209	60	100	1*49L	1*50L	1,24	2,7	2,54	11,3
100-58/55-75 (57,2)	200	60	100	1*49L	1*50L	1,16	2,4	2,43	10,4
100-53/50-70 (51,9)	210	60	100	1*49L	1*50L	1,11	2,2	2,55	11,4
100-53/50-70 (51,8)	200	60	100	1*49L	1*50L	1,03	1,9	2,43	10,4
100-48/45-60 (45,6)	157	60	100	1*49L	1*50L	0,75	1,1	2,54	11,4
100-43/40-60 (41,5)	**210**	**60**	**100**	**1*49L**	**1*50L**	**0,92**	**1,6**	**2,54**	**11,5**
100-43/40-60 (41,4)	200	60	100	1*49L	1*50L	0,85	1,3	2,42	10,5
100-43/40-70	183	60	100	1*49L	1*50L	0,80	1,2	1,47	4,0
100-43/40-80	72	60	100	1*49L	1*50L	0,31	0,2	0,44	0,4
100-36/33-40 (33,1)	74	60	100	1*49L	1*50L	0,29	0,2	2,55	11,7
100-33/30-60	229	60	100	1*49L	1*50L	0,85	1,4	1,84	6,3
100-33/30-60 (32,6)	200	60	100	1*49L	1*50L	0,74	1,0	1,61	4,8

CB60-56L 2V

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 (18,9)	222	60	56	1*14L+1*13L	2*14L	0,96	20,9	1,06	33,2
80-23/10-60 (17,5)	178	60	56	1*14L+1*13L	2*14L	0,77	13,3	0,85	22,1
80-23/10-55 (16,0)	198	60	56	1*14L+1*13L	2*14L	0,85	15,6	1,05	33,0
80-23/10-55 (15,0)	160	60	56	1*14L+1*13L	2*14L	0,69	10,3	0,85	22,3
70-25/10-55 (19,5)	**198**	**60**	**56**	**1*14L+1*13L**	**2*14L**	**1,08**	**24,2**	**1,05**	**32,7**
70-25/10-55 (18,2)	160	60	56	1*14L+1*13L	2*14L	0,87	15,6	0,85	22,1
70-25/10-55 (19,5)	198	60	56	1*14L+1*13L	2*14L	1,01	24,2	1,05	32,7
70-22/10-55 (18,2)	160	60	56	1*14L+1*13L	2*14L	0,82	15,6	0,85	22,1
65-22/10-55	**183**	**60**	**56**	**1*14L+1*13L**	**2*14L**	**1,04**	**28,0**	**0,97**	**28,0**
65-22/10-55 (21,1)	160	60	56	1*14L+1*13L	2*14L	0,91	21,1	0,85	21,9

15.5 Technical data

Electrical data:	230V 50Hz 1-phase, 227-458
Noise level:	<70dB(A), 1,6 m above floor level, 1 m from source
Main measurements:	800x600x1300 mm (WxDxH)
Weight:	80-110 kg

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