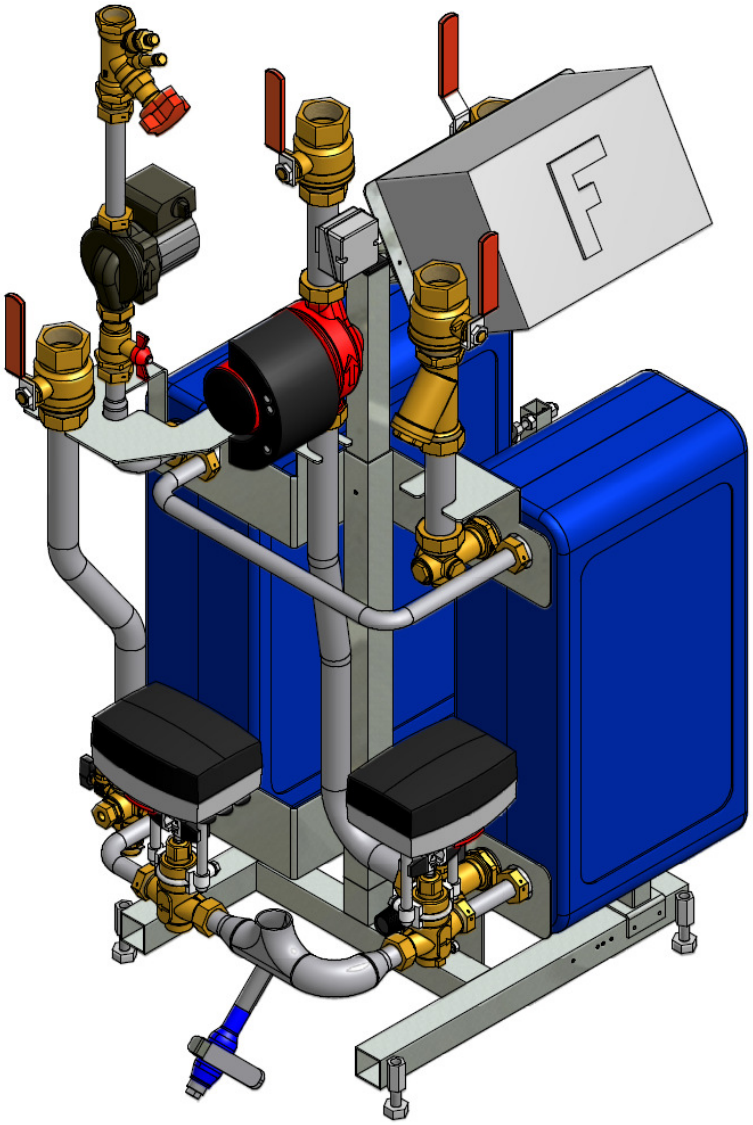
Cetetherm

Installation, service and operating instruction Cetetherm Midi Compact IQHeat DHWC

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



DOC:2018-06-01

Contents

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 substation 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 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.

With supply temperatures above 100°, it is recommended that the actuator is tilted or closed down.

1 General

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

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.

Before installation this manual must be read.

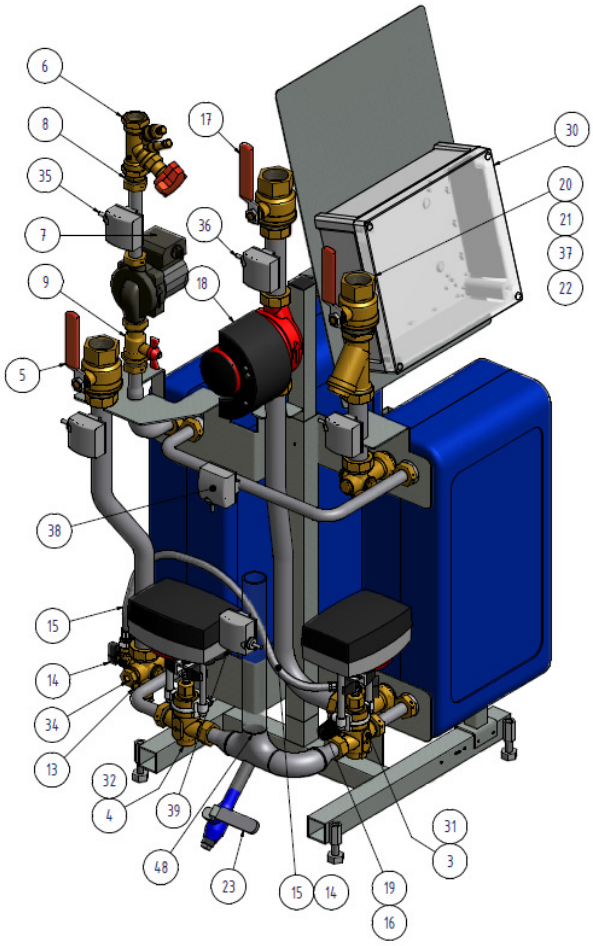
1.3 Long-term security

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 9001:2008 quality assurance system. For future servicing requirements, all components are easily accessible and individually replaceable.

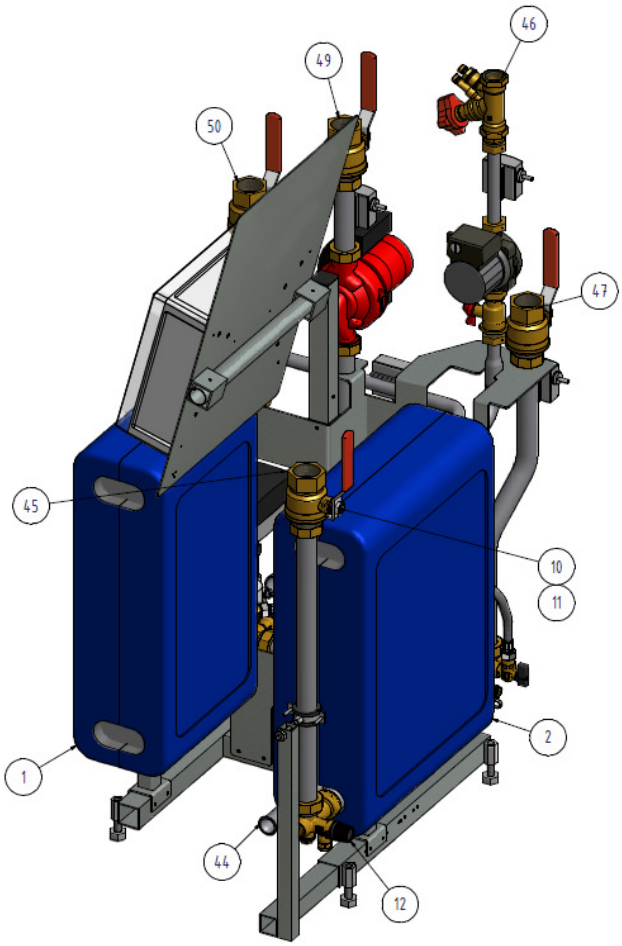
1.4 CE-marking

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 Product overview Midi Compact IQHeat



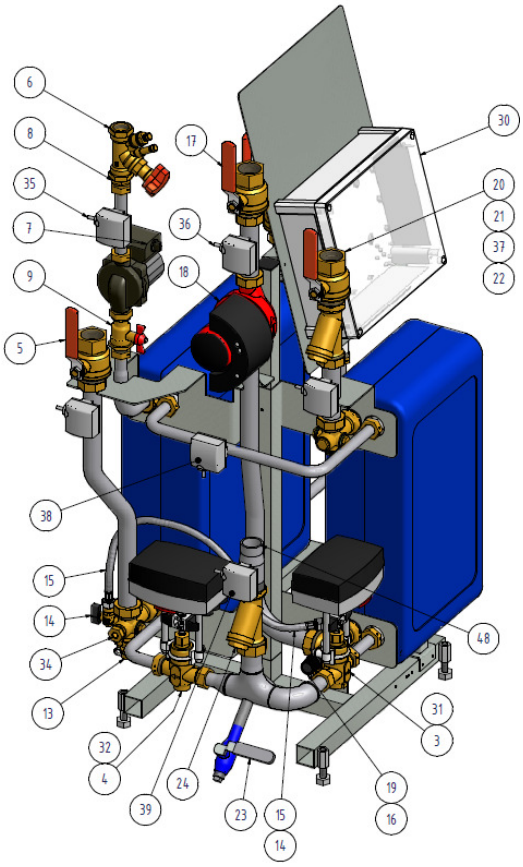
Picture 1



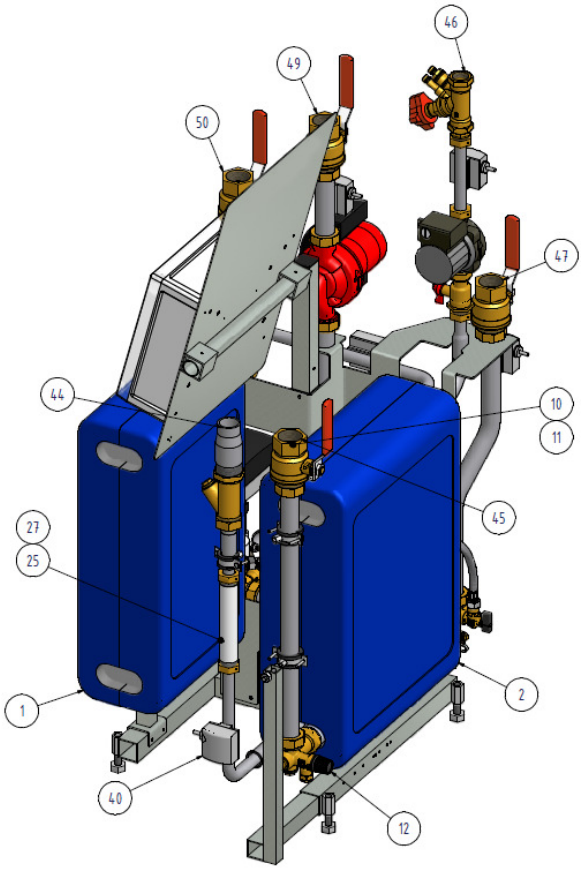
Picture 2

1	Heat exchanger, heat
2	Heat exchanger, DHW
3	Control valve, heating
4	Control valve, DHW
5	Shut off valve, DHW
6	Balancing valve, DHWC
7	Pump DHWC
8	None return valve, DHWC
9	Shut off valve, DHWC
10	Shut off valve, CW
11	None return valve, CW
12	Safety valve, CW
13	Draining valve, DH-Supply
14	Topping up
15	Hose
16	Draining valve, heat supply
17	Shut off valve, heat supply
18	Pump heating
19	Safety valve, heating
20	Shut off valve, heat return
21	Strainer, heat return
22	Connection expansionvessel
23	Draining valve, DH-Supply
30	Control center IQHeat100
31	Actuator, heating
32	Actuator, DHW
33	Temp.sensor, outdoor
34	Temp.sensor, DHW supply
35	Temp.sensor, DHWC return
36	Temp.sensor, heating supply
37	Temp.sensor, heating return
38	Temp.sensor, primary heating return
39	Temp.sensor, primary supply
40	Temp.sensor, primary return
44	DH Return
45	CW
46	DHWC
47	DHW
48	DH supply
49	Heat Supply
50	Heat Return

1.6 Product overview Midi Compact IQHeat with vertical metering



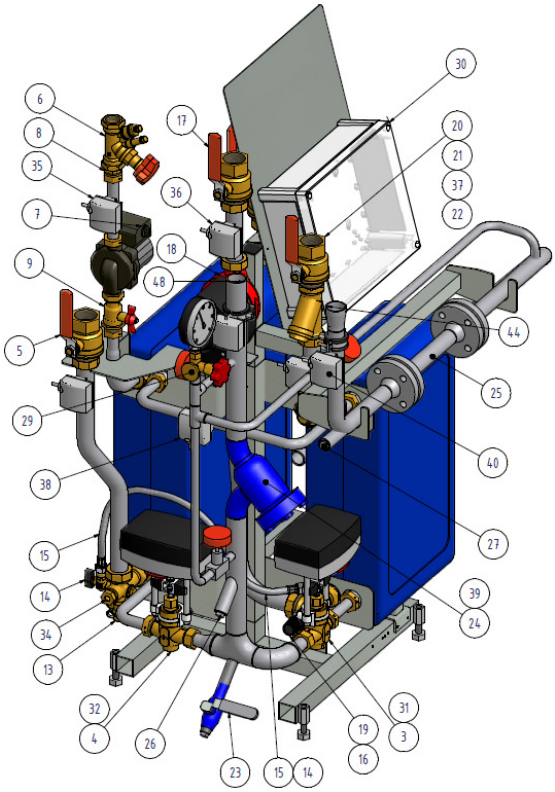
Picture 3



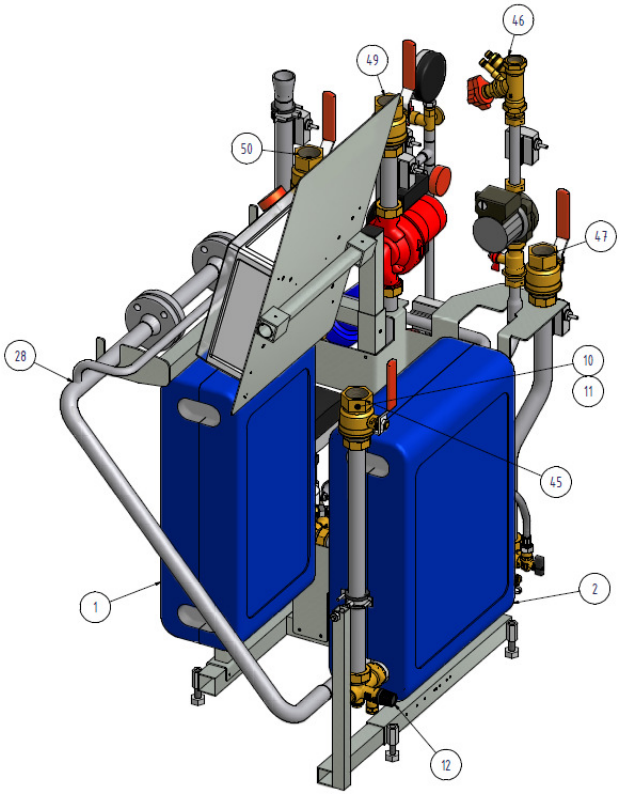
Picture 4

1	Heat exchanger, heat
2	Heat exchanger, DHW
3	Control valve, heating
4	Control valve, DHW
5	Shut off valve, DHW
6	Balancing valve, DHWC
7	Pump DHWC
8	None return valve, DHWC
9	Shut off valve, DHWC
10	Shut off valve, CW
11	None return valve, CW
12	Safety valve, CW
13	Draining valve, DH-Supply
14	Topping up
15	Hose
16	Draining valve, heat supply
17	Shut off valve, heat supply
18	Pump heating
19	Safety valve, heating
20	Shut off valve, heat return
21	Strainer, heat return
22	Connection expansionvessel
23	Draining valve, DH-Supply
24	Strainer, DH-Supply
25	Heat meter dummy
26	Connection energy meter sensor primary supply
27	Connection energy meter sensor primary return
30	Control center IQHeat100
31	Actuator, heating
32	Actuator, DHW
33	Temp.sensor, outdoor
34	Temp.sensor, DHW supply
35	Temp.sensor, DHWC return
36	Temp.sensor, heating supply
37	Temp.sensor, heating return
38	Temp.sensor, primary heating return
39	Temp.sensor, primary supply
40	Temp.sensor, primary return
44	DH Return
45	CW
46	DHWC
47	DHW
48	DH supply
49	Heat Supply
50	Heat Return

1.7 Product overview Midi Compact IQHeat with horizontal metering



Picture 5



Picture 6

1	Heat exchanger, heat
2	Heat exchanger, DHW
3	Control valve, heating
4	Control valve, DHW
5	Shut off valve, DHW
6	Balancing valve, DHWC
7	Pump DHWC
8	None return valve, DHWC
9	Shut off valve, DHWC
10	Shut off valve, CW
11	None return valve, CW
12	Safety valve, CW
13	Draining valve, DH-Supply
14	Topping up
15	Hose
16	Draining valve, heat supply
17	Shut off valve, heat supply
18	Pump heating
19	Safety valve, heating
20	Shut off valve, heat return
21	Strainer, heat return
22	Connection expansionvessel
23	Draining valve, DH-Supply
24	Strainer, DH-Supply
25	Heat meter dummy
26	Connection energy meter sensor primary supply
27	Connection energy meter sensor primary return
28	Connection 3-point HB metering
29	Pressure gauge connection
30	Control center IQHeat100
31	Actuator, heating
32	Actuator, DHW
33	Temp.sensor, outdoor
34	Temp.sensor, DHW supply
35	Temp.sensor, DHWC return
36	Temp.sensor, heating supply
37	Temp.sensor, heating return
38	Temp.sensor, primary heating return
39	Temp.sensor, primary supply
40	Temp.sensor, primary return
44	DH Return
45	CW
46	DHWC
47	DHW
48	DH supply
49	Heat Supply
50	Heat Return

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℃. 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 *Installation And Service Instruction IQHeat EN Doc 1334*.

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 Installation

3.1 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.

3.2 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.

3.3 Mounting

- Place the substation so that connections, adjustment equipment and safety valves are easily accessible.

- Mount the DHWC pump with its gasket, components and pipes to the substation.

- Mount the shutoff valves on district heating supply and return. Shutoff valves are not supplied.

- Connect the pipe works to the connection points.

- On substations without a meter section; mount the surface sensor for primary in and out on the incoming and outgoing pipes for the primary circuit.

- When executing hot work on or close by the substation, all incendiary components should be demounted and removed.

- With supply temperatures above 120°, it is recommended that the actuator is tilted or closed down, see *Picture 7*.

- 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.

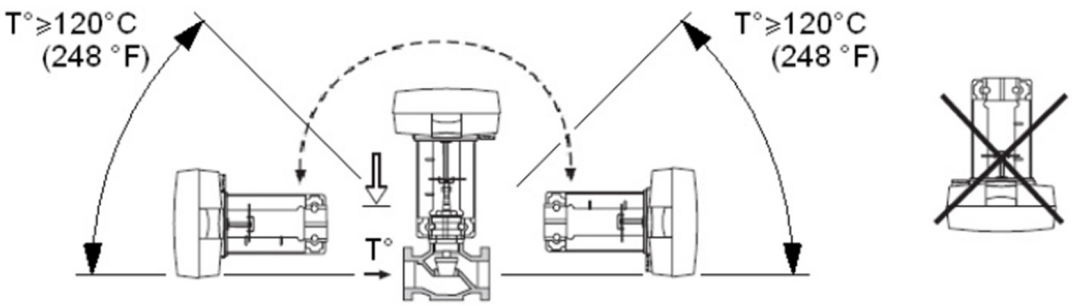
- Energy meters must be installed at a prepared location, replacing a gauge block, or following the instructions of the energy supplier.

- 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 *6.2*.



Picture 7

3.4 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.
- Set the date and time on the control center IQHeat.
  See Installation_And_Service_Instruction_IQHeat_EN_Doc_1334.

- 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℃. 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 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 *8 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.

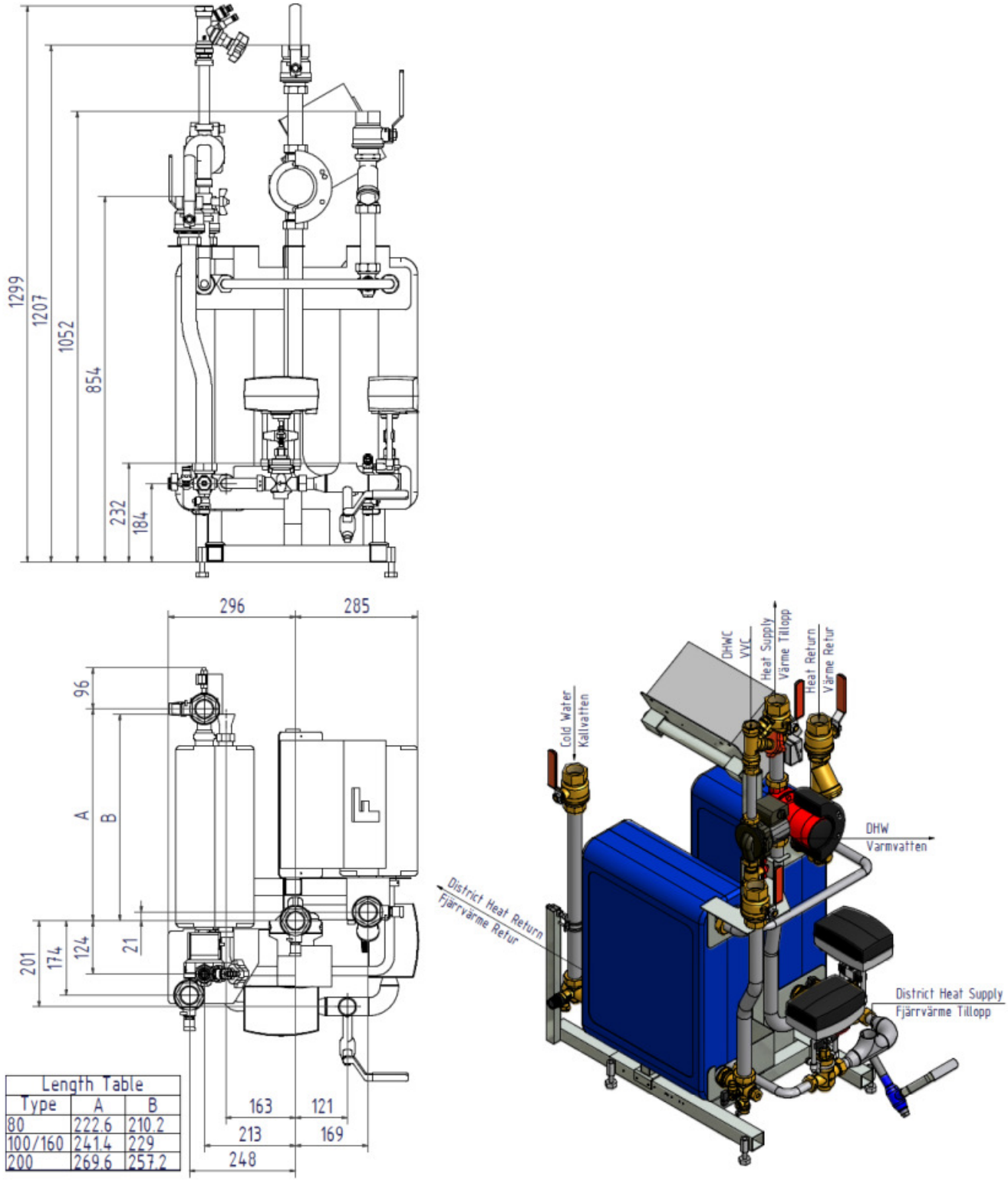
3.5 Dismantlement

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.

3.6 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.

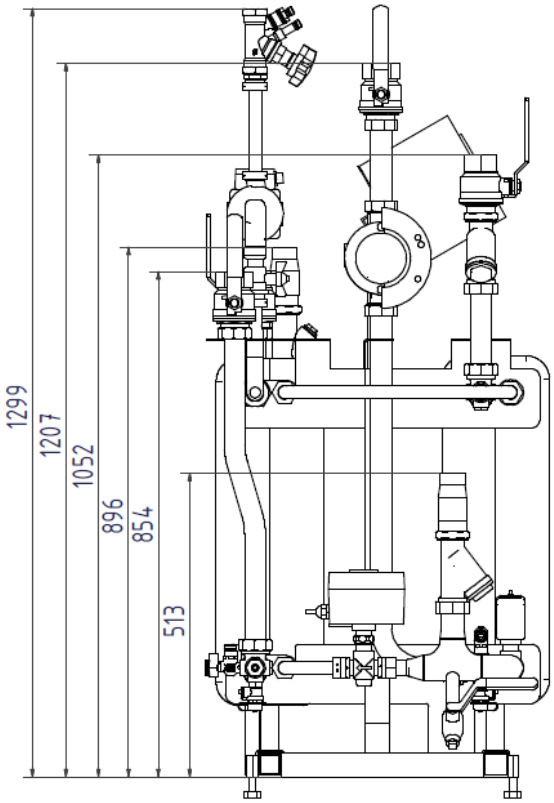
3.7 Measure sketch Midi Compact

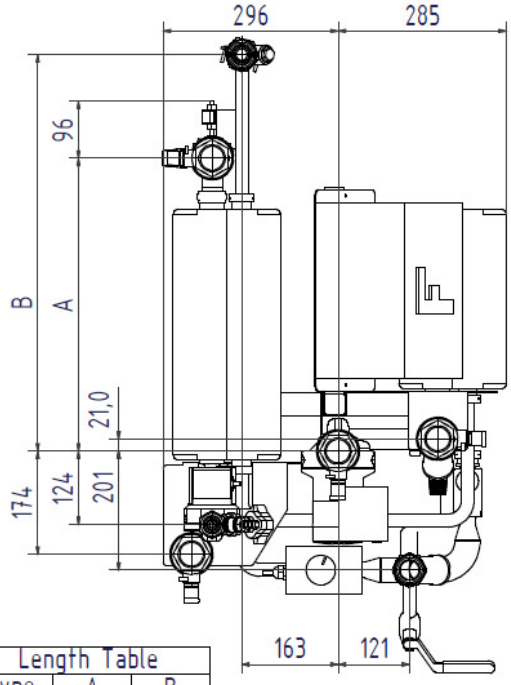


Length Table		
Type	A	B
80	222.6	210.2
100/160	241.4	229
200	269.6	257.2

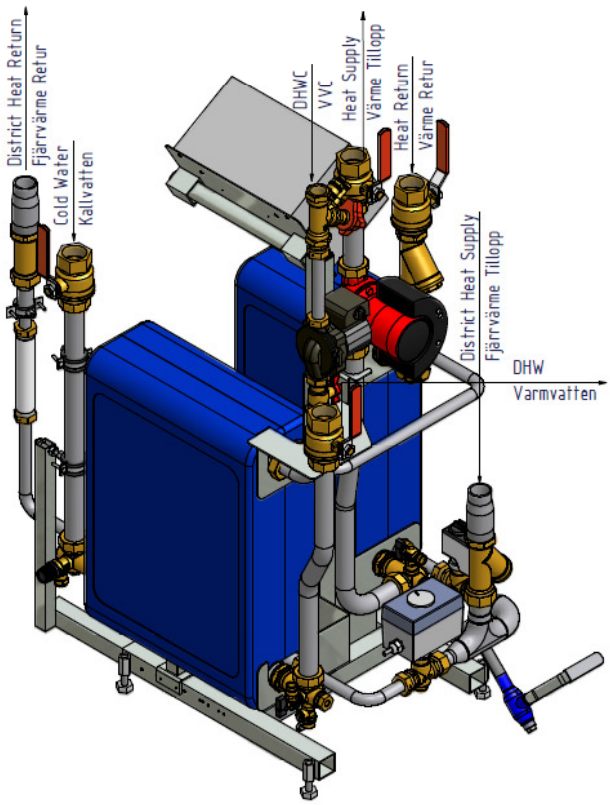
Picture 8

3.8 Measure sketch Midi Compact with vertical metering



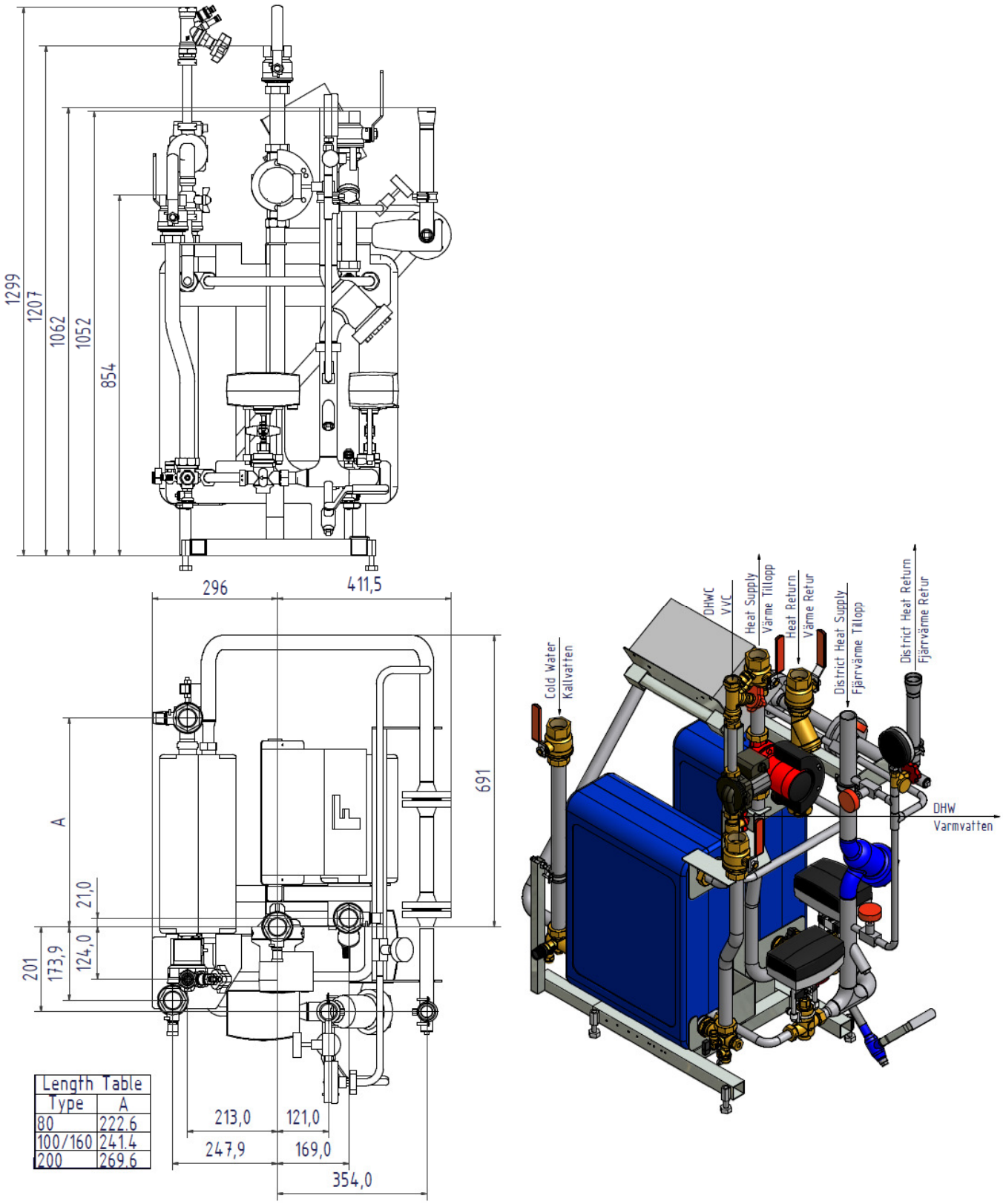


Length Table		
Type	A	B
80	222.6	397.6
100/160	241.4	416.4
200	269.6	444.6



Picture 9

3.9 Measure sketch Midi Compact with horizontal metering



Picture 10

4 Control Center IQHeat100

IQHeat is an intelligent controller for district heating and district cooling substations.
Whether it is energy saving, energy cost reduction or comfort monitoring that is your ultimate goal, IQHeat from Cetetherm is an excellent choice.
IQHeat is fitted with a display.

IQHeat always has a temperature sensor on the primary side supply and return, and on the secondary side supply and return. The sensors allow for the effective limitation of return temperatures and simple monitoring and remote troubleshooting of functional or comfort problems.

IQHeat is always factory tested and factory set. Only the date and time must be set at start up. In order to the time schedule to work correct.

IQHeat is available in a range of models. Midi Compact has an IQHeat100 that serves one heating circuit and one hot water circuit.

Communication with the control unit takes place with Modbus or TCP/IP.
Different methods of communication are available, depending on the external communication modules that are connected.

The following add-on modules are available and can be connected to a Midi Compact.

- MBus
- BacNet IP
- Advanced Web

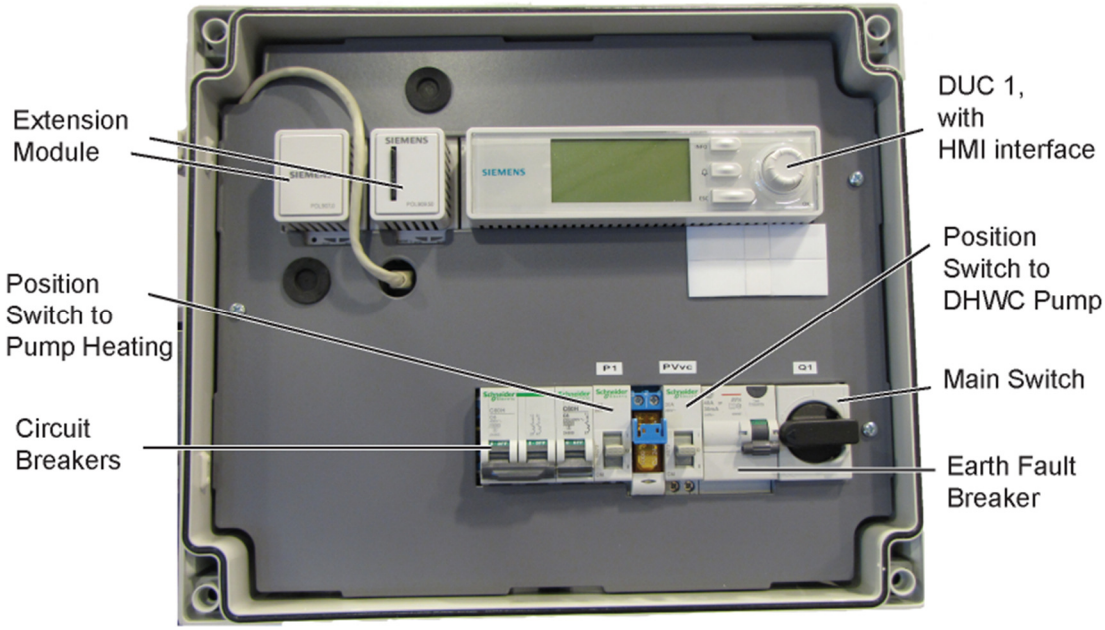
Maximal two add-on modules can be connected.

Add-on modules give you the option of

- meter data via MBus
- Integrated WEB server where all data and history from IQHeat is available through a simple web browser without requiring any special software or server connections
- BacNet and LON as well as ModBus give you the option of controlling IQHeat from the central building automation system.

For more information about the IQHeat, see *Installation And Service Instruction IQHeat EN Doc 1334*.
The manual describes all the services, functions and settings that can be made with the control unit, which is common to all models of IQHeat.

Not all of the services, functions and settings are utilised by the different models.



Picture 11

4.1 Password and login

The controller has password protection, allowing access to different menus.
The following log-in levels are available:

All users: no log-in, no password required

- read access to all menus except the system parameters, configuration and detail menus
- read access to alarm lists and alarm history

End user, level 6, password 1000

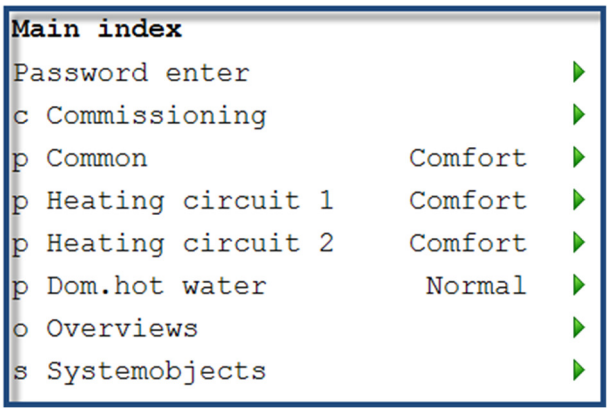
- appears with one key in the upper left corner of the display
- all rights as for in "all users"
- read access to all menus except configuration menus
- write access to the main setpoints (Setpoints/Settings. > Setpoints)
- alarms and alarm history can be acknowledged and reset

Service level, level 4, password 2000

Used for configuring I/Os and system settings. Only qualified service personnel should make changes at this level.

- appears with two keys in the upper left corner of the display
- all rights as for "End users"
- access to all menus except I/O configuration and system settings

4.1.1 Log in



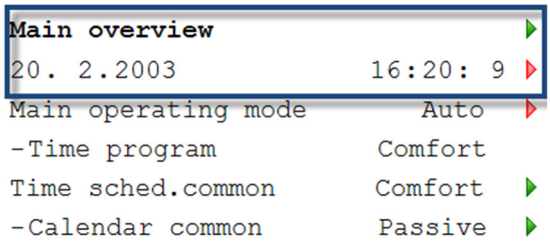
1. Keep the *OK* button pressed to access the Password menu.
2. The first digit of four is marked with 0.
3. Turn the navigation dial until the desired number appears.
4. Press *OK* to proceed to the next digit, continue until all four are entered correctly and press *OK*.

The current key symbol will appear in the upper left corner of the display window.

4.2 Time functions setting of time and date

The controller's clock includes the functions for summer and winter time changes and leap years. The clock has a backup function to cover at least 24 hours of power cuts.

4.2.1 Reading date and time



1. Press *Info* to access *Main overview*.
2. The top line shows the set date and time.

4.2.2 Setting date and time

Requires login at the end user level.

1. Press *Info* until the page with the date and time are displayed.
2. Move the cursor to the line for date and time.
3. Press *OK* to edit the day.
4. Set the correct day with the navigation dial, press *OK* to confirm and continue to edit the month and year.
5. Continue to edit the hours, minutes and seconds in the same way.
6. Exit the menu with *ESC*.

5 Troubleshooting

5.1 Fault indication for IQHeat

The processing unit alerts for different situations. Alarms are indicated on the control display with the alarm symbol  .

Alarms are divided into three classes:

- A or 1 = Alarm, High
- B or 2 = Alarm, Low
- C or 3 = Alarm, Warning

Active alarms:

- alarm symbol in the display flashes
- alarm button on the control panel flashes

Acknowledged but still active alarm:

- alarm symbol in the display lights
- alarm button on the control panel lights

If a GSM modem is connected to the processing unit, an alarm is sent by text message to the specified telephone number.

For more information see *Installation And Service Instruction IQHeat EN Doc 1334*.

5.2 Fault codes chart Magna pump

Indicator light is off

Indicator light is on

Indicator light is flashing

Indicator lights		Fault	Cause	Remedy
Green	Red			
○	○	The pump is not running	One fuse in the installation is blown / tripped out.	Replace / cut the fuse. Check that the electricity supply falls within the specified range.
			The current-operated or voltage operated circuit breaker has tripped out	Cut the circuit breaker. Check that the electricity supply falls within the specified range
			The pump mat be defective	Replace the pump or call service for assistance.
✳	○	The pump is not running	The pump has been stopped in one of the following ways. 1. With the button ⏎. 2. External on/off switch in position off.	1. Start the pump by pressing ⏎. 2. Switch on the on/off switch.
○	☼	The pump has stopped due to a fault.	Electricity supply failure.	Check that the electricity supply falls within the specified range.
			Pump blocked and/or impurities in the pump.	Dismantle and clean the pump.
			The pump may be defective.	Replace the pump or call service for assistance.
☼	☼	The pump is running but is faulty.	The pump is faulty, but is able to operate.	Try to reset the fault indication by briefly switching of the electricity supply or by pressing the button ↺, ⏎ or ⏎. In case of repeated faults, contact service.
✳	☼	The pump has been set to stop and is faulty.	The puma is faulty, but is able to operate (has been set to STOP).	
☼	○	Noise in the system.	Air in the system.	Vent the system.
			The flow is too high.	Reduce the setpoint and possibly change over to AUOT$_{ADAPT}$ or constant pressure.
			The pressure is too high.	Reduce the setpoint and possibly change over to AUOT$_{ADAPT}$ or proportional pressure.
☼	○	Noise in the pump.	The inlet pressure is too low.	Set the pump to “MAX” by continuously pressing the button ⏎. After venting, set the pump back to normal duty by pressing the buttons ⏎, ↺. **Note**: The pump must not run dry.
			Air in the pump.	

6 Electrical installation

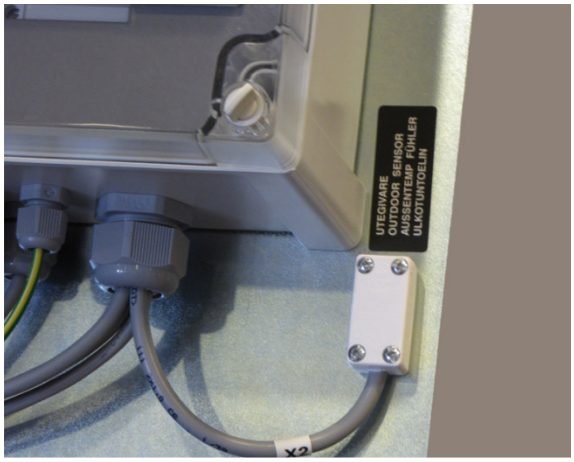
6.1 General

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.

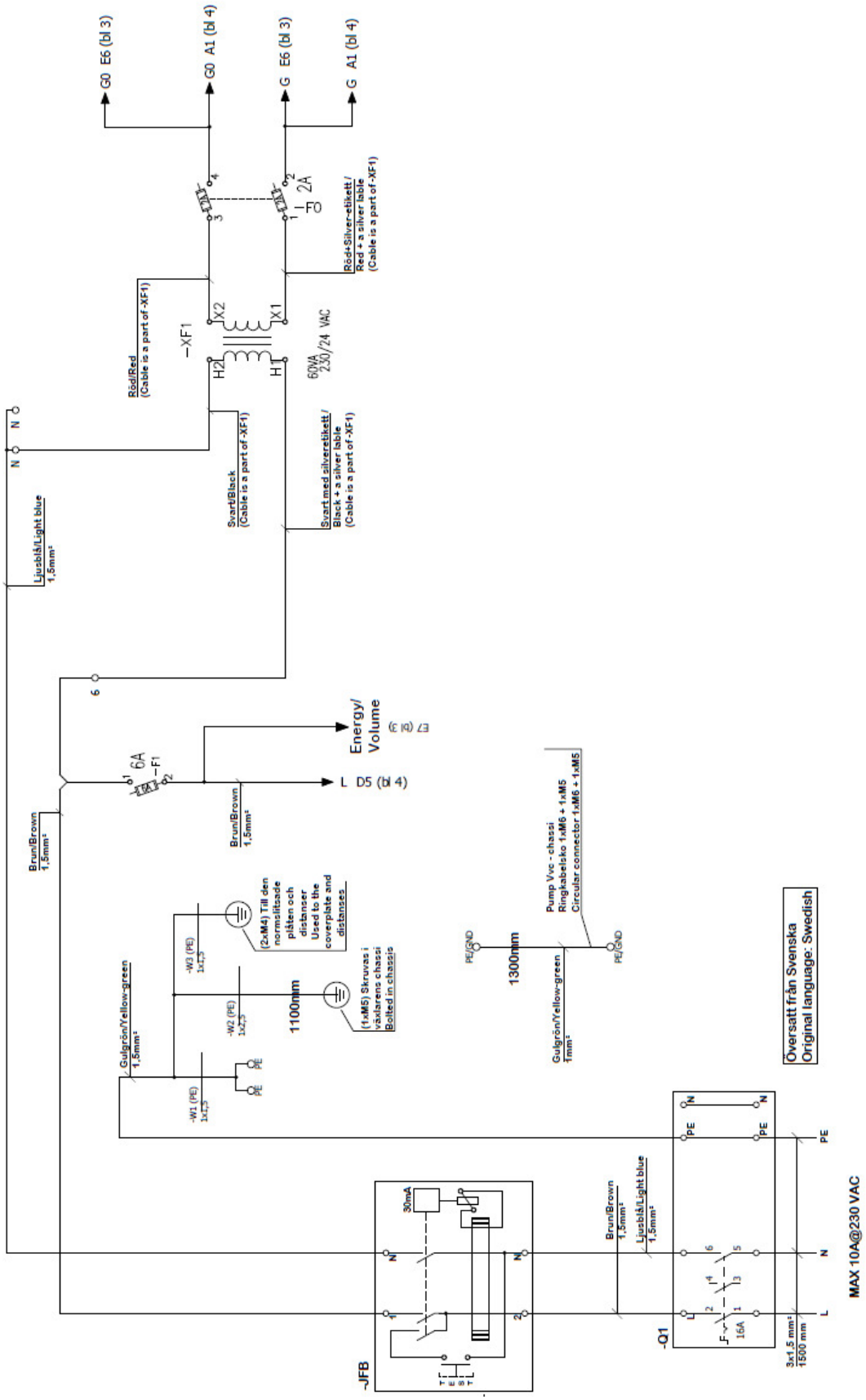
6.2 Installation of outdoor temperature sensor

Connect the outdoor temperature sensor to the terminal block on the montage plate, remove the resistor.
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.

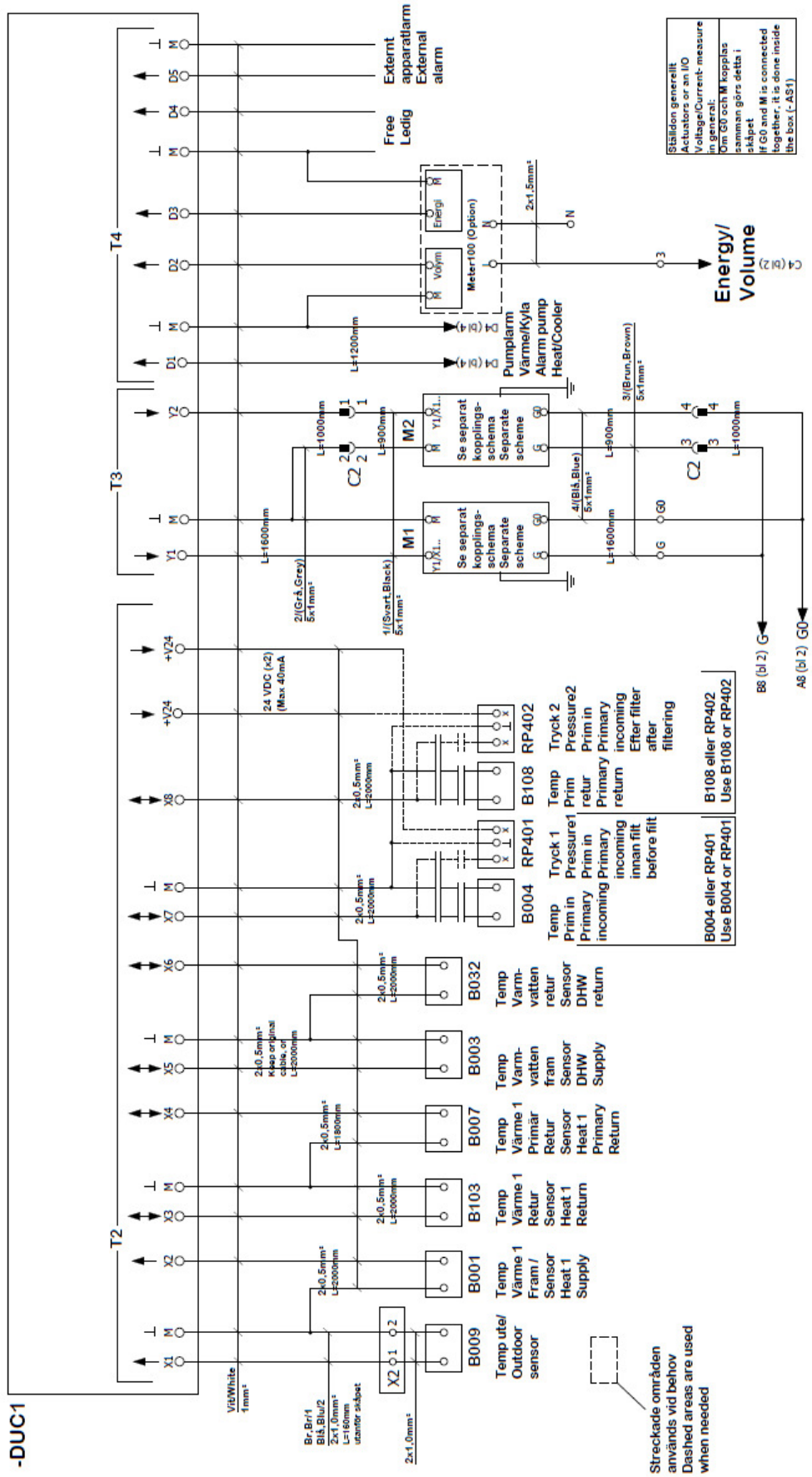


Picture 12

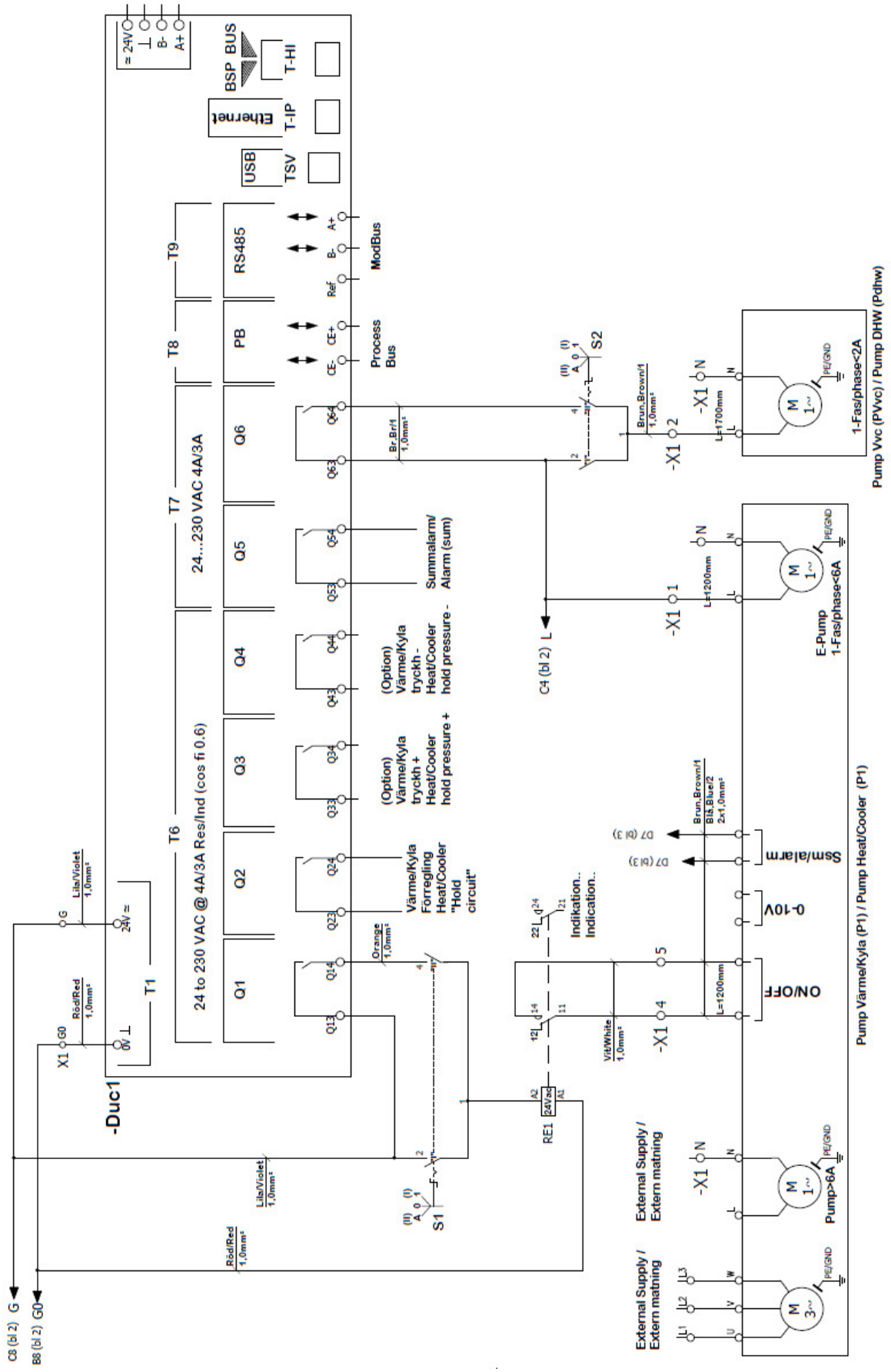
6.3 Electrical circuit diagram EU



Picture 13


-DUC1
T2
T3
T4
Externt apparatlarm
External alarm
Free
Ledig
Energy/
Volume
Pumplarm
Värme/Kyla
Alarm pump
Heat/Cooler
Meter100 (Option)
Se separat kopplingsschema
Separate scheme
M1
M2
C2
24 VDC (x2)
(Max 40mA
B009
Temp ute/
Outdoor
sensor
B001
Temp
Värme 1
Fram /
Sensor
Heat 1
Supply
B103
Temp
Värme 1
Retur
Sensor
Heat 1
Return
B007
Temp
Värme 1
Primär
Retur
Sensor
Heat 1
Primary
Return
B003
Temp
Varm-
vatten
fram
Sensor
DHW
Supply
B032
Temp
Varm-
vatten
retur
Sensor
DHW
return
B004
Temp
Prim in
Primary
incoming
RP401
Tryck 1
Pressure1
Prim in
Primary
incoming
innan filt
before filt
B004 eller RP401
Use B004 or RP401
B108
Temp
Prim
retur
Primary
return
RP402
Tryck 2
Pressure2
Prim in
Primary
incoming
Efter filter
after
filtering
B108 eller RP402
Use B108 or RP402
Streckade områden
används vid behov
Dashed areas are used
when needed

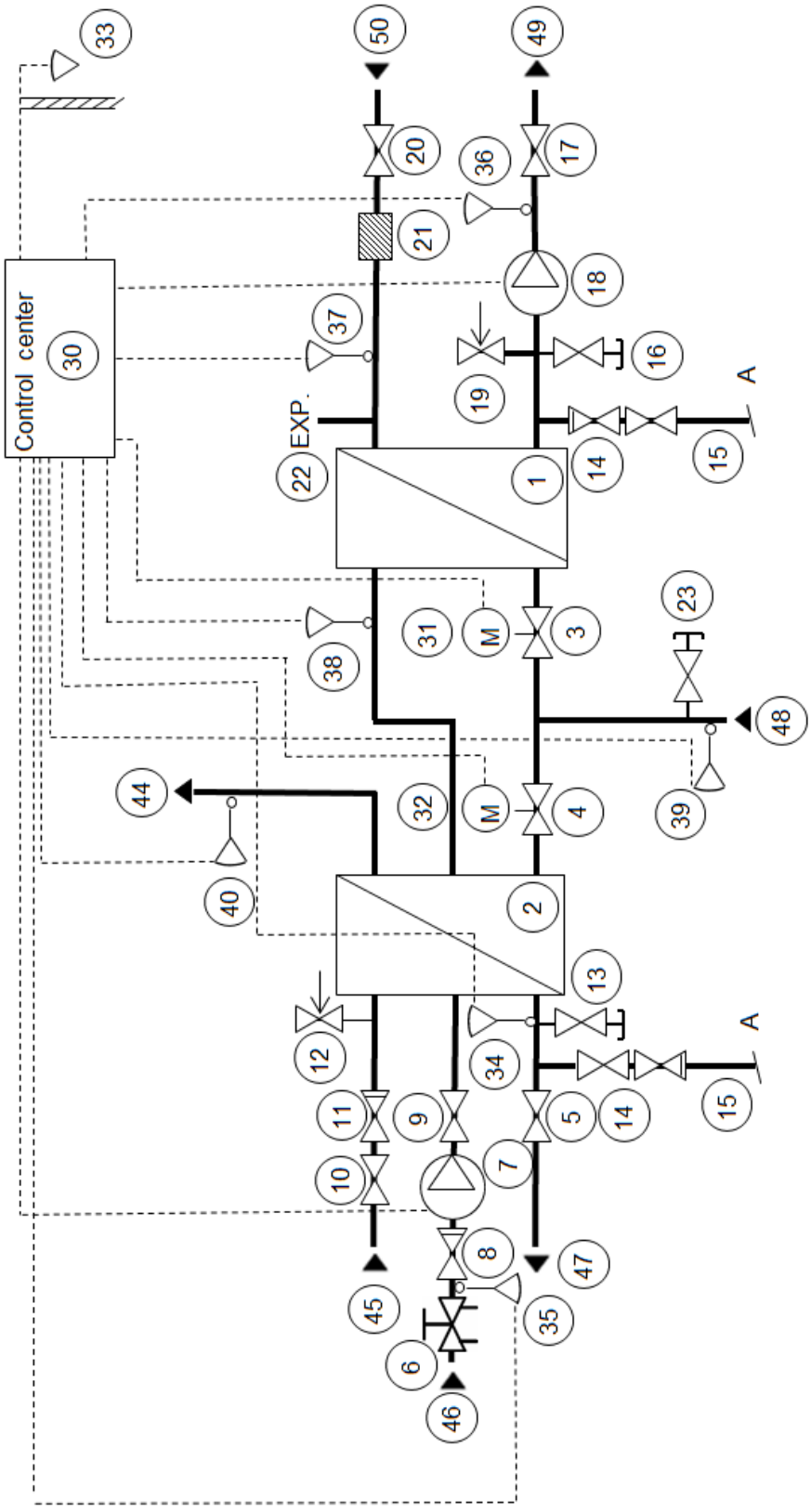
Picture 14


-Duc1
T1
T6
T7
T8
T9
24 to 230 VAC @ 4A/3A Res/Ind (cos fi 0.6)
24...230 VAC 4A/3A
RS485
PB
TSV
T-IP
T-HI
USB
BSP BUS
Ethernet
ModBus
Process Bus
Q1
Q2
Q3
Q4
Q5
Q6
Värme/Kyla Förregling Heat/Cooler "Hold circuit"
(Option) Värme/Kyla tryckh + Heat/Cooler hold pressure +
(Option) Värme/Kyla tryckh - Heat/Cooler hold pressure -
Summalarm/ Alarm (sum)
Indikation.. Indication..
RE1
S1
S2
Pump Värme/Kyla (P1) / Pump Heat/Cooler (P1)
Pump Vvc (PVvc) / Pump DHW (Pdhw)
1-Fas/phase<2A
E-Pump 1-Fas/phase<6A
Pump>6A
External Supply / Extern matning
Ssm/alarm
0-10V
ON/OFF
C4 (bl 2) L
C8 (bl 2) G
B8 (bl 2) G0

Picture 15

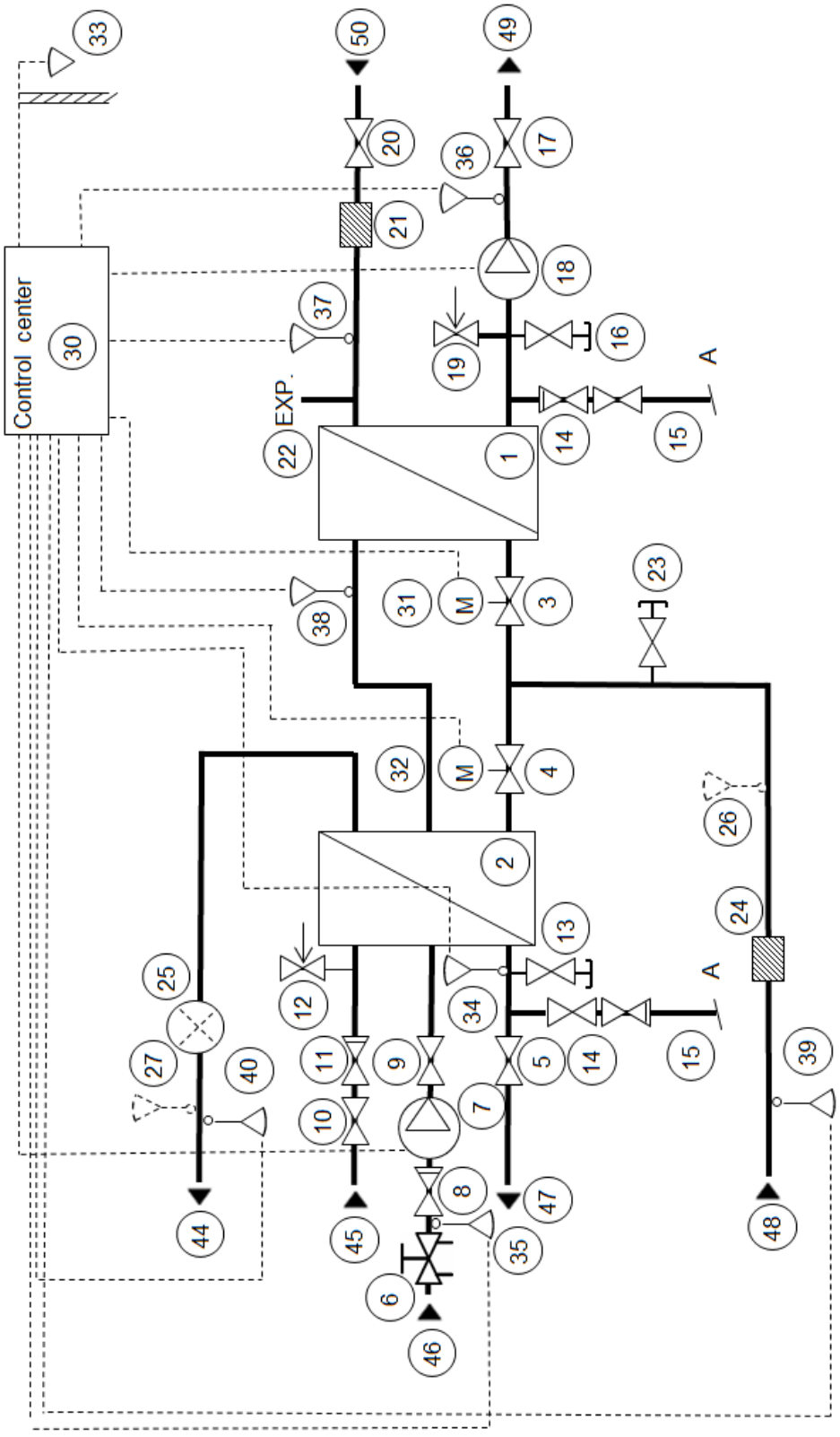
7 Schematic diagram, main components

7.1 Midi Compact



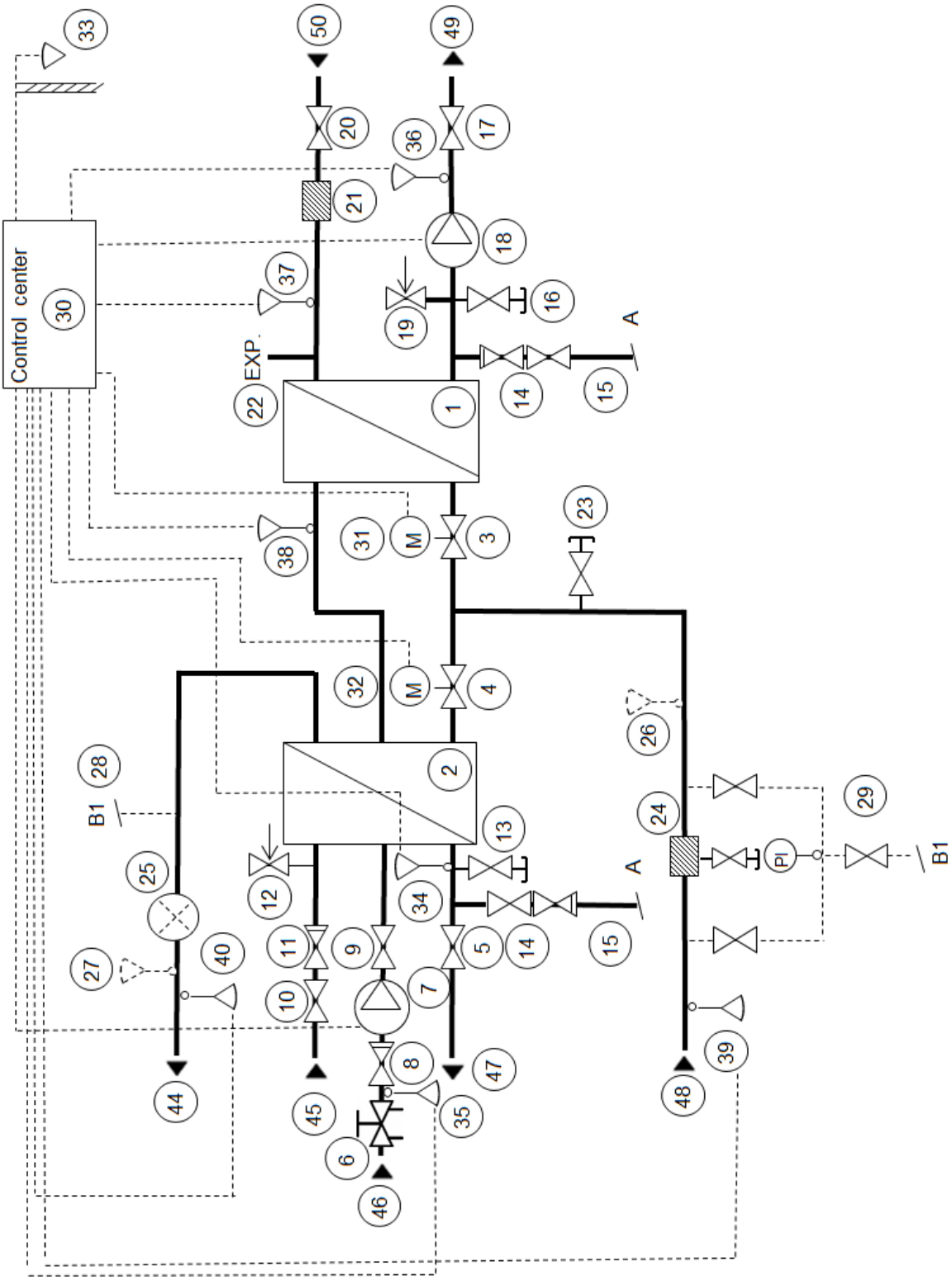
Picture 16

7.2 Midi Compact with vertical metering



Picture 17

7.3 Midi Compact with horizontal metering



Picture 18

8 Pump settings and pump capacity

8.1 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 traditional three speed circulation pump. The DHWC pump has a switch where the speed/capacity can be set.

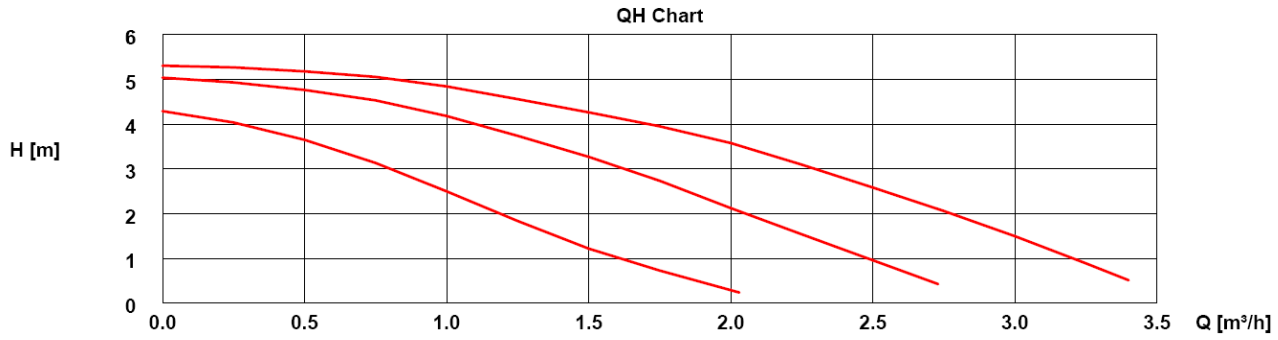
The circulation pump for heating circuit is a pressure controlled pump. The pump is equipped with a GENI module that, via GENIBUS, communicate with IQHeat.

The pressure controlled pump has an operator control panel where the different settings can be done.
If all heaters are not at the same temperature, reset the pump to a higher setting.

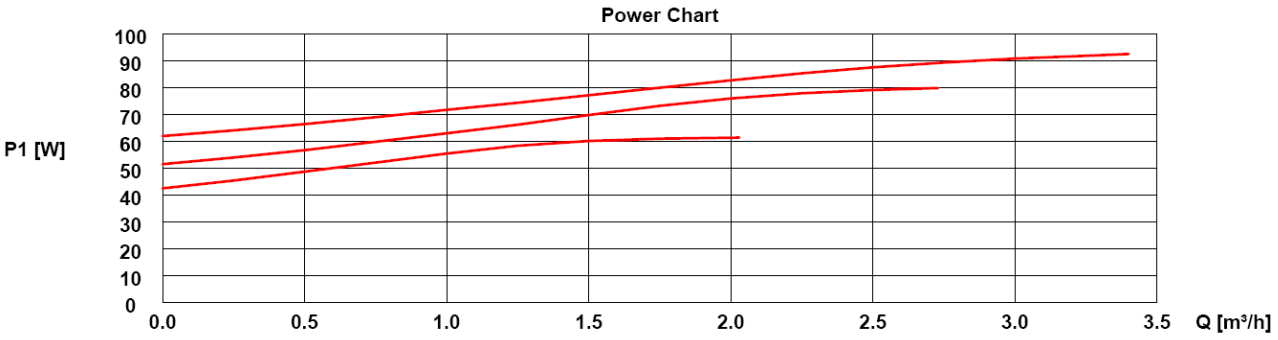
If there is a whistling sound in the pipe system, select a lower output setting. The lowest possible setting is the most economical

For more information, please see below.

8.2 DHWC pump Grundfos UPSO 15-55, capacity



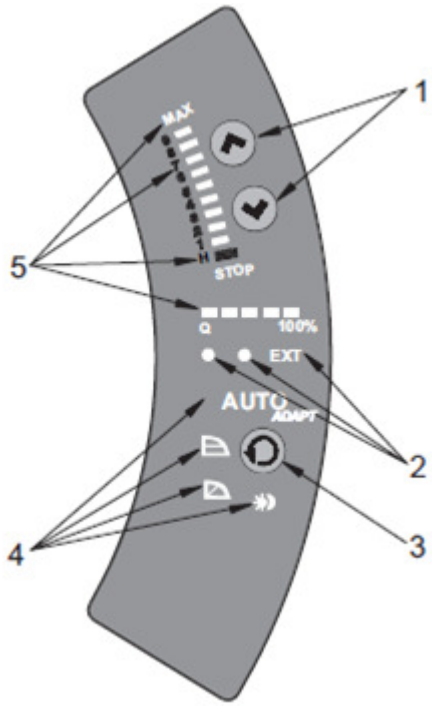
Picture 19



Picture 20

8.3 Heating circuit Grundfos Magna 25-100, settings and capacity

The pump is factory pre-set on AUTO$_{ADAPT}$ without automatic night time decrease.



Pos.	Description
1	Buttons for setting
2	Indicator lights for operating and fault indication and symbol for indication of external control
3	Button for change of control mode
4	Light symbols for indication of control mode and night-time duty
5	Light fields for indication of head, flow and operating mode

Picture 21

8.3.1 Control modes

The Magna pump can be set to the one of three possible control modes.

- AUTO$_{ADAPT}$ (factory setting)
- Proportional pressure
- Constant pressure.

Each of the control modes can be combined with automatic night-time duty.

AUTO$_{ADAPT}$ (factory setting)
This mode is recommended for most heating installations.
During operation, the pump automatically makes the necessary adjustment to the actual system characteristic. This setting ensures minimum energy consumption and noise level which reduces operating costs and increases comfort.

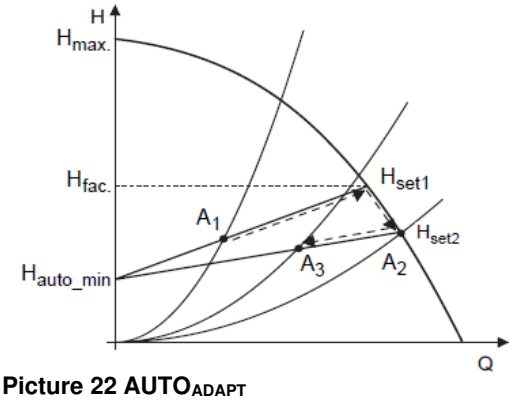
Proportional-pressure control
The pump head is changed continuously in accordance with the water demand in the system. The desired set point can be set on the pump control panel.

Constant-pressure control
A constant head is maintained, irrespective of water demand. The desired set point can be set on the pump control panel.

Automatic night-time duty
The pump changes automatically between normal duty and night-time duty depending on the flow-pipe temperature. Automatic night-time duty can be combined with the above-mentioned control modes.

AUTO$_{ADAPT}$
Set on the control panel. The control mode AUTO$_{ADAPT}$ continuously adapts the pump performance.

The set point of the pump has been factory-set to 5.5 meter and cannot be changed manually.
When the pump registers a lower pressure on the max, curve A2, the AUTO$_{ADAPT}$ function automatically selects a correspondingly lower control curve, Hset2, thus reducing the energy consumption.

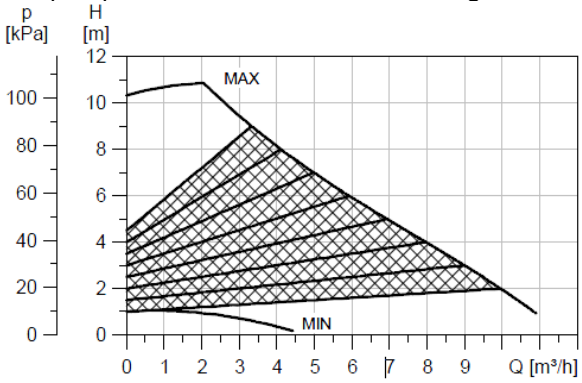


Picture 22 AUTO$_{ADAPT}$

A1: Original duty point.
A2: Lower registered pressure on the max curve.
A3: New duty point after AUTO$_{ADAPT}$ control.
Hset1: Original set point.
Hset2: New set point after AUTO$_{ADAPT}$ control.
Hfac: Factory pre-set set point.

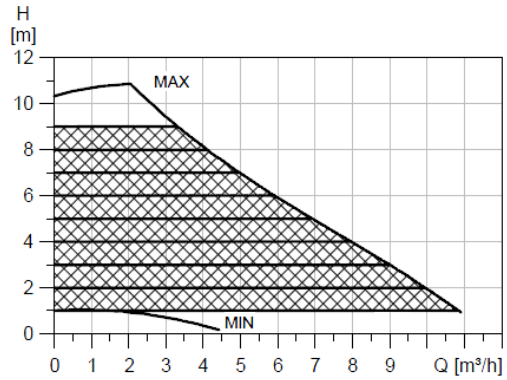
The AUTO$_{ADAPT}$ function can be reset by pressing the button for approx. 10 seconds until the control mode is back to the starting point, AUTO$_{ADAPT}$ or AUTO$_{ADAPT}$ with automatic night-time duty.

Proportional-pressure control
To be set on the control panel.
The pump head is reduced at decreasing water demand and increased at rising water demand.



Picture 23

Constant-pressure control
To be set on the control panel.
The pump maintains a constant pressure, irrespective of water demand.



Picture 24

8.3.2 Selection of control mode

System type	Description		Select this control mode
Typical heating systems	Grundfos recommends letting the pump remain in AUTO$_{ADAPT}$ mode. This ensures optimum performance at the lowest possible energy consumption.		AUTO$_{ADAPT}$
Relatively great head losses in the distribution pipes and air-conditioning systems	1. Two-pipe heating systems with thermostatic valves and:	• with a dimensioned pump head higher than 3 metres, • very long distribution pipes, • strongly throttled pipe balancing valves, • differential pressure regulators, • great head losses in those parts of the system through which the total quantity of water flows (e.g. boiler, heat exchangers and distribution pipe up to the first branching.)	Proportional pressure 
	2. Primary circuit pumps in systems with great head losses in the primary circuit.		
	3. Air- conditioning systems with	• heat exchangers (fan coils), • cooling ceilings, • cooling surfaces	
Relatively small head losses in the distribution pipes	1. Two-pipe heating systems with thermostatic valves and	• with a dimensioned pump head lower than 2 metres, • dimensioned for natural circulation, • with small head losses in those parts of the system through which the total quantity of water flows (e.g. boiler, heat exchangers and distribution pipe up to the first branching.) or • modified to a high differential temperature between glow pipe and return pipe (e.g. district heating).	Constant pressure
	2. Underfloor heating systems with thermostatic valves.		
	3. One-pipe heating systems with thermostatic valves or pipe balancing valves		
	4. Primary circuit pumps in systems with small head losses in the primary circuit.		

Set point setting
If AUTO$_{ADAPT}$ is selected, the set point cannot be set.

The set point can be set by pressing or when the pump is in control mode:
• Proportional pressure
• Constant pressure
• Constant-curve duty

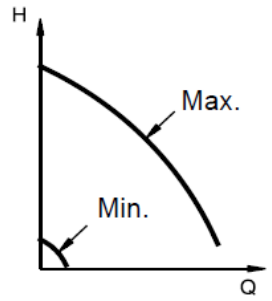
Set the set point so that it matches the system.
A too high setting may result in noise in the system whereas a too low setting may result in insufficient heating or cooling in the system.

Automatic night-time decrease
To be set on the control panel.

Once automatic night-time duty has been activated, the pump automatically changes between normal duty and night-time duty (duty at low performance). Changeover between normal duty and night-time duty is dependent on the flow-pipe temperature. The pump automatically changes over to night-time duty when the built-in sensor registers a flow-pipe temperature drop of more than 10-15 °C within approx. 2 hours. The temperature drop must be at least 0.1 °C/min.
Changeover to normal duty takes place without a time lag when the temperature has increased by approx. 10 °C.

8.3.3 Maximum or minimum curve duty

To be set on the control panel.
The pump can be set to operate according to the max. or min. curve, like an uncontrolled pump., see *Picture 25*.
This operating mode is available, irrespective of the control mode.

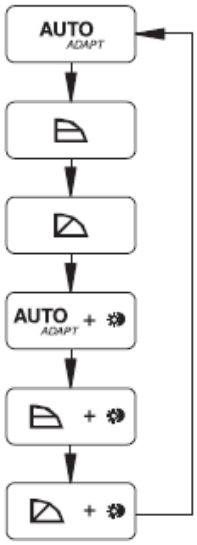


Picture 25 Maximum and minimum curves

The **maximum curve** mode can be selected if an uncontrolled pump is required.
The **minimum curve** mode can be used in periods in which a minimum flow is required. This operating mode is for instance suitable for manual night-time duty if automatic night-time duty is not desired.

8.3.4 **Control mode setting**

To change the control mode, press , pos. 3 on the control panel, according to this cycle:



Picture 26

Automatic night-time duty can be activated together with each of the control modes.
The light symbols, pos. 4 on the control panel, indicate the pump settings:

Light in	Control mode	Automatic night-time duty
Auto$_{ADAPT}$	Auto$_{ADAPT}$	NO
	Proportional pressure	NO
	Constant pressure	NO
-	Constant curve	NO
Auto$_{ADAPT}$	Auto$_{ADAPT}$	YES
	Proportional pressure	YES
	Constant pressure	YES
-	Constant curve	YES

"-" = no light

8.3.5 **Set point setting**

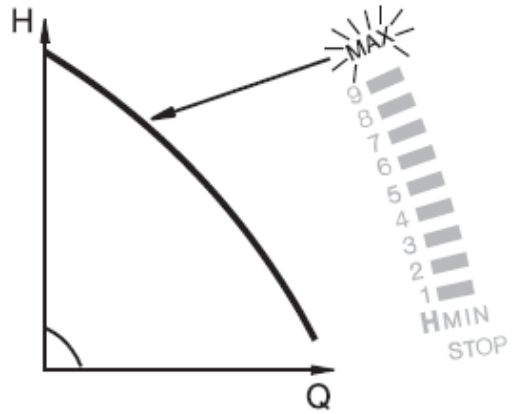
Set the set point of the pump by pressing or when the pump has been set to proportional-pressure control, constant-pressure control or constant-curve duty.
The light fields, pos. 5 on the control panel, indicate the set point set.

The light fields can indicate a maximum set point of 9 meter.

Picture 27

8.3.6 **Setting to maximum curve duty**

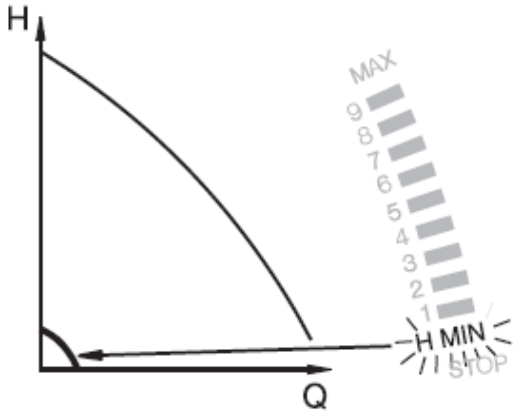
To change over to the maximum curve, press continuously until "MAX" illuminates. To change back, press continuously until the desired set point is indicated.



Picture 28 Maximum curve

8.3.7 Setting to minimum curve duty

To change over to the min. curve, press continuously until "MIN" illuminates. To change back, press continuously until the desired set point is indicated.



Picture 29 Minimum curve

8.3.8 Starting and stopping pump

To stop the pump, press continuously until "STOP" illuminates. When the pump is stopped, the green indicator light will be flashing.

To start the pump, press continuously.

8.3.9 Resetting of fault indications

The fault indications are reset by briefly pressing any button. The settings remain unchanged.
If the fault has not disappeared, the fault indication will reappear. The time until the fault reappears may vary from 0 to 255 seconds.

8.4 GENI module

Function:

- external analog control of head or speed via a signal from an external 0-10 V signal transmitter.
- external forced control via inputs for:
  - max. curve
  - min. curve
- bus communication via GENIbus
  The pump can be controlled and monitored by a Grundfos Control MPC Series 2000, a building management system or another type of external control system.
- external start/stop
  The pump can be started and stopped via the = digital input.

9 Service instructions

NOTE: Make sure that the substation has been correctly installed.
For more information about IQHeat, see Installation_And_Service_Instruction_IQHeat_EN_Doc_1334.

Symptom	Reason	Section	Action
A. Tap water too cold	District heating supply too low	A1	Check available differential pressure and temperature
	District heating filter clogged **NOTE:** This filter is only available on vertical and horizontal metering	A2	Check if the district heating filter is blocked
	Hot water valve and actuator does not work	A3	Check the function of the valve and actuator for hot water
B. Tap water too warm	Hot water valve and actuator does not work	B1	Check the function of the valve and actuator for hot water
C. Heating system temperature too high or too low	Heating supply temperature sensor and outdoor temperature sensor does not work	C1	Check the heating supply temperature sensor and outdoor temperature sensor
	Heating circuit filter clogged	C2	Check heating circuit filter
	The heating control equipment may need to be adjusted	C3	Check and adjust the heating curve
	Heating valve and/or actuator does not work	C4	Check the actuator and valve function
D. No heating	Circulation pump not running		Check that the electrical power is on and that no fuse is broken
	Air pockets in the substation or in the heating circuit	D1	Check the circulation pump
		D2	Check pre-set heating parameters on the control panel display
		D3	Vent the pump
	Heating supply temperature sensor and outdoor temperature sensor does not work	D4	Check the heating supply temperature sensor and outdoor temperature sensor
	Loss of function in the heating control unit.	D5	Run the pump manually
	Heating circuit filter clogged	D6	Check heating circuit filter
E. Noise in the radiator system	The heating pump capacity set too high	E1	Reduce the pump capacity
	Air in the heating pump	E2	Vent the pump
	The heating pump motor or pump component damaged	E3	Change pump components or the complete pump

F. Hot water or heating temperature unstable	Pending differential pressure	F1	Check available differential pressure and temperature
	District heating filter clogged	F2	Check if the district heating filter is blocked
	Heating supply temperature sensor and outdoor temperature sensor does not work	F3	Check the heating supply temperature sensor and outdoor temperature sensor
	DHWC pump is not running		Check that the electrical power is on
		F4	Check the circulation pump, DHWC
	Faulting settings for drain hot water	F5	Check pre-set parameters on control panel display
G. Heating system often needs topping up	Leaks in the substation or in the system	G1	Check the substation and the system for leaks
	The heating system safety valve is leaking or does not work	G2	Check the heating system safety valve
	The expansion vessel cannot handle the systems volume changes	G3	Check the volume take-up and pressure of the expansion vessel, or possible leakage
H. Noise in the DHWC system	The DHWC pump capacity set too high	H1	Reduce the DHWC pump capacity
	Air in the DHWC pump	H2	Vent the DHWC pump.
	The DHWC pump motor or pump component damaged	H3	Change pump components or the complete DHWC pump

A. Tap water too cold

A.1 Check available differential pressure and temperature
The temperature can be checked by means of the energy meter, minimum 65ºC, or at the district heating medium supply.
The hot water drain temperature can be monitored on the control panel display, see document *Installation And Service Instruction IQHeat EN Doc 1334* chapter *General Functions* section *Reading the current temperatures and valve modes*

A.2 Check if the district heating filter is blocked.
Note! This filter is only available on vertical and horizontal metering.
Close the shutoff valves for primary supply and primary return.
Release the filter holder and remove the cartridge (*Picture 30*). Clean the filter with water and refit the cartridge. Screw the filter holder with a momentum of 10-20 Nm. Open the primary supply and return valves carefully.

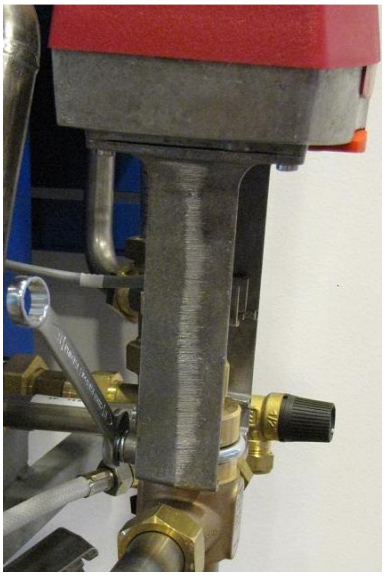
After finishing repair; open the shutoff valves. Start with primary supply and then the return lines, in order to avoid pollutions in the system. Open up the valves slowly to avoid pressure surges.

Picture 30

A.3 Check the function for the hot water valve and actuator

See section *Testing the valves,* chapter *Tests* in document *Installation_And_Service_Instruction_IQHeat_EN_Doc_1334.*

Before the hot water valve can be checked the actuator must be dismantled. Unscrew the screws on the shackle holding the actuator to the valve (*Picture 31*). Dismantle the actuator from the valve (*Picture 32*).



Picture 31

Picture 32

Press the valve guide pin gently (*Picture 33*) and check the valve´s travel and spring back.
Note: The valve may be very hot!

Picture 33

B. Tap water too warm

B.1 Check the function for the hot water valve and actuator
See *A.3*.

C. Heating system too hot or too cold

C.1 Check the heating supply temperature sensor and outdoor temperature sensor
The two temperatures can be monitored on the control panel display, see document *Installation_And_Service_Instruction_IQHeat_EN_Doc_1334* chapter *General Functions* section *Reading the current temperatures and valve modes*.

C.2 Check heating circuit filter
Disconnect the electrical power supply.
Shut closing valves for the heating supply and return. Drain the system with the draining valve.
Release the filter holder and remove the cartridge (*Picture 34*). Clean the filter in water and refit the cartridge. Screw the filter holder with a momentum of 10-20 Nm. Carefully open up the shutoff valves for the heating supply and return.

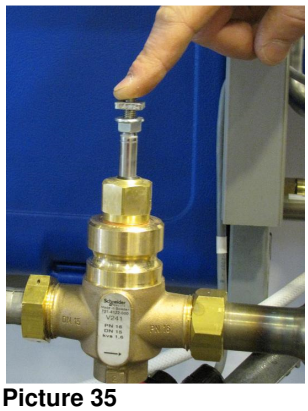
Picture 34

C.3 Check and adjust the heating curve
See chapter *Heating Circuit* in document *Installation_And_Service_Instruction_IQHeat_EN_Doc_1334*.

C.4 Check the actuator and valve function
See *A3*.

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 see *Picture 31* and *Picture 32.* Carefully press the valve spindle with a tool (*Picture 35*) and check the valve´s travel and spring back.

NOTE: The valve may be very hot!



Picture 35

D. No heating

D.1 Check the circulation pump
If the pump fails to start after stopping, start the pump at the highest setting.
See section *Testing the Pumps* in chapter *Tests* in *Installation And Service Instruction IQHeat EN Doc 1334*.

D.2 Check pre-set heating parameters on the control panel display
Check the following:

- set operating mode
- set time and date
- night time decrease
- week program
- weekend decrease

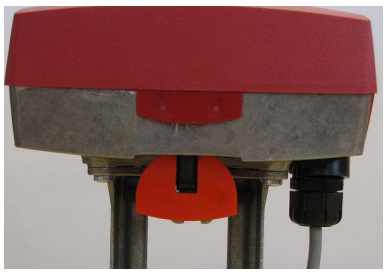
See *Installation And Service Instruction IQHeat EN Doc 1334*. To check operating mode, time and date see section *Reading the current temperatures and valve modes* in chapter *General Functions*. For more information about heating settings see chapter *Heating Circuit*.

D.3 Vent the pump
The Magna pump is self-venting.
Possible remaining air in the pump may cause noise. This noise ceases after a few minutes run time.
If necessary quick venting of the pump can be obtained by setting the pump to the maximum speed for a short period, depending on system size and design. When the pump has been vented, i.e. when the noise has ceased, set the pump according to the recommendations.

D.4 Check the heating supply temperature sensor and outdoor temperature sensor
See *C.1*.

D.5 Run the pump manually
If it becomes necessary to run the pump and actuator manually, this can be done by disconnecting the power to the operator control panel. Disconnect the electrical plug for the pump. Connect the replacement cable to the power supply and to the circulation pump. Next, open the heating valve manually using the red knob on the actuator, see *Picture 36*.

Flick down the red knob and open the valve enough to supply the house property´s heating demand. This is to be regarded as a temporary solution until the control unit problem is solved.



Picture 36

D.6 Check heating circuit filter
See *C.2*.

E. Noise in the radiator system

This instruction is suitable for both the DHWC and the radiator pump

E.1 Reduce the pump capacity
Reduce the pump capacity by selecting a lower setting on the pump when needed. Low pump capacity is the more economical option.

E.2 Vent the pump

E.2.1 Magna pump
The pump is self-venting.
See *D.3*.

E.2.2 Grundfos UPS 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.

E.3 Change the 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 chapter *10 Maintenance and repairs*.

F. Unstable hot water and/or heating temperature

F.1 Check available differential pressure and temperature for district heat inlet from supplier
See *A.1*.

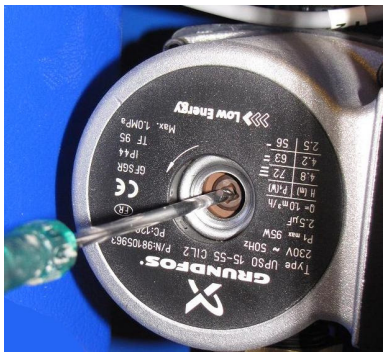
F.2 Check if district heat filter on primary inlet is clogged
Clean if needed. See *A.2.*

F.3 Check flow rate sensor and outdoor temperature sensor
See *C.1*.

F.4 Check DHWC pump.

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

If this doesn't solve the problem, the pump normally can be started by removing the pump motor end nut and helping the pump to start with the aid of a screwdriver (*Picture 37*) in the notch on the engine shaft. If possible, use a short screwdriver. If the pump is difficult to access, disconnect the heating actuator, see A.3.
Connect the power feed to the pump and try to start again.



Picture 37

F.5 Check pre-set parameters for control display panel
Check set value for drain hot water, see *Installation And Service Instruction IQHeat EN Doc 1334*.

G. Heating system often needs topping up

G.1 Check the substation and the system for leaks
leaks from the substation or the heating system cause pressure drops.
Repair any leaks on the substation.

G.2 Check the heating system safety valve
Check that the heating system 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.

G.3 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. Switch off the power supply to the substation and close the shutoff valves for the radiator supply and return.
Replace 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.

H. Disturbing noise from the circulation pumps

See *E*.

10 Maintenance and repairs

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

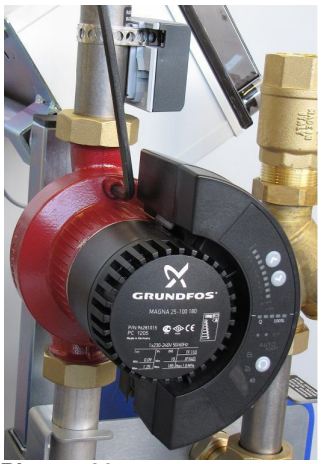
Before starting out repairs always close the primary supply and return shutoff valves and drain the system with the draining valves.
After finishing repair; open the shutoff valves. Start with primary supply and then the return lines, in order to avoid pollutions in the system. Open up the valves slowly to avoid pressure surges

10.1 Change the radiator and DHWC pump

Change the complete pump or just the motor.

1. Disconnect the electrical pump.
2. When changing the complete pump, release the brass nuts with a wrench and replace the pump (*Picture 38*).
3. Reattach the electrical plug.
4. If only changing the motor, release it by unscrewing four socket head cap screws and replace the motor (*Picture 39*).
5. Reattach the electrical plug.

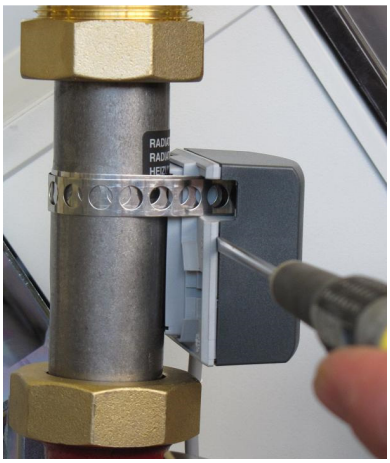
Picture 38



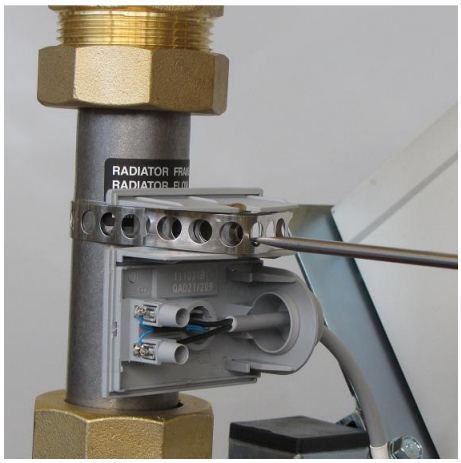
Picture 39

10.2 Change the heat temperature sensor

1. Carefully lift the sensor cover with a screwdriver (*Picture 40*).
2. Loose the band the holds the sensor to the pipe (*Picture 41*). Replace with a new sensor.



Picture 40



Picture 41

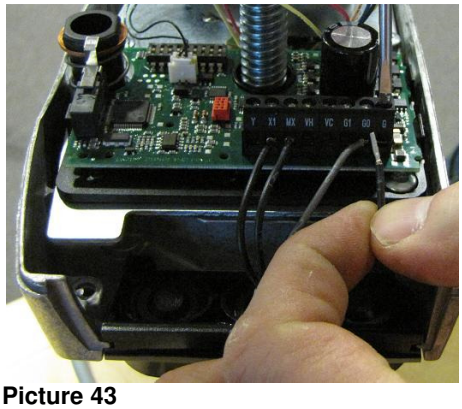
10.3 Change the outdoor temperature sensor:

1. Disconnect the electrical power supply.
2. Unscrew the lid by turning it anti-clockwise.
3. Unscrew the cables.
4. Loosen the cable fitting.
5. Install a new outdoor temperature sensor.

Picture 42

10.4 Change the heating actuator

1. Shut off power supply.
2. Open actuator lid and unscrew connecting wires in attached to the wire terminal (*Picture 43*).
3. Unscrew the shackle attaching the actuator to the valve (*Picture 44*) and lift of the actuator.
4. Mount a new actuator and reattach the wire terminal.

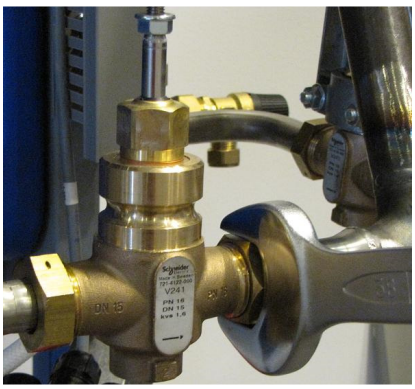


Picture 43

Picture 44

10.5 Change the heating valve

1. Close the primary inlet and return shutoff valves.
2. Unscrew the heating actuator from the control valve (*Picture 44*).
3. Use a wrench to remove the control valve (*Picture 45*). Note the arrow direction on the valve.
4. Mount a new valve; and take especially care to the arrow direction.
5. Fasten the actuator.
6. Open the shutoff valves; start with primary inlet and then return.



Picture 45

10.6 Change the hot water actuator

1 Shut off the power supply.
2 Unsnap electrical wire quick coupling.
3 Unscrew the shackle attaching the actuator to the valve (*Picture 46*) and dismount the actuator.
4 Mount a new actuator and reattach the electrical wire quick coupling.

Picture 46

10.7 Change the hot water valve

1. Shut primary inlet and return closing valves.
2. Unscrew the tap water actuator from the control valve (*Picture 46*).
3. Use a wrench to remove the control valve (*Picture 47*). Note the arrow direction on the valve.
4. Mount a new valve; take special with care the arrow direction.
5. Reattach the actuator.
6. Open the shutoff valves; start with primary inlet and then the return.

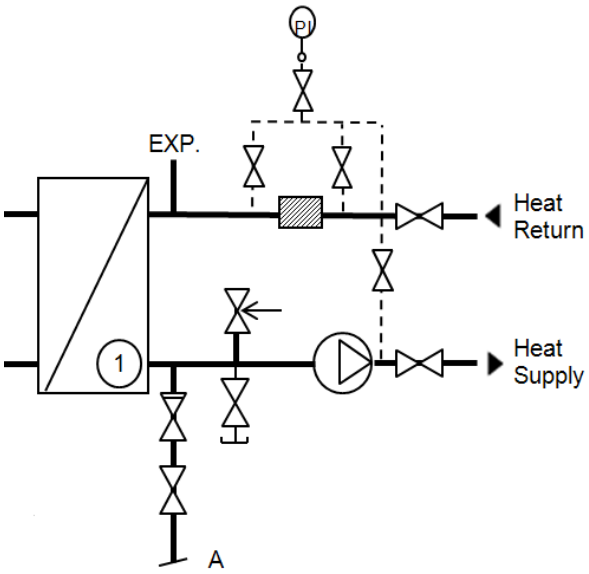
Picture 47

11 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.

11.1 3-point HB metering

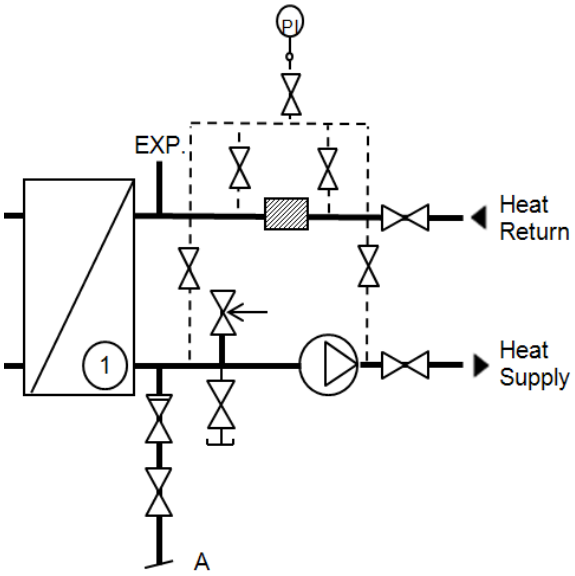
Measure before and after filter, together with after pump.



Picture 48

11.2 4-point HB metering

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



Picture 49

11.3 Communication module BACnet IP

The communication module BACnet IP connects the processing unit to a BACnet IP network.

Picture 50

The BACnet IP module has the following characteristics:

- integration for building automation systems via BACnet IP
- client communication to other BACnet units
- pre-installed generic BACnet server
- supports BACnet/IP (B-AAC-profile and BBMD) network parameters are configured through the processing unit, HMI or SCOPE

11.4 Communication module Web, Adv. Web POL 909.50

The communication module is used to activate the advanced web functionality of the processing unit.
It is therefore called Advanced Web module, Adv.Web.

The Adv Web module has the following characteristics:

Picture 51

- built-in WindowsCE® platform with web server application
- generic tree structure to read and write data points
- platform for programming web applications
- alarm server for SMS/E-mail
- peer to peer communications, no server required
- full modem RS-232 port
    - GSM/GPRS support
    - calling functions.

11.4.1 Services associated with Adv Web

The following services require Adv Web:

- IQAlarm 100
- IQReport

11.5 Module MBus

The MBus module is used to map the necessary data points from the MBus units to the processing unit.

The MBus module has the following characteristics:

Picture 52

- The MBus network operates the MBus module such as MBus master and periodically asks for data points from the MBus units.
- MBus mapping of the MBus module defines all MBus units and their required data points (bonds) that will be integrated and mapped to the processing unit
- Up to 6 MBus units such as heating, water or electricity meters, can be connected directly to the MBus module (up to 64 MBus units with MBus amplifiers)
- Up to 200 data points (bonds) can be defined in the MBus mapping
- Connecting the MBus module to the MBus network is galvanically separated by optocouplers. The bus power supply is short circuit proof:

11.5.1 Services associated with MBus

The following services require Mbus

- IQMeter200

12 Operation data and capacity

12.1 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

12.2 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

12.3 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

12.4 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

12.5 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: 90-120 kg

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