

Service manual

NIBE™ VVM 310

Indoor module

SEM GB 1451-1
M11741

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1 Important information

Document information

This technical manual is a complement to the Installer handbook for VVM 310, containing:

- Component description.
- Information to facilitate fault-tracing.
- Instructions for replacing components.
- Wiring diagram.
- Supplementary technical information.

The document applies to VVM 310 with software versions up to and including **v4272R5**.

The heat pump software version can be found in the info menu (menu 3.1).

Safety information

This manual describes installation and service procedures for implementation by specialists.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

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Marking

The CE marking means that NIBE ensures that the product meets all regulations that are placed on it based on relevant EU directives. The CE mark is obligatory for most products sold in the EU, regardless where they are made.

Symbols



NOTE

This symbol indicates danger to machine or person.



Caution

This symbol indicates important information about what you should observe when maintaining your installation.

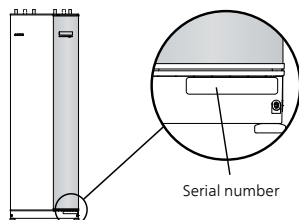


TIP

This symbol indicates tips on how to facilitate using the product.

Serial number

The serial number can be found at the bottom right of the front cover and in the info menu (menu 3.1).



Caution

Always give the product's serial number (14 digits) when reporting a fault.

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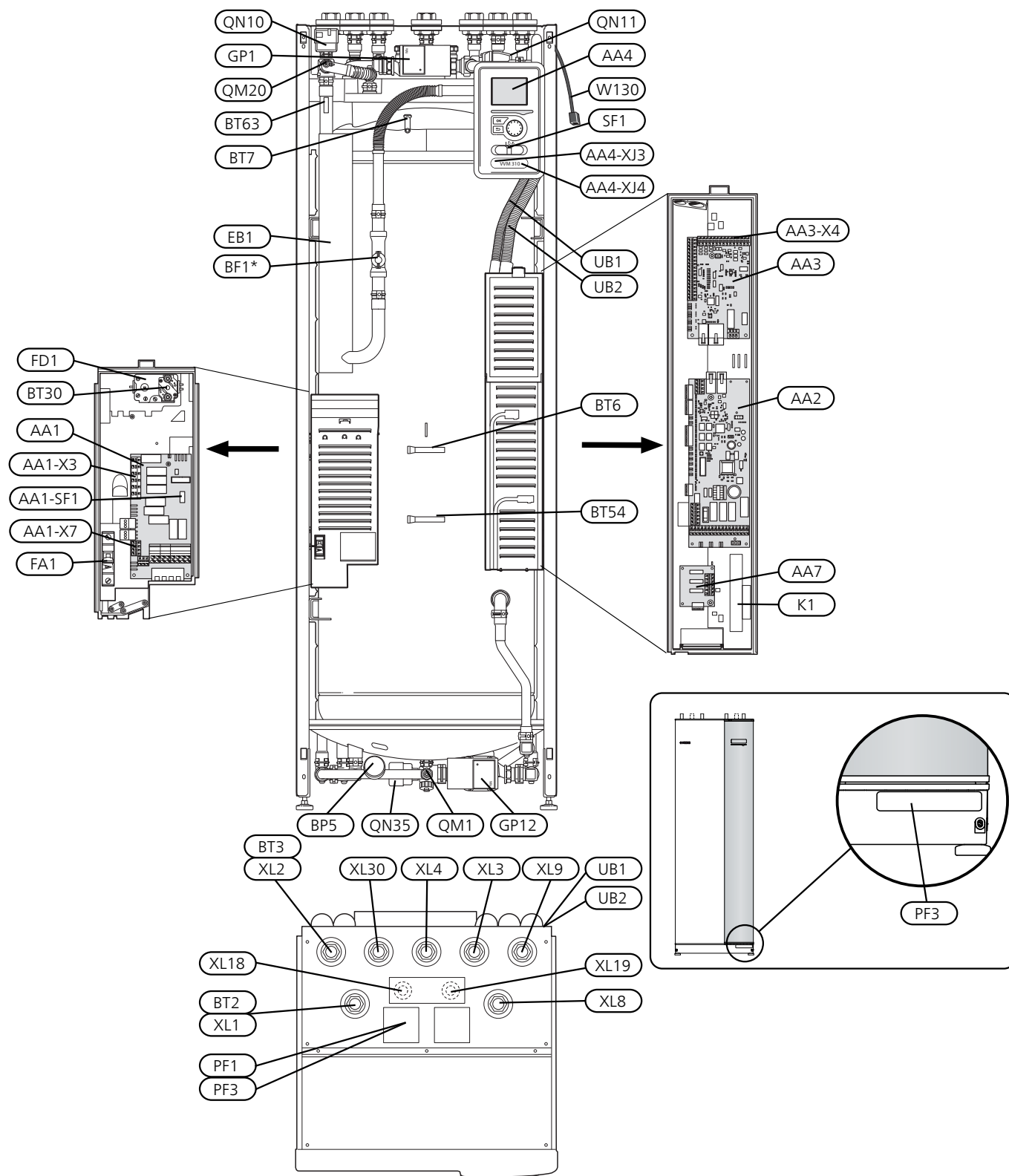
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2 Indoor module's design

VVM 310



Pipe connections

XL1	Connection, heating medium flow line G20 int.
XL2	Connection, heating medium return line G20 int.
XL3	Connection, cold water G20 int.
XL4	Connection, hot water G20 int.
XL8	Connection, docking in heating medium G20 int.
XL9	Connection, docking out heating medium G20 int.
XL18	Connection, docking in high temp Ø22 mm
XL19	Connection, docking out high temp Ø22 mm
XL30	Connection, expansion vessel

HVAC components

GP1	Circulation pump
GP12	Charge pump
QM1	Drain valve, heating medium
QN11	Mixing valve, addition
QM20	Venting, climate system
QN10	Reversing valve, climate system/water heating, flow line
QN35	Reversing valve, climate system/water heating, return line

Sensors etc.

BP5	Manometer, heating system
BT2	Temperature sensor, heating medium flow (not visible in image)
BT3	Temperature sensor, heating medium return (not visible in image)
BT6	Temperature sensor, hot water, charging
BT7	Temperature sensor, hot water, top
BT30	Thermostat, standby mode
BT54	Temperature sensor, external docking
BT63	Temperature sensor, heating medium supply after immersion heater

Electrical components

AA1	Immersion heater card AA1-SF1 Switch AA1-X3 Terminal block, immersion heater AA1-X7 Terminal block, immersion heater
AA2	Base card
AA3	Input circuit board AA3-X4 Terminal block, current sensors
AA4	Display unit AA4-XJ3 USB socket AA4-XJ4 Service socket

AA7	Extra relay circuit board
BF1*	Energy meter*
EB1	Immersion heater
FA1	Miniature circuit-breaker
FD1	Temperature limiter
K1	Auxiliary relay, emergency mode.
SF1	Switch

Miscellaneous

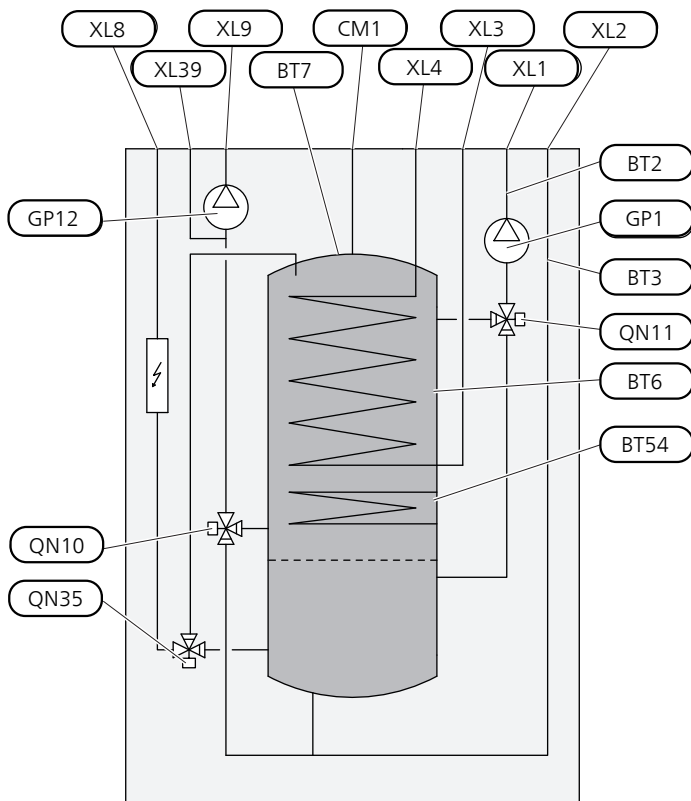
PF1	Rating plate
PF3	Serial number plate
UB1	Cable gland
UB2	Cable gland
W130	Network cable for NIBE Uplink

Designations in component locations according to standard IEC 81346-1 and 81346-2.

*Only available as accessory EMK 310.

3 System description

Principle of operation



List of components

Pipe connections

XL1	Connection, heating medium flow line
XL2	Connection, heating medium return line
XL3	Connection, cold water
XL4	Connection, hot water
XL8	Connection, docking in heating medium
XL9	Connection, docking out heating medium
XL39	Connection, docking pool

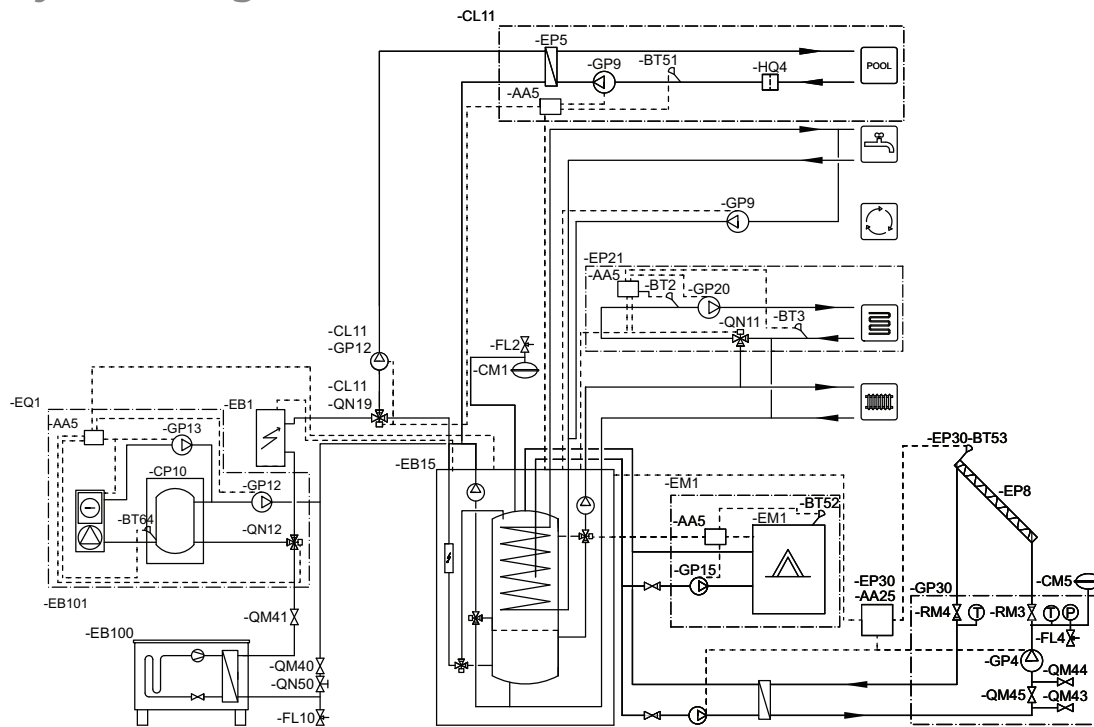
HVAC components

CM1	Expansion tank (connection)
GP1	Circulation pump
GP12	Charge pump
QN10	Shuttle valve, climate system/water heater, flow line
QN11	Shunt valve
QN35	Shuttle valve, climate system/water heater, re-turn line

Sensors

BT2	Temperature sensors, heating medium flow
BT3	Temperature sensors, heating medium return
BT6	Temperature sensor, hot water, control
BT7	Temperature sensor, hot water, display
BT54	Temperature sensor, solar coil

System diagram



AA 5	Accessory card	EP 21	Climate system
AA 25	Control unit	EP 30	Solar kit SCA 35
BT 2	Temperature sensors, heating medium flow	FL 2	Safety valve, climate system
BT 3	Temperature sensors, heating medium return	FL 4	Safety valve, solar
BT 51	Temperature sensor, pool	GP 4	Circulation pump, solar
BT 52	Temperature sensor, boiler	GP 9	Circulation pump, pool
		GP 12	Charge pump
BT 53	Temperature sensor, solar panel	GP 15	Circulation pump, external heat source
CL 11	Pool kit POOL 310	GP 20	Circulation pump
CM 1	Expansion vessel, heating medium	GP 30	Pump station SPS 10, SPS 20
CM 5	Expansion vessel, solar	HQ 4	Particle filter
EB 15	VVM 310	QM 4X	Shut-off valve
EB 101	F2025/F2026/F2030/F2040	QN 11	Shunt valve
EM 1	Oil, gas, or electric boiler	QN 19	Three way valve, pool
EP 5	Exchanger, pool	RM X	Non-return valve
EP 8	Solar panel		

4 Current circuit

Load monitor

Currents sensors are connected on AA3-X4:1-4.

Function:

- If any of the internal phases exceed the set value and the phase sequence is not detected, the power step disconnects from one of the internal phases. Because the phase sequence is not detected this can mean that the incorrect phase sequence is disconnected, so that the output is still too high. The heat pump continues by disconnecting another phase, until the current does not exceed the set value. If the current still exceeds the set value when all internal phases are disconnected, the same process is performed for the external additional heat, if such exists and is set to step controlled additional heat



NOTE

Do not disconnect the external additional heat if it is set to give additional heat in one step.

- If the phase sequence is detected the electrical output is disconnected in the phase that exceeds the set value. This will also handle any external additional heat.
- If disconnecting the phases does not work, the heat pump will finally disengage.
- Reconnection occurs when the current has fallen to a value low enough to permit reconnection.



NOTE

VVM 310 must be filled with water before the phase sequence is detected.

For the heat pump to disconnect the electrical output in the correct phase, the phase sequence must have been detected during the installation. In the menu 5.1.12 the phase sequence must be detected afterwards. An unsuccessful detection may be due to the current sensors not being correctly connected or that other electrical equipment started or stopped during detection.

Menu	Name	Factory setting
5.1.12	fuse size	16A
	detect phase order	

1-phase inverter stepping out:

Variant of load monitor designed to be used in instances where 1-phase inverter compressors are used together with 3-phase disconnectable additional heat.

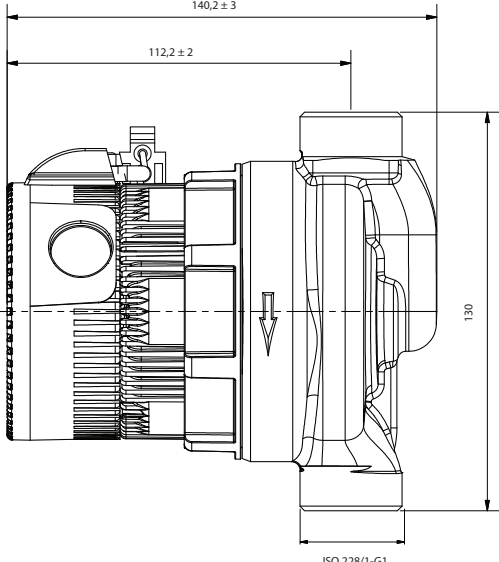
Load monitor initially disconnects the immersion heater's output.

If the electrical power still exceeds the set value the compressor slows to 20 Hz per 30 seconds until the electrical power falls below the set value.

5 Component description

Components

Component	Description
Immersion heater (EB1)	<p>Red coil (3 kW) resistance 55 ohm Black coil (0.5 kW), resistance 110 ohm White coil (3x1333 W) resistance 39.59 ohm Brown coil (3x2667 W) resistance 19.79 ohm</p>
Reversing valve (QN10, QN35)	<p>Actuator motor: 7 VA, 230/24 VAC, 50 Hz, IP 40. Running time approx 8 sec. Max. operating pressure: 1.0 MPa Operating temperature: 5 - 80 °C (90 °C briefly)</p>

Component	Description
Heating medium pump (GP1) and Charge pump (GP12)	<p data-bbox="379 349 644 376">E6PWM7-15/130G NIBE</p>  <p data-bbox="707 949 775 965">ISO 228/1-G1</p>

Sensors

Data temperature sensor

Temperature (°C)	Resistance (kOhm)	Voltage (VDC)
-40	351.0	3.256
-35	251.6	3.240
-30	182.5	3.218
-25	133.8	3.189
-20	99.22	3.150
-15	74.32	3.105
-10	56.20	3.047
-5	42.89	2.976
0	33.02	2.889
5	25.61	2.789
10	20.02	2.673
15	15.77	2.541
20	12.51	2.399
25	10.00	2.245
30	8.045	2.083
35	6.514	1.916
40	5.306	1.752
45	4.348	1.587
50	3.583	1.426
55	2.968	1.278
60	2.467	1.136
65	2.068	1.007
70	1.739	0.891
75	1.469	0.785
80	1.246	0.691
85	1.061	0.607
90	0.908	0.533
95	0.779	0.469
100	0.672	0.414
120	0.380	0.250
150	0.180	0.120

Electronics

Immersion heater card (AA1)

LED	Indication
K1 - K9: Orange	A steady light means that the relevant relay is engaged.

Output	Function
K1	Supply L1
K2	Supply L2
K3	Supply L3
K4	Immersion heater EB1 2 kW
K5	Not used
K6	Immersion heater EB1 2 kW
K7	Immersion heater EB1 only at 3 kW
K8	Immersion heater EB1 2 kW
K9	Immersion heater EB1 1 kW or 3 kW

Base card (AA2)

LED	Indication
Power: Green	A steady light means that 12 V is OK.
Run: Green	Flashing once/sec. Indicates that the processor is OK.
Com: Green	Flashes irregularly during communication.
PWM1: Orange	Continuous light during active output.
PWM2: Orange	Continuous light during active output.
K1 - K4: Orange	A steady light means that the relevant relay is engaged.

Outputs

Output	Function
PWM1	Control signal HM pump (GP1)
PWM2	Control signal charge pump (GP12)
K1	Reversing valve (QN10).
K2	Charge pump (GP12).
K3	Circ-pump (GP1).

Output	Function
K4	No function.

Input circuit board (AA3)

Inputs	Function
X4-1	Current sensor input (GND).
X4-2	Current sensor input (BE1).
X4-3	Current sensor input (BE2).
X4-4	Current sensor input (BE3).
X6:1-2	Outdoor sensor input (BT1).
X6:3-4	Room sensor input (BT50).
X6:9-10	AUX1
X6:11-12	AUX2
X6:13-14	AUX3
X6:15-16	AUX4
X6:17-18	AUX5

Output		Function
X7:1	K1	Potential free relay Common
X7:2	K1	Potential free relay NO
X7:3	K1	Potential free relay NC

Display unit (AA4)

The display unit consists of:

- a colour screen where all information is displayed.
- a status lamp.
- navigation buttons (OK button, Back button and Control knob).
- a USB socket.
- a service socket.

Status lamp	Function
Lights green	Normal function
Lights yellow	Emergency mode activated
Lights red	Alarm tripped

Extra relay circuit board (AA7)

LED	Indication
K1 - K3: Orange	A steady light means that the relevant relay is engaged.

Output	Function
K1	Shunt valve close (QN11)
K2	Shunt valve open (QN11)
K3	Reversing valve (QN35)

6 Troubleshooting

Alarm list

A-alarm

In event of an A alarm the red lamp on the front lights and an alarm icon is displayed. First go through the suggested actions shown in the display.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
1	Sensor fault BT1	Sensor not connected/defective (outdoor sensor)	Calculated flow temperature is set to min supply line (menu 1.9.3).	See fault-tracing schedule page 23.
2	Sensor fault BT2	Sensor not connected/defective (heating medium supply)	Uses BT3 if available. If BT3 is not available, BT63 is used.	See fault-tracing schedule page 24.
3	Sensor fault BT3	Sensor not connected/defective (heating medium return)	No action	See fault-tracing schedule page 24.
6	Sensor fault BT6	Sensor not connected/defective (hot water, controlling)	Uses BT54	See fault-tracing schedule page 24.
31	Sensor fault BT63	Sensor not connected/defective	Blocks internal electrical addition.	See fault-tracing schedule page 24.
33	Sensor fault EP30 - BT53	Sensor not connected/defective (solar panel)	Switches off solar function.	See fault-tracing schedule page 25.
34	Sensor fault EP30 - BT54	Sensor not connected/defective (solar coil)	Switches off solar function.	See fault-tracing schedule page 25.
35	Sensor fault EM1 - BT52	Sensor not connected/defective (boiler)	Shunt closes. Burner stops.	See fault-tracing schedule page 25.
36	Sensor fault EP21 - BT2	Sensor not connected/defective (supply temperature sensor, extra climate system 1)	Controls the return sensor (EP21-BT3)	See fault-tracing schedule page 25.
37	Sensor fault EP22 - BT2	Sensor not connected/defective (supply temperature sensor, extra climate system 2)	Controls the return sensor (EP22-BT3)	See fault-tracing schedule page 25.
38	Sensor fault EP23- BT2	Sensor not connected/defective (supply temperature sensor, extra climate system 3)	Controls the return sensor (EP23-BT3)	See fault-tracing schedule page 25.
39	Sensor fault EQ1-BT64	Sensor BT64 not connected, defective.	Shuts off cooling, Closes shunt (QN18) for cooling.	See fault-tracing schedule page 25.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
45		Motor protection on one phase (Norway) machine has probably blown.		
52	The temperature limiter has tripped	Temperature limiter has tripped	Internal electrical addition is blocked.	
56	Incorrect program	Serial number and program do not match	The compressor stops, all relay outputs are set to 0 V	Check serial number
57	Incorrect program	Serial number and program do not match each other.	Compressor blocked. All relay outputs are set to 0 V.	
70	Communication fault with PCA input EB15	Communication with the input card missing for 60 secs.	Blocking the relevant compressor. Calculated flow temperature is set to min supply line.	See fault-tracing schedule on page 26.
71	Communication fault with PCA base-AA2	Communication with the base card missing for 15 secs.	Compressor (EB101) blocked.	See fault-tracing schedule on page 27.
73 - 95	Existing communication fault with "accessory".	Communication with the accessory card missing for 15 secs.	Accessory is blocked.	- Check communication cables - Check the setting of the dipswitch.
96 - 99	Existing communication fault with "room unit".	Communication with room unit zone 1-4 missing for 60 secs.	Accessory is blocked.	- Check communication cables
208	Communication fault ACC EB1.	Communication with the accessory card missing for 15 secs.	Switches off step controlled additional heat.	- Check the communication cables. - Check settings on the dipswitch.
220	High pressure alarm.	See relevant manual.	Compressor blocked.	See relevant manual.
221	Low pressure alarm.	See relevant manual.	Compressor blocked.	See relevant manual.
222	Motor protection alarm.	See relevant manual.	Compressor blocked.	See relevant manual.
223	Sensor fault.	See relevant manual.	Compressor blocked.	See relevant manual.
224	Fan alarm.	See relevant manual.	Compressor blocked.	See relevant manual.
225	Supply/return line.	See relevant manual.	Compressor blocked.	See relevant manual.
227	Sensor fault.	See relevant manual.	Compressor blocked.	See relevant manual.
228	Defrosting fault.	See relevant manual.	Compressor blocked.	See relevant manual.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
229	Short operating time.	See relevant manual.	Compressor blocked.	See relevant manual.
230	Hot gas alarm.	See relevant manual.	Compressor blocked.	See relevant manual.
231	Phase sequence fault.	See relevant manual.	Compressor blocked.	See relevant manual.
232	Low evaporation.	See relevant manual.	Compressor blocked.	See relevant manual.
250	Communication fault ACC SMS40.	Communication with the accessory card missing for 15 secs.	Accessory is blocked.	See IHB SMS40 for fault tracing.
251	Communication fault ACC Modbus40.	Communication with the accessory card missing for 15 secs.	Accessory is blocked.	See IHB Modbus40 for fault tracing.
252	Slave heat pump 1 comm fault.	Communication with heat pump missing.	Compressor blocked.	Faulty communication cable
261	This alarm is generated by the heat pump	High VVX temp (E35)	Compressor blocked.	See relevant manual.
262	This alarm is generated by the heat pump	Inverter fault, high temperature.	Compressor blocked.	See relevant manual.
263	This alarm is generated by the heat pump	Inverter error, high current (E47)	Compressor blocked.	See relevant manual.
264	This alarm is generated by the heat pump	inverter error, com (E45)	Compressor blocked.	See relevant manual.
265	This alarm is generated by the heat pump	inverter fault, pcb (E46)	Compressor blocked.	See relevant manual.
266	This alarm is generated by the heat pump	Low refrigerant amount (E57)	Compressor blocked.	See relevant manual.
267	This alarm is generated by the heat pump	Inverter error, start error (E59)	Compressor blocked.	See relevant manual.
268	This alarm is generated by the heat pump	Inverter fault, conv	Compressor blocked.	See relevant manual.
277	This alarm is generated by the heat pump	Sensor fault MHI exchange, (E37)	Compressor blocked.	See relevant manual.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
278	This alarm is generated by the heat pump	Sensor fault MHI ambient air, (E38)	Compressor blocked.	See relevant manual.
279	This alarm is generated by the heat pump	Sensor fault MHI discharge, (E39)	Compressor blocked.	See relevant manual.
280	This alarm is generated by the heat pump	Sensor fault MHI suction, (E53)	Compressor blocked.	See relevant manual.
281	This alarm is generated by the heat pump	Sensor fault MHI LP, (E54)	Compressor blocked.	See relevant manual.
283	Com. error Acc. -EQ1	Temporary Comm. Fault Active 4-pipe cooling ULVP	Accessory is blocked.	Check communication cables Check settings of the dipswitch
301	Perm. comm. to a slave unit - EB102	Communication with the slave missing for 15 secs.	Master blocks relevant compressor. The compressors are stopped on the slave.	Check communication cables.
403	Sensor fault on EB101	Sensor fault detected on the slave Off Com-interface MHI-EMMY	Compressor blocked.	See relevant manual.
404	Sensor fault on EB101	Sensor fault detected on the slave Off Com-interface MHI-EMMY	Compressor blocked.	See relevant manual.
412	Sensor fault on EB101-BT12	Sensor fault detected on the slave Off Com-interface MHI-EMMY	Compressor blocked.	See relevant manual.
415	Sensor fault on EB101-BT15	Sensor fault detected on the slave Off Com-interface MHI-EMMY	Compressor blocked.	See relevant manual.

B alarm

In the event of a B alarm the green light lights up on the front and a symbol with a service technician is displayed in the information window until the alarm is reset. All alarms are automatically reset if the cause is rectified.

Alarm no.	Alarm text on the display	Cause	Action	May be due to
101	Sensor fault BT1			Alarm 101-120. See A-alarm 1-20.
103	Sensor fault BT3			
106	Sensor fault BT6			
107	Sensor fault BT7	Sensor temporarily missing	Replace display of BT7 temperature with "---"	Resets automatically when the sensor has worked continuously for 60 s.
112	Sensor fault BT12			
114	Sensor fault BT14			
115	Sensor fault BT15			
116	Sensor fault BT16			
117	Sensor fault BT17			
120	Sensor fault BT20			
150	Temporary HP alarm			See alarm 50.
162	High condenser out			The temperature of BT12 has exceeded 59 °C. The alarm is reset when the Temperature has dropped below 59 °C and condenser return (BT3) has dropped 2K since the alarm.
163	High condenser in			The return temperature (BT3) has exceeded 58 °C. It is reset when the temperature has dropped to 56 °C.
166	Electrical anode incorrect	Electrical anode fault		Suggestion: Check electrical anode, circuit board at the electrical anode as well as cables to the electrical anode.
170	Com. error input card			Temporary communication fault. See alarm 70.
171	Com. error base card			Temporary communication fault. See alarm 71.
173	Com. error heating system2			Temporary communication fault. See alarm 73.
174	Com. error heating system3			Temporary communication fault. See alarm 74.
176	Com. error heating system4			Temporary communication fault. See alarm 76.

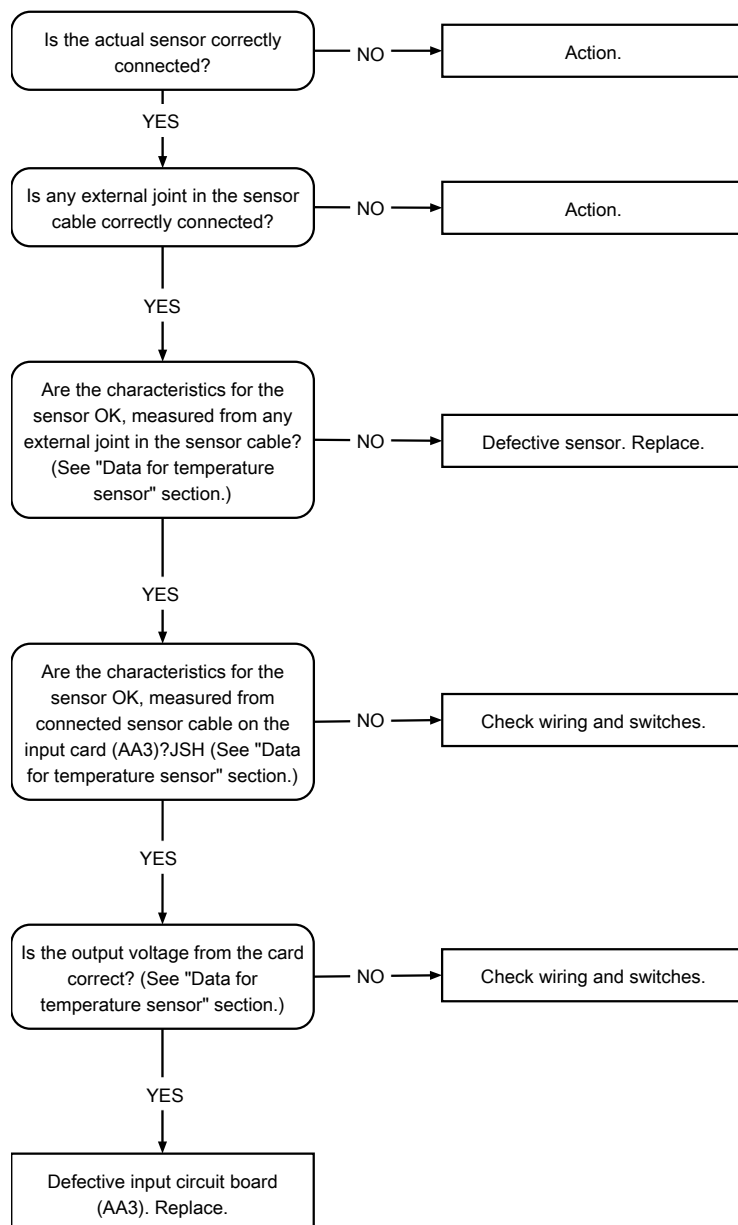
Alarm no.	Alarm text on the display	Cause	Action	May be due to
178	Com. error Acc. –Cl11	3 communication errors in succession have occurred on the pool accessory card	Block accessory	Check the Communication cables. Check settings of the dipswitch
180	Freeze prot			Activates if the heating is blocked and the outdoor temperature (BT1) falls below 3 °C. Heating is permitted and controlled by min. supply.
181	Unsuccessful periodic increase			Periodic increase has failed to reach stop temp. within 5 hours.
182	Load monitor activated			One or more power steps blocked due to high current measured on current sensor.
183	Defrosting			Defrosting in progress.
184	Filter alarm			Reminder to check filter. The machine has not been stopped for the number of months set in menu 5.1.99.
191	Com. error WWC			Temporary communication fault. See alarm 91.
193	Com. Error DEW			Temporary communication fault. See alarm 93.
196	Comm. room unit, zone 1			Temporary communication fault. See alarm 96.
197	Comm. room unit, zone 2			Temporary communication fault. See alarm 97.
198	Comm. room unit, zone 3			Temporary communication fault. See alarm 98.
199	Comm. room unit, zone 4			Temporary communication fault. See alarm 99.
200	Com.Error inverter			Temporary communication fault. See alarm 100.
201	Inverter alarm			Inverter indicates alarm See alarm log menu 3.4 for error code .
202	Inverter errors			Inverter indicates error See alarm log menu 3.4 for error code .

Alarm no.	Alarm text on the display	Cause	Action	May be due to
213	Inverter error type I			Temporary inverter fault. Switches to alarm 203 after 60 minutes.
214	Inverter error type II			Temporary inverter fault. Switches to alarm 204 after 60 minutes or if activated 3 times in less than 120 minutes.
215	Inverter error type III			Temporary inverter fault. Switches to alarm 205 if activated 2 times in less than 60 minutes.
271	Cold outdoor air EB 101	EB 101 sends an error message to the control	Blocks the compressor	See relevant manual
272	Hot outdoor air EB 101	EB 101 sends an error message to the control	Blocks the compressor	See relevant manual
273	HW-start and HW-stop have reset to default	Adjustment of the hot water - settings due to short run times	HW-start and HW-stop for economy and normal have been set to default	See relevant manual
274	The compressor's phase has been overloaded	Load monitor has caused the compressor not to run at the desired frequency	None	Load monitor has prevented compressor running at desired frequency (F2040-12 additional heat: and been below 85Hz) for at least an hour (corresponding)
275	The compressor's phase has been overloaded for a long time	Load monitor has caused the compressor not to run at the desired frequency	None	Load monitor has prevented compressor running at desired frequency (F2040-12 additional heat: and been below 85Hz) for longer than 5% of the total operating time for the compressor. This first detects the total number of operating hours by which the compressor exceeds 1000h.
282	Com. error Acc. -EQ1	3 communication errors in succession have occurred on the accessory card.	Accessory is blocked	Temporary communication fault
354	Slave EB101: Delta BT2-BT3> 2K during calibration. Resets to manual circulation pump speed	Delta BT3-BT12 greater than 2K after calibration	Change from auto to manual pump speed	Uncertain sensor accuracy

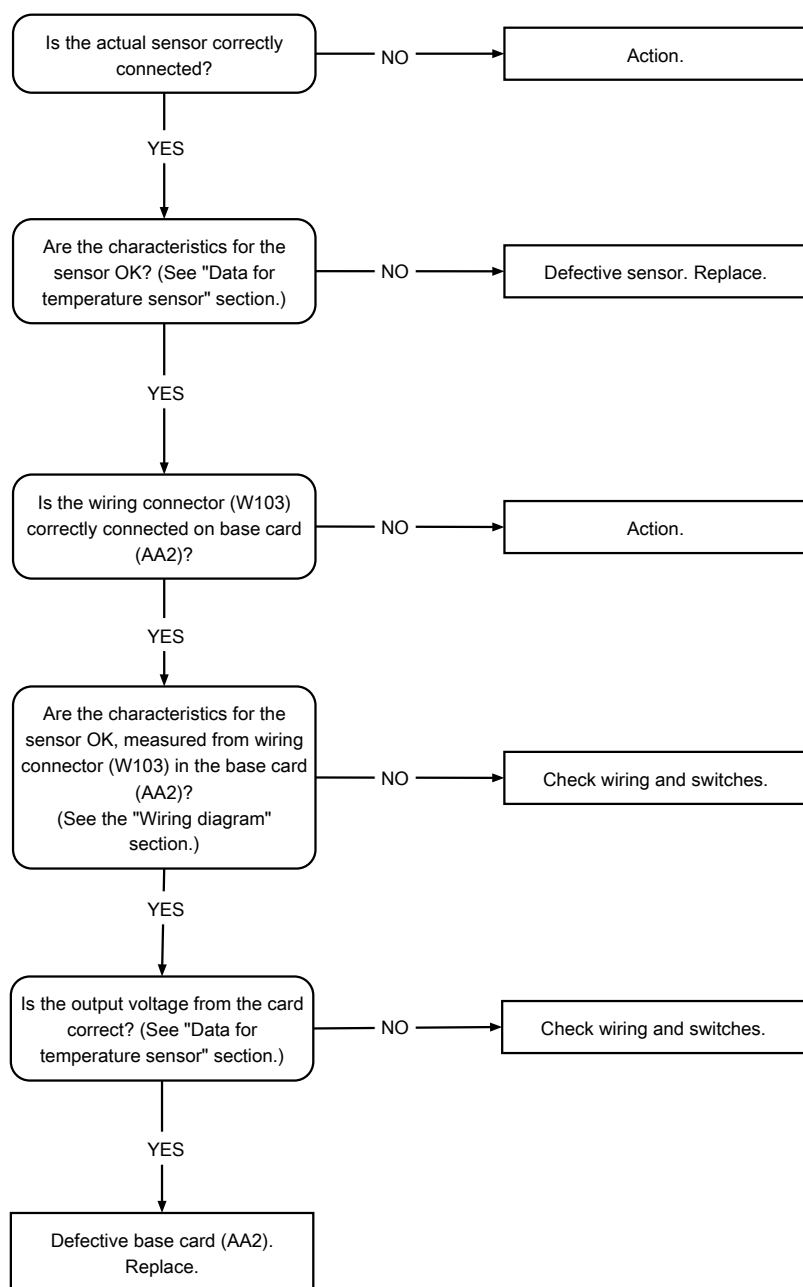
Alarm no.	Alarm text on the display	Cause	Action	May be due to
355	Slave EB101: Delta BT3-BT63> 2K during calibration. Resets to manual circulation pump speed	Delta BT3-BT2 greater than 2K after calibration	Change from auto to manual pump speed	Uncertain sensor accuracy
995	alarm from external input	External alarm	None	Status AUX-in
996	Additional heat external blocked	Signal via AUX input	None	Status AUX-in
997	The compressor is externally blocked	The compressor is externally blocked	None	Status AUX-in
998	Starts	Display has restarted	The display/product has restarted	The display/product has restarted

Troubleshooting guide

Alarm 1 - sensor fault

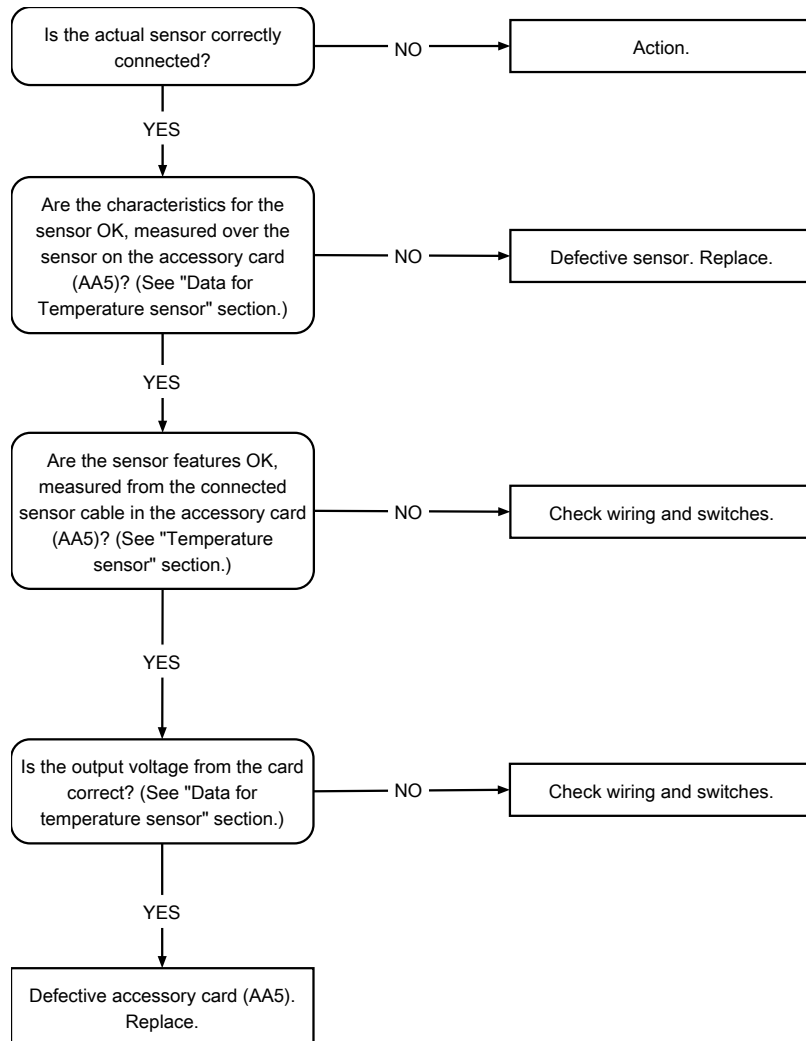


Alarm 2, 3, 6, 31 - sensor fault

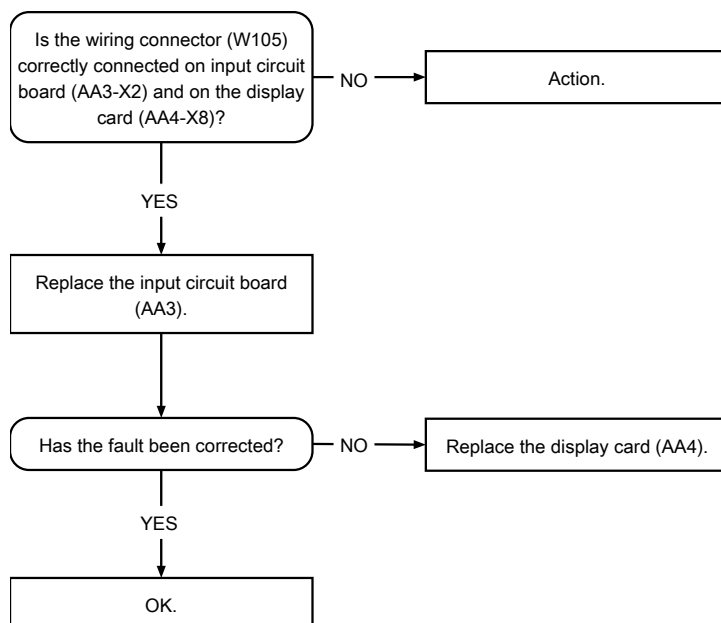


Alarm 33-38 – sensor fault

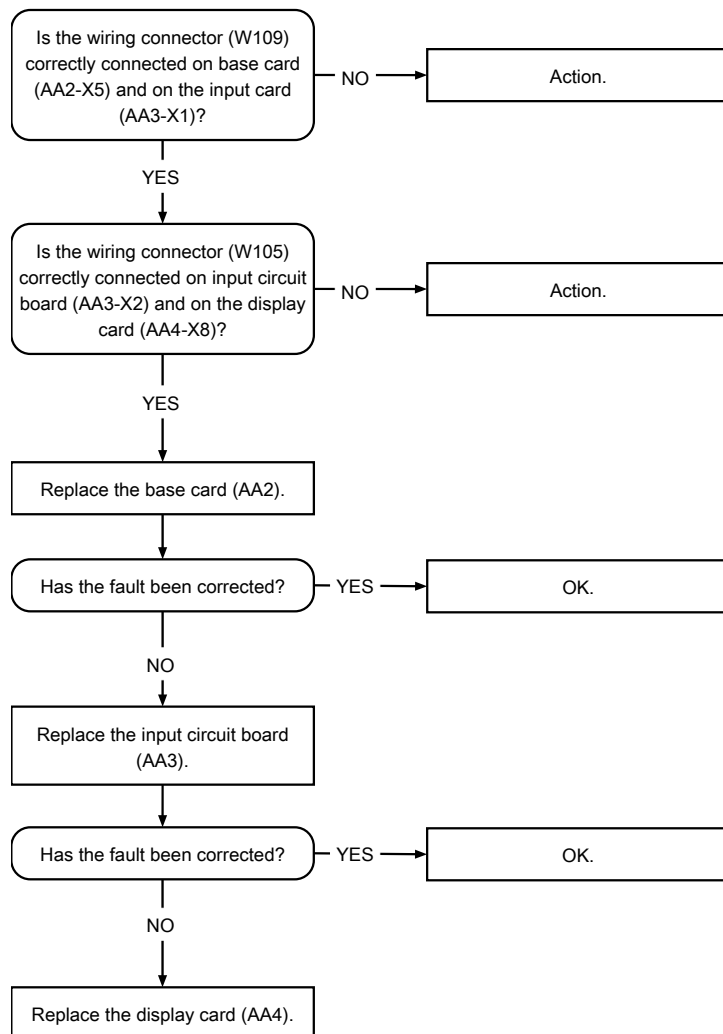
Fault-tracing in accessory card.



Alarm 70 - perm. com.error input card



Alarm 71 - perm. com.error input card



Function check, components

Relay test - forced control

The heat pumps relay outputs can be force controlled from menu 5.6.

1. Tick "activated". Forced control is then activated for 10 minutes.
2. Tick the outputs that you want to activate.
3. Check the relay/component function.



WARNING!

Forced control must only be used by users familiar with the system. When forced control is activated, the alarm functions are disabled.

AA2 Base card

Output	Function
AA2-K1 (reversing valve)	QN10
AA2-K2 (GP12)	Charge pump (GP12)
Charge pump speed	Setting in %
AA2-K3 (GP1)	Heating medium pump (GP1)
Heating medium pump speed	Setting in %
Compressor (request)	Off/On
QN35	Reversing valve QN35
QN11 (close)	Off/On

AA1 Immersion heater card

Output	Function
AA1-K4	EB1/1.33 kW
AA1-K5	EB1/2.67 kW
AA1-K6	EB1/1.33 kW
AA1-K7	EB1/2.67 kW
AA1-K8	EB1/1.33 kW
AA1-K9	EB1/2.67 kW

AA3 Input circuit board

Output	Function
AA3-X7	AUX output

Climate system 2 (ECS 40/ECS 41)

Output	Function
EB21-AA5-K2	Mixing valve, close
EB21-AA5-K3	Mixing valve, open
EB21-AA5-K4	External circulation pump

Climate system 3 (ECS 40/ECS 41)

Output	Function
EB22-AA5-K2	Mixing valve, close
EB22-AA5-K3	Mixing valve, open
EB22-AA5-K4	External circulation pump

Climate system 4 (ECS 40/ECS 41)

Output	Function
EB23-AA5-K2	Mixing valve, close
EB23-AA5-K3	Mixing valve, open
EB23-AA5-K4	External circulation pump

Pool (POOL 500)

Output	Function
CL11-AA5-K1	Not used
CL11-AA5-K2	Not used
CL11-AA5-K3	Reversing valve, pool QN19 as well as circulation pump, cooling GP14
CL11-AA5-K4	Circulation pump, pool GP9

Solar control (SCA 30)

Output	Function
EP8-AA5-K1	Circulation pumps GP4-GP15
EP8-AA5-K2	Solar panel cooling
EP8-AA5-K3	Circulation pump GP14 / cooling to pool.
EP8-AA5-K4	Not used

External additional heater Gas/Electric/Oil fired boiler

Output	Function
EB1-AA5-K1	Control EM1
EB1-AA5-K2	Not used
EB1-AA5-K3	Not used
EB1-AA5-K4	Circulation pump GP15

External additional heat, Electric heater

Output	Function
EB1-AA5-K1	Contactor 1
EB1-AA5-K2	Contactor 2
EB1-AA5-K3	Contactor 3
EB1-AA5-K4	Circulation pump GP15

Cooling

Output	Function
EQ1-AA5-K1	Reversing valve QN12
EQ1-AA5-K2	Circulation pump GP13
EQ1-AA5-K3	Circulation pump GP12
EQ1-AA5-K4	Not used

Function check, circulation pumps

With forced control of the circulation pumps it is necessary to check the supply (230 V AC) and the control signal (0-10 V DC).

Heating medium pump (GP1)

Pump speed GP1	PVM1, X2:1-2	LED PWM1 on Card AA2
100 %	approx 0 V DC	Not lit
50 %	approx 5 V DC	Half lit
0 %	approx 10 V DC	Lit

Charge pump (GP12)

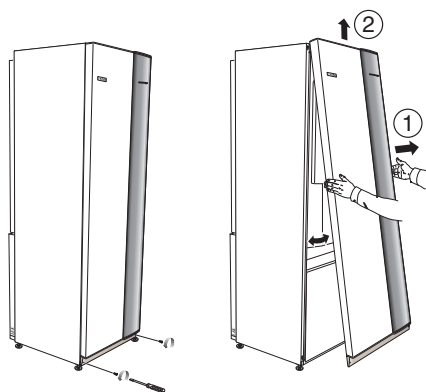
Pump speed GP12	PVM2, X2:3-4	LED PWM2 on Card AA2
100 %	approx 0 V DC	Not lit
50 %	approx 5 V DC	Half lit
0 %	approx 10 V DC	Lit

7 Component replacement

Basic

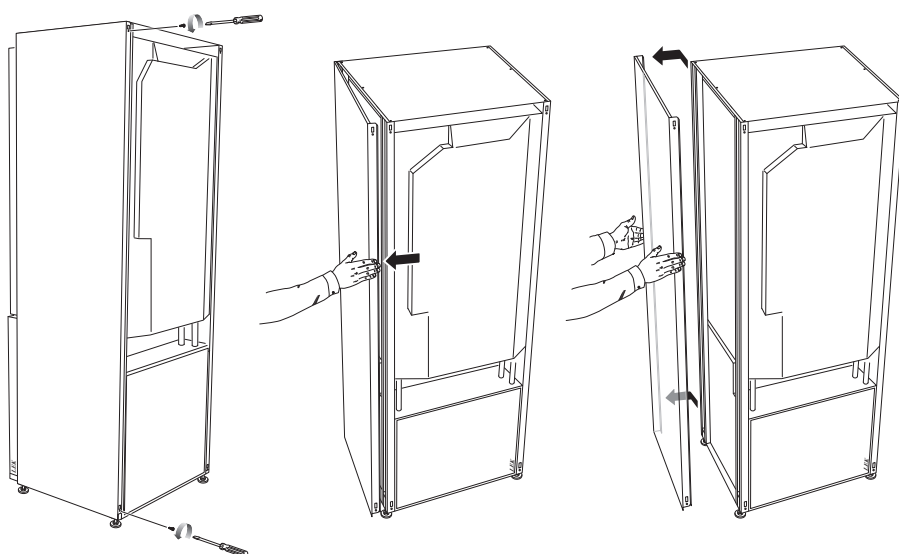
Removing the covers

Front cover



1. Remove the screws from the lower edge of the front cover.
2. Lift the cover out at the bottom edge and up.

Side covers



The side covers can be removed to facilitate the installation.

1. Remove the screws from the upper and lower edges.
2. Twist the cover slightly outward.
3. Move the hatch backwards and slightly to the side.
4. Pull the cover to one side.
5. Pull the hatch forwards.

Accessibility, electrical connection

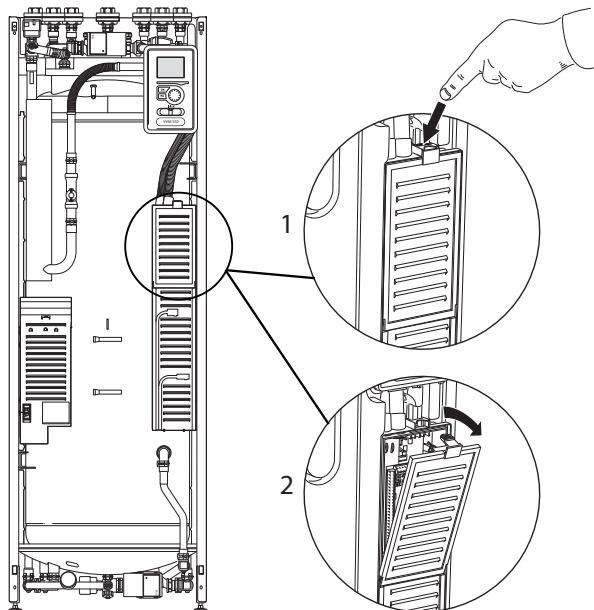
The plastic cap of the electrical boxes is opened using a screwdriver.



NOTE

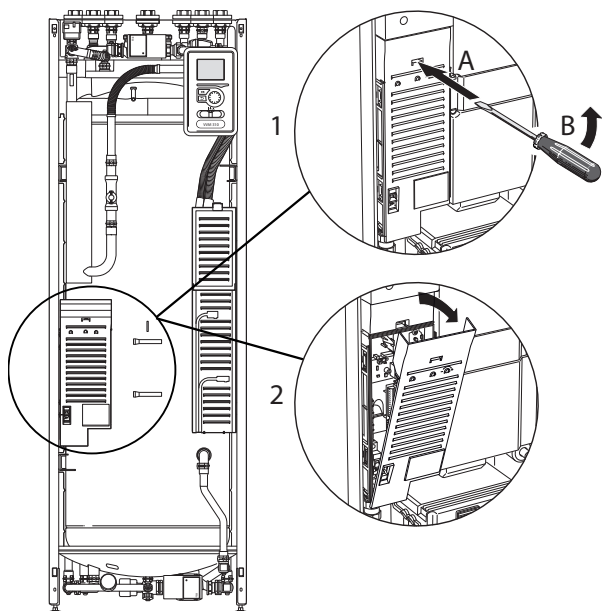
The cover for the input card is opened without a tool.

Removing the cover, input circuit board



1. Push the catch down.
2. Angle out the cover and remove it.

Removing the cover, immersion heater circuit board



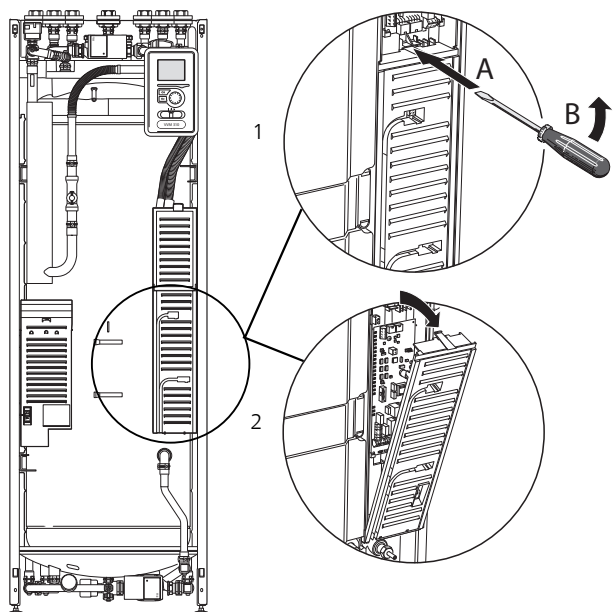
1. Insert the screwdriver (A) and pry the catch carefully downwards (B).
2. Angle out the cover and remove it.

Removing the cover, base board



Caution

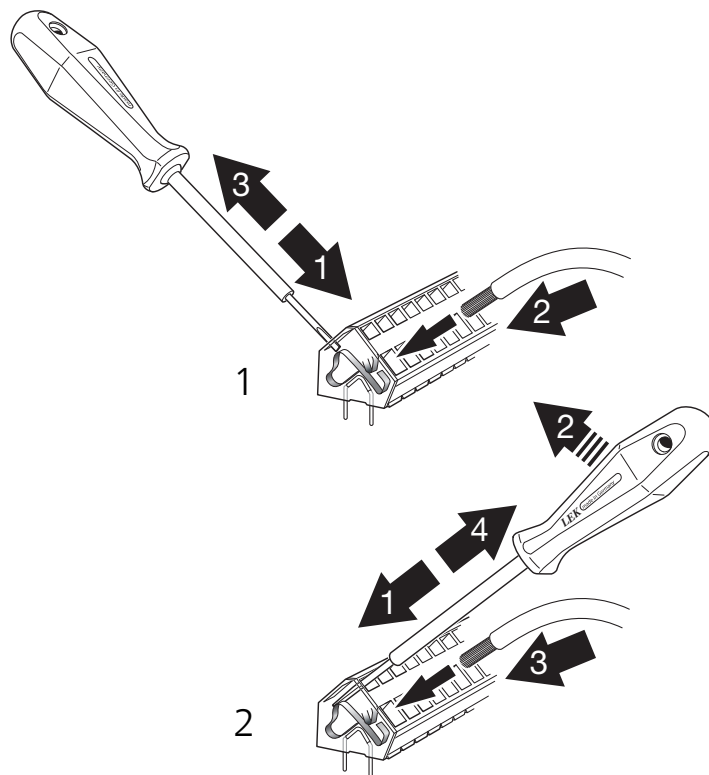
To remove the cover for the base board, the cover for the input circuit board must first be removed.



1. Insert the screwdriver (A) and pry the catch carefully downwards (B).
2. Angle out the cover and remove it.


Cable lock

Use a suitable tool to release/lock cables in the indoor module terminal blocks.

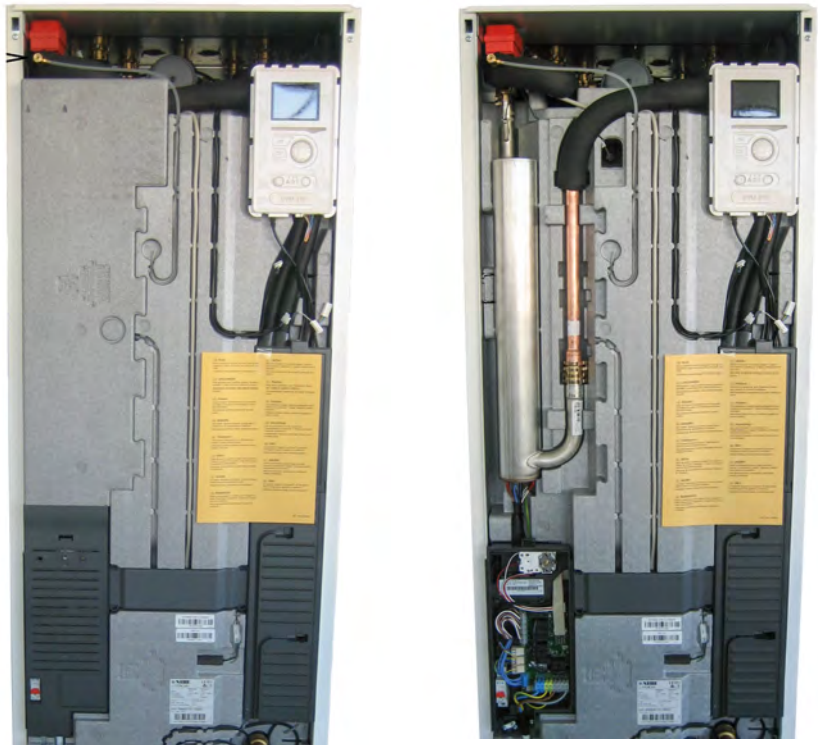


Main components

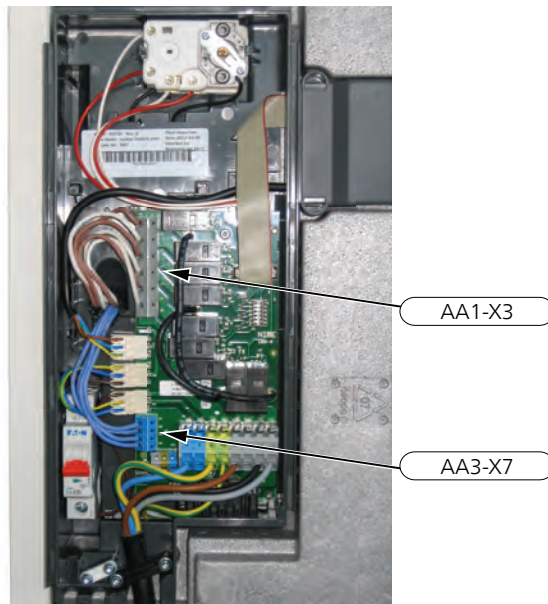
Replacement of immersion heater

1 Set the switch (SF2) to "stand by" mode and wait approx. 30 secs	
2 Cut the power supply to VVM 310 and EB 101.	
3 Close the shut-off valves to the heating system and EB 101	
4 Drain the water by opening the drain valve (QM1) and allow air in via the vent (QM20) until VVM 310 is empty.	
5 Remove the plastic cover above (AA1) using a screw-driver.	

6 Remove the insulation over the immersion heater EB1.



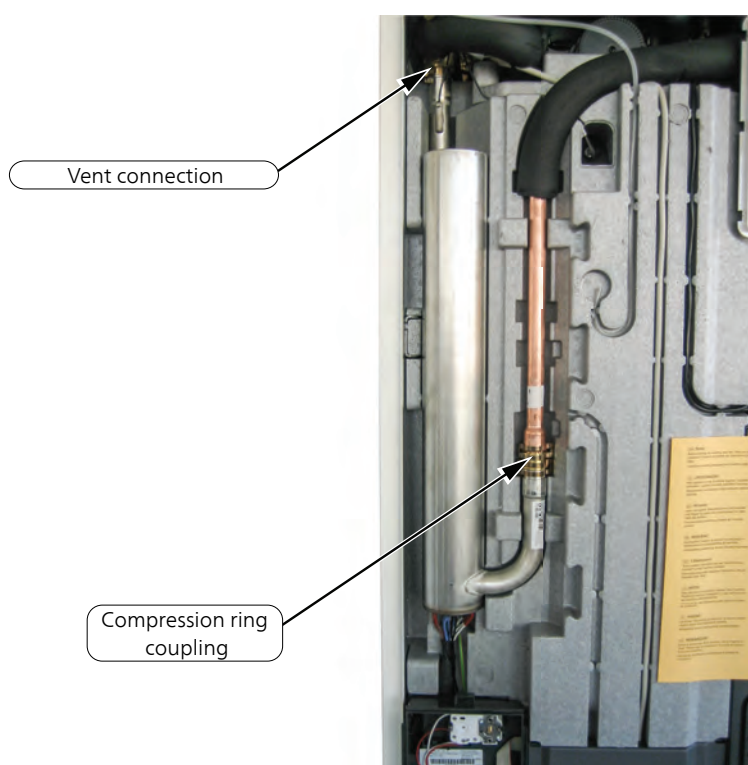
7 Remove the white and brown cables from terminal blocks AA1-X3 as well as the blue cables from AA1-X7.
Pull out the bulbs from immersion heater EB1




9 Disconnect the immersion heater EB1 at the marked couplings.

10 Remove the box for the immersion heater circuit board (AA1).

11 Remove the immersion heater EB1.

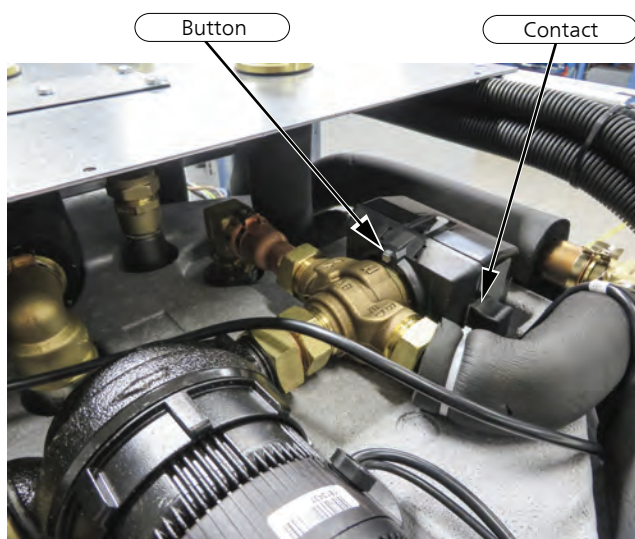


Replacement of shunt valve QN11

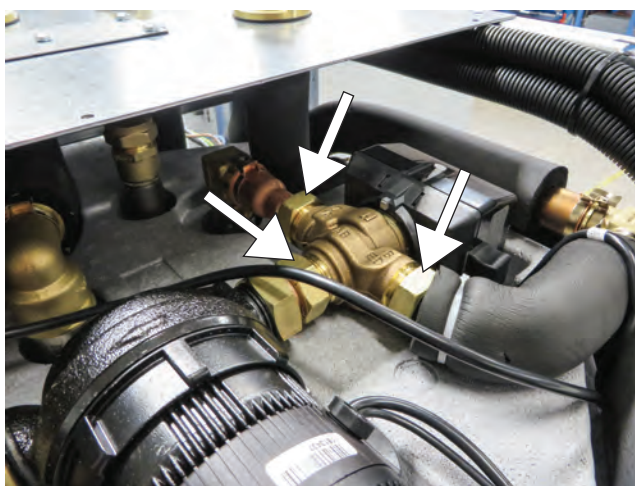
1 Set the switch (SF2) to "stand by" mode and wait approx. 30 secs	
2 Cut the power supply to VVM 310 and EB 101.	
3 Drain the water by opening the drain valve (QM1) and allow air in via the vent (QM20) until VVM310 is empty.	 <p>The diagram shows the internal components of the NIBE VVM 310 unit. A callout labeled 'QM20' points to a red cap at the top left of the unit. Another callout labeled 'Drain valve (QM1)' points to a valve at the bottom of the unit, near the base. The unit is shown with its front panel removed, revealing the internal components and wiring.</p>

4 Remove the switch on the actuator.


5 Remove the actuator by pressing in the button and turning anticlockwise.



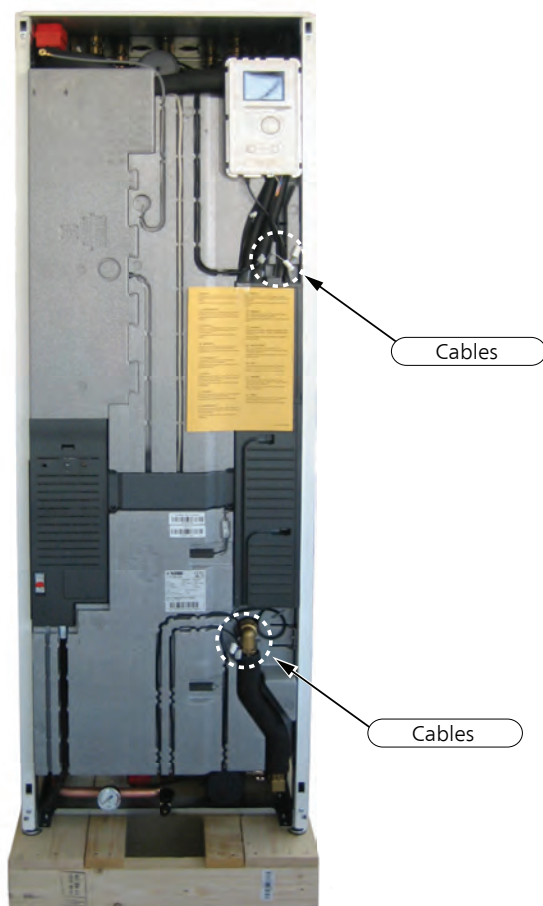
6 Disconnect the connections.



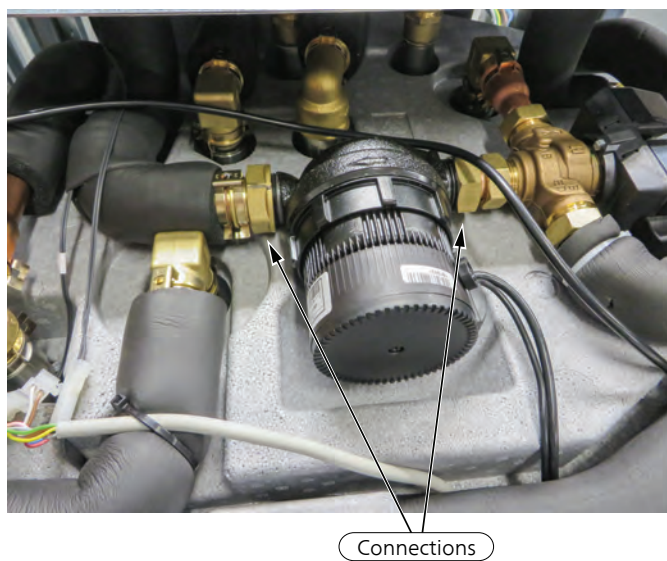
Replacement of circulation pump GP1 and GP12

1 Set the switch (SF2) to "stand by" mode and wait approx. 30 secs	
2 Cut the power supply to VVM 310 and EB 101.	
3 Drain the water by opening the drain valve (QM1) and allow air in via the vent (QM20) until VVM 310 is empty.	 <p>The diagram shows the internal components of the VVM 310 unit. A red cap at the top left is labeled QM20. A drain valve at the bottom is labeled Drain valve (QM1). The unit is mounted on a wooden base.</p>

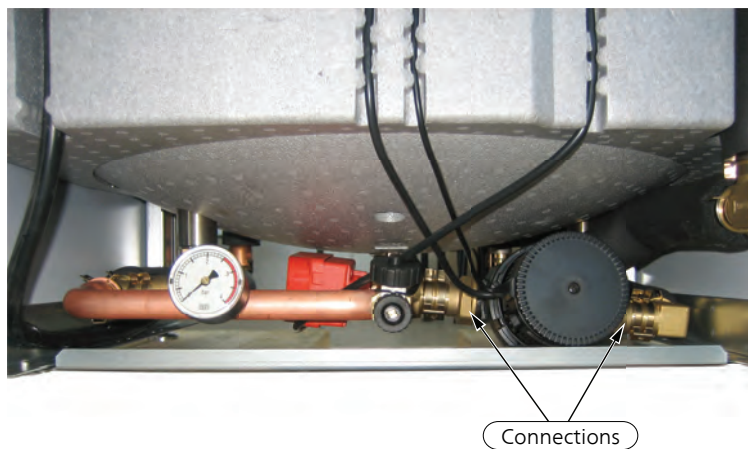
4 Disconnect cables.




5 Disconnect the connections on the circulation pump GP1.



6 Disconnect the connections on the circulation pump GP12.

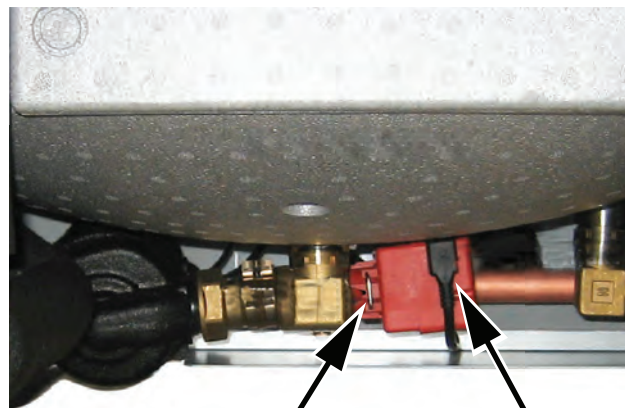
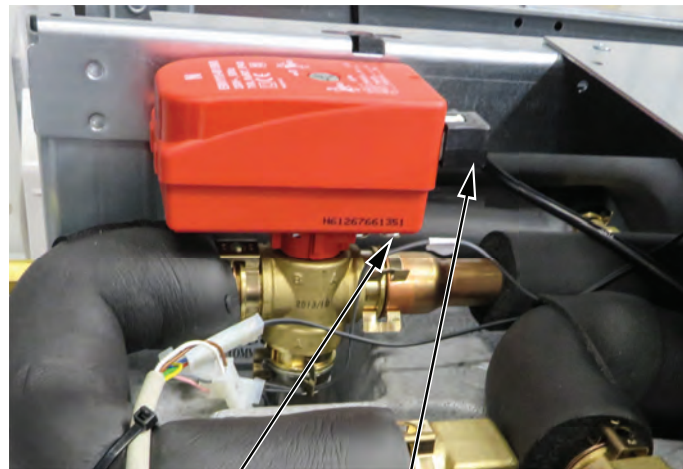


Replacement of reversing valves QN 10 and QN 35

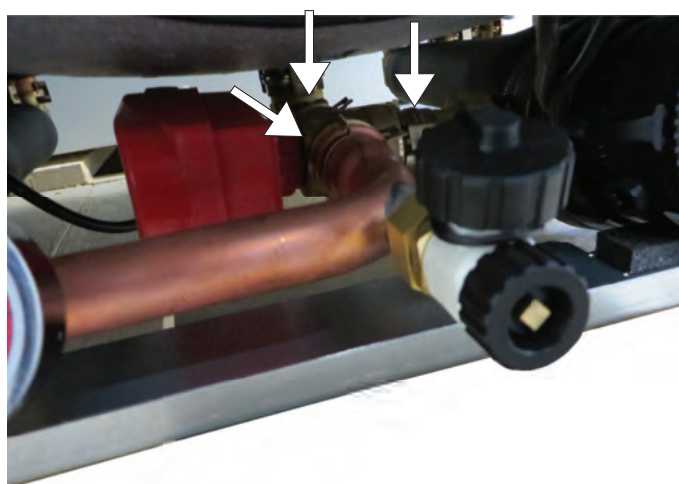
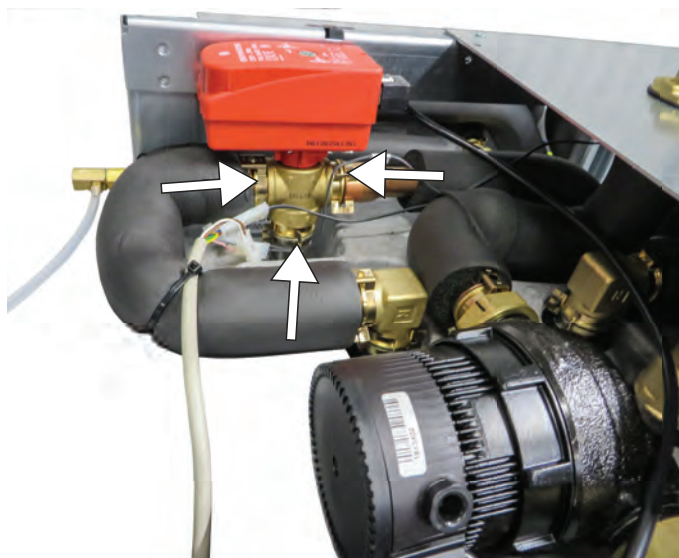
1 Set the switch (SF2) to "stand by" mode and wait approx. 30 secs	
2 Cut the power supply to VVM 310 and EB 101.	
3 Drain the water by opening the drain valve (QM1) and allow air in via the vent (QM20) until VVM310 is empty.	

4 Remove the switch on the actuator.

5 Remove the pin and re-move the actuator.



6 Disconnect the connections.



Circuit board and electronics



NOTE

Cut all power to the product prior to carrying out work on the circuit board and electrical components.



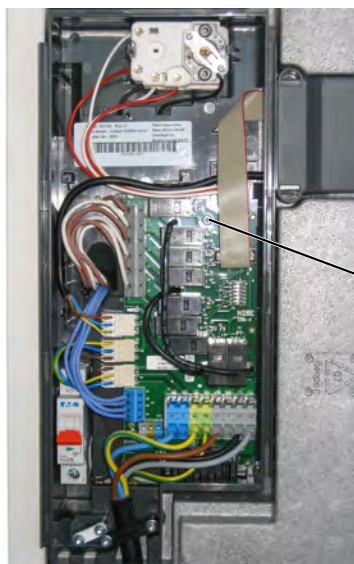
NOTE

During all the work on circuit boards and electronics ensure that the components are not damaged by electro static discharge (ESD).

Immersion heater card (AA1)

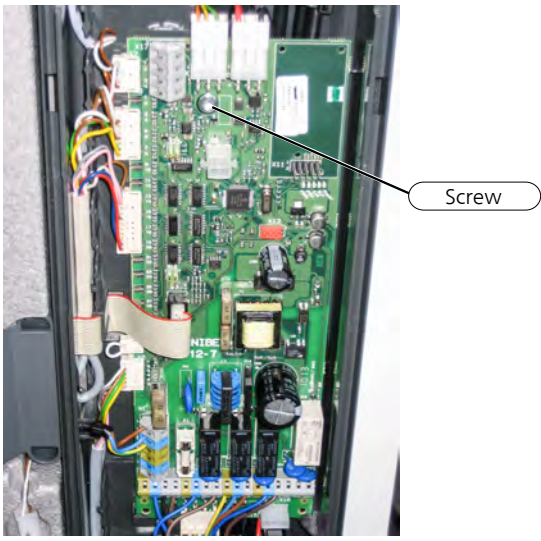
1 Remove the plastic cover over (AA1). See instructions in IHB.

2 Remove the screw and connect cables.

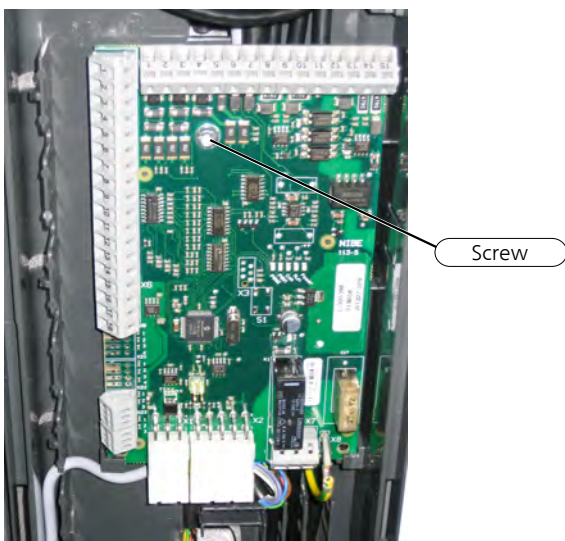


Screw

Base card (AA2)

1 Remove the plastic cover over (AA3). See instructions in IHB.	
2 Remove the plastic cover over (AA2). See instructions in IHB.	
3 Remove the screw and connect cables.	

Input circuit board (AA3)

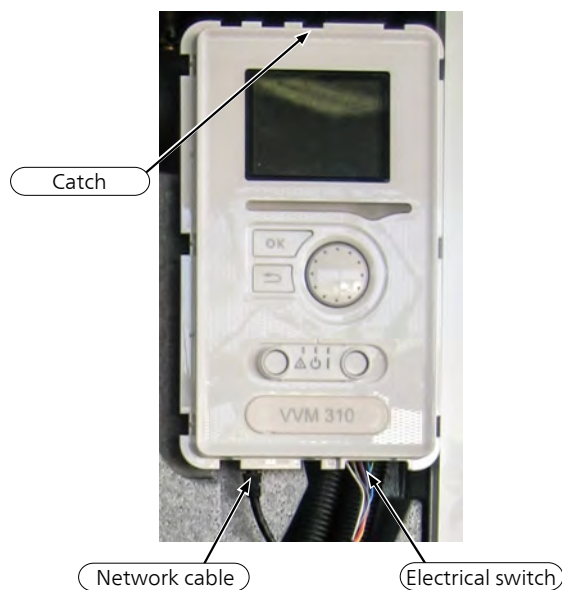
1 Remove the plastic cover over (AA3). See instructions in IHB.	
2 Remove the screw and connect cables.	

Display unit (AA4)

1 Detach the electrical connector as well as the network cable from the lower edge of the display.

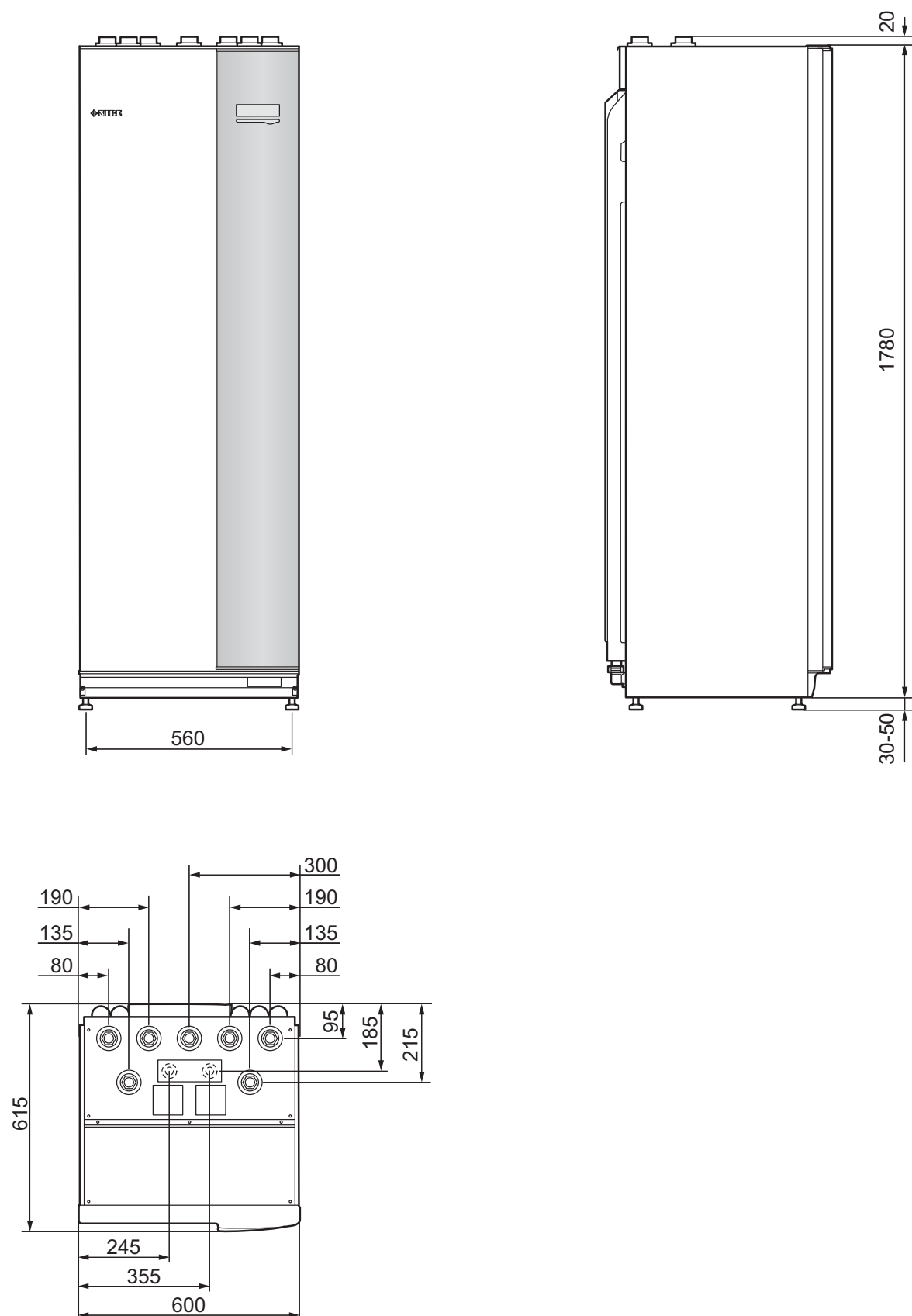
2 Press the catch on the upper rear side of the display unit.

3 Slide the display unit up until it releases from the mounting.



8 Technical data

Dimensions and setting-out coordinates



Technical specifications



3x400V

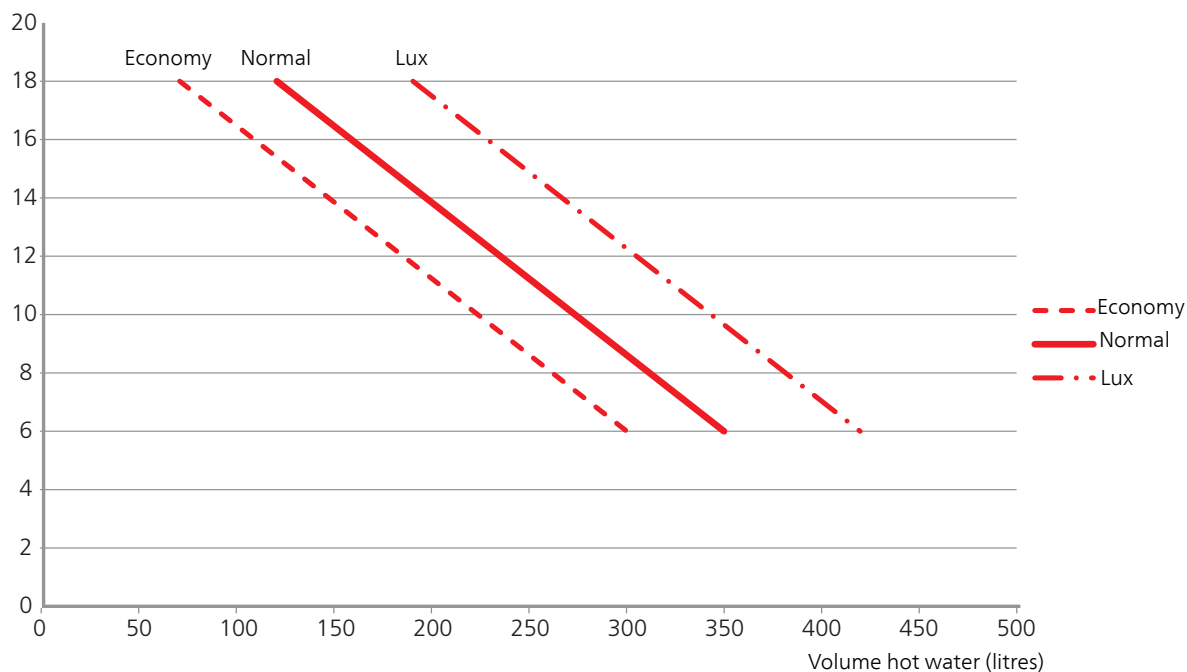
3x400V		
Maxim heat pump output NIBE F2025 with program version 55 or later ¹⁾	kW	14
Maxim heat pump output NIBE F2026 with program version 55 or later ¹⁾	kW	10
Maximum heat pump output NIBE F2030 ¹⁾	kW	9
Maximum heat pump output NIBE F2040 ¹⁾	kW	16
Additional power	kW	12
Electrical data		
Rated voltage		400V 3NAC 50 Hz
Max operating current	A	19.4
Fuse	A	20
Output, Heating medium pump	W	3 – 45
Output, charge pump	W	3 – 45
IP class		IP 21
Heating medium circuit		
Energy class circ-pump		low energy
Energy class charge pump		low energy
Max system pressure heating medium	MPa	0.3 (3 bar)
Min flow	litres/h	500
Max HM temp	°C	70
Pipe connections		
Heating medium		G20 int.
Hot water connection		G20 int.
Cold water connection		G20 int.
Heat pump connections		G20 int.
Connection for expansion vessel		G20 int.

¹⁾Applies with an outdoor air heat pump at 7/45 °C (outdoor temperature/flow line temperature)

Miscellaneous		
Indoor module		
Volume loop	litre	17
Volume, total indoor module	litre	270
Volume buffer vessel	litre	50
Cut-off pressure, loop	MPa (bar)	1.0 (10 bar)
Max permitted pressure in indoor module	MPa (bar)	0.3 (3 bar)
Capacity hot water heating According to EN 255-3		
Tap volume 40 °C at Eco- comfort	litre	See diagram, page 49
Tap volume 40 °C at Normal comfort	litre	See diagram, page 49
Tap volume 40 °C at Lux comfort	litre	See diagram, page 49
Dimensions and weight		
Width	mm	600
Depth	mm	615
Height (without base)	mm	1800
Height (with base)	mm	1830 – 1850
Required ceiling height	mm	1910
Weight (excl. packaging and without water)	kg	140
Part no.		069 430
RSK No.		622 40 85

Hot water capacity

Tap flow
(litres/minut)



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Item register

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