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# **1** Important information

### **Document information**

This technical manual is a complement to the Installer handbook for F750, containing:

- Description of functions and component description.
- Information to facilitate fault-tracing.
- Instructions for replacing components.
- Wiring diagram.
- Supplementary technical information.

The document applies to heat pumps with software versions up to and including 7933R2.

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.

#### Symbols

NOTE

This symbol indicates danger to person or machine .



#### 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.

#### Marking

- **CE** The CE mark is obligatory for most products sold in the EU, regardless of where they are made.
- **IP21** Classification of enclosure of electro-technical equipment.
- Read the Installer Manual.

#### General

#### 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

You need the product's (14 digit) serial number for servicing and support.

# 2 The heat pump design

### **Component positions**



#### F750, copper



#### F750, stainless steel





#### **Pipe connections**

- XL1 Connection, heating medium flow line
- XL2 Connection, heating medium return line
- XL3 Connection, cold water
- XL4 Connection, hot water
- XL10 Connection, draining heating medium
- XL31 Ventilation connection, exhaust air
- XL32 Ventilation connection, extract air

#### **HVAC** components

- CM1 Expansion vessel
- FL6 Vacuum valve<sup>2</sup>
- GP1 Circulation pump
- GP6 Heating medium pump2
- QM13 Filler valve 2, climate system<sup>3</sup>
- QM20 Venting, heating medium
- QM22 Venting, coil
- QM23 Venting, buffer tank
- QM24 Venting, heat exchanger
- QM31 Shut-off valve, heating medium flow
- QN10Shuttle valve, climate system/water heaterQN27Reversing valve, circulation climate system1
- RM1 Non-return valve
- WP3 Overflow pipe, condensation

#### Sensors etc.

- BF1 Flow sensor (located on the rear of the machine)<sup>3</sup>
- BP1 High pressure pressostat
- BP2 Low pressure pressostat
- BP5 Pressure gauge, heating system
- BS1 Air speed sensor
- BT1 Outside sensor<sup>1</sup>
- BT3 Temperature sensors, heating medium return
- BT6 Temperature sensor, hot water, control
- BT7 Temperature sensor, hot water, display
- BT12 Temperature sensor, heating medium flow after condenser
- BT14 Temperature sensor, hot gas
- BT15 Temperature sensor, fluid pipe
- BT16 Temperature sensor, evaporator<sup>1</sup>
- BT17 Temperature sensor, suction gas
- BT20 Temperature sensor, exhaust air
- BT21 Temperature sensor, extract air
- BT30 Thermostat, backup heating
- BT50 Room sensor<sup>1</sup>
- BT61 Temperature sensor, heating medium flow after buffer vessel
- BT62 Temperature sensor, heating medium return after buffer vessel
- BT63 Temperature sensor, heating medium supply after immersion heater

#### **Electrical components**

- AA1 Immersion heater card AA2 Base card
- AA2 Base Card AA3 Input circuit board
- AA4 Display unit
  - AA4-XJ3 USB socket
  - AA4-XJ4 Service socket
- AA8 Electrial anode board
- AA23 Communication board
- AA101 Connection card sensor
- CA1 Capacitor
- EB1 Immersion heater
- EB16 Defrosting element
- FA1 Miniature circuit-breaker
- FD1 Temperature limiter
- FD3 Temperature limiter, defrosting element
- QA40 Inverter
- RA1 Choke
- RF3 EMC card
- SF1 Switch
- W130 Network cable for NIBE Uplink<sup>TM</sup>

#### **Cooling components**

EP1EvaporatorEP2CondenserGQ10CompressorHZ2Drying filterQN1Expansion valve

#### Ventilation

- GQ2 Exhaust air fan
- HQ10 Exhaust air filter<sup>1</sup>
- UR1 Filter cover, exhaust air

#### Miscellaneous

- PF1 Rating plate
- PF3 Serial number plate
- UB1-2 Cable gland

<sup>1</sup>Not visible in the image

<sup>2</sup>Only F750 copper. <sup>3</sup>Only F750 stainless steel.

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

# **3** System description

### **Principle of operation**



#### List of components

#### Pipe connections

- XL1 Connection, heating medium flow
- XL2 Connection, heating medium return
- XL3 Connection, cold water
- XL4 Connection, hot water
- XL5 Connection, hot water circulation \*
- XL8 Connection, docking in
- XL31 Ventilation connection, exhaust air
- XL32 Ventilation connection, extract air

#### **Cooling components**

- EP1 Evaporator
- EP2 Condenser
- GQ10 Compressor
- HZ2 Drying filter
- QN1 Expansion valve

#### Ventilation

GQ2 Exhaust air fan

#### **HVAC** components

- GP1 Circulation pump
- GP6 Circulation pump, climate system
- QM20 Venting, climate system
- QM22 Venting, coil
- QM23 Venting, buffer tank
- QM24 Venting, heat exchanger
- QN10 Shuttle valve, climate system/water heater
- QN27 Reversing valve, circulation climate system
- RM1 Pressure controlled non-return valve

\*Not visible in the image.

#### Sensor.

#### Internal

	Name	Location	Function
BP1	High pressure pressostat	On the liquid line.	Protects the compressor against pres- sures that are too high.
BP2	Low pressure pressostat	On suction gas line.	Protects the compressor against pres- sures that are too low.
BP5	Pressure gauge, heating system	On heating medium return.	Shows the pressure in the heating sys- tem.
BS1	Air speed sensor	In the exhaust air, under the exhaust air filter.	Measures air speed which when recalcu- lated to flow initiates defrosting.
BT1	Outdoor temperature sensor (not visible in the image)	Outdoor, shaded location on north side of the house.	Setpoint for heat calculation. Operating mode change.
BT3	Temperature sensors, heating medium return	On heating medium return, before the heat exchanger.	Stopping the compressor at high tem- perature. Control of heating medium pump (GP1) in heating mode.
BT6	Temperature sensor, hot water, control	On water heater lower section.	Stop and start of hot water charging.
BT7	Temperature sensor, hot water, display	At water heater peak.	View. HW charge if BT7 < HW-start - 5 °K.
BT12	Temperature sensor, heating medium flow after condenser	On heating medium supply, after con- denser	Stopping the compressor at high tem- perature. Even for degree minute calcu- lation, charge pump. regulation and limitation reg. compressor.
BT14	Temperature sensor, hot gas	On hot gas line after compressor (GQ10).	Stopping the compressor at high tem- perature. Even limitation reg. com- pressor.
BT15	Temperature sensor, fluid pipe	On the liquid line after the condenser (EP2).	View.
BT16	Temperature sensor, evaporator	Front end evaporator.	Defrosting and limitation regulation compressor.
BT17	Temperature sensor, suc- tion gas	Suction gas line above evaporator.	View.
BT20	Temperature sensor, ex- haust air	Below filter holder.	Blocking the compressor at low temper- ature.
BT21	Temperature sensor, ex- tract air	Bottom of condensation trough.	Defrosting.
BT30	Thermostat, backup heat- ing	Immersion heater.	On and off of the immersion heater in emergency mode.
BT50	Room temperature sensor*		
BT61	Temperature sensor, heating medium flow after buffer vessel	Inlet pump GP6.	Calculation of degree minutes in hot water mode as well as when com- pressor is stopped and power off.
BT62	Temperature sensors, heating medium return	Inlet reversing valve QN27.	View.
BT63	Temperature sensor, heating medium flow between immersion heat- er and reversing valve	Inlet reversing valve QN10.	Supply and charge temperature sensor when the immersion heater is connec- ted.

#### External

	Name	Location	Function
DEW-BT6	Hot water, charging extra water heater	On extra water heater lower section.	Start and stop of hot water charging.
DEW-BT7	Hot water, peak extra water heater	On extra water heater peak.	View.
EP21-BT2	Flow line, extra climate system	On flow line to extra climate system 2.	Actual value for supply, climate system 2.
EP21-BT3	Return line, extra climate system	On return line from extra climate sys- tem 2.	View.
EP22-BT2	Flow line, extra climate system	On flow line to extra climate system 3.	Actual value for supply, climate system 3.
EP22-BT3	Return line, extra climate system	On return line from extra climate system 3.	View.
EP23-BT2	Flow line, extra climate system	On flow line to extra climate system 4.	Actual value for supply, climate system 4.
EP23-BT3	Return line, extra climate system	On return line from extra climate sys- tem 4.	View.
EP24-BT2	Flow line, extra climate system	On supply line to extra climate system 5.	Actual value for supply, climate system 5.
EP24-BT3	Return line, extra climate system	On return line from extra climate system 5.	View.
EP25-BT2	Flow line, extra climate system	On supply line to extra climate system 6.	Actual value for supply, climate system 6.
EP25-BT3	Return line, extra climate system	On return line from extra climate sys- tem 6.	View.
EP26-BT2	Flow line, extra climate system	On supply line to extra climate system 7.	Actual value for supply, climate system 7.
EP26-BT3	Return line, extra climate system	On return line from extra climate sys- tem 7.	View.
EP27-BT2	Flow line, extra climate system	On supply line to extra climate system 8.	Actual value for supply, climate system 8.
EP27-BT3	Return line, extra climate system	On return line from extra climate sys- tem 8.	View.
WP5-BT6	Hot water, charging extra water heater	On extra water heater lower section.	Start and stop of hot water charging.
WP5-BT7	Hot water, peak extra water heater	On extra water heater peak.	Showing
WP5-BT53	Temperature sensor, solar panel.	In the submerged tube by the outlet from the solar panel.	Control starting and stopping of the circulation pump for the solar coil.
WP5-BT54	Temperature sensor, solar coil.	In the submerged tube, by the lower section of the accumulator tank.	Control starting and stopping of the circulation pump for the solar coil.

	Name	Location	Function
AZ2-BT22	Supply air temperature	At the ventilation connection for supply air.	-
AZ2-BT23	Outdoor air temperature	At the ventilation connection for out- door air	-
AZ2-BT68	Temperature sensor, flow	In submerged tube located after the control valve.	-
AZ2-BT69	Temperature sensor, re- turn	In submerged tube located by the re- turn.	-

# 4 Cooling circuit

### **Outline diagram**



For information about the designations, see page 9.

## Compressor (GQ10)

#### Parameters

#### Time between starts

Minimum time between stop and start is 5 min. Minimum time between two starts is 20 min.

#### Evaporation (BT16)

- -23 °C Compressor stops, defrosting starts. Three successive stops gives alarm 183.
- -17 °C Reduces the compressor's frequency by 1 Hz/ 15s.
- -14 °C Return to free control of the compressor's frequency.

#### Hot gas (BT14)

- 120°C Compressor stops, alarm 55. (From v6468R7 alarm 155). 3 hot gas stops within 240 minutes produce alarm 55.
- 110 °C Reduces the compressor's frequency by 5 Hz/ 60s.
- 107 °C Return to free control of the compressor's frequency.

#### blockFreq

2 selectable blockFreq (5.1.24) with blocking range 2-50 Hz. Factory setting: Off

#### Flow temperature (BT12)

If the supply temperature exceeds the calculated supply by 4 °C, the supply limitation is activated. This controls the supply temperature to calculated supply +2.5 °C.

#### **Compressor start**

At compressor start the compressor is wound up to at least 40 Hz for the first 180 seconds, it is then controlled dependent on operating mode.

#### Heating mode

After the start up sequence the compressor is wound down to 20 Hz. The compressor is locked to this speed for 70 min. unless the degree minutes fall below -180, defrosting starts, there is an A-alarm or there is a first compressor start after voltage drop. Then the speed is regulated and the control tries to restrict the degree minutes to -60. After switching from hot water, the compressor frequency is locked for 4 minutes.

#### Hot water operation

If hot water production starts during heating operation, the compressor frequency increases by 10 Hz.

If there is no heat demand, the compressor produces hot water at speed according to the following table:

State	Speed
Economy	35 Hz*
Normal	35 Hz*
Lux	80 Hz or BT16 reaches - 10 °C

\* If "hot water start" - BT7 < 5, the compressor runs up to 80 Hz or BT16 reaches -10 °C.

In Lux mode or temporary increase the compressor stops when the condenser out (BT12) reaches 59  $^{\circ}$ C and the electrical addition is permitted to step in.

#### Defrosting

Max. defrosting time	180 minutes	
Min. defrosting time	10 minutes	

#### Start conditions for defrosting

At each compressor start a reference value is noted for the air flow on the air speed sensor BS1.

Defrosting starts when:

- the air flow (BS1) decreases by 10 % from the reference value and if the evaporation sensor (BT16) has been below -1°C for 30 minutes.
- the evaporation sensor (BT16) is below -23 °C.

#### Stop conditions for defrosting

Defrosting stops when

- 1. BT21 >8 °C
- 2. The rising speed of the temperature at BT16 has been removed.

If condition 2 is fulfilled before condition 1, defrosting continues for a further 30 minutes after condition 1 is fulfilled.

### **Compressor protection**

#### High pressure pressostat

Stop with automatic restart:

The compressor is stopped when the pressure is above 29 bar and reset at 22 bar.

#### Low pressure pressostat

Stop with manual restart:

The compressor is stopped at 0.5 bar and reset at 1.5 bar.

#### **Time conditions**

Minimum time between stop and start is 4 min. Minimum time from start to next start is 20 min.

### **Expansion valve**

Overheating (BT17-BT16) can be found in service info menu 3.1.

Overheating must be 12-18°°C and must be checked when the temperature of the heating medium flow is 30 - 55 C.

# **5** Component description

Component	Description
Immersion heater (EB1)	White coil (2 kW) resistance 27 ohm Red coil (3 kW) resistance 55 ohm Brown coil (1 kW) resistance 55 ohm Black coil (0.5 kW), resistance 110 ohm
Reversing valve (QN10, QN27)	Actuator motor: 7 VA, 230/24 VAC, 50 Hz, IP 40. Running time approx 8 seconds Max. operating pressure: 1.0 MPa Operating temperature: 5 - 80 °C (90 °C briefly)
Heating medium pump (GP1)	Grundfos UPM15-70
Control signal: PWM 0-10 V DC (max-min speed)	G1"
	Grundfos UPM2 15-70 130

Component	Description
Circulation pump, cli- mate system (GP6) Control signal: PWM 0-10 V DC (max-min speed)	Grundfos ALPHA2L 15-60 ES
High pressure switch (BP1)	Breaking value: 29 bar. Reconnection differential: 7 bar
Low pressure switch (BP2)	Breaking value: 0.5 bar Reconnection differential: 1 bar
Compressor (GQ10)	Mitsubishi RMT5118HDE2 Resistance between phases: 2.3 ohm
Expansion vessel (CM1)	Volume 10 l
Fan (GQ2)	EBM G3G160-BC50-09
Control signal: PWM 0-10 V DC (max-min speed)	
Filter (HQ50)	Filter class G2 445 x 196 mm
Air speed sensor (BS1)	OMRON D6F-W04A1 Measurement range: 0-4 m/s Mains voltage (Vcc): 12 V DC Output voltage (Vout): 1-5 V DC
Inverter (QA40)	Up to and including part no.: 066015, 066060, 066061, 066063 Yaskawa V1000 9 A
	From part no.: 066036, 066037, 066038 Eltwin NI1AB
Exp. valve (QN1)	Danfoss TUBE 068U3473

### Sensors

#### Temperature sensor data

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

# 6 Troubleshooting

## Alarm list

#### Alarm

In event of an alarm, the red lamp on the front lights up 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 Outdoor sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Calculated supply temp is set to min supply. Automatic reset.	See fault-tracing schedule page 32.
3	Sensor fault BT3 Return line sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	GP1 switches to manual speed if auto control is selected. Automatic reset.	See fault-tracing schedule page 34.
6	Sensor fault BT6 Hot water charging	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Blocks hot water. Automatic reset.	See fault-tracing schedule page 33.
12	Sensor fault BT12 Condens- er supply line	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Compressor blocked. GP2 switches to manual speed if auto is selected. Automatic re- set.	See fault-tracing schedule page 34.
14	Sensor fault BT14 Hot gas sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Blocks the compressor. Auto- matic reset.	See fault-tracing schedule page 34.
16	Sensor fault BT16 Evaporat- or sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Blocks the compressor. Auto- matic reset.	See fault-tracing schedule page 34.
23	Sensor fault SAM AZ2-BT22 Supply air sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Automatic reset.	
31	Sensor fault BT63 Supply line	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Automatic reset.	See fault-tracing schedule page 33.
32	Sensor fault BS1 Air flow meter	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Automatic reset.	
33	Sensor fault EP30-BT53 Sol- ar panel tem- perature	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Switches off the solar function.	See fault-tracing schedule page 41.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
34	Sensor fault EP30-BT54 Sol- ar tank temper- ature	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Switches off the solar function.	See fault-tracing schedule page 41.
35	Sensor fault EM1-BT52 Boil- er sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Shunt closes, burner switches off. Circ. pump (GP15) stops. Immersion heater blocking stops.	See fault-tracing schedule page 41.
36	Sensor fault EP21-BT2 Sup- ply line sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Shunt waiting time for EP21- QN25 is shunt waiting time 3*10 and sensor signal is re- placed by "EP21-BT3"-10K during shunt control.	See fault-tracing schedule page 41.
37	Sensor fault EP22-BT2 Sup- ply line sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Shunt waiting time for EP22- QN25 is shunt waiting time 3*10 and sensor signal is re- placed by "EP22-BT3"-10K during shunt control.	See fault-tracing schedule page 41.
38	Sensor fault EP23-BT2 Sup- ply line sensor	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Shunt waiting time for EP23- QN25 is shunt waiting time 3*10 and sensor signal is re- placed by "EP23-BT3"-10K during shunt control.	See fault-tracing schedule page 41.
39	Sensor fault BT64	Sensor not connected/defect- ive (cooling, supply)	Automatic reset.	See fault-tracing schedule page 41.
40	Compressor phase 1 missing	The soft starter card has measured that mentioned	Compressor blocked. Manual reset.	- Connect the mentioned phase to the soft starter card
41	Compressor phase 2 missing	compressor phase has been missing for 30 minutes.		
42	Compressor phase 3 missing			
43	Incorrect phase sequence	The phases are connected in the wrong order	Compressor blocked. Manual reset.	- Reconnect the phase order to the soft starter card
44	Fault in the soft-start fuses.	Fuses in the large soft-start card (15-17 kW) are defect-ive.	Manual reset.	- Replace the soft starter card
50	High pressure alarm	The high pressure switch BP1 has triggered 3 times within 150 minutes or has been triggered for 300 minutes continuously.	Compressor blocked.	See fault-tracing schedule page 35.
51	Low pressure alarm	Low pressure switch BP2 has triggered.	Compressor blocked. Manual reset	See fault-tracing schedule page 36.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
52	Temperature limiter alarm	The temperature limiter has deployed and been "open" for longer than 30 seconds.	None (Handled by hardware).	See fault-tracing schedule page 37.
54	Motor protec- tion	The motor protection breaker has tripped.	Compressor blocked. Manual resetting of the motor protection switch.	Check settings value. Overloaded compressor. - Call qualified refrigeration technician. Mechanical fault on com- pressor. - Call qualified refrigeration technician. Defective motor protection switch. - Replace.
55	Hot gas alarm	3 hot gas stops within 240 minutes.	Compressor blocked.	Flow interruption heating me- dium. Closed valves in heating system, air or pressure too low in heating system
56	Incorrect serial number	The heat pump has a serial number that does not exist	Compressor blocked.	Incorrect serial number.
57	Incorrect pro- gram	Serial number and program do not match each other.	Compressor blocked.	Incorrect software for this serial number.
64	Low exhaust air temperature	The exhaust air temperature has been 16 °C or lower for one hour.	Compressor blocked, Automat- ic reset when the temperature has been 17°C or more for one hour.	For program version before 1770 - select "auxiliary opera- tion". For program version from 1770 onwards - the machine switches to auxiliary operation mode automatically.
70	Communica- tion fault with PCA input	There has been no communic- ation with the input card for 60 seconds.	None. For sensors that are no longer available, see each sensor's alarm action.	See fault-tracing schedule on page 37.
71	Communica- tion fault with PCA base	There has been no communic- ation with the base card for 15 seconds.	Compressor blocked. Manual reset.	See fault-tracing schedule on page 38.
72	Perm. com. fault soft-start card	There has been no communic- ation with the soft-start card for 15 seconds.	Compressor blocked. Manual reset.	<ul> <li>Check the communication cables leading to the card.</li> <li>Check the setting of the dipswitch.</li> <li>Check/replace the ground card.</li> <li>Check/replace the soft starter card.</li> </ul>

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
73	Perm. Com. er- ror heating sys- tem 2	Permanent communication fault leading to the accessory card for heating system 2.	Accessory is blocked. Manual reset	<ul> <li>Check the communication cables leading to the card.</li> <li>Check the setting of the dipswitch.</li> <li>Check/replace the accessory card.</li> <li>Check/replace the input card.</li> <li>Check/replace the display card.</li> </ul>
74	Perm. Com. er- ror heating sys- tem 3	Permanent communication fault leading to the accessory card for heating system 3.	Accessory is blocked. Manual reset	<ul> <li>Check the communication cables leading to the card.</li> <li>Check the setting of the dipswitch.</li> <li>Check/replace the accessory card.</li> <li>Check/replace the input card.</li> <li>Check/replace the display card.</li> </ul>
76	Perm. Com. er- ror heating sys- tem 4	Permanent communication fault with the relevant accessory card.	Accessory is blocked. Manual reset	- Check the communication cables leading to the card. - Check the setting of the
77	Perm. Com. er- ror addition with shunt			dipswitch. - Check/replace the accessory card. - Check/replace the input card. - Check/replace the display card.
83	Unsuccessful defrosting	The defrosting stop condi- tions have not been met for 3 hours		
84	Perm. com. fault OEK11/20	Permanent communication fault with the relevant access-	Manual reset.	- Check the communication cables leading to the card.
86	Perm. com. fault SAM40	ory card.		- Check the setting of the dipswitch.
92	Perm. com. fault DEW 40/41			<ul> <li>Check/replace the accessory card.</li> <li>Check/replace the input card.</li> <li>Check/replace the display card.</li> </ul>
96-99	Communica- tion fault, room unit	Communication with the in- put card missing for 60 secs.	None.	Defective sensor and its con- nections.

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
100	Communica- tion fault with inverter	Communication with the in- verter missing for 15 secs.	Compressor blocked. Manual reset.	
130-133	Com. fault Cli- mate system 5- 8	Communication with the ac- cessory missing for 15 secs.	Accessory is blocked.	Defective sensor and its con- nections.
203 Eltwin	Inverter alarm type l	Inverter alarm 213 has been active for 60 minutes.	Compressor blocked.	See alarm tab menu 6 for error code and inverter alarm listing on page 40 for further instruc- tions.
				* 066015, 066060, 066061, 066063
204 Eltwin	Inverter alarm type ll	Inverter alarm 214 has been active for 60 minutes or has been activated 3 times in less than 120 minutes.	Compressor blocked.	See alarm tab menu 6 for error code and inverter alarm listing on page 40 for further instruc- tions.
				* 066015, 066060, 066061, 066063
205 Eltwin	Inverter alarm type III	Inverter alarm 215 has activ- ated twice in less than 60 minutes.	Compressor blocked.	See alarm tab menu 6 for error code and inverter alarm listing on page 40 for further instruc- tions.
				* 066015, 066060, 066061, 066063
229	Short run times for compressor	Compressor operation has been shorter than 5 minutes 3 times in a row.	Compressor blocked. Manual reset.	Flow problems or incorrect settings.
250	Com. fault acc. SMS	Communication with the ac- cessory missing for 15 secs.	Accessory is blocked. Manual reset.	Check the communication.
251	Com. fault acc. MODBUS	Communication with the ac- cessory missing for 15 secs.	Accessory is blocked. Manual reset.	Check the communication.
254	Com. fault acc. SCA	Communication with the ac- cessory card missing for 15 secs.	Accessory is blocked. Manual reset.	Check the communication.
295	Sensor fault WP5-BT7 SCA	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Accessory is blocked. Automat- ic reset.	Check the sensor connection.
296	Sensor fault WP5-BT6 SCA	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Accessory is blocked. Automat- ic reset.	Check the sensor connection.
327	Low exhaust air	The exhaust air temperature has been 16 °C or lower for one hour.	Compressor blocked. Automat- ic reset.	

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
356	Uncertain sensor accur- acy.	Uncertain sensor accuracy on sensors BT3 and BT63. Differs more than 2K between the sensors during calibration.	GP1 switches to manual speed if auto control is selected.	Flow-related or sensor connec- tion.
357	Com. fault acc. OPT	Communication with OPT missing for 60 secs.	No action	
358	GBM alarm	Alarm from the accessory OPT	No action	See Installer Manual for OPT.
359	GBM alarm	Alarm from the accessory OPT	No action	See Installer Manual for OPT.
421 Eltwin	Inverter alarm type ll	A temporary communication alarm has occurred 3 times within 2 hours or been active continuously for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038
423 Eltwin	Inverter alarm type ll	A temporary alarm on the in- verter's external input has occurred 3 times within 2 hours or the input has been broken continuously for 1 hour.	Compressor blocked. Manual reset.	Communication cable to the inverter and its connections. * 066036, 066037, 066038
427 Eltwin	Inverter alarm type ll	A temporary internal fault in the inverter has occurred 3 times within 2 hours or has been active for 1 hour.	Compressor blocked. Manual reset.	see alarm 423 * 066036, 066037, 066038
429 Eltwin	Inverter alarm type ll	A temporary internal fault in the inverter has occurred 3 times within 2 hours or has been active for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038
431 Eltwin	Inverter alarm type l	Continuous under voltage has been registered by the inverter for one hour.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038
433 Eltwin	Inverter alarm type l	Continuous under voltage has been registered by the inverter for one hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038
435 Eltwin	Inverter error type I	One compressor phase to the inverter has been missing continuously for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
437 Eltwin	Inverter error type ll	A temporary inverter fault has occurred 3 times within 2 hours or continuously for 1 hour.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample.
439 Eltwin	Inverter alarm type ll	The inverter has temporarily reached max. working tem- perature 3 times within 2 hours.	Compressor blocked. Manual reset.	Poor position of inverter, check screws and heat-conducting paste. * 066036, 066037, 066038
441 Eltwin	Inverter alarm type ll	Max. current in has been temporarily too high 3 times within 2 hours or missing continuously for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038
443 Eltwin	Inverter alarm type ll	The inverter has temporarily reached max. working tem- perature 3 times within 2 hours.	Compressor blocked. Manual reset	Heat pump and climate sys- tem. Check the particle filter. Open any radiator/underfloor heating thermostats. Poor po- sition of inverter, check screws and paste. * 066036, 066037, 066038
445 Eltwin	Inverter alarm type ll	A temporary internal fault with the inverter has oc- curred.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038
447 Eltwin	Inverter alarm type ll	One phase has been missing 3 times within 2 hours or missing continually for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Compressor wiring up to inverter. * 066036, 066037, 066038
449 Eltwin	Inverter alarm type ll	The compressor has run tem- porarily at lower speed than minimum permitted 3 times within 2 hours or continu- ously for 1 hour.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. Compressor wiring up to inverter. * 066036, 066037, 066038

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
451 Eltwin	Inverter alarm type ll	A temporary inverter fault has occurred 3 times within 2 hours or continuously for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038
453 Eltwin	Inverter alarm type ll	The current out from the inverter to the compressor has been temporarily too high 3 times within 2 hours or con- tinuously for 1 hour.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. Compressor wiring up to inverter if the compressor is running slowly. If no, replace inverter. * 066036, 066037, 066038
455 Eltwin	Inverter alarm type ll	The power output from the inverter has been too high temporarily 3 times within 2 hours or continuously for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Internal com- pressor wiring to inverter, if OK this can be due to the com- pressor. * 066036, 066037, 066038
461 Eltwin	Inverter alarm type ll	Only 1-phase. The current to the inverter has been too high temporarily 3 times within 2 hours or missing continuously for 1 hour. May be due to low incoming voltage, lower than 198 VAC.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. * 066036, 066037, 066038
469 Eltwin	Inverter error type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038
471 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038

Alarm no.	Alarm text on the display	Cause	Heat pump action.	May be due to
473 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038
475 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038
477 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. Inverter replacement. * 066036, 066037, 066038
479 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. Inverter replacement. * 066036, 066037, 066038
481 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred 3 times within 2 hours or been continuous for 1 hour.	Compressor blocked. Manual reset.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample. * 066036, 066037, 066038
504	The inverter has a message.	The inverter has received an error code.	Depends on error code. Auto- matic reset.	See service info menu for error code.

#### Information messages

In the event of an information message, the green light on the front lights up and a symbol with a service technician is displayed in the information window, until the information message is reset. All information messages are automatically reset when the cause is rectified.

No.	Info in display	Cause	Heat pump action.	May be due to
47	Sensor fault BT28/47	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Outdoor air mix interrupted. Automatic reset.	
61	Sensor fault BT61 Supply line	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds	Freezes the degree minute calculation during HW char- ging	The sensor and its connections.
69	Non-calibrated air flow sensor BS1	Adjustment of the ventilation has not been carried out.	Only information	
107	Sensor fault BT7-VV sensor top	Sensor temporarily missing	Only information	The sensor and its connections.
123	Sensor fault BT23-FTX	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	Stops the fans, opens bypass. Automatic reset.	The sensor and its connections.
138	Sensor fault BT68 SAM	The input for the sensor re- ceives unreasonably high or low value for longer than 2 seconds.	No action, automatic reset	
150	Temporary HP alarm	The high pressure switch has tripped once during a 150 minute period.	Compressor is blocked	See alarm 50.
155	High hot gas temperature	BT14 above 120°		Flow interruptions in the heating medium or air in the heating system
162	High temp. condenser out	The temperature in BT12 has reached max. permitted temperature.	Compressor blocked.	Settings, flow interruptions in the heating medium or air in the heating system.
163	High temp. condenser in	The temperature in BT3 has reached max. permitted temperature.	Compressor blocked.	Settings
166	Electrical anode fault	Signal missing, fault in elec- trical anode for at least 5 min.	Automatic reset.	Defective anode or no contact.
170	Com. error in- put card	Communication with the in- put card is temporarily miss- ing.	Only information.	Communication cables and their connections.
171	Com. error base card	Communication with the base board is temporarily missing.	Only information	Communication cables and their connections.

No.	Info in display	Cause	Heat pump action.	May be due to
173-179	Com. error Acc.	Communication with the ac- cessory board is temporarily missing	Accessory is blocked. Automat- ic reset.	Communication cables and their connections.
180	Freeze prot	Anti-freeze active. Occurs when the outdoor temperat- ure is below 3°C and no heating is permitted.	Heating permitted. Com- pressor is permitted if there is no alarm blocking the com- pressor. Additional heat is permitted if there is no alarm blocking the additional heat. Calculated flow is set to min flow.	Operating settings.
181	Unsuccessful periodic in- crease	Periodic increase did not reach the stop temperature for five hours.	Only information.	Operating settings.
182	Load monitor activated	One or more power steps may not be activated because the current in at least one phase is too high.	Only information	Phase load. Possible need for larger main fuse.
184	Filter alarm	Reminder of cleaning/replace- ment of filter.	Manual reset	Reminder to check filter. The machine has not been stopped for the number of months set in menu 5.1.99.
186-194	Com. fault ac- cessory board	Communication with the ac- cessory board is temporarily missing	Accessory blocked.	Communication cables and their connections.
196-199	Temp. com. fault, room unit.	Communication with the room unit zone 1-4 missing and new communication at- tempt made every 5 seconds.	Room unit is blocked. Automat- ic reset.	Temporary communication fault. See alarm 96.
200	Com.Error in- verter	Communication fault with inverter	Temporary communication fault	See alarm 100
201	Inverter alarm	Inverter alarm/fault	The inverter indicates alarm/fault (Only applies to Yaskawa inverter).	See alarm log menu 3.4 for er- ror code and inverter error listing on page 42
202	Inverter error			Inverter indicates error
210	Com. fault acc. DEW	Communication with the ac- cessory board is temporarily missing.	Accessory is blocked. Automat- ic reset.	
213	Inverter error type l	Temporary inverter fault, switches to alarm 203 after 60 min.		Temporary inverter error. Switches to alarm 203 after 60 minutes.
214	Inverter error type II	Temporary inverter fault, switches to alarm 204 after 60 min. or if the alarm has been activated 3 times in less than 120 min.		Temporary inverter error. Switches to alarm 204 after 60 minutes or if activated 3 times in less than 120 minutes.

No.	Info in display	Cause	Heat pump action.	May be due to
215	Inverter error type III	Temporary inverter fault, switches to alarm 205 if it has been activated 2 times in less than 60 min.		Temporary inverter error. Switches to alarm 205 if activ- ated twice in less than 60 minutes.
260	Com. fault acc. SCA	Sensor temporarily missing	Accessory is blocked	Communication cables and connections
274	The com- pressor's phase has been over- loaded	The load monitor prevents the compressor from running at the desired frequency.	Only information	Main fuse too small.
275	The com- pressor's phase has been over- loaded for a long time	The load monitor prevents the compressor from running at the desired frequency	Only information	Main fuse too small.
322	Spot price could not be downloaded	If Spot price is selected but the relevant price is not available	Influences the installation's priorities. Automatic reset when new prices are down- loaded.	
340	Low supply air temperature	BT22 has been below 11°C	Blocks hot water. Automatic reset when BT22 is above 16°C.	
420 Eltwin	Inverter alarm type ll	A temporary communication alarm has occurred.	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection.
422 Eltwin	Inverter alarm type ll	A temporary alarm on the in- verter's external input has occurred 3 times within 2 hours or the input has been broken continuously for 1 hour.	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection.
426 Eltwin	Inverter alarm type ll	A temporary internal fault in the inverter has occurred	The compressor is stopped.	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample.
428 Eltwin	Inverter alarm type ll	A temporary internal fault in the inverter has occurred	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample.
430 Eltwin	Inverter alarm type ll	A temporary internal fault in the inverter has occurred.	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection.

No.	Info in display	Cause	Heat pump action.	May be due to
432 Eltwin	Inverter alarm type l	A temporary under voltage has been registered by the inverter.	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection.
434 Eltwin	Inverter alarm type l	A compressor phase has been missing temporarily	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection.
436 Eltwin	Inverter alarm type ll	A temporary internal fault in the inverter has occurred.	The compressor is stopped	Main and group fuses, as well as cables to the inverter and its connection. Restart the heat pump by switching it off via its switch and cut the current via the circuit breaker, for ex- ample.
438 Eltwin	Inverter alarm type ll	The inverter has temporarily reached max. working temperature.	The compressor is stopped	Bad circulation in the heating medium circuit. Bleed heat pump and climate system. Check the particle filter. Open any radiator/underfloor heat- ing thermostats.
440 Eltwin	Inverter alarm type II	Max. current in has been too high temporarily	The compressor is stopped	
442 Eltwin	Inverter alarm type ll	The inverter has temporarily reached max. working temperature.	The compressor is stopped	
444 Eltwin	Inverter alarm type II	A temporary internal fault in the inverter has occurred	The compressor is stopped	
446 Eltwin	Inverter alarm type II	A compressor phase has been missing temporarily.	The compressor is stopped	
448 Eltwin	Inverter alarm type ll	The compressor has run tem- porarily at a lower speed than the minimum permitted.	The compressor is stopped	
450 Eltwin	Inverter alarm type II	A temporary inverter alarm has occurred.	The compressor is stopped	
452 Eltwin	Inverter alarm type ll	The current out from the in- verter to the compressor has been too high temporarily.	The compressor is stopped	
454 Eltwin	Inverter alarm type ll	The current out from the in- verter to the compressor has been too high temporarily.	The compressor is stopped	
460 Eltwin	Inverter alarm type ll	(Only single phase) Too high current in to the inverter has occurred temporarily. May be due to low incoming voltage, lower than 198 VAC	The compressor is stopped	

No.	Info in display	Cause	Heat pump action.	May be due to
468 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
470 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
472 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
474 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
476 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
478 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
480 Eltwin	Inverter alarm type III	A temporary inverter alarm has occurred.	The compressor is stopped	
900	Country not defined	Country not selected.	Only information. Resets when country is selected in menu 5.12.	
995	External alarm	An alarm according to selec- ted function on AUX input	Only information.	
996	Blocked	Additional heat is externally blocked via AUX input.	Additional heat is blocked.	
997	Blocked	Compressor is externally blocked via AUX input.	Compressor blocked.	
998	Display starts	Display has restarted.		

## Troubleshooting guide

#### Sensor fault BT1



#### Sensor fault BT6, 7, 61, 63



#### Sensor fault BT3, 12, 14, 15, 16, 17, 20, 21



#### Alarm 50 – high pressure alarm



#### Alarm 51 – low pressure alarm


### Alarm 52 – temperature limiter



### Alarm 70 - Com. fault input board



### Alarm 71 - Com. fault base board





Alarm 73-95 - perm. com. fault accessory board

### Alarm 100 – Inverter fault



### Sensor fault EP21-EP27\_BT2, EP21-EP27\_BT3

Fault-tracing in accessory card.



### Inverter fault Yaskawa 066015, 066060, 066061, 066063

When alarm 203-205 is activated an alarm code can be read out from the alarm tab. The code is displayed within brackets and starts with 0x which

means that a hexadecimal digit follows. The actual code consisting of four characters then follows. The alarms that may occur when the inverter is used in F750 are listed below.

For other alarm codes see the manual for Yaskawa AC Drive – V1000 or contact NIBE Customer support.

The following error codes only apply to Yaskawan inverters. For Eltwin inverters, see alarm list on page 31 While fault codes marked \* may have originated from another alarm that which has been described is most likely. From version 1770 onwards, the alarm code is also displayed in menu 3.1 (alarm 213-215), now also supplemented by "F:" or

"E:" which refers to the inverter's register "Fault" and "Alarm"

The inverter can be loaded with new parameter settings from menu 5.5

Fault	Display code	Description	Cause
0x0001	Uv, UV1	Undervoltage	Too low incoming voltage temperature to the inverter. Phase drop L1-L2. Alarm limit 380VDC
0x0002	Uv2	Control Power Supply Under-	To low incoming voltage.
	ov	voltage Undervoltage	High incoming voltage/inter- ference
			Alarm limit 820VDC
0x0003	оН	Heatsink Overheat	Insufficient cooling of the in- verter
0x0004	Uv3	Soft Charge Circuit Fault	Internal inverter fault
0x0006	GF	Ground Fault	Short-circuit between the in- verter's output and earth
0x0007	oC	Overcurrent	Overcurrent/motor protec- tion
0x0008	ov	Overvoltage	Interference on incoming supply to the inverter. Short- circuit between motor/cables and ground
0x0009	оН	Heatsink Overheat	Insufficient cooling of the in-
0x000A	oH1		verter
0x000C	oL2	Drive Overload	Overloading of the inverter
0x0014	CE	MEMOBUS/ModbusCommu- nication Error	Communication error. The inverter dos not receive the correct input data
0x0016	CALL	Serial Communication Trans- mission Error	The inverter does not achieve contact with the control sys- tem/Buster card
0x0018	oL2	Drive Overload	Overloading of the inverter
0x001B	PF	Input Phase Loss	A phase in the supply to the inverter is missing or has a considerably lower voltage than other phases
0x001D	CALL	Serial Communication Trans- mission Error	The inverter does not achieve contact with the control sys- tem/Buster card
0x0021	CE	MEMOBUS/ModbusCommu- nication Error	Communication error. The inverter dos not receive the correct input data

Fault	Display code	Description	Cause
0x0025	CF	Control Fault	Incorrect parameter setting in the inverter
0x0035	НСА	High Current Alarm	Overcurrent
0x0036	LF2	Output Current Imbalance	Open-circuit in motor cable/winding
0x0037	STO	Pullout Detection	Motor running slowly/stuck or open circuit in motor cable.
0x003B	HbbF	Safe Disable Input	No contact in bridge between input H1 and H2 in inverter
0x003C	Hbb	Safe Disable Input	Alarm input for high pressure switch activated
0x0046	CoF	Current Offset Fault	Internal inverter fault
0x0083	CPF02	A/D Conversion Error	Error in control wiring/Intern-
0x0097	CPF22		al inverter fault
0x0098	CPF23	PWM Feedback Fault	Internal inverter fault

# 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.

### Internal outputs

	3x400 Eltwin
АА1-К4	0.5 kW
АА1-К5	3.0 kW
АА1-К6	1.0 kW
AA1-K7	-
АА1-К8	2.0 kW
АА1-К9	3.0 kW
AA1-K10	-

### Climate system 2-8 (ECS 40/ECS 41)

Output	Function
EB2x-AA5-K2	Mixing valve, close
EB2x-AA5-K3	Mixing valve, open
EB2x-AA5-K4	External circulation pump

### Hot water circulation (AXC 40)

Output	Function
QZ1-AA5-K4	HWC-pump GP11

### Extra water heater (DEW 40)

Output	Function
WP5-AA5-K1	Shuttle valve

### Exhaust air fan and circulation pump

With forced control of the exhaust air pump (GQ2) or the heating medium pump (GP1), it can be necessary to check the supply (230 V AC) and the control signal (0-10 V DC) to the circulation pump.

### Exhaust air fan (GQ2)

Fan speed GQ2	PVM2, X2:3-4	LED PWM2 on Card AA2
100 %	approx 0 V DC	Lit
50 %	approx 5 V DC	Half lit
0 %	approx 10 V DC	Not lit

GQ2 can be tested by the control cable being disconnected from the connecting board (AA101) and bridged between the red and yellow cables.

### 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

GP1 can also be tested by disconnecting control cable W115 from the pump. This produces 100% speed.

# 7 Component replacement

## Basic

### **Removing the covers**

### Front cover





- 1. Remove the upper panel by pulling it straight out.
- 2. Remove the screws from the lower edge of the front panel.
- 3. Lift the panel out at the bottom edge and up.
- 4. Pull the panel towards yourself.



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.

### Pulling out the cooling module

### Insulation, top

1. Disconnect the cable from the motor and remove the motor from the shuttle valve as illustrated.



2. Grip the handle and pull straight out as illustrated.





# Main components

### Remove the air treatment section

General:
When the quick release
connectors to the air
treatment section are split,
the O-rings (part no.
033465) must be replaced.
Air treatment section
weighs approx. 75 kg. Lift-
ing equipment should be
used to lower it to a suit-
able working height safely.

<b>1</b> Turn off the power supply to the product.	
<b>2</b> Remove the upper panel to the air treatment section according to removal of hatches on page 45.	
<b>3</b> Remove the front panel according to removal of hatches on page 45.	
<b>4</b> Shut off incoming water to the product and reduce the pressure in the heating system.	
<b>5</b> Drain the condenser of water by keeping the vent QM24 open and open the drain valve QM1 or safety valve FL2 and vent QM20. When water stops coming out of QM20 the condenser is empty and FL2 can be closed.	
<b>6</b> Remove the top insulation according to Insulation, top side 45.	
<b>7</b> Remove two screws and lift off the side panels.	Screws



**11** Remove two screws holding the air treatment section.

**12** Pull the air treatment section forward slightly and raise the front edge so that the screw plate releases when the air treatment section is pulled forward. Lower the air treatment section and place it on a surface that does not damage pipes and connections.



### Replacing drying filter, compressor, evaporator



<b>4</b> Remove the six small screws for the filter holder on the air treatment section cover (T20).	Screws Filter
<b>5</b> Remove the ten medium length screws for the plastic front. Remove the filter and plastic front.	
<b>6</b> Remove the six short screws for the metal front. Remove the metal front and insulation for the fan as well as the insulation and splash guard for the evaporator.	Evaporator insulation Screws





### Replacing the compressor feet





**7** Remove the refrigerant pipe from the holder. If necessary, remove the holder.



Lubricate the top of the new dampers (part no. 524358) with soap and lower the compressor. Re-install the studs by hand (tighten later using a torque wrench).

**9** Unscrew the inner stud via the opening for the inverter box using a long tool (500mm size 8) and remove the stud using a magnet.

Insert a wooden wedge or similar to raise the compressor approx. 1 cm at the inner edge and remove the inner compressor foot.

Lubricate the top of the new damper (part no. 524358) with soap and lower the compressor. Re-install the stud using a torque wrench (9.6 Nm).

**10** Tighten the outer studs using a torque wrench (9.6 Nm).





<b>11</b> Reinstall the refrigerant pipe in the holder and check that all pipes are not impeded.	
<b>12</b> Re-install the inverter box and check that the com- pressor cable is not against the refrigerant pipe or com- pressor.	
<b>13</b> Reinstall sweep. Use the service hatch to check that the refrigerant pipe and compressor cables are not touching. Check that the sweep seal is not trapped or damaged.	
<b>14</b> Re-install the plastic front and filter hatch.	
<b>15</b> Re-assemble the air treatment section in reverse order according to 1-12 on page 46. Top up and bleed according to instructions in IHB.	

### Replacement of immersion heater

<b>1</b> Set the switch (SF1) to stand by mode and wait approx. 30 seconds.	
<b>2</b> Turn off the power supply to the heat pump.	
<b>3</b> Drain the heat pump of water by opening the safety valve FL2 and allow air to enter via the vents QM20 and QM22. If the heat pump is not the highest point in the system, draining is made easier if the shut-off valves out to the heating system are closed.	



**6** Disconnect: Off AA1:X7 3 blue cables. Off AA1:X3 2 red, 1 brown, 1 black and 1 white cable.

**7** Pull out the bulb and capillary tube from the immersion heater.



**8** Disconnect the immersion heater at the marked couplings.

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

**10** Remove the immersion heater.



### **Replacing VXV + Control device**

<b>1</b> Set the switch (SF1) to stand by mode and wait approx. 30 seconds.	
<b>2</b> Turn off the power supply to the heat pump.	
<b>3</b> Drain the heat pump of water by opening the safety valve FL2 and allow air to enter via the vents QM20 and QM22. If the heat pump is not the highest point in the system, draining is made easier if the shut-off valves out to the heating system are closed.	





### **Replacing the fan**



# **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. Image: Imag



### Input circuit board (AA3)

<b>1</b> Remove the plastic cover over (AA3). See instructions in IHB.	
<b>2</b> Remove the screw and connect cables.	Screw

### Display unit (AA4)

- **1** Detach the cable from the lower edge of the display unit.
- **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**

3x400 V		Copper/Stainless steel
Output data according to EN 14 511		
Specified heating output (P <sub>H</sub> ) <sup>1</sup>	kW	1.144
COP1		4.2
Specified heating output (P <sub>H</sub> ) <sup>2</sup>	kW	1.498
COP <sup>2</sup>		4.72
Specified heating output (P <sub>H</sub> ) <sup>3</sup>	kW	4.994
COP <sup>3</sup>		2.43
Additional power		
Max power, immersion heater (factory setting)	kW	6.5 (6.5)
Energy rating, average climate		1
Efficiency class room heating, average climate 35 / 55 °C		
The system's efficiency class room heating, average climate 35 / 55 °C		
Declared tap profile / efficiency class hot water heating		
Electrical data		
Rated voltage	V	400V 3N ~ 50Hz
Max operating current	А	16.3
Drive output heating medium pump 2 GP6	W	5-45
Driving power exhaust air fan	W	25-140
Fuse	А	16
Enclosure class		IP 21
Refrigerant circuit		
Type of refrigerant		R407C
Volume	kg	0.74
CO <sub>2</sub> equivalent	ton	1,31
Cut-out value pressostat HP	MPa/bar	2.9 / 29.0
Cut-out value pressostat LP	MPa/bar	0.05 / 0.5
Heating medium circuit	i .	1
Max pressure in heating section	MPa/bar	0.25 / 2.5
Max temperature, supply line (factory setting)	°C	70 (60)
Ventilation		1
Min. airflow	l/s	31
Sound effect level according to EN 12 102		1
Sound power level (L <sub>W(A)</sub> ) <sup>4</sup>	dB(A)	40-55
Sound pressure levels		1
Sound pressure level in the boiler room (L <sub>P(A)</sub> ) <sup>5</sup>	dB(A)	36-51
Pipe connections		1
Heating medium ext Ø	mm	22
Hot water ext Ø	mm	22
Cold water ext Ø	mm	22
Docking ext Ø	mm	-
Ventilation Ø	mm	125

Other 3x400V		Copper	Stainless steel	
Water heater and heating section				
Volume boiler section	litre	3	5	
Volume, hot water heater	litre	18	30	
Max pressure in hot water heater	MPa/bar	1.0	/10	
Water heater				
Volume total	litre	2	15	
Volume boiler section (of which buffer vessel)	litre	35	(25)	
Volume, hot water heater	litre	18	30	
Volume buffer vessel	litre	25		
Max pressure in hot water heater	MPa/bar 1.0/10		/10	
Capacity hot water heating <sup>6</sup>				
Capacity hot water heating according to EN 16 147 <sup>6</sup>				
Tap volume 40 °C according to <b>EN 255-3</b> (V <sub>max</sub> ) <sup>7</sup>	litre	213	- 273	
Tap volume 40 °C according to <b>EN 16 147</b> (V <sub>max</sub> ) <sup>7</sup>	litre	177 - 244		
COP at Normal comfort (COP <sub>t</sub> )		2.8		
Idle loss at Normal comfort (P <sub>es</sub> )	W	54		
Dimensions and weight				
Width	mm	600		
Depth	mm	610		
Height excl. inverter box, incl. feet	mm	2,100 - 2,125		
Required ceiling height	mm 2,270			
Weight	kg	237	205	
Part No.		066 036	066 037	

<sup>1</sup>A20(12)W35, exhaust air flow 108 m<sup>3</sup>/h (30 l/s) min compressor frequency

 $^2\text{A20}(12)\text{W35},$  exhaust air flow 252 m³/h (70 l/s) min compressor frequency

<sup>3</sup>A20(12)W45, exhaust air flow 252 m<sup>3</sup>/h (70 l/s) max compressor frequency

<sup>4</sup>The value varies with the selected fan curve. For more extensive sound data including sound to channels visit www.nibe.eu.

<sup>5</sup> The value may vary with the room's damping capacity. These values apply with a damping of 4 dB.

<sup>6</sup>A20(12) exhaust air flow 180 m<sup>3</sup>/h (42 l/s)

<sup>7</sup> The value varies depending on choice of comfort mode (economy, normal and lux)

3x400 V		
Output data according to EN 14 511		
Specified heating output (P <sub>H</sub> ) <sup>1</sup>	kW	1.144
COP <sup>1</sup>		4.2
Specified heating output (P <sub>H</sub> ) <sup>2</sup>	kW	1.498
COP <sup>2</sup>		4.72
Specified heating output (P <sub>H</sub> ) <sup>3</sup>	kW	4.994
COP <sup>3</sup>		2.43
Additional power		
Max power, immersion heater (factory setting)	kW	6.5 (6.5)
Electrical data		
Rated voltage	V	400V 3N ~ 50Hz
Max operating current	A	16.3
Drive output heating medium pump 2 GP6	W	5-45
Driving power exhaust air fan	W	25-140
Fuse	A	16
Enclosure class		IP 21
Refrigerant circuit		
Type of refrigerant		R407C
Volume	kg	0.74
CO <sub>2</sub> equivalent	ton	1,31
Cut-out value pressostat HP	MPa/bar	2.9 / 29.0
Cut-out value pressostat LP	MPa/bar	0.05 / 0.5
Heating medium circuit		
Max pressure in heating section	MPa/bar	0.25 / 2.5
Max temperature, supply line (factory setting)	°C	70 (60)
Ventilation		
Min. airflow	l/s	31
Sound effect level according to EN 12 102		
Sound power level (L <sub>W(A)</sub> ) <sup>4</sup>	dB(A)	40-55
Sound pressure levels		
Sound pressure level in the boiler room $(L_{P(A)})^5$	dB(A)	36-51
Pipe connections		
Heating medium ext Ø	mm	22
Hot water ext Ø	mm	22
Cold water ext Ø	mm	22
Ventilation Ø	mm	125

Other 3x230V		
Water heater		
Volume total	litre	215
Volume boiler section (of which buffer vessel)	litre	35 (25)
Volume, hot water heater	litre	180
Volume buffer vessel	litre	25
Max pressure in hot water heater	MPa/bar	1.0/10
Capacity hot water heating according to EN 16 147 <sup>6</sup>		
Tap volume 40 °C according to <b>EN 255-3</b> (V <sub>max</sub> ) <b>7</b>	litre	213 - 273
Tap volume 40 °C according to <b>EN 16 147</b> (V <sub>max</sub> )7	litre	177 - 244
COP at Normal comfort (COP <sub>t</sub> )		2.8
Idle loss at Normal comfort (P <sub>es</sub> )	W	54

Other 3x230V		
Dimensions and weight		·
Width	mm	600
Depth	mm	610
Height excl. inverter box, incl. feet	mm	2,100 - 2,125
Required ceiling height	mm	2,270
Weight	kg	205
Part No.		066 037

 $^{1}\text{A20}(12)\text{W35},$  exhaust air flow 108 m³/h (30 l/s) min compressor frequency

 $^2\text{A20}(12)\text{W35},$  exhaust air flow 252 m³/h (70 l/s) min compressor frequency

<sup>3</sup>A20(12)W45, exhaust air flow 252 m<sup>3</sup>/h (70 l/s) max compressor frequency

<sup>4</sup>The value varies with the selected fan curve. For more extensive sound data including sound to channels visit www.nibe.eu.

<sup>5</sup> The value may vary with the room's damping capacity. These values apply with a damping of 4 dB.

<sup>6</sup>A20(12) exhaust air flow 150 m<sup>3</sup>/h (42 l/s)

<sup>7</sup> The value varies depending on choice of comfort mode (economy, normal and lux)

3x400V		Enamel
Output data according to EN 14 511		
Specified heating output (P <sub>H</sub> ) <sup>1</sup>	kW	1.144
COP1		4.2
Specified heating output (P <sub>H</sub> ) <sup>2</sup>	kW	1.498
COP <sup>2</sup>		4.72
Specified heating output (P <sub>H</sub> ) <sup>3</sup>	kW	4.994
COP <sup>3</sup>		2.43
Additional power	I	I
Output immersion heater	kW	0.5- 6.5
Electrical data		
Rated voltage	V	400 V 3N~50 Hz
Max operating current	А	16.3
Drive output heating medium pump 2 GP6	W	5-45
Driving power exhaust air fan	W	25-140
Fuse	А	16
Enclosure class		IP 21
Refrigerant circuit		
Type of refrigerant		R407C
Volume	kg	0.74
CO <sub>2</sub> equivalent	ton	1,31
Cut-out value pressostat HP	MPa/bar	2.9/29.0
Cut-out value pressostat LP	MPa/bar	0.05/0.5
Heating medium circuit		
Max pressure in boiler section	MPa/bar	0.25/2.5
Max temperature (flow line)	°C	70 (factory setting 60)
Ventilation		
Min. airflow	l/s	31
Sound effect level according to EN 12 102		
Sound power level (L <sub>W(A)</sub> ) <sup>4</sup>	dB(A)	40-55
Sound pressure levels		
Sound pressure level in the boiler room (L <sub>P(A)</sub> ) <sup>5</sup>	dB(A)	36-51
Pipe connections		
Heating medium ext Ø	mm	22
Hot water ext Ø	mm	22
Cold water ext Ø	mm	22
Ventilation Ø	mm	125

Miscellaneous		Enamel
Water heater		
Volume total	litre	215
Volume boiler section (of which buffer vessel)	litre	35 (25)
Volume, hot water heater	litre	180
Volume buffer vessel	litre	25
Max pressure in hot water heater	MPa/bar	1.0/10
Capacity hot water heating according to EN 16 147 <sup>6</sup>		
Tap volume 40 °C at Normal comfort (V <sub>max</sub> )	litre	206
Tap volume 40 °C at Economy comfort (V <sub>max</sub> )	litre	177
Tap volume 40 °C at Lux comfort (V <sub>max</sub> )	litre	220
COP at Normal comfort (COP <sub>t</sub> )		2.8
Idle loss at Normal comfort (P <sub>es</sub> )	W	54
Dimensions and weight		1
Width	mm	600
Depth	mm	610
Height excl. inverter box, incl. feet	mm	2100-2125
Required ceiling height	mm	2270
Weight	kg	253
Part No.		066 038

<sup>1</sup>A20(12)W35, exhaust air flow 108 m<sup>3</sup>/h (30 l/s) min. compressor frequency

 $^2\text{A20(12)W35},$  exhaust air flow 252 m³/h (70 l/s) min. compressor frequency

 $^{3}A20(12)W45,$  exhaust air flow 252 m³/h (70 l/s) max. compressor frequency

<sup>4</sup>The value varies with the selected fan curve. For more detailed acoustic data including sound to channels visit www.nibe.eu.

<sup>5</sup>The value can vary with the room's damping capacity. These values apply at a damping of 4 dB.

<sup>6</sup>A20(12) exhaust air flow 150 m<sup>3</sup>/h (42 l/s)

# Accessories

More info and images available at www.nibe.eu. Not all accessories are available on all markets.

### **Communications module MODBUS 40**

MODBUS 40 enables F750 to be controlled and monitored using a DUC (computer sub-centre) in the building. Communication is then performed using MODBUS-RTU.

Part no 067 144 RSK no. 625 08 05

### Communications module SMS 40

When there is no internet connection, you can use the accessory SMS 40 to control F750 via SMS.

Part no 067 073 RSK no. 625 06 77

### Docking kit DEW 40

DEW 40 is used to connect the water heater VPB 200 to F750.

Part no. 067 102 RSK no. 62 50 686

### Docking kits SCA 41

SCA 41 means that F750 can be connected to external additional heat and/or prioritised additional heat when docking with the accumulator tanks AHPH or AHPS. Part no. 067 316

### Extra shunt group ECS 40/ECS 41

This accessory is used when F750 is installed in houses with two or more different heating systems that require different supply temperatures.

ECS 40 (Max 80 m <sup>2</sup> )	ECS 41 (approx. 80-250
Part no 067 287	m²)
RSK no. 624 74 93	Part no 067 288
	RSK no. 624 74 94

### Solar package NIBE PV

Solar panel package with extremely long service-life to produce your own electricity.

3 kW	6 kW	9 kW
10 Solar panels	20 Solar panels	30 Solar panels
12 kW	21 kW	
40 Solar panels	70 Solar panels	

### Splitter kit DKI 10

For split installation of F750. Part no. 089 777

### Supply air module SAM

SAM is a supply air module specially developed for houses with supply and exhaust air systems.

### **SAM 40**

Part no. 067 147 RSK no. 624 67 52

### Top cabinet

Top cabinet that conceals the ventilation ducts and reduces the sound to the installation room by 1-2 dB(A).

Height 245 mm Part no. 089 756 RSK no. 625 06 87 Height 345 mm

Part no. 067 522 RSK no. 625 12 99 **Height 385-635 mm** 

Height 445 mm

Part no. 089 757 RSK no. 625 06 88

Part no. 089 758 RSK no. 625 06 89

### Water heater/Accumulator tank

### AHPS

Accumulator tank without an immersion heater with solar coil (copper) and a hot water coil (stainless steel).

Best positioned to the left of F750. Requires that the whole installation (F750 and AHPS) is positioned at a distance of 60 mm from the rear wall. Requires docking kit.

Part no. 056 283 RSK no. 686 16 27

### AHPH

Accumulator tank without an immersion heater with integrated hot water coil (stainless steel).

Best positioned to the left of F750. Requires that the whole installation (F750 and AHPH) is positioned at a distance of 60 mm from the rear wall. Requires docking kit.

Part no. 081 036 RSK no. 651 97 50

### VPB

Water heater without immersion heater with charge coil. Positioned to the left of F750. Requires docking kit.
#### Eminent

Water heater with immersion heater.

Eminent 35		Eminent 55	
Copper	Part no. 072 310 RSK no. 694 43 13	Copper	Part no. 072 340 RSK no. 694 43 14
Enamel	Part no. 072 300 RSK no. 694 43 10	Enamel	Part no. 072 330 RSK no. 694 43 11
Stainless	Part no. 072 320 RSK no. 694 43 16	Stainless	Part no. 072 350 RSK no. 694 43 17
Eminont 100		Eminont	120

Eminent	100	Eminent	120
Copper	Part no. 072 370	Stainless	Part no. 072 384
	RSK no. 694 43		RSK no. 694 43
	15		19
Enamel	Part no. 072 360		
	RSK no. 694 43		
	12		
Stainless	Part no. 072 380		
	RSK no. 694 43		
	18		

### Compact

Water heater with immersion heater.

Compact	100	Compact	200
Copper	Part no. 084 010 RSK no. 693 34 44	Copper	Part no. 084 020 RSK no. 693 34 47
		Enamel	Part no. 084 070 RSK no. 693 34 30
		Stainless	Part no. 084 050 RSK no. 693 34 53

### Compact 300

Copper	Part no. 084 030 RSK no. 693 34 49
Enamel	Part no. 084 080 RSK no. 693 34 31
Stainless	Part no. 084 060 RSK no. 693 34 55

# 9 Item register

## **Item register**

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