Operating instructions

Indoor unit for air-water-heat pumps
Daikin Altherma integrated solar unit

Daikin Altherma
EHS(X/H)04P30A
EHS(X/H)B04P30A
EHS(X/H)08P30A
EHS(X/H)B08P30A
EHS(X/H)08P50A
EHS(X/H)B08P50A
EHS(X/H)16P50A
EHS(X/H)B16P50A

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1 Safety

1.1 Observing instructions

These instructions are a >> ***Translation of the original version*** << in your language.

All the activities required for operation and setting the parameters are described in this instruction manual. All parameters needed for trouble-free operation have been configured at the factory.

- Please read through this manual carefully before operating the heating system or before adjusting the settings for it.
- Make a note of the preset values before you make any changes to the unit configuration.
- Comply strictly with warning instructions.
- Installation and all modifications / settings of the device not described in this manual may be performed only by qualified and authorised specialist heating technicians.

Relevant documents

– Daikin Altherma EHS(X/H):
  – Installation and maintenance instructions
– Operating instructions for the RoCon HP control unit
– External unit for Daikin Altherma EHS(X/H); the associated installation and operating instructions.
– When connecting to a Daikin solar system; the associated installation and operating instructions.
– If a Daikin FWXV(15/20)AVEB is connected; the associated installation and operating instructions.
– In the case of connection to a control component offered as an accessory (room controller, mixer module etc.); the associated installation and operating instructions.

The guides are included in the scope of supply for the individual units.

1.2 Warning signs and explanation of symbols

1.2.1 Meaning of the warnings

Warnings in this manual are classified according into their severity and probability of occurrence.

DANGER!

Draws attention to imminent danger.

Disregarding this warning can lead to serious injury or death.

WARNING!

Indicates a potentially dangerous situation.

Disregarding this warning can result in serious injury or death.

CAUTION!

Indicates a situation which may cause possible damage.

Disregarding this warning can lead to damage to property and the environment.

This symbol identifies user tips and particularly useful information, but not warnings or hazards.

Special warning signs

Some types of danger are represented by special symbols:


Electric power


Risk of burning or scalding


Risk of environmental damage

1.2.2 Validity

Some information in this manual has limited validity. The validity is highlighted by a symbol.


Only valid for Daikin Altherma EHS(X/H) with cooling function


Comply with the specified tightening torque (see installation and maintenance manual)

Only applicable for the unpressurised solar system (Drain Back)

Only applicable for the pressurised solar system.

Only valid/available if a room regulator is connected

Only valid/available if a mixer module is connected

1.2.3 Handling instructions

- Instructions on actions are shown as a list. Actions of which the sequential order must be maintained are numbered.

  ➔ Results of actions are identified with an arrow.

  Entry into a setting procedure

  Exit from a setting procedure

1.3 Avoid danger

The Daikin Altherma EHS(X/H) is state-of-the-art and is built to meet all recognised technical requirements. However, improper use may result in serious physical injuries or death, as well as property damage.

To avoid danger, only operate the Daikin Altherma EHS(X/H):
– as stipulated and in perfect condition,
– with an awareness of the safety and hazards involved.

This assumes knowledge and use of the contents of this manual.

WARNING!

This unit is not intended for use by persons (including children) with impaired physical, sensory or mental faculties or persons with insufficient experience and/or expertise unless supervised by a person responsible for ensuring their safety or are given instruction by this person on how to use the unit.

1.4 Intended use

The Daikin Altherma EHS(X/H) may only be used for preparation of hot water, as a room heating system, and depending on its design, as a room cooling system.

Internal unit		External unit
Heating and cooling (X) ❄	**Heating only (H)**	
EHS**X**04P30A	EHS**H**04P30A	ERLQ004CAV3
EHS**XB**04P30A	EHS**HB**04P30A	
EHS**X**08P30A	EHS**H**08P30A	ERLQ006CAV3 ERLQ008CAV3
EHS**XB**08P30A	EHS**HB**08P30A	
EHS**X**08P50A	EHS**H**08P50A	
EHS**XB**08P50A	EHS**HB**08P50A	
EHS**X**16P50A	EHS**H**16P50A	ERLQ011CA(V3/W1)
EHS**XB**16P50A	EHS**HB**16P50A	ERLQ014CA(V3/W1) ERLQ016CA(V3/W1)

***B** - Additional heat exchanger for the bivalent connection*

Tab. 1-1 Permissible combinations of Daikin exterior heat pump units and Daikin Altherma EHS(X/H) internal units

Any other use outside the intended use is considered as improper. The operator alone shall bear responsibility for any resulting damage.

Use as intended also involves compliance with maintenance and inspection conditions. Spare parts must at least satisfy the technical requirements defined by the manufacturer. This is the case, for example, with original spare parts.

1.5 Instructions for operating safety

- Work on the Daikin Altherma EHS(X/H) (such as setup, servicing, connection and initial start-up) is only to be carried out by persons who are authorised and who have successfully completed qualifying technical or vocational training and who have taken part in advanced training sessions recognised by the appropriate responsible authorities. This, in particular, includes heating specialists and climate control technicians who have experience, as a result of their technical training and their knowledge of the subject, of proper and appropriate installation and maintenance of heating, climate control and cooling installations and heat pumps.
- Electrical installation may be carried out only by electrical engineers and in compliance with the valid electro-technical guidelines as well as the regulations of the relevant energy supply company (EVU).

For work on stationary refrigeration systems (heat pumps) and air conditioning systems, proof of expertise is required in the European Community according to the F-Gases Directive (EC) No. 303/2008.

- up to 3 kg coolant fill quantity: Expert certificate category II
- 3 kg coolant fill quantity or over: Expert certificate category I

Observe the current technological regulations to prevent corrosion products and deposits.

Minimum requirements regarding the quality of filling and supplementary water:
- Water hardness (calcium and magnesium, calculated as calcium carbonate): ≤ 3 mmol/l
- Conductivity: ≤ 2700 µS/cm
- Chloride: ≤ 250 mg/l
- Sulphate: ≤ 250 mg/l
- pH value (heating water): 6,5 - 8,5

Using filling water and top-up water which does not meet the stated quality requirements can cause a considerably reduced service life of the equipment. The responsibility for this lies solely with the operator.

2 Product description

2.1 Brief description

The air-water heat pump system uses the physical effect of condensation and latent heat and makes it possible as required to heat or cool buildings. The Daikin Altherma EHS(X/H) (Altherma integrated solar unit) is the primary component of the highly-efficient heating- and cooling system for domestic applications.

Located in the external heat pump unit (ERLQ) are the coolant compressor and a finned heat exchanger, which, in heating mode, acts as a vaporiser and extract heat from the ambient air.

In cooling mode this acts as a condensator and returns heat to the environment (refrigerator principle).

The heat pump external unit is connected to the heat pump internal unit in the building by means of a closed coolant circuit. Heat or cold is transported between the heat pump external unit and the heat pump internal unit by means of the circulating refrigerant, which alternately takes on the liquid and gaseous phases.

The internal heat pump unit contains the control devices, the heat exchanger and integrated storage tank. In the heat exchanger, the heat is transferred to the water flowing in the heating circuit or the water in the storage tank (heating/hot water supply), or heat is extracted from the water (cooling).

The storage tank on the Daikin Altherma EHS(X/H) is built in such a way to enable the heat pump system to be combined with a Daikin solar system without needing an additional hot water tank.

With optional solar heating, the entire hot water storage tank can be heated, depending on the heat offered by the sun. The stored heat is used both for hot water heating and for heating support. The high total storage capacity also temporarily allows time without sunshine to be bridged. The excellent heat insulation properties of the integrated storage tank also ensure that heat losses are kept to a minimum. This allows efficient and economic water heating and also solar support.

If the heating capacity of the Altherma EHS(X/H) is not adequate, the optional backup heater (EKBUxx) can provide additional heating capacity for heating the heating circuit.

In order to make more cost effective use of the Daikin Altherma EHS(X/H), it can be operated on a low tariff network connection (HT/NT) or with an intelligent controller (SMART GRID). Here the energy supply company (EVU) is afforded the opportunity to control their network utilisation by changing the heat pump operating mode. Information on the prerequisites and connection possibilities are described in the enclosed installation manual.

2.1.1 Mode of operation

In **room heating mode** the refrigerant which was compressed in the refrigerant compressor in the heat pump external unit condenses in the plate heat exchanger in the heat pump internal unit. The heat released during the liquefaction of the coolant is transferred to the heating water in the plate heat exchanger. The heat circulating pump ensures the required flow of the heating water in the internal hear generation circuit.

The lower the required temperature in the heating circuit, the more effectively the heat pump works.

It is, in particular, possible to achieve the lowest flow temperatures possible with under-floor heating, as the heat transfer surface is very large. Furthermore, the building to be heated should ideally have extremely good heat insulation, so that when there is a low heat requirement, the heat carrier can run with a low flow temperature.

The hot water zone of the storage tank integrated into the interior heat pump unit is heated by the heat pump or other external heat generators (solar system, backup heater. The cold water flowing downstream of the hot water extraction cools the lower area of the integrated storage tank to maximum effect.

The drinking water is heated indirectly in a corrosion resistant stainless steel corrugated pipe heat exchanger by the unpressurised water from the integrated storage tank. On its way to the top, it continuously absorbs the heat from the storage tank water.

The flow direction, operating on the principle of counter-flow, and the coil-shaped heat exchanger create a pronounced temperature layering in the hot water storage tank. As high temperatures can be maintained for a very long time in the upper section of the storage tank, a high hot water output is achieved even if water is drawn off over a long period of time.

In the case of **room cooling** the 3-way switching valves (3UV1 + 3UVB) mounted on the heat pump internal unit switches off the flow to storage tank charging/heating support. The heat circulation pump of the heat pump internal device now operates exclusively within the heating circuit.

The cooling process now takes place by inverting the heat pump process in the heat pump external unit. Thus the heat exchanger of the heat pump internal unit acts as a vaporiser and extracts heat from the heating water that flows through it. This cools the heating circuit.

2.1.2 Solar support

The Daikin Altherma EHS(X/H) is prepared for integration into a Daikin solar system.

The pressureless Daikin Solar-System p=0 (Drain Back), and in the case of Daikin Altherma EHS(X/H)B type systems the Daikin Solar-Pressure system +p can be used.

The high performance flat collectors are highly effective in converting solar radiation into heat, which is transferred via the solar circuit into the integrated storage tank of the Daikin Altherma EHS(X/H).

The heat that is fed in is transferred to the hot water circuit. If there are sufficiently high temperatures in the hot water tank the solar heat is also used for heating support. The RoCon HP control unit controls this heat distribution fully automatically.

2.1.3 Safety management

The total security management of the Daikin heat pump system is assumed by the electronic control integrated in the Daikin Altherma EHS(X/H). In the event of a water shortage, loss of refrigerant or undefined operating states, a safety switch-off is performed. A corresponding fault signal provides an engineer with all the necessary information for troubleshooting.

2.1.4 Electronic control

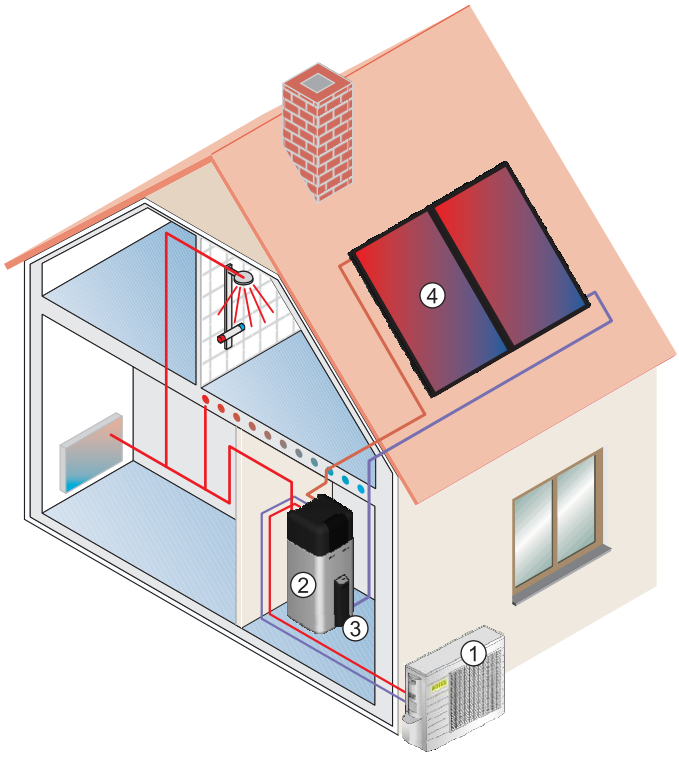
Depending on the heating unit, the RoCon HP electronic digital controller automatically controls all the heating, cooling and hot water functions for a direct heating circuit, a storage tank charging circuit and, using optionally connected mixer modules, additional heating circuits as well.

All function settings for the Daikin Altherma EHS(X/H) and the optional equipment (terminal function) connected via the data bus are performed by the operating elements of the RoCon B1 integrated into the controls and are displayed in clear text on a coloured backlit ground.

The display and operation of a connected Daikin solar system are performed by the associated controller for this component (e.g., Control and Pump Unit EKSRPS3B).

2.2 Design and components

2.2.1 System overview



1 Heat pump external unit (ERLQ)
2 Daikin Altherma integrated solar unit (Altherma EHS(X/H))

Daikin p=0 Solar system (optional):
3 Solar control and pump unit
4 Solar panels

Fig. 2-1 Components of the heat pump system with the Daikin Altherma EHS(X/H) internal unit and optional Daikin p=0 solar system

2.2.2 Device external and internal design Daikin Altherma EHS(X/H)...P30A

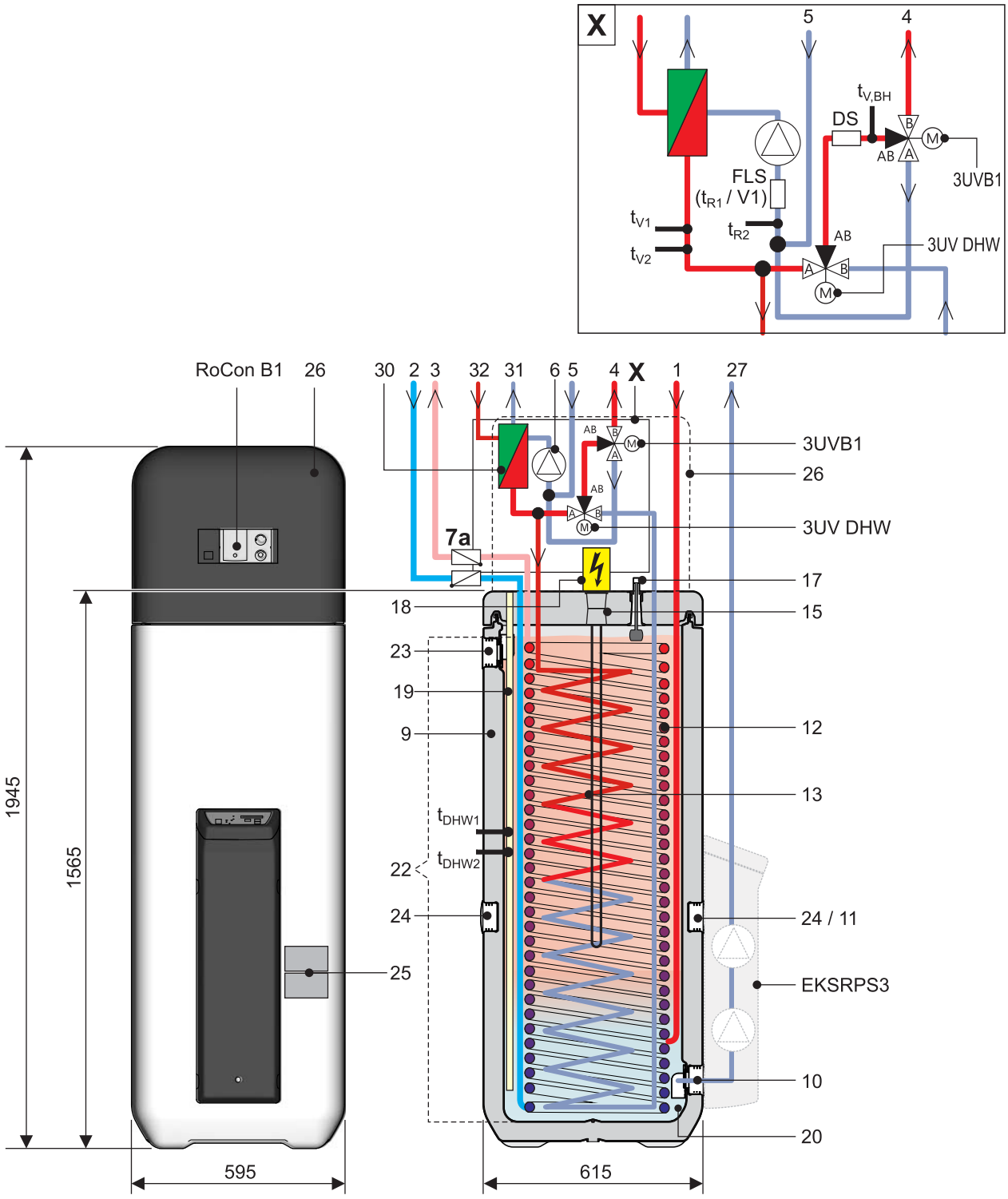


Fig. 2-2 Design and components of the Daikin Altherma EHS(X/H)...P30A (external view and internal design)
For legend descriptions see tab. 2-1

2.2.3 Device external and internal design Daikin Altherma EHS(X/H)B...P30A

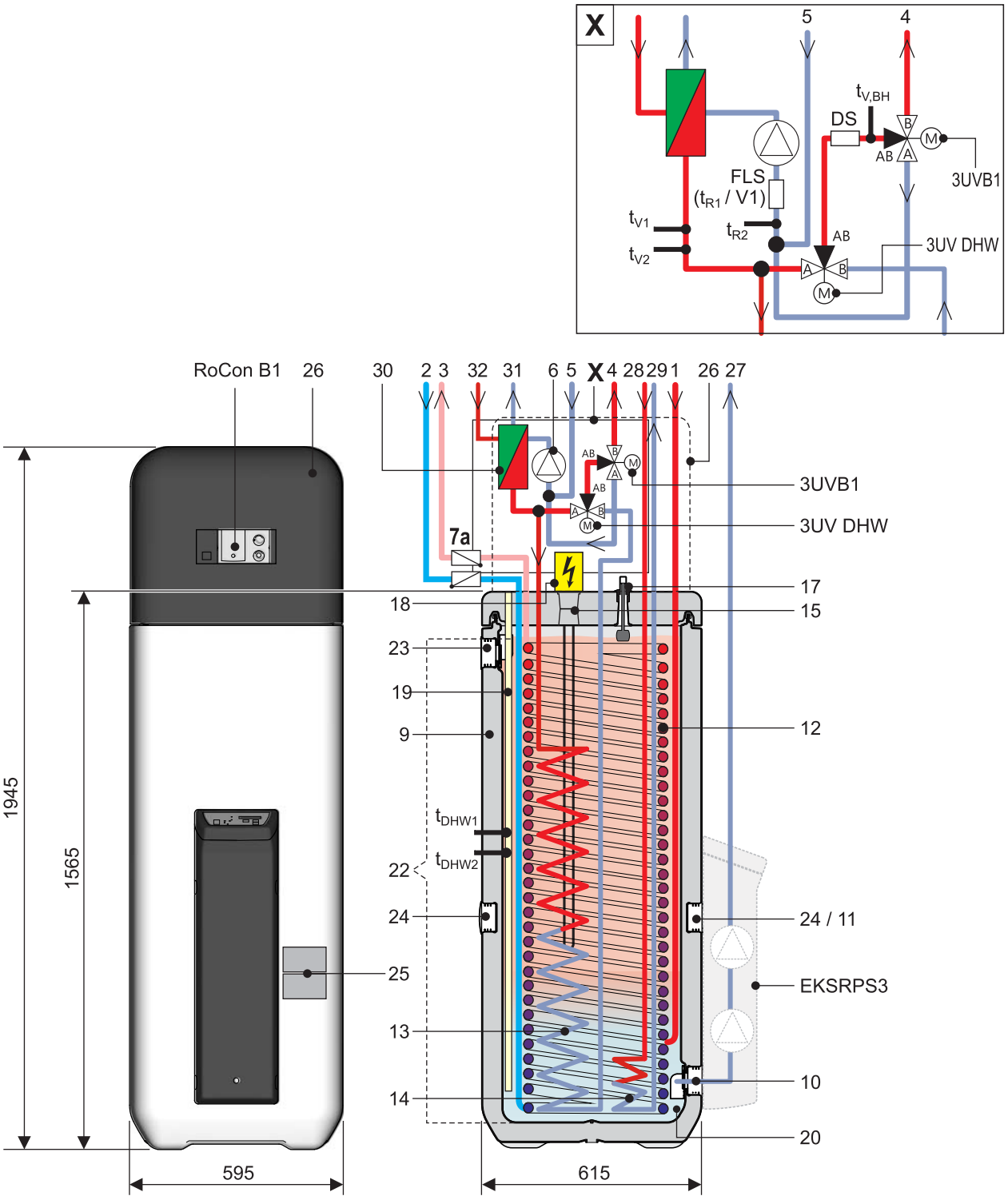


Fig. 2-3 Design and components of the Daikin Altherma EHS(X/H)B...P30A (external view and internal design)
For legend descriptions see tab. 2-1

2.2.4 Device external and internal design Daikin Altherma EHS(X/H)...P50A

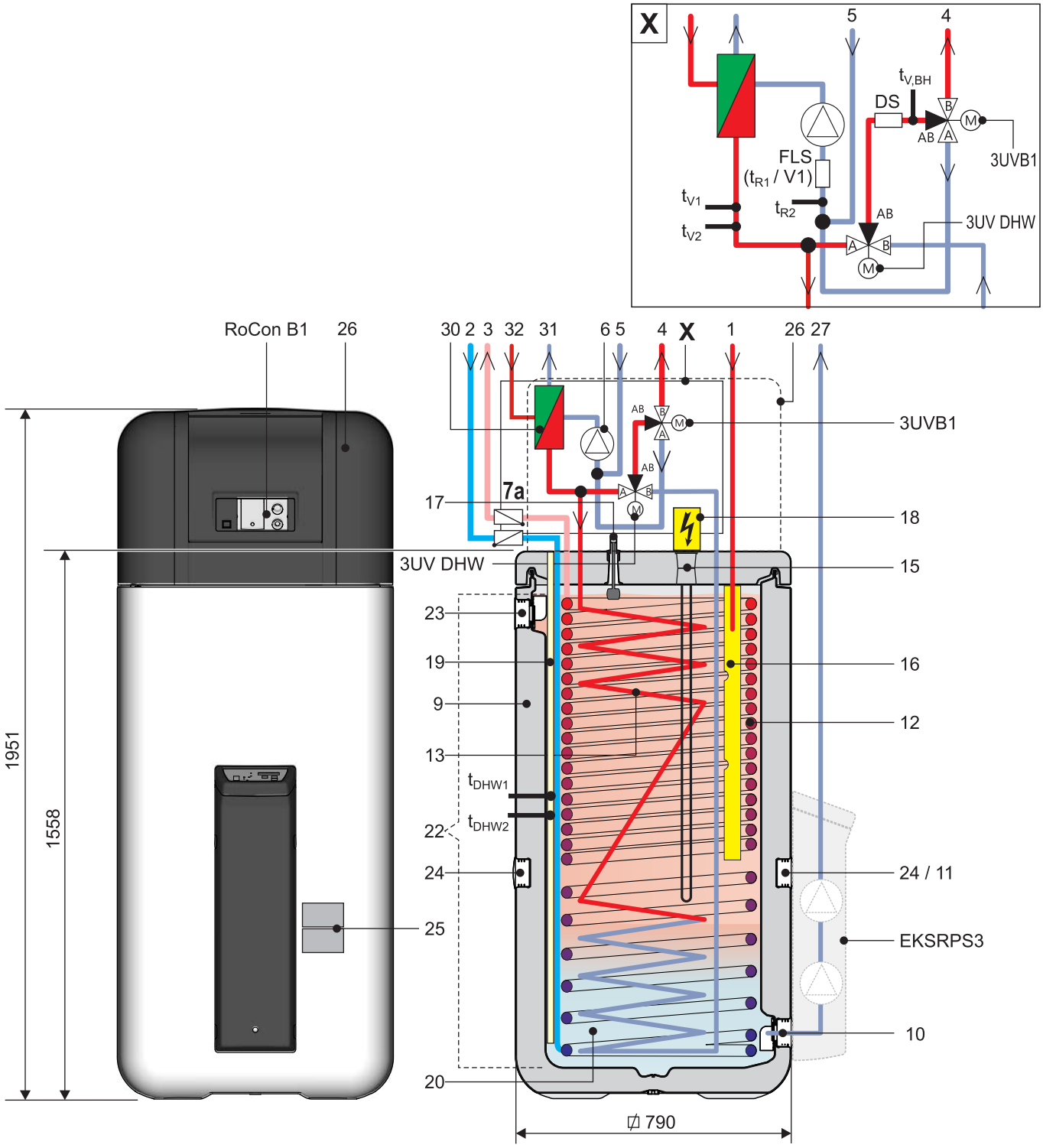


Fig. 2-4 Design and components of the Daikin Altherma EHS(X/H)...P50A (external view and internal design)
For legend descriptions see tab. 2-1

2.2.5 Device external and internal design Daikin Altherma EHS(X/H)B...P50A

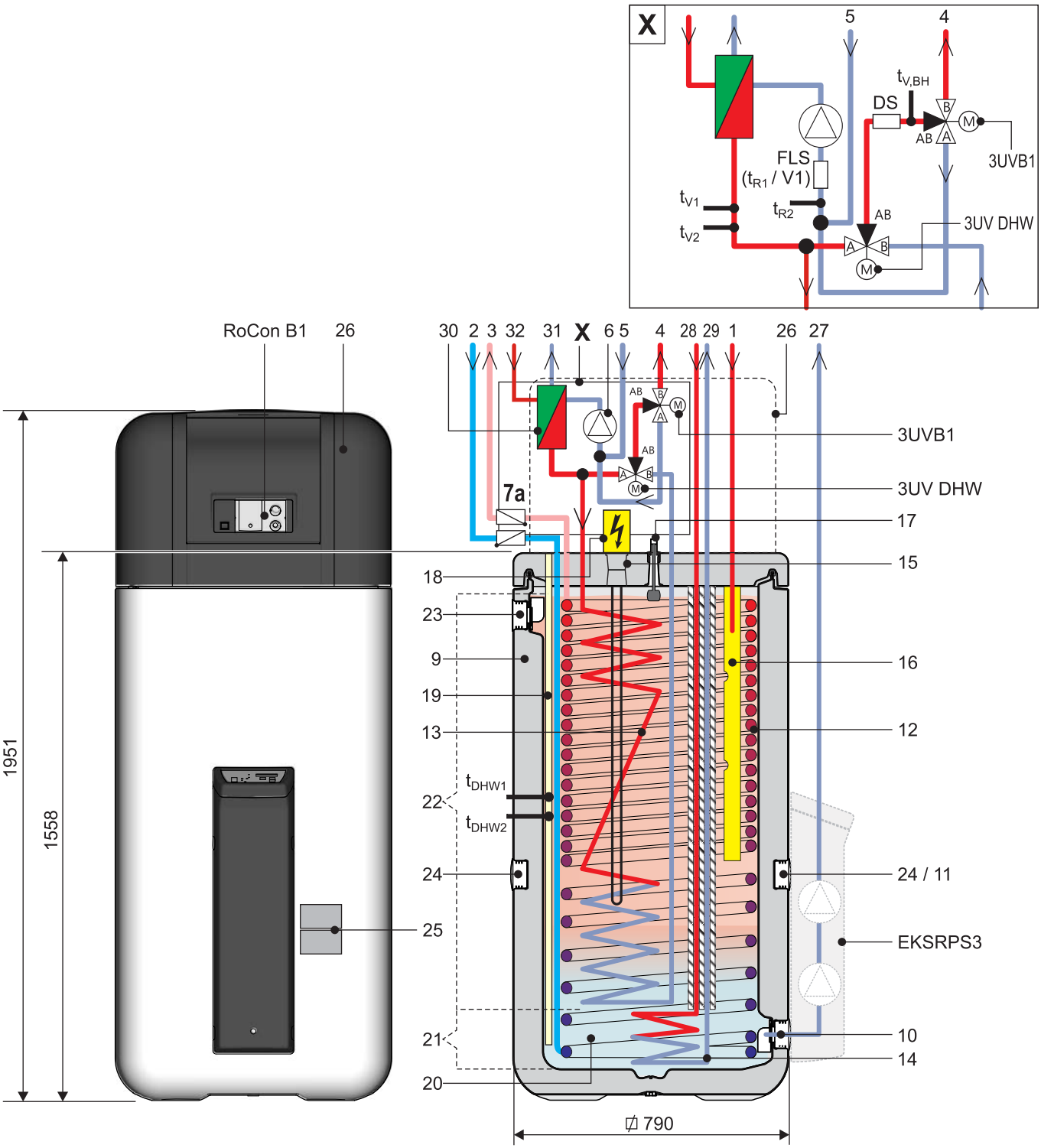


Fig. 2-5 Design and components of the Daikin Altherma EHS(X/H)B...P50A (external view and internal design)
For legend descriptions see tab. 2-1

1 p=0 Solar - flow or connection for additional heat source (1" IG)	19 Submersible sensor sleeve for storage tank temperature sensor t_{DHW1} and t_{DHW2}	DS Pressure sensor
2 Cold water flow (1" AG)	20 Unpressurised storage tank water	FLS (t_{R1} / V1) Return flow temperature and flow sensor
3 Hot water flow (1" AG)	21 Solar zone	t_{DHW1}, t_{DHW2} Tank temperature sensor
4 Heating flow (1" AG)*	22 Hot water zone	t_{R2} Return temperature sensor
5 Heating return (1" AG)*	23 Safety overflow connection	t_{V1}, t_{V2} Feed temperature sensors
6 Circulation pump	24 Mount for handle	$t_{V, BH}$ Flow temperature sensor backup heater
7a Recommended accessories: non-return valves (2 pcs.)	25 Type plate	RoCon B1 Operating section Daikin Altherma EHS(X/H) control unit
9 Storage tank (double walled jacket made of polypropylene with PUR hard foam heat insulation)	26 Protective cover	EKSRPS3B Optional: p=0 Daikin R3 solar control and pump unit
10 Filling and drainage connection or p=0 Solar - Return flow connection	27 p=0 Solar - Return	⚠ Safety devices
11 Mount for solar R3 controller or handle	28 Solar - Flow (3/4" IG) (nur Typ Daikin Altherma EHS(X/H)B)	Observe tightening torque!
12 Heat exchanger (stainless steel) for drinking water heating	29 Solar - Return flow (3/4" IG) (nur Typ Daikin Altherma EHS(X/H)B)	AG Male thread
13 Heat exchanger (stainless steel) for storage tank charging or heating support	30 Panel heat exchanger	IG Female thread
14 Heat exchanger (stainless steel) for pressurised solar storage tank charging	31 Liquid-side coolant connection Daikin Altherma EHS(X/H) ...04P30A/08PxxA: Cu Ø 6.4 mm (1/4"), Daikin Altherma EHS(X/H)...16P50A: Cu Ø 9.5 mm (3/8")	* Ball cock (1" IG) is supplied with the equipment
15 Connection for optional electrical backup heater (R 1½" IG)	32 Connection to coolant gas line Cu Ø 15,9 mm (5/8")	
16 p=0 Solar inflow layering pipe		
17 Fill level indicator (tank water)	3UVB1 3-way diverter valve (internal heat generator circuit)	
18 Optional: Electrical backup heater (EKBUxx)	3UV DHW 3 way diverter valve (hot water/heating)	

Tab. 2-1 Legend from fig. 2-2 to fig. 2-5

3 Operation

3.1 General

DANGER!

If electrical components come into **contact** with **water**, this can cause an **electric shock** as well as potentially fatal injuries and burns.

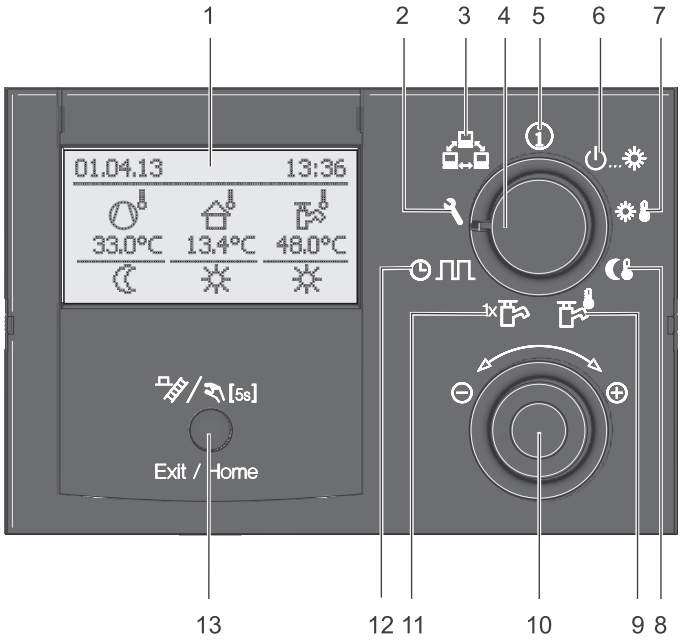
- The **displays and** the **buttons** on the Controller **must be protected from the** effects of **moisture**.
- To **clean** the Controller use a **dry cotton cloth**. Using aggressive **cleaning agents** and other **liquids** can cause **damage to equipment or lead to an electric shock**.

Maximum energy utilisation

The most effective energy utilisation is achieved by the Daikin Altherma EHS(X/H) at the lowest possible return flow and hot water temperatures.

If an external heat generator (e.g. the optional Backup Heater) is used at inflow target temperatures of over 50°C, the efficiency (COP) of the Daikin Altherma EHS(X/H) can be affected negatively (depending on the outside temperature).

3.2 Display and operating elements



1	*Clear text display*	7	*Setting: Set Temp Day*
2	*Setting: Configuration*	8	*Setting: Set Temp Night*
3	*Setting: Remote Param*	9	*Setting: DHW Set Temp*
4	*Rotary switch*	10	*Rotary button*
5	*Setting: Info*	11	*Setting: DHW Install*
6	*Setting: Operating Mode*	12	*Setting: Time Program*
		13	*Exit button*

Fig. 3-1 Arrangement of display and operating elements

3.2.1 Display

All the operating steps are supported by appropriate displays in a clear text display on a coloured background.

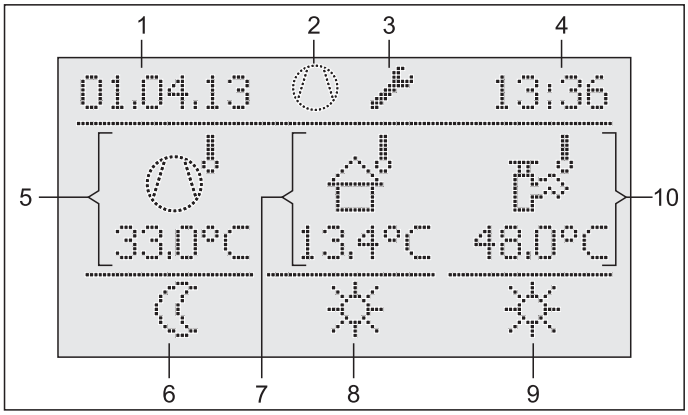
Menu navigation is available in 7 different languages (see section 3.4.8).

Malfunctions are generally indicated by a fault code and a clear text fault message on the display.

For troubleshooting instructions refer to chapter 8.

The colour of the backlighting indicates the operational status and the operational mode:

White:	Standard lighting, normal operational display.
Red:	Fault status, depending on the type of fault, the Daikin Altherma EHS(X/H) continues to function with restrictions.
Green:	Operating mode with operator authorisation.
Blue:	Operating mode with expert technician authorisation.



1	*Date display*	7	*Current outdoor temperature*
2	*Status of refrigerant compressor*	8	*Active operating mode*
3	*Status display (e.g. Technician access rights active)*	9	*Status of hot water generation*
4	*Display time*	10	*Current storage tank temperature*
5	*Current flow temperature*		
6	*Status heating circuit*		

Fig. 3-2 Display of the Controller - standard display

Explanation of symbols

Item fig. 3-2	Symbol	Explanation
2		Flashing: Heat pump demand active Permanently on: Refrigerant compressor is working
2		No connection to the external heat pump unit
3		Access Rights Expert active (see section 3.6.1)
2 / 3		Air Purge active (can only be activated by the heating technician)
2 / 3		Terminal function active (see section 3.4.9)
2 / 3		Frost protection function active (see section 3.6.5)
2 / 3		"Party" temporary timer programme active (see section 3.4.7)
2 / 3		"Away" temporary timer programme active (see section 3.4.7)
2 / 3		"Holiday" temporary timer programme active (see section 3.4.7)
2 / 3		"Vacation" temporary timer programme active (see section 3.4.7)
2 / 3		Screed Program active (can only be activated by the heating technician)
5		Direct heating circuit – Under normal conditions, the current inflow temperature $t_{V, BH}$ is displayed. – In the case of no demands from the heat pump, the abbreviation "ES" is displayed instead of the current inflow temperature. ➔ The control system has switched to **energy saving mode** (see section 3.4.2). Superfluous electronic components are switched off.
5		Mixer circuit (M1) The current inflow temperature of the selected heating circuit is displayed.
5		Room temperature sensor (U1) The current room temperature is displayed.
6		Heating circuit status – Heating circuit active (room heating function) – Heating circuit active (room cooling function) – Heating circuit not active (currently no heat transfer in the heating circuit)
7		Outside temperature sensor The current outside temperature is displayed.
8		Current operating mode (see section 3.4.2) Standby active Reducing active Heating active Cooling active Summer active Automatic 1 active Automatic 2 active
9		Domestic hot water generation active Domestic hot water generation not active
10		Domestic hot water circuit status The current storage tank temperature t_{DHW1} is displayed.

Tab. 3-1 Explanation of display symbols

3.2.2 Operating elements

CAUTION!

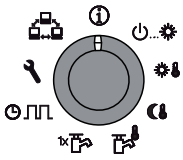
Never operate the operating elements on the controller with a hard, pointed object. This can cause damage and can cause the control unit to malfunction.

If special key combinations or extended key pushes are required for certain function, a separate note is made in each specific section of this description.

Rotary switch

The rotary switch is used to gain rapid direct access (main function level) to frequently required functions and setting options.

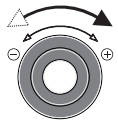
Independent of the setting of the rotary switch, the Daikin Altherma EHS(X/H) operates in accordance with the operating mode set in the switch position ***"Operating Mode"*** ⏻…☼ or which has been activated by a special programme.

Action	Result
Rotating 	Direct selection of the main function level allocated to this switch position.

Tab. 3-2 Function of rotary switch

Rotary switch

The rotary switch can be used to navigate in the individual levels, setting values can be selected, changed and these changes can then be accepted by pressing briefly.

Action	Result
Rotating 	To the right (+): Increased regulation To the left (–): Reduced regulation
Pressing 	Confirm, accept, selection and execute the function.

Tab. 3-3 Functions of the rotary switch

Exit button

This button can be used to jump back to the previous display within a menu display or a function / input can be interrupted.

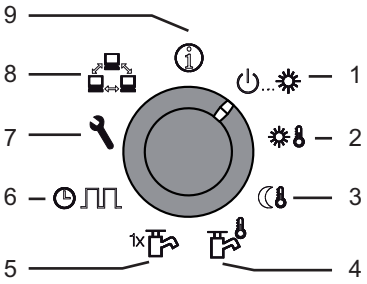
This button can also be used to call up the special level (see section 3.5).

Action	Result
Brief pressing. 	– Jump back to the previous display or previous level or – Cancellation of a special function or an active temporary timer programme.
Pressfor more than 5 secs. 	– Special level is called up.

Tab. 3-4 Functions of the exit button

3.3 Operating concept

The operating concept for controlling the RoCon HP is structured in such a way that the frequently required settings options are accessible quickly and directly at the **main function level** (selection using the **rotary switch**), while the less frequently required settings options are arranged at a lower parameter level.



1 Operating Mode (section 3.4.2)
2 Set Temp Day (section 3.4.3)
3 Set Temp Night (section 3.4.4)
4 DHW Set Temp (section 3.4.5)
5 DHW Install (section 3.4.6)
6 Time Program (section 3.4.7)
7 Configuration (section 3.4.8)
8 Remote Param (section 3.4.9)
9 Info (section 3.4.1)

Fig. 3-3 Illustration of main function level (rotary switch position)

Certain functions and parameters are restricted by access authorisation and can only be adjusted by the heating technician (see Section 3.6.1).

In normal operating mode the rotary switch should be in position ⓘ.

After switching on and successful initialisation, the display automatically shows the standard display with rotary switch position ⓘ.

In the first commissioning, the setting for language selection is displayed first.

- Select the language using the rotary switch.
- Confirm the changes with a brief press of the rotary switch.

Adaption to the special installation configuration is carried out in the ***"Configuration"*** 🔧 rotary switch position (see section 3.4.8).

When the system is switched on, based on the stipulations set in the Controller RoCon HP, it fully automatically regulates the operation of the

– room heating, room cooling and the
– sanitary hot water generation.

Independent of the setting of the rotary switch, the Daikin Altherma EHS(X/H) operates in accordance with the operating mode set in the ***"Operating Mode"*** ⏻…☼ switch position or that has been activated by a special programme.

If the user enters a value manually, this setting remains active until the user changes it or until the programme clock forces another operating mode.

The operating mode can be affected by additional functions such as:
– Weather-controlled flow temperature regulation
– Switching time program
– Setting the temperature target value
– Setting at the room station
– EXT signal (external operating mode switching)
– Quite Mode
– Interlink fct
– SMART GRID - Signal
– EVU (reduced cost tariff) - Signal
– Screed function
– Air Purge
– Manual Operation

Button block

The operating panel on the RoCon HP can be blocked to prevent inadvertent actuation (see fig. 3-4).

Unlocking can be carried out in the same way.

The prerequisite for this function is that, in the level *"Setup"*, the parameter [Keylock Function] is set to "On" (see chapter 6.2.1, tab. 6-1).

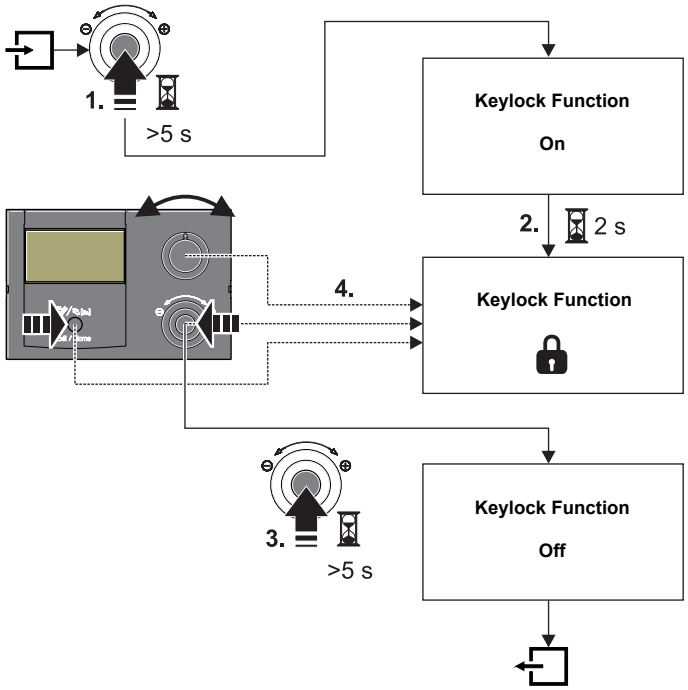


Fig. 3-4 Activating and deactivating the key lock

3.4 Basic functions and operating modes

If the storage temperature falls below a certain minimum value, the safety settings of the Daikin Altherma EHS(X/H) prevent the operation of the heat pump in the case of low external temperatures:
– **External temperature < -2°C**, minimum **storage temperature = 30°C**
– **External temperature < 12°C**, minimum **storage temperature = 23°C**.

Without backup heater:
The storage tank water must be heated to the minimum required storage temperature by an external heater.

With backup heater (EKBUxx):
With an outdoor temperature <12°C and a storage tank temperature <35°C, the backup heater (EKBUxx) is switched on automatically on in order to heat up the storage tank water to at least 35°C.

Automatic defrosting function

At low outdoor temperatures and corresponding humidity values, the external heat pump unit may ice up. This icing impairs efficient operation. The system detects this condition automatically and starts the defrosting function.

During the defrosting function, heat is drawn from the hot water storage tank and the backup heater is turned on if required. Depending on the heat demand for the defrosting function, heating of the direct heating circuit may be interrupted temporarily.

After 8 minutes at most, the system returns to normal mode.

3.4.1 System information (Info)

In this rotary switch position, the rotary switch can be used to call up all the system temperatures, the type of Daikin Altherma EHS(X/H), various software information and the operating statuses of all system components, one after the other. The number of displayed parameters depends on the connected components.

No settings can be made to these values.

- Place the rotary switch in the ***"Info"*** ⓘ position.
  ➔ Standard display is shown (see fig. 3-2).
- Press the rotary switch briefly.
  ➔ The parameter overview is displayed.
- Select the desired information level with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ The value is displayed (for example, see fig. 3-6).
- Select the individual information with the rotary switch.

More detailed explanations and possible setting values for this rotary switch setting can be seen in chapter 6.10.

Display operating data overview

The current operating data for the Daikin Altherma EHS(X/H) are shown on the RoCon HP Controller in the "Overview" information level.

The display of the operating data is not divided into several windows. By adjusting the rotary switch it is toggled between the windows.

Short designation		Explanation of the displayed value
Page 1	Mode	Current mode of the heat pump: ☼ : Heating ❄ : Cooling : Domestic hot water generation : Automatic defrosting function active
	Ext	Current energy mode of the heat pump: LT: EVU function active and low tariff. HT: EVU function active and standard tariff. SGN: SMART GRID - Function active, normal mode. SG1: SMART GRID - Function active, Disconnection: no heat pump operation, no frost protection function. SG2: SMART GRID - Function active, Switching on recommendation, Operation with higher target temperatures, cheaper electricity. SG3: SMART GRID - Function active, Command to switch on and storage tank charging to 70 °C, cheaper electricity - - -: No external mode active, heat pump works in normal mode.
	RT	Parameter [Room thermostat] / [Interlink fct] = Off: - - - Parameter [Room thermostat] = On: – ☼ : Heating or cooling demand – ○ : No heating demand Parameter [Interlink fct] = On (priority): – - - -: Only frost protection – IL1: Normal inflow target temperature – IL2: – Increased inflow target temperature in heating operation – Decreased inflow target temperature in cooling operation
	Pump	Actual output of the internal heating circulation pump in %
	EHS	Current output of the backup heater in kW
	BPV	Current position of the mixing valve 3UVB1 (100% = A, 0% = B)
Page 2	TV	Current inflow temperature after the plate heat exchanger (t_{V1})
	TVBH	Current heating inflow temperature or temp. after heating support heat exchanger ($t_{V, BH}$)
	TR	Current heating return flow temperature (t_{R1})
	Tdhw	Current temperature in domestic hot water storage tank (t_{DHW1})
	TA	Actual outdoor temperature (measured by optional temperature sensor RoCon OT1)
	V	Actual volume flow (flow rate) in the heating system
Page 3	TVBH2	= TVBH
	TR2	Current heating return flow temperature, secondary sensor (t_{R2})
	TDHW2	Current temperature in domestic hot water storage tank, secondary sensor (t_{DHW2})
	Tliq2	Current coolant temperature (t_{L2})
	TA2	Actual outdoor temperature (measured by temperature sensor of the external heat pump)
	quiet	Shows the status of the whisper mode

Tab. 3-5 Description of the operating data displayed as an overview

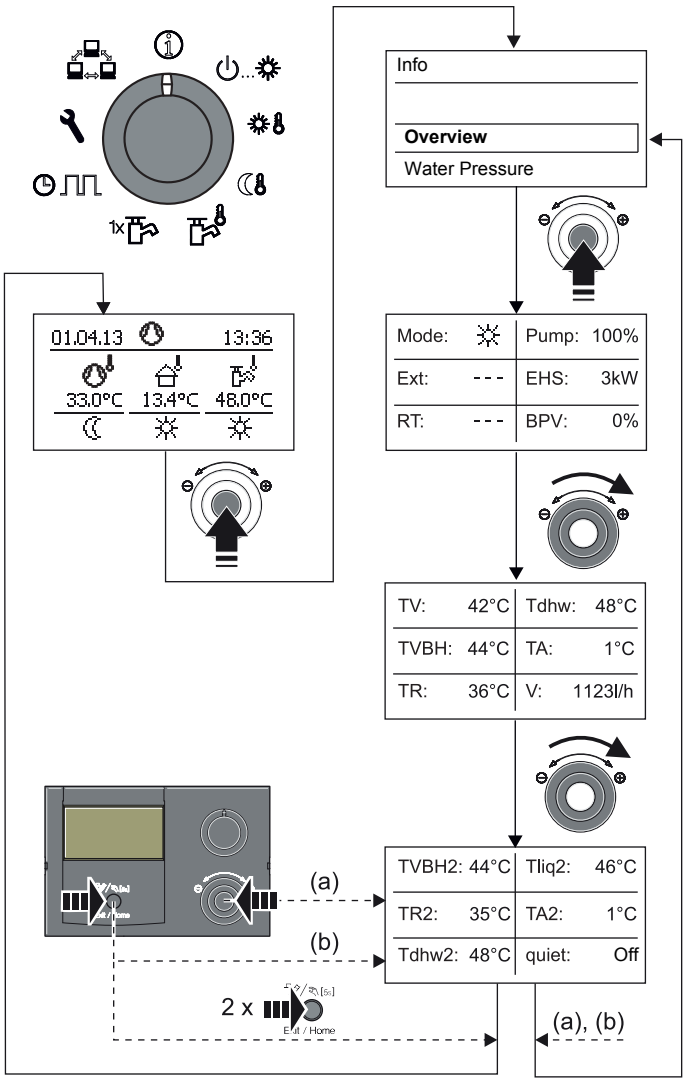


Fig. 3-5 Display operating data overview

Displaying the water pressure

On the Controller RoCon HP, when it is switched on, you can display the system pressure (water pressure) in the internal circuit (direct heating circuit). The water pressure is available as the first info parameter (see fig. 3-6).

The permissible range of water pressure during operation depends on the Daikin Altherma EHS(X/H) and the heating system. The set values and threshold values must only be changed by the heating technician. If the water pressure falls below the minimum value (set parameter value), it must be increased by topping up the system (see chapter on "Inspection and Maintenance").

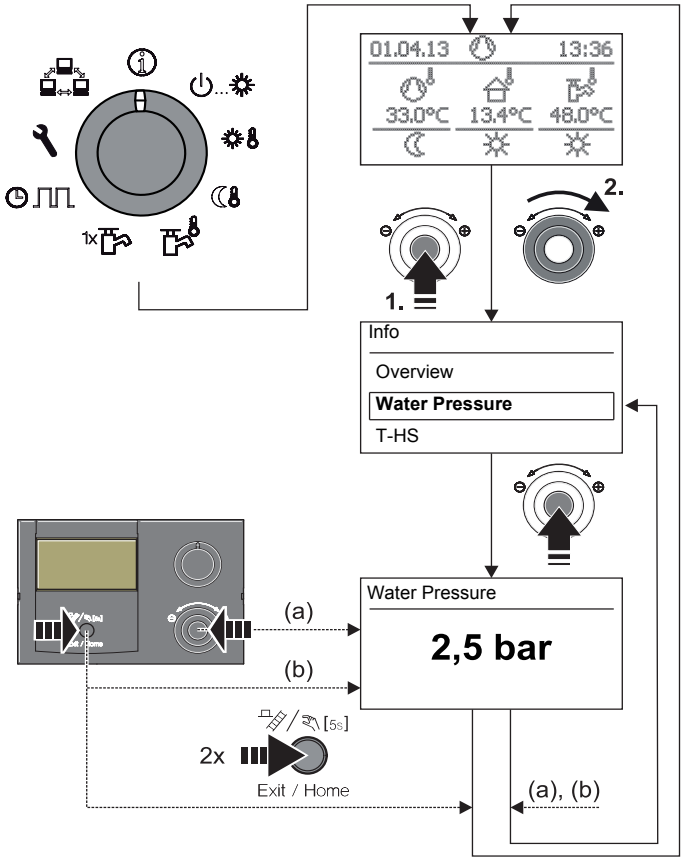


Fig. 3-6 Info values display (e.g. system pressure)

3.4.2 Setting the operating mode

The selection of the operating mode with which the Daikin Altherma EHS(X/H) is to operate is undertaken on the rotary switch in the setting ***"Operating Mode"*** ⏻...☼.

The selected operating mode is activated by briefly pushing the rotary switch.

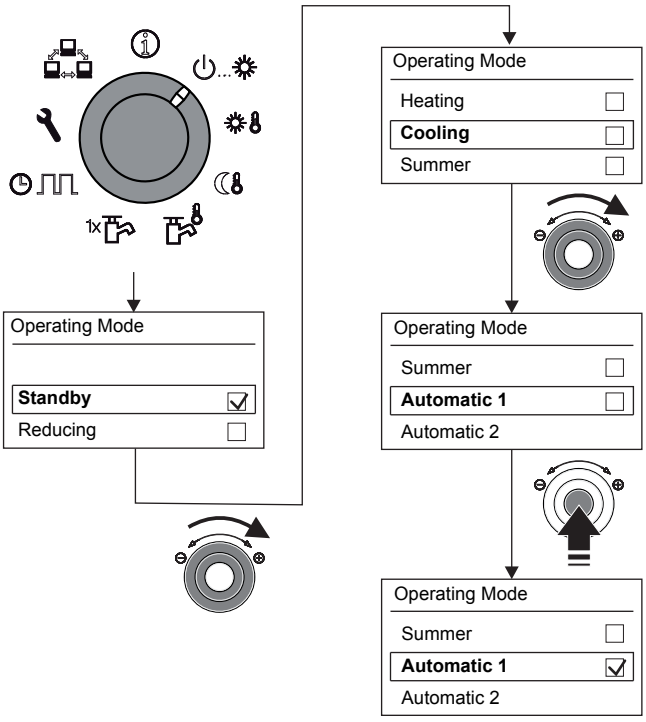


Fig. 3-7 Switching the operating mode (e.g.: from "Standby" to "Automatic 1")

- Place the rotary switch in the ***"Operating Mode"*** ⏻...☼ position.
  - ➔ An overview is displayed.
- Select the desired operating mode with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  - ➔ Daikin Altherma EHS(X/H) operates in accordance with the set operating mode.
  - ➔ The current operating mode is indicated by an appropriate symbol in the standard display.

Operating mode Standby (Stand-by)

CAUTION!

A heating system that is not frost-protected can freeze in cold weather and may be damaged.

- Drain the water out of the heating system if there is a risk of frost.
- If the heating system is not drained and there is a risk of frost, the power supplies must be secured and the external main switch must remain switched on.

In this mode, the Daikin Altherma EHS(X/H) is shifted to the stand-by mode. The **frost-protection function** (see section 3.6.5) remains in place. In order to maintain this function, the system must not be disconnected from the mains!

All controllers integrated into the RoCon-system via the CAN bus are also switched at a higher level to the operating mode "Standby".

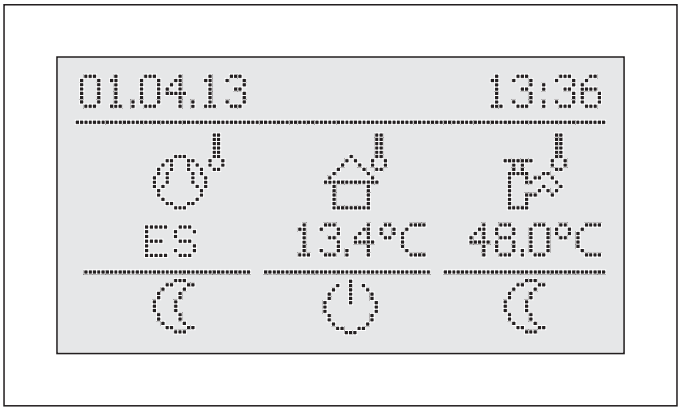


Fig. 3-8 Standard display in "Standby" operating mode (above the frost-protection limit)

In the "Standby" operating mode, the heat pump and any optionally connected backup heaters are isolated from the power supply (**Energy saving mode**) when the following conditions are met:

- The outdoor temperature sensor (RoCon OT1) is connected and correctly parametrised in the system configuration,
- The outdoor temperature is over 8 °C,
- There is no heating command,
- The frost protection function is not active in any of the connected heating circuits, and
- Daikin Altherma EHS(X/H) has been switched on for at least 5 mins.

Operating modeReducing
Reduced heating mode (lower set room temperature) in accordance with the target temperature set for economy mode in the parameter [T-Reduced] (see section 3.4.4).

Hot water generation according to the set target domestic hot water temperatures and switching cycles in the hot water time programme [DHW Program 1] (see section 3.4.5).

Operating modes Heating, Cooling
Heating or cooling operation in accordance with the room temperature set in the parameter [T-Room 1 Setpoint] (see section 3.4.3).

A connected outdoor temperature sensor (weather-controlled flow temperature regulation) or a connected room station will also influence the set flow temperature regulation (requirements: Parameter [HC Function] = On).

Hot water generation according to the set target domestic hot water temperatures and switching cycles in the hot water time programme [DHW Program 1] (see section 3.4.5).

Operating modeSummer
Hot water generation according to the set target domestic hot water temperatures and switching cycles in the hot water time programme [DHW Program 1] (see section 3.4.5).

All controllers integrated into the RoCon-system via the CAN bus are also switched at a higher level to the operating mode "Summer".

Operating mode Automatic 1 (Timer programme)
Automatic heating and economy mode in accordance with the permanent timer programmes (see section 3.4.7):
– [HC Program 1]
– [DHW Program 1]

Operating mode Automatic 2 (Timer programme)
Automatic heating and economy mode in accordance with the permanent timer programmes (see section 3.4.7):
– [HC Program 2]
– [DHW Program 2]

In addition to these operating modes there are various different temporary heating programmes available (see tab. 3-6), which run according to priority after they have been activated.

Temporary timer programme	Setting / activating in level	Rotary switch setting	Note
DHW Install	DHW Install		section 3.4.6
Party	Time Program		section 3.4.7
Away			
Holiday			
Vacation			

Tab. 3-6 Overview of temporary timer programmes

If a temporary timer programme (DHW Install, Party, Away, Holiday, Vacation) is started during the selected operating mode, the regulation will take place with preference according to the settings of this timer programme.

3.4.3 Temperature setting Daytime room temperature

The set room temperatures for room heating during the day are determined in the rotary switch setting .

- Place the rotary switch in the ***"Set Temp Day"*** position.
  ➔ An overview is displayed.

The end figures of the parameter designations (1 - 3) within this rotary switch setting designate the association with each individual cycle of the timer programme.

- Select the temperature block to be set with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Settings are displayed.
- Set the temperature.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Change has been accepted. Jump back to previous display.

More detailed explanations and possible setting values for this rotary switch setting can be seen in chapter 6.5.

3.4.4 Temperature setting Economy mode

The set room temperatures for room heating in economy mode are determined in the rotary switch setting .

- Place the rotary switch in the ***"Set Temp Night"*** position.
  ➔ An overview is displayed.
- Select the parameter to be set with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  – [T-Reduced]: Set value for "Reducing" operating mode or setback by a permanent timer programme.
  – [T-Absence]: Set value for temporary heating / cooling programmes ("Away" and "Vacation").
  ➔ Settings are displayed.
- Set the temperature.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Change has been accepted. Jump back to previous display.

More detailed explanations and possible setting values for this rotary switch setting can be seen in chapter 6.6.

3.4.5 Temperature setting hot water generation

The hot water set temperatures for hot water generation for each individual timer programme are determined in the rotary switch setting .

- Place the rotary switch in the ***"DHW Set Temp"*** position.

The end figures of the parameter designations (1 - 3) within this rotary switch setting designate the association with each individual cycle of the timer programme.

- Select the temperature block to be set with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Settings are displayed.
- Set the temperature.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Change has been accepted. Jump back to previous display.

More detailed explanations and possible setting values for this rotary switch setting can be seen in chapter 6.7.

3.4.6 Unscheduled hot water generation

You can charge the hot water up manually outside a hot water timer programme to the preset temperature set in parameter [T-DHW Setpoint 1] in the rotary switch position . Heating up is carried out as a priority and independently of any other heating programmes.

- Place the rotary switch in the ***"DHW Install"*** position.
  ➔ An overview is displayed.
- Select the parameter to be set with the rotary switch.
  – [1x Hot Water]: Activating one-off hot water generation.
- Confirm the changes with a brief push of the rotary switch.
- Setting parameters
- Confirm the changes with a brief push of the rotary switch.
  ➔ Begin unscheduled hot water generation.

After this temporary function has expired, the Controller automatically jumps back to the previously active operating mode. The rotary switch should therefore be returned to the position ***"Info"*** after activation.

The function is subject to time limits.

It will be suspended at the latest after the maximum charging time set by the technician and can only be restarted after the expiration of the blocking time set by the technician at the earliest.

Possible setting values for this rotary switch setting can be seen in chapter 6.3.

3.4.7 Switching time program

Various different timer programmes are available, that are set in the factory, but which can be adjusted to suit, to provide convenient and individual room and hot water temperature control.

The timer programmes regulate the associated heating circuit, the storage tank charging circuit and an option connected circulation pump in accordance with the stipulated switching times.

Adjustment

In the rotary switch position we set the time intervals for the heating circuit, the integrated hot water generation and the optional circulation pump.

- Place the rotary switch in the ***"Time Program"*** position.
  ➔ An overview is displayed.
- Select the timer programme to be set with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Settings are displayed.
- Select and change the value to be set with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.

More detailed explanations and possible setting values for this rotary switch setting can be seen in chapter 6.8 "Rotary switch setting: Time Program".

Permanent timer programmes

For the connected heating circuits and the storage tank charging circuit, timer programmes regulate the heating circuit temperatures or the operating times for the circulation pump in accordance with the stipulated switching cycles. The switching cycles are saved in time blocks for which various set temperatures apply.

In the switching cycles the heating system is regulated differentiated into **day** and **economy mode**.

The target room temperatures for these timer programmes are set in ***"Set Temp Day"***, ***"Set Temp Night"*** and ***"DHW Set Temp"***.

The following switching time programmes are available:
– **2 timer programmes for the heating circuit**, each with 3 possible time cycles
  – [HC Program 1]
  – [HC Program 2]

A separate input for each individual day of the week is possible, or in blocks of "Monday to Friday", "Saturday to Sunday" and "Monday to Sunday".

Programme	Time period	Switching cycle	
HC Program 1	Single day of the week (Monday, Tuesday ...)	1. 2. 3.	06:00 -> 22:00 --:-- -> --:-- --:-- -> --:--
	Working week (Monday to Friday)	1. 2. 3.	06:00 -> 22:00 --:-- -> --:-- --:-- -> --:--
	Weekend (Saturday to Sunday)	1. 2. 3.	07:00 -> 23:00 --:-- -> --:-- --:-- -> --:--
	Entire week (Monday to Sunday)	1. 2. 3.	06:00 -> 22:00 --:-- -> --:-- --:-- -> --:--
HC Program 2	See HC Program 1	1. 2. 3.	See HC Program 1

Tab. 3-7 Menu structure heating circuit timer programme

Time settings for one switching cycle in one weekday or block programme are also adopted for other time periods, provided that they affect the same weekdays. Examples referring to tab. 3-7:

a) For the single working day "Monday" the start time for the 1st switching cycle changed from 06:00 to 05:00.
   ➔ In the time period "Working week" and "Entire week", the 1st switching cycle also changed from 06:00 to 05:00.

b) For the time period "Weekend", the start time for the 1st switching cycle changed from 07:00 to 08:00.
   ➔ In the individual weekdays "Saturday" and "Sunday", the 1st switching cycle also automatically changed from 07:00 to 08:00.

c) For the time period "Entire week", the end time in the 1st switching cycle changed from 22:00 to 21:30.
   ➔ In all the weekdays the 1st switching cycle is also changed from 22:00 to 21:30.

– **2 timer programmes for the hot water circuit**, each with 3 possible switching cycles
  – [DHW Program 1]
  – [DHW Program 2]

The setting and input structure of the timer programmes are identical to the ones for the heating circuit timer programme (see also tab. 3-7).

– **1 timer programme for one optionally connected** circulation pump with 3 individual possible switching cycles
[Circulation Time]

The setting and input structure of the timer programmes are identical to those for the heating circuit timer programme (see also tab. 3-7).

For further instructions concerning settings for an optional circulation pump, see section 3.6.8.

Saved switching time programmes can be changed at any time. To provide a better overview, we recommend making a record of the programmed switching times and keeping it in a safe place (see chapter 10.1.1).

The permanent timer programmes are preset as per tab. 3-8.

	Switching cycle 1		Switching cycle 2		Switching cycle 3	
Time period	**On**	**Off**	**On**	**Off**	**On**	**Off**
Room heating / Room cooling						
Temperature setting	[T-Room 1 Setpoint]: 20°C		[T-Room 2 Setpoint]: 20°C		[T-Room 3 Setpoint]: 20°C	
	[T-Reduced]: 10°C					
"HC Program 1"						
Monday - Friday	06:00	22:00	- - : - -	- - : - -	- - : - -	- - : - -
Saturday, Sunday	07:00	23:00	- - : - -	- - : - -	- - : - -	- - : - -
"HC Program 2"						
Monday - Friday	06:00	08:00	- - : - -	- - : - -	- - : - -	- - : - -
Saturday, Sunday	07:00	23:00	- - : - -	- - : - -	- - : - -	- - : - -
Domestic hot water generation						
Temperature setting	[T-DHW Setpoint 1]: 48°C		[T-DHW Setpoint 2]: 48°C		[T-DHW Setpoint 3]: 48°C	
"DHW Program 1"						
Monday - Sunday	00:00	24:00	- - : - -	- - : - -	- - : - -	- - : - -
"DHW Program 2"						
Monday - Friday	05:00	21:00	- - : - -	- - : - -	- - : - -	- - : - -
Saturday, Sunday	06:00	22:00	- - : - -	- - : - -	- - : - -	- - : - -
"Circulation Time"						
Monday - Friday	05:00	21:00	- - : - -	- - : - -	- - : - -	- - : - -
Saturday, Sunday	06:00	22:00	- - : - -	- - : - -	- - : - -	- - : - -

Tab. 3-8 Factory setting for the permanent switching time programmes

Temporary timer programmes

For a specific situation there are 4 **temporary programmes** available, **which deactivate the permanent timer programmes** or the current operating mode for **the duration of their validity**.

The symbol of the temporary time program is displayed in the header line of the standard display, as long as the time program is active.

The following temporary time programmes may be interrupted anytime by the manually change of the operating mode.

1. [Party]: **Immediate one-off extension of the room heating**
   a) If an automatic programme is activated, the last applicable switching cycle is always extended. In the time before switching cycle 1, the target room temperature set in the parameter [T-Room 1 Setpoint] applies.
   b) In all other operating modes, the target room temperature set in the parameter [T-Room 1 Setpoint] applies.
   – The hot water generation is not affected.
   – The time programme runs for the set time period after activation.
2. [Away]: **Immediate one-off setback** up to 6 hours
   – The system operates in economy mode according to the room temperature set in the rotary switch setting ***"Set Temp Night"*** in the parameter [T-Absence].
   – The hot water generation is not affected.
   – The time programme runs for the set time period after activation.
3. [Holiday]: **One-off calendar-controlled presence**.
   – The system operates exclusively in accordance with the "Sunday" settings in the [HC Program 1].
   – The hot water generation operates exclusively in accordance with the "Sunday" settings in the [DHW Program 1].
4. [Vacation]: **One-off calendar-controlled reduction**.
   – The system only operates in economy mode according to the room temperature set in the rotary switch setting ***"Set Temp Night"*** in the parameter [T-Absence].
   – Hot water generation according to the set temperatures and switching cycles in the hot water time programme [DHW Program 1] (see section 3.4.5).
   – The calendar-controlled programme [Vacation] is **not started** if the operating mode [Standby] or [Manual Operation] is active on the set start date.

3.4.8 System settings

We undertake the basic settings for the Controller RoCon HP and the system configurations for the installation environment of the Daikin Altherma EHS(X/H), the direct heating circuit, the hot water generation and any optionally connected components in the rotary switch setting ***"Configuration"*** .

Depending on access authority (user or expert), various different parameters are available. Certain parameters are only accessible to the heating expert.

Setting the Language, Date, Time

An internal pre-programmed calendar ensures automatic time reset at the annually recurring summer/winter time changes.

- Place the rotary switch in the ***"Configuration"*** position.
  ➔ An overview is displayed.

- Select the *"Setup"* level with the rotary switch.
  ➔ An overview is displayed.
- Use the rotary switch to select and confirm the [Language], [Date] or [Time] parameters.
- Select and change the value to be changed within the individual display using the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ Change has been accepted. Jump back to previous display.

More detailed explanations and possible setting values for this rotary switch setting can be seen in section 3.6 and in chapter 6.2.

3.4.9 Terminal function

In the rotary switch setting ***"Remote Param"*** , if terminal mode is activated, other controllers in the RoCon system can also be parameterised via the controller integrated in the CAN bus.

After activation of the "Bus - Scan" a list of the equipment that was recognised is shown for selection in the display (external equipment and local equipment).

After selection and acknowledgement of an external item of equipment, this is shown on the local Controller. The local control element acts as the remote control for the external equipment. In this case all the control functions are provided and saved 1:1 as on the external equipment.

During this terminal function the header of the display carries additional information on the remotely controlled equipment; the symbol #X indicates the bus ID setting for the remotely controlled equipment.

The displayed values and symbols are always loaded from the selected equipment (such as the mixer circuit infeed temperature of the mixer module EHS157068).

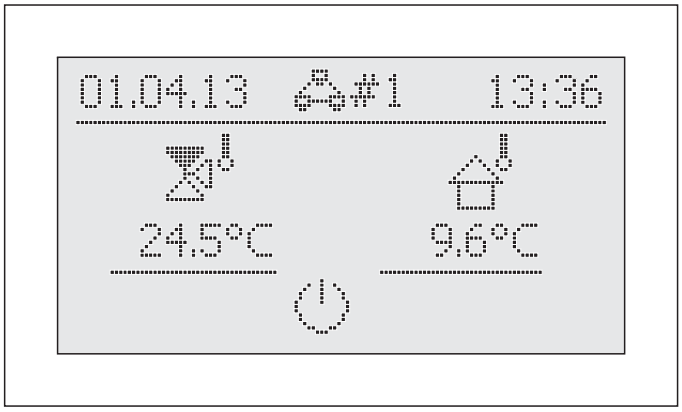


Fig. 3-9 Display example for a remotely controlled mixer module

For operation of the local equipment, this must be activated again in the selection list (parameter [No selection]).

If the message "n. A." is displayed at rotary switch setting , the control unit has yet to be assigned a valid terminal address.

If the message "n. A." is still displayed it may be necessary to update the device software before the terminal function can be used. Contact the Daikin Service Team in such cases.

Activating / Deactivating normal operation

Requirement: A valid terminal address is assigned to the RoCon B1 control element of the Daikin Altherma EHS(X/H) or the EHS157034 room station.

The terminal address can be set only after the Technician password has been input. Contact your specialist heating technician in this regard.

- Place the rotary switch in the ***"Remote Param"*** position.
  ➔ The level "*Remote Param*" is displayed.
- Select the parameter [Bus - Scan] with the rotary switch.
- Confirm the changes with a brief press of the rotary switch.
  ➔ The context menu is displayed.

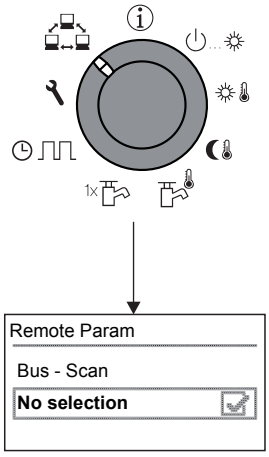


Fig. 3-10 Display of the level "Remote Param" at commissioning or temporary disconnection from the mains

- Use the rotary switch to select the parameter [New scan?] and confirm with "Yes".
  ➔ Bus - Scan is performed.
  ➔ An overview of all the equipment found is displayed.
- Use the rotary switch to select the equipment for which the terminal function is to be performed.
- Confirm the changes with a brief push of the rotary switch.
  ➔ The local control element acts as the remote control for the external equipment.

To **end terminal mode** and restore operation of the assigned equipment to the control element, at the **level "*Remote Param*"** the **parameter [No selection] must be selected and acknowledged** (see fig. 3-10).

3.4.10 Quite Mode

Quite Mode means that the exterior heat pump unit is operating at reduced output. This reduces the operating noise caused by the exterior heat pump unit.

CAUTION!

Active Quite Mode reduces the performance in room heating and room cooling operation with the result that it may no longer be possible to reach the preset target temperatures.

- With outside temperatures below freezing, there is a risk of material damage caused by frost.

The Quite Mode is set and turned off as follows:

- Place the rotary switch in the ***"Configuration"*** position.
  ➔ An overview is displayed.
- Select the *"System Configuration"* level with the rotary switch.
  ➔ An overview is displayed.
- Select the parameter [Quite Mode] with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ The setting for the parameter is displayed.
- Setting parameters
  – Parameter [Quite Mode] = 0: Deactivated
  – Parameter [Quite Mode] = 1: Permanently activated
  – Parameter [Quite Mode] = 2: Only activated at night
- Confirm the changes with a brief push of the rotary switch.
  ➔ Change has been accepted. Jump back to previous display.

More detailed explanations and possible setting values for this function can be seen in chapter 6.2.2.

3.5 Special functions

In the ***"Special Level"*** we can carry out various functions that are usually used by the heating expert.

The following special functions are possible:
– Manual mode (see section 3.5.1).
– Message display (see section 8)
– Resetting to factory settings (see section 3.6.7)

More detailed explanations of these functions can be found in chapter 6.11.

The call-up of special functions does not depend on the setting on the rotary switch.

- Depress the exit button for at least 5 secs.
  ➔ Menu ***"Special Level"*** is displayed.
- Select the programme to be started with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ The selected programme starts.
- Cancellation and jump back by:
  – Pressing the exit button again, or
  – Briefly pressing the rotary switch or
  – Selecting a different menu using the rotary switch.

3.5.1 Manual Operation

Manual Operation is used to regulate the Daikin Altherma EHS(X/H) manually to a specific flow temperature. The manual mode should only be used for diagnostic purposes.

With hydraulically controlled priority operation for the hot water generation you must make sure that the inflow target temperature set in manual mode is adequate to achieve the stored hot water set temperature (parameter [T-DHW Setpoint 1]).

- Depress the exit button for at least 5 secs.
  ➔ Menu ***"Special Level"*** is displayed.
- Select the programme *"Manual Operation"* with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ *"Manual Operation"* active.
- Set the inflow target temperature with the rotary switch.

Do **not** confirm the setting with the **rotary switch**, as this will close the programme.

  ➔ During active manual mode the hot water is consistently regulated to the parameter value for the first target hot water temperature ([T-DHW Setpoint 1]).
- Cancellation and jump back by:
  – Pressing the exit button again, or
  – Briefly pressing the rotary switch or
  – Selecting a different menu using the rotary switch.
  ➔ If the manual mode is closed, the Controller RoCon HP automatically switches to the operating mode "Standby".

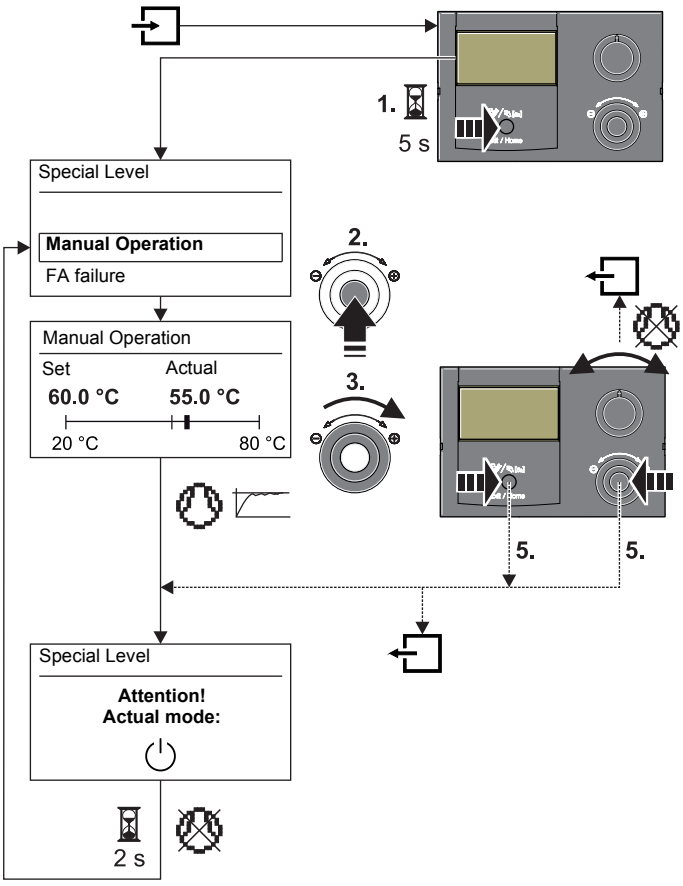


Fig. 3-11 Brief symbol-based instructions for manual mode

3.6 Special system settings

Adaption is carried out via the setting of parameters in the rotary switch setting ***"Configuration"*** .

Navigating with the rotary switch accesses either the next deeper level or directly to the appropriate parameter.

3.6.1 Access Rights (Technician password)

Certain settings are restricted by Controller access rights. In order to gain access to these setting values (parameters) you need to enter the expert *"Setup"* code in the level.

The fig. 3-12 shows the fundamental procedure for entering the access code. The expert code will be advised to the expert company in a separate letter.

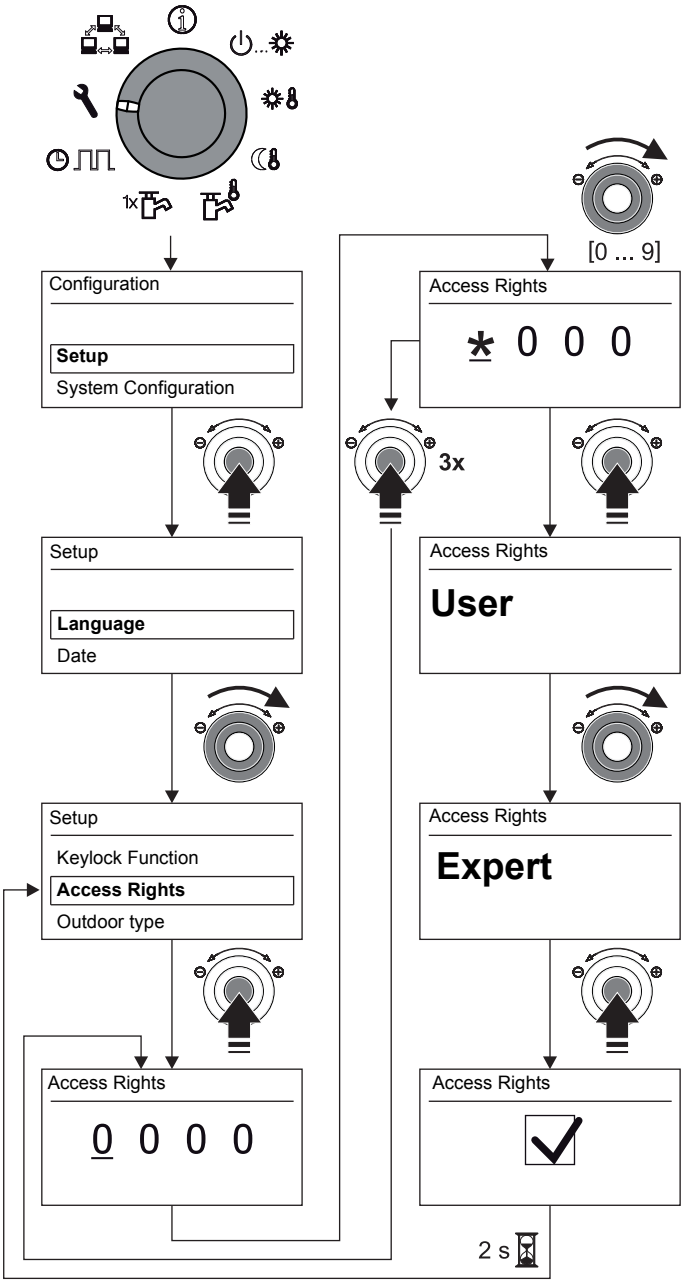


Fig. 3-12 Entering the access code

3.6.2 Heat curve

With the heating characteristic curve, the inflow target temperature is adjusted to building conditions in accordance with the relevant external temperature (weather-controlled flow temperature regulation, see section 3.6.4). Generally speaking, the steepness of the heating characteristics describes the ratio of the flow temperature change to the external temperature change.

The heating characteristic curve applies within the minimum and maximum temperature limits that have been set for the corresponding heating circuit. The room temperature measured in the living area may differ from the desired room temperature; these deviations can be kept to a minimum by installing a room station or a room thermostat.

The **Controller** is **configured in the factory** so that the **heating curve does not adjust itself** during operation.

The **automatic heat curve adjustment** can only be activated by the heating technician.

Starting conditions for the automatic heating curve adaption:
– Outdoor temperature < 8 °C
– Operating mode is automatic (I or II)
– Duration of setback phase at least 6 hours

If **an automatic heat curve adaption** is not activated, the heat curve can be set **manually** by **adjusting** the **parameter [HeatSlope]**.

Manually adjusting the heating curve
Do not make any corrections to the set values for 1 - 2 days, and then only make them in small increments.

- Deactivate additional heat sources (e.g. fireplaces, direct solar radiation, open windows).
- Fully open any existing radiator thermostat valves or setting drives.
- Activate the operating mode "Heating". Approximate setting values:
  – Radiator: 1.4 to 1.6.
  – Under floor heating system: 0.5 to 0.9.

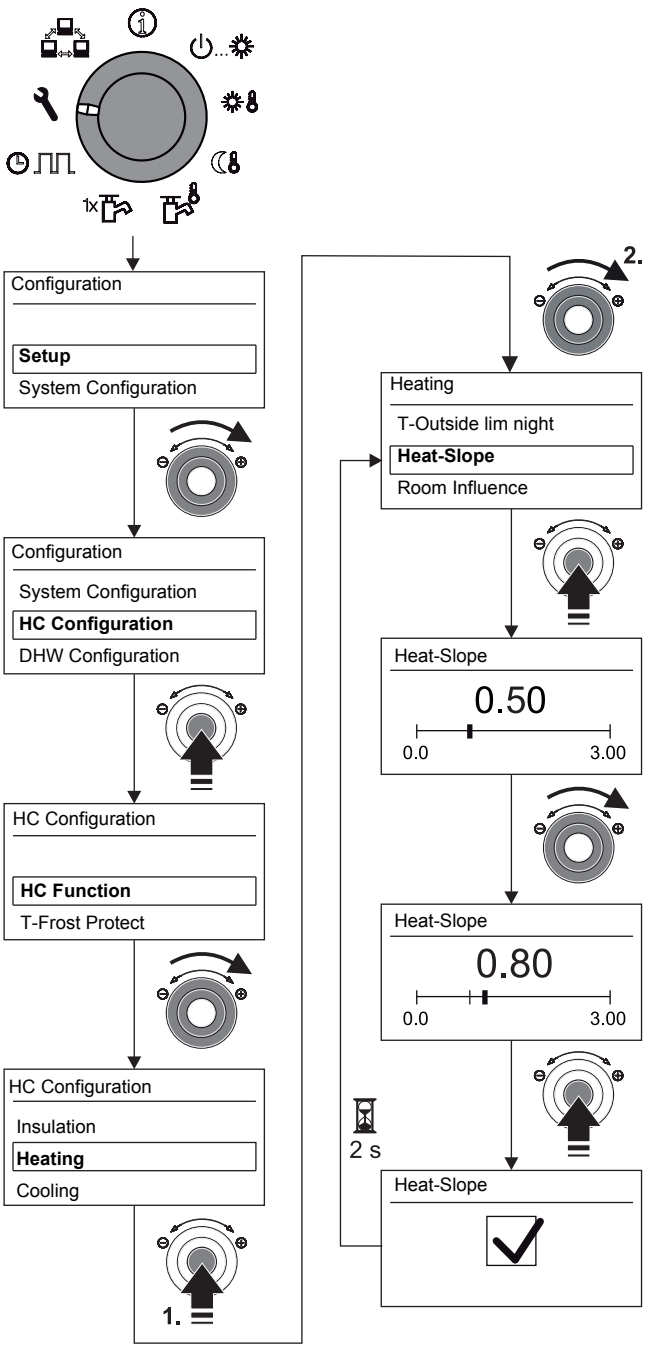
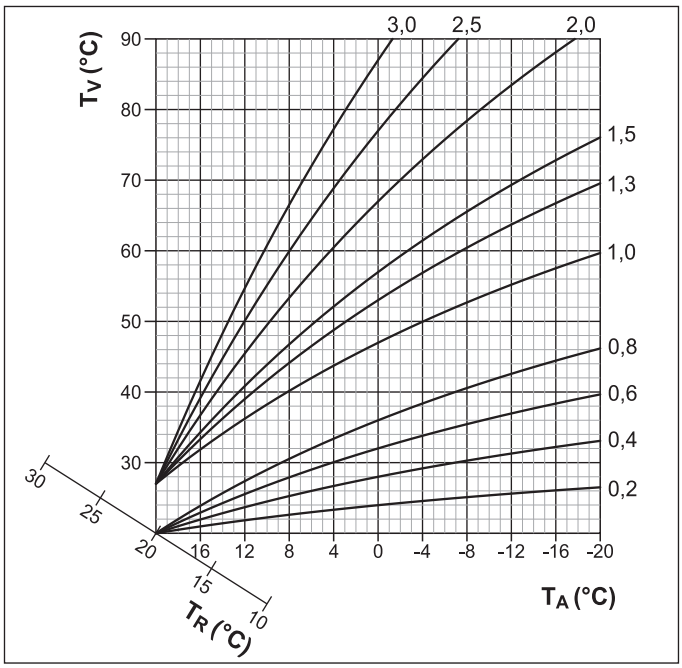


Fig. 3-13 Manual setting of the heat curve (shown for "User" access rights)



T_A *External temperature* T_V *Flow temperature*
T_R *Room temperature set value*

Fig. 3-14 Heat curves

More detailed explanations and possible setting values for this function can be seen in chapter 6.2.

3.6.3 Cooling characteristic curve

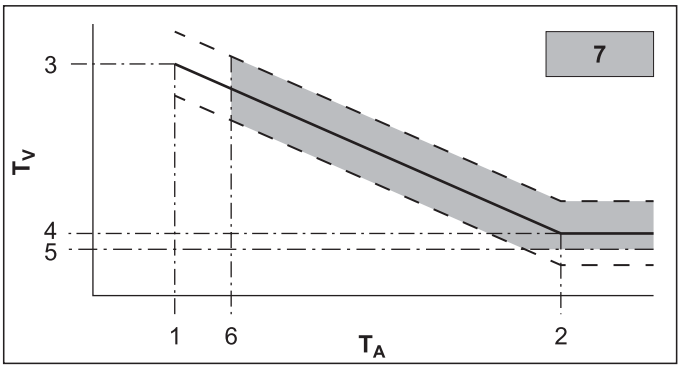
With the cooling characteristic curve, the inflow target temperature is adjusted to suit building conditions in accordance with the relevant external temperature (weather-controlled flow temperature regulation, see section 3.6.4). Warmer outdoor temperatures result in a colder inflow target temperature and vice versa.

Conditions for **cooling operation**:
– Outside temperature > Target room temperature setting
– Outside temperature > [Start T-Out Cooling] parameter setting
– Operating mode *"Cooling"* activated.
  a) with the rotary switch in the ***"Operating Mode"*** position or
  b) via the room thermostat function (cooling switching contact closed)
– No heating demand active in the heating system.

The cooling characteristic curve is specified using the following four parameters:

1. [Start T-Out Cooling]
2. [Max T-Out Cooling]
3. [T-Flow Cooling start]
4. [T-Flow Cooling max]

During the weather-controlled flow temperature regulation, the user can adjust the inflow target temperature using the parameter [Cooling Setpoint adj] by a maximum of 5°C up or down. The lower temperature limit is limited by the parameter [Min T-Flow Cooling].



1	*Parameter [Start T-Out Cooling]*	T_A	*External temperature*
2	*Parameter [Max T-Out Cooling]*	T_V	*Flow temperature*
3	*Parameter [T-Flow Cooling start]*	—	*Cooling characteristic curve*
4	*Parameter [T-Flow Cooling max]*	---	*Possible parallel displacement of the cooling characteristic curve*
5	*Parameter [Min T-Flow Cooling]*		
6	*Target room temperature*		
7	*Cooling operation possible*		

Fig. 3-15 Parameter-dependency of characteristic cooling curve

More detailed explanations and possible setting values for this function can be seen in chapter 6.2.3.

3.6.4 Weather-controlled flow temperature regulation

If the weather-controlled flow temperature regulation is active, the inflow target temperature (see info parameter [T-HS Set-point], section 6.10) is determined automatically in accordance with the set heating/cooling curve depending on the outside temperature.

In delivery status, this function is activated. It can only be deactivated or reactivated with the technician code (set point control). Contact your specialist heating technician for this.

The weather-controlled flow temperature regulation can be optimised with the **RoCon OT1** optional external temperature probe, which can be installed on the north face of the building. If no **RoCon OT1** is installed, the Controller RoCon HP uses the value for the outside temperature measured in the exterior heat pump unit.

If the room station (**EHS157034**) is additionally connected to the Daikin Altherma EHS(X/H), the inflow target temperatures will be controlled dependent on the weather and room temperature (see tab. 6-3 / tab. 6-15, parameter [Room Influence]).

If a mixer module (M1) is connected

The heating/cooling curve setting for the assigned heating circuit is configured as described above.

There is the option of operating the assigned heating circuit as a

a) Mixer extension
   The outside temperature determined by the outside temperature sensor connected to the Daikin Altherma EHS(X/H) is transmitted to the mixer module via the CAN bus.

or as

b) Mixer extension with zone regulation
   A separate outside temperature sensor (**RoCon OT1**) must be connected to the mixer module. The assigned heating circuit is regulated based on the relevant outside temperature for this zone.

When the terminal function is activated, the mixer module is operated via the Controller RoCon HP of the Daikin Altherma EHS(X/H), and the settings for the assigned heating circuit are applied.

In conjunction with the EHS157034 room station, the mixer module can also autonomously control the assigned heating circuit, fully independently of the Daikin Altherma EHS(X/H).

If the message "n. A." is displayed at the rotary switch setting , the control unit has yet to be assigned a valid terminal address.

If the message "n. A." is still displayed it may be necessary to update the device software before the terminal function can be used. Contact the Daikin Service Team in such cases.

More detailed explanations and possible setting values for this function can be seen in sections 6.2.3 and 6.12.2.

3.6.5 Frost protection function

If the outdoor temperature is below the parameter value [T-Frost Protect], the integrated heating circulation pump is switched on in order to prevent the heating system from freezing.

In addition, the inflow, storage tank and connected room temperature sensors are continually monitored. If the temperature measured by any of these sensors drops below 7°C (in the case of room temperature: 5°C), the frost protection function is automatically activated.

When the frost protection function is active, the Controller RoCon HP standard display shows the ❄ symbol alongside the time.

If the inflow heating temperature drops below 7°C, the Daikin Altherma EHS(X/H) heats up until the temperature reaches at least 12°C once more.

The function ceases once the outside temperature has risen to the set parameter value [T-Frost Protect] + 1 K is reached and there are no other activation conditions present.

If low tariff functions are activated; with certain technician settings the operation of the heat pumps by the energy supply company can be completely switched off for a limited period of time. In such cases, no additional heating is carried out and the internal device heating circulation pump is not switched on, even in frost-protection conditions.

These situations can can arise when the "Overview" information level (see section 3.4.1) in the operating data field "Ext" displays the value "HT" or "SG1".

3.6.6 Legionella protection

This function serves to prevent bacterial contamination in the hot water storage tank. For accurate controllers for drinking water hygiene, refer to the national provisions.

The Legionella protection function in the Daikin Altherma EHS(X/H) is deactivated when leaving the factory as the possibility of bacterial contamination is very low:

- Low volume of heat exchanger (stainless steel) used for heating drinking water.
- Frequent complete water replacement "first-in-first-out".
- No stagnant water areas in drinking water storage.

An active Legionella protection function (parameter [Anti-Legionella day]) involves heating the connected storage tank to a disinfection temperature 1 x a day or 1 x a week. The legionella protection function is active for an hour.

The maximum hot water temperature set by the user or the heating technician is ignored when hot water is heated for disinfection purposes.

A connected circulation pump is automatically switched on during thermal disinfection.

Setting the parameters for legionella protection is carried out in the rotary switch setting ***"Configuration"*** in level *"DHW Configuration"*.

Using the factory settings, the storage tank is heated at 03:30 hours if the target hot water temperature is below 65°C at that time.

More detailed explanations and possible setting values for this function can be seen in chapter 6.2.4.

3.6.7 Reset to factory settings (Reset)

If the Daikin Altherma EHS(X/H) no longer works properly and any other cause for the malfunction cannot be detected, it may be helpful to reset all the controller settings to the factory settings. There are 3 options for this.

Option 1

User access rights allow the **switching time program** in the "Special Level" to be reset to the factory setting according to tab. 3-8.

1. Press the exit button for at least 5 secs.
   ➔ Menu ***"Special Level"*** is displayed.
2. Select the programme *"Timeprog Reset"* with the rotary switch.
3. Execute the programme by briefly pressing on the rotary switch.
   ➔ The respective values are reset to the factory setting.
4. Select *"Return"* with the rotary switch.
5. Confirm the changes with a brief push of the rotary switch.

Possibility 2

Technician access rights permit all **customer-specific parameter settings** in the "Special Level" to be reset to the factory setting according to tab. 6-1 to tab. 6-11.

Possibility 3

If fundamental changes to the Daikin Altherma EHS(X/H) equipment for the function within the RoCon system are necessary, the **Basic Configuration** can be reset using **Technician access rights** to the **Factory settings** or can be redefined.

After a reset to the factory settings via option 2 or 3, the system must be configured again by the heating technician to the installation environment and all the customer-specific parameters reset.

3.6.8 Settings for optional circulation pump

To increase convenience when drawing off hot water we can switch an optional circulation pump using the Controller RoCon HP.

There are 2 switching possibilities:

a) Separate timer programme (see section 3.4.7). The circulation pump operates according to its own timer programme.

b) Together with a hot water timer programme. The circulation pump is actuated in parallel with the operating periods of the hot water timer programme.

Independent of the set timer programme, the energy consumption of the circulation pump van be minimised by operating it on a cyclic basis. The parameter [Circl-Pump Interval] is used to set how long the circulation pump is operated within a 15 minute interval.

Setting the timer programme for the circulation pump

- Place the rotary switch in the ***"Configuration"*** position.
  ➔ An overview is displayed.
- Select the *"DHW Configuration"* level with the rotary switch.
- Confirm the changes with a brief push of the rotary switch.
  ➔ An overview is displayed.
- Select the parameter to be set with the rotary switch.
  – [Circl-Pump DHW]: Setting as to whether the circulation pump is actuated by the active hot water timer programme [ON] or from a separate timer programme [OFF].
  – [Circl-Pump Interval]: Setting the interval control for an optional circulation pump.
- Confirm the changes with a brief push of the rotary switch.
- Setting parameters
- Confirm the changes with a brief push of the rotary switch.
  ➔ The circulation pump is actuated in accordance with the settings made by the Controller RoCon HP.

Possible setting values for this rotary switch setting can be seen in chapter 6.2.4.

3.6.9 Remote control via Internet

Using an optional gateway (**EHS157056**), the Controller RoCon HP can be connected to the internet. This means that the Daikin Altherma EHS(X/H) can be controlled remotely via mobile phone (using an App).

4 Commissioning

WARNING!

- A Daikin Altherma EHS(X/H) that is installed or started incorrectly may not operate properly and is dangerous for the health and safety of individuals.

CAUTION!

A Daikin Altherma EHS(X/H) not put into operation properly can lead to damage to property and the environment.

- Minimum requirements regarding the quality of filling and supplementary water:
  - Water hardness (calcium and magnesium, calculated as calcium carbonate): ≤ 3 mmol/l
  - Conductivity: ≤ 2700 µS/cm
  - Chloride: ≤ 250 mg/l
  - Sulphate: ≤ 250 mg/l
  - pH value (heating water): 6.5 - 8.5.
- If the above-mentioned minimum water quality requirements set by the local water supply company cannot be guaranteed, suitable water treatment measures must be taken.
- During system operation, the water pressure at the pressure gauge must be checked at regular intervals. If necessary, readjust by refilling

4.1 Initial commissioning

The Daikin Altherma EHS(X/H) may be commissioned only by authorised and trained heating experts.

4.2 Re-commissioning

4.2.1 Requirements

CAUTION!

Commissioning in frosty conditions can result in damage to the entire heating system.

- Only commission at temperatures below 0 °C when a water temperature of at least 5 °C can be guaranteed in the heating system and storage tank.

Daikin recommends that you avoid operating the system in extremely frosty conditions.

– The Daikin Altherma EHS(X/H) is fully connected.
– The coolant system is dehumidified and filled with the specified amount of coolant.
– The heating and hot water systems are filled and charged at the right pressure (see chapter 7.5).
– The storage tank is filled up to the overflow (see chapter 7.4).

4.2.2 Start-up

If the storage temperature falls below a certain minimum value, the safety settings of the Daikin Altherma EHS(X/H) prevent the operation of the heat pump in the case of low external temperatures:
– **External temperature <-2 °C**, minimum **storage temperature = 30 °C**
– **External temperature <12 °C**, minimum **storage temperature = 23 °C**.

Without backup-heater:
The storage tank water must be heated to the minimum required storage temperature by an external heater.

With backup heater (EKBUxx):
With an outdoor temperature <12 °C and a storage tank temperature <35 °C, the backup heater (EKBUxx) is switched on automatically on in order to heat up the storage tank water to at least 35 °C.

1. Check the cold water connection and, where necessary, fill the potable water heat exchanger.
2. Turn power supply to Daikin Altherma EHS(X/H) on.
3. Wait for the start phase.
4. After the start phase has completed, in heating mode, evacuate the heating system, check the installation pressure and adjust where necessary (max. 3 bar).

Air Purge

(Can only be performed by an expert heating technician.)

5. Carry out a visual inspection for leaks on all joints internally. Seal any leaks that occur in a professional manner.
6. Set the dial on the controller to the required operating mode.
7. If a Daikin p=0 solar system is connected, commission this in accordance with instructions provided. After disconnecting the Daikin p=0 solar system, check the level in the buffer storage tank once again.

5 Decommissioning

WARNING!

Danger of scalding and flooding when opening the solar return flow coupling or heating and hot water pipes due to escaping hot water.

- Only drain the storage tank container or heating system
  - when they have been left to cool sufficiently,
  - with a suitable device for the safe draining or catching of escaping water,
  - wearing appropriate protective clothing.

5.1 Temporary shutdown

CAUTION!

A heating system that is shut down can freeze in the event of frost and may suffer damage.

- If there is any risk of frost, drain any water from the decommissioned heating system.
- If the heating system is not drained and there is a risk of frost, the power supplies must be secured and the external main switch must remain switched on.

If the Daikin Altherma EHS(X/H) is not required for a long time, it can be temporarily decommissioned.

Daikin therefore recommends that you do not disconnect the system from power supply, but rather only place it in "Stand-By Mode" (consult the operating manual for the control system).

The system is then protected from frost. The pumps and valve protection functions are active.

If it is not possible to guarantee the power supply when there is danger of frost,
– completely discharge the Daikin Altherma EHS(X/H) on the water side, or
– suitable antifreeze measures must be taken for the connected heating system and hot water storage tank (e.g. draining).

If there is a danger of frost and the power supply cannot be guaranteed for just a few days, the unit's excellent heat insulation means that the Daikin Altherma EHS(X/H) does not have to be drained, provided that the storage tank temperature is monitored regularly and does not fall below +3 °C.

However, this does not provide frost protection for the connected heat distribution system.

5.1.1 Draining the storage tank

- Daikin Disconnect the Altherma EHS(X/H) from the power supply.
- Connect the outlet hose to the **KFE filling connection (Accessory KFE BA)** (fig. 5-1, item A) and run to a drainage point that is at least soil deep.

If no **KFE filling connection** is available, the connection piece (fig. 5-1, item C) can be removed from the safety overflow (fig. 5-1, item B) and used.

Once the drainage process is complete, this must be replaced before the heating system can be started again.

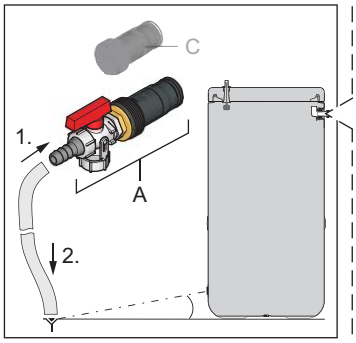
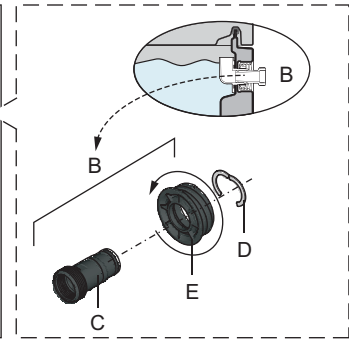


Fig. 5-1 Connecting the drainage hose



Optional: Removing the connection piece from the safety overflow

A	*KFE filling connection (Accessory KFE BA)*	*E*	*Threaded piece*
B	*Safety overflow*	*F*	*Sealing plug*
C	*Connection piece for safety overflow*	*G*	*Connecting angle*
D	*Clamping piece*	*X*	*Valve insert*

Tab. 5-1 Legend from fig. 5-1 to fig. 5-6

Without p=0 solar installation

- Remove the cover plate from the filling and emptying fitting.
- **When using the KFE filling connection (Accessory KFE BA):** Remove the cover plate from the handle and unscrew the threaded piece (fig. 5-2, item E) from the storage tank container.

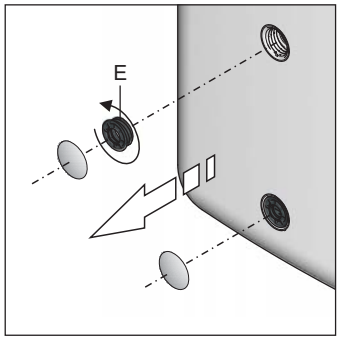


Fig. 5-2 Unscrew threaded piece

- Insert the **KFE filling connection** into the threaded piece (fig. 5-3, item E) and secure it using a clamping piece (fig. 5-3, item D).
- Place a suitable collection trough beneath the filling and emptying fitting.
- At the filling and emptying fitting, unscrew the threaded piece (fig. 5-4, item E), remove the sealing plug (fig. 5-4, item F) **and immediately screw** the pre-assembled threaded insert with the **KFE filling connection** back into the filling and empyting fitting (fig. 5-4).

CAUTION!

Storage water will gush out as soon as the sealing plug is removed.

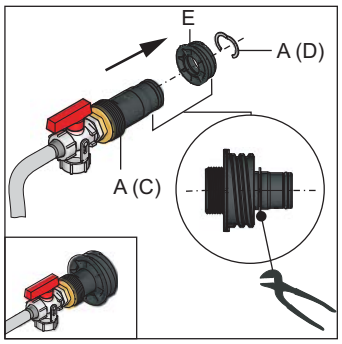


Fig. 5-3 Assembling the KFE filling connection

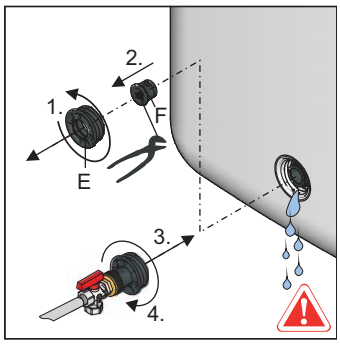


Fig. 5-4 Screwing the into the filling and emptying fitting KFE filling connection

- Open the KFE cock of the **KFE filling connection** and drain the water content of the storage tank.

Only for the p=0 solar installation

- Adjust the valve insert on the connecting angle so that the path to the blind plug is blocked off (fig. 5-5).
- Remove the blanking plug from the connecting angle (fig. 5-5) and place a suitable collection trough beneath the unit.

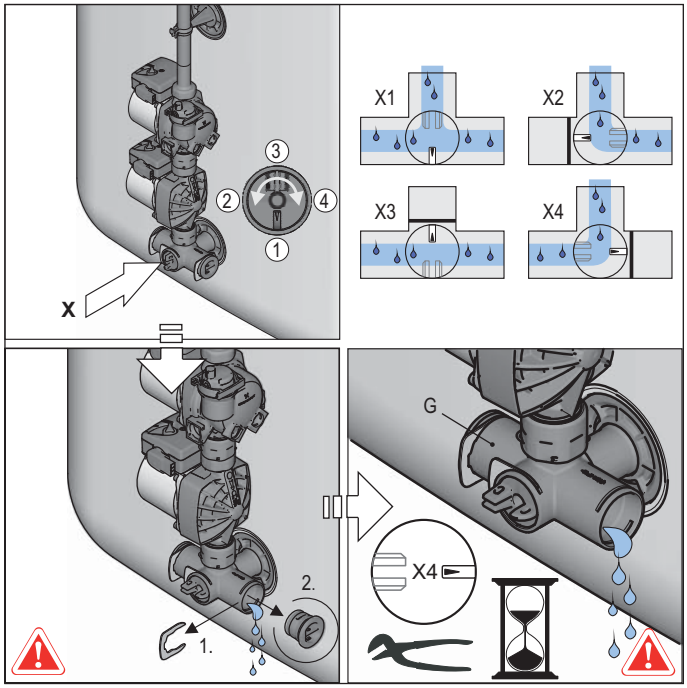


Fig. 5-5 Shutting off the valve insert and removing the blanking plug from the connecting angle

- Insert the **KFE filling connection** into the connecting angle and secure using a retaining clamp (fig. 5-6).

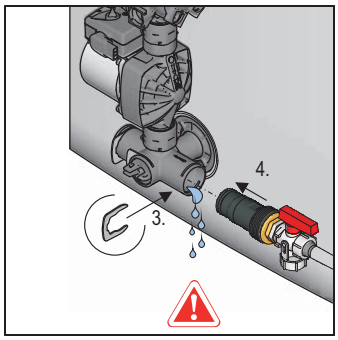


Fig. 5-6 Assembling the in the connecting angle KFE filling connection

- Open the KFE cock on the **KFE filling connection**.
- Adjust the valve insert on the connecting angle so that the flow to the drain hose is opened (also refer to fig. 5-5) and drain the water content of the storage tank.

5.1.2 Draining the heating circuit and hot water circuit

- Connect the drainage hose to the combined filling and drainage valve on the Daikin Altherma EHS(X/H).
- Open the combined filling and drainage valve on the Daikin-Altherma EHS(X/H).
- Allow the heating and hot water circuit to drain.
- Disconnect the heating flow and return flow as well as the cold water inflow and the hot water outflow from the Daikin Altherma EHS(X/H).
- Connect the discharge hose on the heating flow and return flow as well as the cold water inflow and hot water outflow so that the hose opening is at ground level.
- Allow the individual heat exchangers to run empty one after the other, using the suction lifter method.

5 Decommissioning

5.2 Final shutdown

WARNING!

Cooling systems (heating pumps), climate control systems and heating devices that are incorrectly dismantled can both endanger the life and health of people and exhibit impaired function during start-up.

- Work on the Daikin Altherma EHS(X/H) (such as dismantling components, temporary or final shutdown of system) is only to be carried out by persons who are authorised and who have successfully completed **qualifying technical or vocational training** and who have taken part in advanced training sessions recognised by the relevant responsible authorities. These include, in particular, **certified heating engineers, qualified electricians and HVAC specialists**, who on account of their **professional training** and **expert knowledge**, have experience in the professional installation and maintenance of heating, cooling and air conditioning systems and heat pumps.
- You **must observe** the **warning and safety instructions** in the installation manual on working in the coolant system.

A final shutdown may be necessary if
– the system is defective and is being dismantled and disposed of.
– components of the system are defective, and are being dismantled and replaced.
– the system or parts of the system are being dismantled and reassembled in another location.

The Daikin Altherma EHS(X/H) is designed to be environmentally friendly and easy to install: the jobs described above can therefore be carried out in an efficient and environmentally-friendly manner.

When changing location or replacing parts on the coolant system in the pipe network:
- Pump the coolant back into the external heat pump unit (see installation and operating guide for the particular external heat pump unit).

When disposing of the machine or replacing parts in the coolant system:

- Suction the coolant from the machine and recycle (see installation and operating guide for the particular external heat pump unit).

CAUTION!

Coolant escaping from the system causes long-term damage to the environment.

Mixing different kinds of coolant can result in hazardous toxic gases being released. Mixing with oils when coolant escapes can lead to the soil being contaminated.

- Never allow coolant to be released into the atmosphere - always suction it off and recycle using a suitable recycling device.
- Always recycle coolant, in so doing keeping it separated from oils and other additives.
- Only store different types of coolant separately, in suitable pressure vessels.
- Dispose of coolants, oils and additives properly and in accordance with the applicable national regulations of the country it is being used in.

- Decommissioning a Daikin Altherma EHS(X/H) (see section 5.1).
- Disconnect the Daikin Altherma EHS(X/H) from all electrical connections, coolant and water connections.
- Dismantle the Daikin Altherma EHS(X/H) or components in accordance with the installation guide in reverse order.
- Daikin Altherma EHS(X/H) disposed off in a professional manner.

Recommendations for disposal

The Daikin Altherma EHS(X/H) has an environmentally-friendly design. During the disposal process, the only waste created is that which can be used for material or thermal recycling. The materials used that are suitable for recycling can be sorted into individual types.

Daikin has complied with the standards for environmentally-friendly disposal as a result of the environmentally-friendly design of the Daikin Altherma EHS(X/H). Proper disposal in compliance with the respective national regulations of the country of use is the responsibility of the user/owner.

The designation of the product means that electrical and electronic products may not be disposed of together with unsorted domestic waste.

Proper disposal in compliance with the respective national regulations of the country of use is the responsibility of the user/owner.

- Disassembly of the system, handling of coolant, oil and other parts may only be carried out by a qualified fitter.
- Disposal may only be carried out by an organization that specialises in reuse, recycling and recovery.

Further information is available from the installation company or the responsible local authorities.

6 Parameter settings

6.1 Explanation of the parameter tables

The parameter tables listed in the sections 6.2 to 6.11 contain important information concerning all parameters that are available in the individual rotary switch setting on the controller (1st menu level, 2nd menu level).

In addition to the parameter designations, the tables contain details for the setting ranges, factory settings, setting options or setting step distances and brief function explanations.

In addition, they provide explanation of the access rights for the operation of the controller. The following abbreviations are available for appropriate catheterisation:

BE Access right for the operator

HF Access permission with Technician password

Status:

N Not visible

E Visible and configurable

S Visible

6.2 Rotary switch setting: Configuration

6.2.1 Level "Setup"

Sub-level	Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
			BE	HF			
	Language	Language of the display text in the operating panel	E	E	German English French Dutch Italian Spanish Portuguese	German	1
	Date	Current date in format Day / Month / Year. The current day of the week is calculated automatically from the date.	E	E			
	Time	Time in format Hours / Minutes.	E	E			
	Keylock Function	Release of the keylock function: Off: Button block cannot be activated. On: The button block can be activated using the rotary switch (see chapter 3.3).	E	E	Off On	Off	-
	Access Rights	Entering access code. Setting character by character like a combination lock (see chapter 3.6.1).	E	E	0 - 9	0000	1

Tab. 6-1 Parameter in rotary switch setting "Configuration" level "Setup"

6.2.2 Level "System Configuration"

Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Equilibrium Temp	Only if the parameter [Equilibrium Func.] = On is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Outdoor temperature from which the optional ancillary heating is activated for supporting the room heating. The bivalent temperature is relevant for operation of the optional ancillary heater based on a backup demand (room heating operation). The temperature of the sensor integrated into the external unit for heat pump (info value TA2) is used. The displayed info value TA2 may deviate from the value in the standard display.	E	E	-15°C to +35°C	0°C	1°C
Quite Mode	Mode for low-noise operation with reduced output (see section: 3.4.10). 0: Deactivated 1: Activated 2: Operated in whisper mode only at night between 22:00 and 6:00 hours.	E	E	0 - 2	0	-

Tab. 6-2 Parameter in rotary switch setting "Configuration" level "System Configuration"

Depending on the version of the device software certain information parameters for the device, not described in tab. 6-2, can be displayed at this level. For this see tab. 6-12.

6.2.3 Level "HC Configuration"

Sub-level	Parameter	Description	Access BE	Access HF	Setting range Min / Max	Factory setting	Increment
	T-Frost Protect	Off: No frost protection of the heating circuit Otherwise: If the outside temperature falls below the programmed value, the system switches into the frost protection mode (switches the pumps on). The function ceases once the outside temperature has risen to the set value +1 K.	E	E	Off, -15 to +5°C	0°C	1°C
	Insulation	Setting the insulation standard of the building. This affects the way the heating curve and the heating times automatically adapt to the outside temperature.	E	E	Off low Normal Good Very Good	low	-
Heating							
	T-Outside lim day	Setting the automatic summer shutdown of the heating system. If the outside temperature measured and averaged out by the controller exceeds the set value by 1 K, the heating circuit is switched off. The heating is released again if the outdoor temperature falls below the set heat curve.	E	E	Off, 10 - 40°C	19°C	0.5°C
	T-Outside lim night	Parameter for setting the heating limit for "Switch-off" of the heating circuit during economy mode (functionality as for parameter [T-Outside lim day]).	E	E	Off, 10 - 40°C	10°C	0.5°C
	Heat-Slope	Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the heating curve. The heating curve reflects the dependence of the set inflow temperature of the heating circuit on the outside temperature (see chapter 3.6.2).	E	E	0.0 - 3.0	0.5	0.1
	Room Influence	Only if the room station (U1) is connected and assigned to the heating circuit. Setting of the impact the deviation of the room temperature measured by the EHS157034 from the actual set value (see sections 3.4.3 and 3.4.4) has on the flow temperature. Off: Exclusively weather-controlled flow temperature regulation 0: Purely weather-controlled flow temperature regulation, but internal heat recirculation pump continues to run until the next heating cycle following a heat demand during the setback time. 1-20: Causes a correction of the set flow temperature (parallel shift of the heat curve) by the set factor. For example: If the measured temperature is 2 K below the set value, the set flow temperature is raised 2-times the set value.	E	E	Off, 0 - 20	Off	1
	T-Room Adj	Only if the room station (U1) is connected and assigned to the heating circuit. Individual adaptation of the room temperature relevant for control. Should a systematic deviation of the room temperature as measured by the EHS157034 from the actual temperature in the living area of this room be detected, the measured value can be corrected by the set value.	E	E	-5.0 to +5.0 kW	0.0 K	1 K
	T-Flow Day	Only if the parameter [HC Function] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the inflow target temperature for the heating circuit during the heating time when in operating mode: "Automatic 1", "Automatic 2", "Heating".	E	E	20 - 90°C	40°C	1°C
	T-Flow Night	Only if the parameter [HC Function] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the inflow target temperature for the heating circuit during the setback time when in operating mode: "Automatic 1", "Automatic 2", "Reducing".	E	E	10 - 90°C	10°C	1°C
Cooling (❄ Can be used only if the assigned heat generator has a cooling function.)							
	Start T-Out Cooling	Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting from which outside temperature the cooling operation with the highest cooling infeed target temperature [T-Flow Cooling start] starts (Setting condition: operating mode "Cooling").	E	E	15 - 45°C	24°C	1°C
	Max T-Out Cooling	Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting to determine from which outdoor temperature the lowest cooling flow temperature [T-Flow Cooling max] is stipulated (Setting condition: operating mode "Cooling").	E	E	20 - 45°C	35°C	1°C
	T-Flow Cooling start	Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the cooling inflow target temperature at the start of cooling mode (outside temperature = parameter [Start T-Out Cooling]).	E	E	5 - 25°C	18°C	1°C
	T-Flow Cooling max	Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the minimum cooling inflow target temperature. This is kept constant relative to the outside temperature (parameter [Max T-Out Cooling]).	E	E	5 - 25°C	8°C	1°C
	T-Flow Cooling	Only if the parameter [HC Function] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the cooling inflow target temperature (fixed value) when cooling mode is active.	E	E	8 - 30°C	18°C	1°C
	Cooling Setpoint adj	Parallel displacement of the cooling characteristic curve to match the set value.	E	E	-5.0 to +5.0 kW	0.0 K	1 K

Tab. 6-3 Parameter in rotary switch setting "Configuration" level "HC Configuration"

6.2.4 Level "DHW Configuration"

Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Circl-Pump DHW	Setting for activating a circulation pump. Off: Optional circulation pump operates according to the timer programme [Circulation Time]. On: The optional circulation pump operates synchronously with the switching timer program activated for generation of hot water.	E	E	Off On	Off	-
Circl-Pump Interval	Setting the interval control for an optional circulation pump. Off: Deactivated The circulation pump operates continuously throughout the enabled time of the assigned switching timer program (parameter [Circl-Pump DHW]). Otherwise: The circulation pump runs cyclically (duty ratio: pump running time = set value every 15 min).	E	E	Off, 1 - 15 min	Off	1 min
Anti-Legionella day	Setting the day for the thermal disinfection of the circulating tank. Off: No thermal disinfection Monday - Sunday: Day for thermal disinfection Mon - Sun: Daily thermal disinfection	E	E	Off, Monday ... Sunday, Mon - Sun	Off	-

Tab. 6-4 Parameter in rotary switch setting "Configuration" level "DHW Configuration"

6.3 Rotary switch setting: DHW Install

Parameter	Designation	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
1x Hot Water	Start of the one-off heating up of the hot water and the set value [T-DHW Setpoint 1], independent of the heating programmes.	E	E	Off On	Off	-
Hyst HP	Switching threshold hot water charging Setting of the temperature difference to which the temperature in the domestic hot water storage tank compared to the current target hot water temperature [T-DHW Setpoint] can drop before the heat pump is switched on to provide hot water.	E	E	2 - 20 K	5 K	1 K
Timer BOH	Delay time after which the reserve heating may support the heat pump in hot water charging.	E	E	20 - 95 min	50 min	1 min

Tab. 6-5 Parameter in rotary switch setting "DHW Install"

6.4 Rotary switch setting: Operating Mode

Parameter	Designation	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Standby	In this operating mode, all internal functions are turned off. Frost protection remains active and a blocking protection for the pump is guaranteed. All controllers integrated in the RoCon-system via the CAN bus are also switched at a higher level to the operating mode when this setting is selected. ⚠ Outputs are not free of voltage always.	E	E	☐ / ☑	☐	-
Reducing	The internal heating circuit provides continuous (24 h per day) regulation to the parametrised setback temperature. The hot water generation takes place according to [DHW Program 1].	E	E	☐ / ☑	☐	-
Heating	The internal heating circuit provides continuous (24 h per day) regulation to the parametrised day set room temperature (heating). The hot water generation takes place according to [DHW Program 1].	E	E	☐ / ☑	☐	-
Cooling	The internal heating circuit provides continuous (24 h per day) regulation to the parametrised day room temperature set (cooling). The hot water generation takes place according to [DHW Program 1]. Frost protection remains active and a blocking protection for the pump is guaranteed.	E	E	☐ / ☑	☐	-
Summer	The internal heating circuit is turned off. Frost protection remains active and a blocking protection for the pump is guaranteed. The hot water generation takes place according to [DHW Program 1]. All controllers integrated in the RoCon-system via the CAN bus are also switched at a higher level to the operating mode when this setting is selected.	E	E	☐ / ☑	☐	-
Automatic 1	The internal heating circuit regulates according to the parametrised timer programme [HC Program 1] with the individual day room temperatures set. The hot water generation takes place according to [DHW Program 1].	E	E	☐ / ☑	☐	-
Automatic 2	The internal heating circuit regulates according to the parametrised timer programme [HC Program 2] with the individual day room temperatures set. The hot water generation takes place according to [DHW Program 2].	E	E	☐ / ☑	☐	-

Tab. 6-6 Parameter in rotary switch setting "Operating Mode"

6 Parameter settings

6.5 Rotary switch setting: Set Temp Day

Parameter	Designation	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
T-Room 1 Setpoint	Target room temperature for the 1st switching cycle of the timer programmes [Automatic 1] and [Automatic 2].	E	E	5 - 40°C	20°C	0.5°C
T-Room 2 Setpoint	Target room temperature for the 2nd switching cycle of the timer programmes [Automatic 1] and [Automatic 2].	E	E	5 - 40°C	20°C	0.5°C
T-Room 3 Setpoint	Target room temperature for the 3rd switching cycle of the timer programmes [Automatic 1] and [Automatic 2].	E	E	5 - 40°C	20°C	0.5°C

Tab. 6-7 Parameter in rotary switch setting "Set Temp Day"

6.6 Rotary switch setting: Set Temp Night

Parameter	Designation	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
T-Reduced	Target room temperature for the setback times for the permanent timer programmes [Automatic 1] and [Automatic 2].	E	E	5 - 40°C	15°C	0.5°C
T-Absence	Target room temperature for the setback times for the temporary timer programmes [Away] and [Vacation].	E	E	5 - 40°C	15°C	0.5°C

Tab. 6-8 Parameter in rotary switch setting "Set Temp Night"

6.7 Rotary switch setting: DHW Set Temp

Parameter	Designation	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
T-DHW Setpoint 1	Target hot water temperature for the 1st switching cycle of the timer programmes [Automatic 1] and [Automatic 2].	E	E	10 - 70°C	48°C	1°C
T-DHW Setpoint 2	Target hot water temperature for the 2nd switching cycle of the timer programmes [Automatic 1] and [Automatic 2].	E	E	10 - 70°C	48°C	1°C
T-DHW Setpoint 3	Target hot water temperature for the 3rd switching cycle of the timer programmes [Automatic 1] and [Automatic 2].	E	E	10 - 70°C	48°C	1°C

Tab. 6-9 Parameter in rotary switch setting "DHW Set Temp"

6.8 Rotary switch setting: Time Program

Parameter	Designation	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Party	The heating circuit operates at the target room temperature set in the [T-Room 1 Setpoint] parameter for the set period of time. If the [Automatic 1] or [Automatic 2] timer programmes are active, the heating cycle is extended or started early. (Target room temperature - see section 3.4.7). The hot water generation is not affected.	E	E	00:00 - 06:00	00:00	1 h
Away	The heating circuit operates at the target room temperature set in the [T-Absence] parameter for the set period of time. The hot water generation is not affected.	E	E	00:00 - 06:00	00:00	1 h
Vacation	The heating circuit operates at the target room temperature set in the [T-Absence] parameter permanently (24 h per day). A calendar function can be used to enter a time period for the absence.	E	E	Date on first day - Date on last day	-	1 Day
Holiday	A calendar function can be used to enter a time period for presence. During this time, the system operates exclusively in accordance with the "Sunday" settings in [DHW Program 1] and [HC Program 1].	E	E	Date on first day - Date on last day	-	1 Day
HC Program 1	In this menu we can parametrise the 1st timer programme for the heating circuit. 3 switching cycles with a resolution of 15 minutes can be set. A separate entry for each weekday is possible. Format: (On) hh:mm - hh:mm (Off) Also, the cycles can be parametrised from Monday to Friday, Saturday to Sunday and Monday to Sunday.	E	E	see chapter 3.4.7	see tab. 3-8	15 min
HC Program 2	In this menu we can parametrise the 2nd timer programme for the heating circuit. 3 switching cycles with a resolution of 15 minutes can be set. A separate entry for each weekday is possible. Format: (On) hh:mm - hh:mm (Off) Also, the cycles can be parametrised from Monday to Friday, Saturday to Sunday and Monday to Sunday.	E	E	see chapter 3.4.7	see tab. 3-8	15 min
DHW Program 1	In this menu we can parametrise the 1st timer programme for hot water generation. 3 switching cycles with a resolution of 15 minutes can be set. A separate entry for each weekday is possible. Format: (On) hh:mm - hh:mm (Off) Also, the cycles can be parametrised from Monday to Friday, Saturday to Sunday and Monday to Sunday.	E	E	see chapter 3.4.7	see tab. 3-8	15 min
DHW Program 2	In this menu we can parametrise the 2nd timer programme for hot water generation. 3 switching cycles with a resolution of 15 minutes can be set. A separate entry for each weekday is possible. Format: (On) hh:mm - hh:mm (Off) Also, the cycles can be parametrised from Monday to Friday, Saturday to Sunday and Monday to Sunday.	E	E	see chapter 3.4.7	see tab. 3-8	15 min
Circulation Time	In this menu we can parametrise a timer programme for the circulation pump. 3 switching cycles with a resolution of 15 minutes can be set. A separate entry for each weekday is possible. Format: (On) hh:mm - hh:mm (Off) Also, the cycles can be parametrised from Monday to Friday, Saturday to Sunday and Monday to Sunday.	E	E	see chapter 3.4.7	see tab. 3-8	15 min

Tab. 6-10 Parameter in rotary switch setting "Time Program"

6.9 Rotary switch setting: Remote Param

Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Bus - Scan	Off: No function On: Controller checks which RoCon devices are connected to the system using the CAN bus lines. Devices that are detected are displayed with their type and data bus address (for example: MM#8 = mixer module with data bus address 8). The selection and activation of a device with the rotary switch switches the function of the control unit to that of the selected device (see chapter 3.4.9).	E	E	Off On	Off	-
No selection	Activation switches to the local device.	E	E	☐ / ☑	☐	-
Contr BM1/BE1 #X	Activation switches to the Daikin Altherma EHS(X/H) with the bus ID X.	E	E	☐ / ☑	☐	-
Mix Valve #X	Activation switches to the mixer module with the bus ID X.	E	E	☐ / ☑	☐	-

Tab. 6-11 Parameter in rotary switch setting "Remote Param"

6 Parameter settings

6.10 Rotary switch setting: Info ⓘ

Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Overview	Display of different current operating data (see section 3.4.1).	S	S	-	-	-
Water Pressure	The current water pressure is displayed in bar.	S	S	0 - 4 bar	-	0.1 bar
T-HS	The current temperature (TVBH) of the heat generator is displayed in °C.	S	S	0 - 100°C	-	1°C
T-HS Setpoint	The current Inflow target temperature of the heat generator is displayed in °C (see section 3.6.4).	S	S	0 - 90°C	-	0.1°C
T-Outside	The current external temperature is displayed °C.	S	S	-39 to +50°C		0.1°C
T-DHW	The current temperature of the hot water storage tank is displayed in °C. If there is no hot water function activated, "- - -" is displayed.	S	S	0 - 100°C	-	0.1°C
T-DHW Setpoint	The current target hot water temperature is displayed °C. If there is no hot water function activated, "- - -" is displayed. The current set value is here always the maximum value of all relevant demands for this hot water circuit.	S	S	10 - 70°C	-	0.1°C
T-Return	The current return flow temperature of the heat generator is displayed in °C. If there is no relevant sensor connected to the heat generator, "- - -" is displayed.	S	S	0 - 100°C	-	0.1°C
Flow Rate	The filtered value of the current volume flow in litres per hour is displayed.	S	S	0 - 5100 l/h	-	l/h
T-HC	The inflow temperature in the direct heating circuit is displayed in °C.	S	S	0 - 100°C	-	0.1°C
T-HC Setpoint	The set temperature of the flow in the direct heating circuit is displayed in °C.	S	S	0 - 90°C	-	0.1°C
Status HS pump	The current status of the internal heat circulation pump in the Daikin Altherma EHS(X/H) is displayed.	S	S	Off On	-	-
Runtime Compressor	The running time of the refrigerant compressor is displayed in h.	S	S	-	-	h
Runtime Pump	The running time of the internal heating circulation pump is displayed in h.	S	S	-	-	h
Mixer Position	The current position of the 3UV DHW 3-way switch valve is displayed. 0%: Position A (room heating) 100%: Position B (domestic hot water generation)	S	S	0 - 100 %	-	1 %
Qboh	The amount of heat in the additional heat generator for hot water generation is displayed in kWh.	S	S	-	-	kWh
Qchhp	The amount of heat in the additional heat generator for heating mode is displayed in kWh.	S	S	-	-	kWh
Qsc	The quantity of heat in the heat pump for cooling is displayed in kWh.	S	S	-	-	kWh
Qch	The quantity of heat in the heat pump for heating is displayed in kWh.	S	S	-	-	kWh
QWP	The total amount of heat in the heat pump is displayed in kWh.	S	S	-	-	kWh
Qdhw	The quantity of heat for hot water generation is displayed in kWh.	S	S	-	-	kWh
HS type	The heat generator type Daikin Altherma EHS(X/H) detected is displayed.	S	S	-	-	-
Sw Nr B1/U1	The software and version of the RoCon B1 operating unit is displayed.	S	S	-	-	-
Sw Nr Controller	The software number and the version of the RoCon BM1 circuit board are displayed.	S	S	-	-	-
Sw Nr RTX RT	The software number and the version of the RTX-AL4 circuit board are displayed.	S	S	-	-	-

Tab. 6-12 Parameter in rotary switch setting "Info"

6.11 Exit button: Sonderfunktion

Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
Manual Operation	The direct heating circuit and the target hot water temperature are controlled according to the temperature set in this parameter (see section 3.5.1).	E	E	20 - 80°C	50°C	1°C
FA failure	Display of a current heat pump malfunction in the Daikin Altherma EHS(X/H). If "----" is displayed there is no fault (see chapter 8).	E	E	-	-	-
Protocol	Display of protocol (error and information messages). Here we display the saved messages of the Daikin Altherma EHS(X/H) and the connected data bus units with date a code, in each case as a menu item. By selecting an entry with the rotary switch, all other corresponding information is displayed concerning the selected fault message: - Date and time of the message - Code number (Information for the heating technician) - Location (device) where the message originated - Bus identification (device) where the message originated	E	E	-	-	-
Delete message	By setting this parameter to "On" and briefly pressing the rotary switch all the entries of the protocol, including the faults from connected data bus devices, are deleted.	E	E	Off On	Off	-
Timeprog Reset	Resets all permanent time programmes to factory setting (see tab. 3-8).	E	E	Off On	Off	-
Return	This parameter is used only to exit the special level.	E	E			

Tab. 6-13 Parameter in the level "Sonderfunktion"

6.12 (M1) Parameter levels for the EHS157068 mixer module

The parameter levels, parameter priorities, setting ranges and associated functions are essentially the same as those described in the preceding sections.

In some cases there exist at individual levels a restricted scope of available parameters.

The description below relates only to the sections indicated. Areas where there are significant differences are described in greater detail.

Rotary switch setting: Info ⓘ
See section 6.10

If the assigned control unit is set to "Mix Valve #X", the displayed values relate to the assigned heating circuit and to the components connected to the EHS157068. (pump, mixer valve, ...).

When the assigned control unit is set to "Living Room", the [T-Room adj] parameter is available. The rotary switch can be used to change the room target temperature to the range -5 K to +5 K. This function is not available if the control unit is being used as a terminal function for remote control.

Rotary switch setting: Operating Mode ⏻…☼
See section 6.4

Rotary switch setting: Set Temp Day ☼🌡
See section 6.5

Rotary switch setting: Set Temp Night ☾🌡
See section 6.6

Rotary switch setting: DHW Set Temp
No function

Rotary switch setting: DHW Install
No function

Rotary switch setting: Time Program
See section 6.8

Rotary switch setting: Configuration 🔧
See section 6.12.1 and 6.12.2.

Rotary switch setting: Remote Param
See section 6.9

6.12.1 (M1) Rotary switch setting: Configuration 🔧, level "Setup"

Sub-level	Parameter	Description	Access BE	Access HF	Setting range Min / Max	Factory setting	Increment
	Language	Language of the display text in the operating panel	E	E	German English French Dutch Italian Spanish Portuguese	German	1
	Date	Current date in format Day / Month / Year. The current day of the week is calculated automatically from the date.	E	E			
	Time	Time in format Hours / Minutes.	E	E			
	Keylock Function	Release of the keylock function: Off: Button block cannot be activated. On: The button block can be activated using the rotary switch (see chapter 3.1).	E	E	Off On	Off	-
	Access Rights	Entering access code. Setting character by character like a combination lock (see chapter 3.6.1).	E	E	0 - 9	0000	1

Tab. 6-14 (M1) Parameter in rotary switch setting "Configuration" level "Setup"

6.12.2 (M1) Rotary switch setting: Configuration 🔧, level "Mixer Config"

Parameter	Description	Access BE	Access HF	Setting range Min / Max	Factory setting	Increment
T-Outside lim day	Only if the parameter [Pump Mode] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the automatic summer shutdown of the heating system. If the outside temperature measured and averaged out by the controller exceeds the set value by 1 K, the heating circuit is switched off. The heating is enabled again once the outside temperature falls below the set heating curve.	E	E	Off, 10 - 40 °C	19 °C	0.5 °C
T-Outside lim night	Only if the parameter [Pump Mode] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Parameter for setting the heating limit for switch-off of the heating circuit during economy mode (functionality as for parameter [T-Outside lim day]).	E	E	Off, 10 - 40 °C	10 °C	0.5 °C
Heat-Slope	Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the heating curve. The heating curve reflects the dependence of the set inflow temperature of the heating circuit on the outside temperature (see chapter 3.6.2).	E	E	0.0 - 3.0	0.5	0.1
Room Influence	Only if the room station (U1) is connected and assigned to the heating circuit. Setting of the impact the deviation of the room temperature measured by the EHS157034 from the actual set value (see sections 3.4.3 and 3.4.4) has on the flow temperature. Off: Exclusively weather-controlled flow temperature regulation 0: Purely weather-controlled flow temperature regulation, but internal heat recirculation pump continues to run until the next heating cycle following a heat demand during the setback time. 1-20: Causes a correction of the set flow temperature (parallel shift of the heat curve) by the set factor. For example: If the measured temperature is 2 K below the set value, the set flow temperature is raised 2-times the set value.	E	E	Off, 0 - 20	Off	1

Parameter	Description	Access		Setting range Min / Max	Factory setting	Increment
		BE	HF			
T-Room Adj	Only if the room station (U1) is connected and assigned to the heating circuit. Individual adaptation of the room temperature relevant for control. Should a systematic deviation of the room temperature as measured by the EHS157034 from the actual temperature in the living area of this room be detected, the measured value can be corrected by the set value.	E	E	-5.0 to +5.0 kW	0.0 K	1 K
T-Flow Day	Only if the parameter [HC Function] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the inflow target temperature for the heating circuit during the heating time when in operating mode: "Automatic 1", "Automatic 2", "Heating".	E	E	20 - 90°C	40°C	1°C
T-Flow Night	Only if the parameter [HC Function] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the inflow target temperature for the heating circuit during the setback time when in operating mode: "Automatic 1", "Automatic 2", "Reducing".	E	E	10 - 90°C	10°C	1°C
T-Frost Protect	Off: No frost protection of the heating circuit Otherwise: If the outside temperature falls below the programmed value, the system switches into the frost protection mode (switches the pumps on). The function ceases once the outside temperature has risen to the set value +1 K.	E	E	Off, -5 to +5°C	0°C	1°C
Insulation	Setting the insulation standard of the building. This affects the way the heating curve and the heating times automatically adapt to the outside temperature.	E	E	Off Low Normal Good Very good	Normal	-
Start T-Out Cooling	Can be used only if the assigned heat generator has a cooling function (❄). Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting from which outside temperature the cooling operation with the highest cooling infeed target temperature [T-Flow Cooling start] starts (Setting condition: Operating mode "Cooling").	E	E	20 - 45°C	24°C	1°C
Max T-Out Cooling	Can be used only if the assigned heat generator has a cooling function (❄). Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting to determine from which outdoor temperature the lowest cooling flow temperature [T-Flow Cooling max] is stipulated (Setting condition: Operating mode "Cooling").	E	E	20 - 45°C	35°C	1°C
T-Flow Cooling start	Can be used only if the assigned heat generator has a cooling function (❄). Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the cooling inflow target temperature at the start of cooling mode (outside temperature = parameter [Start T-Out Cooling]).	E	E	5 - 25°C	18°C	1°C
T-Flow Cooling max	Can be used only if the assigned heat generator has a cooling function (❄). Only if the parameter [HC Function] = 0 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the minimum cooling inflow target temperature. This is kept constant relative to the outside temperature (parameter [Max T-Out Cooling]).	E	E	5 - 25°C	18°C	1°C
T-Flow Cooling	Can be used only if the assigned heat generator has a cooling function (❄). Only if the parameter [HC Function] = 1 is in delivery status is this function activated. It can only be changed with a technician code. Contact your specialist heating technician in this regard: Setting the cooling inflow target temperature (fixed value) when cooling mode is active.	E	E	8 - 30°C	18°C	1°C

Tab. 6-15 (M1) Parameter in rotary switch setting "Configuration" level "Mixer Config"

7 Service and maintenance

7.1 General

Regular inspection and maintenance of the Altherma EHS(X/H) reduces energy consumption and ensures a long life and smooth operation.

RISK OF ENVIRONMENTAL DAMAGE!

Important information regarding the coolant used.

The entire heat pump system contains coolant with fluorinated greenhouse gases, which are listed in the Kyoto Protocol and, if released, are harmful to the environment.

Coolant type: R410A
GWP* value: 1975

** GWP = Global Warming Potential*

- Work on fixed cooling systems (heat pumps) and air-conditioning systems can only be performed by persons who hold a certificate of competence for the European Region, in accordance with the F-Gas Regulation (Ec) No. 303/2008.

Have the inspection and maintenance carried out by authorised and trained HVAC engineers once a year, ideally **before the heating period**. This can prevent faults during the heating period.

Daikin recommends an inspection and maintenance contract to ensure regular inspection and maintenance.

Legal requirements

According to the F-Gases Directive (EC) No. 842/2006 Article 3, replaced on 01.01.2015 by (EC) No. 517/2014 Articles 3 and 4, Operators (or Owners) must perform regular maintenance on their fixed cooling systems, check impermeability and have any leaks repaired immediately.

All installation, maintenance and repair work on the cooling circuit must be documented e.g. in the operating manual.

Operators of Daikin heat pump systems are subject to **the following obligations**:

The European statutory investigation period applies for heat pumps from a total system coolant filling quantity of 3 kg or, as of 01.01.2017 from a total filling quantity of 5 t CO_2-equivalent (in the case of R410A from 2.4 kg).

Daikin nonetheless recommends the conclusion of a maintenance contract, including documentation of the work carried out in the operating manual in order to preserve the right to guarantee, including for systems for which there is not legal obligation to monitor impermeability.

- With a system coolant **total filling quantity** of **3 kg – 30 kg** or from **6 kg** in hermetic systems and from 01.01.2017 with a total filling quantity of 5-50 t CO_2-equivalent or from 10 t CO_2-equivalent in hermetic systems:
  - ➔ **Inspections** carried out by certified personnel at intervals of no more than **12 months** and documentation of the work performed in accordance with valid regulations. This documentation must be retained for at least 5 years.

Certified people are those who have proof of expertise for the European Community for work on stationary refrigeration systems (heat pumps) and air conditioning systems, according to the F-Gases Directive (EC). 303/2008.

- up to 3 kg coolant fill quantity: Expert certificate category II
- 3 kg coolant fill quantity or over: Expert certificate category I

7.2 Removing the protective cover

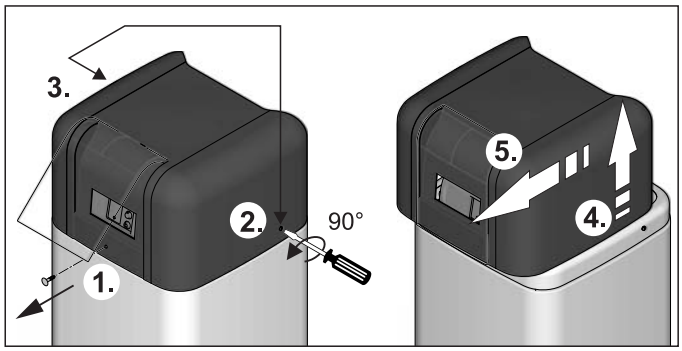


Fig. 7-1 Unscrew/loosen screws, lift the cover at the back and remove in a forwards direction.

7.3 Activities to be performed annually

WARNING!

Improperly carried out work on the Daikin Altherma EHS(X/H) and its components that have been connected as an option can endanger human life and health and adversely affect the operation of the these components.

- Work on the Daikin Altherma EHS(X/H) (such as maintenance or servicing) is only to be carried out by persons who are authorised and who have successfully completed **qualifying technical or vocational training** and who have taken part in advanced training sessions recognised by the appropriate responsible authorities. These include in particular **certified heating engineers, qualified electricians and HVAC specialists**, who because of their **professional training** and **expert knowledge**, have experience in the professional installation and maintenance of heating, cooling and air conditioning systems and heat pumps.

WARNING!

Under the cover of the Daikin Altherma EHS(X/H) **temperatures of up to 90°C** can arise during operation. During operation, **hot water temperatures >60°C arise.**

– Touching components during or after operation leads to a **risk of burns**.
– Water discharged during maintenance and servicing work can cause **scalding** on contact with the skin.

- Before carrying out servicing and maintenance work, allow the Daikin Altherma EHS(X/H) to cool down sufficiently.
- Wear protective gloves.

WARNING!

Live parts can cause an **electric shock** on contact and cause fatal burns and injuries.

- Before beginning work on live parts, **disconnect** all of the systems circuits **from the power supply** (switch off main switch, disconnect fuse) and secure against unintentional restart.
- Electrical connection and work on electrical components must only be carried out by **qualified electricians** in compliance with valid standards and guidelines as well as the specifications of the energy supply company.
- **Covers off equipment and servicing flaps are to be replaced** as soon as the work is completed.

1. Dismount the protective cover (see section 7.2).
2. Carry out a functional inspection of the Daikin Altherma EHS(X/H), as well as all installed accessory components (backup heater, solar installation) by checking the temperature display and the switching states in the individual modes.
3. If a Daikin solar system of the DrainBack p=0 type is connected and in operation, switch this off and empty the solar panels.
4. When operating the Daikin Altherma EHS(X/H) in a bivalent-alternative system; switch off all heat generators and deactivate the bivalent control unit.
5. Visual check of general condition of the Daikin Altherma EHS(X/H).
6. Visual check of the water storage tank level (filling level indicator)
   ➔ Top up the water if necessary (see section 7.4), determine the reason for the low water level and remedy it.

The Daikin Altherma EHS(X/H) is designed to be low-maintenance. No corrosion protection equipment is required (such as expendable anodes). This means there is no need for maintenance work such as changing the protective anodes or cleaning the inside of the storage tank.

7. Check the connection of the safety overflow and drain hose for leaks, free drainage and gradient.
   ➔ If necessary, clean the safety overflow and drain hose and relay it; replace damaged parts.
8. Visual check of connections, lines and safety pressure relief valve. In the event of damage, determine the cause.
   ➔ Have damaged parts replaced by an expert heating technician.
9. Check all electrical components, connections, and cables.
   ➔ Have damaged parts repaired or replaced by an expert heating technician.
10. Check the water pressure of the cold water supply (<6 bar)
    ➔ and if necessary the fitting or adjustment of the pressure reducer.
11. Check the system water pressure on the RoCon HP controller of the Daikin Altherma EHS(X/H).
    ➔ Top up the water in the heating system if necessary, until the pressure display is within the permitted range. (see section 7.5).
12. Clean plastic surface of Daikin Altherma EHS(X/H) **with a soft cloth and mild cleaning agent**. Do not use any cleaners with aggressive solvents (damage to the plastic surface may occur).
13. Refit the cover (see section 7.2).

7.4 Filling and topping up the storage tank

CAUTION!

Filling the storage container with excessive water pressure or at too great a flow speed can result in damage to the Daikin Altherma EHS(X/H).

- Only fill with a water pressure <6 bar and a flow speed <15 l/min.

CAUTION!

UK only!

If filling or topping up the storage tank is done by means of the boiler filling and drain valve, a temporary filling loop must be used with the appropriate backflow prevention device in accordance with clause G24.2, Guidance to the Water Supply (Water Fittings) Regulations 1999.

If the storage temperature falls below a certain minimum value, the safety settings of the Daikin Altherma EHS(X/H) prevent the operation of the heat pump in the case of low external temperatures:

– **External temperature < -2°C**, minimum **storage temperature = 30°C**
– **External temperature < 12°C**, minimum **storage temperature = 23°C**.

Without backup-heater:
The storage tank water must be heated to the minimum required storage temperature by an external heater.

With backup heater (EKBUxx):
With an outdoor temperature < 12°C and a storage tank temperature < 35°C, the backup heater (EKBUxx) is switched on automatically on in order to heat up the storage tank water to at least 35°C.

Without installed solar system

- Connect the **filling hose** with back flush prevention (1/2") **to** the **connection "DrainBack Solar - feed"** (see fig. 7-2, **item 1)**.
- **Fill** the storage tank on the Daikin Altherma EHS(X/H) **until water comes out of** the **connection** (fig. 7-2, **item 23)**, that has **been connected as the safety overflow**.
- Disconnect the filling hose with back flush prevention (1/2") again.

With KFE filling connection or with installed p=0 solar system (see also chapter 5.1)

- Without solar system: **KFE filling connection (Accessory KFE BA)** at the filling and draining connection of the Daikin Altherma EHS(X/H) (fig. 2-2 to fig. 2-5, item 10)
  or
  with solar system: mount the **KFE filling connection (Accessory KFE BA)** at the interaction of the p=0 control and pump unit (EKSRPS3B).
- Connect the **filling hose** with back flush prevention (1/2") **to** the previously installed **KFE cock**.
- **Fill** the storage tank on the Daikin Altherma EHS(X/H) **until water comes out of** the **connection** (fig. 7-2, **item 23)**, that has **been connected as the safety overflow**.
- Disconnect the filling hose with back flush prevention (1/2") again.

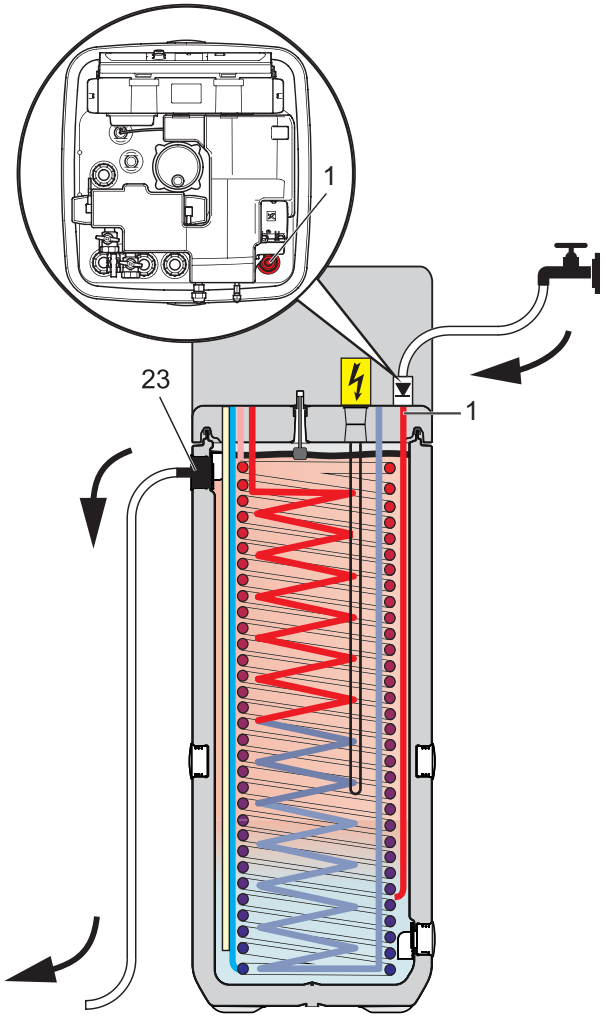


Fig. 7-2 Buffer storage filling - Without solar system

7.5 Filling and topping up the heating system

DANGER!

During the filling procedure, water can leak from potential leaking sites, which, in the event of contact with live parts, can result in an electric shock.

- Prior to the filling procedure, disconnect the Daikin Altherma EHS(X/H) from the power.
- After the initial filling, prior to switching on the power supply to the Daikin Altherma EHS(X/H), check whether all electronic parts and connection points are dry.

WARNING!

Polluted domestic water is hazardous to health.

- When filling the heating system prevent any back-flow of heating water into the drinking water piping.

1. **Only required upon initial start-up and re-commissioning following complete drainage!**
   Remove the valve drive of the 3-way diverter valve **3UVB1 + 3UV DHW** (see fig. 7-3). To do so, press the unlock button on the valve drive (see fig. 7-3, item 5.2) and turn the valve drive a 1/8-turn anti-clockwise (bayonet socket).

   When the valve drive is removed, the AB-B path is opened.

2. Connect the filling hose (fig. 7-3, item 1) with back flush prevention (1/2") and an external pressure gauge (on-site) to the KFE cock (fig. 7-3, item 2) and secure from slipping using a hose clamp.
3. Open the water cock (fig. 7-3, item 4) in the supply line.
4. Open KFE cock (fig. 7-3, item 2) and watch the pressure gauge.
5. Fill the system with water until the system target pressure is reached on the pressure gauge (**System height +2 m**, whereby 1 m water column = 0.1 bar).
   The overpressure valve must not be triggered!
6. Close KFE cock (fig. 7-3, item 2).
7. Switch on the power supply of the Altherma EHS(X/H).
8. Turn the rotary switch to the operating mode "Heat".
   ➔ Daikin Altherma EHS(X/H) runs in the hot water heating mode after the start phase.
9. During the hot water heating mode, continuously check the water pressure at the external pressure gauge. Where necessary, refill with water via the KFE cock (fig. 7-3, item 2).
10. Vent the entire heating network (open the regulation valve. At the same time the under floor heating system can be filled and flushed with the under floor heating distributor.).

11. Only required upon initial start-up and re-commissioning following complete drainage!

- **Remove the valve drive** of the 3-way diverter valves **3UVB1 + 3UV DHW**.
- Begin the Air Purge.

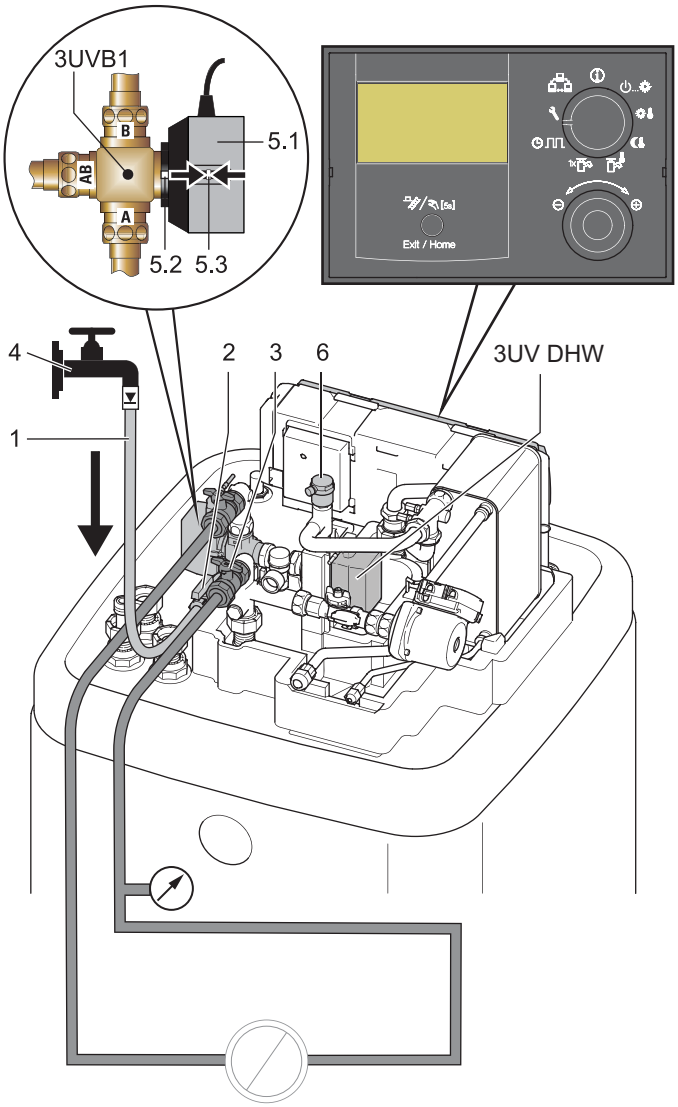
Air Purge

(Can only be performed by an expert heating technician.)

12. Inspect the water pressure at the external pressure gauge again. Where necessary, refill with water via the KFE cock (fig. 7-3, item 2).

13. Close the water cock (fig. 7-3, item 4) in the supply line.

14. Disconnect the filler hose (fig. 7-3, item 1) with flow-back preventer from the KFE cock (fig. 7-3, item 2).



1 *Filler hose*
2 *KFE cock*
3 *Ball cock*
4 *Water cock*
5.1 *Valve drive*
5.2 *Unlocking button of the drive lock*
5.3 *Hand lever*
6 *Automatic bleeder*
3UVB1, 3UV DHW *3-way diverter valve*

Fig. 7-3 Filling the heating circuit

8 Errors, malfunctions and messages

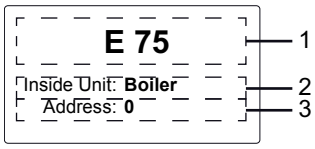
8.1 Deleting errors, correcting malfunctions, deleting messages

Electronic control of the Daikin Altherma EHS(X/H):
– signals an error by means of the background of the display lighting up red and shows an error code in the display (see Installation and Maintenance Instructions).
– shows information messages regarding the operating status, which is not signalled by red background lighting.

An integrated Protocol saves up to 15 error related or other information messages regarding the operating status that last occurred.

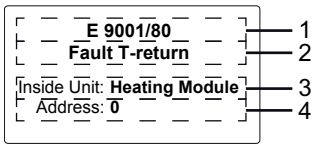
Depending on the operating mode, messages are also forwarded to connected room stations or room thermostats.

8.1.1 Current fault display



1 Fault message as code (see tab. 8-2)
2 Location information (equipment) of the detected fault
3 Bus address of the unit causing the fault

Fig. 8-1 Displays an active error message (controller fault)



1 Fault message as code (see tab. 8-2)
2 Fault message as clear text (see tab. 8-2)
3 Location information (equipment) of the detected fault
4 Bus address of the unit causing the fault

Fig. 8-2 Display of a current error message (heat pump fault)

8.1.2 Read Protocol

The Protocol can be read in the *"Special Level"* (see fig. 8-3).

The last received (latest) message is in the first position. All other previous messages are then pushed backwards by one place when a new entry is made. The 15th message will be deleted any time a new message is received.

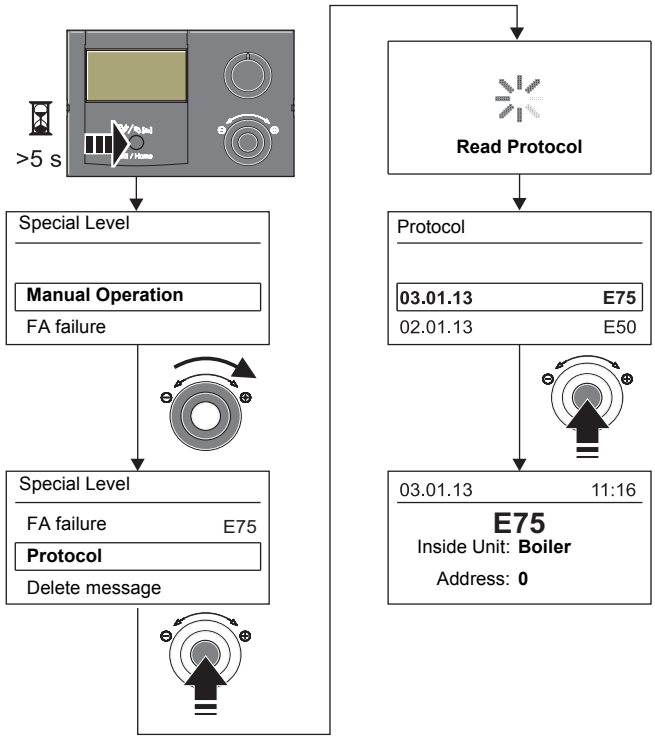


Fig. 8-3 Reading the protocol

8.1.3 Troubleshooting

Troubleshooting the electrical, coolant and hydraulic systems of the Daikin Altherma EHS(X/H) may be performed only by authorised and trained heating experts.

In section 8.2 conceivable faults and their possible causes are listed. Tips to correct the faults are also provided.

Information messages, which are displayed **without red backlighting**, normally result in **no permanent limitations** on the operation of the Daikin Altherma EHS(X/H).

Messages that are displayed **with an error code E.... and red back-lighting** required error correction by an **authorised and trained expert heating technician**.

For information on warning messages see section 8.3.

➔ Once the cause has been eliminated, the system continues to work normally.

8 Errors, malfunctions and messages

8.2 Malfunctions

Malfunction	Possible cause	Possible solution
System not working (no display)	No mains voltage	● Switch on the external main switch of the machine. ● Switch on system fuse(s). ● Replace system fuse(s).
Switching time program is not working or programmed switching times are being carried out at the wrong time.	Date and time are not correctly set.	● Set date. ● Set time. ● Check week day-switching time allocation.
	Incorrect operating mode set.	● Set to operating mode "Automatic 1" or "Automatic 2".
	During a switching time the user made a manual setting (e.g. changed the target temperature, changed the operating mode)	1. Place the rotary switch in the ***"Info"*** ⓘ position. 2. Place the rotary switch in the ***"Operating Mode"*** ⏻...☼ position. 3. Select correct operating mode.
Control unit does not respond to entries	Operating system of control unit crashed.	● Carry out RESET of control unit. o do so, disconnect the system from the power supply for at least 10 s and then switch on again.
Operating data are not updated	Operating system of control unit crashed.	● Carry out RESET of control unit. To do so, disconnect the system from the power supply for at least 10 s and then switch on again. ● Have the heating system checked by a Daikin heating technician.
Heating does not warm up	Heating request switched off (e.g. switching time program is in the economy phase, external temperature is too high, parameters for backup heater (EKBUxx) are set incorrectly, hot water request is active)	● Check the operating mode setting. ● Check the request parameters. ● Check setting of the date, time and switching time program on the control unit.
	Refrigerant compressor is not working.	● Have the heating system checked by a Daikin heating technician.
	❄ System is in the operating mode "Cooling".	● Switch the operating mode to "Heating".
	Settings for off-peak mains connection do not correspond to settings for electrical connections.	● Have the heating system checked by a Daikin heating technician.
	The power company has sent the high-cost signal.	● Wait for the repeat off-peak rate signal which reactivates the power supply.

Malfunction	Possible cause	Possible solution
Heating does not warm up enough	Water flow too low.	• Check that all stop valves of the water circuit are completely open. • Fully vent the heating system and device-internal circulation pump. • On the control unit (rotary switch position ***"Info"*** ⓘ) check that there is sufficient water pressure (>0.5 bar), if necessary, refill the heating water. • Have the heating system checked by a Daikin heating technician.
	Target value range is too low.	• Increase parameter [Heat-Slope]. • Have the heating system checked by a Daikin heating technician.
	Weather-controlled flow temperature regulation.	• Check the settings on the *"HC Configuration"* level of the parameters [T-Outside lim day], [Heat-Slope] and the settings in the ***"Set Temp Day"*** ☼🌡 rotary switch position.
	Optional backup heater (EKBUxx) or alternative heater not switched on.	• Have the heating system checked by a Daikin heating technician.
	Water quantity in heating system too low	• Check the primary pressure in the expansion container and the water pressure, if necessary, refill the heating water and reset the primary pressure (see chapter 7.5).
	Hot water supply is taking too much of the output of the heat pump.	• Have the heating system checked by a Daikin heating technician.
Hot water does not warm up	DIP switch configured incorrectly	• Have the heating system checked by a Daikin heating technician.
	Hot water supply switched off (e.g. switching time program is in the economy phase, parameters for hot water supply have been set incorrectly).	• Check the operating mode setting. • Check the request parameters.
	Storage tank charging temperature too low.	• Increase the target hot water temperature.
	Draw-off rate too high.	• Reduce the draw-off rate, limit throughput.
	Output of heat pump too low.	• Check the switching times for room heating and hot water supply for overlaps.
	Water quantity in heating system too low.	• Check the primary pressure in the expansion container and the water pressure, if necessary, refill the heating water and reset the primary pressure (see chapter 7.5).
	Optional backup heater (EKBUxx) or alternative heater not switched on.	• Have the heating system checked by a Daikin heating technician.

8 Errors, malfunctions and messages

Malfunction	Possible cause	Possible solution
❄ Room cooler does not cool	Water flow too low.	● Check that all stop valves of the water circuit are completely open. ● Fully vent the heating system and device-internal circulation pump. ● On the control unit (rotary switch position ***"Info"*** ⓘ) check that there is sufficient water pressure (>0.5 bar), if necessary, refill the heating water. ● Have the heating system checked by a Daikin heating technician.
	"Cooling" switched off (e.g. room thermostat requires "Cooling", but switching time program is in economy phase, outside temperature too high).	● Check the operating mode setting. ● Check the request parameters. ● Check setting of the date, time and switching time program on the control unit.
	Coolant compressor is not working.	● Have the heating system checked by a Daikin heating technician.
	System is in the operating mode "Heating".	● Switch the operating mode to "Cooling".
	Outdoor temperature < 4 °C	The heat pump has automatically switched to the "Heating" operating mode so as to be able to guarantee frost protection should the external temperature drop further. Room cooling not possible.
❄ Cooling effect of room cooling insufficient	Water flow too low.	● Check that all stop valves of the water circuit are completely open. ● Fully vent the heating system and device-internal circulation pump. ● On the control unit (rotary switch position ***"Info"*** ⓘ) check that there is sufficient water pressure (>0.5 bar), if necessary, refill the heating water ● Have the heating system checked by a Daikin heating technician.
	Water quantity in the heating system too low	● Check the primary pressure in the expansion container and the water pressure, if necessary, refill the heating water and reset the primary pressure (see chapter 7.5).
	Quantity of coolant in the heating system too low or too high.	● Have the coolant level checked by a Daikin specialist heating technician.
Device-internal circulation pump is excessively noisy while running	Air in the water circuit	● Fully vent the heating system and device-internal circulation pump.
	Noises caused by vibrations.	● Check the Altherma EHS(X/H), its components and covers to ensure they are fastened correctly.
	Bearing damage in the device-internal circulation pump.	● Have the heating system checked by a Daikin heating technician.
	Water pressure at pump inlet too low.	● On the controller (rotary switch setting ***"Info"*** ⓘ) check whether there is adequate water pressure (>0.5 bar). ● Check that the pressure gauge is working correctly (connect an external pressure gauge). ● Check the primary pressure in the expansion container and the water pressure, if necessary, refill the heating water and reset the primary pressure (see chapter 7.5). ● Have the heating system checked by a Daikin heating technician.

Malfunction	Possible cause	Possible solution
Safety pressure relief valve is leaking or always open.	Expansion tank is defective.	• Have the expansion tank checked by a Daikin specialist heating technician.
	Water pressure in the heating system is too high.	• On the control unit (rotary switch position ***"Info"*** ⓘ) check that the water pressure lies beneath the stated maximum pressure. If necessary, bleed the water until the pressure lies in central permissible range.
	Safety pressure relief valve is stuck.	• Have the heating system checked by a Daikin heating technician.

Tab. 8-1 Possible malfunctions of the Altherma EHS(X/H)

8.3 Fault codes

Code		Malfunction / Error message	Component/Designation	Causes and possible error correction
Display	Internal			
W8006	—	Pressure loss warning	Pressure sensor DS	Warning message: Maximum permissible pressure drop exceeded. Too little water in the heating system. • Check heating system for leakage, refill water.
W8007	—	Water pressure in the heating system too high		Warning message: Water pressure has exceeded the maximum permissible value. – Drain water (see chapter 7.5). ➔ If the cause was corrected, the heating system works normally again. ➔ If the cause was not corrected, contact your Daikin heating technician.

Tab. 8-2 Error codes on the main control unit of Altherma EHS(X/H)

8.4 Emergency operation

In the case of incorrect setting in the electronic control system, emergency heating operation can be maintained by activating the special "Manual Operation" function on the control unit (see chapter 3.5.1).

If the 3-way valves are intact, the Daikin Altherma EHS(X/H) switches to **Heating mode**. The necessary flow temperature can be adjusted with the rotary switch:

A **storage charge** can be realised using the special "Manual Operation" function,

- **Remove** the **valve drive** of the 3-way diverter valve **3UV DHW** (see fig. 7-3). To do so, press the unlock button on the valve drive (see fig. 7-3, item 5.2) and turn the valve drive a 1/8-turn anti-clockwise (bayonet socket).

When the valve drive is removed, the AB-B path is opened.

Should the **valve drive** of the 3-way diverter valve **3UVB1** be **defective**, a **parallel operating mode** can be enforced. For this:

- **Remove valve drive** from both 3-way diverter valves **3UVB1 + 3UV DHW**.
  ➔ The flow temperature is configured for storage charging by means of heat absorption in the heat exchanger (series switching).

In order to prevent a malfunction due to a low flow level, when the valve drive of the 3-way diverter valve 3UVB1 has been removed, sufficient heat absorption must be ensured in the heating system.

- Open actuators in the heat distribution network.
- Set flow temperature as low as possible.

9 Glossary

Ancillary heater	An additional heat generator (e.g. backup heater or external heating boiler) which is part of the heating system and which helps bring the system up to the inflow target temperature in case of an insufficient or ineffective heat pumping process.
Anti-legionella system	Periodic heating of storage water to >60°C for preventative elimination of pathogenic bacteria (legionella) in the hot water circuit.
Backup demand	Operating situation in which the desired infeed temperature cannot be reached or cannot be achieved efficiently through the heat pump process. As a result, an extra heater (e.g. backup heater) is used to support the Daikin Wärmeerzeuger to generate heat.
Backup heater	Optional electric ancillary heater for general support of the Daikin Wärmeerzeuger during heat generation.
Circulation circuit	Is an optional ancillary circuit in the hot water circuit which serves to ensure that hot water flows out of the discharge point as soon as the tap is turned on. In this circuit the hot water circulates via a circulation pump between the hot water storage tank and the draw-off point.
Circulation pump	An optional electrical circulation pump which permanently re-circulates the hot water in the hot water pipes (feed from the tap connection back to the domestic hot water storage tank) and thus provides it at each draw-off point without delay. Circulation is particularly effective in widely branched piping networks. In hot water distribution systems without a circulation pipe, at first the water cooled in the outlet pipe escapes during the tapping process until the outlet pipe is sufficiently heated by the hot water flowing subsequently.
Control	Device electronics, with which the processes for heat generation and heat distribution for the heating system are controlled. The Altherma EHS(X/H) consists of many electronic components. The component that is most important to the operator is the operating element at the front of the heat generator which has operating elements (rotary switch, rotary button and Exit key) and a display.
Direct circuit	The water circuit that is heated directly by the heat generator, without additional temperature regulation.
Domestic hot water generation	Operating status of the heat generator, in which heat is generated at increased temperatures and supplied to the hot water circuit, e.g. filling the hot water storage tank.
Flow pipe	Part of the hydraulic circuit that directs the heated water from heat generator to the heating surfaces.
Heat exchanger	A part that transfers thermal energy from one circuit to another. Both circuits are separated from each other hydraulically by a wall in the heat exchanger.
Heat pumping process	In a closed coolant circuit, the coolant absorbs heat from the surrounding air. Compressing this coolant results in a higher temperature which can then be transferred to the heating unit (thermodynamic circuit).
Heating characteristic curve	Mathematical relationship between the external temperature and the target flow temperature (synonym = heating curve), in order to achieve the desired room temperature at all outside temperatures.
Hot water circuit	Is the water circuit in which the cold water is heated and directed to the hot water discharge point.
Low tariff mains connection (HT/NT)	A special mains connection to the energy supplier, which offers various cheaper rates during so-called low-load periods for electrical current (day-, night-, heat pump current, etc.).
Mixing circuit	A heating circuit in which a heating temperature that deviates from that of the direct circuit is set by means of the controlled mixing of the return flow of this heating circuit.
Modulation	Automatic and continuous adjustment of the thermal / pump output to the particular heat requirement, without having to switch various heating / pumping stages or cycles.
Nominal output	Maximum heat output given by the heat generator at certain operating temperatures under test conditions.
Operating mode	User or Altherma EHS(X/H)-demanded function of the heat generator (e.g. room heating, hot water heating, stand-by, etc.).
Parameter	A value that influences the execution of programs or processes or defines specific states.
Refrigerant	A material which is used for thermal transfer in a heating system. At low temperature and low pressure, heat is absorbed and at high temperature and a high pressure, heat is emitted.
Return flow	Part of the hydraulic circuit that directs the cooled water from the radiators in the rooms back to the heat generator via the piping system.
SMART GRID (SG)	Intelligent energy utilisation for economical heating. Using a special electricity meter it is possible to receive a "SMART GRID signal" from the energy supply company. Depending on the signal from the energy supply company, the heat pump is turned off, put into standard mode or run in high-temperature mode.
Storage tank charging circuit	Is the water circuit which heats the water stored in the hot water storage tank (not to be confused with the hot water circuit).

Switching time programme	Programme for setting dates and times on the Altherma EHS(X/H) to define regular heating, cooling, economy and hot water cycles.
Water shortage/ overheating protection	Safety device which switches off the heat generator automatically if there is a water shortage, in order to avoid over-heating.
Weather-controlled flow temperature regulation	The inflow target temperature for temperature control in the heating unit is calculated from the measured value for the external temperature and a defined heating curve.

10 Notes

10.1 User-specific settings

10.1.1 Switching timer program

The factory settings of the timer programs are stated in chapter 3.4.7, tab. 3-8.

- Enter your switching time settings in the table below.

		Switching cycle 1		Switching cycle 2		Switching cycle 3	
	Temperature setting	[T-Room 1 Setpoint]: ____ °C		[T-Room 2 Setpoint]: ____ °C		[T-Room 3 Setpoint]: ____ °C	
	Time period	**On**	**Off**	**On**	**Off**	**On**	**Off**
HC Program 1	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Sunday						
HC Program 2	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Sunday						

Tab. 10-1 Individual settings in the heating timer programmes

		Switching cycle 1		Switching cycle 2		Switching cycle 3	
	Temperature setting	[T-DHW Setpoint 1]: ____ °C		[T-DHW Setpoint 2]: ____ °C		[T-DHW Setpoint 3]: ____ °C	
	Time period	**On**	**Off**	**On**	**Off**	**On**	**Off**
DHW Program 1	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Sunday						
DHW Program 2	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Sunday						

Tab. 10-2 Individual settings in the hot water timer programmes

		Switching cycle 1		Switching cycle 2		Switching cycle 3	
	Time period	On	Off	On	Off	On	Off
Circulation Time	Monday						
	Tuesday						
	Wednesday						
	Thursday						
	Friday						
	Saturday						
	Sunday						

Tab. 10-3 Individual settings of the circulation-switching time programme

10.2 Parameter

- Enter your parameter changes in the table below.

Rotary switch setting	Parameter levels / Parameter	Old value	New value	Date	Comments

Tab. 10-4 Individual parameter modifications

10.2.1 Data bus addresses

RoCon appliance	Data bus address	Comments

Tab. 10-5 Data bus addresses in the RoCon system

10 Notes

10.3 Other items

11 List of keywords

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