

District Heating
Installation Guide

Calefa II V

Heat interface unit
with electronic control



wavin

orbia 

Table of contents

GENERAL	3
CONNECTION, SAFETY & HANDLING.....	3
COMPONENT OVERVIEW AND CONNECTION SKETCH.....	4
SCHEMATIC DIAGRAMS	5
DIMENSIONS AND TECHNICAL DATA	6
INSTALLATION	7
NEW INSTALLATION	7
ASSEMBLY OF THE UNIT.....	7
FITTING AN ENERGY METER.....	7
INITIAL SYSTEM FILLING AND PRESSURISING.....	8
CONNECTING AN OUTDOOR SENSOR.....	8
CALEFA II V CONTROLLER	10
OVERVIEW OF INDICATORS AND ICONS	11
CALEFA II V HOT WATER CONTROL	12
ADVANCED SETTINGS	12
BYPASS SETTINGS.....	12
BYPASS SCHEDULING OPTIONS	13
CHANGING THE BYPASS TEMPERATURE.....	14
THERMAL DISINFECTION (LEGIONELLA)	14
CENTRAL HEATING CONTROL	15
MANUAL CONTROL (<i>NON-ITC UNITS</i>).....	15
WEATHER COMPENSATION SETTINGS (<i>ITC UNITS ONLY</i>).....	15
ADVANCED SETTINGS	16
SETTING FLOW TEMPERATURE LIMITS.....	16
ITC SETTINGS	17
HEAT CURVE.....	17
MINIMUM AND MAXIMUM TEMPERATURES.....	17
SLOPE	18
HIGH TEMPERATURE CUT-OFF (HTCO).....	19
RETURN TEMPERATURE LIMITER	19
GENERAL SETTINGS	20
ENROLLING A WIRELESS OUTDOOR SENSOR (<i>ITC UNITS ONLY</i>).....	21
SETTING THE DATE AND TIME	21
SERVICING OR REPLACING VALVES	22
IMPORTING CONFIGURATION FROM USB.....	23
READING SENSOR VALUES	24
OVERVIEW OF DISPLAY ABBREVIATIONS.....	24
ELECTRICAL INSTALLATION	24
ACCESSING THE CONTROL WIRING.....	24
WIRING DIAGRAM	25
CONNECTING A WIRED OUTDOOR SENSOR.....	25
GUIDE FOR GRUNDFOS UPM3 AUTO	26
OPERATION & MAINTENANCE	28
TROUBLESHOOTING AND FAQ	30
COMPONENT OVERVIEW	33
APPENDIX I - FLOW RATE SETTING	35

General

Connection, safety & handling

Instruction

Before installing and starting up the unit, these instructions must be read thoroughly. Wavin assumes no responsibility for damage to persons or property if the instructions in this user manual are disregarded. Installation, commissioning and maintenance must be carried out by qualified and authorised personnel, for both plumbing and electrical works.

Application

Calefa heat interface units have been developed for district heating, but can also be used with other heat sources if the operating conditions are comparable to district heating at all times.

Handling

Upon receipt, the unit must be checked for any transport damage. Before installation, the unit must be stored in a dry and heated room. Multiple units must not be stacked higher than they are delivered from the factory. Transport over longer distances should take place on a pallet. Avoid lifting the unit by the pipes, as this may cause leaks. The packaging must be disposed of in accordance with local waste management regulations.

Connection

It must be possible to disconnect all energy sources for the unit, including electrical connection. The unit must be connected to an electrical equalisation connection. Before the system is filled with water, all joints should be inspected and tightened if necessary, as vibrations during transport can cause leaks. When the system is filled and there is heat in the system, it may be necessary to re-tighten the loops.

Safety

The unit is approved for a maximum supply temperature in the district heating network of 120°C and an operating pressure of up to 16 bar. Special attention must be paid to hot surfaces, as touching can cause personal injury. If the unit's operating parameters for pressure and temperature are exceeded, there is a significant risk of property damage and personal injury. The unit must always be equipped with safety valves in accordance with local regulations.

Warranty and product liability

The unit is covered by a Wavin warranty of up to 2 years from the date of supply. Wavin's product liability does not cover site-specific adjustments or any issues arising from incorrect connection or installation. Wavin also accepts no responsibility for performance issues if the unit is sized and purchased based on incorrect third-party design calculations. Wavin's product liability expires if changes are made to the unit's construction, or if the product is used for purposes other than those described in these instructions.

CE label

The CE marking confirms that the products comply with the basic requirements of the relevant directives. If the device is exposed to conducted radio frequency interference close to the user interface, the user interface of the device may not be operable as intended. However, the device will continue to work safely at all times.

REACH

Calefa II V complies with the requirements set out in accordance with REACH. Any content of materials on the REACH candidate list is stated in the SCIP database. The product contains brass parts which contain lead in a concentration above 0.1% w/w.

Disposal

In accordance with the WEEE Directive 2012/19/EU for electronic equipment, Calefa II must be separated for recycling, and not disposed of with regular waste.



Calefa II V components

01	Plate heat exchanger (DHW)
02	Plate heat exchanger (heating)
07	Shock absorber
10	Shut-off valves (optional)
22	Pressure independent valve (PICV), heating
25	Safety valve (heating)
28(A)	Controllable non-return valve
34	Motorised actuator (ITC)
34(A)	Capillary thermostat (manual control)
36	Flow meter
37	Pressure independent valve (PICV), hot water
40	UPM3 pump
49	Automatic air vent
51	Temperature sensors
52	1/2" pressure outlet
53	Strainer
54	Pressure transmitter
57	Expansion vessel
59	1/2" sensor pocket
60	Calefa DHW 212 V ITC controller
70	Calefa DHW 211 V hot water controller
90	3/4" x 110mm connections for heat meter installation

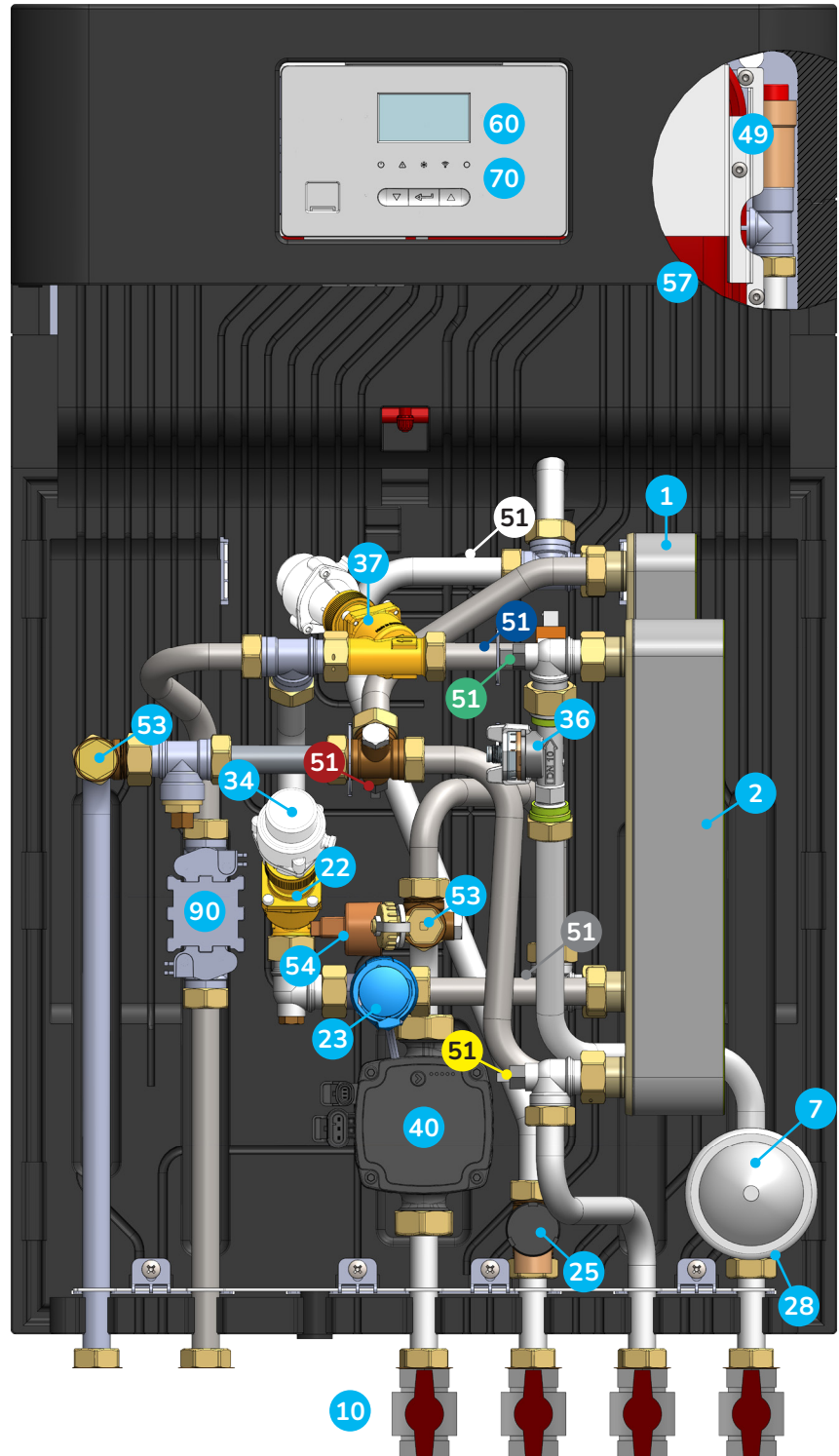
Temperature sensors (51)

All units

District heating return	DARK BLUE
Domestic cold water	GREEN
Domestic hot water	YELLOW
District heating supply	RED

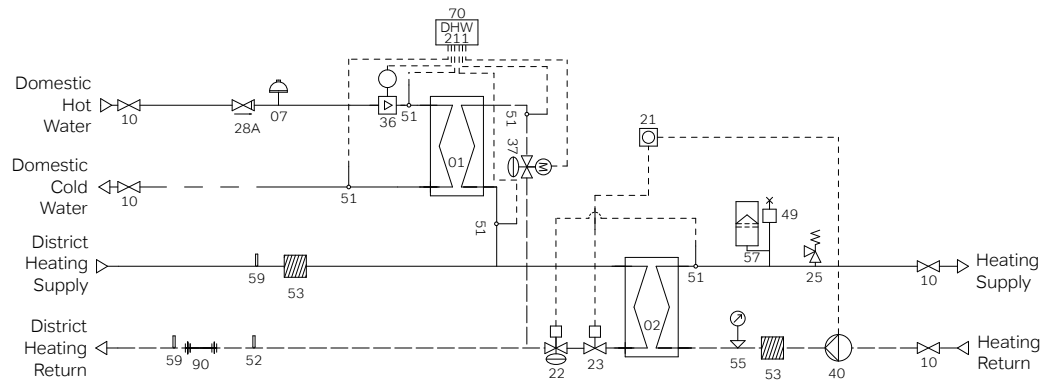
ITC units only

Heating return	GREY
Heating supply	WHITE

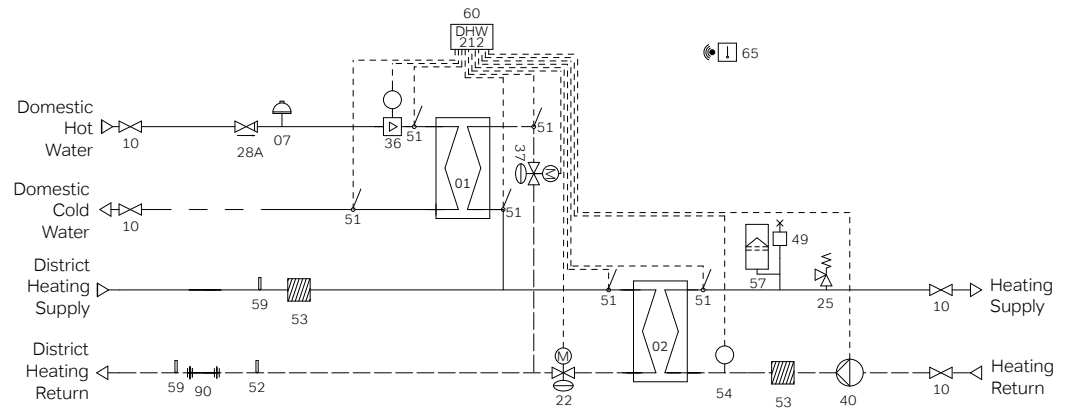


01	Plate heat exchanger (DHW)
02	Plate heat exchanger (heating)
07	Shock absorber
10	Shut-off valve
22	Pressure independent valve (PICV), heating
25	Safety valve (heating)
28(A)	Controllable non-return valve
34	Motorised actuator (ITC)
34(A)	Capillary thermostat (manual control)
36	Flow meter
37	Pressure independent valve (PICV), hot water
40	UPM3 pump
49	Automatic air vent
51	Plant sensors
52	1/2" pressure outlet
53	Strainer
54	Pressure transmitter
57	Expansion vessel
59	1/2" sensor pocket
60	Calefa DHW 212 V ITC controller
65	Wireless outdoor sensor (optional)
70	Calefa DHW 211V hot water controller
90	3/4" x 110mm connections for heat meter installation

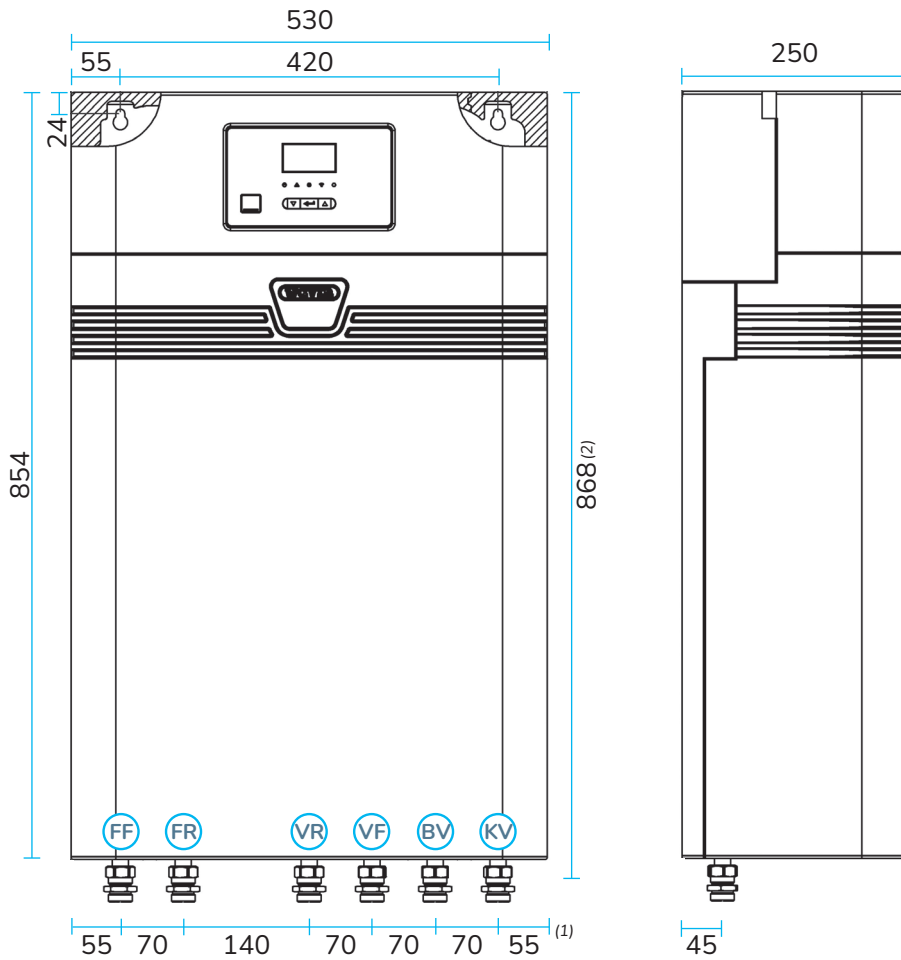
HIU schematic, Calefa II V



HIU schematic, Calefa II V ITC



Unit dimensions (mm)



Entry	Connection
FF	District heating supply
FR	District heating return
VR	Heating return
VF	Heating supply
BV	Domestic hot water
KV	Domestic cold water

(1) Dimensions shown are for the left-handed unit. For right-handed units, the connection positions and dimensions are mirrored.

(2) +60 mm if optional DN15 ball valves are included.

Technical data

Hydraulic

Max. system pressure (primary)	16 bar / 1600 kPa
Max. system pressure (secondary)	2.5 bar / 250 kPa
Max. system pressure (DHW)	10 bar / 1000 kPa
Max. system temperature (primary)	120°C
Max. system temperature (secondary)	85°C
Max. system temperature (DHW)	90°C
Total water volume	Max. 3 litres
Power supply	230V 50Hz 45W
Meter connection	3/4" x 110mm standard (165/190mm options available)
Insulation	EPP, λ : 0.039 (W/mK)

Heat loss

HIU with insulated jacket	Type	DHW (W/k)	Heat (W/k)
Calefa V 40/40	Indirect	0.44	0.25

DHW-212-V-ITC controller

Power supply	230V/50Hz
Power consumption	Stand by 1W / Max 45W
Plug type	Type K
IP rating	IP41
Operating temperature	0 to 50°C
Battery	CR2032 3V/0.2A
Radio frequency	868.5 MHz/25mW

Grundfos UPM3 15-70 130 pump

Curve	H	P _{Max}	Adjusted consumption (F _p = 0,4 automatic control)
Curve 1	5 m	33 W	13.2 W
Curve 2	6 m	39 W	15.6 W
Curve 3	7 m	52 W	20.8 W

Installation

Calefa II V is an indirect district heating unit with flow-through water heater and heat exchanger, for space heating of apartments and larger housing complexes. The intelligent hot water management, based on the actual consumption pattern, ensures hot water when the need arises and thus means minimal energy waste outside of the time of use. The hot water temperature is easily set on the control's digital display. Calefa II V can be supplied with weather compensation, for simple control of heating demand and comfort periods, which are also easily set on the display.

New installation

The isolation valves are provided loose with the unit and must be attached before mounting the unit on the wall.

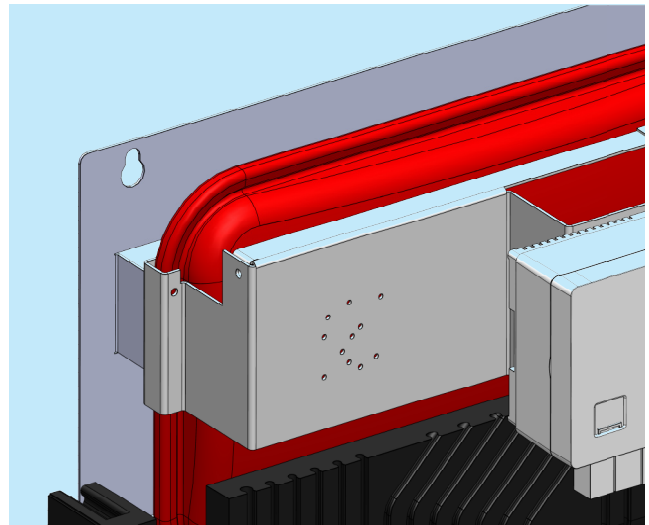
1. Flush the system thoroughly for impurities before installing the unit.
2. Mount the unit on a solid wall using strong bolts or similar.
3. Check all connections inside the unit for tightness, as some may have loosened during transport.
4. An energy meter may also be fitted (see "Fitting an energy meter" on this page).
5. Connect the unit to the property's water and heating installation (see connection diagram on page 6).
6. Check if there are any additional pressurisation requirements (see "Pressurising the system" on page 8).
7. Open the isolation valves on the mains flow and return.
8. Fill the system with water (see "Initial system filling" on page 8).
9. Check the unit and mains supply connections for leaks.
10. Check for the latest firmware, either by connecting to LAN or downloading from wavin.com and copying to USB-A.
11. Pressure test the entire installation in compliance with the applicable regulations.
12. Connect the unit to the power supply.
13. Mount and connect any outdoor sensors if the system is provided with ITC (see "Weather compensation settings" on page 8).
14. Heat the system for the first time and vent the underfloor heating and/or radiators.
15. Make any final control adjustments required.

Before any further adjustments are made, it is recommended to read the section "Calefa II V controller" starting on page 10.

If the unit is delivered with weather compensation, follow the instructions in the sections: "Enrolling a wireless outdoor sensor" on page 21, and "Advanced settings" on page 15.

Assembly of the unit

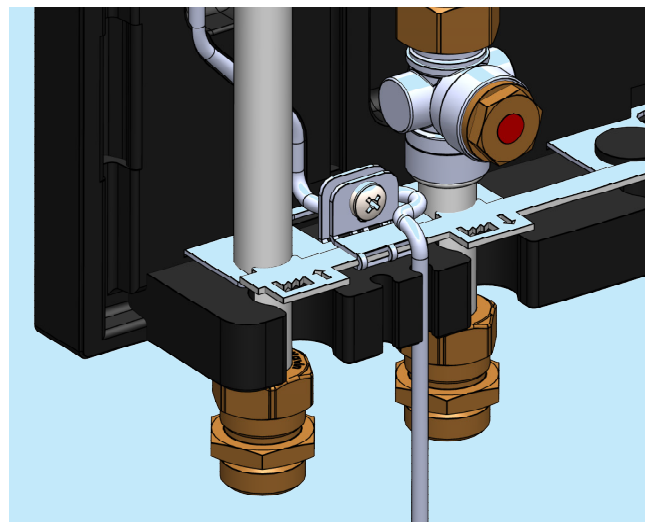
Before the district heating unit is installed, the installation must be thoroughly flushed for impurities. The unit is mounted on the wall using the two keyholes on the back plate with strong bolts, screws or expansion bolts. The keyholes are found by removing the corner of the insulation on the back plate. See picture below.



Fitting an energy meter

The district heating unit is delivered as standard with $\frac{3}{4}$ "x110mm fitting pipes in the flow and return lines for mounting an energy meter. It is possible to install sensor pockets at the positions marked with red labels on the flow and return lines of the district heating.

The display unit is mounted on the steel plate in the upper left corner, which is pre-drilled with holes to suit the most commonly used meters. The wiring is routed down through the insulation as shown the picture below.



Initial system filling

Before filling with water and commissioning, please ensure that:

- ⌚ The unit is connected as shown in the diagram (page 6).
- ⌚ Any energy meters are fitted.
- ⌚ All bypasses in the unit are tightened.
- ⌚ The isolation valves on the mains flow and return are open.

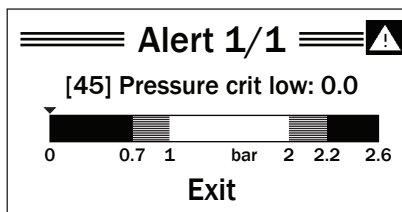
Pressurising the system

The expansion vessel is pre-pressurised to 0.5 bar from the factory. The pressure requirement of the expansion tank depends on the mounting height of the unit (the distance from the lowest to the highest point). See table below.

Height (m)	Pressure (bar)
0-5	0.5
5-10	1.0
10-15	1.5
15-20	2.0

The Calefa II V unit cannot be filled from a point on the unit itself, so the filling must be carried out from the building's main system. The system is filled from the nearest tap and should ideally be vented at the highest point to displace as much air as possible. In single-storey properties, the automatic air vent within the unit will be sufficient.

During filling, the controller will display the pressure level and alert if it is not at an acceptable level.



The water pressure is measured electronically and can be read on the controller's display. See section "Reading sensor values" on page 24.

The unit should be filled to between 1-2 bar to avoid warnings or alarms. If the pressure ever falls below 0.1 bar, dry run protection will be triggered and the pump will stop.

Heating settings

For optimal cooling from the unit, the water volume for the heating circuit should be regulated. For the heating side, this is not necessary as the unit is able to regulate the flow automatically. Adjustment is carried out on the valve for the heating circuit. See "Component overview" item 22, page 4. If the unit is supplied with a motorised actuator, this should be removed following the instructions in "Servicing or replacing valves" on page 18.

The manual valve setting is determined by the water flow volume required. APPENDIX I at the rear of this guide shows how to find the correct valve setting based on the system flow requirement in litres per hour.

Weather compensation (ITC) settings

Calefa II V can be supplied with a motorised actuator for both the heating and hot water valves. If preferred, the unit can be supplied with a manual capillary thermostat. See "Component overview" item 34, page 4. The supply temperature is then set using this manual head.

If the unit is supplied with weather compensation, the automatic ITC settings are optimised for underfloor heating in new or energy-renovated buildings. For systems being installed outside of these parameters, refer to section "Weather compensation settings", starting on page 15.

Connecting an outdoor sensor

If the unit's heating circuit is controlled using weather compensation, an outdoor sensor must be installed to achieve the correct demand-controlled supply temperature to the heating system. Calefa II V ITC is supplied with a wireless outdoor sensor as standard, so that a cable does not have to be run between the control unit and the outdoor sensor. The outdoor sensor is typically mounted to the north, where it is not exposed to direct sunlight. Also avoid mounting where the outdoor sensor is affected by heat from the building, such as placement above doors, windows and ventilation ducts.

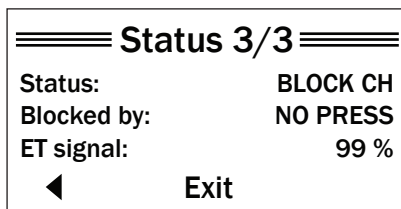
The outdoor sensor is easily connected, simply by removing the battery strip from the sensor during the enrolment process. Pairing between the controller and outdoor sensor is described in detail in the section "Enrolling a wireless outdoor sensor" on page 21.

The outdoor sensor must be placed within range of the wireless connection. The signal strength between the sensor and the controller can be seen via the heating settings. The signal strength must be at least 25% for a secure connection.

From the SETTINGS menu, navigate to:

> **ITC**

> **Status** page 3/3, ET signal



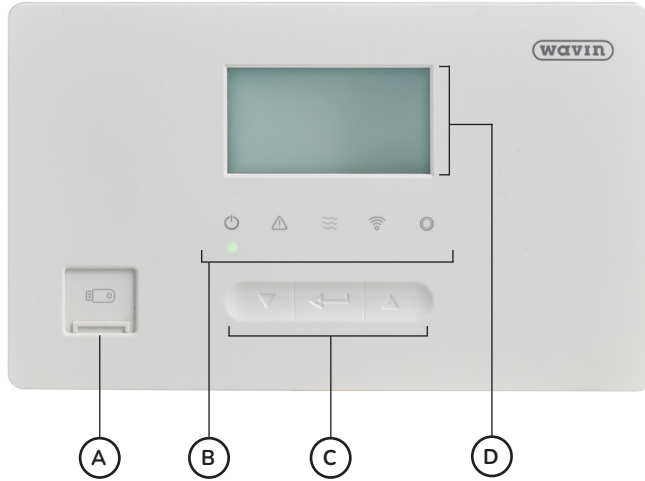
If a wired sensor is preferred, this is also available separately. See section "Electrical installation" on page 24.

Hot water settings

The factory default settings for the hot water will be sufficient for the majority of applications, allowing the system to be set up without any need to alter the basic settings. However, adjustments can be made if required. See the "Calefa II V hot water control" section starting on page 12.

Calefa II V controller

Controller overview



Controller key

A	USB port for communication with external devices
B	Status indicators:
	Power
	Fault
	Mode
	LAN
	Peripheral component
C	Touch-sensitive buttons:
	Down arrow
	Confirm / Return
	Up arrow
D	Digital display

The Calefa II V controller is equipped with a display and three function buttons that make it easy to operate the property's heating and hot water system on a daily basis.

With a few presses on the control's touch-sensitive buttons, the user can set the desired temperature for hot water or change the flow temperature for the home's heating system, to ensure optimal heating comfort. The application symbol in the upper left corner of the display shows the current function menu.

The controller consists of three main buttons:



UP and DOWN arrows: Used to navigate the menus and change values.

ENTER: Two functions, depending on the length of the button press:

Short press: Confirm selection / Scroll through main menus






Long press: Access to submenu / Return to top

Overview of indicators and icons

Digital display icons

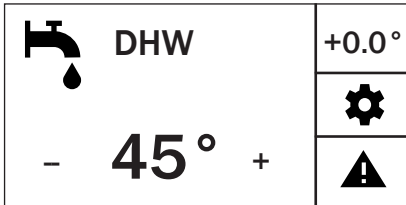
	This icon will display in the top-left to confirm that you are changing the heating settings
	This icon will display in the top-left to confirm that you are changing the hot water settings
	Current temperature setting
	Lowest available temperature setting
	Highest available temperature setting
	This icon confirms that you are currently in a menu where settings are being altered
	When this alert icon appears, the next button press will take you directly to the setting that requires attention

Status indicator lights

Light	State	Meaning
Power	Off	Power off
	Blue solid	Power USB
	Green solid	Power on
Fault	Off	No error
	Yellow solid	Device warning
	Red solid	Device error
	Red fast	Power failure
	Yellow slow	Booting
	Yellow fast	Updating
Mode	Off	No DHW or heating
	Cyan solid	DHW on
	Red solid	Heating on
	Cyan slow	Bypass active
	Magenta solid	Cleaning routine
LAN	Off	LAN connection off
	Green flash	Connecting to cloud
	Green solid	Connected to cloud
	Blue slow	Checking for firmware update
	Blue solid	Firmware update available
Peripheral	Off	No peripheral learned
	Red slow	Learning activated
	Green solid	One or more peripherals learned
	Green slow	One or more peripherals in alarm

Hot water control

Daily usage



The hot water temperature can easily be adjusted using the controller.

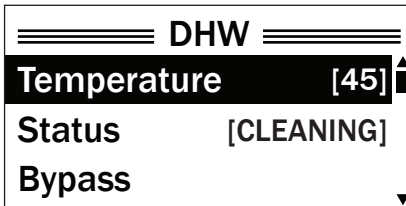
Tap ENTER (↵) until you reach the DHW menu as shown to the left.

Use the UP/DOWN arrows △ ▽ to adjust the desired hot water temperature.

Advanced settings

The hot water control is preset from the factory, to allow the system to work out of the box without it being necessary to change the basic settings. However, it is possible to access the basic settings for hot water production, check the status of temperature sensors and flow, change bypass settings and access advanced settings for hot water regulation.

From the main DHW screen, press and hold ENTER (⏏) to access the advanced settings menu.



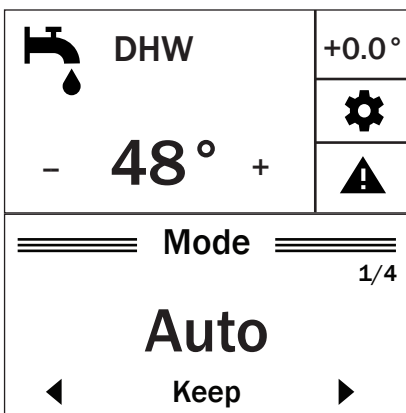
Use the UP/DOWN arrows △ ▽ to navigate the menu. The menu may be longer than the display can allow, so continue to scroll until you reach the desired item. The scrollbar on the right-hand side will indicate your overall position.

The currently selected item is indicated by a black bar. Select an item by pressing ENTER (↵).

To return to a previous menu, either press and hold ENTER (⏏), or scroll to the "Exit" option at the very bottom of the current menu and press ENTER (↵).

Bypass settings

The electronic bypass is factory set to AUTO. The default setting is a constant temperature of 40°C. If a different setting is desired, this can be changed as follows:



Go to the main DHW screen. Press and hold ENTER (⏏) to access the DHW settings menu as described above.

Navigate to:

- > **Temperature**
- > **Bypass**
- > **Mode**

The default AUTO setting ensures that the bypass is only active during the times when water is normally drawn off. If a different setting is desired, switch between the options using the UP/DOWN arrows △ ▽ and confirm the selection with ENTER (↵).

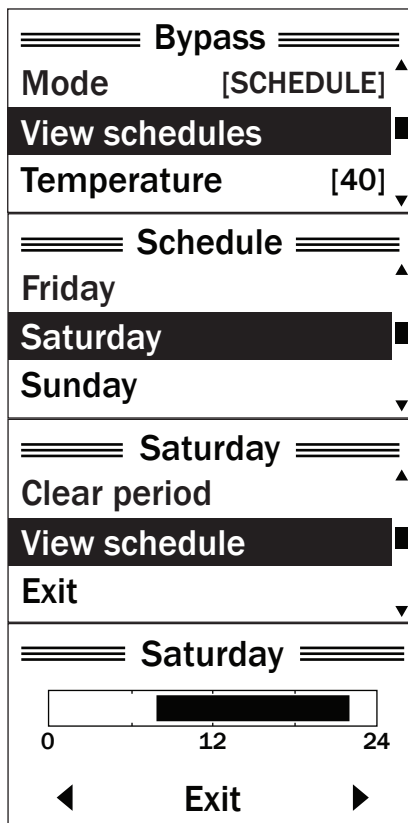
There are four bypass mode options to select from: AUTO, SCHEDULE, COMFORT and ECO.

The final selection is confirmed with ENTER (↵), after which the display will return to the "Bypass" menu.

Bypass scheduling options

- ⦿ **Auto:** The controller analyses the consumption pattern and forms a need-based programme where the bypass is only in operation when hot water is expected to be required. Recommended setting that works well for all systems.
- ⦿ **Schedule:** A fixed weekly programme is entered, where the bypass only operates at specific times. Good for systems that are used within a certain period of time.
- ⦿ **Comfort:** The bypass is always active. This ensures the fastest hot water response, but also results in higher operating costs.
- ⦿ **Eco:** The bypass is always closed. This creates a longer waiting time for hot water, but also minimises operating costs.

If **Schedule** is selected, the desired time programme must also be entered in the "Schedule" menu as below:



Navigate to "View schedules" and select with ENTER (↵) .

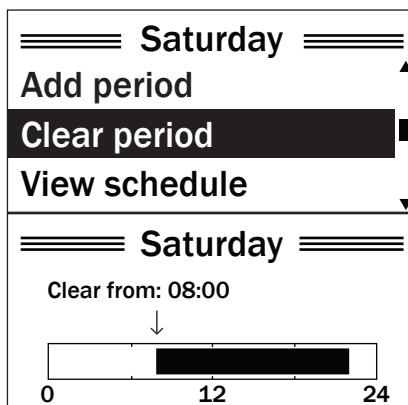
The schedule can be set on a weekly or daily basis. A weekly plan can be set and then refined further by selecting the individual days. For example, select "Saturday".

The current schedule for Saturday can be viewed by navigating the menu with the arrow keys and selecting "View schedule".

This screen shows that the bypass is currently set to run from 8am to 10pm. Press ENTER (↵) to return to the previous menu.

To change the schedule, you can choose to clear or add a period.

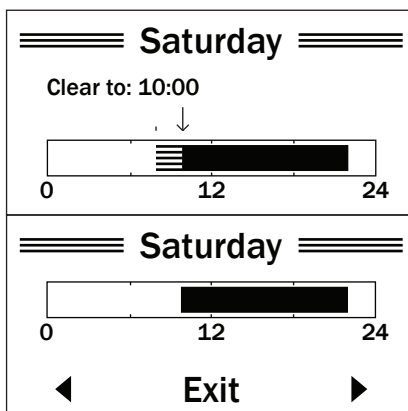
The example below shows how to shorten the schedule by clearing the hours between 8am and 10am



Navigate to "Clear period".

Using the ARROW keys, you can move the arrow on the display left and right to select the starting point for clearing the schedule.

Press ENTER (↵) to confirm.



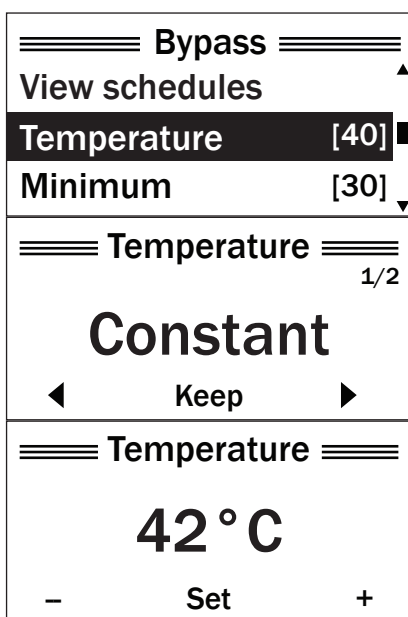
Using the ARROW keys, you can then move the arrow on the display left and right to select the ending point for clearing the schedule. The shaded portion of the bar shows the section that will be removed once confirmation is made. Press ENTER (↵) to confirm.

The new schedule for Saturday is now shown. Press ENTER (↵) to return to the previous menu.

The schedule can also be extended in the same way, using the "Add period" function.

Changing the bypass temperature

If the desired hot water temperature is not achieved within a reasonable time, it may be because the bypass temperature is set too low. From the factory, it is set to a constant temperature of 40°C.



From the "Bypass" menu, navigate to "Temperature".

In the temperature menu, you can choose between **Constant** and **Dynamic**. If **Constant** temperature is selected, the bypass will operate at the set temperature regardless of the desired hot water temperature.

If **Dynamic** is selected, the bypass temperature will adjust to suit the desired hot water temperature. The higher the set hot water temperature, the higher the bypass temperature.

Press ENTER (↵) to save the selection.

Use the ARROW keys △ ▽ to set the default bypass temperature and confirm with ENTER (↵).

Thermal disinfection (Legionella)

In small systems without warm distribution (distribution pipes are cooling down after each tapping to <25°C), Legionella is very rarely found in large quantities. Such systems can be considered safe with no less than 55 °C at the outlet or >50 °C at the tap. This can be achieved both in AUTO mode and ON and SCHEDULE mode.

When the circulation function is added, the circulation loop becomes part of the DHW system. With AUTO or SCHEDULE mode the system will cool down according to the adaptive learning or schedule and the bypass can be considered safe when set at 55°C. If the ON mode is selected the system is maintained constant at the set temperature.

The above follows the guideline of maintaining temperature according to CEN 16355:2012.

Central heating control

Manual control (non-ITC units only)




For non-ITC units, the heating flow temperature can be adjusted manually using the blue thermostatic valve. Increasing the number setting gives a higher flow temperature, whilst lower numbers represent lower temperatures. The setting range is between 20°C and 70°C.



Weather compensation settings (ITC units only)

The heating control is set from the factory to operate in conjunction with underfloor heating systems. If the property is heated solely by underfloor heating, the control will operate optimally at startup, without any necessary changes to the basic settings.

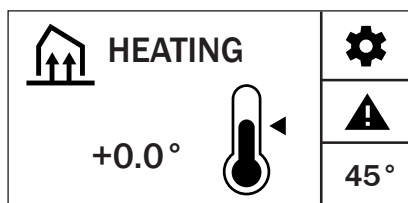
However, it may be necessary to change the basic settings if the property's heat loss differs from the below factory settings for underfloor heating. The below recommendations are based on the degree of building insulation and the age of the building. If a different setting is desired that deviates from the factory settings for underfloor heating, the procedure can be found in the "Advanced settings" section starting on page 16.




Insulation standard		Radiator	UFH
Good	 Well-insulated properties. Passive house standard or similar.	0.8 – 1.0	0.3 – 0.6
Medium	 Newer or energy-renovated properties.	1.0 – 1.4	0.6 – 0.8
Low	 Older properties with high heating requirements.	1.4 – 1.8	0.8 – 1.0
Wavin default factory setting		1.0	0.6

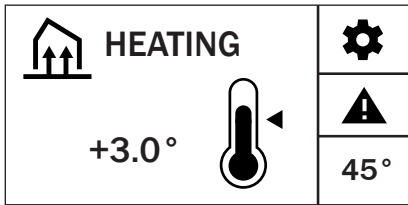
Daily usage

In most cases, the heating controller will automatically find the lowest possible supply temperature in relation to the outside temperature. This aims to ensure optimal comfort in the property as well as the best possible regulation for the district heating supply.

In cases with, for example, large wind influence on the building, it may be necessary to manually adjust the supply temperature to compensate for the additional cooling of the building. This can be easily changed on the electronic display via the HEATING menu.



Tap ENTER  until you reach the HEATING menu as shown to the left. Use the UP/DOWN arrows   to adjust the flow temperature for the heating system.

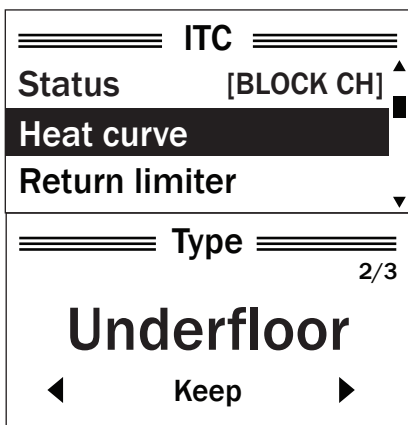


For example, if you want to increase the flow temperature by 3°C, press the UP arrow \triangle three times.

The flow temperature can be adjusted up or down by up to 9°C from this menu. If you need a higher temperature, the heating curve must be changed, as described in the following section.

Advanced settings

The factory settings for Calefa II V are optimised for use with underfloor heating systems in newer or energy-renovated buildings. If the building standard for the property differs (see table on page 15), the ITC settings can be adjusted as required.



From the Heating screen as seen above, press and hold ENTER \leftarrow to access the "ITC" menu.

Navigate to:

> *Heat curve*
> *Type & value*

On the "Type" screen, there are three operation options available to choose from. Use the ARROW keys \triangle ∇ to view the options.

Manual: The slope of the heating curve can be set manually if the building's degree of insulation deviates significantly from the predefined setting options for underfloor heating or radiators.

Underfloor: Used where only underfloor heating is used for heating the property. The factory setting for underfloor heating is set to a slope of 0.6 on the heating curve and max/min. supply temperatures of 45/25°C.

Radiator: Used in a heating system where radiators or a combination of several heating applications are used, for example radiators and underfloor heating. The factory setting for this option is set to a slope of 1.2 on the heating curve.

Press ENTER \leftarrow to confirm the selection. See the "ITC settings" section, starting on page 17, for further explanation of the heat curve settings and functions.

Setting flow temperature limits

The minimum and maximum supply temperature can be limited using the controller. This setting is typically used in connection with underfloor heating, to ensure optimal comfort or limit the surface temperature to protect sensitive floor coverings.

Navigate through the "ITC" menu to find options "Minimum HS" and "Maximum HS":



For example, the maximum heating supply temperature is set using the ARROW keys \triangle ∇ .

Press ENTER \leftarrow to confirm the new flow temperature limits.

ITC settings

General settings

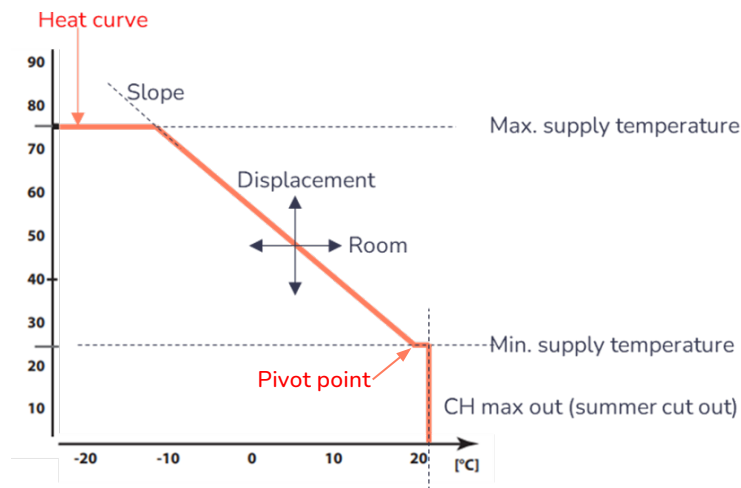
The heat curve is a key function to obtain optimal energy efficiency in a heating system. It must always go hand in hand with the design and balance of the connected heating system and the overall evaluation of the insulation level/energy label of the building.

The below table shows the recommended starting conditions for three typical applications, not taking the building type into account. The commissioning process must always be tailored to the individual project considerations.

Factory settings	Slope	Min./Max. temperature	Return limiter	Room
Underfloor	0.6	25/45°C	35°C	Comfort: 20°C
Radiator	1.2	30/55°C	35°C	Comfort: 20°C
1-pipe system <i>(Note: Not a factory type and value)</i>	1	50/75°C	45°C	Extra comfort: 30°C
Manual	0.1-4.0	20/55°C	30-85°C	Eco: 18°C Comfort: 20°C Extra comfort: 23°C Range: 10-30°C

Heat curve

The heat curve regulates the desired supply temperature. It is defined by **Minimum temperature**, **Maximum temperature**, **Slope** and **CH max out** (summer cut out). The slope's pivot point can be positioned by **Displacement** and **Room**.



Minimum and maximum temperatures

The minimum and maximum supply temperatures should reflect the heating application, temperature setting of the heat source, and any risk related to the building design e.g. wooden floors and burn risk.

If the maximum supply temperature is set below 40°C, there is a risk of the high temperature cut-off (HTCO) alarm being triggered unintentionally. It is not intended to use the maximum temperature as a controlling parameter. In case of a low maximum supply temperature setting, the HTCO alarm setting should be raised and/or the delay integration increased. This is performed under the Safety settings menu.

Parallel displacement

This function is available in the main Heat menu, and allows end users to displace the slope by increasing/decreasing the supply temperature $\pm 9^{\circ}\text{C}$. It is not intended to use this function as part of the commissioning process, and should be left at 0°C to allow the end user freedom to adjust.

CH max out

Outdoor temperature based (standard):

Central Heating max out (summer cut out) will close the heating valve and turn off the circulation pump. The controller will trigger a pump exercise function once per week to avoid the pump getting stuck or seizing outside of the heating season.








The factory setting is 20°C and can be changed in the **Settings | Programs** menu.

Slope

The slope pivots from (X = Room, Y = Supply temperature). The factory setting is (20, 25).

The slope can be set between 0,1 and 4,0. A setting of 1,0 corresponds to a heat curve angle of 45° , effectively lowering the supply temperature 1°C if the outdoor temperature increases by 1°C .

To achieve optimal energy efficiency the slope should only be limited by minimum and maximum parameters in the outliers of the outdoor temperature range. The below table can be used for basic guidance.

Application	Energy Label	Slope	Outdoor temperature						Room
			20°C	15°C	10°C	5°C	0°C	-5°C	
Radiators		1.8	25	34	43	52	61	70	20°C
		1.4	25	32	39	46	53	60	
		1	25	30	35	40	45	50	
UFH		0.8	25	29	33	37	41	45	20°C
		0.6	25	28	31	34	37	40	
		0.4	25	27	29	31	33	35	
1-pipe system		1	35	40	45	50	55	60	25°C
		1	45	50	55	60	65	70	30°C

Room

Dummy Room (factory setting):

The Room function is used to move the pivot point of the slope. It displaces the slope placement horizontally (see figure on previous page). The factory setting regulates as a dummy room (virtual reference room). If the desired room temperature (Room) differs from the actual room temperature setting, this can be corrected by increasing the Room setting. This will affect the supply temperature. The Room terminology is linked to a design calculation of the slope and should not be confused with room temperature. Only apply in cases where a supply starting temperature higher than 25°C is needed.

Examples:

- 1) 1-pipe systems that require a higher temperature setting
- 2) Room comfort temperature above 20°C is requested by the end user
- 3) CH max out is increased above the factory setting of 20°C to meet a higher comfort temperature requested by the end-user

There are three factory settings: Eco, Comfort and Extra comfort. There is also a manual setting option.

Room control (Reference Room):

The Room function's regulation principle changes in case peripheral components (such as a Sentio Room thermostat, sensor or Sentio SRT) are added to the system. The Room function will no longer be linked to the pivot point of the slope when connecting a peripheral to Room. The slope will pivot around 20°C (factory setting). The room thermostat will act as a reference room for all rooms in the system. This will allow the heat valve to close and stop the circulation pump when there is no heat demand, without the need for additional controls. When the outdoor temperature passes the CH max out setting point, the heat valve will close and turn off the pump regardless of the room thermostat's set point.

Note: 1-pipe systems commissioned as a dummy room with a Room set point above 20°C will not work in connection with peripherals.

Room control (Room temperature):

If a Wavin Sentio system is connected to Calefa, the Room function will be controlled by demand linked to the connected room thermostats and the desired indoor comfort setting. This will allow the heat valve to close and stop the circulation pump when there is no heat demand. The Sentio system will inherit the Slope and pivot around 20°C (factory setting). When the outdoor temperature passes the CH max out setting point, the heat valve will close and turn off the pump regardless of the room thermostat's set point.

Calculating ITC supply temperature

The corresponding supply temperature is affected by Outdoor temperature, slope, room and displacement and can be calculated by following formula:

$$\text{Supply temp. [°C]} = 24,6 + (20 - \text{outdoor temp.}) \times \text{Slope} + (\text{Room}-20) \times \text{Slope} \times 2 + \text{Displacement}$$

Example: Outdoor temperature: 5°C | Room: 22°C | Slope: 1,2 | Displacement: 1
 $24,6 + (20 - 5) \times 1,2 + (22-20) \times 1,2 \times 2 + 1 = 48,4^\circ\text{C}$

High-temperature cut off (HTCO)

HTCO is a safety function that will turn off the circulation pump in the case of a defective valve or motor compromising the regulation function.

Factory setting: +5°C above max supply temperature (HS). Delay of 2500 K:Sec. This will trigger the pump to stop to prevent damage. The pump will start with a 5-minute delay once the temperature is below the maximum supply setting.

Note: Lowering the maximum supply temperature <40°C will increase the risk of HTCO cutting in unnecessarily.

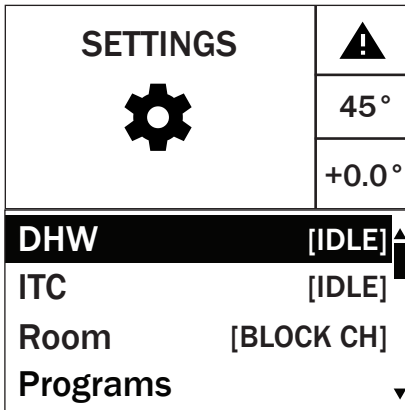
Return temperature limiter

The return temperature limiter will allow the regulation to lower the supply temperature to secure a desired return temperature. A hydraulically balanced system and sufficient heat emitters are a prerequisite for obtaining good ΔT in a heating system.

Note: 1-pipe systems and radiator systems designed for high-temperature setting or insufficient heating surfaces can cause high return temperatures. Setting the return limiter too low will cause the system to limit the energy supplied, thereby compromising the desired comfort temperature of the living space.

General settings

As well as the specific advanced menus for heating and hot water, the Calefa II V controller also has a basic settings menu which will allow actions such as changing the date and time, registering wireless components, servicing the unit, and so on.



Press any key to activate the display.

Tap ENTER (↵) until you see the SETTINGS screen as shown on the left.

Press and hold ENTER (⇧) to enter the menu.

The first two items, "DHW" and "ITC", provide a shortcut back to the settings for hot water and heating respectively. Other available menu items are summarised below:

Summer mode, frost protection and standby

From the "Programs" menu item, you can choose between different operating situations for the unit depending on the behaviour of the building where the system is installed. Calefa II V automatically activates frost protection if the outside temperature falls below 3 °C.

Summer mode

The Calefa II V controller can automatically switch off the heating system if the outside temperature exceeds a level where heating is no longer required. This switches off the circulation pump, and the control valve for heating will remain fully closed, so that power and heat consumption are minimised as much as possible. During any shutdown period, the pump and valve will continue to be exercised at weekly intervals to avoid sticking or blockage.

To set the parameters for Summer shutdown: from the "Programs" menu, select "Temperature" and then "CH max out".



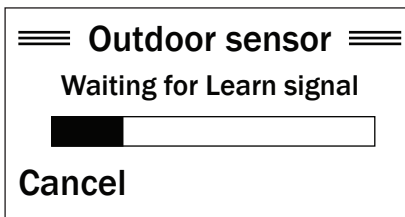
With the ARROW keys (△ ▽) set the outdoor temperature to the value at which the heating should be switched off.

Press ENTER (↵) to confirm the setting..

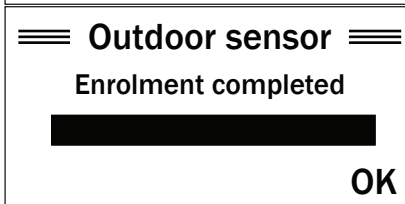
Enrolling a wireless outdoor sensor

From the SETTINGS menu, navigate to:

- > **Advanced**
- > **Components**
- > **Enrol**
- > **Outdoor sensor**



Remove the battery strip from the sensor, or remove and replace the battery. The pairing process will begin automatically.
Wait for the process to complete.



The display when confirm when enrolment has completed successfully.

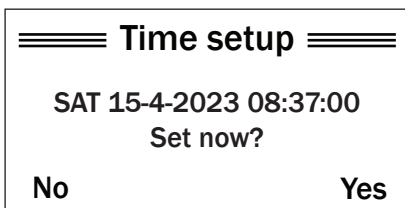
Setting the date and time

Several functions of the Calefa II V controller are dependent on the date and time. It is therefore important that the date and time are set correctly.

From the SETTINGS menu, select "Date & time".

Adjust the values with the ARROW keys \triangle ∇ , and press ENTER \leftarrow to confirm and move to the next screen in the sequence:

Year > Month > Day > Hours > Minutes.



Confirm the date and time setup by pressing UP \triangle .

Servicing or replacing valves

In order to remove the motorised heating and hot water valves in the event of servicing or replacement, the controller's built-in servicing routine must be utilised. This is because the motorised actuator must be fully open in order to dismount and remount it to the valve body. When replacing the motor, the assembly should be hand-tightened only - no tools should be used.

There are two service routines available - one for the heating (CH) valve, and another for the hot water (DHW) valve.

Navigate to the "Advanced" submenu within SETTINGS (see page 10), and scroll down until you see the options for "DHW valve rewind" and "CH valve rewind". The example below shows the DHW routine:

<p>≡≡≡ Advanced ≡≡≡</p> <p>CH valve ctrl [0] ▲</p> <p>DHW valve rewind ■</p> <p>CH valve rewind ▼</p>
<p>≡ DHW valve rewind ≡</p> <p>Close inlet valve!</p> <p>Cancel OK</p>
<p>≡ DHW valve rewind ≡</p> <p>Motor rewind</p> <p>Processing</p>
<p>≡ DHW valve rewind ≡</p> <p>Motor can be unmounted now</p> <p>OK</p>
<p>≡ DHW valve rewind ≡</p> <p>Motor mounted back in place?</p> <p>Yes</p>

Use the ARROW keys ▲ ▼ to navigate to the required service routine and press ENTER (↵).

Follow the instructions on the display.
Press DOWN ▼ to confirm the step is complete.

The routine will start. Wait until complete.

The motor is now fully open and can be removed.
Press UP ▲ to confirm the step is complete.

Once the motor is replaced, press UP ▲ to finalise the procedure.

Copying configuration to USB

If you have a project or property with multiple Calefa units, you can copy your settings file from one of the DHW-212 controllers using a USB drive. With this, you can then import the same settings to other units, allowing you to duplicate the configurations and save the trouble of having to manually change settings on every single Calefa controller.

Place an empty USB drive in the USB slot. Then, from the SETTINGS menu, navigate to:

> **Advanced**

> **Config export**

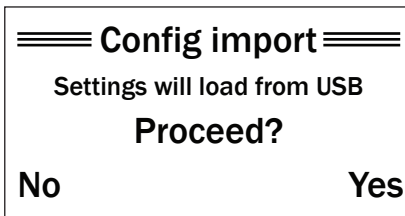


Confirm to proceed, and remove the USB drive once the process has completed.

Import configuration from USB

Insert the USB drive into the USB slot. If DHW-21x configuration data is detected, the import screen will automatically open.

Note: Transferring configuration data is only possible between identical controller models. DHW-212 config files are **not** compatible with the DHW-211, or vice versa.



Confirm to proceed, and remove the USB drive once the process has completed.

Configuration data

These are the settings and parameters that can be transferred using the configuration copy function:

DHW temperature	Return temperature limiter on/off	Manual heat curve
Min. DHW temperature	Max. return temperature	Manual min. temperature
Max. DHW temperature	CH max. out (Summer shutdown)	Manual max. temperature
Set temperature bypass/circ.	Heating type	Room temperatures (Eco, Comfort, Extra Comfort)
Min. bypass/circ. temperature	Floor heat curve	Comfort level (Eco, Comfort, Extra Comfort)
Max. bypass/circ. temperature	Floor min. temperature	HTCO temperature
Bypass program	Floor max. temperature	HTCO delay
Bypass week schedule	Radiator heat curve	Time zone
DHW circulation enable/disable	Radiator min. temperature	Language
DHW prioritisation	Radiator max. temperature	

Reading sensor values

All measured sensor values can be read electronically using the Calefa II V controller. In the menus, navigate to SETTINGS then select SENSORS. Refer to the "Controller overview" and operation guide starting on page 9 if needed.

Sensors 1/4			
DHI:	22.70	DHW:	22.70
DHO:	23.60	DCW:	23.60
PRE:	0.00	FLW:	0.00
Exit			▶

There are four screens in total. Switch between them using the UP/DOWN buttons \triangle ∇ .

Sensor name abbreviations

DHI: District heating input	DHW: Hot water temperature
DHO: District heating output	DCW: Cold water temperature
PRE: Hot water pressure	FLW: Water flow volume (litres per hour)
DHV: Hot water valve open %	BYP: Bypass status (Active if value = 1)
HS: Heating flow temperature	HR: Heating return temperature
CHV: Heating valve open %	PUM: Pump status (On if value =1)
SET: Room temperature setpoint	OUT: Outdoor temperature

Electrical installation

Connection

The unit's internal components and control systems are pre-wired and pre-connected from the factory. To power the unit for the first time, connect the plug to a switched and earthed wall socket.

Establishing potential equalisation

Potential equalisation is an electrical equalisation connection which protects against any potentially dangerous electrostatic discharge that may occur, for example between two different pipe systems. Potential equalisation also reduces corrosion in heat exchangers, as well as other conductive components in the pipe installation.

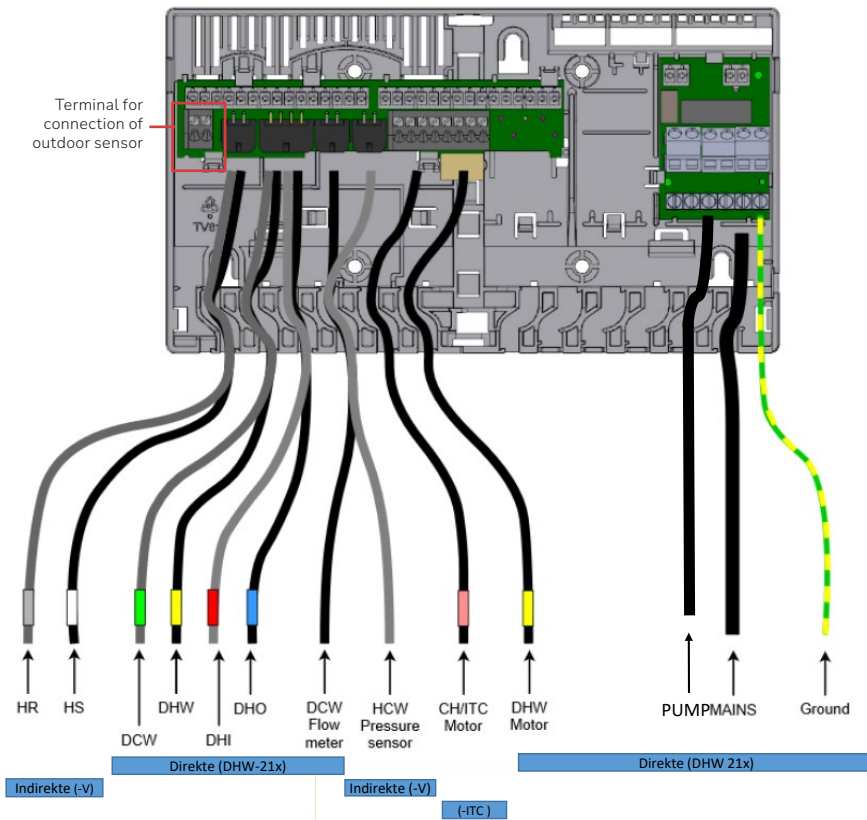
Circuit breaker

The unit is to be connected to a network with 230V AC. The unit must be connected to an external switch so that it can be switched off in connection with maintenance, cleaning, repair or in an emergency.

Accessing the control wiring

All electronic components, such as motors, pumps and sensors, are pre-installed in the Calefa II V control from the factory. Under normal circumstances, the unit should not be opened during setup, as all components are functionally tested before the unit is packaged. If access is required to connect the additional outdoor sensor, instructions can be found on the following page.

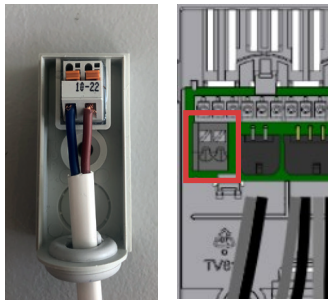
Calefa II V ITC controller - wiring diagram



Connecting a wired outdoor sensor

To connect a hard-wired outdoor sensor, use the following procedure:

1. Disconnect the power to the control unit.
2. Locate the locking pin on the underside of the control unit, and pull it down using a flat-headed screwdriver. The controller's front panel can then be removed.
3. Remove the cover to the outdoor sensor and connect the cables as pictured below.
4. Connect the sensor to the two terminals in the main control unit, as pictured below.



5. Reattach the front panel of the controller and push the locking pin up until you hear a click.
6. Reconnect the power supply.

Component	Abbreviations	Connection	Plug	Colour
Temperature sensor	HS	Heating flow	Mini-Fit Jr. 2x1 female straight	White
Temperature sensor	HR	Heating return	Mini-Fit Jr. 2x1 female straight	Grey
Temperature sensor	DCW	Hot water return	Mini-Fit Jr. 2x1 female straight	Green
Temperature sensor	DHW	Hot water flow	Mini-Fit Jr. 2x1 female straight	Yellow
Temperature sensor	DHI	District heating flow	Mini-Fit Jr. 2x1 female straight	Red
Temperature sensor	DHO	District heating return	Mini-Fit Jr. 2x1 female straight	Blue
Flow meter	DCW Flow	Hot water return	M12x1 5-conductor	Black
Pressure sensor	CH PS	District heating	TE AMP 3-conductor	Grey
Motor	CH/ITC Motor	District heating/ITC	Delphi Metri-Pack 150.2 4-conductor	Red
Motor	DHW Motor	Hot water flow	Delphi Metri-Pack 150.2 4-conductor	Yellow
Pump	UPM3	Heating	TE mini superseal 3-conductor	Black
Power supply	Mains	230V	Schuko	Black


Technical specification

Calefa DHW 21x	
Power supply	230V/50Hz
Power consumption	Stand by 1W / Max 45W
IP rating	IP41
Operating temperature	0 to 50°C
Battery	CR2032 3V/0.2A
Radio frequency	868.5 MHz/25mW

Guide for Grundfos UPM3 Auto

The Grundfos UPM3 Auto pump is supplied preset to mode "Constant pressure 2".

Operation of the pump

The LEDs show the current operating mode of the pump. The overview below shows all operating modes of the pump in sequential order. To change the current setting, press the button . Each press will change the setting to the next one in the sequence.



Setting	Heat source	LED 1	LED 2	LED 3	LED 4	LED 5
Proportional pressure Auto-adapt	Radiators	Green				
Constant pressure Auto-adapt	Underfloor		Green			
Proportional pressure step 1	Radiators	Green		Yellow		
Proportional pressure step 2	Radiators	Green		Yellow	Yellow	
Proportional pressure step 3 - Max	Radiators	Green		Yellow	Yellow	Yellow
Constant pressure 1	Underfloor		Green	Yellow		
Constant pressure 2	Underfloor		Green	Yellow	Yellow	
Constant pressure 3 - Max	Underfloor		Green	Yellow	Yellow	Yellow
Constant curve step 1	Underfloor			Yellow		
Constant curve step 2	Underfloor			Yellow	Yellow	
Constant curve step 3 - Max	Underfloor			Yellow	Yellow	Yellow

If the pump has registered an error, this is indicated by LED 1 lighting up red and one of the other LEDs lighting up yellow. See the table below for an overview of the possible error messages.

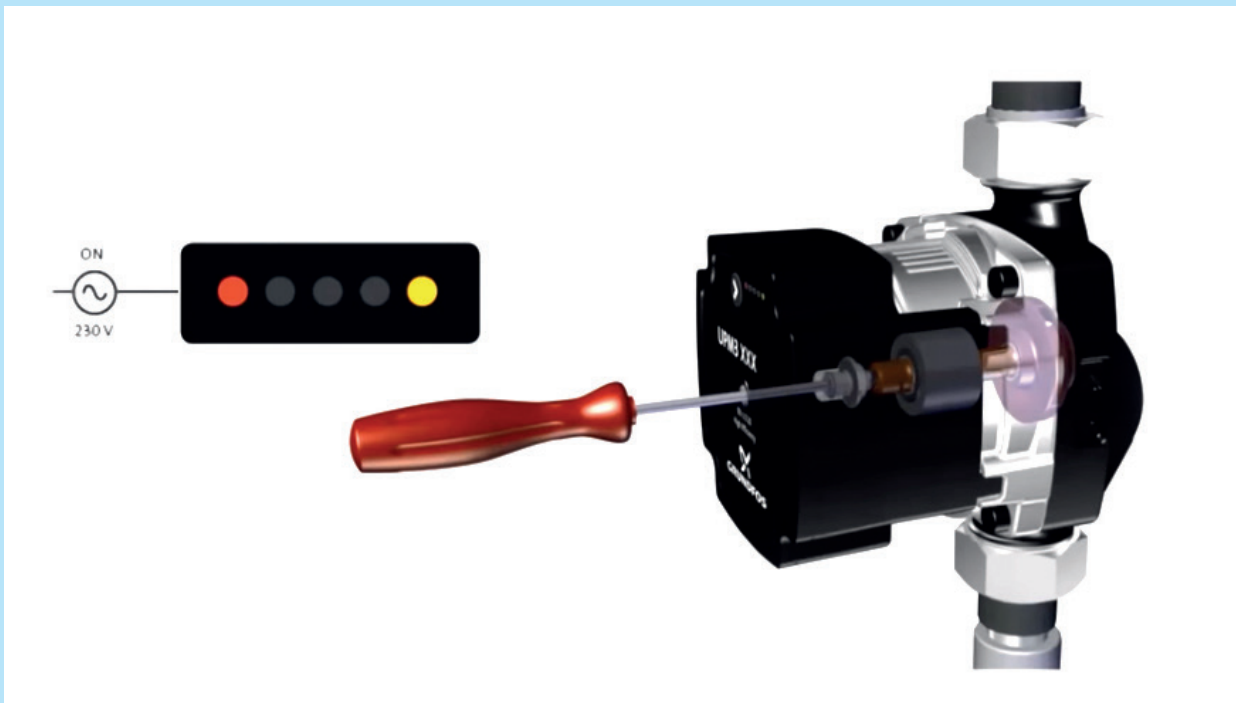
Error	LED 1	LED 2	LED 3	LED 4	LED 5
Pump blocked	Red				Yellow
Supply voltage too low	Red			Yellow	
Electrical fault	Red		Yellow		

Preventing pump blockages

- ⌚ Grundfos recommends that the pump runs continuously after installation. This reduces the risk of limescale deposits forming in the bearings over time.
- ⌚ For pumps installed in newly built or renovated houses and apartments for later commissioning, it is recommended that the pump is allowed to run for more than one hour after installation. This ensures that the system and pump are properly vented.

In the event of a blocked pump

If the pump LEDs display a blocked pump error, first try the anti-blocking screw as pictured below. Push the screw in and turn it from side to side whilst the pump is powered. If this does not solve the problem: Switch off the mains power, then remove the pump head and loosen the impeller manually. Refit the pump head and start the pump. If you cannot loosen the impeller or the pump does not start, it will need to be replaced.



Operation and maintenance

Daily use and inspection

It is always prudent to visually examine the unit regularly for any leaks, in conjunction with checks of the district heating meter. Check the meter to ensure the return temperature back to the district heating is not too high - this should be 30°C lower than the flow temperature during hot water supply or while the heating is active. If any issues are found, contact an authorised plumber.

The temperature of the hot water is easily changed using the push buttons on the front of the district heating unit. It is recommended that the water temperature is set to a maximum of 50°C to avoid unnecessary limescale formation in the plate heat exchanger. See section "Daily usage" page 12. Should problems arise with the hot water supply, the most common errors will be shown on the display of the Calefa controller. If the problem cannot be diagnosed by the controller, contact an authorised plumber.

Scheduled maintenance

To prevent operational problems, we recommend that scheduled maintenance is carried out on your Calefa unit. As with other technical equipment, it is typically much simpler to carry out maintenance than it is to correct errors. The table below details the recommended tasks and frequencies, to minimise issues and maximise the lifespan of the unit.

Service item	Action	Interval
Unit	Read the energy meter and check for leaks	Once a month
Hot water	Check to ensure within correct range	Twice a year
Visible edges	Inspect for leaks and corrosion	Once a year
Isolation valves	Open and close 1-2 times	Once a year
Strainers	Remove and clean filters (by approved plumber)	Once a year
Electrical connections	Check cables and connections	Once a year
Safety valve	Open and relieve the valve (handle is turned until water exits)	Once a year
Plant pressure	Read from display. See section "Reading sensor values" page 18	Twice a year, after venting / testing the safety valve

Troubleshooting - FAQ

Before starting troubleshooting, the following should be examined:

- ⦿ Is the unit connected as shown on the connection diagram? (page 4)
- ⦿ Are pump pressure and supply temperature from the district heating plant at normal levels?
- ⦿ Is there power for the unit and pump?
- ⦿ Is the system ventilated?
- ⦿ Are the filters in the system clean?

In the section below, the basic settings for Calefa II V are described, which should also be reviewed.

Hot water temperature setting

Calefa II V is designed such that no daily supervision should be required. The domestic water temperature is set via the push buttons on the front of the district heating unit. The arrows are used to raise and lower the temperature. It is recommended to set the service water temperature to 45°C and not higher than 50 °C. See section "Daily usage", page 12.

Setting the heating flow temperature

Calefa II V units can be supplied with ITC weather compensation. The temperature in the heating circuit is regulated in relation to the outside temperature and the set heating curve. The heating control is set from the factory to suit a heating system equipped with underfloor heating. If the operating parameters are to be changed, see "Advanced settings heat regulation" page 16.

Summer mode setting

A district heating unit with ITC weather compensation will automatically stop the circulation pump and close the motor valve at an outside temperature of 20°C. It is therefore not necessary to make additional settings for summer operation. It is not recommended to cut off the power to the pump, as the continuous power ensures that the pump is routinely exercised, reducing the risk of the pump sticking at the beginning of the next heating season

On a district heating unit without ITC weather compensation, it rarely makes sense to consider summer operation, as the pump automatically reduces power consumption in line with the heat demand. We therefore do not recommend switching off the pump, as this can result in the pump getting stuck.

Bypass setting

Depending on the setting for the bypass function, you may experience a long wait for hot water outside of the heating season. Read the description below of the setting options for the bypass and assess which best suits your needs.

The Calefa II V controller has 4 bypass settings: Auto, Schedule, Comfort and Eco (See pages 13-14).

Auto: The controller analyses the consumption pattern and forms a need-based programme where the bypass is only in operation when the need arises. Recommended setting that works well for all systems.

Schedule: A fixed weekly programme is entered, where the bypass only operates at specific times. Good for systems that are used within a certain period of time.

Comfort: The bypass is always active. Ensures the fastest hot water response, but also results in higher operating costs.

Eco: The bypass is always closed. Longer waiting time for hot water, but lowest operating costs.

Domestic Hot Water		
Fault	Possible Cause	Solution
Water is cold or lukewarm	No district heating supply	Check availability of district heating supply
	Strainer on flow or return pipes may be blocked	Clean strainer (via Plumbing Contractor)
	Faulty Calefa II controller	Check electrical connections / Replace
	Faulty motor	Check electrical connections / Replace
	Faulty flow meter on cold water inlet	Check electrical connections / Replace
	Faulty plant sensors	Check electrical connections / Replace
	Faulty DHW sensors	Check electrical connections / Replace
	Faulty or incorrectly set booster pump	Check booster pump
Little or no water flow	Defective or blocked valves	Check or replace
	Calcified plate heat exchanger	Replace (via Plumbing Contractor)
Hot water from some taps, but not all	Hot and cold water mixing through a faulty thermostatic valve or non-return valve	Check or replace
	Faulty or clogged check valve or pump in circulation pipes	Check/clean or replace
Hot water temperature suddenly drops mid flow	Calcified plate heat exchanger	Replace (via Plumbing Contractor)
	Hot water demand is exceeding the designed capacity of the system	Reduce simultaneous use of hot water appliances
Water is too hot	Domestic hot water controller is set too high	Adjust temperature down using arrow key
	Faulty sensor	Replace

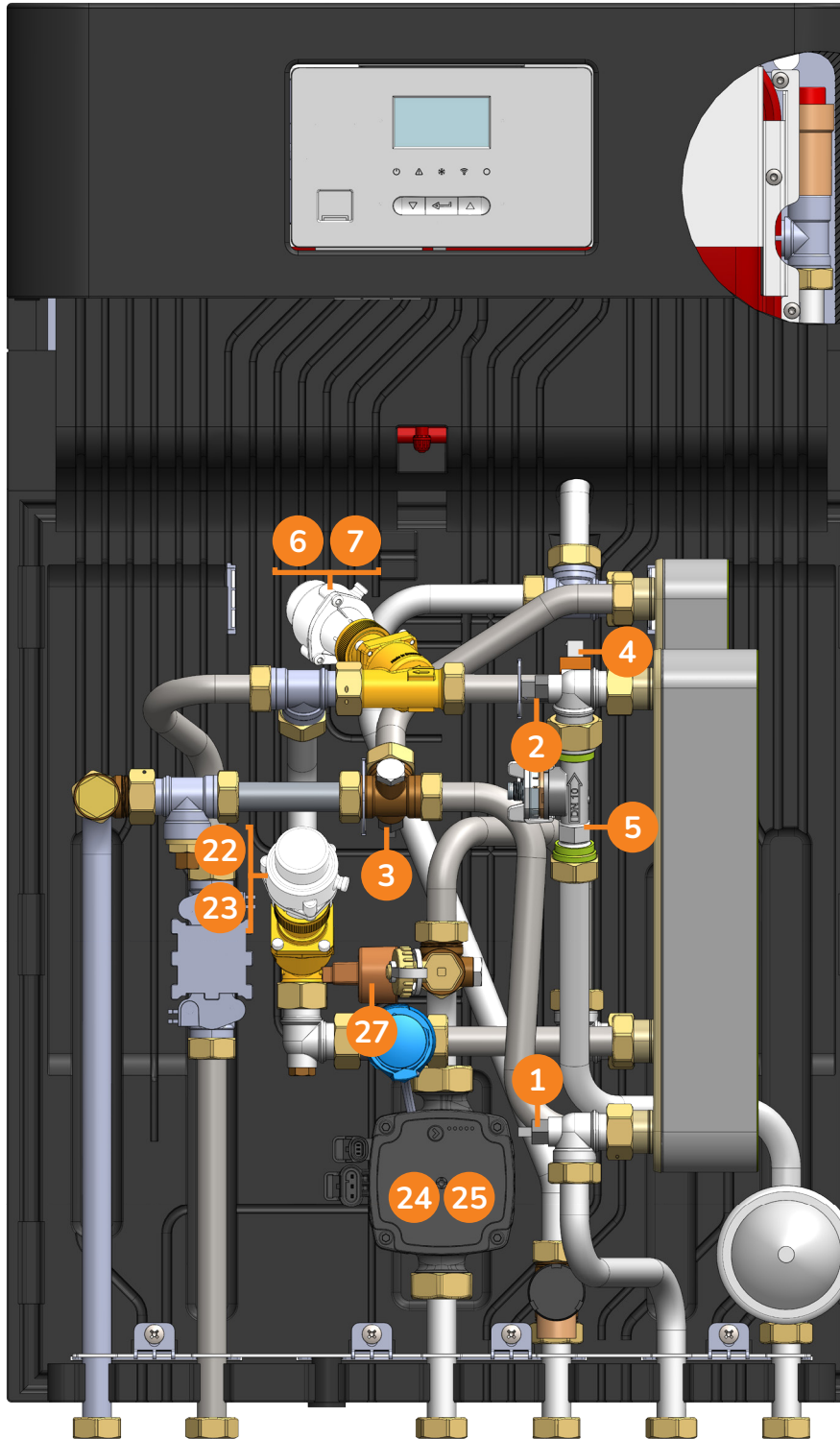
Heating		
Fault	Possible Cause	Solution
Little or no heating	Strainer on flow or return pipes may be blocked	Clean strainer (via Plumbing Contractor)
	Faulty flow temperature sensor	Replace (via Plumbing Contractor)
	Circulation pump is not running	Check power connections. Check connection to heating system pump relay (via Plumbing Contractor)
	Circulation pump is not set correctly	Set the circulation pump according to the instructions
	Incorrectly set inlet temperature control	Check ITC settings on controller. Check that there is power to the ITC
	Air trapped in the heating system	Vent Calefa unit by opening auto vent (49). Vent underfloor heating system and/or bleed radiators.
	Pressure in the system has dropped	Ensure that the system is filled to a pressure or 0.5 to 1.5 bar.
Pressure drops regularly	Leaking or defective expansion vessel	Replace expansion vessel
Poor cooling performance	Faulty valve	Clean or replace (via Plumbing Contractor)
	Incorrectly set inlet temperature control	Check ITC settings on controller
Flow temperature too high	Flow temperature sensor faulty or set too high	Check setting or replace
	Inlet temperature control faulty or set too high	Check setting or replace
Flow temperature too low	Flow temperature sensor faulty or set too low	Check setting or replace
	Inlet temperature control faulty or set too low	Check setting or replace

Error code troubleshooting

Error codes

Code	Display message	Error LED	Description	Action
1	DHW_FAILURE	Red	Temperature sensor for DHW failed	Check cable and connector for temperature sensor (cable marked with yellow) or call authorised technician
2	DCW_FAILURE	Red	Temperature sensor for DCW failed	Check cable and connector (cable marked with green) or call authorised technician
3	DHI_FAILURE	Red	Temperature sensor for DHI failed	Check cable and connector (cable marked with red) or call authorised technician
4	DHO_FAILURE	Red	Temperature sensor for DHO failed	Check cable and connector (cable marked with blue) or call authorised technician
5	FLOW_FAILURE	Red	Flow sensor failed	Call authorised technician
6	DHW_FAILURE	Red	DHW stepper motor or valve failed. Possible causes are: disconnection, short circuit, continuous overheating	Check cable and connector for DHW motor (cable marked with yellow) or call authorised technician
7	DHW_MOTOR_STUCK	Red	DHW stepper motor is stuck	Call authorised technician
8	DHI_FROST_PROTECT	Yellow	Measured DHI, DHO or DHW triggered frost protection (defined by DHI/DHO/DHW frost protection user set temperature)	Risk of frost in the unit - small supply flow is active to prevent frost damage or pipe bursts
9	LOW_ENERGY	Yellow	Low energy for DHW preparation (not enough energy to reach requested DHW)	DHW flow demand may be too high - try lowering the DHW flow setting Mains supply flow may be interrupted - call authorised technician
21	HS_FAILURE	Red	Temperature sensor for HS failed	Check cable and connector for temperature sensor, cable marked with white or call authorised technician
22	CH_MOTOR_FAILURE	Red	Failure of Central Heating stepper motor	Check cable and connector for DHW motor (cable marked with red) or call authorised technician
23	CH_MOTOR_STUCK	Red	Central Heating stepper motor is stuck	Call authorised technician
24	PUMP_FEEDBACK	Red	Central Heating circulation pump does not provide correct feedback signal	Check cable and connector for pump, or call authorised technician
25	PUMP_ERROR	Red	Central Heating circulation pump indicates error state	Call authorised technician
26	HR_FAILURE	Yellow	Temperature sensor for HR failed	Check cable and connector for temperature sensor (cable marked with grey) or call authorised technician
27	PRESSURE_FAILURE	Yellow	Failure of pressure sensor	Call authorised technician
28	OUT_FAILURE	Yellow	Outdoor temperature sensor failed	Check cable and connector for outdoor temperature sensor, or call authorised technician
29	HS_TOO_HIGH_HTCO	Yellow	Measured heating supply temperature is too high, high temperature cut off (HTCO) is triggered	Call authorised technician
30	HS_FROST_PROTECT	Yellow	Measured heating supply temperature triggered frost protection (defined by HS frost protection user set temperature)	Risk of frost in the unit - small supply flow is active to prevent frost damage or pipe bursts

Component identification by error code



Component overview

Component / spares list



Plate heat exchanger XB06-26

Wavin nr: 3095150

Plate heat exchanger XB06-40

Wavin nr: 3095151

Plate heat exchanger XB06-60

Wavin nr: 3095152



7 Pressure relief valve

Wavin nr: 3097087

This pressure relief valve releases excess pressure in the domestic water system.



22 Calefa OPTIMA Compact, 4mm

Wavin nr: 3094517

Optima Compact is a differential pressure control and relief valve, and is used to regulate the temperature in the heating circuit. The valve is fitted with either a motor or a thermostatic sensor element.



25 Safety valve

Wavin nr: 3097088

This valve will open when the system pressure exceeds 2.5 bar, to ensure that the system is not damaged.



28 + 28A Check valve DN20, 2 pack

Wavin nr: 3095543

This non-return valve ensures the correct flow direction and prevents accidental back-flow.



34 Fast-acting actuator incl. Delphi connector

Wavin no.: 3092834

The stepper motor for Calefa II is used to control the valves for both the heating circuit and the domestic hot water circuit in the Calefa II unit. The motor is easily connected by plugging it into the connector linked to the Calefa II controller. A replacement cable is included in case the cable on the existing motor is damaged.



34A Capillary thermostat

Wavin nr: 3094061

If the unit is delivered without a weather compensator, this thermostat will regulate the supply temperature to the heating circuit. Setting range 20°C to 70°C.



36 Flow meter

Wavin nr: 3094513

This flow meter detects when domestic hot water is drawn off and provides a signal to the controller that additional hot water must be produced.



37 Calefa OPTIMA Compact, 1500 l/h

Wavin nr: 3094518

The Optima Compact with fast-acting motor is a pressure-independent control valve, which is used to regulate the temperature of the hot water. The valve is controlled by the Calefa DHW-212 controller.



40 Grundfos UPM 3 Auto incl. power cable

Wavin nr: 3094512

The UPM 3 pump is a highly efficient circulation pump. The pump has three modes of regulation: proportional pressure, constant pressure and fixed speed. Proportional pressure is most often used for two-pipe radiator systems. Constant pressure is used with underfloor heating and single-pipe radiator systems. Fixed speed is utilised where you want to circulate a large amount of water at a fixed velocity.



49 Automatic air vent

Wavin nr: 3094509

The automatic air vent is used to release any excess air from the system.



51 Temperature sensor set

Wavin nr: 3094514

Comprises 2no. clamp-on sensors, 1no. submersible hot water sensor, and 1no. submersible heating sensor.



57 Expansion vessel

Wavin nr: 3094511

Accommodates expansion in the heating system

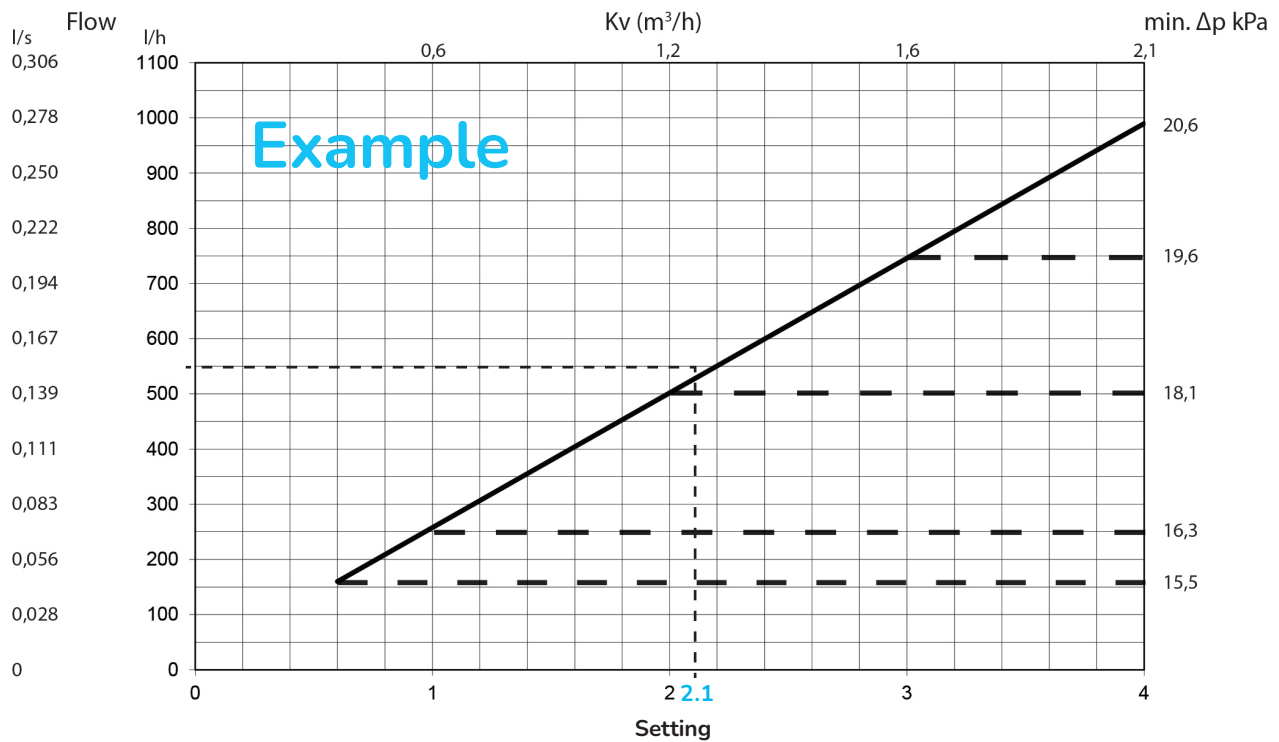


65 Sentio outside temperature sensor

Wavin nr. 4063807

Appendix I

Frese OPTIMA Compact - 4,0 mm



In the example above, we require a flow of 550 litres per hour (l/h). From 550 l/h on the y-axis a horizontal line is drawn to the diagonal. The preset value is read on the x-axis where the horizontal line intersects the flow line. In this case the default will be approximately 2.1.

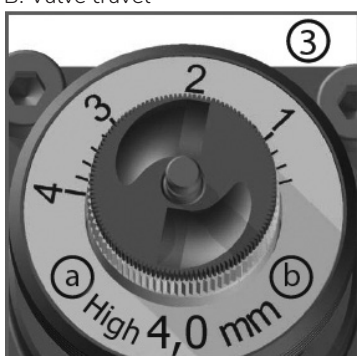
The flow in l/h for each preset value can also be seen in the table to the right.

Setting the flow is adjusted with the dial on the valve below the motor/thermostat.

Setting flow: 0 min - 4 max.

A: Flow range on valve (low or high)

B: Valve travel



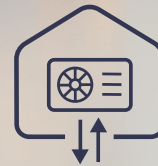
Setting	Flow l/h
0.6	160
0.8	209
1.0	258
1.2	306
1.4	355
1.6	404
1.8	453
2.0	502
2.2	551
2.4	559
2.6	648
2.8	697
3.0	746
3.2	795
3.4	844
3.6	892
3.8	941
4.0	990

Advancing Indoor Comfort with Wavin

From family homes to apartments, Wavin stands as the trusted choice for a comprehensive indoor climate solution. Through innovative controls, it seamlessly integrates underfloor heating, ceiling heating and cooling, heat interface units and mechanical ventilation.

All components work harmoniously in a unified solution, Advancing Indoor Comfort with efficiency and ease.

- Surface heating and cooling
 - Heat interface units
- Mechanical ventilation
- Smart control systems



Wavin is part of Orbia, a community of companies working together to tackle some of the world's most complex challenges.

We are bound by a common purpose:
To Advance Life Around the World.

Wavin | Edlington Lane | Doncaster | DN12 1BY | Telephone +44 (0)800 038 3088 |
E-mail indoorclimate.uk@wavin.com | Internet www.wavin.com

Wavin operates a programme of continuous product development, and therefore reserves the right to modify or amend the specification of their products without notice. All information in this publication is given in good faith, and believed to be correct at the time of going to press. However, no responsibility can be accepted for any errors, omissions or incorrect assumptions.

© 2026 Wavin Wavin reserves the right to make alterations without prior notice. Due to continuous product development, changes in technical specifications may occur. Installation must comply with the installation instructions.