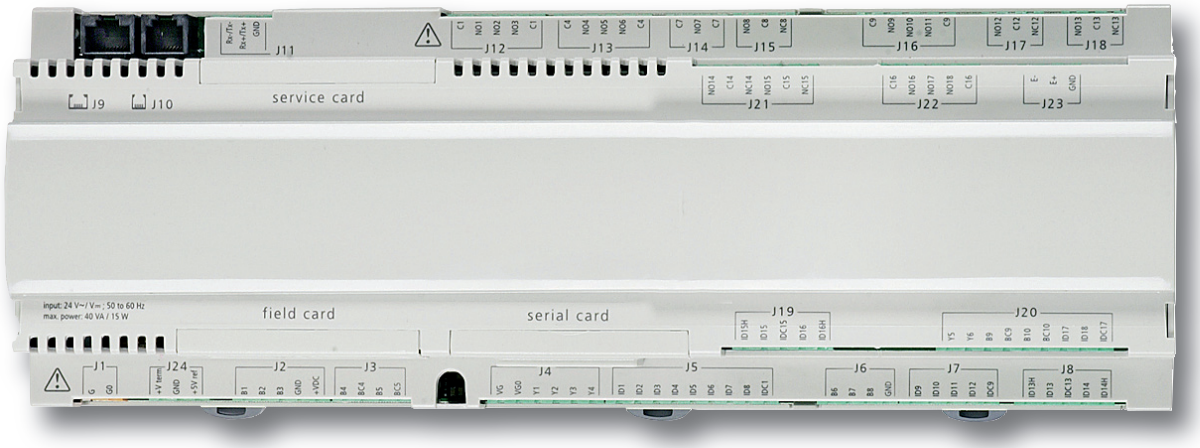
Heat pump manager

Operating instructions

for technicians



Heat pump manager

Order no. : 452115.66.35

EN · FD 9709 / L23

(DE)

Einstellung der Sprache
Die Einstellung der Sprache ist nach einem Neustart des Wärmepumpenmanagers oder im Menü Einstellungen möglich.

- MENUE-Taste für einige Sekunden gedrückt halten
- Auswahl des Menüpunktes Einstellungen und bestätigen durch Drücken der ENTER-Taste (↵)
- Auswahl des Untermenüpunktes Sprache mit der Pfeiltasten (⇑) und bestätigen durch Drücken der ENTER-Taste (↵) bis Cursor zum Einstellwert springt
- Gewünschte Sprache mit Pfeiltasten (⇑ und ⇓) einstellen
- Gewählte Sprache mit ENTER-Taste (↵) bestätigen oder durch die ESC-Taste verwerfen

(GB)

Sets the desired language
The language can be set after restarting the heat pump manager or in the Settings menu.

- Press and hold the MENUE button for several seconds
- Select the menu item Settings and confirm by pressing the ENTER key (↵)
- Select the Language submenu item with the arrow keys (⇑) and confirm by pressing the ENTER key (↵) until the cursor jumps to the setting value
- Set the desired language with the arrow keys (⇑ and ⇓)
- Confirm the selected language with the ENTER key (↵) or revoke with the ESC key

(FR)

Réglage de la langue
Il est possible de régler la langue après un redémarrage du gestionnaire de pompe à chaleur ou dans le menu Réglages.

- Maintenir la touche MENUE enfoncée pendant plusieurs secondes.
- Sélectionner l'option de menu Réglages et confirmer en appuyant sur la touche ENTRÉE (↵).
- Sélectionner l'option de sous-menu Langue à l'aide des touches flèches (⇑) et confirmer en appuyant sur la touche ENTRÉE (↵) jusqu'à ce que le curseur se positionne sur la valeur de réglage.
- Sélectionner la langue souhaitée à l'aide des touches flèches (⇑ et ⇓).
- Confirmer la langue choisie avec la touche ENTRÉE (↵) ou la rejeter à l'aide de la touche ESC.

(SI)

Nastavitev jezika
Nastavitev jezika je mogoèa po ponovnem zagonu upravitelja toplotne èrpalke ali v meniju za nastavitve.

- Tipko MENUE držite pritisnjeno nekaj sekund
- Izberite menijsko toèko za nastavitve in jo potrdite s pritiskom na tipko ENTER (↵)
- Podmenijsko toèko za jezik izberite s tipkami s pušèico (⇑) in potrdite s pritiskom na tipko ENTER (↵), dokler kazalec ne skoèi na nastavitveno vrednost
- Želeni jezik nastavite s tipkami s pušèico (⇑ in ⇓)
- Izbrani jezik potrdite s tipko ENTER (↵) ali zavrzite s tipko ESC

(IT)

Impostazione della lingua
È possibile impostare la lingua al riavvio del programmatore della pompa di calore oppure nel menu Impostazioni.

- Tenere premuto il tasto MENUE per alcuni secondi
- Selezionare la voce di menu Impostazioni e confermare premendo il tasto ENTER (↵)
- Selezionare la voce di sottomenu Lingua con il tasto freccia (⇑) e confermare premendo il tasto ENTER (↵) fino a che il cursore non si posiziona sul valore da impostare
- Impostare la lingua desiderata con i tasti freccia (⇑ e ⇓)
- Confermare la lingua selezionata con il tasto ENTER (↵) oppure scartarla con il tasto ESC

(SE)

Inställning av språket
Inställningen av språket är möjligt efter en nystart av värmepumphanteraren eller i menyn Inställningar.

- Håll MENUE- knappen nedtryckt några sekunder.
- Välj menypunkt Inställningar och bekräfta med ENTER-knappen (↵)
- Välj undermenypunkten Språk med pilknapparna ⇑) och bekräfta med ENTER-knappen (↵) tills markören hoppar till inställningsvärdet
- Ställ in önskat språk med pilknapparna (⇑ och ⇓)
- Bekräfta utvalt språk med ENTER-knappen (↵) eller annulera med ESC-knappen

(CZ)

Nastavení jazyka
Nastavení jazyka je možné po novém spuštìní manažera tepelného èerpadla nebo v nabídce Nastavení.

- Po dobu nìkolika sekund držte stisknuto tlaèítko MENUE
- Výbìr nabídky menu Nastavení a potvrzení stisknutím tlaèítka ENTER (↵)
- Výbìr nabídky podmenu Jazyk pomocí šipkových tlaèítek (⇑) a potvrzení stisknutím tlaèítka ENTER (↵), až kurzor pøeskoèí k hodnotì nastavení
- Nastavení požadovaného jazyka pomocí šipkových tlaèítek (⇑ a ⇓)
- Zvolený jazyk potvrdit pomocí tlaèítka ENTER (↵) nebo zrušit volbu pomocí tlaèítka ESC

(PL)

Ustawienia języka
Ustawienie języka możliwe jest po ponownym uruchomieniu sterownika pompy ciepła lub w menu Ustawienia.

- Przytrzymać przycisk MENUE przez kilka sekund
- Wybrać punkt menu Ustawienia ipotwierdzić wciskając przycisk ENTER (↵)
- Wybrać podpunkt menu „Język" strzałkami (⇑) ipotwierdzić wciskając przycisk ENTER (↵) aż kursor przejdzie do ustawień
- Ustawić żądany język strzałkami (⇑ i ⇓)
- Wybrany język potwierdzić przyciskiem ENTER (↵) lub odrzucić przyciskiem ESC

(RC)

语言设定
可在重新启动热泵管理器后或通过菜单中的设定项设定语言。

- 持续按住 MENUE 键几秒钟
- 选择菜单项 " 设定 " 并通过按 ENTER 键 （↵）进行确认
- 用方向键（⇑）选择子菜单项 " 语言 " 并通过按 ENTER 键（↵）进行确认，直至光标跳至设定值
- 通过方向键 （⇑ 及 ⇓）对所需语言进行设定
- 通过 ENTER 键 （↵） 确定所需语言或通过 ESC 键取消

(PT)

Definição do idioma
A definição do idioma é possível depois de reiniciado o controlador da bomba de calor ou através do menu Definições.

- Manter a tecla MENUE premida durante alguns segundos
- Seleção do ponto de menu Definições e confirmar premindo a tecla ENTER (↵)
- Seleção do ponto do submenu Idioma com as teclas de setas (⇑) e confirmar premindo a tecla ENTER (↵) até o cursor saltar para o valor de definição
- Definir o idioma desejado com as teclas de setas (⇑ e ⇓)
- Confirmar o idioma selecionado com a tecla ENTER (↵) ou cancelar através da tecla ESC

NL

Instelling van de taal
De taal kan worden ingesteld na een nieuwe start van de warmtepompmanager of in het menu Instellingen.

- Houd de MENUE-toets enkele seconden lang ingedrukt
- Kies de menuoptie Instellingen en bevestig de keuze met de ENTER-toets (↵)
- Kies de submenuoptie Taal met de pijltjestoets (⇑) en bevestig de keuze met de ENTER-toets (↵) tot de cursor naar de instelwaarde springt
- Stel de gewenste taal in met pijltjestoetsen (⇑ en ⇓)
- Bevestig de gekozen taal met de ENTER-toets (↵) of annuleer met de ESC-toets

FI

Kielen valinta
Kieli voidaan valita lämpöpumpun ohjausyksikön uudelleenkäynnistyksen jälkeen tai asetusvalikon kautta.

- Pidä MENUE-näppäintä alhaalla muutaman sekunnin ajan
- Valitse valikkokohta Asetukset ja vahvista painamalla ENTER-näppäintä (↵)
- Valitse valikosta alakohta Kieli nuolinäppäimillä (⇑) ja vahvista painamalla ENTER-näppäintä (↵), jolloin kursori siirtyy asetettavaan arvoon
- Valitse haluamasi kieli nuolinäppäimillä (⇑ ja ⇓)
- Vahvista valitsemasi kieli painamalla ENTER-näppäintä (↵) tai hylkää painamalla ESC-näppäintä

DK

Indstilling af sprog
Det er muligt at indstille sproget efter en ny start af varmepumpestyringen eller i menuen Indstillinger.

- MENUE-tasten holdes inde i nogle sekunder
- Vælg menupunktet Indstillinger og bekræft ved at trykke på ENTER-tasten (↵)
- Valg af undermenupunktet Sprog med piltasten (⇑) og bekræft ved at trykke på ENTER-tasten (↵), indtil cursoren går til indstillingsværdien
- Indstil det ønskede sprog ved hjælp af piltasterne (⇑ og ⇓)
- Bekræft det valgte sprog med ENTER-tasten (↵) og eller fortryd ved at trykke på ESC.

ES

Ajuste del idioma
El idioma se puede ajustar después de reiniciar el controlador de la bomba de calor o en el menú "Ajustes".

- Mantener pulsada la tecla MENUE durante algunos segundos.
- Selección de la opción de menú "Ajustes" y confirmar pulsando la tecla ENTER (↵)
- Selección de la opción de submenú "Idioma" con las teclas de flecha (⇑) y confirmar pulsando la tecla ENTER (↵) hasta que el cursor salte al valor de ajuste
- Ajustar el idioma deseado con las teclas de flecha (⇑ y ⇓)
- Confirmar el idioma seleccionado con la tecla ENTER (↵) o rechazarlo con la tecla ESC

TR

Dil ayarı
Dil ayarı, ısı pompası kontrol ünitesi yeniden başlatıldıktan sonra veya Ayarlar menüsünden gerçekleştirilebilir.

- MENUE tuşu birkaç saniye süreyle basılı tutulmalıdır
- Ayarlar menü noktası seçilmeli ve ENTER tuşuna (↵) basılarak seçim onaylanmalıdır
- Ok tuşları (⇑) ile Dil alt menü noktası seçilmeli ve imleç istenen ayar değerine geldiğinde ENTER tuşuna (↵) basılarak seçim onaylanmalıdır
- Ok tuşları (⇑ ve ⇓) ile tercih edilen dil ayarı yapılmalıdır
- Yapılan dil seçimi ENTER tuşuna (↵) basılarak onaylanmalıdır, iptal etmek için ESC tuşuna basılmalıdır

NO

Stille inn språket
Man kan innstille språket etter oppstart av varmepumpestyring eller i menyen Innstillinger.

- Hold MENUE-tasten inne i noen sekunder.
- Velg menypunktet Innstillinger og bekreft ved å trykke på ENTER (↵)
- Velg undermenypunktet "Språk" med piltastene (⇑) og bekreft ved å trykke på ENTER (↵) til kursøren treffer innstillingsverdien
- Still inn ønsket språk med piltastene (⇑ og ⇓)
- Bekreft språket som du valgte med ENTER-tasten (↵), eller forkast det med ESC-tasten

RU

Языковые настройки
Выбрать язык можно после перезапуска системы управления тепловым насосом или в меню «Настройки».

- Удерживать нажатой клавишу «Меню» (MENUE) в течение нескольких секунд.
- Выбрать пункт меню «Настройки» и подтвердить выбор нажатием клавиши «Ввод» (ENTER) (↵).
- При помощи клавиш со стрелками (⇑) выбрать подпункт меню «Язык» и подтверждать нажатием клавиши «Ввод» (ENTER) (↵), пока курсор не достигнет регулируемого параметра.
- Выбрать желаемый язык при помощи клавиш со стрелками (⇑ и ⇓).
- Подтвердить выбранный язык при помощи клавиши «Ввод» (ENTER) (↵) или отменить выбор при помощи клавиши выхода (ESC).

RO

Setarea limbii
Setarea limbii este posibilă după restartarea managerului pompei de căldură sau din meniul Setări.

- Menţineţi apăsată tasta MENUE timp de câteva secunde
- Selectaţi Setări din punctele meniului şi confirmaţi prin apăsarea tastei ENTER (↵)
- Selectaţi Limba din punctele submeniului cu ajutorul tastelor săgeată (⇑) şi confirmaţi prin apăsarea tastei ENTER (↵) până când cursorul ajunge la valoarea setată
- Setaţi limba dorită cu ajutorul tastelor săgeată (⇑ şi ⇓)
- Confirmaţi limba selectată cu ajutorul tastei ENTER (↵) sau renunţaţi cu ajutorul tastei ESC

JP

言語の設定
言語の設定はヒートポンプマネージャーの再起動後に行うか、あるいは設定メニューから行うことができます。

- MENUE キーを数秒間押し続けます
- 設定のメニュー項目の選択し、ENTER キー（↵）で確定します
- 言語のサブメニュー項目を矢印キー（⇑）で選択し、ENTER キー（↵）で確定します
- 希望の言語を矢印キー（⇑および⇓）で設定します
- 選択した言語を ENTER キー（↵）で確定、または ESC キーで拒否します

Table of contens

1 Preconfiguration

The preconfiguration informs the heat pump manager which components are connected to the heat pump heating system. Preconfiguration must be carried out before the system-specific settings, in order to show or hide menu items (dynamic menus).
The following table shows not only the menu structure and explanations in the right-hand column, but also the corresponding setting ranges. Values shown in bold print indicate the factory settings.
The factory settings in the "Preconfiguration" menu correspond to the integration diagram for a mono energy heat pump (normally an air-to-water heat pump) with 1 compressor and one heating circuit without domestic hot water heating using the heat pump.

1.1 Commissioning

After starting the heat pump manager, the following settings must be made. On setting the standard heat output, pre-settings are made which refer to the type of heat pump. This setting is automatically omitted if a standard heat output has already been set.

Selection	Preconfiguration of all system components for dynamic menu structuring	Setting range	Display
language	The language for menu navigation can be selected from the available languages. The 'ENTER' key can be used to select the desired language and the arrow key ↑ can be used to change the language. The 'ENTER' key is used to confirm the selection and the 'ESC' key is used to cancel the selection. Additional languages are available from the after-sales service via Smart Key.		When switching on the voltage, always for 1 min.
heat pump code see type plate	During the first startup of the heat pump manager, the heat pump type must be entered with a 4-digit code that can be found on the type plate. The 'ENTER' key is used to confirm the selection and the 'ESC' key is used to cancel the selection.	**0** other standard output 1001 ... 8999	Always when switching on the voltage, if no heat pump code has been selected.
start mask	Settings and displays Date, time and current operating mode Outside temperature display Status display of the HP with error messages Setting for heating, adapted to heating circuit 1 control setting as parallel shift, fixed-setpoint or room set temperature Setting the number of days on holiday or party hours with activated Holiday or Party operating mode		always
master control	Settings and displays for the master control		master control
hot water set temperature	Sets the desired domestic hot water temperature	30 °C **...60 °C...** 85 °C	domestic hot water sensor
initial heating	Display of information on a running initial heating program Which initial heating program is currently running? Start date of the initial heating Current step / number of steps required Current status of the initial heating program Current return temperature / required return temperature Number of hours passed / number of hours required		initial heating active
high pressure	Which safety unit led to the high-pressure switch-off?	sensor pressure switch flow ODU	high pressure switch-off active

Selection	Preconfiguration of all system components for dynamic menu structuring	Setting range	Display
low press.	Which safety unit led to the low pressure cut-off?	sensor pressure switch flow frost protection refrigeration	low pressure cut-off active
block since	Which block is currently active and since when has it been active.		block active
block	Which block is currently active and how long will it remain active for. This calculation is only possible with individual blocks, e.g. minimum pause time or switch cycle block.		block active Remaining runtime can be calculated
EvD	Display of a detailed error code for the EvD		HP with EvD fault evd
ventilation	Selection of the ventilation level Display of the current status message for the ventilation unit Display of a detailed error code for the ventilation unit		ventilation active
ODU	Display of a detailed error code for the ODU		ODU HP

1.2 Menu

Certain menu items and/or possible settings may be omitted depending on the type of heat pump and the connected hardware.

The preconfiguration menu can be accessed by:

- Simultaneously pressing (for approx. 5 seconds) the button combination (ESC) and (MENU).
- The preconfiguration is exited via the (ESC) button.

The following presettings must be carried out:

Preconfiguration	Preconfiguration of all system components	Setting range
operating mode	*monovalent* (heat pump as sole heat generator), *mono energy* (heat pump and electric heating/immersion heater), *bivalent* (heat pump or/and boiler), *bivalent-renewable* (heat pump and/or ren. heat source)	monovalent **mono energy** bivalent bivalent-renewable
electrical heater	electrical heater Is an immersion heater installed in the buffer that is used as heating support? Is a pipe heater installed that can be used for heating, domestic hot water or swimming pool reheating?	**none** IH in tank / heating pipe heater / heating + DHW + SPW pipe heater / heating
therm.ener. meter	Has the system got an external thermal energy meter WMZ25 or WMZ32? The thermal energy meter emits a pulse of at least 2 seconds per kWh. The pulses are added together depending on the operating mode.	**no** / yes
additional heat exchanger	Is the additional heat exchanger that is integrated into the heat pump connected for waste heat recovery (domestic hot water / swimming pool)?	**no** / yes
therm.ener. meter additional heat exchanger	Is a thermal energy meter WMZ25 or WMZ32 available for domestic hot water or swimming pool water preparation via the additional heat exchanger?	**no** / yes
solar control internal	Is an EconSol solar controller present and connected with the heat pump manager?	**no** / yes
ground regeneration	Is ground regeneration possible via the EconSol solar controller?	**no** / yes
ventilation	Is a decentral ventilation unit present and connected with the heat pump manager?	**no** / yes
network operation parallel connect.	Are several heat pumps running parallel in a network?	**no** / yes
parallel connect. hot water swimming pool	Is the master control to take on a central or decentralised function in network operation in relation to swimming pool water and domestic hot water preparation?	**central** / decentral
4 way valve external	Is an external four-way valve installed in the heat pump heating system for optimized heating and cooling operation? (Observe the installation instructions for four-way valves!)	**WITHOUT (cooling + heating)** WITH (cooling + heating) WITHOUT (heating only)
design hydraulic	How is the heating water flow guaranteed by the heat pump in the heat pump heating system?	**with M13** / with M16
cooling active	Will the active cooling function of the reversible heat pump be used?	**yes** / no
cooling passive	Is a passive cooling controller connected to the heat pump manager?	**no** / yes
cooling passive system design	Is a two or four-pipe system used for passive cooling?	**2-pipe system** 4-pipe system
heating circuit 1	Is heating circuit 1 also used for dynamic or silent cooling?	**heating** heating/dyn. cooling heating/silent cooling

Preconfiguration	Preconfiguration of all system components	Setting range
heating control by	The following heating control options can be selected for heating circuit 1: ♦ Return flow temperature regulation based on the outside temperature and the set heating curve ♦ Return temperature regulation via a fixed-setpoint ♦ Return temperature regulation based on the room temperature in a reference room	**external temp.** fixed-setpoint room temperature
heating room control	What hardware is used for the heating room control?	**RTM Econ** RT/RTH Econ R13
cooling room control	What hardware is used for the cooling room control?	**RTM Econ** RCC
numbers room control	How many RTM Econ are used for heating circuit 1?	**1** ... 10
heating circuit 2	How is heating circuit 2 used?	**no** heating heating/silent cooling silent cooling
heating control by	The following heating regulation options can be selected for heating circuit 1: ♦ Return temperature regulation based on the outside temperature and the set heating curve ♦ Return temperature regulation via a fixed-setpoint ♦ Return temperature regulation based on the room temperature in a reference room	**external temp.** fixed-setpoint room temperature
cooling room control	What hardware is used for the cooling room control?	**RMT Econ** RCC
numbers room control	How many RTM Econ are used for heating circuit 3?	**1** ... 10
heating circuit 3	How is heating circuit 3 used?	**no** heating heating/silent cooling silent cooling
heating control by	The following heating regulation options can be selected for heating circuit 1: ♦ Return temperature regulation based on the outside temperature and the set heating curve ♦ Return temperature regulation via a fixed-setpoint ♦ Return temperature regulation based on the room temperature in a reference room	external temp. fixed-setpoint room temperature
cooling room control	What hardware is used for the cooling room control?	**RMT Econ** RCC
numbers room control	How many RTM Econ are used for heating circuit 2?	**1** ... 10
hot water	Is domestic hot water preparation carried out with the heat pump? Is a thermostat or a sensor used for this purpose?	**no** yes with a sensor yes with a thermostat
hot water flange heater	Has a flange heater for reheating and thermal disinfection been installed in the domestic hot water cylinder?	no / yes
hot water circulation	Is a circulation pump present and is it controlled via the heat pump manager? Does it activate a pulse or time function?	**no** yes (pulse) yes (time)
swimming pool	Is swimming pool water heating carried out with the heat pump? Is a thermostat or a sensor used for this purpose?	**no** yes with a sensor yes with a thermostat

1.3 Coding

Following resumption of the power supply, the heat pump manager automatically identifies the type of heat pump connected. A special coding resistance is installed in every heat pump for this purpose, according to the following table:

⚠ ATTENTION!

An air-to-water heat pump with defrosting via reverse circulation is only identified if no sensor is connected to input N1-J6/B7. (Brine limit protection for BW or WW HP)

Heat pump type	Coding resistor Controller with removable control panel
Air-to-water heat pump with defrosting via reverse circulation	∞
Brine-to-water or water-to-water HP (display for HP with wall-mounted controller)	0 Ω
Brine-to-water HP (display for HP with integrated controller)	40.2 kΩ
Water-to-water HP (display for HP with integrated controller)	49.9 kΩ
High temperature air-to-water HP	63.0 kΩ
Reversible air-to-water HP	28.7 kΩ
Reversible brine-to-water HP	19.6 kΩ
Reversible water-to-water HP	33.2 kΩ
Air/water HP with hot gas defrosting	14.7 kΩ

i NOTE

Before setting the heat pump manager, check the heat pump type coding in the “Operating data" menu. Coding is defined when the voltage is recovered. If the message "Coding, HP fault" appears in the display, the (ESC) button must be pressed.

2 Configuration

The extended configuration level for the installer contains the following menus: "Settings", "Operating data", "History", "Network", "Inputs", "Outputs" and "Special function". The "Operating data", "History" and "Network" menus are described in the user guide.

You can access extended installation level by

- simultaneously pressing (approx. 5 seconds) the key combination (MENU) and (ENTER↵)
- select the menu item "Settings" with the arrow buttons and confirm with the ENTER button (↵)

2.1 Settings

Depending on the system configuration, the full "Settings" menu contains the following inquiries:

Settings	System-specific parameters	Setting range
date weekday time clock change	Sets the year, day, month, weekday and time. The time can be switched between summer and winter time with the clock change option.	01.01.11 MO … SU **00:00** ... 23:59 yes / **no**
mode	Mode operation settings	
operating mode	Mode operation selection. Changes can be made directly using the mode button. auto mode can only be selected if the outside temperature-dependent mode operation switching is activated.	summer winter vacation party HG 2 cooling **auto**
operating mode switching ext.temp.dependent □ time	When the outside temperature-dependent operating mode switching is activated, the mode operation is changed automatically depending on an adjustable limit temperature. A change takes place if the limit temperatures are exceeded or undercut for the set time.	**1 h**…150
external temp. heating < cooling >	Limit temperatures at which the heat pump mode operation switches automatically. The summer operating mode is active between the limit temperatures.	-30 … **15 °C** … 40 -30 … **25 °C** ... 40
party mode numbers hours	Duration of party mode in hours. After the set period has elapsed, the system returns automatically to automatic operation. The value for the raise is set in the menu heating circuit 1 – raise.	0 ...**4 hours**… 72
vacation mode numbers days	Duration of vacation mode in days. After the set period has elapsed, the system returns automatically to automatic operation. The value for lowering is set in the menu heating circuit 1 – lower.	0 ...**15 days**… 150
heat pump		
compressor numbers	This setting of the number of compressors is dependent on the heat pump type. For the relevant number, refer to the operating and installation instructions of the heat pump or the heat pump's type plate.	**1** / 2
limit temperature compressor 2	The limit temperature of compressor 2 must be selected according to the design of the heat pump heating system. Below the compressor 2 limit temperature, the heat pump runs with 2 compressors for heating the building. Compressor 2 is only switched on when the temperature falls below the set limit temperature parallel and performance level 2.	limit temperature parallel ... **+35 °C** … +99
fan	Settings for lowering the fan speed. Lowering causes an output reduction of approx. 15%.	
lower time 1 time 2	Settings of times during which the fan speed is to be lowered.	**00:00** ... 23:59

Settings	System-specific parameters	Setting range
lower MO ... SU	For each weekday, it is possible to select whether Time 1, Time 2, no time or both times are active when the fan speed is lowered. Operations to lower the fan speed that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
lower	Value for lowering the fan speed during cooling. A fixed value applies during heating.	0.0 … **1.0 V** … 1.5
lower cooling		
heat pump code see type plate	The 4-digit heat pump code printed on the type plate can be corrected with these setting.	
brine limit prote	Setting the lower operating limit for using ground water as heat source or for waste heat recovery via intermediate heat exchanger. Depending on the heat pump type, the operating range (brine) of the heat source can be expanded according to need. In this case, the minimum brine concentration must be adjusted to 30 %.	15 ... **-9 °C** … -13
flow rate switch primary side	Does flow rate monitoring take place in the primary circuit?	**no** / yes
flow rate switch secondary side	Does flow rate monitoring take place in the secondary circuit?	**no** / yes
2nd heat generat.		
limit temperature parallel	The limit temperature of the 2nd heat generator must be selected according to the design of the heat pump heating system. Below the limit temperature parallel, the heat pump and the 2nd heat generator runs for heating the building. The 2nd heat generator is only switched on when the temperature falls below the set limit temperature parallel and performance level 3. If parallel operation is not desired, the limit temperature parallel should be adapted to the limit temperature alternative.	limit temperature alternative ... **-5 °C** … limit temperature compressor 2
limit temperature alternative	If the limit temperature alternative and performance level 3 are undercut, only the 2nd heat generator is used for heating the building. The heat pump is blocked from this point	lower operating limit ... **-10 °C** … limit temperature parallel
operating mode	A variably-regulated (sliding) 2nd heat generator has its own regulation. Full volume can flow through it when required. A constantly-regulated 2nd heat generator is set to a constant temperature. The mixer regulation is active.	**gliding (valve)** constant (mixer)
mixer runtime	The runtime between the OPEN and CLOSED end positions varies according to the mixer used. The mixer runtime should be adjusted to ensure optimum temperature regulation.	1 ... **4 minutes** … 6
mixer hysteresis	The mixer hysteresis forms the neutral zone for operation of the 2nd heat generator. If the set temperature plus hysteresis is reached, a "Mixer closed" signal is generated. If the set temperature minus hysteresis is undershot, a "Mixer open" signal is generated.	0.5 …**2K**
utility block release	This setting specifies the behaviour of the 2nd heat generator during a utility block (interruption of the supply voltage) (Cap. 5.2.1 on page 26). Performance level 3: The 2nd heat generator is only released in performance level 3 during the utility block. The immersion heater of mono energy systems is always blocked. Permanent: The 2nd heat generator is released during the utility block. Limit temp.-dependant: The 2nd heat generator is enabled during the utility block if the limit temperature is also undershot.	**Performance level 3** permanent limit temp.-dependant
utility block limit temperature	Limit temperature for releasing the 2nd heat generator when setting limit temp dependent.	-10 ... **0 °C** … +10

Settings	System-specific parameters	Setting range
special program	The special program should be used for old boilers or bivalent systems with main cylinders to help prevent corrosion caused by condensation. When the 2nd heat generator is released, it remains in operation for at least the number of hours set.	0 ... **1 hour** … 99
heating bivalent-renewable	Temperature difference between renewable cylinder and flow temperature that must be overshot if the heat pump is to be blocked when a heating request is pending. *Comfort:* A renewable heating block is only active when the temperature in the renewable cylinder is higher than the current return set temperature minus hysteresis. *Energy optimised:* A renewable heating block is dependent on the return set temperature.	2 ... **10 K** ... 20 **comfor**t / energy optim.
hot water bivalent+renewable	Temperature difference between renewable cylinder and domestic hot water temperature that must be overshot if the heat pump is to be blocked when a domestic hot water request is pending.	2 … **5 K** … 50
swimming pool bivalent+renewable	Renewable cylinder temperature that must be overshot if the HP is to be blocked when a swimming pool water request is pending.	10 … **35 °C** … 50
solar		
tank charging switch on difference	Temperature difference between the collector and the cylinder at which charging is activated	1 … **6 K** …30
maximum tank temperature	Maximum cylinder temperature In areas with very hard water, it is advisable to lower the cylinder temperature.	30 … **85 °C** … 95
collector cooling function	Before the stagnation temperature is reached, the maximum cylinder temperature is raised by 5K in order to cool the collector through heat loss in the cylinder and the pipes.	**no** / yes
maximum brine temperature	Maximum brine temperature up to which solar regeneration should take place	0 … **22 °C** … 65
pump kick solar pump	Advisable if the collector is shaded	**no** / yes
thermal energy volume flow	Nominal volume flow in the collector circuit	**0.0 l/min** … 10.0
thermal energy glycol type	Is monoethylene glycol or propylene glycol mixed in?	**propylene** / monoethylene
thermal energy glycol cocentrat.	Proportion of glycol in the solar collector fluid (as a percentage)	0 / 10 / 20 / 30 / **40 %**
thermal energy reset	Current errors from the solar function can be reset here	**no** / yes
fault reset	Current errors from the solar function can be reset here	**no** / yes
ventilation		
level preset minutes	Selection of the ventilation level for the connected ventilation unit	off automatic level 1 level 2 level 3 Pulse ventilation 1 minutes … 99
heating/cooling		
hysteresis return set temp.	The return set temperature hysteresis forms the neutral zone for operation of the heat pump. If the "Return set temperature plus hysteresis" is reached, the heat pump switches itself off. If the "Return set temperature minus hysteresis" is reached, the heat pump switches itself on.	0.5 … **2.0K** … 5.0

Settings	System-specific parameters	Setting range
heating compressor 2 limit temperature	The limit temperature of compressor 2 must be selected according to the design of the heat pump heating system. Below the compressor 2 limit temperature, the heat pump runs with 2 compressors for heating the building. Compressor 2 is only switched on when the temperature falls below the set limit temperature parallel and performance level 2.	*limit temperature parallel* ... **+35°C** … +99
cooling compressor 2 limit temperature	The limit temperature of compressor 2 must be selected according to the design of the heat pump heating system. Below the compressor 2 limit temperature, the heat pump runs with 2 compressors for heating the building. Compressor 2 is only switched on when the temperature falls below the set limit temperature parallel and performance level 2.	15 ... **+15°C** … +99
cooling 2nd cool generat.	Setting to specify whether a second refrigerator is to be used in the system.	**no** / yes
cooling limit external temperature	Setting of the outside temperature below which the cooling operation is terminated in the case of reversible brine HPs or passive cooling.	-20 ... **3°C** … 35
cooling passive hysteresis	If the current return set temperature for cooling minus the passive hysteresis is greater than the current set temperature, passive cooling occurs.	0.1 … **2.0K** … 9.9
heating room control I: P:	Settings for control when room temperature control is selected during heating I * Amplification factor minimum number of minutes / maximum number of minutes P * Amplification factor (grade rule) value after voltage recovery in % between 18°C and 50°C	0 … **4** … 9 0 ... 30 … 999 / 0 … 120 … 999 0 … **1** … 9 0 … **10%** … 99
heating room control ventilation reset	Reset ventilation function	**no** / yes
cooling room control	Sets the I ratio when room temperature control is selected during cooling	001 … 060 … 999
heat/cool circ. 1		
heating curve end point (-20 °C)	The heating curve end point should be set according to the design of the heat pump heating system. This should be done by entering the maximum return set temperature, which is the product of the maximum calculated flow temperature minus the temperature difference in the heating system (spread).	20 … **30 °C** … 70
fixed-setpoint return set temp.	Sets the desired return set temperature when fixed setpoint control is selected	min.set temp. … **40 °C** … 60
room control room set.temp.	Sets the desired room set temperature and I ratio when room temperature control is selected	15.0 … **20.0 °C** … 30.0 001 … **060** … 999
heating circuit 1 minimum return temperature	Setting the minimum return set temperature for heating operation. When the reference room is activated, you can select whether the minimum return set temperature adapts automatically to the set room set temperature (Cap. 3.2 on page 23).	**manual** / automatic 15 … **20 °C** … 30
maximum return temperature	Different maximum temperatures are permissible for panel and radiator heating systems. The upper limit of the return set temperature can be set between 25°C and 70°C.	25 … **50 °C** … 70
hysteresis mixer	The mixer hysteresis forms the neutral zone for operation of the 2nd heat generator. If the set temperature plus hysteresis is reached, a "Mixer closed" signal is generated. If the set temperature minus hysteresis is undershot, a "Mixer open" signal is generated.	0.5 … **2.0 K** … 5.0
runtime mixer	The runtime between the OPEN and CLOSED end positions varies according to the mixer used. The mixer runtime should be adjusted to ensure optimum temperature regulation.	1 ... **4 minutes** … 6
heating circuit 1 room control limit temperature	Below the set limit temperature room control, the rooms with a low room set temperature are taken into account for overheating if a Smart Grid function is activated.	15 … **19°C** … 30

Settings	System-specific parameters	Setting range
heating circuit 1 room control hysteresis	To prevent unnecessary activation of the control valves, the hysteresis can be adapted for opening and closing the control valves depending on the room set temperature in relation to the actual room temperature.	0.0 … **0.5K** … 2.0
heating circuit 1 room control flow	It is possible to select whether the flow temperature required for the mixer takes place automatically, via the determined spread of the system, or manually.	manual / **automatic** 0 … **5K** … 10
lower	Settings to lower the heating characteristic curve of heating circuit 1.	
time 1: time 2:	Sets the times during which the temperature in heating circuit 1 is to be lowered.	**00:00** ... 23:59 **00:00** ... 23:59
lower value	Sets the temperature value the heating characteristic curve of heating circuit 1 is to be lowered by during a lower process.	**0K** … 19
MO ... SU	For each weekday, it is possible to select whether time 1, time 2, no time or both times are active when the temperature is lowered. Operations to lower the fan speed that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
raise	Settings to raise the heating characteristic curve of heating circuit 1.	
time 1: time 2:	Sets the times during which the raise for heating circuit 1 should take place.	**00:00** ... 23:59 **00:00** ... 23:59
raise value	Sets the temperature value by which the heating characteristic curve of heating circuit 1 is to be raised during a raise process.	**0K** … 19
MO ... SU	For each weekday, it is possible to select whether time 1, time 2, no time or both times are active during a raise. Operations to raise the temperature that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
dynamic cooling return set temp.	Sets the desired return set temperature when dynamic cooling is selected. The return nominal value is adapted linear to the outside temperature. A characteristic line is used for this purpose, which is set at two specific operating points. The return nominal value is determined at the fixed outside temperatures of 15°C and 35°C.	10 … **15 °C** … 30 10 … 15 °C … 30
block	Sets the time programs for dynamic cooling	
time 1: time 2:	Sets the times during which dynamic cooling is blocked.	00:00 ... 23:59 00:00 ... 23:59
MO ... SU	For each weekday, it is possible to select whether time 1, time 2, no time or both times are active for a block. Blocks that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
silent cooling room set.temp.	Sets the room set temperature for silent cooling. The actual value is measured by room climate station 1.	15.0 … **20.0 °C** … 30.0
silent cooling dew point distance	Raises the minimum permissible flow temperature calculated from the measured values from room climate station 1. A raised value reduces the risk of condensate forming.	1.5 … **3.5 K** … 5.0
heat/cool circ. 2/3		
temperat. sensor	Is the sensor installed in the flow or return for heating circuit 2/3? When setting the return, the calculated setpoint for heating circuit 2 is also used for the heat pump heating request. Setting the flow means it is only used for mixer control.	**return** / flow
heating curve end point (-20 C)	The heating curve end point should be set according to the design of the heat pump heating system. This should be done by entering the maximum flow or return temperature depending on the position of the sensor.	20 … **30 °C** … 70
heating curve colder warmer	Parallel shift of the set heating curve for heating circuit 2/3. By pressing the arrow keys once, the heating curve is shifted by 1K upwards (hotter) or downwards (colder).	indicator bar
fixed-setpoint set temperature	Sets the desired return set temperature when fixed setpoint control is selected	*min.set temp.*. … **40 °C** … 60

Settings	System-specific parameters	Setting range
heating circuit 2/3 minimum return temperature	Setting the minimum return set temperature for heating operation. When the reference room is activated, you can select whether the minimum return set temperature adapts automatically to the set room set temperature. (Cap. 3.2 on page 23)	**manual** / automatic 15 … 20°C … 30
maximum temperature	Different maximum temperatures are permissible for panel and radiator heating systems. The upper limit of the set temperature can be set to between 25 °C and 70 °C.	30 … **50 °C** … 70
hysteresis mixer	The set temperature hysteresis forms the neutral zone for operation of the heat pump.	0.5 … **2.0K** … 5.0
runtime mixer	The runtime between the OPEN and CLOSED end positions varies according to the mixer used. The mixer runtime should be adjusted to ensure optimum temperature regulation.	1 ... **4 minutes** … 6
heating circuit 2/3 room control limit temperature	Below the set limit temperature room control, the rooms with a low room set temperature are taken into account for overheating if a Smart Grid function is activated.	15 … **19°C** … 30
heating circuit 2/3 room control hysteresis	To prevent unnecessary activation of the control valves, the hysteresis can be adapted for opening and closing the control valves depending on the room set temperature in relation to the actual room temperature.	0.0 … **0.5K** … 2.0
heating circuit 2/3 room control flow	It is possible to select whether the flow temperature required for the mixer takes place automatically, via the determined spread of the system, or manually.	manual / **automatic** 0 … **5K** … 10
lower	Settings to lower the heating characteristic curve of heating circuit 2/3.	
time 1: time 2:	Sets the times at which the lower process for heating circuit 2/3 should take place.	**00:00** ... 23:59 **00:00** ... 23:59
lower value	Sets the temperature to raise the heating characteristic curve of heating circuit 2/3 is to be lowered by during a lower process.	**0 K** … 19
MO ... SU	For each weekday, it is possible to select whether Time 1, Time 2, no time or both times are active when the temperature is lowered. Operations to lower the fan speed that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
raise	Settings to raise the heating characteristic curve of heating circuit 2/3.	
time 1: time 2:	Sets the times at which the raise process for heating circuit 2/3 should take place.	**00:00** ... 23:59 **00:00** ... 23:59
raise value	Sets the temperature value by which the heating characteristic curve for heating circuit 2/3 should be raised during a raise process.	**0 K** … 19
MO ... SU	For each weekday, it is possible to select whether Time 1, Time 2, no time or both times are active during a raise. Operations to raise the temperature that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
silent cooling room set.temp.	Sets the room set temperature for silent cooling. The actual value is measured by room climate station 1/2.	15.0 … **20.0 °C** … 30.0
silent cooling dew point distance	Raises the minimum permissible flow temperature calculated from the measured values from room climate station 1/2. A raised value reduces the risk of condensate forming.	1.5 … **3.5 K** … 5.0
hot water		
switching compressor 2	For heat pumps with 2 compressors, this sets the outside temperature below which domestic hot water preparation is carried out with 2 compressors.	-30 … **-25 °C** … 35 *(10)*
hysteresis	The hysteresis of the domestic hot water set temperature forms the neutral zone below which a domestic hot water request will be issued.	2 … **7 K** … 15
parallel cooling-hot water	Does hydraulic isolation of the cooling circuit and the domestic hot water circuit allow for parallel operation of cooling and domestic hot water?	**no** / yes

Settings	System-specific parameters	Setting range
set temperature	Sets the desired domestic hot water set temperature.	30 ... **50 °C** … *85*
maximum temperat.	Sets the desired domestic hot water set temperature to be achieved in parallel operation.	30 … **60 °C** … 85
hot water	When a domestic hot water request is pending during heating operation, heat pumps with an additional heat exchanger allow the user to select whether domestic hot water preparation should have priority (convenience) or continue to take place parallel to heating operation (energy-optimised).	comfort / **energy optim.**.
hot water reheating	Sets whether the existing flange heater is also to be used for reheating. If set to "No", domestic hot water preparation only takes place to the current HP maximum temperature depending on the heat source temperature.	**no** / yes
block	Sets the time program for domestic hot water blocks.	
time 1: time 2:	Sets the times in which domestic hot water preparation is blocked.	**00:00** ... 23:59 **00:00** ... 23:59
MO ... SU	For each weekday, it is possible to select whether time 1, time 2, no time or both times are active for a block. Blocks that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
minimum temperature	Sets the domestic hot water set temperature which should be maintained even during a domestic hot water block.	0 … **10** … *Domestic hot water set temp.*
thermal disinfection	To carry out a thermal disinfection, the domestic hot water heating takes place once to the desired temperature. The heating period is terminated automatically when the set temperature is reached, at 12:00 p.m. or after 4 hours at the latest.	
start:	Sets the start time for the thermal disinfection.	**00:00** ... 23:59
temperature	Sets the desired domestic hot water set temperature which is to be reached during thermal disinfection.	**60 °C** … *85*
MO ... SU	For each weekday, it is possible to select whether thermal disinfection is desired at the set start time.	**N** / Y
circulation switch off delay	The circulation pump is started using a paddle flow switch, for example. When the paddle flow switch returns to the original position, the circulation pump operates for the duration of the set time.	1 ... **5 minutes** … 15
circulation	The circulation pump is controlled by a timer function.	
time 1: time 2:	Sets the times at which the circulation pump is to be activated.	**00:00** ... 23:59 **00:00** ... 23:59
MO ... SU	For each weekday, it is possible to select whether time 1, time 2, no time or both times are active for the circulation pump. Operations that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
HP max reset	By setting Reset to "Yes", the maximum calculated domestic hot water temperatures in heat pump operation are reset to a value of 65 °C. The setting is automatically reset to "No".	**no** / yes
swimming pool		
switching compressor 2	For heat pumps with 2 compressors, this sets the outside temperature below which swimming pool water preparation is carried out with 2 compressors.	-30 … **-25 °C** … 35 *(10)*
hysteresis	The hysteresis of the swimming pool set temperature forms the neutral zone below which a swimming pool water request will be issued.	0.0 … **0.5 K** … 10.5
set temperature	Sets the desired swimming pool set temperature.	5 … **25 °C** … 60
maximum temperat.	Sets the desired maximum swimming pool set temperature to be achieved.	30 … **60°C** … 85

Settings	System-specific parameters	Setting range
parallel cooling maximum temperat.	Sets the desired swimming pool set temperature during parallel cooling operation.	5 … **25 °C** … 60
waste heat use cooling	Sets whether the waste heat recovery during cooling is dependent on the switching status of the thermostat or in continuous operation.	**no** / yes
block	Sets the time programs for blocking swimming pool water preparation.	
time 1: time 2:	Sets the times for the swimming pool block.	**00:00** ... 23:59 **00:00** ... 23:59
MO ... SU	For each weekday, it is possible to select whether Time 1, Time 2, no time or both times are active for a block. Blocks that exceed a weekday are activated or deactivated at the end of each day accordingly.	**N** / T1 / T2 / Y
minimum temperature	Sets the swimming pool set temperature to be maintained even during a swimming pool block.	0 … **10** … DHW set temp.
priority	Sets the time programs for the prioritisation of swimming pool water preparation.	
start:	Sets the start time for the prioritisation of swimming pool water preparation.	**00:00** ... 23:59
no.of hours	Sets the desired number of hours of the prioritisation of the swimming pool water preparation.	**1 hour** … 10
MO ... SU	For each weekday, it is possible to select whether prioritisation is desired at the set start time.	**N** / Y
pump control	These settings must be selected according to the system hydraulics.	
☐ M16 function M13	Is the auxiliary circulating pump M16 to take on the function of the heat circulating pump M13?	¨
heating ☑ M13	Setting of the electronically regulated circulating pump M13 in heating operation	automatic level 1 level 2 level 3 manual 30 …**50 %**…100
cooling ☑ M13	Setting of the electronically regulated circulating pump M13 in cooling operation	automatic level 1 level 2 level 3 manual 30 …**50 %**…100
hot water ☐ M16	Setting the electronically regulated domestic hot water circulating pump M18. Should the auxiliary circulating pump operate during domestic hot water preparation?	automatic level 1 level 2 level 3 manual 30 …**50 %**…100 ¨

Settings	System-specific parameters	Setting range
swimming pool	Setting of the electronically regulated swimming pool circulating pump.	automatic level 1 level 2 level 3 manual 30 …**50 %**…100
☐ M16	Should the auxiliary circulating pump operate during swimming pool water preparation?	¨
renewable ☐ M16	Should the auxiliary circulating pump run during the renewable generator request?	þ
2nd heat generat. ☐ M16	Should the auxiliary circulating pump run during the 2nd heat generator request?	¨
passive cooling	Setting of the electronically regulated primary circulating pump M12 passive cooling	automatic level 1 level 2 level 3 manual 30 …**50 %**…100
☐ M11 ☐ M13	Should the primary circulating pump heat source M11 or the heat circulating pump M13 run during the passive cooling.	☐
M11	Setting of the electronically regulated primary circulating pump heat source M11.	automatic level 1 level 2 level 3 manual 30 …**50 %**…100
optimisat. heating pump	Should the heat circulating pump switches on and off as required? When the temperature falls below the set temperature, the heat circulating pump will run in continuous operation.	-10 …**3 °C**…35 (10)
pump forerun	Setting the flow time of the secondary pump before the compressor starts.	10 … **60 s** … 420
pump after run secondary pump	Setting the delay time for the secondary pumps once the compressor is switched off.	0 … **5 s** … 420
N1/Y1	Display which pump function is output as control voltage on the analogue output N1/Y1.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N1/Y1	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N1/Y1, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N1/Y2	Display which pump function is output as control voltage on the analogue output N1/Y2.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N1/Y2	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N1/Y2, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N1/Y3	Display which pump function is output as control voltage on the analogue output N1/Y3.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N1/Y3	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N1/Y3, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0

Settings	System-specific parameters	Setting range
N1/Y4	Display which pump function is output as control voltage on the analogue output N1/Y4.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N1/Y4	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N1/Y4, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N1/Y5	Display which pump function is output as control voltage on the analogue output N1/Y5.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N1/Y5	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N1/Y5, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N1/Y6	Display which pump function is output as control voltage on the analogue output N1/Y6.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N1/Y6	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N1/Y6, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N17.1/Y1	Display which pump function is output as control voltage on the analogue output N17.1/Y1.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N17.1/Y1	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N17.1/Y1, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N17.2/Y1	Display which pump function is output as control voltage on the analogue output N17.2/Y1.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N17.2/Y1	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N17.2/Y1, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N17.3/Y1	Display which pump function is output as control voltage on the analogue output N17.3/Y1.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N17.3/Y1	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N17.3/Y1, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
N17.4/Y1	Display which pump function is output as control voltage on the analogue output N17.4/Y1.	-- / M11 / M12 / M13 / M14 / M15 / M16 / M17 / M18 / M19 / M20 / M23 / M24
pump type	Display of the pump type on the analogue output N17.4/Y1	0-10V
pump stop	Setting of the voltage value for pump stop on the analogue output N17.4/Y1, see technical data of the pump manufacturer.	0.1 ... **0.7 V** ... 1.0
plant		
flex input N1/J5-ID4 digital	Input N1 J5-ID4 can be parametrized according to what function it should perform.	**frost protection** Vacation mode Domestic hot water block Summer mode
flex input N1/J5-ID1+2 digital	The inputs N1/J5-ID1+2 can be paramaterized according to what function they should perform.	thermostat Performance levels Smart Grid
language	The language for menu navigation can be selected from the available languages. The desired language can be selected by pressing the ENTER button. The 'ENTER' key is used to confirm the selection and the 'ESC' key is used to cancel the selection. Additional languages are available from the after-sales service via Smart Key.	

2.2 Outputs

Depending on the system configuration, the "***Outputs***" menu displays the "OFF" ☐ or "ON" ☑ and/or "Mixer open" ▲▼ or "Mixer closed" ⧗ for the outputs that are described below.

Outputs
heat pump
☐ compressor 1
☐ compressor 2
☐ fan / M11
heat pump
☐ 4 way valve
☐ nozzlering heater
plant
☐ M16
☐ Y12
☐ H5
passive cooling
☐ M12
☐ M17
☐ Y5
2nd heat generat.
☐ E10.1
☐ M21
renewable
☐ M21
ventilation bypass damper
heat/cool circ. 1
☐ M13
☐ M22
heat/cool circ. 2
☐ M15
☐ M22
heat/cool circ. 3
☐ M20
☐ M21
cooling
☐ N9
☐ E13
hot water
☐ M18
☐ E10
☐ M24
swimming pool
☐ M19
solar
☐ M23
☐ Y12

2.3 Inputs

Depending on the system configuration, the *"Inputs"* menu displays the "Contact open" ⌐‾ or "Contact closed" ⌐_ status display for the digital inputs that are described below.

Inputs	Status display of all digital inputs
pressure switch low press. high pressure	low pressure contact open = fault (setting LP pressure switch NC contact) high pressure contact open = fault (setting HP pressure switch NC contact)
pressure switch defrost end	contact closed = defrost end
monitoring flow rate primary secondary	contact open = fault
thermostat hot gas	thermostat hot gas contact open = fault
thermostat brine limit prote	brine limit protection thermostat contact open = fault
motor protect. compressor primary pump/fan	motor protection compressor/primary/fan contact open = fault.
block utility block external	 contact open = utility block contact open = external block
pressure switch low press. brine	low pressure switch brine contact open = fault
dew point monitor	dew point monitor contact closed = fault.
thermostat hot water	domestic hot water thermostat contact closed = domestic hot water demand
thermostat swimming pool	thermostat swimming pool contact closed = swimming pool demand
circulation demand	Contact closed = circulation pump demand

Heat pump type	High pressure pressure switch	Low pressure pressure switch
LI / LA	NO contact	NO contact
SI / WI	NO contact	NC contact
High temperature	NO contact	NC contact

Table 2.1: Switching mode of pressure switches for heat pumps with a manufacturing date before FD8404

2.4 Special functions

Depending on the system configuration, the "***Special functions***" menu contains the following options for changing the current operating states:

⚠ ATTENTION!

Special functions should only be activated by a technician to carry out a commissioning or an analysis of the heat pump system.

Special functions	Activation of special functions	Setting range
quick start	By activating the "quick start" function, the heat pump can start up after the safety-related periods have elapsed. A switching cycle block is overridden.	**no** / yes
lower operat. lim switch off	By activating the "Lower operating limit deactivate" function, the heat pump can start up after the safety-related periods have elapsed. The lower operating limit undershoot monitor is turned off.	**no** / yes
commissioning	By activating this function, defrosting is disabled for one hour in the case of air-to-water heat pumps. The 2nd heat generator is enabled. If defrosting is taking place, it will be terminated.	**no** / yes
system control	Function testing of pumps and mixer	
outputs M11 M18 M24	By activating this function, the pumps on the primary side are switched on constantly for a period of 24 hours. The heat pump remains blocked during this period.	**no** / yes **no** / yes
outputs M13/M15/M16	By activating this function, the pumps on the secondary side are switched on constantly for a period of 24 hours. The heat pump remains blocked during this period.	**no** / yes
mixer	By activating this function, the mixers are firstly moved in an OPEN and then in a CLOSED direction for the set mixer runtime.	**no** / yes
solar M23 Y11	By activating this function, the solar pump and the reversing valve can be switched on constantly for a period of 24 hours.	**no** / yes **no** / yes
functional check minutes start seconds	Activating this function activates a functional check for an adjustable number of minutes. In this time, individual output functions can be activated in the outputs. The heat pump remains blocked during this period.	1 … **30 minutes** … 60 **no** / yes 1 … **10 seconds** … 99
initial heating	Automatic program for targeted heat drying of screed floors	
maximum temperat.	Sets the maximum return flow temperature to be reached during initial heating.	25 … **35 °C** … 50
hot water swimming pool	Selecting this function will permit any request for domestic hot water or swimming pool water during initial heating.	**no** / yes
heating function	Activates the heating function program.	**no** / yes
standard program screed drying	Activates the standard program for screed drying.	**no** / yes
individual prog. heat up period	Sets the duration of the individual steps during the heating-up phase.	1 … **24** … 120
individual prog. maintaining period	Sets the maintaining time.	1 … **24** … 480
individual prog. heating-down period	Sets the duration of the individual steps during the heating-down phase.	1 … **24** … 120
individual prog. heat up difference temp.	Sets the temperature difference between the two steps in the heating-up phase.	1 … **5K** … 10
individual prog. heating-down difference temp.	Sets the temperature difference between the two steps in the heating-down phase.	1 … **5K** … 10
individual prog. screed drying	Activates the individual program for screed drying.	**no** / yes
service	Function for the heating technician	

3 Energy-efficient operation

If heating operation is carried out on the basis of the external temperature, the heat pump manager calculates a return set temperature from the set heating characteristic curve and the current external temperature.
The heating curve should be set to the maximum calculated return temperature of the heating system. By using the buttons Hotter (⇧) and Colder (⇩), the heating curve can be shifted upwards or downwards in parallel according to customer requirements to attain the actually desired room temperatures.

Regulation via return temperature

Regulating a heat pump heating system via the return temperature offers the following advantages:

1) Long runtimes for the heat pump, with all of the circulated heating volume heated according to need.
2) Measuring disturbance variables in the heating system.
3) A reduction in the temperature spread at a constant return temperature results in lower flow temperatures and thus in more efficient operation.

TIP

The heating curve should be set as high as necessary but as low as possible!

3.1 External temperature dependent heating curve

The heating curve must be adjusted - separately for heating circuit 1 and 2 / 3 - to suit the respective building and local conditions so that the desired room temperature is also attained when the external temperatures vary. If the external temperature rises, the return set temperature is lowered, thus ensuring energy-efficient operation of the heating system.
Make selections in the menu
„Settings – Heating circuit 1/2/3 – Control via – External temperature“. The desired heating curve can be set in the following menu item ***"Heating curve – End point".***

1) In the „***Settings - Heating curve end point“*** menu, the maximum required return temperature at an external temperature of -20 °C is entered. The aim is to attain an average constant room temperature even if the external temperatures vary.
2) All heating characteristic curves intersect at an external temperature of +20 °C and a return temperature of +20 °C. This means that at this operating point no more heat output is required. The indicator bar (Hotter ⇧ and Colder buttons ⇩) can be used to shift the operating point between 5 °C and 30 °C along the axis marked by a slope. This shifts the entire heating curve upwards or downwards in parallel, by a consistent amount of 1 K per indicator bar unit. The user can make this setting according to their individual temperature requirements.
3) Each heating curve is limited in an upward direction by the value set in ***"Settings – Heating circuit 1/2/3 – Heating curve maximum"***. In the downward direction, each heating curve is limited by the value 18 °C (air HP) or 15 °C (brine or water HP).

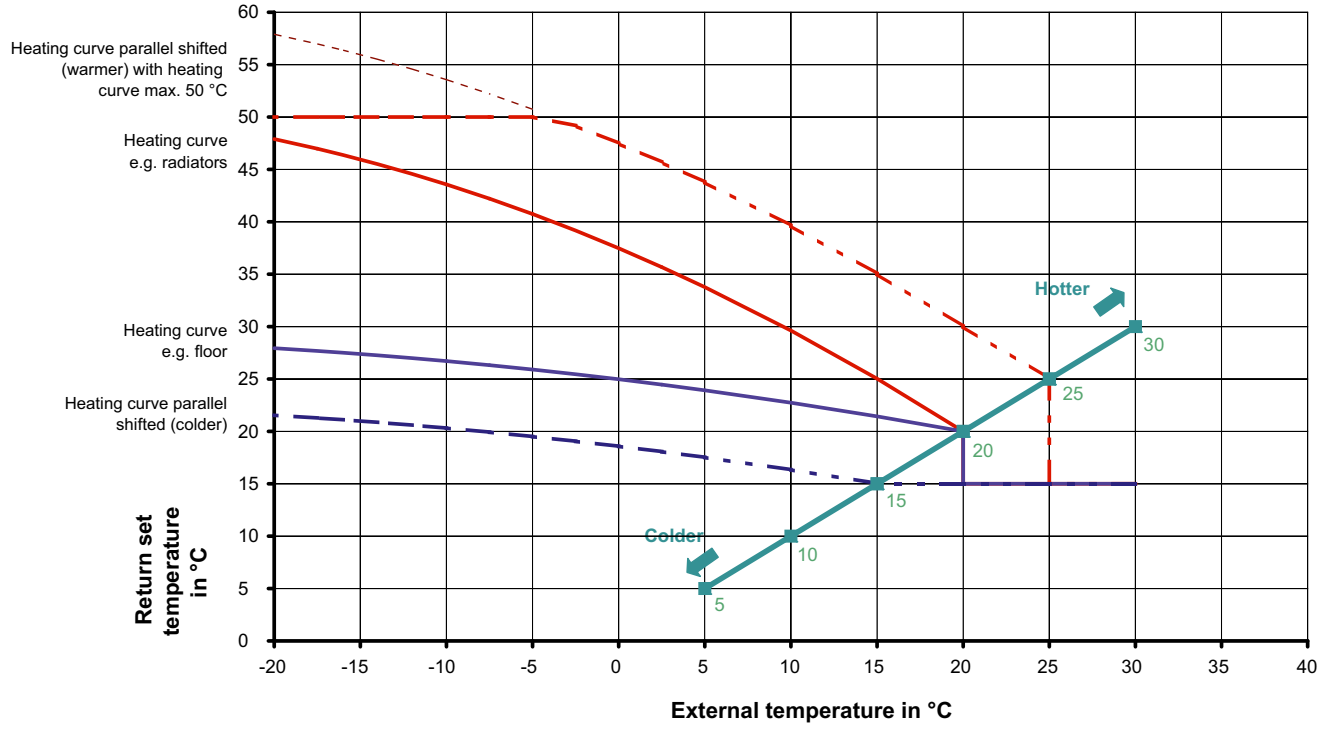


Fig. 3.1: Setting options for the heating curve

3.1.1 Setting examples

	Underfloor heating 35 °C/28 °C			Radiators 55 °C/45 °C		
Standard external air temperature in °C	-12	-14	-16	-12	-14	-16
Required flow temperature (at standard design temperature)	35 °C	35 °C	35 °C	55 °C	55 °C	55 °C
Temperature spread flow/return-flow	7 °C	7 °C	7 °C	10 °C	10 °C	10 °C
Required return temperature (at standard design temperature)	28 °C	28 °C	28 °C	45 °C	45 °C	45 °C
Setting for heating curve end point	**30 °C**	**29 °C**	**29 °C**	**48 °C**	**47 °C**	**46 °C**
	Example 1			**Example 2**		

A heat distribution system (e.g. underfloor heating) is dimensioned for a maximum flow temperature at a particular standard external temperature. This is dependent on the location of the heat pump and, in Germany, lies between -12 and -18 °C. The maximum return temperature to be set on the heating controller must be entered for an external temperature of -20 °C. This is done by entering the maximum return temperature for the given standard external temperature in Fig.3.2 on pag. 22. The setting at -20 °C can be read using the curves.

NOTE

Step 1:
Adjust the heating curve to suit the respective building and local conditions by setting the gradient (heating curve end point).
Step 2:
Set the desired temperature level via a parallel shift of the heating curve upwards or downwards (indicator bar).

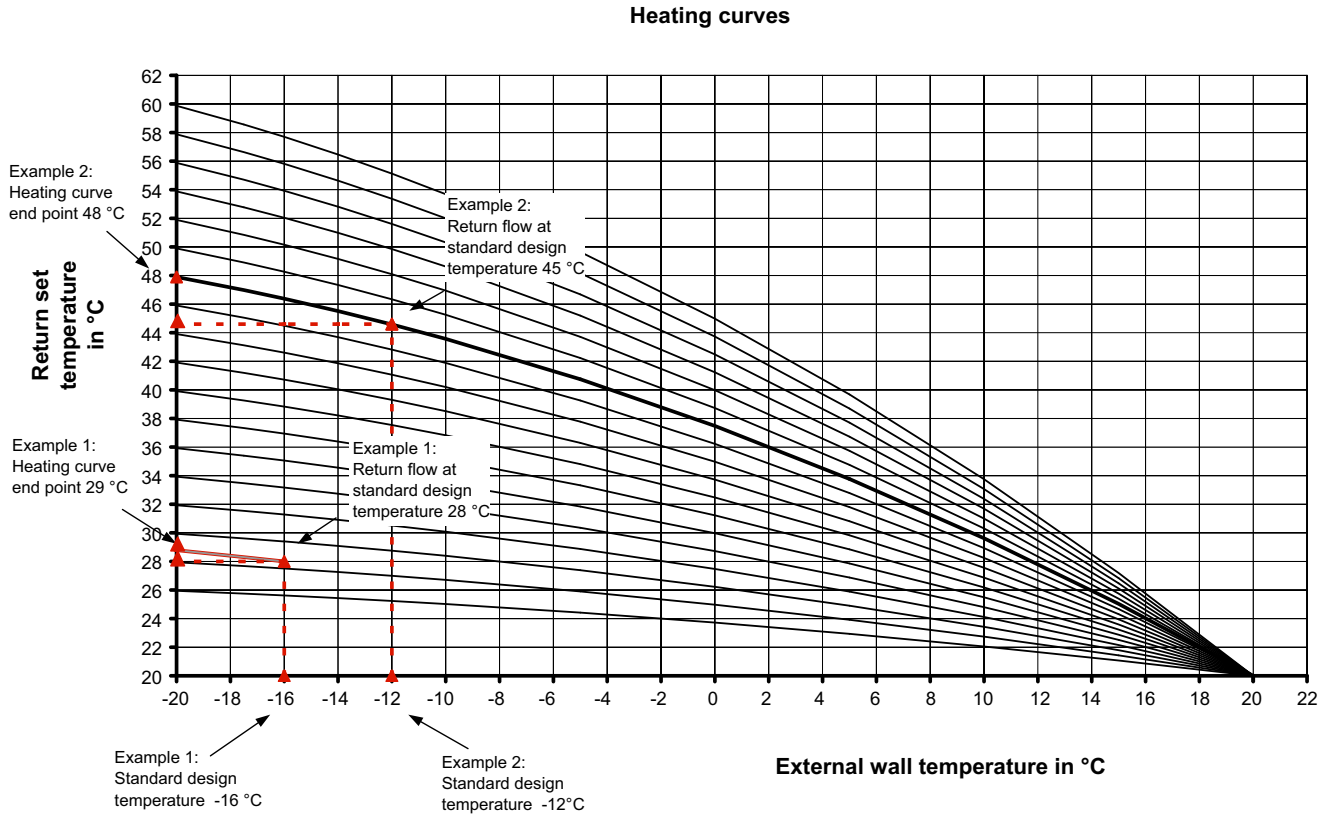


Fig. 3.2: Heating curves to calculate the max. return set temperature

3.1.2 Heating Curve Optimisation

There are two setting options for optimising the heating curve:

- Changing the gradient by means of a higher or lower "Heating curve end point"
- Raise and/or lower the entire heating curve by means of the buttons Hotter (⇑) and Colder (⇓)

If	External temperature		
	below -7 °C	-7 to +7 °C	above +7 °C
Too cold	Raise "Heating curve end point" value by 2 °C to 3 °C	Raise Hotter (⇑)/ Colder (⇓) by 1 °C to 2 °C	Raise Hotter (⇑)/ Colder (⇓) by 1 °C to 2 °C and lower value "Heating curve end point" by 2 °C to 3 °C
Too hot	Lower "Heating curve end point" value by 2 °C to 3 °C	Lower Hotter (⇑)/ Colder (⇓) by 1 °C to 2 °C	Lower Hotter (⇑)/ Colder (⇓) by 1 °C to 2 °C and raise "Heating curve end point" value by 2 °C to 3 °C

3.2 Room temperature controller

For well-insulated houses, open-plan designs or when heating large individual rooms, the return set temperature can be calculated using the room temperature in a reference room.
Make selections in the menu ***"Settings – Heating circuit 1 – Control by – Room temperature".***

Automatic controller action

The greater the deviation between the room temperature and the room set temperature, the faster the return set temperature is adjusted.
The response time can be changed by means of the adjustable interval value (I value) if required. The longer the response time, the slower the room set temperature is adjusted.
The minimum return set temperature adapts automatically to the set room temperature. If this is not desired, it can be changed from "automatic" to "manual" in the menu "***Settings - Heating circuit 1 - minimum return temperature***.

Prerequisites:

- For systems with silent cooling, the room climate control station or the reference room controller RTH Econ is used for room temperature measurement. For all other systems, an additional room sensor (R13) must be connected to the analogue input X3-R13.
- Deactivation of individual room control, if installed, in the reference room.
- The required return temperature in standard design temperature is recommended as the entry for a maximum return set temperature.
- Constant room set temperature with the elimination of as many raise and lower operations as possible

i NOTE

Activating the room temperature regulation or changing the room set temperature can initially result in the room temperature being exceeded.

3.2.1 Setting examples

Recommended settings for a room set temperature of 22 °C	Minimum return temperature	Maximum return temperature
Surface heater (35/28 °C) (floor, wall, ceiling)	22 °C	30 °C
Low temperature radiators (45/38 °C)	25 °C	40 °C
Radiators (55/45 °C)	30 °C	50 °C

To achieve optimum regulation, select as small a controlling range as possible between the minimum and maximum return temperature. Automatic operating mode switching makes it possible to set an external temperature above which heating operation is blocked.

3.2.2 Room temperature control optimisation

	1. Measure	2. Measure
Building too hot	Reduce the room set temperature	
Building is not heating up	Raise room set temperature, increase volume flow	Raise maximum return temperature
Reference room is warm, but individual rooms (e.g. bathroom) too cold	Carry out hydraulic equalisation (reduce volume flow in the reference room)	
Reference room is not reaching the room set temperature, but individual rooms (e.g. bathroom) are hot	Carry out hydraulic equalisation (raise volume flow in the reference room)	Raise maximum return temperature

3.3 Fixed-setpoint control

In special cases (e.g. heating a buffer to a constant temperature), it is possible to set a characteristic curve which is independent of the external temperature. Make selections in the menu ***"Settings – Heating circuit 1/2/3 – Control by – Fixed-setpoint"***. The desired return set temperature can be set in the following menu item ***"Fixed-setpoint Control – Return set temp."***.

4 Domestic hot water preparation

Domestic hot water cylinders with a sufficient heat exchange surface should be used for domestic hot water preparation. These must be capable of permanently transferring the maximum heat output of the heat pump.
Control is carried out using a sensor (R3) installed in the domestic hot water cylinder. The sensor is connected to the heat pump manager.
The temperatures attainable in heat-pump-only operation are below the maximum flow temperature of the heat pump.

For higher domestic hot water temperatures, the heat pump manager offers optional control of a flange heater.
Regulation can also be carried out using a thermostat. With this application, selective reheating using a flange heater is not possible.

NOTE

The additional setting options for heat pumps with an additional heat exchanger installed in the hot gas are described in Chapter Cap. 8 on page 36.

4.1 Basic heating

A request for domestic hot water is recognised if the current
Domestic hot water temperature < Domestic hot water set temperature - is domestic hot water hysteresis.
A request for domestic hot water is ended if either the domestic hot water set temperature or the maximum (Cap. 4.1.2 on page 24) HP temperature, as depending on the heat source, is reached.

NOTE

The domestic hot water preparation can be interrupted by defrosting or by the high pressure safety program.

Menu	Submenu	Set value
Preconfiguration	Domestic hot water preparation	Yes with a sensor
Preconfiguration	Flange heater	No

Table 4.1: Setting of base heating for domestic hot water

4.1.1 Attainable Domestic Hot Water Temperatures

The maximum domestic hot water temperature which can be attained with heat-pump-only operation is dependent on:

- The heat output of the heat pump
- The heat exchange surface installed in the cylinder and
- The volume flow in relation to the pressure drop and the capacity of the circulating pump.

4.1.2 Domestic Hot Water Temperatures Dependent on the Heat Source

The heat pump manager automatically calculates the maximum possible domestic hot water temperature. It is designated as the HP-maximum temperature.
The HP-maximum temperature is - along with the influencing factors described in Cap. 4.1.1 on page 24 - also dependent on the current temperature of the air, brine or water heat source. To ensure that the maximum possible domestic hot water temperature is always attained, the permissible range of the heat source temperature is divided into temperature ranges. Each range has a specific HPmaximum temperature and each HP maximum is pre-assigned a default value of 65 °C.
If the high pressure switch activates during domestic hot water preparation with the heat pump, the current heat source temperature is measured and the associated HP Maximum Temperature is calculated as follows:
1 K is deducted from the currently measured domestic hot water temperature and is stored as HP-maximum temperature.

4.2 Reheating

Reheating means that the heat pump undertakes domestic hot water preparation until the HP-maximum temperature is reached. After this, an additional heat generator takes over domestic hot water preparation until the desired domestic hot water set temperature is reached. The reheating is only activated if the desired set temperature is higher than the current HP-maximum temperature.
Reheating is activated whenever

- the domestic hot water temperature is above the maximum temperature attainable with the heat pump.

If the domestic hot water temperature falls below the domestic hot water set temperature – hysteresis DHW during reheating, the reheating process is stopped and basic heating is started using the heat pump.
Selection of the respective heat generator for domestic hot water generation is dependent on the operating mode of the heat pump heating system, the configuration, and the current statuses of the system.
Reheating must be enabled in the menu "Settings – domestic hot water reheating".

Menu	Submenu	Set value
Preconfiguration	Domestic hot water preparation	Yes with a sensor
Preconfiguration	Flange heater	Yes
Settings	Domestic hot water reheating	Yes

Table 4.2: Enabling of reheating of domestic hot water via a flange heater

4.3 Thermal disinfection

A start time is specified for the thermal disinfection. By starting the thermal disinfection, the system will immediately attempt to reach the set temperature. Selection of the domestic hot water generator used for thermal disinfection is dependent on the operating mode of the heat pump heating system, the configuration, and the current statuses of the system. Thermal disinfection is ended once the set temperature is reached.

To enable the thermal disinfection settings menu, a bivalent heating system and/or flange heater must be set with “Yes" in the preconfiguration.

NOTE

If the set temperature is not reached within 4 hours, the thermal disinfection is terminated. The set start time can be activated or deactivated separately for each week day.

4.4 Block

A domestic hot water block can be set for two different times and week days in the ***"Settings - domestic hot water - block"*** menu. Despite a domestic hot water block, a minimum domestic hot water temperature can still be specified for comfort purposes. The minimum domestic hot water temperature is complied with under all circumstances in the case of a domestic hot water block. A request for domestic hot water occurs if the minimum domestic hot water temperature - hysteresis is undershot.

5 Program Description

5.1 Limit temperature

The external temperature at which the heat pump is just able to cover the heat consumption is called the HG2 limit temperature or bivalence point. This point marks the transition from heat-pump-only operation to bivalent operation combined with an immersion heater or boiler.
The theoretical bivalence point may deviate from the optimal bivalence point. Particularly during transition periods (cold nights, warm days), energy consumption can be reduced by means of a lower bivalence point, in accordance with the wishes and usage of the user. For this purpose, a limit temperature can be set on the heat pump manager in the menu ***"Settings – 2nd heat generator – Limit temperature"*** to enable the 2nd heat generator.
The limit temperature is normally only used in mono energy systems with air-to-water heat pumps or bivalent systems in combination with boilers.
For ***mono energy*** operation, a limit temperature of –5 °C should be aimed for. The limit temperature is calculated from the heat consumption of the building in relation to the external temperature and the heat output curve of the heat pump.

5.2 Blocking the requests

Different states and settings can result in a heat pump request being blocked. The blocks shown reset automatically or are lifted once they have been processed.

5.2.1 Utility Block

Temporary disconnection of the heat pump may be required by utility companies (***E***nergie-***V***ersorgungs-***U***nternehmen (EVU)) as a condition for a favourable electricity tariff. The voltage on terminal X3/A1 is interrupted during a utility block.
In the case of systems without a utility block, the enclosed bridge must be inserted at the relevant terminal connections.
Set the utility block in the menu ***"Settings – 2nd heat generator – Utility block (EVU)".***
In the case of bivalent systems, it is possible to react in different ways to a utility block:
only performance level 3
Heat pump blocked, the 2nd heat generator is only enabled in performance level 3 (see Cap. 5.4 on page 28).
Permanent
Heat generator 2 is always enabled during the utility block in the event of a heat request.
Limit temperature dependant
Heat pump blocked, the 2nd heat generator is enabled below the adjustable Limit temperature utility 3.
In mono energy and monovalent systems, the 2nd heat generator is normally blocked during a utility block. The setting for the utility block is hidden.

NOTE

For an external block of heat pump operation which does not automatically reset after a maximum of 2 hours, the external disable contactor (contact X3/A2) should be used. If the minimum permissible return temperature is undershot, the heat pump is enabled even when a blocking signal is applied.

5.2.2 Line load

The power-up line load is a requirement of the energy supply companies. It can take up to 200 seconds after power reconnection or after a utility company block. There is no shortcut around the line load.

5.2.3 Minimum pause time

It can take up to five minutes for the compressor to switch on again to ensure an adequate pressure balance in the refrigeration circuit and to protect the heat pump. After the minimum pause time has elapsed, the heat pump starts in order to meet any requests that may be pending. There is no shortcut around the minimum pause time.

5.2.4 Switch cycle block

According to the connection conditions of the utility companies, a heat pump may switch on only 3 times per hour. The heat pump manager will therefore only allow the heat pump to switch on at most every 20 minutes.

5.3 Heat generator 2

5.3.1 Control of Immersion Heaters

Supplementary electric heating systems are used in mono energy systems. These are switched on or off depending on the heat consumption if the ***"Mono energy"*** operating mode is selected in the preconfiguration menu and the set limit temperature (see Cap. 5.1 on page 26) is undershot.

5.3.2 Pipe heater control

In mono energy systems, an electric pipe heater can be used. The electrical pipe heater control is selected in ***"Preconfiguration - Electric heater - Pipe heater heating/ DHW/swimming pool water"*** and switched on/switched off in heating, domestic hot water and swimming pool operations as required.

5.3.3 Constantly regulated boiler

When implementing this type of boiler, the boiler water is always heated to a set temperature (e.g. 70 °C) when the command is issued accordingly by the heat pump manager. This temperature must be set so high that domestic hot water preparation can also be carried out by the boiler (according to need). Regulation of the mixer is undertaken by the heat pump manager. If required, it calls for the boiler and adds more domestic hot water until the desired set return temperature or domestic hot water temperature is reached. The boiler is called via the 2nd heat generator output of the heat pump manager and the mode of operation of the 2nd heat generator is coded as being "constant".

5.3.4 Gliding-regulated boiler

In contrast to constantly-regulated boilers, gliding-regulated boilers supply hot water at a temperature that is directly based on the respective external temperature. The three-way reversing valve has no regulatory function. However, it has the task of directing the heating water flow past or through the boiler, depending on the operating type.
In the case of heat pump only operation, the heating water is directed past the boiler to avoid losses caused by heat dissipation of the boiler. If the system is equipped with atmospherically controlled burner regulation, the voltage supply for burner regulation should be disconnected in the case of heat pump only operation. The control of the boiler is then connected to the 2nd heat generator output of the heat pump manager, and the operating mode of the 2nd heat generator is coded as being "gliding". The characteristic curve of the burner regulation is set according to the heat pump manager.

5.3.5 Special Program for Older Boilers and Main Cylinder Systems

If the 2nd heat generator was requested and the so-called special program is activated in the menu ***"Settings - 2nd heat generator"***, the 2nd heat generator remains in operation for at least 30 hours. If the heat consumption is reduced during this period, the 2nd heat generator goes into "Active stand-by operation" (2nd heat generator voltage on, but Mixer CLOSED). It is not fully switched off until there has been no request for the 2nd heat generator for a period of 30 hours.

This function can be used in bivalent systems as follows:

1) To prevent corrosion damage with older oil or gas boilers due to frequent undershooting of the dew point.
2) To ensure that with main cylinder systems, tank charging for the following day is independent of the current heat consumption.

5.3.6 Bivalent parallel

The "parallel limit temperature" is set in the „***Settings - 2nd heat generator“.*** If the parallel limit temperature is undershot, the heat pump and the 2nd heat generator are needed as required.

5.3.7 Bivalent alternative

The "alternative limit temperature" is set in the „***Settings - 2nd heat generator“.*** If the alternative limit temperature is undershot, the heat pump is blocked and the 2nd heat generator enabled for the heating and domestic hot water preparation.

i NOTE

If alternative operation is required rather than parallel operation, the alternative and parallel limit temperatures must be of the same value.

5.3.8 Bivalent-renewable

When integrating a renewable heat source (e.g. solar, wood), this must be given priority over heat pump operation. This is done by coding to bivalent renewable in the preconfiguration. As long as the renewable cylinder is cold, the system responds like a mono energy system.
The sensor for the renewable cylinder is connected to the analogue input N1-B8. The mixer outputs of the bivalence mixer are active.

NOTE

Heat pumps which are not equipped with an integrated flow sensor must be retrofitted (N1-B5).

Basic function:
The temperature in the renewable cylinder is measured and compared with the flow temperature of the corresponding request (domestic hot water, heating or swimming pool). If the temperature is above the conditions listed below, the heat pump is blocked, the renewable cylinder is used as the 2nd heat generator and the bivalence mixer is activated accordingly.

Block by heating request:
If the temperature in the cylinder is 2-20K higher than the current flow temperature, the heat pump is blocked when there is a pending heating request. It is not enabled again until the difference between the renewable cylinder and the flow is less than half of the switching value.

NOTE

When integrating solar heat sources, adjust the set overtemperature to the maximum value to prevent the heat pump from surging.

Block by request for domestic hot water:
If the temperature in the cylinder is 2-5K higher than the current domestic hot water temperature, the heat pump is blocked by a pending request for domestic hot water. It is not enabled again until the difference between the renewable cylinder and the domestic hot water is less than half of the switching value.

Block by request for swimming pool water:
If the temperature in the cylinder is higher than 35 °C (value is adjustable from 10 – 50 °C in the menu "Settings - 2nd heat generator - Overtemperature"), the heat pump is blocked when there is a pending swimming pool water request. It is not enabled again until the temperature in the buffer tank connected in parallel is 5K under the switching temperature.
As soon as one of the three blocks described occurs, the heat pump is blocked, and the following message is displayed: HP waiting, Block BR. The 2nd heat generator output is not activated.

Mixer control:
If there is no block by bivalent-renewable, the mixer is switched to continuously CLOSED.
If there is a bivalent-renewable block because of domestic hot water or swimming pool, the mixer is switched to continuously OPEN.
If there is a bivalent-renewable block because of heating, mixer regulation is active.

5.4 Power Regulation

The heat pump manager can define a maximum of 3 performance levels, L1, L2 und L3, which it switches depending on the heat consumption. Rising heat consumption causes the next highest performance level to be switched, falling heat consumption the next lowest.
L1: Heat pump operates with one compressor
L2: Heat pump operates with two compressors
L3: Heat pump operates and 2nd heat generator is active (not with monovalent systems)

- The heat pump manager always starts in performance level L1 after the commissioning or a power failure.
- The performance levels are not redefined during defrosting, preparation of swimming pool water, a request for domestic hot water or a utility block.

5.4.1 Heat Pumps with One Compressor

Criteria for the switching:

- from L1 to L3 if the heat pump manager demands "more heat" for more than 60 minutes and the external temperature simultaneously remains under the limit temperature of the 2nd heat generator for more than 60 minutes.
- from L3 to L1 if the heat controller demands "less heat" for more than 15 minutes or the limit temperature is exceeded.

5.4.2 Heat Pumps with Two Compressors

Criteria for the switching:

- from L1 to L2 if the heat pump manager demands "more heat" for more than 25 minutes,
- from L2 to L3 if the heat pump manager demands "more heat" for more than 60 minutes and the external temperature is simultaneously under the limit temperature for more than 60 minutes,
- from L3 to L2 or L1 if the heat pump manager demands "less heat" for more than 15 minutes or the limit temperature is overshot,
- from L2 to L1 if the heat pump manager demands "less heat" for more than 15 minutes.

In performance level L1, one of the heat pump's compressors is switched on or off according to the “more" or “less" signals from the heat pump manager. In level L2, one of the heat pump's compressors operates continuously to cover the base load. The second compressor is switched on or off according to the “more" or “less" signals from the heat pump manager. In level L3, both compressors operate continuously to cover the increased base load. The 2nd heat generator is controlled. Only one compressor ever operates during defrosting.

Performance level	Heat pump with one compressor	Heat pump with two compressors
Level L1	One compressor switching only	One compressor switching only
Level L2	-	1 compressor base load, 1 compressor switching
Level L3	One compressor and second heat generator, if required	Both compressors and second heat generator
Defrost	Compressor running	One compressor running
Domestic hot water heating	Compressor running	One or two compressors running depending on the external temperature
Swimming pool heating	Compressor running	One or two compressors running depending on the external temperature

5.4.3 High temperature air-to-water heat pumps

Normally, only 1 compressor operates at external temperatures over 10 °C. If the external temperature is under 10 °C and the flow temperature higher than 50 °C, both compressors are enabled:
1 compressor is switched on initially followed shortly afterwards by the 2nd compressor. If the request is no longer pending or a block is activated, both compressors are switched off simultaneously.

In respect of the performance level, the high temperature heat pump responds like a heat pump with 1 compressor in this temperature range independent of the selection in the configuration menu, i.e. there is no performance level 2.
If the conditions for switching to performance level 3 as specified in Cap. 5.4.1 on page 28 are fulfilled, the 2nd heat generator is enabled.

5.5 Hysteresis

The so-called hysteresis for different requests can be set in the ***"Settings"*** menu. The hysteresis forms a "neutral zone" around the corresponding set temperature. If the current temperature is lower than the reduced set temperature around the hysteresis, the request is then recognised. This request remains pending until the current temperature exceeds the upper limit of the neutral zone. This results in a switching cycle around the setpoint.

Hysteresis of the return set temperature

A hysteresis can be set around the return set temperature for the heating request.
If the hysteresis is large, the heat pump will operate longer, whereupon the temperature fluctuations in the return are correspondingly large. A smaller hysteresis reduces the compressor runtimes and the temperature fluctuations.

NOTE

For panel heating with relatively flat characteristic curves, set a hysteresis of approx. 1 K as a hysteresis that is too large can prevent the heat pump from switching on.

5.6 Control of Circulating Pumps

Via control of the heat, domestic hot water or swimming pool circulating pumps, it can be determined where the heat generated by the heat pump should flow. Individual processing of different requests enables the heat pump to be always operated with the lowest possible flow temperature. This ensures energy-efficient operation.
With heat pumps for heating and cooling, additional cooling circulating pumps can be controlled (Cap. 8 on page 36).

NOTE
Pump units with check valves maintain the specified flow direction.

NOTE
In the summer operating mode, the heating pump operates for 1 minute every 150 hours (this prevents the heating pump from sticking at the beginning of the heating period).

5.6.1 Frost protection

Independent of the setting, the heat circulating pump always operates in heating or defrost operation and when there is danger of frost. On systems with several heating circuits the 2nd/3rd heat circulating pump has the same function.

ATTENTION!
To ensure that the frost protection function of the heat pump works properly, the heat pump manager must remain connected to the power supply and the flow must be maintained through the heat pump at all times.

5.6.2 Heat circulating pump

For the heat circulating pump (M13, M15, M20), an outside temperature dependent heat pump optimisation is set in the menu *Settings - Pump control - Heat pump optimisation* ".

If the temperature falls below the selected limit temperature, the heating pump optimisation is inactive. With the exception of during domestic hot water preparation, swimming pool water preparation and in "*Summer*"mode, the heat circulating pumps are permanently in operation.

If the temperature rises above the selected limit temperature, the heating pump optimisation is active. The heat circulating pumps continue to run for 30 minutes after a power up and after switch-off of the heat pump. If the heat circulating pumps have been switched off for longer than 40 minutes or if the return set temperature has been intentionally increased by raising it, the heat circulating pumps are activated for a 7-minute rinse time to return the return sensor (R2, R2.1) to the representative temperature of the heating circuit.

If the setting is switched from heating to domestic hot water or swimming pool water preparation, the heat circulating pump overruns.
The heat circulating pumps are operated permanently when the temperature falls below the minimum system temperatures and in temperatures smaller than 10 °C on the frost protection sensor (R9) of the air-to-water heat pumps.

NOTE
In the summer operating mode, the circulating pump operates for 1 minute every 150 hours. This prevents the shaft from sticking.

5.6.3 Domestic hot water loading pump

The domestic hot water circulating pump (M18) runs during domestic hot water preparation. If a request for domestic hot water is made during heating operation, the heat circulating pump is deactivated and the heat circulating pump is activated with the heat pump running.

In the case of heat pumps with additional heat exchangers and „***Setting – Parallel heat - DHW***“ set to ***"Yes"***, the domestic hot water pump operates parallel to the heating pump during heating operation until the set maximum temperature is reached.

5.6.4 Swimming pool circulating pump

The swimming pool circulating pump (M19) operates during swimming pool water preparation. The swimming pool water preparation can be interrupted at any time by a request for domestic hot water, defrosting or by a raise of the heating characteristic curve (e.g. after lowering the temperature at night), but not by a "more" signal from the heat pump manager. If the request is still pending after the swimming pool water has been prepared for 60 minutes, the swimming pool circulating pump is switched off for 7 minutes and the heat circulating pump is activated for a 7 minute flushing time to supply the return sensor with the representative temperature of the heating circuit again. If the heat pump manager generates a "more" signal during these 7 minutes, the request for heating will be processed first.

NOTE
In the summer operating type the swimming pool water preparation is not interrupted with a flushing period after 60 minutes.

5.6.5 Auxiliary circulating pump

The output of the auxiliary circulating pump (M16) can be configured to allow parallel operation of the auxiliary circulating pump and the heat pump's compressor. Configuration is possible for heating, domestic hot water preparation and swimming pool water preparation. It also operates if the minimum system temperatures are undershot.

NOTE
In the summer operating mode, the circulating pump operates for 1 minute every 150 hours. This prevents the shaft from ceasing up.

5.6.6 Primary Pump for Heat Source

The primary pump (M11) delivers the energy of the heat source to the heat pump.

Type of heat pump	Primary pump
Air-to-water heat pump,	Fan
Brine-to-water heat pump	Brine circulating pump
Water-to-water heat pump	Well pump

The well water or brine circulating pump always operates if the heat pump is switched off. It starts 1 minute before and switches off 1 minute after the compressor.
In the case of air-to-water heat pumps, the fan is switched off during defrosting.

5.6.7 Circulation pump

If it is possible to connect a circulation pump (M24) then this can be requested via a pulse input or via time programs.
If the circulation pump is requested via the input pulse (X3/G - ID17), the overrun time can be defined in the menu "*Settings - Domestic hot water circulation*". If the request takes place via a time program, the program can be set for two different times and days of the week.

TIP

A circulation pipe is a major energy consumer. To save on energy costs, circulation should not be used. If circulation cannot be avoided, however, it is advisable to adapt the time window to the optimal conditions. It is best to let the circulation run for a specific period via an impulse. This function is also possible with the heat pump manager

5.7 Building management technology

From software version L09, there are two options for connecting the heat pump to building management technology.

- Transferring the default values via the BMS (Building Management System) via an interface. A variety of different traces and interfaces are available for this (Cap. 5.7.1 on page 31).
- Wiring digital inputs with the option of influencing the power regulation outlined in Cap. 5.4 on page 28 on the heat pump manager. There is also the option of influencing the operating mode from heating to cooling, as well as a configurable external block (frost protection/domestic hot water/holiday/summer) via digital inputs (Cap. 5.7.2 on page 32).

⚠ ATTENTION!

In all cases, the primary pump (M11) and the secondary pump (M16) or the heat circulating pump (M13) depending on the hydraulic integration must be clamped to the heat pump manager. Only in this way can the flows and returns required for the operation be complied with and the necessary safety measures be applied.

5.7.1 BMS interface

The extensions available as special accessories are available on the BMS interface for connecting to:

- LAN
- KNX
- Modbus

With these extensions, the operating data and the history can be read out and settings made such as mode or nominal value.
As a general rule, a heat pump request via an interface is preferable in connection with building management technology.
If an interface is used, we suggest the following programming on the heat pump manager. They are set to a fixed-setpoint regulation depending on the number of heating and cooling circuits. The set temperature calculated by the GLT is transferred to the heat pump manager as a fixed value temperature. The heat pump is also switched to the Auto, Summer and Cooling mode via the GLT.
Further information on these options is available in the description for the relevant product.

5.7.2 Compressor control via digital inputs

In addition to a nominal value defined by the BMS, it is also possible to control the compressor via digital inputs.

Performance levels

The performance levels (L) are influenced via the digital inputs N1-J5/ID1 and N1-J5/ID2. Table 5.1 shows an overview of the performance level switching.

Performance level	N1-J5/ID1-X3/G	N1-J5/ID2-H§/G
Level L1	Closed	Open
Level L2	Open	Closed
Level L3	Closed	Closed

Table 5.1: Overview performance levels

The sequence of performance level switching takes place as outlined in Cap. 5.4 on page 28 Power regulation.

Note that the building management technology can increase or reduce the performance levels within the operating limits. This does not override the TAB (technical connection conditions) of the utility companies. The set temperatures on the heat pump manager are ignored. The heat pump is only blocked under extreme circumstances via the operating limits (high and low pressure, flow and return temperature) or switched off by safety functions.

Table 5.2 highlights the performance level switchings and their effects on the compressor and heat generator or chiller 2.

Switching the performance levels

For parallel connections of heat pumps, it is advisable to set up and program the performance levels in a ring connection. This means that, depending on the performance required, heat pump 1 is enabled with L1, followed by heat pump 2 with L1 and heat pump 3 with L1. If more performance is required, heat pump 1 is enabled with L2, followed by heat pump 2 with L2 and heat pump 3 with L3. Switching back takes place in the same way. First of all, heat pump 1 is switched to L1, heat pump 2 to L1 and then heat pump 3 to L1. This not only ensures that the compressors receive the same runtimes, but also that the heat pumps are operated in the most effective way.

Performance level	Description	Compressor 1	Compressor 2	2. Heat generator/ chiller 2
Level L1	Set temperature - hysteresis	on	off	off
	Set temperature + hysteresis	off	off	off
Level L2	Set temperature - hysteresis	always ona	on	off
	Set temperature + hysteresis	always on	off	off
Level L3	Set temperature - hysteresis	always on	always on	on
	Set temperature + hysteresis	always on	always on	off

Table 5.2: Example of performance level switching

When programming the performance level switching via the building management technology, the minimum pause time (Cap. 5.2.3 on page 26), switch cycle block (Cap. 5.2.4 on page 26) and, where applicable, the utility company block (Cap. 5.2.1 on page 26) relevant for the heat pump must be taken into account.

5.7.3 External block

The heat pump can be blocked or released for one of the following functions via the digital input N1-J5/ID4-X3/G (external block):

- Frost protection
  - Heat pump maintains minimum system temperatures, domestic hot water and swimming pool preparation is blocked
- Domestic hot water block
  - Heat pump is released, minimum domestic hot water temperature is maintained
- Operating mode Holiday
  - Heat pump maintains lower value, domestic hot water is blocked
- Operating mode Summer
  - Heat pump maintains minimum system temperature, domestic hot water and swimming pool preparation is released

External block	N1-J5/ID4-X3/G
Active	Open
Inactive	Closed

Table 5.3: *Overview block function

Frost protection is guaranteed at all times.
If "Performance level switching" and "External block" are to be used, these functions must be activated by the after-sales service when the heat pump is commissioned.

5.7.4 Switching heating/cooling

On heat pumps for heating and cooling, the operating mode is switched via digital input N17.1-J4/ID4-X3/G.

Operating mode	N17.1-J4/ID4-X3/G
Active	Open
Inactive	Closed

Table 5.4: Overview switching Heating/Cooling

6 Commissioning: Air-to-Water Heat Pumps

To ensure defrosting for air-to-water heat pumps, the return temperature must be at least 18 °C, in order to ensure that defrosting is not interrupted due to undershooting of the minimum permissible temperature on the frost protection sensor.
By activating the commissioning function (special function), the 2nd heat generator is enabled for a period of one hour, defrosting is disabled and the current defrosting process is terminated.

The heat circulating pump operates continuously during the commissioning and requests for domestic hot water or swimming pool water are overridden.

NOTE

At low heating water temperatures, heat up the buffer tank first before gradually opening the individual heating circuits.

7 Initial Heating Program (Drying of Screed Flooring)

The initial heating of a screed floor takes place according to the applicable standards and regulations. However, these have to be adapted to suit the requirements of a heat pump heating system (see Cap. 7.1 on page 34).
The individual programs are activated in the menu ***"Special functions - Initial heating program").***

During initial heating, the following applies:

- The heat circulating pumps for heating circuits1 and 2 and 3 operate continuously
- programmed lowers and/or raises of the temperature are overridden. A fixed hysteresis of ± 0.5 K applies (independent of the configuration in the menu)
- The limit temperature for HG2 is fixed at +35 °C (independent of the configuration in the menu)
- The calculated set temperature applies for all heating circuits
- The mixer of heating circuit 2/3 is switched to continuously OPEN
- In the case of a fault or voltage interruption, only the selected program is interrupted. After the voltage is recovered or the fault is acknowledged, the relevant program step is continued.
- The heat pump manager records the data in the HISTORY regarding the initial heating program that was last completed.

NOTE

If the manufacturer has not made any special requirements, we recommend using the standard program for screed drying (max. return temperature 35-40 °C).

NOTE

If no button is pushed within 3 minutes following the activation of an initial heating program, the display changes every minute.
In the bottommost display line, the current heating-up step, the set temperature, completed and required hours are displayed.

7.1 Implementing the Heat Pump Heating System Directive

The directive is based on whole days for which a specified temperature is to be reached or maintained.
If the screed flooring has a high moisture content, the specified temperatures are often not reached within the prescribed period of time. For the flooring to be sufficiently dried out, however, it is essential that the temperature level is maintained for a definite period.
For this reason, the days described in the standard are implemented as program steps. One program step corresponds to the combination of the number of days and/or hours and the respective temperature.

ATTENTION!

Depending on the ratio between the heat output of the heat pump and the living space area to be heated, the specified minimum heating-up period can be exceeded considerably. This is because the required minimum number of hours are not totalled until after the set temperature has been reached.

The relevant standards and directives always refer to the flow temperature of the heating system. Regulation of the heat pump is based primarily on the return temperature.

NOTE

The maximum return temperature must be entered for the initial heating program. This is the sum of the max. flow temperature minus the temperature spread (e.g. 7 K).

7.2 Heating function program according to DIN EN 1264-4

This program is a recognised function test for underfloor heating and is carried out after the prescribed waiting time for screed flooring.
By doing this, any shortcomings in the screed flooring and the underfloor heating will be shown.

1). Schritt: A constant return temperature of 20 °C is to be maintained for 72 hours (3 days).

2). Schritt: The maximum return temperature (adjustable) is to be maintained for 96 hours (4 days).

3). Schritt: The heat pump remains off until the return temperature has fallen below 20 °C.

The time period for step 3 is limited to a maximum of 72 hours, because the return temperature of 20 °C will probably not be undershot at high external temperatures.

ATTENTION!

The heating function program is used to check the function of the heated floor. The check must not be carried out any earlier than 21 days after completion of the screed work in the case of a cement floor and 7 days in the case of a calcium sulphate floor.

After completion of the screed flooring, the appropriate waiting time and the heating function program, determining whether the screed is dry is a prerequisite for fitting the final floor covering.

7.3 Screed drying in order to dry the screed flooring

7.3.1 General information

This program is used to reduce the humidity in the screed flooring to such an extent that the floor covering can be laid.
However, it is still mandatory to measure the moisture content of the floor as it may be necessary to continue the drying-out process.
The directive regarding drying out screed flooring calls for a fixed number of steps with specified temperatures and times. This sequence can be selected in the menu as ***"Screed drying - Standard program".***
In consultation with your screed flooring contractor, the Standard program should normally be used. It is only necessary to individually adapt the specified sequence in the Standard program if there are any special heating-up requirements. In this case, selections can be made in the menu ***"Screed drying - Individual program".***

7.3.2 Standard Program for Screed Drying

This program consists of 8 steps and is normally suitable for all underfloor heating systems. Before activation, the maximum permissible return temperature, e.g. 32 °C, must be entered.

Step 1-4: Heating-up sequences
Step 5: Keep
Step 6-8: Heating-down sequences

Steps 1 to 4 are heating-up sequences with a duration of 24 hours each. The return set temperature is raised from 20 °C to the maximum return temperature in each step.
Two conditions must be fulfilled to end a program step. The associated set temperature must be reached or overshot and the 24-hour period must have elapsed. If the temperature is reached before the 24-hour period has elapsed, the heat pump maintains the associated set temperature throughout the remaining period. No evaluation is made of how long this temperature was actually attained.
In Step 5, the maximum return temperature should be maintained for a period of 264 hours.
The periods in which the maximum return temperature was also actually reached are totalled up. Limit to top open, limit to bottom setpoint value - hysteresis.
This program step is not ended until the totalled time reaches a value of 264 hours.
Steps 6 to 8 are heating-down steps with a duration of 24 hours each. The return set temperature is lowered from the maximum return temperature to 20 °C with every step.
Two conditions must be fulfilled to end a program step. The associated set temperature must be undershot and the 24-hour period must have elapsed. If the temperature is undershot before the 24-hour period has elapsed, the heat pump maintains the associated set temperature throughout the remaining period. However, no evaluation is made of how long this temperature was actually attained.
The period for the heating-down sequences is limited to a maximum of 72 hours because the required return temperature will probably not be undershot at high external temperatures.

Example:

Max. return temperature: 32 °C

Step 1-4: 20 / 24 / 28 / 32 °C
Step 5: Keep
Step 6-8: 28 / 24 / 20 °C

7.3.3 Individual Program for Screed Drying

This program allows the following settings:

- ***Heat up temp. difference:***
  Starting from the initial temperature of 20 °C up to the set maximum temperature, the set temperature is raised by the set difference with every program step.
  The number of steps depend on the following factors.
- ***Heating-up period:***
  The number of hours can be entered here during which the corresponding set temperature must be reached and maintained (function as described above).
- ***Maintaining time period:***
  The number of hours can be entered here during which the maximum set temperature must be maintained.
- ***Heating-down temp. difference:***
  Starting from the set maximum temperature down to the initial value of 20 °C, the set temperature is reduced by the set difference with every program step.
  The number of steps depend on the following factors.
- ***Heating-down period:***
  The number of hours can be entered here during which the corresponding set temperature must be reached and should be maintained.

8 Extended Installation Instructions for the Heat Pump Manager (Heating/Cooling)

8.1 Active Cooling

8.1.1 Heat Pumps without Additional Heat Exchangers

Cold is generated actively by reversing the process in the heat pump. The switching of the refrigerating cycle from heating to cooling operation via a four-way reversing valve.

NOTE

The heat pump is blocked for 10 minutes during switching from heating to cooling operation. This allows the different pressures in the refrigerating cycle to equalize.

Requests are processed as follows:

- Domestic hot water then
- Cooling then
- Swimming pool

The heat pump operates as in heating operation during domestic hot water or swimming pool water preparation.

8.1.2 Additional Heat Exchanger for Use of Waste Heat

A heat exchanger in the hot gas can use the waste heat generated during cooling for domestic hot water or swimming pool water preparation. The heat exchanger menu item must be set to ***"YES"*** to do this.

Requests are processed as follows:

- Cooling then
- Domestic hot water then
- Swimming pool

The maximum temperature ***"Parallel operation heat – domestic hot water"*** is set in the menu item ***"Settings – domestic hot water".*** As long as the domestic hot water temperature remains below this limit, the domestic hot water charging pump runs during cooling operation. Once the maximum set temperature has been reached, the domestic hot water charging pump is switched off and the swimming pool circulating pump is switched on (independent of the swimming pool thermostat input).

If there is no cooling requirement it is possible to process domestic hot water or swimming pool requests. However, if cooling has been requested, these functions are each cancelled after a maximum continuous runtime of 60 minutes and priority is given to the cooling request.

8.2 Passive cooling

In the summer, the ground and the ground water are significantly colder at greater depths than the ambient temperature. A plate heat exchanger installed in the ground water or brine circuit, transfers the refrigeration capacity to the heating and cooling circuit. The heat pump compressor is not active and is therefore available for domestic hot water preparation. Activate parallel operation of cooling and domestic hot water preparation in the menu item ***"Settings - Domestic hot water - Parallel cooling - DHW".***

NOTE

Ensure that the special hydraulic integration requirements are fulfilled for the parallel operation of cooling and domestic hot water preparation (see project planning documentation).

The behaviour of the primary pump (M11), the primary cooling pump (M12) and the heat circulating pump (M13) in cooling operation can be changed under ***Settings – Pump control .***

8.3 Cooling Program Description

8.3.1 Cooling Operating Mode

The cooling functions are activated manually as the 6th operating mode. External temperature dependent switching of the "Cooling" operating mode is also possible. External switching is possible via input N17.1-J4-ID4.

The ***"Cooling"*** operating mode can only be activated if the cooling function (active or passive) has been enabled in the preconfiguration.

Switching off cold generation

The following limits are provided as safeguards:

- The flow temperature falls below a value of 7 °C
- Activation of the dew point monitor at vulnerable points in the cooling system
- Reaching of the dew point with silent cooling

8.3.2 Activation of Cooling Functions

Special regulatory functions are performed when cooling operation is activated. The cooling controller assumes these cooling functions independently of the remaining regulatory functions.
The cooling functions can fail to activate due to the following reasons:

- The external temperature is below 3 °C (danger of frost)
- With reversible air-to-water heat pumps, the external temperature is below the cooling operating limit.
- The cooling controller is not available or the connection is broken (E/A extension).
- Neither silent nor dynamic cooling was selected in the heating/cooling circuit settings

In all these cases, the cooling operating mode will remain active. However, the regulation system responds as in the summer operating mode.

8.3.3 Circulating Pumps in Cooling Operation

With a heat pump heating system the specific circulating pumps that are activated or deactivated, and the operating mode in which they function, is set in the preconfiguration of the corresponding heating circuit.
The heat circulating pump of heating circuit 1 (M14) is not active in cooling operation if only silent cooling is configured.
The heat circulating pump of the 2nd heating/cooling circuit (M15) is not active if "heating" was selected only.
The heat circulating pump of the 3rd heating/cooling circuit (M20) is not active if "heating" was selected only.

NOTE

The potential-free contact N17.2 / N04 / C4 / NC4 can be used for switching heating components in heating or cooling operation (e.g. room temperature controllers)

Passive cooling

The cooling system can be supplied using either the existing heat circulating pump (M13) or an additional cooling circulating pump (M17).

NOTE

The cooling circulating pump (M17) operates continuously in "cooling" operating mode.

With passive cooling, the operating behaviour of the heat circulating pump (M13) can, depending on the hydraulic integration, be changed under Settings – Pump control.

8.3.4 Silent and Dynamic Cooling

Different system configurations can be implemented according to each integration diagram. Make selections in the menu item ***"Settings – Cooling".***

- *Dynamic cooling only* (e.g. fan convectors)
  The fixed-setpoint control determines the regulation. Set the desired return set temperature in the "Settings" menu item.
- *Silent cooling only* (e.g. coolings of underfloor, wall panels or ceilings)
  The room temperature determines the regulation. Regulation is based on the temperature of the room where room climate station 1 is connected according to the circuit diagram. Set the desired room temperature in the "Settings" menu item.
  The maximum transferrable cooling capacity for silent cooling is heavily dependent on the relative humidity. High humidity reduces the maximum cooling capacity, because the flow temperature can not be lowered any further once the calculated dew point has been reached.
- *Combination of dynamic and silent cooling*
  Regulation is carried out separately in two different control circuits.
  The dynamic circuit is regulated according to a fixed-setpoint (as described for dynamic cooling).
  Silent cooling is regulated on the basis of the room temperature (as described for silent cooling) via control of the mixer of the 2nd/3rd heating circuit (silent heating and cooling circuit).

NOTE

If the chiller switches off because the minimum flow temperature of 7 °C has been reached, then either the water flow rate must be increased or a higher return set temperature must be set (e.g. 16 °C).

8.4 Room temperature controller

Heating systems are normally equipped with an automatic mechanism for separately regulating the room temperature in each room.
The room thermostats measure the current temperature in heating operation. If the current temperature undershoots the set temperature, the thermostats activate the regulating device (e.g. actuator).
In cooling operation, the room thermostats must be either deactivated or replaced with units which are suitable for both heating and cooling.
The room thermostat responds inversely in cooling operation i.e. if the set temperature exceeds the current temperature, the regulating device is activated.

9 Troubleshooting

9.1 Faults

The heat pump is blocked in the event of faults. In the case of bivalent systems, the second heat generator undertakes heating and domestic hot water preparation. In the case of mono energy systems domestic hot water preparation is stopped. The immersion heater maintains the minimum permissible return temperature.
The heat pump manager displays any faults in plain text and, in addition, the (ESC) button flashes red. The heat pump is blocked. After rectifying the fault, the heat pump can be restarted by pressing the button (ESC). (Switching off the control voltage also acknowledges an existing fault.)

⚠ ATTENTION!

In the case of mono energy systems, by switching to the 2nd heat generator operating type, the immersion heater can take over heating and the flange heater can take over domestic hot water preparation.

9.2 Low-pressure brine controller

If the "low-pressure brine controller" available as a special accessory is installed in the primary circuit of a brine-to-water heat pump, an error is reported if there is a fall in brine pressure. No further setting is required in the pre-configuration.

9.3 Faults troubleshooting - Alarm - Block

In the "Operating data - History - Documentation" menu the ten most recent triggers for an alarm and a block are recorded. The documentation includes the date, time of day, heat source temperature (->), flow temperature (arrow pointing upwards), return temperature (arrow pointing downwards) as well as the numeric code for the status notification (please incorporate this square). The error code for the sensor fault is also stored in the alarm memory. The decryption of the error code is described in the 'Code' column.

i NOTE

The texts prefaced with "!" cause the heat pump to switch off and must be manually acknowledged.

Code		Current status message	Measure
1	fault N17.1	Extension module N17.1 (general cooling) is not recognised.	Check connecting line + Line interrupted + Plug loose + Individual lines mixed up ♦ Check power supply
2	fault N17.2	Extension module N17.2 (active cooling) is not recognised.	
3	fault N17.3	Extension module N17.3 (passive cooling) is not recognised.	
4	fault N17.4	Extension module N17.4 (solar) is not recognised.	
6	fault evd	The electronic expansion valve is not recognised.	
7	fault RTC	The reference room modulator is not recognized.	
15	fault sensor	There is a fault with the required sensor technology; the exact cause is shown in the plain text display.	
1	external temp.		
2	return		
3	hot water		
4	coding		
5	flow		
6	heating circuit 2		
7	heating circuit 3		
8	storage renew.		
9	room temperature 1		
10	room temperature 2		
11	heatsource outlet		
12	heatsource inlet		
13	defrosting		
14	collector		
15	!lp sensor		
16	!hp sensor		
17	humidity room 1		

Code		Current status message	Measure
18	humidity room 2		
19	frost prot. refr.		
20	hot gas		
21	return DDV		
22	swimming pool		
23	flow passive		
24	return passive		
25	brine		
26	solar cylinder		
27	heat source solar		
16	lp brine	The low pressure switch in the brine circuit has switched.	Check the brine pressure
19	!primary side	Fault caused by primary pump or fan motor protection	Motor protection primary pump or fan Check setting and/or function
21	!lp brine	Fault caused by the low pressure switches in the brine circuit.Cap. 9.2 on page 38	
22	!hot water	Domestic hot water set temperatures in heat pump operation below 35 °C.	• Domestic hot water circulating pump flow is insufficient • Heating check valve is defective • Check domestic hot water sensors
23	!load compressor	Incorrect direction of rotation Phase failure Start-up of compressor is too long Undervoltage Operating current of compressor is too high Overtemperature of soft starter Incorrect network frequency	• Check rotary field • Check supply voltage • Inform after-sales service
24	!coding	Coding does not correspond to the heat pump type	The type of heat pump recognised can be read in the operating data
25	!low press.	The heat source is producing low amounts of energy	• Clean the dirt trap filter • Purge the heat source system • Check brine / water flow • Inform after-sales service • Evaporator iced or the system temperatures are too low (return < 18 °C)
26	!frost protection	The flow temperature in heating operating mode is below 7 °C.	• Raise heating water temperature
28	!high pressure	The heat pump was switched off by the high pressure sensor or pressure switch.	• Set heating curve lower • Increase heating water flow rate • Check overflow valve
29	!temp. difference	Temperature difference between flow and return is too large (>12 K) or negative for defrosting.	• Check heating water flow rate • Check overflow valve and pump size • Flow and return mixed up
30	!hot gas therm.		• Inform after-sales service
31	!flow	The heat pump has been switched off because there is no flow in the primary or secondary circuit. The flow rate switch must be activated in the "Settings - Heat pump" menu.	• Insufficient water flow in the well or brine circuit • Insufficient water flow in the secondary circuit • Incorrect flow direction

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For the terms of the guarantee and after-sales service addresses, please refer to the Installation and Operating Instructions for Heat Pumps.

Subject to alterations and errors.