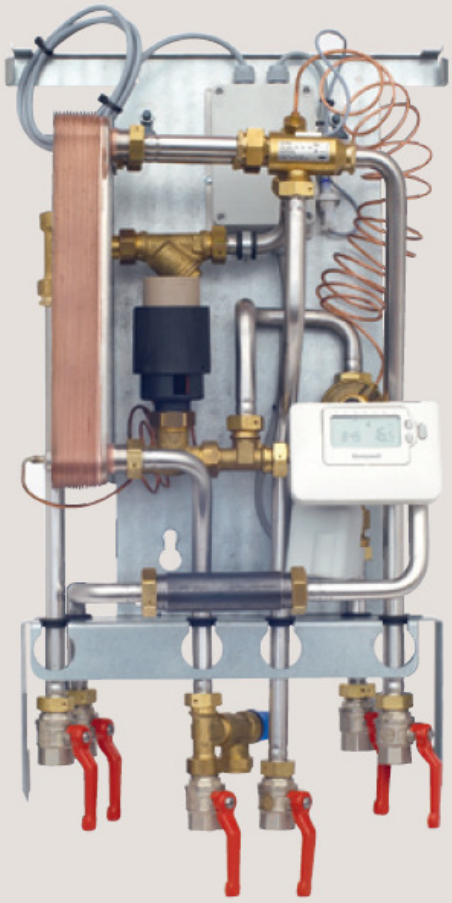
Operating instruction Cetetherm Mini City

Heating & domestic hot water substation for apartments and single family houses



DOC-1104 Rev:2008-08-28

Contents

The temperature and the pressure of the district heating water are very high. **Only qualified technicians** are allowed to work with the district heating substation. Incorrect operation may cause serious personal injury and result in damage to the building.

If the hot water temperature is set too high, people may be scalded. If the hot water temperature is set too low, unwanted bacteriological growth may occur in the hot water system. This can result in serious personal injury.

Parts of the Cetetherm Mini City may get very hot and should not be touched.

1 General information

Cetetherm Mini City is a complete, ready-to-install heating network substation for heating and hot water. It is designed for buildings with a primary connection to a heating network. Alfa Laval has years of experience in heating network technology and has developed Cetetherm Mini City with well-planned pipe work and with all components easily accessible for inspection and possible future servicing.

1.1 Comfort

Cetetherm Mini City has fully-automatic temperature control for heating and hot water. The heating is controlled in relation to desired room temperature. The hot water is controlled and maintained at the desired temperature.

1.2 Installation

Well planned pipe work and ready made electrical wiring make installation very simple. A pre-programmed controller and plug-and-socket connection provide further simplification, so that the substation can be started without delay. The Cetetherm Mini City is designed for hanging on wall.

Before installation chapter 1 Installation in the manual Installation and Service instructions must be read for details and requirements regarding the installation.

1.3 Long-term security

All the plates and pipes in the heat exchanger are made of acid-resistant stainless steel for long life. All components are adjusted together and undergo thorough function testing in accordance with Alfa Laval's ISO 9001:2000 quality assurance system. For future servicing requirements, all components are easily accessible and individually replaceable.

Cetetherm Mini City is CE-marked to certify that the substation conforms to international safety regulations. To maintain the validity of the CE marking, only identical replacement parts must be used.

2 Operating instructions

2.1 Operation

The heat from the heating network water is transferred to the hot water systems of the building in the heat exchangers. The heat is transferred through thin plates of acid-resistant stainless steel which keep the district heating water completely separate from the systems in the building.

Cetetherm Mini City has automatic temperature control for heating and hot water. The heating circuit is controlled in relation to desired room temperature by means of a controller/room panel, flow line sensor (option) and temperature sensor. When no heat is needed, the heating valve is closed. The hot water temperature is controlled by a temperature control system which is set to about 50 ºC.

After adjustment, the **Cetetherm Mini City** operates completely automatically. However, in hard water areas it is advisable to be attentive and to remedy any faults in good time if the temperature of the hot water is too high, otherwise the risk of lime deposits in the heat exchanger may increase.

2.2 Safety equipment/inspection

- Daily inspection to check for leaks from pipes or components.
- Weekly inspection to make sure that the operation of the heating and hot water control systems is stable and that the temperature does not fluctuate. Temperature hunting causes unnecessary wear of valves, actuators and heat exchangers.
- Every three months, check the safety valves and the pressure in the heating system.

To check the operation of a safety valve, turn its wheel/knob until water escapes from the waste pipe of the valve, then close the wheel/knob quickly. Occasionally a safety valve may open automatically to release excess pressure. After a safety valve has been open it is important that it closes properly and does not drip.

The hot water temperature can be set to around 50°C. If the temperature is set too high, there is a risk of scalding. Setting the hot water temperature too low, may result in unwanted bacteriological growth in the hot water system.

For setting and (if necessary) fine adjustment of the heating and hot water temperatures, see the troubleshooting chart.

2.3 Troubleshooting chart

Symptom	Cause	Action
Too low tap water temperature	Controller incorrectly set or not working	Adjust or call a service technician
	District heating filter clogged	Contact a service technician
Too high tap water temperature	Controller incorrectly set or not working	Adjust or call a service technician
Heating system temperature too high or too low	The heating control equipment may need adjusting	Adjust or call a service technician
No heating	Air pockets in the substation or in the heating circuit	Contact a service technician Bleed off the air
Hot water or heating temperature unstable	District heating flow unstable	Contact a service technician
Heating and hot water temperatures too low temperature	District heating strainer clogged	Contact a service technician
	District heating water temperature too low	Contact the district heating supplier

3 Operating data and performance

Primary side:	Primary side	Heating	DHW
Design pressure PS	10 bar	10 bar	10 bar
Design temperature	100ºC	100 ºC	100 ºC
Relief pressure safety valve	-	-	9 bar/10 bar

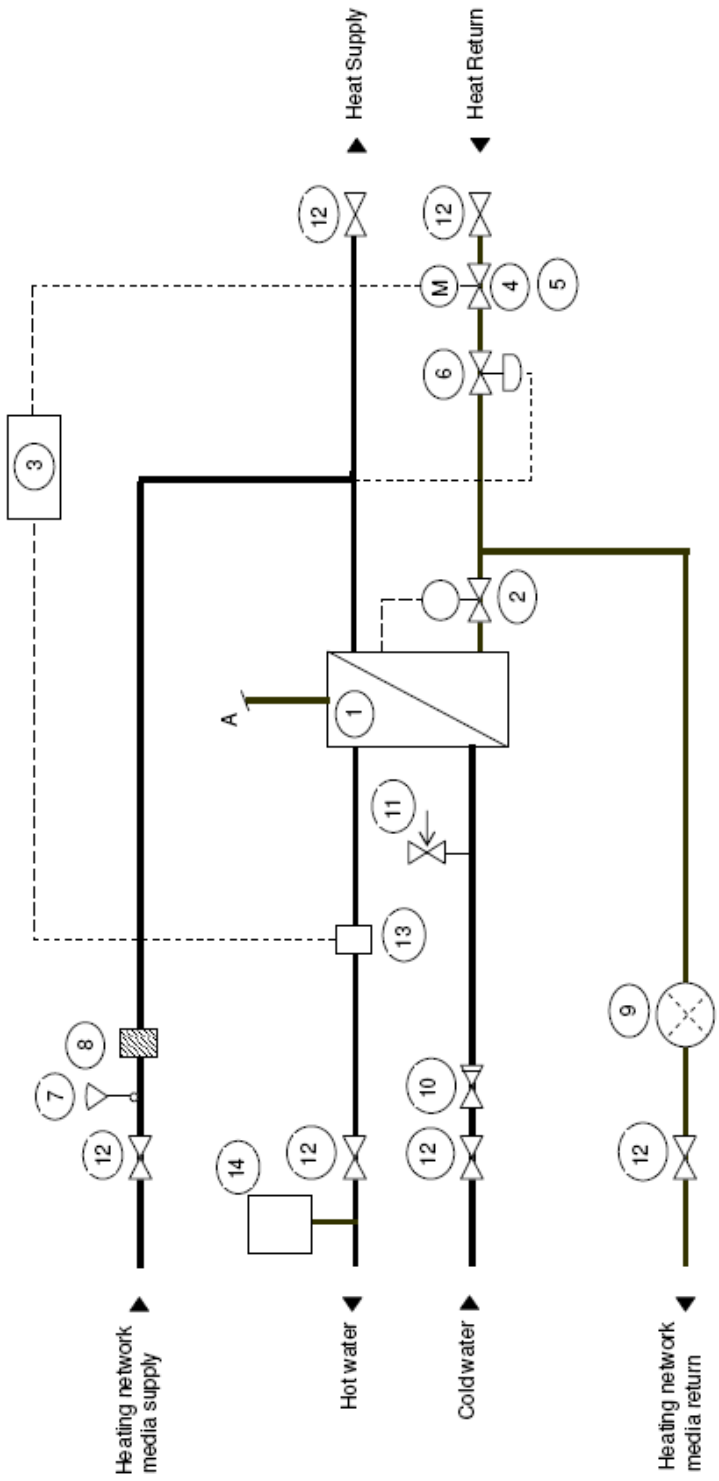
Temperature program (°C) Heating	**Capacity** KW	**CB** type	**Plates** no	**Flow P** l/s	**dPp** kPa	**Flow S** l/s	**dPs** kPa
80-60	12			0,14		0,14	
85-60	12			0,12		0,12	
85-45	12			0,07		0,07	
75-55	12			0,14		0,14	
75-60	12			0,19		0,19	
75-60	5			0,08		0,08	

Temperature program (°C) DHW	Capacity KW	CB	Plates no	Flow P	dPp	Flow S	dPs
80-25/10-60	41,8	20	27	0,17	9,2	0,2	11
80-25/10-55	56,4	20	27	0,23	15,6	0,3	23
65-25/10-50	50,2	20	27	0,29	24	0,3	23

Other DATA

Electrical Connection	230V 1~, <300 W, max 10 A fuse.
Main measures	See Measure sketch
Wheight	About 17 kg.
Transportation	Wheight about 21 kg, volume 0,16 m³.
Sound level	<70dB(A) 1.6 m from floor, 1 m from unit.

4 Schematic diagram, main components



1 Heat exchanger and temp controller for hot water
2 Control valve for hot water
3 Room thermostat/controller
4 Control valve for heating circuit
5 Actuator for heating circuit
6 Differential pressure controller
7 Temperature sensor connection, heating network media supply
8 Filter for heating network media
9 Energy meter or adapter for energy meter
10 Check valve for cold water
11 Safety valve for domestic hot water
12 Shutoff valve
13 Flow sensor (option)
14 Expansion vessel DHW (option)

5 User instruction

5.1 General

Thermostatic valve for hot water control
The thermostatic valve consists of a temperature controller, sensor and actuator (1 in the diagrammatic arrangement) and a control valve (2). The hot water temperature can be adjusted by turning the control valve hand wheel towards a higher or lower temperature while hot water is being drawn off. The stabilizing period after resetting is around 20 seconds. A suitable temperature from the hygienic and economic viewpoint is around 50°C. Note that a high water temperature involves the risk of scalding.

5.2 User manual control system

CM707 - USER GUIDE

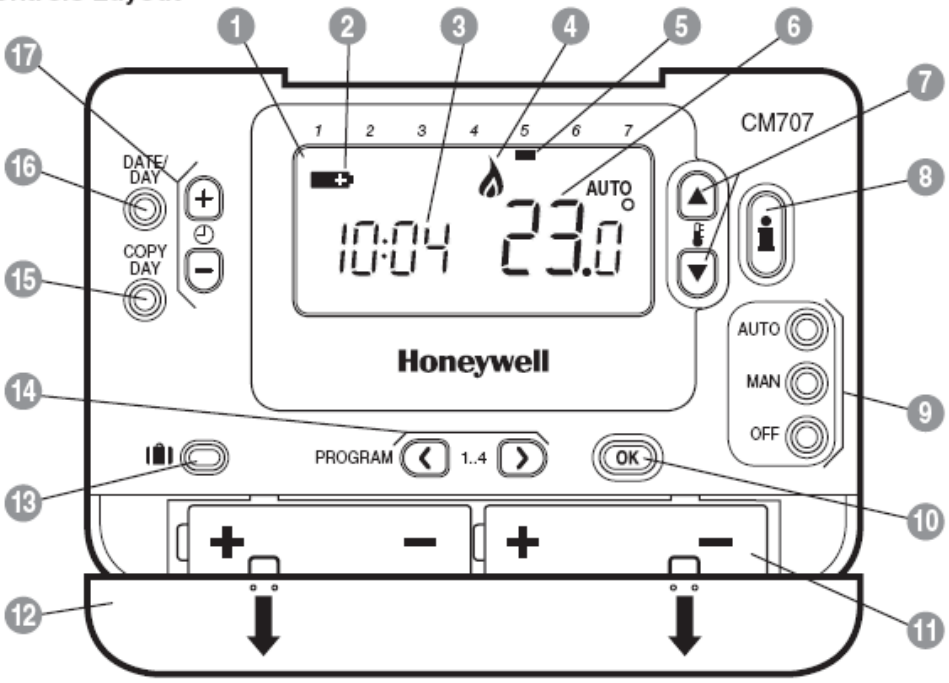
Description

The Honeywell CM707 is a programmable room thermostat designed to control your heating system efficiently, providing comfortable temperatures when you are at home and energy savings when you are away. The following instructions explain how to program and use the thermostat to provide the most home comfort at the least cost.

Features

- Ergonomic user interface featuring an 'OK-button'.
- Large LCD (Liquid Crystal Display) Screen with backlight.
- 7-day heating program to match your lifestyle, whilst maximising energy savings.
- 4 independent temperature levels per day (from 5°C to 35°C).
- Holiday button saves energy by letting you reduce the temperature for 1 to 99 days.
- Automatic Summer/Winter Time Change.
- Optimum Start to achieve the right temperature at the right time.
- Built-in Memory holds the user program indefinitely.

Controls Layout



1. LCD Screen
2. Battery Low Indicator
3. Time Display
4. Burner On Indicator
5. Day Indicator
6. Temperature Display
7. Temperature Change Buttons
8. Temperature Enquiry Button
9. Operating Mode Buttons
10. Green OK Button
11. Battery Compartment
12. Battery Cover
13. Holiday Function Button
14. Program Buttons
15. Copy Day Button
16. Set Date/Day Button
17. Time Change Buttons

SETTING-UP THE CM707 *'Getting Started'*

This section shows you how to setup and run the thermostat in 3 simple steps:

STEP 1: Installing the Batteries

Note: *Please follow the instructions in this section only if the thermostat screen is blank (no symbols or digits are displayed). If the room temperature is already displayed move on to* ***Step 2: Setting the Date and Time****.*

To install the Batteries:

a. Lift up the front cover of the thermostat to reveal the battery cover and product controls.

b. Remove the battery cover by pressing down and sliding out.

c. Insert the 2 x AA LR6 Alkaline Batteries supplied with the thermostat, ensuring the correct orientation (see '**Controls Layout**' on page 8).

d. After a short pause the thermostat will display information on the screen and is now ready for use.

e. Replace the battery cover by sliding it firmly back into the front of the thermostat.

STEP 2: Setting the Date and Time

To set the Date and Time:

a. Press the **DATE/DAY** button to begin setting the date. When you set the date for the first time after the batteries are inserted, the display will show:

Press the ◴ ⊕ or ⊖ buttons to set the current day of the month (e.g. *d 01* = 1st day of the month) then press the green OK button to confirm.

b. Press the ◴ ⊕ or ⊖ buttons to set the current month of the year (e.g. *m 01* = January) then press the green OK button to confirm.

c. Press the ◴ ⊕ or ⊖ buttons to set the current year (e.g. *yr 06* = 2006) then press the green OK button to confirm.

The date is now stored and the Day Indicator will be displayed under the current day of the week (e.g. 1 = Monday, 2 = Tuesday, etc.)

d. Use the ◴ ⊕ or ⊖ buttons to set the correct time then press the green OK button to confirm. Each press of the buttons will change the time by one minute and holding them down will change the time slowly at first and get progressively quicker.

Note: *If this mode is entered accidentally then press the* ***AUTO****,* ***MAN*** *or* ***OFF*** *buttons to exit.*

STEP 3: Running the Built-in Heating Program

The thermostat is now ready for operation. Press the **AUTO** button and the built-in heating program will start running. ***Note:*** *The built-in heating program has been designed to provide normal comfort requirements, but if you want to customise the settings please see the next section '****Programming the CM707****'.*

The Built-in Heating Program

The built-in heating program has 4 temperature level changes per day that can be set between 3.00am and 2.50am the following day - allowing you to maintain the evening temperature after midnight. Each temperature level can be set between 5°C and 35°C, and adjusted in 0.5°C increments. The factory default program for heating is as follows.

Monday to Friday ***(Day 1 to 5)***

Period	1	2	3	4
Time	6:30	8:00	18:00	22:30
Temperature	21°C	18°C	21°C	16°C

Saturday & Sunday ***(Day 6 & 7)***

Period	1	2	3	4
Time	8:00	10:00	18:00	23:00
Temperature	21°C	21°C	21°C	16°C

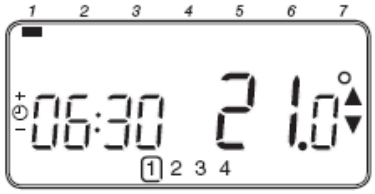
Reviewing the Heating Program

To review or edit the heating program use the **PROGRAM** ‹ or › buttons to navigate between the 4 individual programming periods for that day. Use the **DATE/DAY** button to step through each day of the week, so the complete 7 day heating program can be reviewed or edited.

Modifying the Heating Program

To change the heating program:

a. Press either of the **PROGRAM** ‹ or › buttons to enter the programming mode. The time / temperature settings for period 1 on Monday (Day 1) will be flashing as shown. The active period is highlighted by a flashing square around the numbers at the bottom of the screen and the selected day is shown with the day indicator.



b. To adjust the period start time use the ⊕ or ⊖ buttons, the 'OK?' indicator will be displayed to confirm the change. Holding the button down will change the time quickly.

Note: *If you are pressing the ⊕ or ⊖ buttons and the display flashes the next period, it means the next period will be pushed forward.*

c. Once the required time is reached press the green OK button to confirm.

Note: *If the original time setting did not require adjustment press the green OK button to move to step 'd'.*

d. The temperature setting for period 1 on Monday (Day 1) will now be flashing. To adjust this press the ▲ or ▼ buttons and confirm the setting again by pressing the green OK button.

e. The next time and temperature period will now be active. Adjust this by repeating steps b - d above until all 4 periods are set for Monday or press the **AUTO** button to run the program as set, at any time.

You now have a choice of how to set the program for the next day:

PROGRAMMING THE CM707 *'Efficient Daily Use'*

f. **I)** Press the **COPY DAY** button to copy Monday's program into Tuesday. The display will go blank apart from the 'non flashing' day indicator, which indicates the day copied and the 'flashing' target day to copy the program to. To accept this day press the green OK button. To select a different target day press the **DATE/DAY** button until the 'flashing' day indicator is under the required day, then accept it by pressing the green OK button. ***Note:*** *Once the target day is confirmed it becomes the day that is copied if the* ***COPY DAY*** *button is pressed again.*

OR

II) Press the **DATE/DAY** button to move the day indicator to Tuesday (Day 2). The program for that day can then be adjusted by following steps **b to e**. Programs for the remaining days can be set in the same way, using the **DATE/DAY** button to move to the next day.

To exit the programming mode select the desired operating mode by pressing the **AUTO**, **MAN** or **OFF** buttons. ***Note:*** *To run the adjusted program select the* ***AUTO*** *mode.*

Disabling / Enabling Time Periods

The thermostat has 4 periods each day that can be programmed, but you may not need all of these switch points for your heating requirements. Therefore, any period from 2 to 4 can be removed from (or returned to) the heating program profile.

To disable or enable time periods:

a. To disable unwanted periods go to the desired period (2 to 4) using the **PROGRAM** ‹ or › buttons to navigate, ensure the correct period is highlighted with the flashing square symbol. Press and hold the ℹ button for at least 2 seconds and the display will indicate the period has been removed from the program.

b. To enable periods again follow the same procedure as above, navigating to the already disabled period. To enable this period again press and hold the ℹ button for at least 2 seconds.

OPERATING THE CM707 *'Using the Features'*

Choosing the Operating Mode

The thermostat can operate in three different modes: Automatic, Manual or Off. To set the operating mode press either of the **AUTO**, **MAN** or **OFF** buttons. The screen indicates which mode is currently active by displaying **AUTO**, **MAN** or **OFF**.

- **AUTO (automatic)** mode sets the thermostat to follow the built-in temperature program (default or personalised). Operating the thermostat in this mode is the best way to maintain a high level of temperature comfort whilst maximising your energy savings.
- **MAN (manual)** mode sets the thermostat to act as a simple thermostat with a fixed setpoint throughout the day. The setpoint can be adjusted from 5°C to 35°C by using the ▲ or ▼ buttons. The thermostat will continue to maintain this temperature until another operating mode or temperature is selected.
- **OFF** mode sets the thermostat to control to a minimum temperature setting of 5°C (default) that acts as a frost protection measure for your home.

During Normal Operation

- **Temperature Enquiry**

  In **AUTO**, **MAN** and **OFF** operating modes the thermostat will display the current room temperature. To review the programmed **'target'** temperature (the temperature which the thermostat is trying to maintain) press the button. This 'target' temperature value will be displayed flashing for 5 seconds before returning to the current room temperature value.

- **Temperature Override**

  During normal operation (**AUTO** mode) the programmed temperature can be adjusted manually by pressing the or buttons or the button. The 'target' temperature will be displayed and flash for 5 seconds - during this time the or buttons can be used to modify the set value.
  Note: *This temperature override is cancelled at the next programmed temperature change.*

Adjusting the Time

To adjust only the time during normal operation use the or buttons to adjust the time and press the green OK button again to confirm any changes.

Using the Special Functions

- **HOLIDAY Function**

  The holiday function allows you to set a constant temperature (default = 10°C) for a specified number of days (from 1 - 99 days). This lets you save energy and related costs when you are away from home, but resumes normal operation on the day of your return.

  To set the Holiday function:

  a. Ensure the thermostat is running in **AUTO** or **MAN** operating modes.

  b. Press the holiday button to display the holiday days counter and temperature setting, along with the holiday indicator .

  c. Press the or time buttons to set the holiday time (1 - 99 days) and press the green OK button to confirm.

  d. Press the or buttons to set the holiday temperature (5°C - 35°C) and press the green OK button to confirm.

The thermostat will now control to the new temperature for the set number of days that your home is vacant. At midnight the holiday counter will be reduced by one until the selected number of days have passed. The thermostat will then return to normal operation as set by the **MAN** or **AUTO** mode. To cancel the HOLIDAY function or to exit the function at any time press the button a second time.

TROUBLESHOOTING THE CM707

Symptom	Remedy
Blank Display (Power Loss).	Check batteries are installed by removing the battery cover. Check batteries have been installed in the correct orientation. Replace the batteries.
Display shows flashing symbol.	The batteries in the thermostat are low on power - Replace the batteries.
Display shows symbol.	A fault has occurred in your heating system. Remove and re-insert the batteries. If the symbol does not clear after a few minutes contact your installer.
Display shows the word '**SERVICE**'	Your installer has set a scheduled maintenance alert period on your CM707 as a recommendation that your heating system should receive a routine inspection. Call your installer to arrange a maintenance visit. ***Note:*** *The CM707 and heating system will continue to operate as normal.*