Operating manual

CETA 104

Heating circuit controller with burner control
and DHW charging control

Version 1308-22
Art. 0450021016

Content

Scope of delivery

1. 1x Central unit CETA 104
2. 1x Outside sensor AF200
3. 1x Boiler immersion sensor KVT 20/2/6
4. 1x Tank immersion sensor KVT 20/2/6
5. 8x Screw, plate 2,9x19 mm
6. 3x Screw assembly 4x35 mm
7. 3x Plug U6
8. 2 x Cable clamp

General

Systems with unmixed heating circuit are controlled via the heating circuit controller. Required heating circuit temperature is determined in the flow, depending on outside temperature.

The burner control adjusts the heat generator temperature via a switching contact at the boiler immersion sensor.

The DHW control is accessing a DHW charging pump and controls the DHW requirement in a DHW tank at the tank immersion sensor.

Intended use

The unit is manufactured in accordance with state of the art technology and approved safety regulations. Nevertheless, using the unit can cause danger to the user or third persons, or damage to the unit and other assets. The unit must be used exclusively as heating circuit controller with burner control and DHW charging control.

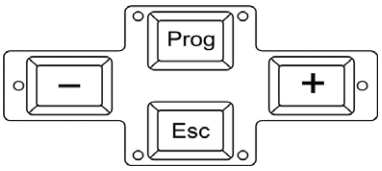
Safety

All electrical connections, safety measures and protections have to be carried out by an authorised professional electrician according to the valid standards and VDE-guidelines, as well as the local regulations. The electrical connection must be a fixed connection according to VDE 0100.

Hazard symbols in this operating manual

Hazard!
This symbol indicates information that warns of possible safety risks or severe and fatal injuries!

1. General key functions



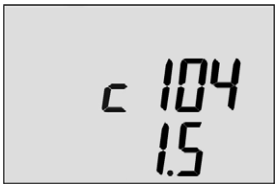
Prog
·Change selected submenus
·Change (parameter) setting
·Save value

+ (Plus) or - (Minus)
·Change parameter
·Change menu item

Esc
·Exit setting
·Keep old value
·Select next higher menu level

Esc-Lang
·Return to basic display

2. Version display (when starting)



c 104=	Type designation Ceta 104
1.5=	Version display (due to update it can differ from example shown)

3. Basic display

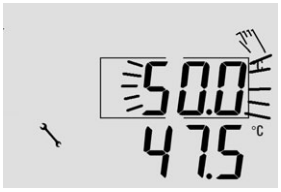
1	Display weekday
14:48	Display time
47.5°C	Temperature F1 heat generator

Explanation of symbols

- Display heat generator in operation
- Display pump function heating circuit
- Display pump function tank loading
- Automatic mode heating circuit after timer program I or II
- Heating mode heating circuit (Operating mode AUTOMATIC or HEATING)
- Reduced mode heating circuit (Operating mode AUTOMATIC or RED. HEATING)
- Standby heating circuit
- Summer switch-off heating circuit
- Frost protection heating circuit

4. Functions with direct access

Manual operation



Controller is in manual mode

- Activate by pressing and holding [Prog] button
- Change heat generator setpoint via buttons [+] and [−]
- end function by pressing [Esc] button

Function: Manual operation allows manual start-up of the system, e.g. to perform emission measurement.
The heat generator adjusts the temperature to the set value
- The heating circuit pump runs continuously
- The DHW charging pump runs continuously

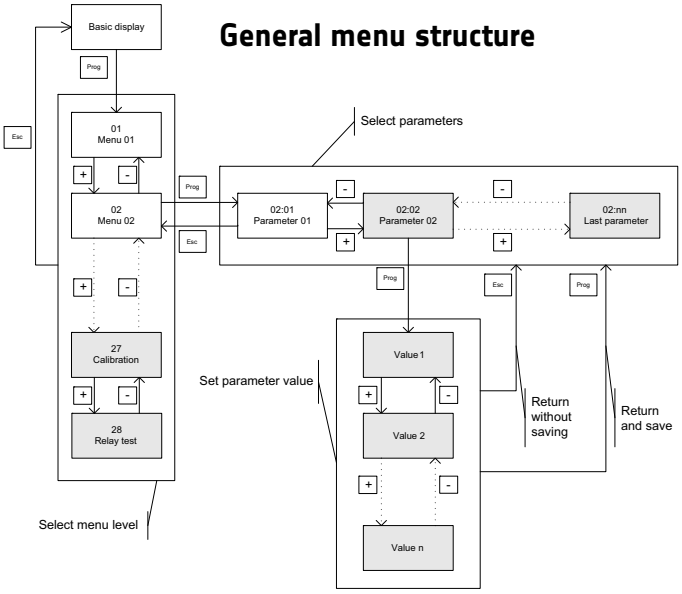
Important!
This function shall only be used by an authorised professional. Heating circuit temperatures are not monitored during measurement of emission. Faulty operation or unsupervised operation of this function may result in damages to the heating system.

Adjustment room setpoint

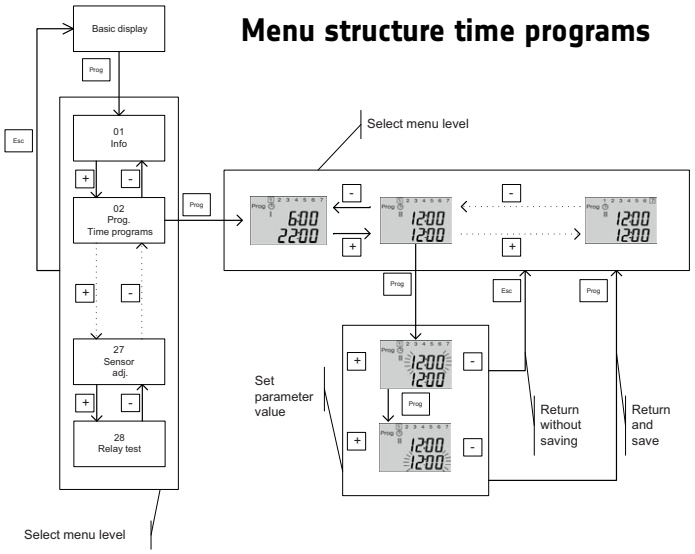
Press buttons [+] and [−] in the basic display to directly set room day temperature. Such a variation changes the parameter 06:02 (see parameter description).

5. Menu level

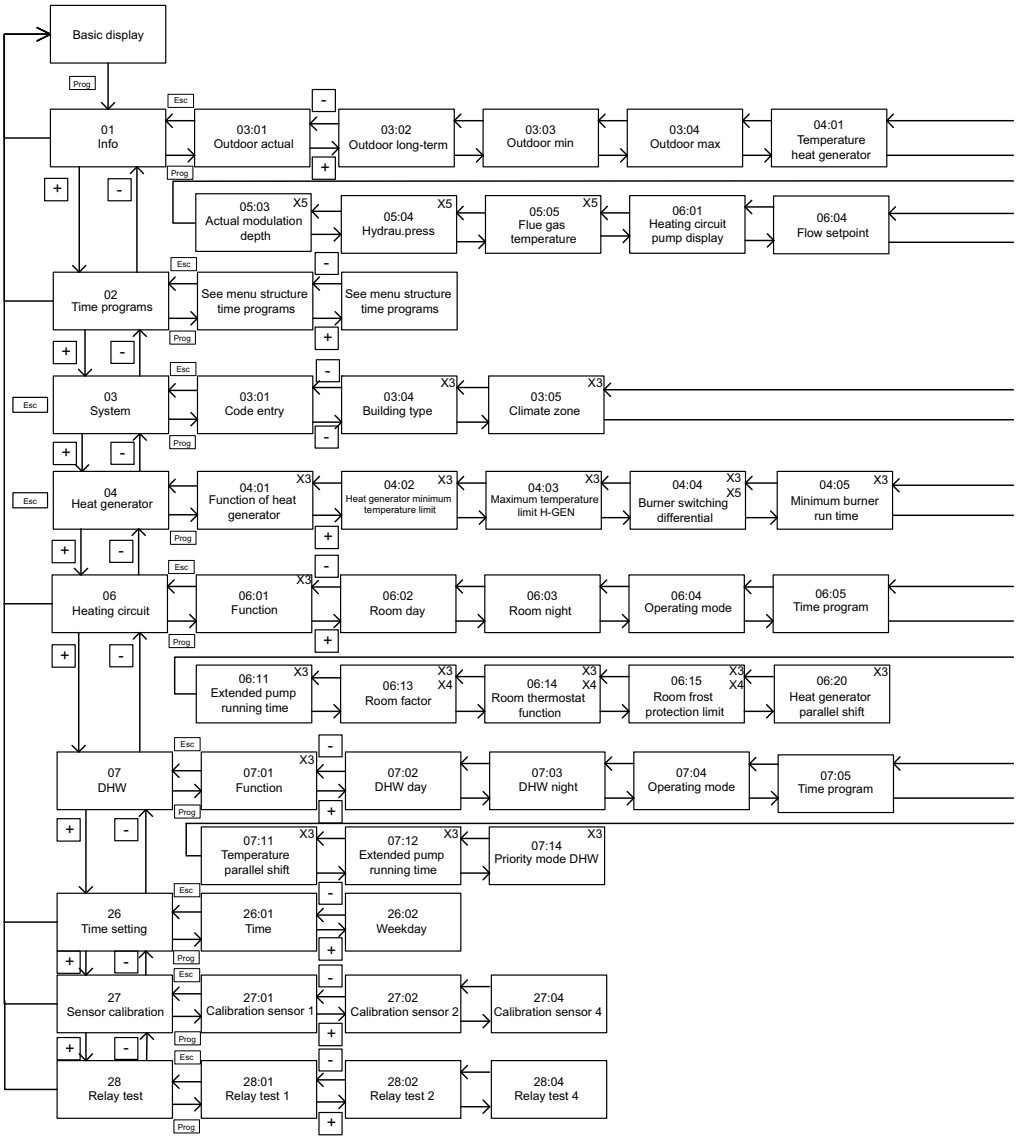
General menu structure



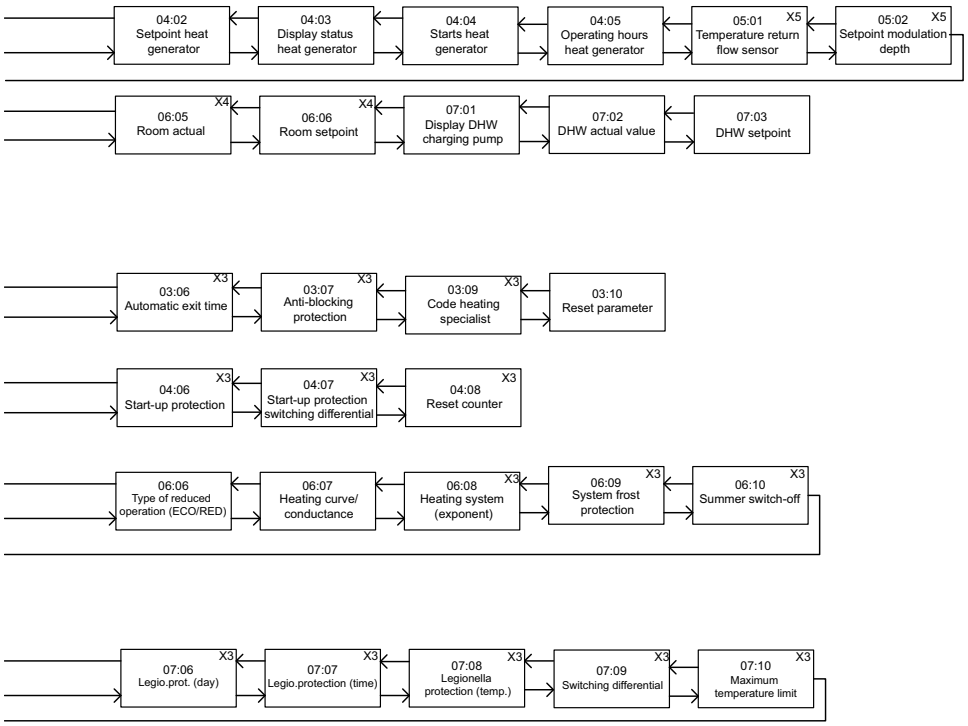
Menu structure time programs



Overview of menu level



Menu level



X2: Function only in bus connection
X3: Are hidden when activating code 03:09
X4: Only when connecting CETA RC
X5: Only in conjunction with heat generator connection via OpenTherm, and when supported by heat generator

6. Parameter description

01 Information level

Display	Designation	Description	
03:01	Outdoor actual	Current outside temperature	
03:02	Outdoor long-term	Average long-term value of outside temperature. Depending on set building type (03:04), the value is averaged longer or shorter.	
03:03	Outdoor min	Minimum outside temperature value (0.00 to 24.00 h)	
03:04	Outdoor max	Maximum outside temperature value (0.00 to 24.00 h)	
04:01	Temperature heat generator	Actual temperature on heat generator sensor	
04:02	Setpoint heat generator	Setpoint temperature for heat generator	
04:03	Display status heat generator	0: Heat generator outlet is switched off 1: Heat generator outlet is switched on	
04:04	Starts Heat generator	Number of heat generator starts	
04:05	Operating hours Heat generator	Number of heat generator operating hours	
05:01	Temperature Return flow sensor	Actual temperature heat generator return	X5
05:02	Setpoint Modulation depth	Setpoint heat generator-modulation depth (only if system contains information	X5
05:03	Actual value Modulation depth	Actual value heat generator-modulation depth (only if system contains information)	X5
05:04	Hydrau.press	Water pressure in heating system in bar (only if system contains information)	X5
05:05	Flue gas temperature	Flue gas temperature of heat generator (only if system contains information)	X5
06:01	Display heating circuit pump	0: Heating circuit pump is switched off 1: Heating circuit pump is switched on	
06:04	Flow heating circuit setpoint	Flow setpoint temperature for heating circuit	
06:05	Room actual	Actual temperature in room	X4
06:06	Room setpoint	Room setpoint temperature for heating circuit	
07:01	Display DHW charging pump	0: Pump is switched off 1: Pump is switched on	
07:02	DHW actual value	Sensor mode: Actual temperature on DHW sensor Thermostat mode: 0 = Input open 1 = Input closed	

Display	Designation	Description
07:03	DHW setpoint	Setpoint temperature for DHW tank

02 time programs

Weekday	Cycle of operation	Switch-on time	Switch-off time
1	I	06:00	22:00
1	II	12:00	12:00
2	I	06:00	22:00
2	II	12:00	12:00
3	I	06:00	22:00
3	II	12:00	12:00
4	I	06:00	22:00
4	II	12:00	12:00
5	I	06:00	22:00
5	II	12:00	12:00
6	I	06:00	22:00
6	II	12:00	12:00
7	I	06:00	22:00
7	II	12:00	12:00

Note: When switch-on and switch-off time are the same, cycle of operation is switched off. Observe menu heating circuit parameter 06:05 (time program)!

03 Parameter system

Display	Designation	Description
03:01	Code entry	Setting range: 0 ... 999 Factory setting: 0 Function: Show parameters marked with X3 if they are hidden by the "Code heating specialist" 03:09.
03:04	Building type	Setting range: 1: light construction (mean value over 6 hours) X3 2: Medium construction (mean value over 24 hours) 3: Heavy construction (mean value over 72 hours) Factory setting: 2 Function: This parameter considers the building type by adapting the calculation of the outside temperature mean value according to its setting.
03:05	Climate zone	Setting range: -50°C ... 0°C X3 Factory setting: -12°C Function: The climate zone is the coldest outside temperature value to be expected.
03:06	Automatic exit time	Setting range: 0,5 ... 10 Min X3 Factory setting: 2 min Function: When unit is not operated during the set time, the display returns to basic display.
03:07	Anti-blocking protection	Setting range: 0 = OFF X3 1 = ON Factory setting: OFF Function: Pump is switched on 20 s daily during extended shutdown (> 24h) as protection against blocking when function is activated.
03:09	Code heating specialist	Setting range: 0 ... 999 Factory setting: 0 Function when setting is greater than 0: Hide parameters marked with X3.
03:10	Total reset	Reset to factory settings

04 Parameters heat generator

Display	Designation	Description
04:01	Function of heat generator	Setting range: 0 = OFF X3 1 = H-GEN single stage 2 = H-GEN OpenTherm Factory setting: 1 Function: 0: OFF 1: Control of a single-stage heat generator via a relay output 2: Control of a heat generator with standardised OpenTherm interface via setpoint transfer
04:02	Minimum temperature limit H-GEN*	Setting range: 5°C ... 95°C X3 Factory setting: 38°C Function: To protect the heat generator against aggressive condensate, the minimum temperature limit specified by the manufacturer of the heat generator must be set. · Forced switch-on of DHW when value drops below limit · Switch-off DHW at set value + burner switching differential If there is no demand from heating system or DHW, the boiler will be switched off. If the temperature in the heat generator drops below the heat generator frost protection temperature of +5°C, the burner will be switched on and the heat generator is heated to the minimum temperature limit. Note: for condensing boilers, this value may need to be lowered.
04:03	Maximum temperature limit H-GEN*	Setting range: 5°C ... 100°C X3 Factory setting: 95°C Function: · Forced switch-off of DHW when value is exceeded · H-GEN is switched on again at set value – ½SD – 2K
04:04	Burner switching differential (SD) *	Setting range: 2...30K X3, X5 Factory setting: 6K Function: On multiple stage heat generators, the setpoint on heat generator sensor is controlled by the burner switching differential. · Switch-on of heat generator at setpoint temperature – ½ SD · Switch-off of heat generator at setpoint temperature + ½ SD

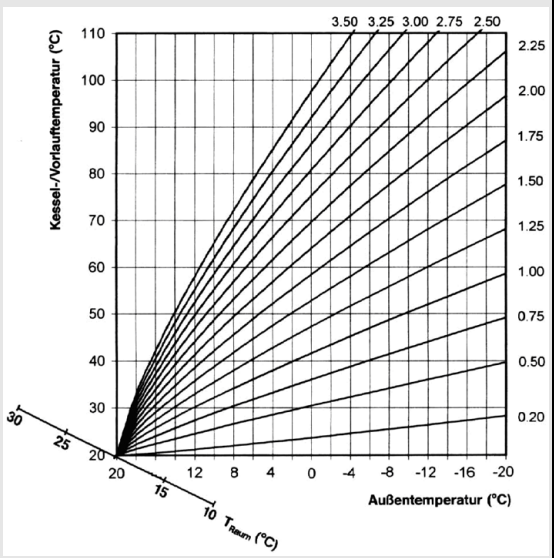
* ***This function shall only be used by an authorised professional. Incorrect settings can result in system damages.***

Display	Designation	Description
04:05	Minimum burner run time	Setting range: 0...20 Min X3 Factory setting: 2 min Function: After starting the heat generator, at least the set time must lapse before the heat generator is deactivated again. Note: The maximum temperature limit takes priority over this function.
04:06	Start-up protection	Setting range: 5 ... 95°C X3 Factory setting: 36°C Function: Start-up protection of heating circuits helps in preventing condensate discharge when heating up in cold condition. · Switch-off of heating circuits (unmixed circuits, mixed circuits, DHW loading) when heat generator temperature drops below the value · Heating circuits are enabled when heat generator temperature exceeds the value + start-up prot.switching differential.
04:07	Start-up protection switching differential	Setting range: 2 ... 20K X3 Factory setting: 4K Function: See description of parameter 04:06.
04:08	Reset counter	Reset counter of heat generator starts and operating hours

06 Parameter heating circuit

Display	Designation	Description
06:01	Function	Setting range: 0=OFF 1=Unmixed circuit Factory setting: 1
06:02	Room day	Setting range: 5 ... 30°C Factory setting: 20°C Function: The set temperature is the room setpoint during active cycles of operation in AUTOMATIC mode and during HEATING mode.
06:03	Room night	Setting range: 5 ... 30°C Factory setting: 16°C Function: The set temperature is the room setpoint between the cycles of operation in AUTOMATIC mode and during RED. HEATING mode.

Display	Designation	Description
06:04	Operating mode	Setting range: 1: Automatic 2: Heating 3: Red. heating 4: Standby Factory setting: 1 Function: Automatic: Heating circuit operates in Heating or Red. heating mode according to the time program assigned under 06:05 Heating: Heating circuit operates continuously according to set room day temp. (06:02) Red. heating: Heating circuit operates continuously set room night temp. (06:03) under consideration of 06:06 Standby: Frost-protected switch-off of heating circuit
06:05	Time program	Setting range: 1: Time program 1 2: Time program 2 3: Time program 1 and 2 Factory setting: 1 Function: Depending on the setting, the heating circuit operates according to time program 1, 2 or both, as set in menutree 02 (time programs).
06:06	Type of reduced operation (ECO/RED)	Setting range: 0: ECO 1: RED Factory setting: 0 Function: The settings are effective in Reduced operating mode. ECO Frost-protected switch-off mode RED: Reduced mode

Display	Designation	Description
06:07	Heating curve/ conductance	Setting range: 0.05 ... 3.50 Factory setting: 1.50 Function: Determines the heating curve for the heating circuit. 
06:08	Heating system (exponent)	Setting range: 1.00...10.00 X3 Factory setting: 1.30 Function: Curvature of heating circuit's heating curve. Recommendation: 1,10: Floor or other panel heating systems 1,30: Radiator heating 2,00: Convector and baseboard heating >3,00: General ventilator applications with high start temperatures
06:09	Frost protection	Setting range: OFF (----) X3 -50 °C ... +10 °C Factory setting: 3°C Function: To keep the heating system from freezing in switch-off mode, the controller is equipped with electronic frost protection. Caution: Faulty operation can result in damages to building!

Display	Designation	Description
06:10	Summer switch-off	Setting range: OFF (----) X3 10 °C ... 30 °C Factory setting: 20°C Function: Switch-off of heating operation at outside temperatures above the desired outside temperature.
06:11	Extended pump running time	Setting range: 0.0...60.0 Min X3 Factory setting: 5 min Function: This function determines extended run time of heating circuit pump after heating circuit is switched off by time programs.
06:13	Room factor	Setting range: 0...500% X3, X4 Factory setting: 100% Function: This function determines to what extent a deviation of the room temperature from the setpoint affects the control of boiler flow temperature. Corrected room setpoint = set room setpoint - (deviation x room factor) / 100
06:14	Room thermostat function	Setting range: Off (----) X3, X4 0.5 ... 5K Factory setting: Off (---) Function: This function determines a room temperature limit; if limit is exceeded, heating is turned off.
06:15	Room frost protection limit	Setting range: 5...30°C X3, X4 Factory setting: 10°C Function: This function determines the room setpoint of the corresponding heating circuit during switch-off mode with frost protection activated.
06:20	Heat generator parallel shift	Setting range: 0 ... 20K X3 Factory setting: 0K Function: The demand value of the heating circuit, plus the shift value, is transmitted to the heat generator.

07 DHW parameters

Display	Designation	Description
07:01	Function	Setting range: 0 = OFF 1 = Sensor mode 2 = Thermostat mode 3 = Automatic mode DHW Factory setting: 1 Function: Sensor mode: Control via temperature sensor in domestic hot water tank Thermostat mode: Alternatively, DHW heating can also be controlled via a mechanical temperature controller (thermostat switching contact) In this case a DHW thermostat is connected instead of a DHW sensor and set to the desired DHW setpoint. If the contact is closed, DHW loading takes place at the set DHW maximum temperature until the contact is opened again.
07:02	DHW day	Setting range: 5 ... 65°C Factory setting: 50°C Function: The set temperature is the DHW setpoint during active cycles of operation in AUTOMATIC mode and during HEATING mode.
07:03	DHW night	Setting range: 5 ... 65°C Factory setting: 20°C Function: The set temperature is the DHW setpoint between the cycles of operation in AUTOMATIC mode and during RED. HEATING mode.
07:04	Operating mode	Setting range: 1: Automatic 2: Heating 3: Red. heating 4: Standby Factory setting: 1 Function: Automatic: DHW operates in Heating or Red. heating mode according to the time program assigned under 07:05 Heating: DHW operates continuously according to set DHW day temperature (07:02) Reduced: DHW operates continuously according to set room night temp. (07:03) Standby: Frost-protected switch-off of DHW

Display	Designation	Description
07:05	Time program	Setting range: 1: Time program 1 2: Time program 2 3: Time program 1 and 2 Factory setting: 1 Function: Depending on the setting, the DHW operates according to time program 1, 2 or both, as set in menutree 02 (time programs).
07:06	Legionella protection (day)	Setting range: 0: OFF X3 1 ... 7: Monday ... Sunday 8: All Factory setting: 1 Function: A legionella protection function can be activated to eliminate the legionella germs in the tank. In order to completely kill all germs, the Legionella protection temperature should be set at least at 60-65°C. The legionella protection function is activated for 1 hour. OFF: Function is not active 1 ... 7: Function is performed once a week on the set weekday All: Function is performed each weekday
07:07	Legionella protection (time)	Setting range: 00:00 ... 23:00 o'clock X3 Factory setting: 02:00 o'clock Function: This value is used to set the time at which the legionella protection function is to be started on the set weekday (see 07:06).
07:08	Legionella Protection (temperature)	Setting range: 10 ... 65°C X3 Factory setting: 60°C Function: This value is used to specify setpoint temperature for legionella protection function (see 07:06).
07:09	Switching differential	Setting range: 2 ... 20K X3 Factory setting: 5K Function: To prevent frequent loading of the DHW tank, the DHW setpoint temperature is adjusted under consideration of a switching differential. • Activation of DHW loading at setpoint temperature – ½ switching differential • Termination of DHW loading at setpoint temperature + ½ switching differential

Display	Designation	Description
07:10	Maximum temperature limit	Setting range: 20 ... 80°C X3 Factory setting: 65°C Function: This function serves as protection of the DHW tank. Irrespective of parameter settings 07:02, 07:03 and 07:08, at most the set value will be adjusted. If exceeded, the charging pump is switched off immediately. CAUTION: observe operating instructions of DHW tank before making any changes. Excessive maximum temperatures can result in damages on DHW tank.
07:11	Exceeded load temperature	Setting range: 0 ... 20K X3 Factory setting: 10K Function: This function determines the lead value for the tank load temperature through the heat generator, compared to the set DHW setpoint. Heat generator setpoint = DHW setpoint + Loading temperature excessive increase
07:12	Extended pump running time	Setting range: 0...60 Min X3 Factory setting: 5 min Function: After switching off the heat generator, the tank loading pump is stopped after a time delay to prevent a safety switch-off in case of high temperatures.
07:14	Priority mode DHW	Setting range: 0: Parallel mode X3 1: Priority mode Factory setting: 1 Function: Parallel mode: During tank loading the heating circuits remain operative Priority mode: During tank loading the heating circuits are shut down. They are restarted after the extended running time of the pump (07:12).

26 Time setting

Display	Designation	Description
26:01	Time	Setting range: 00:00 ... 23:59 Factory setting: Current time Function: Setting of current time. Note: Daylight saving time must be adjusted manually.
26:02	Weekday	Setting range: 1 ... 7 Factory setting: Current weekday Function: Setting of current weekday.

27 Sensor calibration

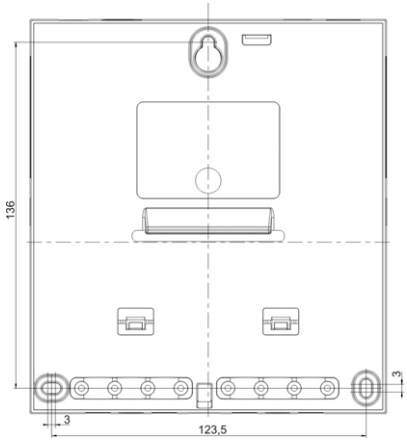
Display	Designation	Description
27:01	Calibration F1	Setting range: -5K ... +5K Factory setting: 0K Function: Correction of measured sensor value at input of heat storage tank F1
27:02	Calibration F2	See 27:01 on input DHW sensor F2
27:04	Calibration F4	See 27:01 on input outside sensor F4

28 Relay test

Display	Designation	Description
28:01	Test output 1	Setting range: 0 = OFF 1 = ON Factory setting: 0 Function: By changing the value, the output switches heat circuit pump on and off (test function), independent of function.
28:02	Test output 2	See 28:01 for output DHW charging pump
28:04	Test output 4	See 28:01 for output DHW charging pump

7. Mounting

Hazard!
Installation must be performed only by an authorised professional electrician! Ensure that unit is de-energised before opening it!

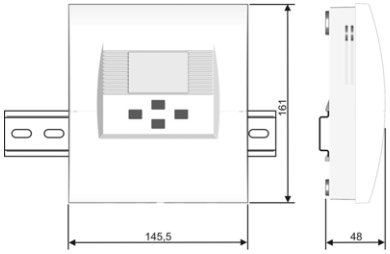


Drilling pattern for wall fastening

1. Remove terminal area cover from casing.
2. For mounting, first put a screw into the wall.
3. Hang controller into the opening.
4. Use controller as template for the other screw holes.

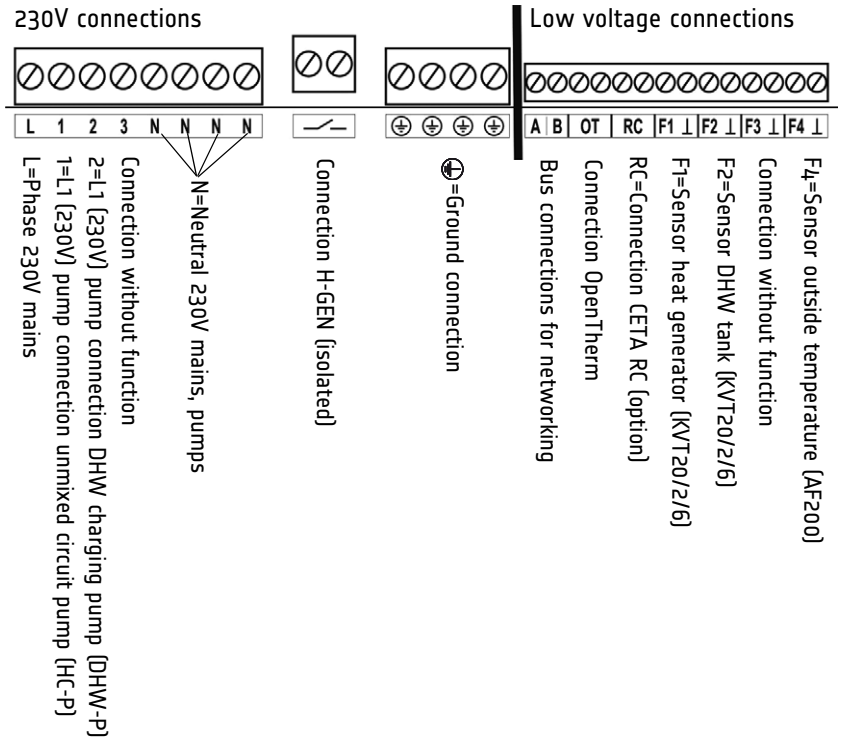
Rail mount

1. Insert mounting feet into rail mount opening.
2. Lock hook in place by pushing down.



8. Terminal diagram

Hazard!
Connection must be performed only by an authorised professional electrician! Ensure that unit is de-energised before opening it!



9. Fault clearance

To allow an accurate diagnosis in case of malfunction, the unit is equipped with a fault display system. The faults are shown on the basic display of the unit in form of an error code.

Fault overview:

Fault code	Cause	Repair
11-0	Interruption sensor F1	Check cable and plug connection, replace if necessary
11-1	Short circuit sensor F1	Replace tank sensor
12-0	Interruption sensor F2	See 11-0
12-1	Short circuit sensor F2	See 11-1
13-0	Interruption sensor F3	See 11-0
13-1	Short circuit sensor F3	See 11-1
14-0	Interruption sensor F4	See 11-0
14-1	Short circuit sensor F4	See 11-1
71-6	Data bus OpenTherm no signal (terminal OT)	Repair malfunction on data bus to heat generator
72-6	Data bus CETA RC no signal (terminal RC)	Repair malfunction on data bus to room unit CETA RC
73-2	Unit bus address collision (Terminal AB)	Set controls of the same type to different bus addresses (parameter 03:03)
73-6, 74-0 to 74-9	Unit bus error communication (Terminal AB)	Check bus connection between the units
5-00	General errors on heat generator (only for OpenTherm)	Purely display function in CETAsystem, troubleshooting on heat generator
5-00	Locking errors on heat generator (only for OpenTherm)	Purely display function in CETAsystem, troubleshooting on heat generator
6-00	Blocking errors on heat generator (only for OpenTherm)	Purely display function in CETAsystem, troubleshooting on heat generator

10. Sensor resistance values

Depending on temperature:

PT1000

T (°C)	R (kOhm)
40	1,155
50	1,194
60	1,232
70	1,271
80	1,309
90	1,347
100	1,385
110	1,423
120	1,461
130	1,498
140	1,536
150	1,573
160	1,611
170	1,648
180	1,685
190	1,722
200	1,758
210	1,795
220	1,832
230	1,868
240	1,905
250	1,941

KVT20/2/6, AF200

T (°C)	R (kOhm)
10	1,783
12	1,812
14	1,840
16	1,869
18	1,898
20	1,928
25	2,002
30	2,078
35	2,155
40	2,234
45	2,314
50	2,395
55	2,478
60	2,563
65	2,648
70	2,735
75	2,824
80	2,914
85	3,005
90	3,098
95	3,192
100	3,287

12. Technical Data

Power supply voltage:	230V +6%/ -10%
Rated frequency:	50...60Hz
Power input:	max. 2.1VA
Fuse:	6.3A
Output relay contact load:	2 (2)A
Ambient temperature:	-10...+50°C
Storage temperature:	-25...+80°C
Degree of protection:	IP 30
Protection class according to EN 60730:	II
CE compliance:	89/336/EEC
Casing dimensions:	145.5 x 161 x 48 mm (W x H x D)
Casing material:	ABS V0
Weight:	420g
Mains connection technology:	Screw terminals 1.5 mm^2
Sensor connection technology:	Screw terminals 1.0 mm^2

13. Liability

Our general terms and conditions of business are generally applicable. Any liability claims based on failure to observe operating manual as well as safety instructions contained therein, are excluded. Subject to technical modifications.

14. Disposal

Dispose of all replaced parts, and eventually the controller itself, in an environmentally sound manner in compliance with applicable statutory regulations of the corresponding country.

Company stamp: