Operating manual

CETA 101

Double differential temperature control

Version 1308-22
Art. 0450021015

Contents

Scope of delivery

1. 1x Central unit CETA 101
2. 1x Tank immersion sensor KVT 20/2/6
3. 2x Collector sensor PT1000/6
4. 8x Screw, plate 2,9x19 mm
5. 3x Screw assembly 4x35 mm
6. 3x Plug U6
7. 2 x Cable clamp

General

Systems with 2 heat sources and hot water tanks are controlled via the differential temperature control. When the heat source temperature exceeds the tank temperature by the value set on the controller, the circulation pump is activated by the control and the heat absorbed in the heat source is transported to the hot water tank.

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 differential temperature controller.

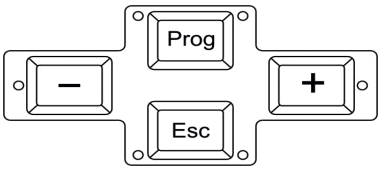
Safety

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

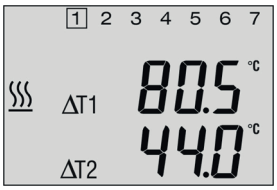
Esc
·Exit setting
·Keep old value
·Select next higher menu level

Esc-Lang
·Return to basic display

2. Version display (when starting)

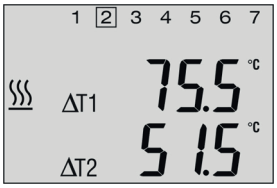
c 101=	Type designation Ceta 101
2.2=	Version display (due to update it can differ from example shown)

3. Basic display



1=	Basic display 1
80.5°C=	Temperature F3 heat supplier 1 (e.g. collector or solid fuel boiler)
44.0°C=	Temperature F1 heat storage tank 1
ΔT1=	Display pump function P1
ΔT2=	Display pump function P2
	Display burner block

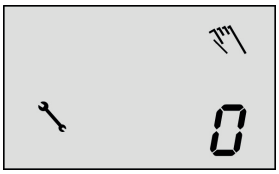
Use + / - to switch to:



2=	Basic display 2
75.5°C=	Temperature F4 heat supplier 2 (e.g. collector or solid fuel boiler)
51.5°C=	Temperature F2 heat storage tank 2 (if sensor F2 is available)
ΔT1=	Display pump function P1
ΔT2=	Display pump function P2
	Display burner block

4. Function with direct access

Manual operation



0...4

Controller is in manual mode

manual function

- Activate by pressing and holding [Prog] button
- Change pump function via buttons [+] and [–]
- end function by pressing [Esc] button

Function: The manual functions 0 ... 4 allow manual start-up of the system, e.g. to perform venting.
0 = All relays OFF

1 = Pump ΔT1 ON

2 = Pump ΔT2 ON

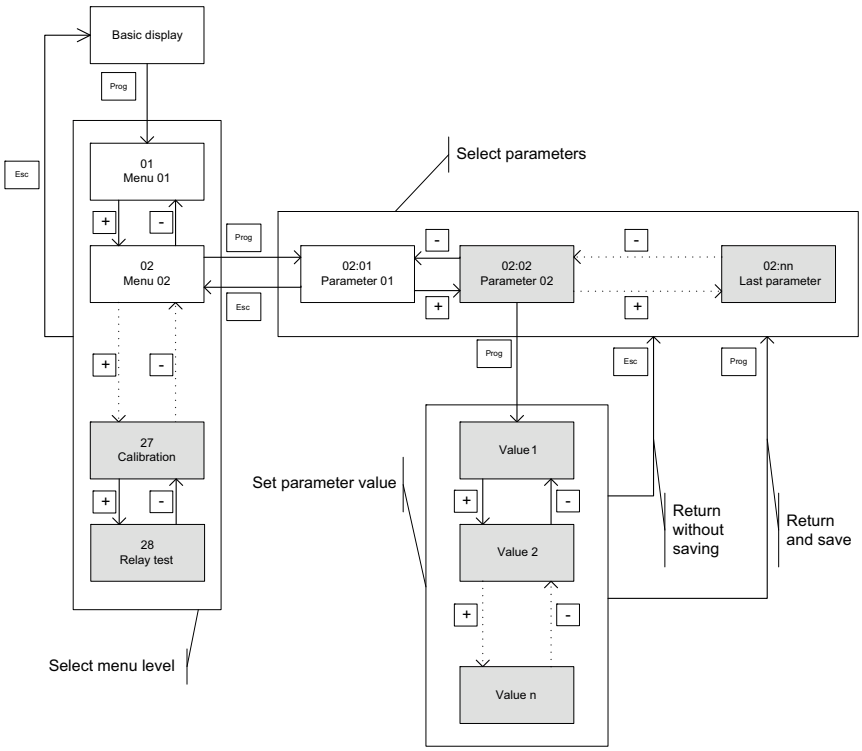
3 = Pump ΔT1 + ΔT2 ON

4 = Pump ΔT1, ΔT2 and burner block relay ON

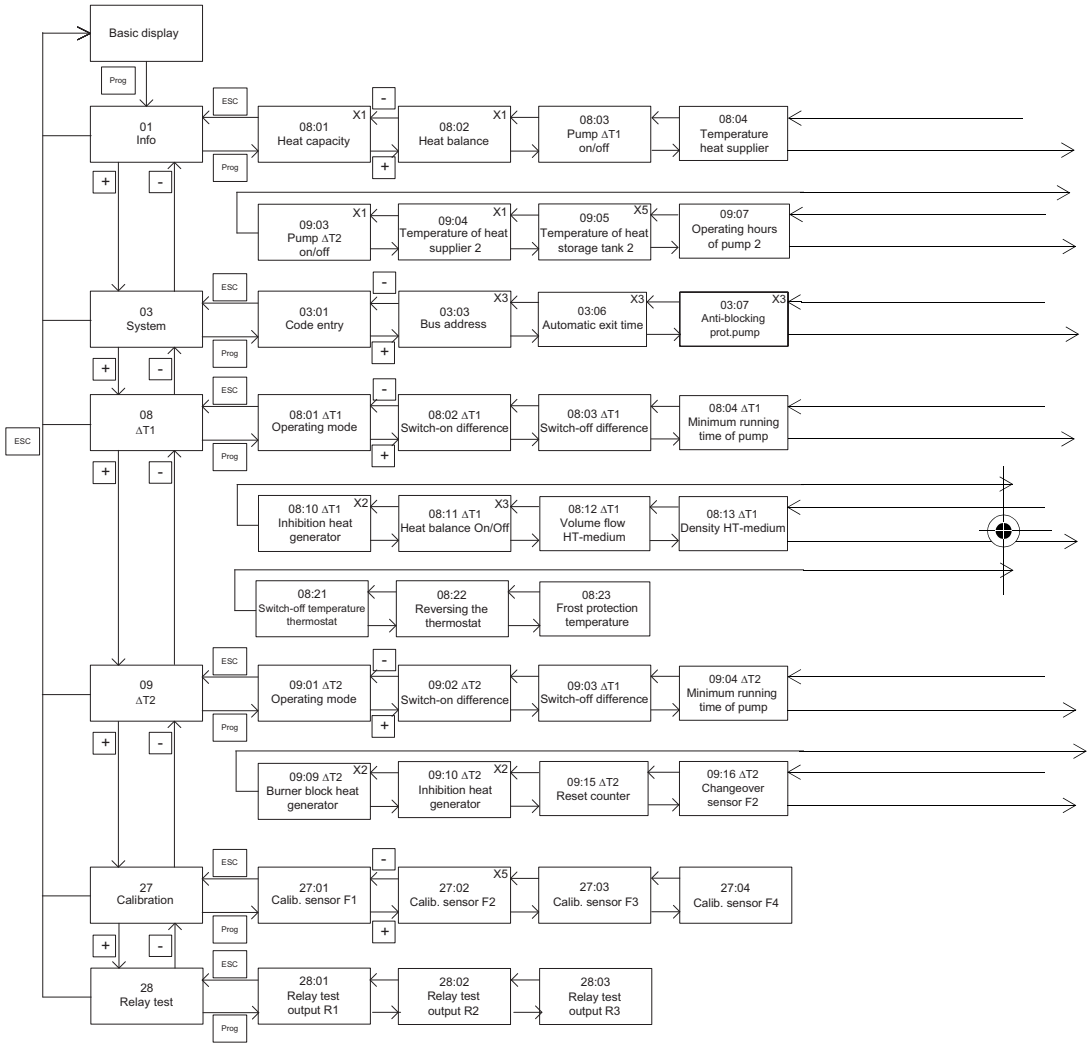
Important!
This function shall only be used by an authorised professional. Temperatures are not monitored during manual operation. Faulty operation or unsupervised operation of this function may result in damages to the heating system.

5. Menu level

General menu structure Ceta series



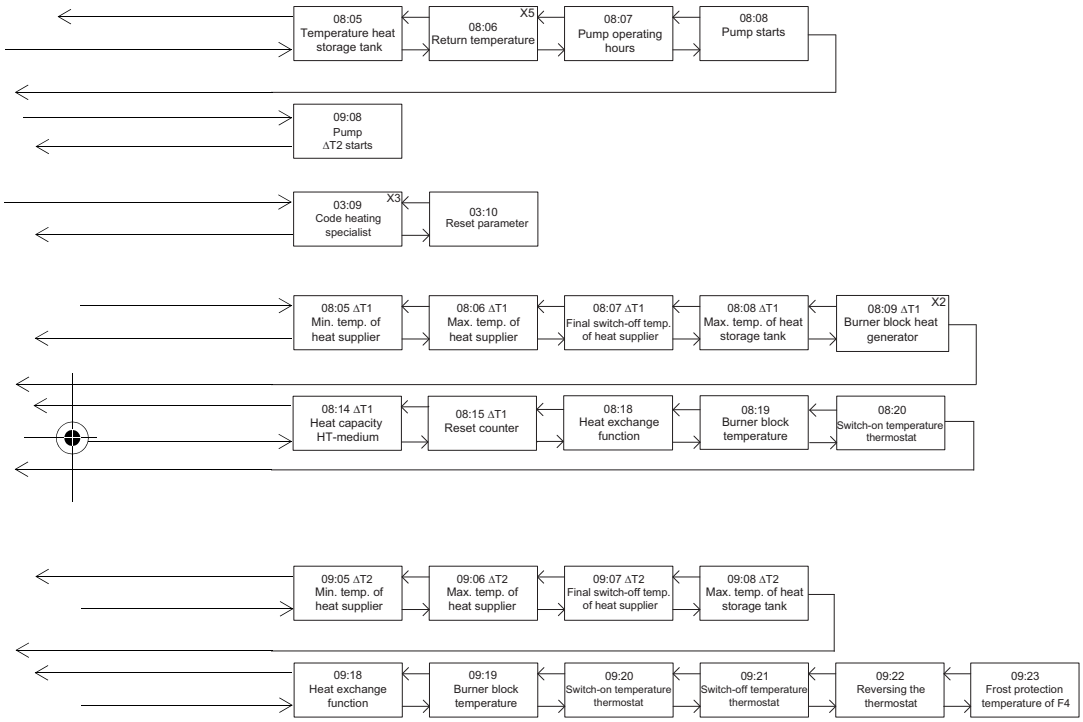
Overview of menu level



X1: Only displayed during active heat balancing

X2: Function only in bus connection

Menu level



X3: Are hidden when activating code 03:09

X5: Option

6. Parameter description

01 Information level

Display	Designation	Description	
08:01	Heat capacity ΔT1	Current heat capacity in W	X1
08:02	Heat balance ΔT1	Display of cumulative heat energy in kWh	X1
08:03	Display pump function ΔT1	0: Pump is switched off 1: Pump is switched on	
08:04	Temperature heat supplier ΔT1	Sensor temperature of heat supplier (e.g. collector, solid fuel boiler) at input F3	
08:05	Temperature heat storage tank ΔT1	Sensor temperature of heat storage tank at input F1	
08:06	Temperature return ΔT1	Sensor temperature of return at input F2, if available.	X5
08:07	Pump operating hours ΔT1	Number of pump operating hours	
08:08	Pump starts ΔT1	Number of pump starts	
09:03	Display pump function ΔT2	0: Pump is switched off 1: Pump is switched on	
09:04	Temperature heat supplier ΔT2	Sensor temperature of heat supplier (e.g. collector, solid fuel boiler) at input F4	
09:05	Temperature heat storage tank ΔT2	Sensor temperature of heat storage tank at input F1 (or F2, if available)	X5
09:07	Pump operating hours ΔT2	Number of pump operating hours	
09:08	Pump starts ΔT2	Number of pump starts	

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.

Display	Designation	Description
03:03	Bus address	Setting range: 21...25 X3 Factory setting: 21 Function: If more than one CETA 100 or 101 has to be connected via data bus within a system, each unit must be set to a unique address.
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: Hide parameters marked with X3.
03:10	Total reset	Reset to factory settings

08 Parameter DeltaT1

Display	Designation	Description
08:01	Control mode ΔT1	Setting range: 0...3 Factory setting: 1 Function: 0 = OFF 1 = Delta-T without return flow sensor 2 = Delta-T with return flow sensor F2 3 = Thermostat function F1
08:02	Switch-on differential ΔT1	Setting range: (Switch-off differential + 3K) ... 30K Factory setting: 10K Function: If temperate difference between sensors of heat supplier F3 and heat storage tank F1 is **larger** than set value, the pump switches **on**.

Display	Designation	Description
08:03	Switch-off differential ΔT1	Setting range: 2K ... (Switch-on differential - 3K) Factory setting: 5K Function: If temperate difference between sensors of heat supplier F3 and heat storage tank F1 is **smaller** than set value, the pump switches **off**.
08:04	Minimum pump running time ΔT1	Setting range: OFF (----) 0.5 ... 60 min Factory setting: 3 min Function: Minimum switch-on time of pump per start.
08:05	Minimum temperature heat supplier ΔT1	Setting range: OFF (----) 5 ... 80 °C Factory setting: OFF Function: Irrespective of switching differentials, the pump switches on only after the sensor of heat supplier F3 has exceeded the set value. Note: The set minimum temperature has a fixed switching hysteresis of 10K!
08:06	Maximum temperature heat supplier ΔT1	Setting range: OFF (----), 30 ... 110 °C Factory setting: 90°C Function: Irrespective of switching differentials, the pump performs a forced switch on after the sensor of heat supplier F3 has exceeded the set value.
08:07	Final switch-off temperature heat supplier ΔT1	Setting range: OFF (----), 70 ... 210 °C Factory setting: OFF Function: Irrespective of switching differentials, the pump performs a forced switch off after the sensor of heat supplier F3 has exceeded the set value.
08:08	Maximum temperature heat storage tank ΔT1	Setting range: OFF (----), 50 ... 110 °C Factory setting: 75°C Function: Irrespective of switching differentials, the pump performs a forced switch off after the sensor of heat storage tank F1 has exceeded the set value. This switch-off takes priority over functions 08:07 and 08:06.

Display	Designation	Description
08:09	Burner block Heat generator ΔT1	Setting range: 0 ... 2 X2 Factory setting: 1 Function: 0 = OFF 1 = Burner block when pump is active 2 = Burner block only for DHW when pump is active
08:10	Inhibition heat generator ΔT1	Setting range: OFF (----) ... 24h X2 Function: After burner block is active, the heat generator is also blocked for the duration of the set time.
08:11	Activation heat balance ΔT1	Setting range: OFF (----) X3, X5 1 = Heat balancing via return sensor on F2 (option) Factory setting: 1 Function: The settings of parameters 08:12 to 08:14 are only active if the heat balance function has been switched on via this parameter.
08:12	Volume flow HT-medium ΔT1	Setting range: 0.0 ... 30 l/min Factory setting: 0.0 l/min Function: Here the volume flow is set in litre/minute when calculating flow rate, according to respective pump capacity.
08:13	Density HT-medium ΔT1	Setting range: 0.8 ... 1.2 kg/l Factory setting: 1.05 kg/l Function: Using this parameter, the density of the heat transfer medium is entered in kilogramme per litre, according to manufacturer's data.
08:14	Heat capacity HT-medium ΔT1	Setting range: 2.0 ... 5.0 kJ/kgK Factory setting: 3.6 kJ/kgK Function: This setting value is used to enter the specific heat capacity of the heat transfer medium according to manufacturer's information.
08:15	Reset counter ΔT1	Setting range: 0 = no reset, 1 = reset counter Factory setting: 0 Function: When value is changed to 1 and confirmed, all counters (heat balance, operating hours and starts) are reset.

Display	Designation	Description
08:18	Heat exchange difference	Setting range: OFF (----), 5 ... 50K Factory setting: OFF Function: If the F1 temperature is higher than 08:08 and the F3 temperature below 40°C, the pump will be switched on until the F1 is lowered to the set difference below 08:08.
08:19	Burner block temperature	Setting range: OFF (----), 5 ... 80 °C Factory setting: OFF Function: Additionally or alternatively to 08:09, an F1 temperature can be set whereby the burner block will be activated (via data bus). When the temperature sinks below the value of 08:19 by 5K, it will be deactivated.
08:20	Switch-on temperature thermostat	Setting range: 5 °C ... (switch-off temperature -3K) Factory setting: 30 °C Function: If F1 sinks below the set value, the ΔT1 pump switches on.
08:21	Switch-off temperature thermostat	Setting range: (switch-on temperature +3K) ... 120 °C Factory setting: 90 °C Function: If F1 exceeds the set value, the ΔT1 pump switches off.
08:22	Reversing the thermostat	Setting range: 0, 1 Factory setting: 0 Function: reverts the pump function. 0 = closer, 1 = opener
08:23	Frost protection temperature of sensor F3	Setting range: OFF, -15 °C ... 10 °C Factory setting: OFF Function: When the F3 temperature is below the set value, the ΔT1 pump will be switched on, and it will be switched off when the F3 temperature exceeds the set value by +2.5K.

9 Parameter DeltaT2

Display	Designation	Description
09:01	Control mode ΔT2	Setting range: 0 , 1 , 3 Factory setting: 1 Function: 0 = Delta T2 OFF 1 = Delta T2 ON 3 = Thermostat function

Display	Designation	Description
09:02	Switch-on differential ΔT2	Setting range: (Switch-off differential + 3K) ... 30K Factory setting: 10K Function: If temperate difference between sensors of heat supplier F4 and heat storage tank F2 is **larger** than set value, the pump switches **on**.
09:03	Switch-off differential ΔT2	Setting range: 2K ... (Switch-on differential - 3K) Factory setting: 5K Function: If temperate difference between sensors of heat supplier F4 and heat storage tank F2 is **smaller** than set value, the pump switches **off**.
09:04	Minimum running time pump ΔT2	Setting range: OFF (----), 0.5 ... 60 min Factory setting: 3 min Function: Minimum switch-on time of pump per start.
09:05	Minimum temperature heat supplier ΔT2	Setting range: OFF (----), 5 ... 80 °C Factory setting: OFF Function: Irrespective of switching differentials, the pump switches on only after the sensor of heat supplier F4 has exceeded the set value. Note: The set minimum temperature has a fixed switching hysteresis of 10K!
09:06	Maximum temperature heat supplier ΔT2	Setting range: OFF (----), 30 ... 110 °C Factory setting: 90°C Function: Irrespective of switching differentials, the pump performs a forced switch on after the sensor of heat supplier F4 has exceeded the set value.
09:07	Final switch-off temperature heat supplier ΔT2	Setting range: OFF (----), 70 ... 210 °C Factory setting: OFF Function: Irrespective of switching differentials, the pump performs a forced switch off after the sensor of heat supplier F4 has exceeded the set value.
09:08	Maximum temperature heat storage tank ΔT2	Setting range: OFF (----), 50 ... 110 °C Factory setting: 75°C Function: Irrespective of switching differentials, the pump performs a forced switch off after the sensor of heat storage tank F1 (optionally F2, if available) has exceeded the set value. This switch-off takes priority over functions 08:07 and 08:06.

Display	Designation	Description
09:09	Burner block Heat generator ΔT2	Setting range: 0 ... 2 X2 Factory setting: 1 Function: 0 = OFF 1 = Burner block when pump is active 2 = Burner block only for DHW when pump is active
09:10	Inhibition heat generator ΔT2	Setting range: OFF (----) ... 24h X2 Factory setting: OFF Function: After burner block is active, the heat generator is also blocked for the duration of the set time.
09:15	Reset counter ΔT2	Setting range: 0 = no reset, 1 = reset counter Factory setting: 0 Function: When value is changed to 1 and confirmed, all counters (Delta T2 pump, operating hours and starts) are reset.
09:16	Changeover Sensor F2	Setting range: 1, 2 X5 Factory setting: 1 Function: 1 = Sensor F2 (option) is return flow sensor and both Delta-T controls adjust to sensor heat storage tank 1 (F1) 2 = Sensor F2 (option) is the sensor of heat storage tank 2
09:18	Heat exchange difference	Setting range: OFF (----), 5 ... 50K Factory setting: OFF Function: If the F2 temperature is higher than 09:08 and the F4 temperature is below 40 °C, the ΔT2 pump will be switched on until the F2 is lowered to the set difference below 09:08.
09:19	Burner block temperature	Setting range: OFF (----), 5 ... 80 °C Factory setting: OFF Function: Additionally or alternatively to 09:09, an F2 temperature can be set whereby the burner block will be activated (via data bus). When the temperature sinks below the value of 09:19 by 5K, it will be deactivated.
09:20	Switch-on temperature thermostat	Setting range: 5 °C ... (switch-off temperature -3K) Factory setting: 30 °C Function: If F1 (F2) sinks below the set value, the ΔT2 pump switches on.

Display	Designation	Description
09:21	Switch-off temperature thermostat	Setting range: (switch-off temperature +3K) ... 120 °C Factory setting: 90 °C Function: If F1 (F2) sinks below the set value, the ΔT2 pump switches off.
09:22	Reversing the thermostat	Setting range: 0, 1 Factory setting: 0 Function: reverts the pump function. 0 = closer, 1 = opener
09:23	Frost protection temperature of sensor F4	Setting range: OFF, -15 °C ... 10 °C Factory setting: OFF Function: When the F4 temperature is below the set value, the ΔT2 pump will be switched on, and it will be switched off when the F4 temperature exceeds the set value by +2.5K.

27 Sensor calibration

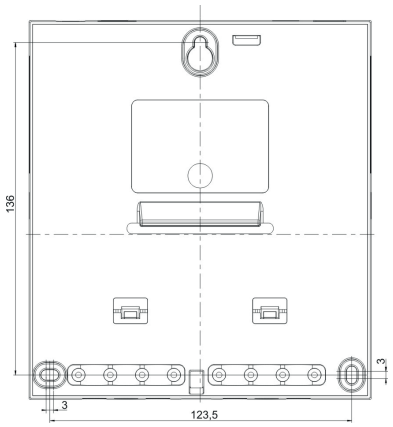
Display	Designation	Description
27:01	Calibration F1	Setting range: -5K ... +5K Factory setting: 0K Function: Correction of measured sensor value on Input heat storage tank F1
27:02	Calibration F2	See 27:01 on input return heat storage tank F2 (option)
27:03	Calibration F3	See 27:01 on input heat supplier F3
27:04	Calibration F4	See 27:01 on input heat supplier F4

28 Relay test

Display	Designation	Description
28:01	Test pump output Delta T1	Setting range: 0 = OFF 1 = ON Factory setting: 0 Function: By changing the value, the output switches on and off (test function), independent of function.
28:02	Test pump output Delta T2	see 28:01
28:03	Test output Burner block	see 28:01

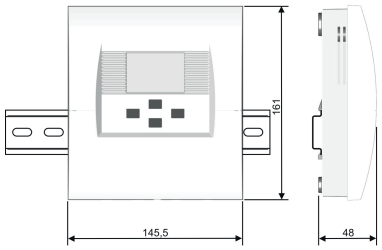
7. Mounting

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.

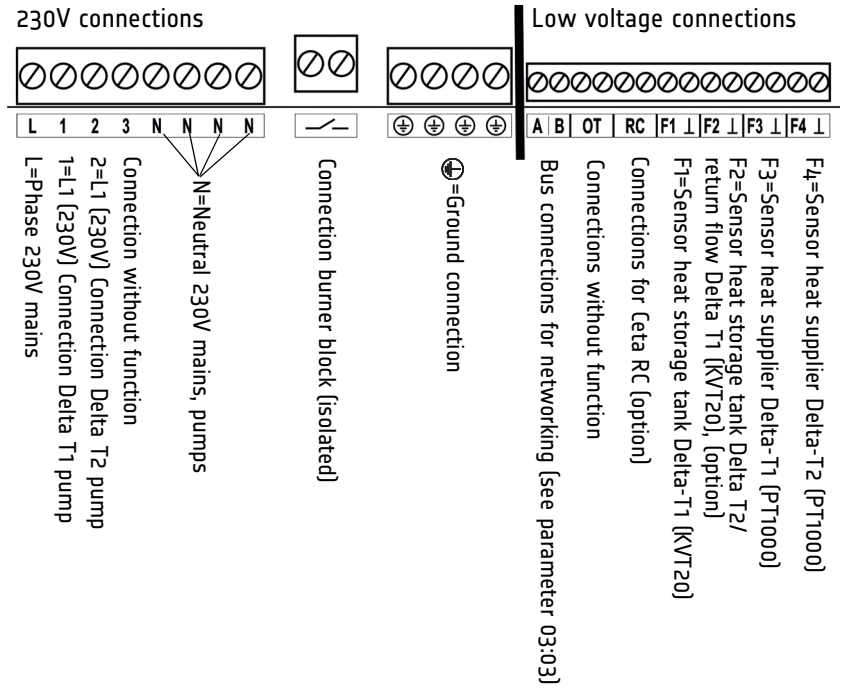


Rail mount

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

8. Terminal diagram

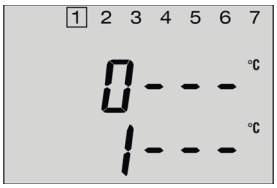
Hazard!
Connection must be performed only by an authorised professional electrician! Ensure that unit is de-energised before opening it!



9. Fault clearance

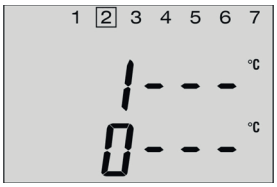
To allow an accurate diagnosis in case of malfunction, the unit is equipped with a fault display system. The faults are shown on the basic display of the unit in form of an error code:

1 =	Display 1
0---°C =	Sensor F3 Heat supplier 1 (z.B. collector1, solid fuel boiler1) is interrupted
1---°C =	Sensor F1 heat storage tank 1 has short circuit



Use + / - to switch to:

2 =	Display 2
1---°C =	Sensor F4 Heat supplier 2 (e.g. collector2, solid fuel boiler2) has short circuit
0---°C =	Sensor F2 (option) heat storage tank 2 is interrupted



Fault overview:

Fault code	Cause	Repair
0---	Sensor F1, F2 or F3 interruption	Check cable and plug connection; repair if necessary
1---	Sensor F1, F2 or F3 short circuit	Replace sensor
Fault	**Cause**	**Repair**
Display text not visible	No power, defective fuse in unit	Check cable and plug connection; repair if necessary; replace fuse

A corresponding fault code is shown alternately in the lower display:

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

Fault code	Cause	Repair
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

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

KVT 20

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: