

TAC 200 OTP is a heating compensator complete with optimum control of the boiler.

It can be used for conventional supply temperature control of mixing valve systems for radiator or floor heating. It can also be used for two stage on/off control of gas boilers.

With a room sensor, automatic reset of the supply temperature from the room temperature can be obtained.

Great flexibility in adjusting the reset curve—a number of curves are available for each individual application—enables optimum matching to the pertinent heating system.

TAC 200 OTP has high and low limits for the supply water temperature.

The controller has a built in safety function with three stages of frost protection.

Reading and adjusting of values are easy to make thanks to a display window and push buttons on the front of the controller.

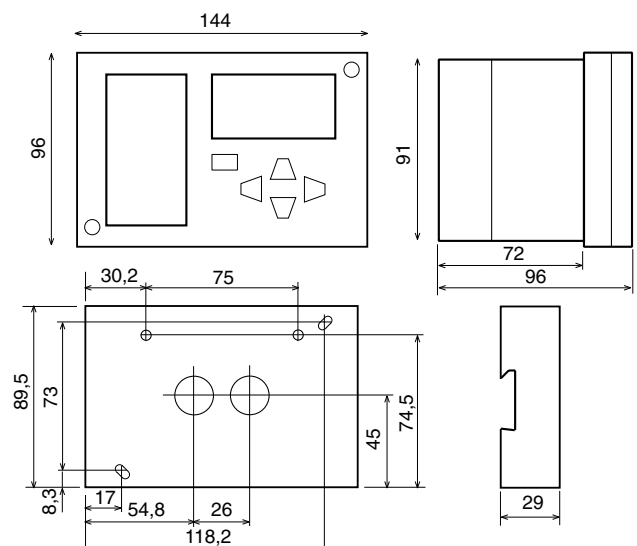
TAC 200 OTP is powered with 230 V AC. It has two relay outputs for heating control. There is also an output for switching on/off of a circulating pump and one for switching on/off of a boiler.

TECHNICAL DATA

Part number	200-1005-000
Power supply voltage	220–230 V AC $\pm 10\%$, 50–60 Hz
Power consumption	2 VA
Ambient temperature:	
Operation	± 0 to $+50$ °C
Storage	-20 to $+50$ °C
Ambient humidity	max. 90% RH, non-condensing
Calendar clock accuracy ..	max. dev. 12 min./year at $+25$ °C
Running reserve, clock	12 hours
Materials:	
Housing and cover	ABS plastic
Protection	IP 40
Colours	black/transparent
Control function	PI
Application selection	DIP-switch with 8 switches
Digital inputs:	
Number of inputs	2
Analog inputs:	
Number of inputs	3
Sensor type	NTC thermistor, 1,8 kohms at $+25$ °C
Relay outputs:	
Number of outputs	4
Function	making (NO)
Voltage rating	max. 250 V AC
Load rating	2 A, min. 50 mA at 24 V

Standards:

Emission	EN 50081-1
Immunity	EN 50082-1
Weight	0,7 kg
Dimensions WxHxD (mm)	144x96x96
	see diagram below
Panel cutout, DIN 43 700 (mm)	138x92



Applications

TAC 200 OTP is intended for supply water temperature control in hot water heating systems. Two types of applications are available:

1. Mixing valve control circuit (figure 1).
2. Gas boiler, two stage on/off control circuit (figure 2).

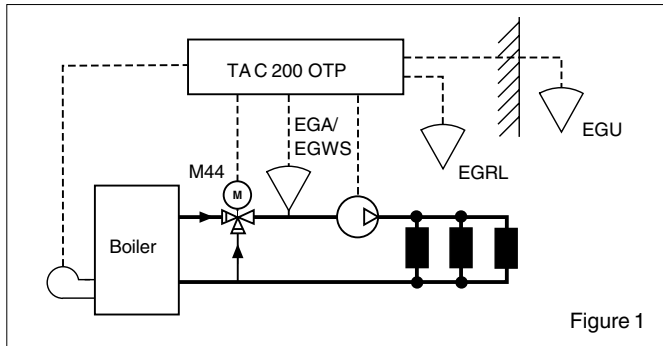


Figure 1

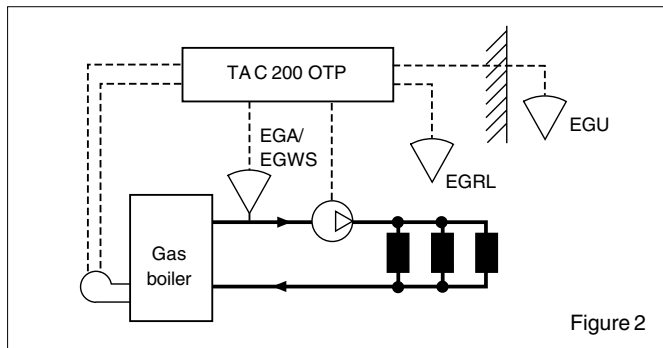


Figure 2

Selection of the desired function is made by means of a hardware switch behind the front panel.

When using mixing valve control, the boiler is always running during day operation and normally not running during night operation. If a room sensor is not used, the boiler is running when the circulating pump is running. During start time optimisation, the boiler is always running.

In addition it is also possible to select between radiator and floor heating.

Reset curve

TAC 200 OTP controls the supply water temperature according to the outdoor temperature. The relationship between the outdoor temperature and the supply water temperature is given by means of a reset curve with three adjustable curve points, see figure 3.

Depending on whether radiator or floor heating system has been selected, two different basic reset curves apply. Also the high limit of the setpoint for the supply water temperature will be different in the two cases.

A suitable shape, and also parallel displacement, if desired, are selected by means of the operator's panel.

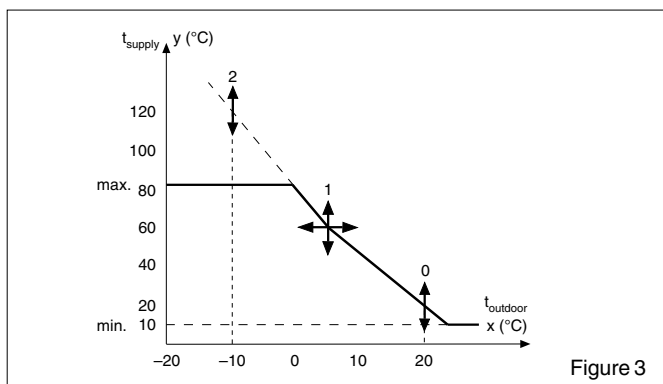


Figure 3

Room sensor

Control can be done with a room sensor. When a room sensor is used, it will automatically displace the reset curve for achievement of optimum room temperature control.

Forced day or night operation

If extended day or night operation is desired, i.e. keeping the temperature at day or night level after the normal switching time between the two, a push button, or a separate timer, is wired to terminals X1 and X2.

Night setback

If no room sensor is used, the reset curve is parallel displaced during night operation. If a room sensor is used, there is no night setback. The boiler and the circulating pump are turned off during night operation and only turned on to protect the system from freezing.

Frost protection

The three stages of frost protection are active during night operation and during forced night operation. If the outdoor temperature falls below a preset value, the first step will start the circulating pump. The second stage will start the boiler if the supply water temperature falls below a preset value. When a room temperature sensor is fitted, the third stage will start the plant to maintain a preset minimum room temperature.

Morning boost and start time optimisation

TAC 200 OTP is equipped with morning boost to ensure that the heating system can restore the room temperature after a night setback. During morning boost the supply water temperature setpoint is increased by a preset value. This value is adjustable. If no room sensor is used, the morning boost starts when the controller turns from night to day operation. If a room sensor is used, the start time is calculated from the outdoor temperature and the preset limits for start time, see figure 4. The curve is automatically adjusted after each optimisation.

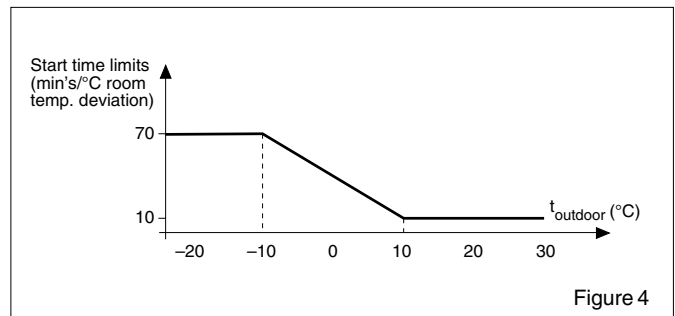


Figure 4

Holiday compensation

After holidays and on Mondays, when night operation has been active for a longer period of time, the controller can start to heat earlier than if the usual morning boost is used. A percentage of time is added to the usual morning boost. This percentage can be adjusted.

Pump control

To save energy, the circulating pump is automatically stopped when the outdoor temperature exceeds a certain, adjustable value. The pump is also stopped if the calculated setpoint for the supply water temperature falls below an adjustable value. If a room sensor is used, the pump control is only active during day operation. If no room sensor is used, the pump control is always active. During on/off control the pump does not stop until both steps are inactive.

The pump stop is always time delayed 5 minutes.

To prevent the pump from seizing, it is exercised for one minute at noon every Monday. The exercising function can be made inoperative.

Time control

The digital clock of TAC 200 OTP has a time program, which is used for switching between day and night operation. All times can be set individually for every day of the week, with a resolution of 30 minutes. This means that start/stop times can be set within 15 minutes of the required time, with up to 24 on/off times for each day.

Daylight saving time

Switching to and from daylight saving time (DST) is fully automatic. The DST switching function can also be made inoperative, or different times for switching to and from DST can be entered. Also the offset of the DST can be changed.

OPERATOR'S PANEL

Reading and entering of values are done from the operator's panel on the front of the controller, see figure 5.

Program functions are selected by means of **P** and **P**. The selected function is shown on the display. Values that can be changed, can be increased or decreased by means of **+** or **-**. **□/■** is used for activating/deactivating the days of the week and the segments of 30 minutes on the time scale for the time program, see figure 7.

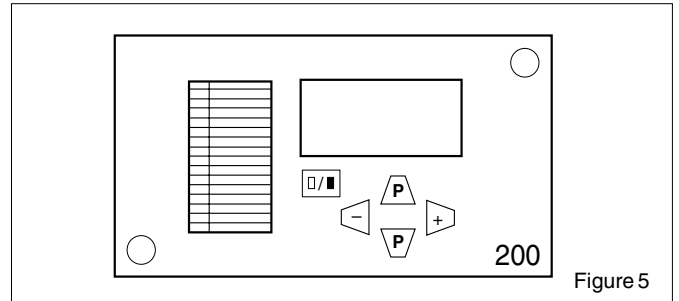


Figure 5

SETTINGS

On the DIP switch (see figure 6):

Switch	Position off (0)	Position on (1)
1	on/off control	mixing valve
2	radiator system	floor heating
3	no room sensor installed	room sensor
4-7	no function	
8	hardware reset when switched 0-1-0	

Factory setting, 1-8: 1000 0000.

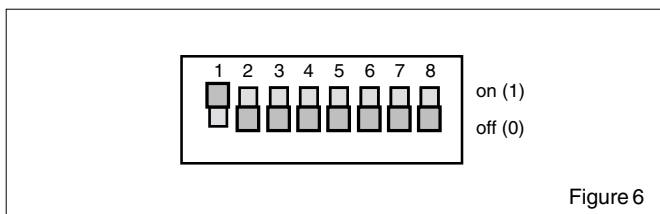


Figure 6

On the operator's panel (see figure 7):

- P:00 Normal position:
Day, time, mode and day operation times are displayed
Change current operating mode
- P:01-P:15 Daily operation:
Current temperatures are displayed
Change setpoints, curve displacement and time program
Change time and date

P:16-P:66 Commissioning, normally not shown

Change:

- reset curve high/low limitation
- shape of reset curve
- start time adjustment
- holiday compensation
- parameters, room controller
- parameters, supply water temp. controller
- actuator running time
- values for morning boost
- values for pump control
- values for frost protection
- time format i.e. 12/24 hour display
- daylight saving time, information

Check:

- program version
- relays K1-K4
- all segments of 30 minutes

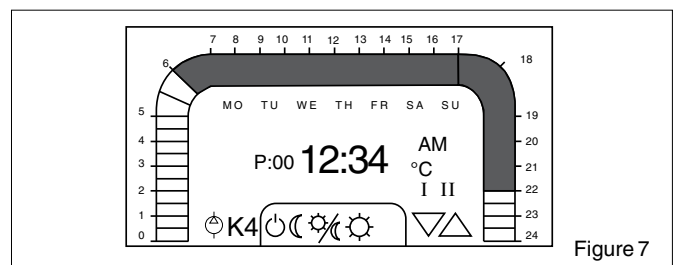


Figure 7

INDICATION

On the operator's panel there are a number of special characters which denote specific functions and also operating mode, see figure 7.

- Circulating pump running
- K4** Boiler running
- Forced off
- Forced night operation
- Automatic control
- Forced day operation
- I** On/off control: stage 1 on
- II** On/off control: stage 2 on

- Mixing valve: decrease
- Mixing valve: increase

0-24 Selected time interval, in half-hours

P:xx Selected function xx, i.e. display or change value

12:34 Current time of the day (at P:00), or some other value, according to selected function P:xx

AM/PM 12-hour clock display

°C Current temperature scale

Current weekday according to:

MO	TU	WE	TH	FR	SA	SU
	Tuesday		Thursday		Saturday	
Monday		Wednesday		Friday		Sunday

CONSTRUCTION

The controller is encased in a plastic enclosure with the standardised measurements 144×96×96 mm.

The casing is equipped with a transparent cover with a simple lock.

A brief instruction covering program functions is inserted in a pocket on the front.

The electronic circuitry is located on two circuit boards, connected with a ribbon cable.

The panel board is fastened with screws in the front of the casing, whereas the lower I/O board is fastened with snap-in locks.

The bottom casing has six holes for connecting cables.

The only care needed is to keep the controller dry and to clean it externally with a dry cloth when needed.

WIRING

TAC 200 OTP is mounted directly onto a wall, or flush-mounted in a panel. It can also be mounted on a 35 mm DIN rail.

1	230 V/L	Mains, phase (live)
2	230 V/N	Mains, neutral
3	PE	Protective earth
4	KC1	Power supply, relays K1 and K2
5	K1	K1: increase/stage 1
6	K2	K2: decrease/stage 2
7	KC2	Power supply, relays K3 and K4
8	K3	K3: circulating pump
9	K4	K4: boiler
10	M	Measurement neutral
11	B1	Supply sensor, EGWS/EGA
12	B2	Outdoor sensor, EGU
13	B3	Room sensor, EGRL
14	M	Measurement neutral
15	X1	Input, forced day oper.
16	X2	Input, forced night oper.
17	X3	Not in use
18	M	Measurement neutral

Length of cables

To terminals B1–B3, and X1–X2:
Max. 200 m, area 0,5 mm².

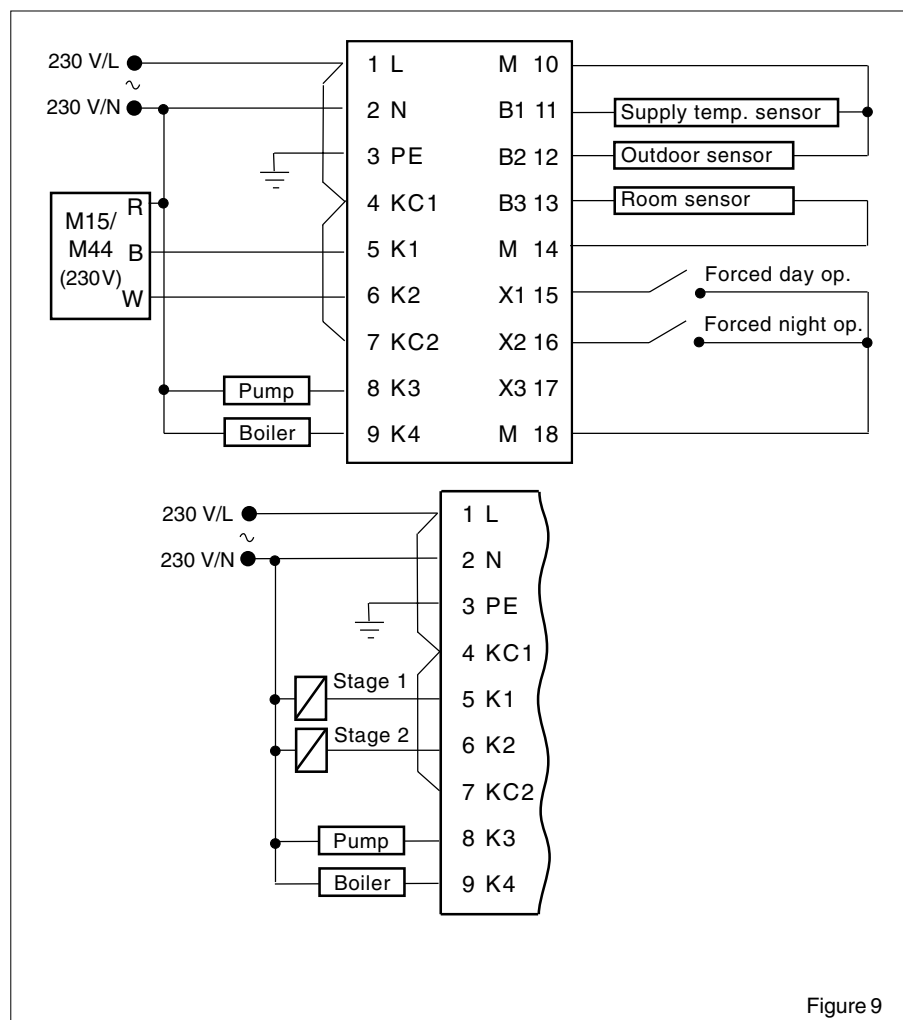
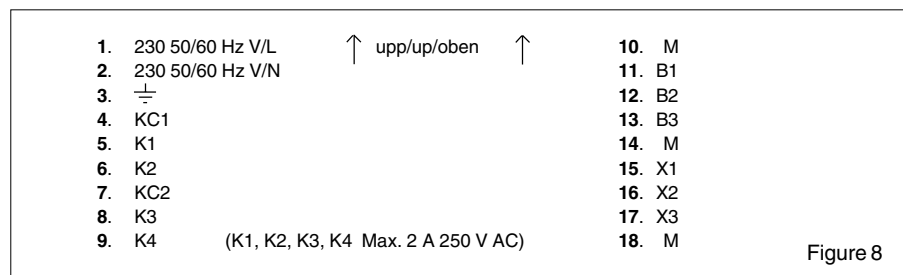
To other terminals:
Max. 100 m, area 1,5 mm².

Cables for power supply and for temperature sensors should be installed well separated (spaced 20 cm or more).

TAC 200 OTP has six cable inlet holes. Two of these are sized for Pr 18,6 (Pg 11) cable glands.

Signal and power supply cables, that enter the casing from the rear, must be routed well separated.

Also 24 V power supply cables must be installed in compliance with local high voltage wiring regulations in force.



POWER FAILURE

The controller maintains the settings for at least twelve hours during a power failure. The clock keeps running and when the power returns, the controller continues to control the system as if nothing had happened.

Should the power failure last longer than twelve hours, the time, date and year will require re-setting.

ACCESSORIES

TAC 200 OTP Handbook, part number 0-004-1400.