



Assembly and Operating
instructions

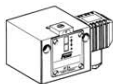
Thermostats TAM, TRM, and TX series

Basic models	Additional functions
TAM...	...-205
TRM...	...-206
TX...	...-213
	...-301
	...-351
Ex-i	...-513
Ex-de, Ex-t	

Type code

Basic version ABC XXX	Version with additional function ABC XXX-YYY	Ex-version Ex-ABC XXX
ABC	Identification for series	
XXX	Identification for temperature range	
YYY	Identification for additional functions	
Ex-	Identification for Ex version	

Connection housings



ABC XXX

Plug connection housing (200)

ABC XXX-2...

(Plug connection to DIN EN 175301)



ABC XXX-3...

Terminal connection housing

ABC XXX-5...

(300 or 500)



Ex- ABC XXX

Ex-housing t (700)

Important notes

Thermostats are precision instruments, set and adjusted in factory. **Do not open the device or reset the varnished adjustment screw.** This would alter the switching points, and resetting in the factory would then be necessary.

Important safety information

Please read this before installing and commissioning!

Installation and commissioning

- ▶ Thermostats may only be installed by personnel trained in this application area in accordance with installation instructions and local legal requirements.
- ▶ Thermostats always should be installed by using suitable thermowells (TAM and TX). Never dip the sensor without pocket direct into the medium. Before selection of a thermowell, it is necessary to check for material compatibility with measured medium.
- ▶ Caution when touching the device – risk of burns. Device can reach on sensor side a temperature of up to 130 °C. Risk of freezing when work with medium temperatures below 0 °C.
- ▶ In any case, do not open wiring-box or plug and do not remove terminal screws before the device is de-energized.
- ▶ The device must be used only within the electrical and thermal limits specified in the data sheet.

- ▶ Inductive loads can cause contact burns or fuse the contacts. The customer must implement preventive measures, e.g., through the use of suitable RC elements.
- ▶ Devices must be protected from solar radiation and rain!
- ▶ Prevent vibrations from reaching the thermostat, e.g., with mechanical isolation or other vibration damping measures.
- ▶ Never use thermostats as a climbing aid.
- ▶ Avoid condensation water when operating the device below 0 °C!
- ▶ Honeywell GmbH accepts no liability for non-compliance.

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1. Basic equipment

Chapter 1 describes the basic equipment, the technical data, the mounting and electrical wiring of the thermostats.

1.1 Technical data (not for Ex-version)

Installation

Vertical

Switch

Single-pole changeover

Switching capacity

8 (5) A, 250 V AC

Max. ambient temperature at switch housing

70 °C

Degree of protection according to EN 60529

Housing 2... IP54

Housing 3... IP65

Housing 5... IP65

Ex-housing 7... IP65

1.2 Mounting and installation

Wall installation

With wall bracket H1 (included as standard with room thermostats type TRM). For wall installation of TX and TAM, H1 bracket needs to be ordered separately. This is valid for all versions with housing 2..., 3..., 5..., and 7... (Ex).

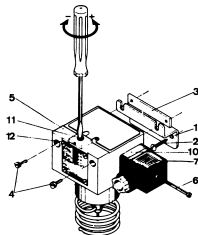


Fig. 1. Wall installation 2...

- Fasten holding bracket (1) horizontally on wall by means of screws and plugs (6 mm diameter)
- Fasten terminal plate (3) by means of 2 screws M4 on the reverse side of the switching unit (do not tighten – maintain approx. 2 mm distance between casing and terminal plate).
- Hang casing on the bracket and clamp it with two screws M4.

The thermostats can also be fixed directly by means of 2 screws (4 mm diameter) on a flat surface (without wall bracket H1).

Wall fixing of the sensor cartridge by means of clamping bracket H2



Fig. 2. Fixing the sensor cartridge

- ▶ Fix clamping bracket (1) by means of 2 screws on the wall.
- ▶ Press together the angles and insert the sensor cartridge. After releasing, the sensor cartridge fits tightly.

Sensor mounting in containers and pipes

For pressure-tight installation thermowells in 3 different lengths are available.

For further accessories, see technical data sheets.

1.3 Electrical wiring

Plug connection (Housing 2...)

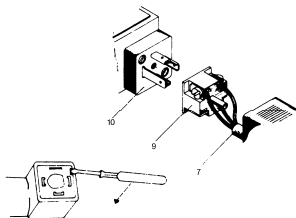


Fig. 3. Wiring



CAUTION

Switch off power before opening.

- ▶ Remove fixing screw
- ▶ Insert screwdriver into the split and press downwards. The part with terminals will move out of the housing.
- ▶ Pull connecting cable (7) through conduit and wire contacts according to plan.
- ▶ Place wired contact plate (9) to desired mounting direction (4 directions possible) and move mounting plate back into connector housing. Refasten cable gland.
Caution: Not fastening cable gland would cause loss of IP protection and strain relieve of the cable.
- ▶ Plug Connector (9) to Pins (10) and fix connector with fixing screw!

Screw terminal connection (Housing 3... and 5...)

Accessible after removing cover at screw terminal housing.



CAUTION

Switch off power before opening.

- ▶ Unfasten 4 screws and remove cover.
- ▶ Pull connecting cable through cable gland and wire terminals according to plan.
- ▶ Fasten cable gland. Caution: Not fastening cable gland would cause loss of IP protection and strain relief of the cable.

Factory adjustment

With falling temperature, switching occurs at the set scale value. Switching back (as soon as temperature begins to rise) occurs at a value higher by the amount of the switching differential.

Wiring diagrams

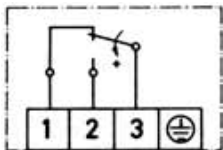


Fig. 4. Monitor

As the temperature rises

3-1 opens, 3-2 closes

As the temperature falls

3-2 opens, 3-1 closes

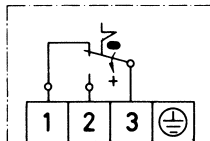


Fig. 5. Maximum limiter

Additional function -205, -305

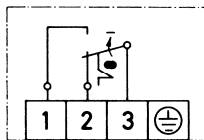


Fig. 6. Minimum limiter

Additional function -206, -306

1.4 Adjustment of switching points

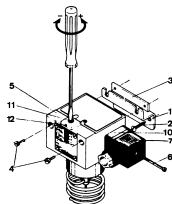


Fig. 7. Adjustment of switching points

Turning to the right
lower switching point

Turning to the left
higher switching point

The grub screw (12) located above the scale is to be slackened off approx. 2 turns before making an adjustment and tightened up again after setting.

In general adjustment procedure of switchpoints at screw terminal housing is similar to procedure for plug connector housing.

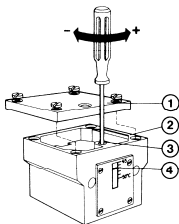


Fig. 8. Screw terminal housing



CAUTION

Switch off power before opening.

After removal of the casing-cover (1), the adjustment screw (3) and thus also the setpoint (4) can be adjusted to the required value by means of a screwdriver.

After adjustment of switchpoint, replace cover and tighten 4 cover screws.

2. Thermostats with adjustable differential

The switching differential is changed by turning the grub screw (2) inside the setting screw (1). The switching point is not changed by adjusting the differential, only the reset point is shifted by the amount of the differential. One 360°-rotation of the differential screw varies the switching differential by approx. 25 % of the total differential range.

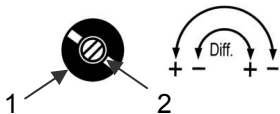


Fig. 9. Switching differential



CAUTION

With TRM...-303, there is a risk of touching the mains power. Therefore, switch off power.

Turning to the right

Greater switching differential.

Turning to the left

Smaller switching differential.

Caution

Grub screw without end-stop to the left. Drive out only max. flush to the surface of the adjustment screw, otherwise risk of loosening the screw.

3. Temperature limiter

3.1 Temperature limiter with mechanical interlock

Max. temperature limitation (...-205)

When the temperature **exceeds** the value set on the scale, the microswitch switches over and remains in this position. The catch can be released by pressing in the unlocking button (marked on the scale side of the switching device by a red dot). The limiter can not be unlocked until the temperature has **decreased** by approx. 8-10 K.

Min. temperature limitation (...-206)

When temperature **falls below** the value set on the scale, the microswitch switches over and remains in this position. The catch can be released by pressing the unlocking button (marked on the scale side of the switching device by a red dot). The limiter cannot be unlocked until the temperature has **increased** by approx. 8-10 K.

3.2 Interlock in control cabinet

A thermostat can act as a temperature limiter if interlock function is provided by electrical circuitry. Below are two examples for interlock circuitry.

In any case, valid standards (e.g., DIN EN 50156 / VDE 0116-1 and valid local standards) must be observed for design of electrical interlocking circuitry.

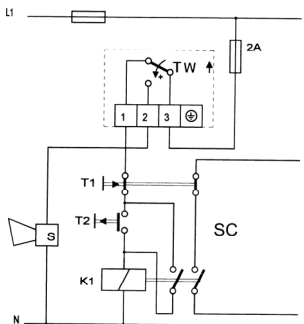
Maximum temperature limitation

Fig. 10. Max. temperature limitation

TW = Thermostat

T1 = STOP

T2 = START

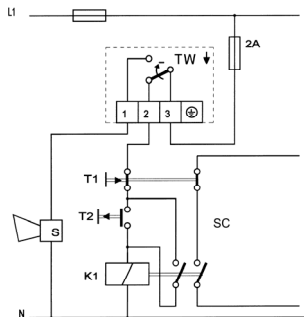
Minimum temperature limitation

Fig. 11. Min. temperature limitation

S = Signal (if required)

K1 = Relais with catch contact

SC = Safety circuit

4. Thermostats with gold-plated contacts ...-213

Gold-plated contacts are used exclusively in the low-voltage range in order to keep the transit resistance at the contacts low during lifetime.

4.1 Technical data as per 1.1

Switching capacity	max. 24 V DC
	max. 100 mA
	min. 5 V DC
	min. 2 mA

At higher voltages and currents, the gold layer on the contacts will be damaged.

All other data correspond to the basic equipment.

5. Thermostats in intrinsic safe circuits Ex-i

according to chapter 5.7 of EN 60079-11, "Simple electrical apparatus".

Gold contacts SPDT.

Switching differential not adjustable.

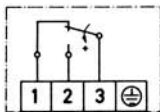


Fig. 12. Connection layout

The wiring diagram applies for max. pressure monitoring.

At rising pressure contact 3-1 opens and 3-2 closes.

Installation only in combination with a suitable EC-type tested switching amplifier. Amplifier must be installed outside the Ex-zone. The wiring diagram of the switching amplifier and valid installation guidelines for Ex-i circuits must be observed.

Ratings

Max. switching load: 24 VDC, 50 mA

Min. switching load: 5 VDC, 2 mA

Operation of the pressure switch only within the allowed specification limits.

During selection of a suitable switching amplifier and planning of wiring lengths the following parameters must be observed:

$U_i = \text{max. } 24 \text{ VDC}$

$I_k = \text{max. } 50 \text{ mA}$

$L_i < 100 \text{ mH}$

$C_i < 1 \text{ nF}$

6. Ex-proof thermostats (Ex-de, Ex-t)

Ex-proof thermostats from “flameproof enclosure” must be supplied in the form that has been type test approved according to ATEX. Versions and additional functions are herewith not possible

6.1 Technical data of Ex-proof switch housings**Type of Ex-protection**

CE 0035  II 2G Ex db eb IIC T6

CE 0035  II 2D Ex tb IIIC T120°C

Ex-Approval

PTB 02 ATEX 1121

Ex-Zone

Suitable for zone 1, 2, 21 and 22

Type of protection

IP 65

Ambient temperature

–20 bis +60 °C

Max. temperature at switching device

60 °C.

Cable entry type

M16 x 1.5, for fixed installation only

Mounting position

Vertically upwards

Switching element

Microswitch single-pole changeover contact.

6.2 Connection plan

The terminal board can be accessed after the protective casing has been removed. After connecting the supply lines, the protective casing should in all cases be reattached.

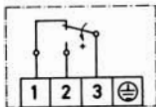


Fig. 13. Connection layout

With increasing pressure 3–1 will be interrupted and 3–2 will be closed.

Connection of conductive protection accessible after removal of cover.
(See also Fig. 14).

6.3 Electrical ratings of components

Microswitch

Voltage rating

up to 250 VAC

Current rating at 250 VAC

3 A resistive, 3 A inductive

Current rating at 250 VDC

0.25 A resistive, 0.03 A inductive

Current rating at 125 VDC

0.5 A resistive, 0.06 A inductive

Current rating at 75 VDC

1 A resistive, 1 A inductive

Current rating at 30 VDC

3 A resistive, 3 A inductive

Wiring terminals (Housing 700)

Voltage rating

Up to 440 V

Current rating

Max. 23 A

Tightening torque

Max. 0.4 Nm

Wire cross section

Max. 2.5 mm²:

Earthing connection outside

Max. cross section 4 mm².

6.4 Serial number

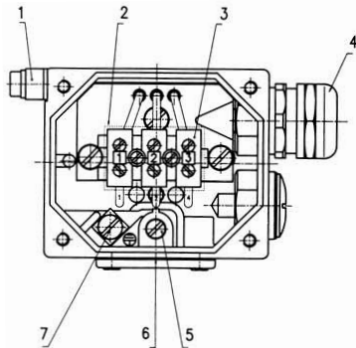
All switch units and their respective terminal board casings are marked with a serial number.

When installing, you should ensure that the terminal board casings do not get mixed up.

Important notice

When installing the Ex switch units and setting them up for operation, you should comply with the recognized rules and guidelines for installations in Ex-areas.

6.5 Setting of switching points



1. Potential equalization
2. Protective casing for terminals (removable)
3. Connection terminals
4. Cable inlet M16 x 1.5
For fixed installation only!
5. Switching point adjustment
6. Locking bolt for setting spindle
7. Connection of conductive protection

Fig. 14. Setting of switching points

The switching point can be set within the range given in the datasheet by using a screwdriver on the setting spindle.

Additionally, you should remove the terminal board casing (with 4 hexagon screws M4). The affixing screw on the front end (above the scale) has to be removed and should be reattached after setting the switching point.

Turning the setting spindle clockwise gives a lower switching point; turning anticlockwise gives a higher switching point.

The scale should be used as a guide; for more exact settings, you should use a thermometer.



by Honeywell

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