



Thermostats for Industrial Applications



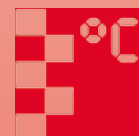
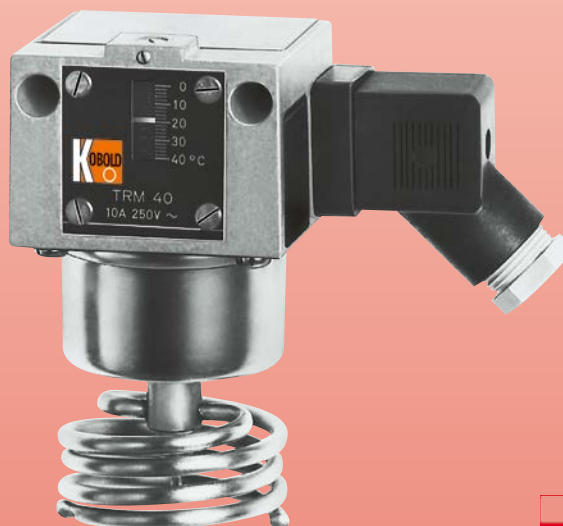
measuring
•
monitoring
•
analysing

TER



- Switching range:
-20 ... +30 °C to 80 ... +130 °C
- Housing material: aluminium
- Capillary tube: copper

Model: TER-TX490 with thermo well



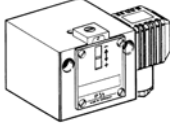
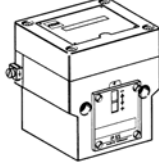
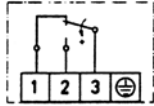
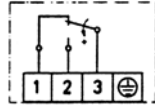


T1

KOBOLD companies worldwide:

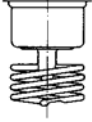
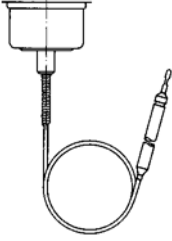
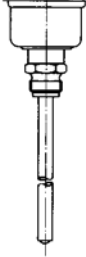

ARGENTINA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, SINGAPORE, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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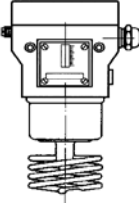


Technical Details

Switching devices	Normal version	Ex-version
		
Switch housing	Aluminium die-cast GD Al Si 12	Aluminium die-cast GD Al Si 12
Switching function and connection drawing (applies only for version with micro-switch)	Floating change-over contact. With rising temperature switching over single-pole from 3-1 to 3-2 	Floating change-over contact. With rising temperature switching over single-pole from 3-1 to 3-2 
Switch capacity (applies only for version with micro-switch)	8 A at 250 V _{AC} 5 A at 250 V _{AC} inductive 8 A at 24 V _{DC}	3 A at 250 V _{AC} 2 A at 250 V _{AC} inductive 3 A at 24 V _{DC} 0,03 A at 250 V _{DC} min. 2 mA, 24 V _{DC}
Installation position	Vertical or horizontal, preferably vertical	Vertical, housing on top
Protection IP 65 (in vertical position)	IP 54 (on request IP 65 by ZF 351)	IP 65
Type of protection	-	 II 2G Ex d e IIC T6 Gb  II 1/2D Ex ta/tb IIIC T80°C Da/Db -20 °C ≤ Ta ≤ +60 °C
ATEX-approval	-	IBExU13ATEX1125
Electrical connection	Plug connection to DIN EN 175301	Terminal connection
Cable entry	Pg 11	M16x1,5
Ambient temperature	-15...+70 °C	-20...+60 °C
Switch point	Adjustable on the spindle	Adjustable on the spindle after the terminal box lid is removed
Switching difference	Adjustable or not adjustable (see type overview)	Not adjustable
Medium temperature	Max. 70 °C, short time 85 °C	Max. 60 °C
Vibration strength	Up to 4 g no noteworthy deviations At higher vibrations, the switching difference reduces. Usage above 25 g is not permitted.	
Insulation values	Overvoltage category III, contamination class 3, reference surge voltage 4000 V. The conformity to DIN VDE 0110 (01.89) is confirmed.	

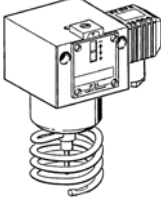
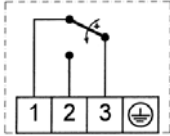
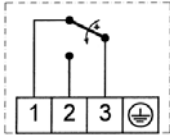
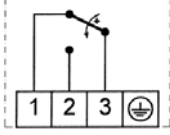
Sensor systems

Room sensor	Capillary tube sensor	Rod sensor	Frost-protection sensor
			
TER-TRM	TER-TAM	TER-TX + R10	TER-TX + R6

Temperature monitoring in explosion-endangered areas

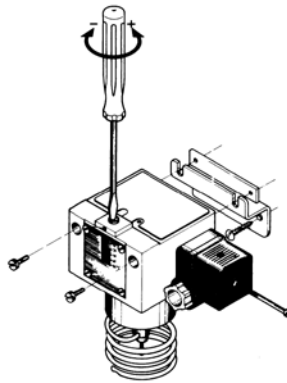
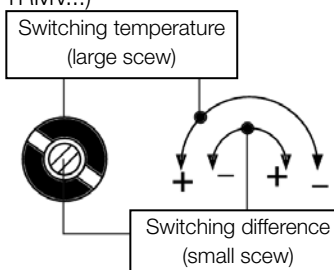
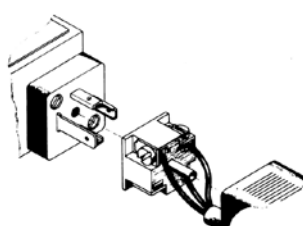
	<p>Temperature switches with special equipment can also be used in the Ex area \geq Zone 1.</p> <p>Thermostats with pressure-proof encapsulated switching device.</p> <p>Type of protection</p> <p> II 2G Ex d e IIC T6 Gb</p> <p> II 1/2D Ex ta/tb IIIC T80 °C Da/Db $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$</p>	<p>The thermostat in pressure-proof encapsulation can be used directly in the Ex area (\geq Zone 1). Maximum switching voltage, switch capacity and ambient temperature must be taken into account and the rules for the installation in the Ex area must be observed.</p> <p>All thermostats can be equipped with Ex switching mechanisms.</p> <p>Nevertheless, special circuits as well as versions with adjustable switching differences are not possible.</p>
<p>Ex-Zone 1 or 2</p>		

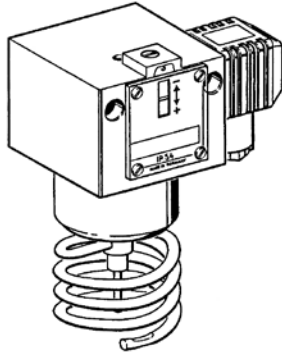
Switch units / additional functions / connection diagrams

Plug connection	Description	Connection diagram
	Normal version Microswitch, single pole changeover	
213	Gilded contacts with little transition resistance (e. g. for low tension). Cannot be supplied with adjustable switching differential	
301	Terminal connection housing Protection IP65	
351	Protection IP 65 and switch housing with surface protection (terminal connection housing)	
970	Switch point adjustment according to the customer requirement.	
971	Adjustment and sealing according to the customer requirement.	

In case that one of the above mentioned options are needed, please add the above suffix to the ordering code.

General technical information

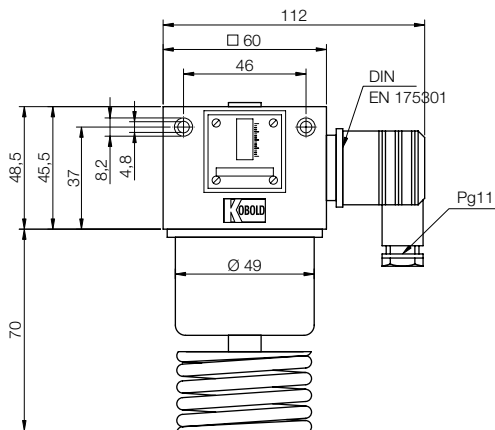
<p>Adjustment of the thermostats</p>	<p>Adjustment to the lower switching point The desired value x_s corresponds to the lower switching point (on falling temperature), the upper switching point x_o (on rising temperature) is higher by the switching difference x_d.</p>
<p>Setting the switching temperature (desired value setting)</p> 	<p>The grub screw located above the scale is to be slackened off approx. 2 turns before making an adjustment and tightened up again after setting.</p> <p>The switching temperature is set by the spindle. The set switching temperature can be read off on the scale.</p> <p>Slight variations between the set value and the switching point are inevitable due to the tolerances and spreads in the characteristics of the sensors and springs, also to friction in the moving parts of the switch.</p> <p>The thermostats are as a rule set in such a way the desired value setting and the actual switching temperature coincide best in the middle range.</p> <p>Any possible divergences are uniformly distributed to either side.</p> <p>Turning to right: low switching temperature Turning to left: high switching temperature</p>
<p>Changing the switching difference (only on switching units TRMV...)</p> 	<p>The switching difference is changed by turning the threaded rod inside the setting spindle. The lower switching point is not changed by adjusting the difference, only the upper switching point is shifted by the amount of the difference. One revolution of the difference screw varies the switching difference by approximately 1/4 of the total differential range.</p> <p>Bear in mind when making the adjustment:</p> <p>Switching temperature: Turning to right: lower switching point Turning to left: higher switching point</p> <p>Switching difference: Turning to right: larger difference Turning to left: smaller difference</p>
<p>Electrical connection</p> 	<p>Plug connection according to DIN EN 175 301. Cable entry Pg 11, max. cable diameter 10 mm. Cable outlet possible in 4 directions - spaced 90° apart.</p>
<p>Mounting position</p>	<p>Preference is to be given, if possible, to the vertical mounting position. Protection IP 54 is guaranteed in accordance with the conditions of DIN 40050 for vertical mounting. The type of protection may be changed by a different mounting position.</p>
<p>Outdoor installation of the instruments</p>	<p>The thermostats can also be installed outdoor, if they are mounted in a vertical position. On temperatures below 0 °C take care that there can form no condensation at the sensor and inside the housing.</p>



Description

KOBOLD room thermostats are suitable for industrial plant, for greenhouses, cowsheeds and warehouses, also for monitoring the maximum temperature in switchgear cabinets and relay stations. Room thermostats are supplied with TER-H 1 wall bracket.

Dimensions [mm]



Technical Details (not for Ex-versions)

- Housing: Aluminium die-cast GD Al Si 12 to DIN1725, resistant to ammonian steam and seawater
- Mounting position: Optional
- Max. ambient temperature: 70 °C (60 °C on Ex-versions)
- Max. temperature at the sensor: 70 °C
- Contact: Single-pole changeover
- Protection: IP54 to DIN EN 40050 (in the case of vertical mounting)
- Installation: With TER-H 1 support bracket or with 2 screws (Ø 4 mm) bulk-head mounting
- Adjustment: Scale value corresponds with the lower switching point (with falling temperature), the upper switching point is higher by the switching differential
- Plug connection: By means of obliquely angled plug to DIN EN 175301 (3-pole + earth contact), cable entry Pg 11, max. cable diameter 10 mm. Cable outlet possible in 4 directions (spaced 90° apart)
- Switching temperature: Adjustable from outside with screw-driver
- Switching difference: Not adjustable on TER-TRM adjustable on TER-TRMV for values see summary of types

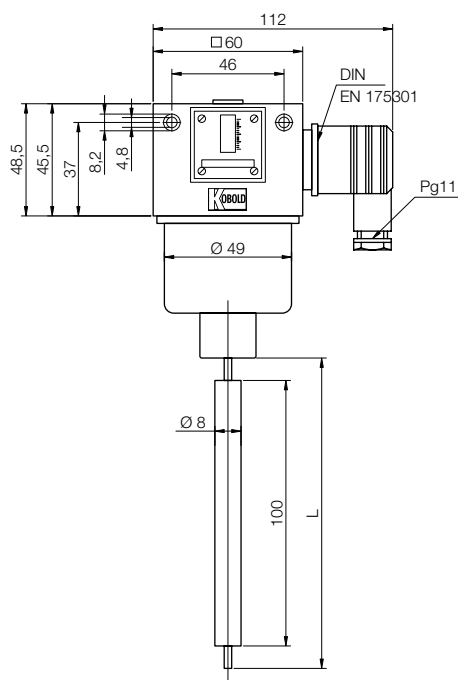
Order Details: (Example: TER-TRM 022)

Model	Range of adjustment	Switching difference (mean value)
TER-TRM 022	-20... +20 °C	1.0 K (fixed)
TER-TRM 40	0... +40 °C	1.0 K (fixed)
TER-TRM 150	+10... +50 °C	1.0 K (fixed)
TER-TRMV 40	0... +40 °C	3 - 10 K (adjustable)
TER-TRMV 150	+10... +50 °C	3 - 10 K (adjustable)

Description

The KOBOLD rod thermostats can be installed as immersion thermostats in pipelines and containers and for monitoring temperature in air ducts. The suitable immersion tube has to be chosen according to the application. (Immersion tubes see page 11).

Dimensions [mm]



Technical Details (not for Ex-versions)

- Housing: Aluminium die-cast GD Al Si 12 to DIN1725,
- Mounting position: Arbitrary, preferably vertical
- Max. ambient temperature at the switching device: 70 °C
- Max. temperature at the sensor: See table
- Contact: Single-pole changeover
- Protection: IP54 nach DIN EN 60529 (in the case of vertical mounting)
- Adjustment: Scale value corresponds with the lower switching point (with falling temperature), the upper switching point is higher by the switching differential
- Plug connection: By means of obliquely angled plug to DIN EN 175301 (3-pole + earth contact), cable entry Pg 11, max. cable diameter 10 mm. Cable outlet possible in 4 directions (spaced 90° apart); Plug is included
- Switching temperature: Adjustable from outside with screw-driver
- Switching difference: Not adjustable for values see summary of types
- Immersion tubes: See accessories (page 11)

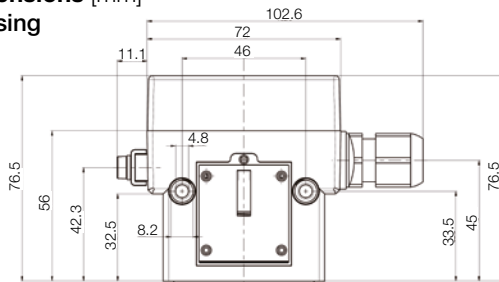
Order Details: (Example: TER-TRM 023)

Model	Range of adjustment	Immersion depth	Switching difference (mean value)	Max. permissible temperature at sensor
TER-TX 023	-20 ... +30 °C	135 mm	1.5 K	110 °C
TER-TX 150	+10 ... +50 °C	135 mm	1.5 K	110 °C
TER-TX 490	+40 ... +90 °C	135 mm	2.5 K	125 °C
TER-TX 813	+80 ... +130 °C	135 mm	4.0 K	150 °C
TER-TXB 023	-20 ... +30 °C	220 mm	1.5 K	110 °C
TER-TXB 150	+10 ... +50 °C	220 mm	1.5 K	110 °C
TER-TXB 490	+40 ... +90 °C	220 mm	2.5 K	125 °C

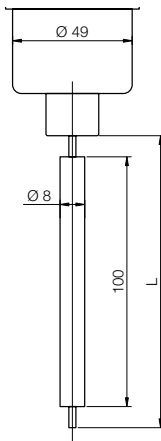
Description

The KOBOLD rod thermostats can be installed as immersion thermostats in pipelines and containers and for monitoring temperature in air ducts. The suitable immersion tube has to be chosen according to the application. (Immersion tubes see page 11).

Dimensions [mm]
Housing



Temperature sensor



Technical Details (for Ex-versions)

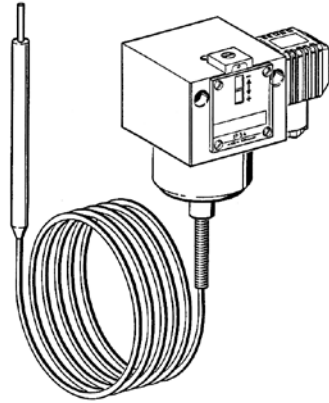
- Housing: Aluminium die-cast GD Al Si 12 to DIN1725,
- Mounting position: Vertical, housing on top
- Max. ambient temperature at the switching device: -20°C ... +60°C
- Max. temperature at the sensor: See table
- Contact: Single-pole changeover
- Protection: IP65 nach DIN EN 60529 (in the case of vertical mounting)
- Adjustment: Scale value corresponds with the lower switching point (with falling temperature), the upper switching point is higher by the switching differential
- Switching temperature: Adjustable from outside with screw-driver
- Switching difference: Not adjustable for values see summary of types
- Immersion tubes: See accessories (page 11)

Type of protection II 2G Ex d e IIC T6 Gb

II 1/2D Ex ta/tb IIIC T80°C Da/Db

Order Details: (Example: TER-Ex-TX 490)

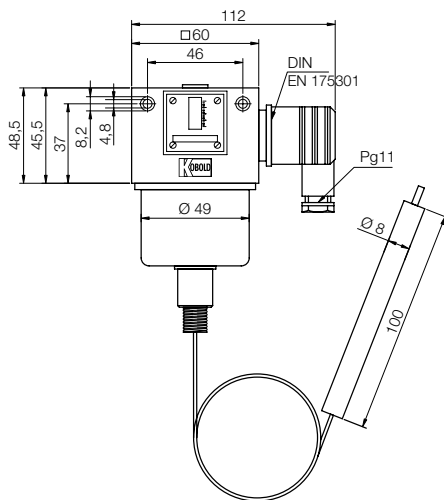
Model	Range of adjustment	Immersion depth	Switching difference (mean value)	Max. permissible temperature at sensor
TER-Ex-TX 490	+40 ... +90 °C	135 mm	2.5 K	125 °C



Description

The sensor cartridge at the end of the capillary tube is the actual active (temperature-sensitive) part of the sensor. Changes in temperature on the capillary tube have no effect on the switching point. Pressure-tight installation of the sensor in pressure vessels of all kinds is possible with the aid of immersion tubes. (Immersion tubes see page 11).

Dimensions [mm]



Technical Details (not for Ex-versions)

- Housing: Aluminium die-cast GD Al Si 12 to DIN 1725
- Mounting position: Arbitrary, preferably vertical
- Max. ambient temperature at the switching unit: 70 °C
- Capillary tube: Cu-Capillary tube, 1.5 m long, other capillary tube lengths are not available
- Sensor cartridge: Ø 8 mm, length 100 mm, material: Cu
- Contact: Single-pole changeover
- Protection: IP54 to DIN EN 60529 (in the case of vertical mounting)
- Installation: Temperature sensor with or without immersion tube in vessels, air ducts etc. switching unit with 2 screws (Ø 4 mm) bulkhead mounting
- Adjustment: Scale value corresponds with the lower switching point (with falling temperature), the upper switching point is higher by the switching differential
- Plug connection: By means of obliquely angled plug to DIN EN 175301 (see the other thermostats)
- Switching temperature: Adjustable by means of screwdriver on setting spindle (accessible after removing terminal box cover)
- Switching difference: Not adjustable
- Immersion tubes: See accessories (page 11)

Order Details: (Example: TER-TAM 022)

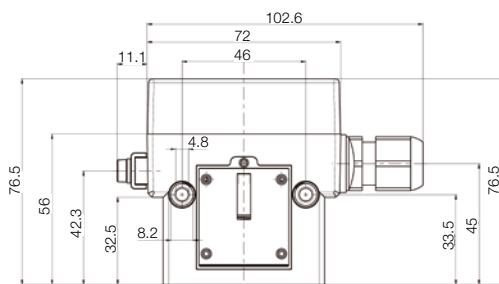
Model	Range of adjustment	Switching difference (mean value)	Max. permissible temperature at sensor
TER-TAM 022	-20 ... +20 °C	1.5 K	110 °C
TER-TAM 150	+10 ... +50 °C	1.5 K	110 °C
TER-TAM 490	+40 ... +90 °C	2.0 K	125 °C
TER-TAM 813	+80 ... +130 °C	2.0 K	150 °C

Description

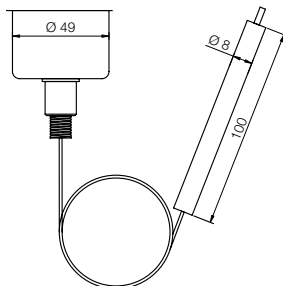
The sensor cartridge at the end of the capillary tube is the actual active (temperature-sensitive) part of the sensor. Changes in temperature on the capillary tube have no effect on the switching point. Pressure-tight installation of the sensor in pressure vessels of all kinds is possible with the aid of immersion tubes. (Immersion tubes see page 11).

Dimensions [mm]

Housing



Temperature sensor



Technical Details (not for Ex-versions)

- Housing: Aluminium die-cast GD Al Si 12 to DIN 1725
- Mounting position: Vertical, housing on top
- Max. ambient temperature at the switching unit: -20°C ... +60°C
- Capillary tube: Cu-Capillary tube, 1.5 m long, other capillary tube lengths are not available
- Sensor cartridge: Ø 8 mm, length 100 mm, material: Cu
- Contact: Single-pole changeover
- Protection: IP54 to DIN EN 60529 (in the case of vertical mounting)
- Installation: Temperature sensor with or without immersion tube in vessels, air ducts etc. switching unit with 2 screws (Ø 4 mm) bulkhead mounting
- Adjustment: Scale value corresponds with the lower switching point (with falling temperature), the upper switching point is higher by the switching differential
- Switching temperature: Adjustable by means of screwdriver on setting spindle (accessible after removing terminal box cover)
- Switching difference: Not adjustable
- Immersion tubes: See accessories (page 11)

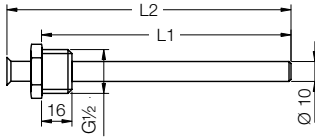
Type of protection II 2G Ex d e IIC T6 Gb
 II 1/2D Ex ta/tb IIIC T80°C Da/Db

Order Details: (Example: TER-Ex-TAM 150)

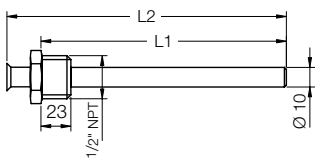
Model	Range of adjustment	Switching difference (mean value)	Max. permissible temperature at sensor
TER-Ex-TAM 150	+10 ... +50 °C	1.5 K	110 °C

Thermowells

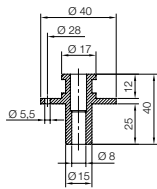
Thermowells G 1/2, internal Ø 8 mm



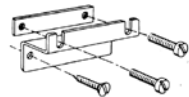
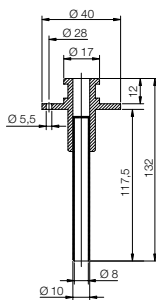
Thermowells 1/2" NPT, internal Ø 8 mm



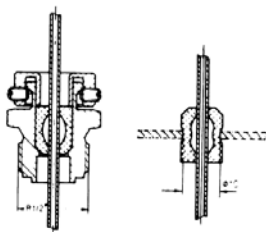
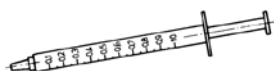
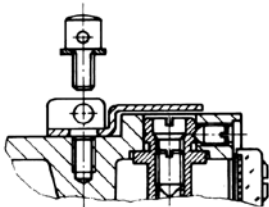
TER-R 6



TER-R 7



TER-H 2



Model	Immersion depth L ₁ [mm]	Overall length L ₂ [mm]	Suitable for
Nickel-plated brass type, G 1/2, max. permissible pressure: 25 bar			
TER-R 1 / Ms	135	151	TER-TAM...
TER-R 2 / Ms	220	236	
TER-R 10 / Ms	135	-	TER-TX...
TER-R 20 / Ms	220	-	
Stainless steel type (1.4571 + 1.4401), G 1/2, max. permissible pressure: 63 bar			
TER-R 1 / Nst	135	151	TER-TAM...
TER-R 2 / Nst	220	236	
TER-R 10 / Nst	135	151	TER-TX...
TER-R 20 / Nst	220	236	
Nickel-plated brass type, 1/2" NPT, max. permissible pressure: 25 bar			
TER-RN 1 / Ms	135	151	TER-TAM...
TER-RN 2 / Ms	220	236	
TER-RN 10 / Ms	135	151	TER-TX...
TER-RN 20 / Ms	220	236	
Stainless steel type (1.4571 + 1.4401), 1/2" NPT, max. permissible pressure: 63 bar			
TER-RN 1 / Nst	135	151	TER-TAM...
TER-RN 2 / Nst	220	236	
TER-RN 10 / Nst	135	151	TER-TX...
TER-RN 20 / Nst	220	236	
Thermowells with fixing flange for air ducts Material: steel, chromated			
TER-R 6	Immersion depth 135 mm		TER-TX...
TER-R 7	Immersion depth 220 mm		

Wall bracket model TER-H 1

including fixing screws and plugs (Ø 6 mm).
Included as standard with model TRM thermostats.

Wall bracket model TER-H 2

for fixing the sensor cartridges of capillary tube thermostats.
Suitable for all TER-TAM... capillary tube thermostats.

Sealing, model TER-P 2

consisting of cover plate and screw for covering and adjusting screws.

Heat conducting compound model TER-WLP 1

to improve the transfer of heat, e. g. in the case of contact thermostats.
Approx. 0.5 cm³ in handy dispenser.

Capillary tube bushing model TER-R 4

with 3 mm capillary tube screw in thread G 1/2.
Suitable for all models TER-TAM.

Capillary tube bushing model TER-R 5

rubber plug for 3 mm capillary tube, bore diameter 10 mm. Not pressure-tight, (5 pcs. packed in bag). Suitable for all models TER-TAM.