

**Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output**

**TM 54**  
Basic unit

Calibratable temperature measuring transducer **THERMASGARD® TM 54** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media.

It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

|                         |                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power supply:           | 24 V AC / DC (± 10 %) for U variant<br>15...36 V DC for I variant, depending on working resistance,<br>residual ripple stabilised ± 0.3 V                                                                                                                                                                                              |
| Working resistance:     | $R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant                                                                                                                                                                                                                                                                |
| Load resistance:        | $R_L > 5 \text{ kOhm}$ for U variant                                                                                                                                                                                                                                                                                                   |
| Power consumption:      | < 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC                                                                                                                                                                                                                                                                                           |
| Sensor:                 | Pt1000, DIN EN 60571, class B<br><b>(Perfect Sensor Protection)</b>                                                                                                                                                                                                                                                                    |
| Measuring ranges:       | <b>multi-range switching<br/>with 8 switchable measuring ranges,</b><br>see table (other ranges optional)<br>$T_{\text{max}} = +150^\circ\text{C}$<br><b>with manual zero point correction (± 10 K)</b>                                                                                                                                |
| Deviation, temperature: | typically ± 0.2 K at +25 °C                                                                                                                                                                                                                                                                                                            |
| Output:                 | 0 - 10 V or 4...20 mA                                                                                                                                                                                                                                                                                                                  |
| Connection type:        | 2- or 3-wire connection                                                                                                                                                                                                                                                                                                                |
| Electrical connection:  | 0.2 - 1.5 mm <sup>2</sup> , via push-in terminal                                                                                                                                                                                                                                                                                       |
| Cable connection:       | <b>TM 54</b> (standard)<br>adjusting screw made of metal (M 20 x 1.5)<br><br><b>TM 54-KV</b> (optional)<br>cable gland, brass, nickel-plated<br>(M 20 x 1.5; with strain relief, exchangeable,<br>inner diameter 6 - 12 mm)<br><br><b>TM 54-Q</b> (optional)<br>M12 connector according to DIN EN 61076-2-101<br>(male, 5-pin, A-code) |
| Dimensions:             | see dimensional drawing                                                                                                                                                                                                                                                                                                                |
| Connecting head:        | form B, material aluminium,<br>colour white aluminium (similar to RAL 9006),<br>ambient temperature -30...+70 °C                                                                                                                                                                                                                       |
| Protective tube:        | stainless steel, V4A (1.4571) Ø = 6 mm,<br>inserted length (EL) = 50 - 400 mm (see table)                                                                                                                                                                                                                                              |
| Process connection:     | by means of immersion sleeve or mounting flange<br>(accessories)                                                                                                                                                                                                                                                                       |
| Humidity:               | < 95 % r. H., non-precipitating air                                                                                                                                                                                                                                                                                                    |
| Protection class:       | III (according to EN 60 730)                                                                                                                                                                                                                                                                                                           |
| Protection type:        | <b>IP 54</b> (according to EN 60 529) <b>TM 54</b><br><b>IP 65</b> (according to EN 60 529) <b>TM 54-KV / TM 54-Q</b>                                                                                                                                                                                                                  |
| Standards:              | CE conformity, electromagnetic compatibility<br>according to EN 61 326, EMC directive 2014 / 30 / EU                                                                                                                                                                                                                                   |
| <b>ACCESSORIES</b>      | (see table)                                                                                                                                                                                                                                                                                                                            |
| <b>TH-ms / xx</b>       | <b>Immersion sleeve, brass, nickel-plated,</b><br>Ø = 8 mm, $T_{\text{max}} = +150^\circ\text{C}$ , $p_{\text{max}} = 10 \text{ bar}$                                                                                                                                                                                                  |
| <b>TH-VA / xx</b>       | <b>Immersion sleeve, stainless steel, V4A (1.4571),</b><br>Ø = 8 mm, $T_{\text{max}} = +600^\circ\text{C}$ , $p_{\text{max}} = 40 \text{ bar}$                                                                                                                                                                                         |
| <b>TH-VA / xx / 90</b>  | <b>Immersion sleeve, stainless steel, V4A (1.4571),</b><br>with neck tube (90 mm),<br>Ø = 8 mm, $T_{\text{max}} = +600^\circ\text{C}$ , $p_{\text{max}} = 40 \text{ bar}$                                                                                                                                                              |
| <b>MF-06-M</b>          | <b>Mounting flange, metal, galvanised steel, Ø = 32 mm,</b><br>Ø = 6.3 mm tube gland, $T_{\text{max}} = +700^\circ\text{C}$                                                                                                                                                                                                            |

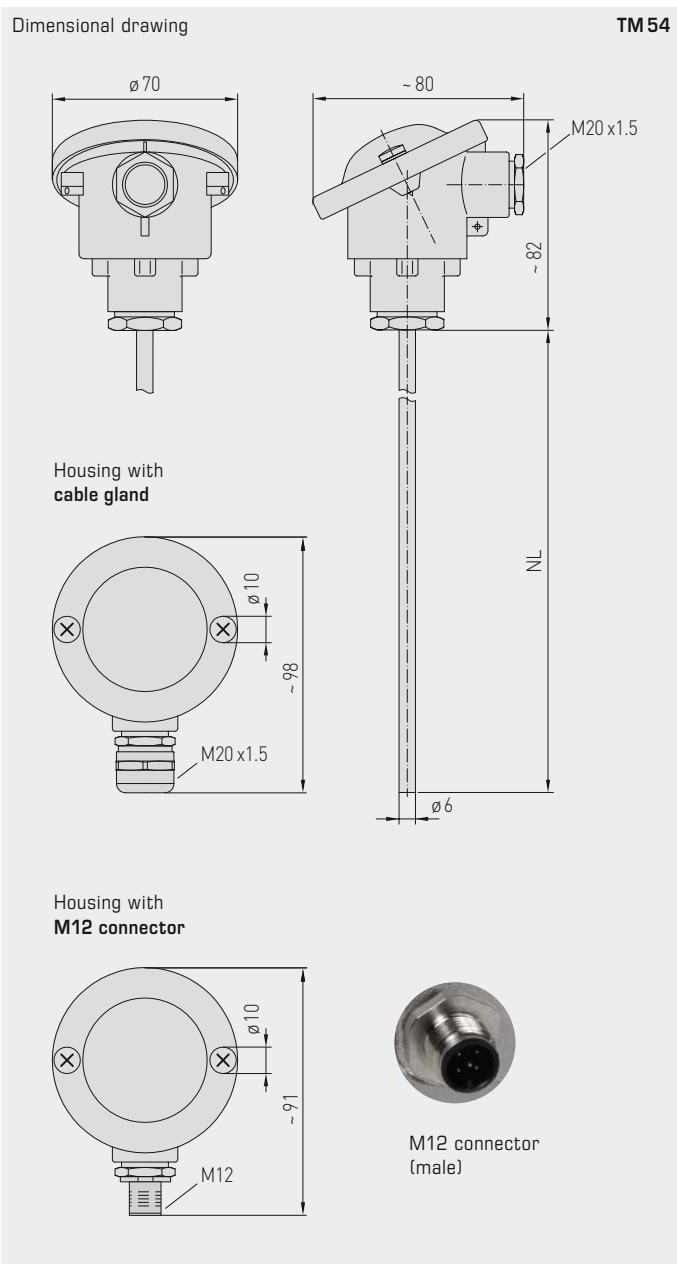




S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output



TM 54  
standard  
(IP 54)



TM 54 - KV  
with cable gland  
(IP 65)



TM 54 - Q  
with M12 connector  
(IP 65)



High-performance encapsulation against  
vibration, mechanical stress and humidity



**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

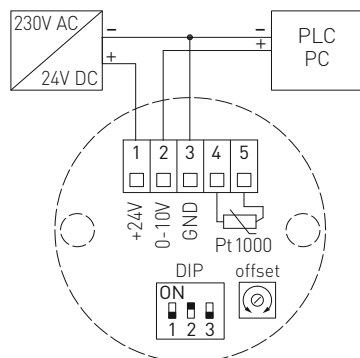
Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output



S+S REGELTECHNIK

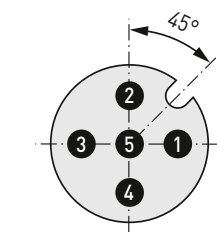
Connecting diagram

TM 54-U



Pin assignment  
(M12)

TM 54-U



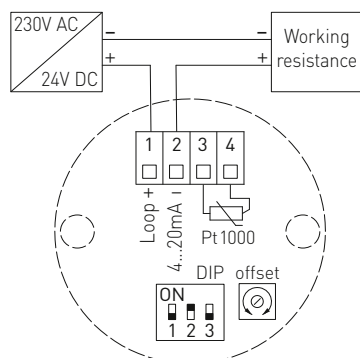
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

TM 54-U  
Connecting head



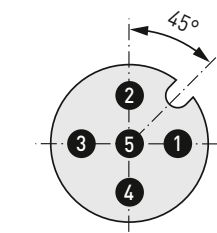
Connecting diagram

TM 54-I



Pin assignment  
(M12)

TM 54-I



- 1 +UB 15...36V DC
- 2 Output temperature 4...20mA [°C]
- 3 free
- 4 -UB GND
- 5 Shield

TM 54-I  
Connecting head



| Measuring ranges<br>(adjustable) | DIP<br>1 | DIP<br>2 | DIP<br>3 |
|----------------------------------|----------|----------|----------|
| -20... +150 °C                   | ON       | ON       | ON       |
| -50... +50 °C                    | OFF      | ON       | ON       |
| -20... +80 °C                    | ON       | OFF      | ON       |
| -30... +60 °C                    | OFF      | OFF      | ON       |
| 0... +40 °C                      | ON       | ON       | OFF      |
| 0... +50 °C (default)            | OFF      | ON       | OFF      |
| 0... +100 °C                     | ON       | OFF      | OFF      |
| 0... +150 °C                     | OFF      | OFF      | OFF      |



Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

**TM 54**  
standard  
(IP 54)



| THERMASGARD®<br>TM 54   |        | Temperature measuring transducer<br>(Basic unit)                                                                                                              |                             |                           |
|-------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------|
| Type / WG01             | Sensor | Output                                                                                                                                                        | Installation length<br>(EL) | Item No.                  |
| <b>TM 54-I</b>          |        |                                                                                                                                                               |                             | <b>IP 54, I - variant</b> |
| TM54-I 50mm             | Pt1000 | 4...20 mA                                                                                                                                                     | 50 mm                       | 1101-7152-0019-910        |
| TM54-I 100mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 100 mm                      | 1101-7152-0029-910        |
| TM54-I 150mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 150 mm                      | 1101-7152-0039-910        |
| TM54-I 200mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 200 mm                      | 1101-7152-0049-910        |
| TM54-I 250mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 250 mm                      | 1101-7152-0059-910        |
| TM54-I 300mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 300 mm                      | 1101-7152-0069-910        |
| TM54-I 350mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 350 mm                      | 1101-7152-0079-910        |
| TM54-I 400mm            | Pt1000 | 4...20 mA                                                                                                                                                     | 400 mm                      | 1101-7152-0089-910        |
| <b>TM 54-U</b>          |        |                                                                                                                                                               |                             | <b>IP 54, U - variant</b> |
| TM54-U 50mm             | Pt1000 | 0 - 10 V                                                                                                                                                      | 50 mm                       | 1101-7151-0019-910        |
| TM54-U 100mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 100 mm                      | 1101-7151-0029-910        |
| TM54-U 150mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 150 mm                      | 1101-7151-0039-910        |
| TM54-U 200mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 200 mm                      | 1101-7151-0049-910        |
| TM54-U 250mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 250 mm                      | 1101-7151-0059-910        |
| TM54-U 300mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 300 mm                      | 1101-7151-0069-910        |
| TM54-U 350mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 350 mm                      | 1101-7151-0079-910        |
| TM54-U 400mm            | Pt1000 | 0 - 10 V                                                                                                                                                      | 400 mm                      | 1101-7151-0089-910        |
| <b>Housing variant:</b> |        | equipped as standard with pressure screw (IP 54),<br>optional housing variants with cable gland (IP 65) or<br><b>M12 connector (IP 65)</b> see the next page! |                             |                           |
| <b>Extra charge:</b>    |        | other measuring ranges optional                                                                                                                               |                             |                           |

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output



S+S REGELTECHNIK

**TM 54 - Q**  
with M12 connector  
(IP65)



#### THERMASGARD® TM 54 - Q

Temperature measuring transducer  
(Basic unit with M12 connector)

| Type / WG01                 | Sensor | Output                                                    | Installation length<br>(EL) | Q | Item No.                  |
|-----------------------------|--------|-----------------------------------------------------------|-----------------------------|---|---------------------------|
| <b>TM 54 - I xx Q</b>       |        |                                                           |                             |   | <b>IP 65, I - variant</b> |
| TM54-I 50mm Q               | Pt1000 | 4...20 mA                                                 | 50 mm                       | ● | 2001-4111-2100-011        |
| TM54-I 100mm Q              | Pt1000 | 4...20 mA                                                 | 100 mm                      | ● | 2001-4111-2100-021        |
| TM54-I 150mm Q              | Pt1000 | 4...20 mA                                                 | 150 mm                      | ● | 2001-4111-2100-031        |
| TM54-I 200mm Q              | Pt1000 | 4...20 mA                                                 | 200 mm                      | ● | 2001-4111-2100-041        |
| TM54-I 250mm Q              | Pt1000 | 4...20 mA                                                 | 250 mm                      | ● | 2001-4111-2100-051        |
| TM54-I 300mm Q              | Pt1000 | 4...20 mA                                                 | 300 mm                      | ● | 2001-4111-2100-061        |
| TM54-I 350mm Q              | Pt1000 | 4...20 mA                                                 | 350 mm                      | ● | 2001-4111-2100-071        |
| TM54-I 400mm Q              | Pt1000 | 4...20 mA                                                 | 400 mm                      | ● | 2001-4111-2100-081        |
| <b>TM 54 - U xx Q</b>       |        |                                                           |                             |   | <b>IP 54, U - variant</b> |
| TM54-U 50mm Q               | Pt1000 | 0 - 10 V                                                  | 50 mm                       | ● | 2001-4111-1100-011        |
| TM54-U 100mm Q              | Pt1000 | 0 - 10 V                                                  | 100 mm                      | ● | 2001-4111-1100-021        |
| TM54-U 150mm Q              | Pt1000 | 0 - 10 V                                                  | 150 mm                      | ● | 2001-4111-1100-031        |
| TM54-U 200mm Q              | Pt1000 | 0 - 10 V                                                  | 200 mm                      | ● | 2001-4111-1100-041        |
| TM54-U 250mm Q              | Pt1000 | 0 - 10 V                                                  | 250 mm                      | ● | 2001-4111-1100-051        |
| TM54-U 300mm Q              | Pt1000 | 0 - 10 V                                                  | 300 mm                      | ● | 2001-4111-1100-061        |
| TM54-U 350mm Q              | Pt1000 | 0 - 10 V                                                  | 350 mm                      | ● | 2001-4111-1100-071        |
| TM54-U 400mm Q              | Pt1000 | 0 - 10 V                                                  | 400 mm                      | ● | 2001-4111-1100-081        |
| <b>Housing variant "Q":</b> |        | Cable connection with M12 connector (male, 5-pin, A-code) |                             |   |                           |
| Extra charge:               |        | other measuring ranges optional                           |                             |   |                           |

#### ACCESSORIES

Special accessories for M12 connector  
see chapter Accessories!



S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

**TM 54 - KV**  
with cable gland  
(IP 65)



| THERMASGARD®<br>TM 54 - KV   |        | Temperature measuring transducer<br>(Basic unit with cable gland) |                             |                           |
|------------------------------|--------|-------------------------------------------------------------------|-----------------------------|---------------------------|
| Type / WG01                  | Sensor | Output                                                            | Installation length<br>(EL) | Item No.                  |
| <b>TM 54 - I xx KV</b>       |        |                                                                   |                             | <b>IP 65, I - variant</b> |
| TM54-I 50mm KV               | Pt1000 | 4...20 mA                                                         | 50 mm                       | 1101-7172-0019-910        |
| TM54-I 100mm KV              | Pt1000 | 4...20 mA                                                         | 100 mm                      | 1101-7172-0029-910        |
| TM54-I 150mm KV              | Pt1000 | 4...20 mA                                                         | 150 mm                      | 1101-7172-0039-910        |
| TM54-I 200mm KV              | Pt1000 | 4...20 mA                                                         | 200 mm                      | 1101-7172-0049-910        |
| TM54-I 250mm KV              | Pt1000 | 4...20 mA                                                         | 250 mm                      | 1101-7172-0059-910        |
| TM54-I 300mm KV              | Pt1000 | 4...20 mA                                                         | 300 mm                      | 1101-7172-0069-910        |
| TM54-I 350mm KV              | Pt1000 | 4...20 mA                                                         | 350 mm                      | 1101-7172-0079-910        |
| TM54-I 400mm KV              | Pt1000 | 4...20 mA                                                         | 400 mm                      | 1101-7172-0089-910        |
| <b>TM 54 - U xx KV</b>       |        |                                                                   |                             | <b>IP 65, U - variant</b> |
| TM54-U 50mm KV               | Pt1000 | 0 - 10 V                                                          | 50 mm                       | 1101-7171-0019-910        |
| TM54-U 100mm KV              | Pt1000 | 0 - 10 V                                                          | 100 mm                      | 1101-7171-0029-910        |
| TM54-U 150mm KV              | Pt1000 | 0 - 10 V                                                          | 150 mm                      | 1101-7171-0039-910        |
| TM54-U 200mm KV              | Pt1000 | 0 - 10 V                                                          | 200 mm                      | 1101-7171-0049-910        |
| TM54-U 250mm KV              | Pt1000 | 0 - 10 V                                                          | 250 mm                      | 1101-7171-0059-910        |
| TM54-U 300mm KV              | Pt1000 | 0 - 10 V                                                          | 300 mm                      | 1101-7171-0069-910        |
| TM54-U 350mm KV              | Pt1000 | 0 - 10 V                                                          | 350 mm                      | 1101-7171-0079-910        |
| TM54-U 400mm KV              | Pt1000 | 0 - 10 V                                                          | 400 mm                      | 1101-7171-0089-910        |
| <b>Housing variant "KV":</b> |        | Cable connection with cable gland                                 |                             |                           |
| Extra charge:                |        | other measuring ranges optional                                   |                             |                           |

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

One basic device in four variants ...



**TM54 +  
TH -ms/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
brass, nickel-plated



**TM54 +  
TH -VA/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
stainless steel, V4A



**TM54 +  
TH -VA/xx/90**

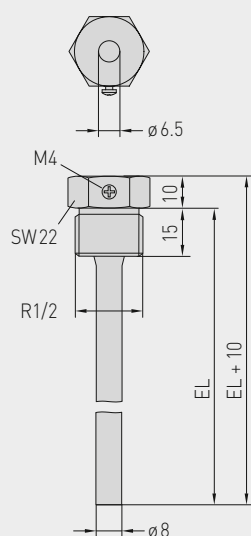
Immersion / screw-in  
temperature sensor  
with immersion sleeve with  
neck tube, stainless steel, V4A



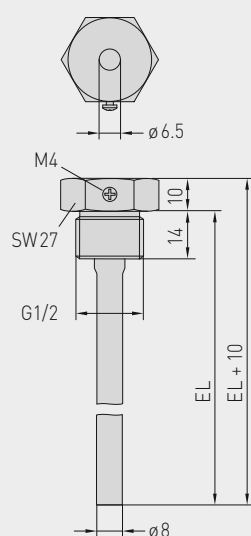
**TM54 +  
MF-06-M**

Duct temperature sensor  
with mounting flange, metal

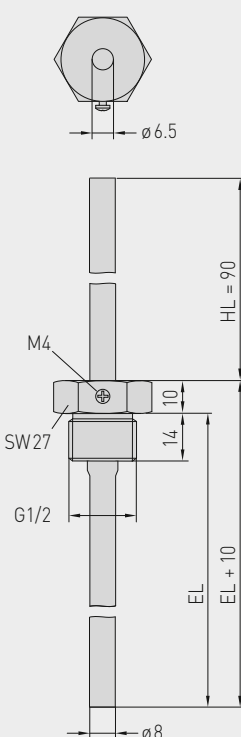
**Dimensional drawing  
TH -ms/xx**



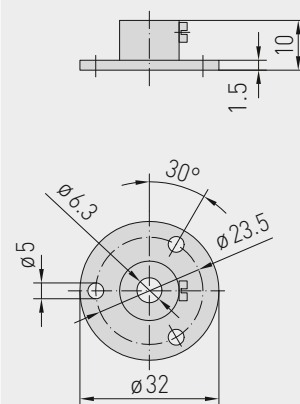
**Dimensional drawing  
TH -VA/xx**



**Dimensional drawing  
TH -VA/xx/90**



**Dimensional drawing  
MF-06-M**





S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

...through combination with accessories:



**TH -ms/xx**

Immersion sleeve,  
brass, nickel-plated,  
thread-sealing, conical,  
according to DIN 10226



**TH -VA/xx**

Immersion sleeve,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**TH -VA/xx/90**

Immersion sleeve with neck tube,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**MF-06-M**

Mounting flange,  
metal

| THERMASGARD® TH               |  |                                                                              |  |                  | Immersion sleeve Ø 8 mm (accessories) |                        |  |                    |  |
|-------------------------------|--|------------------------------------------------------------------------------|--|------------------|---------------------------------------|------------------------|--|--------------------|--|
| Type / WG01                   |  | p <sub>max</sub> (static)                                                    |  | T <sub>max</sub> |                                       | Inserted Length (EL)   |  | Item No.           |  |
| TH -ms / xx                   |  | Brass nickel-plated                                                          |  |                  |                                       | without neck tube      |  |                    |  |
| TH-MS 50MM                    |  | 10 bar                                                                       |  | +150 °C          |                                       | 50 mm                  |  | 7100-0011-0010-001 |  |
| TH-MS 100MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 100 mm                 |  | 7100-0011-0020-001 |  |
| TH-MS 150MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 150 mm                 |  | 7100-0011-0030-001 |  |
| TH-MS 200MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 200 mm                 |  | 7100-0011-0040-001 |  |
| TH-MS 250MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 250 mm                 |  | 7100-0011-0050-001 |  |
| TH-MS 300MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 300 mm                 |  | 7100-0011-0060-001 |  |
| TH-MS 350MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 350 mm                 |  | 7100-0011-0070-001 |  |
| TH-MS 400MM                   |  | 10 bar                                                                       |  | +150 °C          |                                       | 400 mm                 |  | 7100-0011-0080-001 |  |
| TH -VA / xx                   |  | Stainless steel, V4A (1.4571)                                                |  |                  |                                       | without neck tube      |  |                    |  |
| TH-VA 50MM                    |  | 40 bar                                                                       |  | +600 °C          |                                       | 50 mm                  |  | 7100-0012-0010-001 |  |
| TH-VA 100MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 100 mm                 |  | 7100-0012-0020-001 |  |
| TH-VA 150MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 150 mm                 |  | 7100-0012-0030-001 |  |
| TH-VA 200MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 200 mm                 |  | 7100-0012-0040-001 |  |
| TH-VA 250MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 250 mm                 |  | 7100-0012-0050-001 |  |
| TH-VA 300MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 300 mm                 |  | 7100-0012-0060-001 |  |
| TH-VA 350MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 350 mm                 |  | 7100-0012-0070-001 |  |
| TH-VA 400MM                   |  | 40 bar                                                                       |  | +600 °C          |                                       | 400 mm                 |  | 7100-0012-0080-001 |  |
| TH -VA / xx / 90              |  | Stainless steel, V4A (1.4571)                                                |  |                  |                                       | with neck tube (90 mm) |  |                    |  |
| TH-VA 50/90MM                 |  | 40 bar                                                                       |  | +600 °C          |                                       | 50 mm                  |  | 7100-0012-2010-001 |  |
| TH-VA 100/90MM                |  | 40 bar                                                                       |  | +600 °C          |                                       | 100 mm                 |  | 7100-0012-2020-001 |  |
| TH-VA 150/90MM                |  | 40 bar                                                                       |  | +600 °C          |                                       | 150 mm                 |  | 7100-0012-2030-001 |  |
| TH-VA 200/90MM                |  | 40 bar                                                                       |  | +600 °C          |                                       | 200 mm                 |  | 7100-0012-2040-001 |  |
| TH-VA 250/90MM                |  | 40 bar                                                                       |  | +600 °C          |                                       | 250 mm                 |  | 7100-0012-2050-001 |  |
| TH-VA 300/90MM                |  | 40 bar                                                                       |  | +600 °C          |                                       | 300 mm                 |  | 7100-0012-2060-001 |  |
| Note:                         |  | inner diameter of socket 6.5 mm<br>For further information see last chapter! |  |                  |                                       |                        |  |                    |  |
| Mounting flange (accessories) |  |                                                                              |  |                  |                                       |                        |  |                    |  |
| Type / WG01                   |  |                                                                              |  |                  |                                       | T <sub>max</sub>       |  | Item No.           |  |
| MF                            |  |                                                                              |  |                  |                                       |                        |  |                    |  |
| MF-06-M                       |  | Mounting flange, metal (galvanised steel) Ø 32 mm,<br>tube gland Ø 6.3 mm    |  |                  |                                       | +700 °C                |  | 7100-0030-5000-100 |  |
| Note:                         |  | For further information see last chapter!                                    |  |                  |                                       |                        |  |                    |  |