Expansion thermometer with electrical output signal
Stainless steel version, with/without capillary
Model TGT70

Applications

- General-purpose instrument for gaseous, liquid and highly-viscous media
- Refrigeration and air-conditioning applications
- Machine building and plant construction
- Power engineering, renewable energies
- Building services

Special features

- Case and stem from stainless steel
- Nominal size 63, 100
- Scale range -40 ... +250 °C
- Easy-to-read analogue indication
- Electrical output signal e.g. 4 ... 20 mA

Expansion thermometer with electrical output signal
Fig. left: model TGT70.063
Fig. right: model TGT70.100

Description

At any point where the process temperature must be displayed locally and there is a requirement to simultaneously transmit the signal to a central controller or remote control room, the model TGT70 intelliTHERM® can be used.

Through the combination of a mechanical measuring system and electronic signal processing, the process temperature can be read securely, even if the power supply is lost.

The built-in Bourdon tube system generates a rotational pointer movement that is proportional to the temperature. An electronic angle encoder (non-contact, and therefore completely free from wear and friction) determines the position of the instrument pointer. From this, the electrical output signal, proportional to the temperature, is produced. The basis of the intelliTHERM® comes from instrument variants derived from the the model 70 expansion thermometers (see data sheet TM 81.01).

Part of your business

Standard version

Measuring principle
Bourdon tube system

Nominal size in mm
63, 100

Fill medium measuring system
Xylol or silicone oil

Models

Version	NS	Connection location	Mounting option
H	63 100	Lower mount (LM) (radial)	Instrument with capillary and rear surface mounting flange
M	63 100	Lower mount (LM) (radial)	Instrument with capillary and surface mounting bracket
B	63	Back mount (axial)	Instrument with capillary, triangular bezel and mounting clamp
R	100	Lower mount (LM) (radial)	Direct connection without capillary

Indication accuracy
Class 2, EN 13190

Capillary
Length in accordance with customer specifications (max. 10 m)
Ø 2 mm, stainless steel 1.4571, bending radius no less than 6 mm

Capillary entry
lower mount

Capillary mounting
Take care that the mounting is free from vibration

Case and bayonet ring
Stainless steel

Connection
plain, stainless steel 1.4571

Stem
Ø 8 mm, stainless steel 1.4571

Active sensor length
Depends on Ø d and scale range

Dial
Plastic sticker, white with logo
Aluminium, white, black lettering

Pointer
Aluminium, black

Window
Laminated safety glass

Temperature limits for storage and transport
-20 ... +60 °C per EN 13190

Permissible ambient temperature at case
0 ... 40 °C max. (others on request)

Permissible pressure rating at the stem
max. 25 bar, static

Ingress protection
IP 65 per EN/IEC 60529

Electronics

Output signal

- **Voltage output**
  With U_S = DC 5 V, ratiometric: 0.5 … 4.5 V
  With U_S = DC 12 … 32 V,
  not ratiometric (NS 100 only): 0.5 … 4.5 V

- **Current output**
  4 … 20 mA, 2-wire

- **Accuracy of electrical output signal**
  Mechanical ±1 % of measuring span

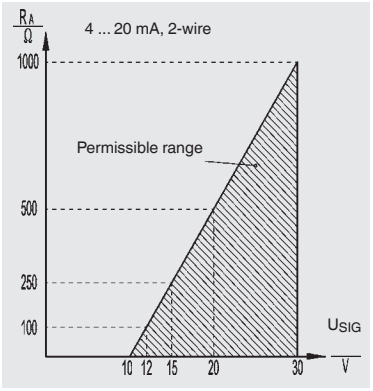
Power supply (U_S)
DC 5 V / DC 12 … 32 V

Electromagnetic compatibility
per test standards EN 61000-4-6 / EN 61000-4-3

Output signal and permissible load

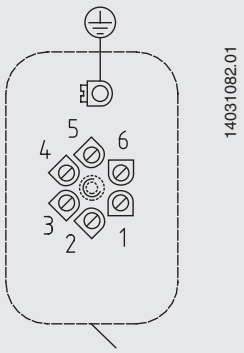
- Voltage output (3-wire)
  R_A > 5 kΩ

- Current output (2-wire) 4 ... 20 mA
  $R_A \leq (U_{SIG} - 10\ V) / 0.02\ A$ with R_A in Ω and U_{SIG} in DC V



Electrical connection

NS 100, terminal box on side



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Output signal	U_{B+}	U_{B-}	Signal
2-wire (current output)	1	2	-
3-wire (voltage output)	1	2	3
Colour	red	black	orange

Options

- Other connection designs
- Other measuring ranges
- Thermowell to DIN or customer specification
- Front panel mounting flange (version V), stainless steel, only with rear cable output or M12 connector
- Electrical connection via cable gland, cable entry or M12 connector
- Other output signals
  0.5 … 2.5 V (ratiometric or non-ratiometric)
  0.5 … 3.5 V (ratiometric or non-ratiometric)
- Indication accuracy: class 1, EN 13190

Scale and measuring ranges [1)]

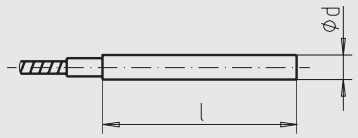
Scale range in °C	Measuring range in °C	Error limit ±°C	Scale graduation in °C
-40 ... +60	-30 ... +50	2	1
-30 ... +50	-20 ... +40	2	1
-20 ... +60	-10 ... +50	2	1
-20 ... +80	-10 ... +70	2	1
0 ... 60	10 ... 50	2	1
0 ... 80	10 ... 70	2	1
0 ... 100	10 ... 90	2	1
0 ... 120	10 ... 110	4	2
0 ... 160	20 ... 140	4	2
0 ... 200	20 ... 180	4	2
0 ... 250	30 ... 220	5	5

Other scale ranges on request

1) The measuring range is indicated on the dial by two triangular marks. Only within this range is the stated error limit valid per EN 13190.

Connection designs

Design 1, plain stem (without thread)
Insertion length l = 140, 200, 240, 290 mm
(Basis for design of connection 4, compression fitting)



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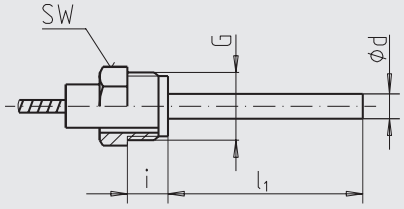
Legend:
Ø d Stem diameter

Design 2, male nut
Process connection: G ½ B
Insertion length l_1 = 80, 140, 180, 230 mm

Process connection G	Dimensions in mm SW	i
G ½ B	27	20



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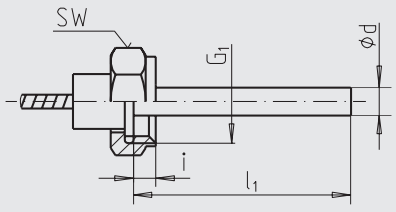
Legend:
G Male thread
i Thread length
SW Flats
Ø d Stem diameter

Design 3, union nut

Process connection: G ½, G ¾, M24 x 1.5

Insertion length l_1 = 89, 126, 186, 226, 276 mm

Process connection	Dimensions in mm	
G	SW	i
G ½	27	8.5
G ¾	32	10.5
M24 x 1.5	32	13.5



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Legend:

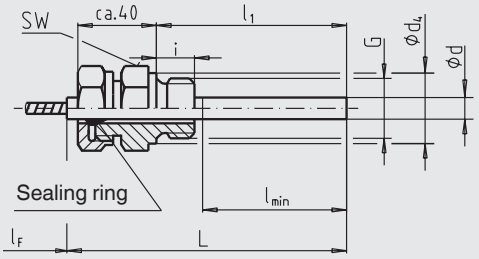
G_1	Male thread	SW	Flats
i	Thread length	Ø d	Stem diameter

Design 4, compression fitting (sliding on stem)

Process connection: G ½ B, G ¾ B, M18 x 1.5
as well as ½ NPT, ¾ NPT

Insertion length l_1 = 100, 160, 200, 250 mm
(insertion length used can be reduced to the minimum immersion length l_{min} = 60 mm)

Process connection	Dimensions in mm		
G	SW	d_4	i
G ½ B	27	26	14
G ¾ B	32	32	16
M18 x 1.5	24	23	12
½ NPT	22	-	19
¾ NPT	30	-	20



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Legend:

G	Male thread	Ø d	Stem diameter
i	Thread length	L	Overall length
Ø d_4	Diameter of the sealing collar	l_F	Capillary length
SW	Flats		

Design 5, union nut with fitting

Union nut: G ½

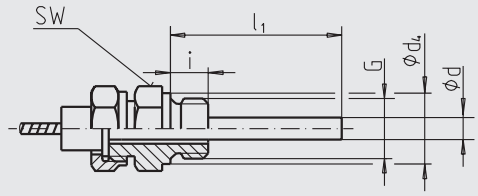
Process connection: G ½ B, G ¾ B as well as ½ NPT, ¾ NPT

Union nut: M24 x 1.5

Process connection: M18 x 1.5

Insertion length l_1 = 63, 100, 160, 200, 250 mm

Process connection	Dimensions in mm		
G	SW	d_4	i
G ½ B	27	26	14
G ¾ B	32	32	16
M18 x 1.5	24	23	12
½ NPT	22	-	19
¾ NPT	30	-	20



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Legend:

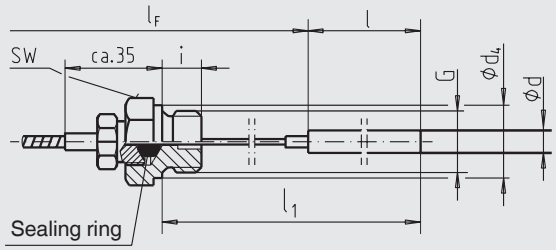
G	Male thread	SW	Flats
i	Thread length	Ø d	Stem diameter
Ø d_4	Diameter of the sealing collar		

Design 6, compression fitting (sliding on capillary)

Process connection: G ½ B, G ¾ B as well as ½ NPT, ¾ NPT

Insertion length l = 100, 140, 200, 240, 290 mm

Process connection	Dimensions in mm		
G	SW	d_4	i
G ½ B	27	26	14
G ¾ B	32	32	16
½ NPT	22	-	19
¾ NPT	30	-	20



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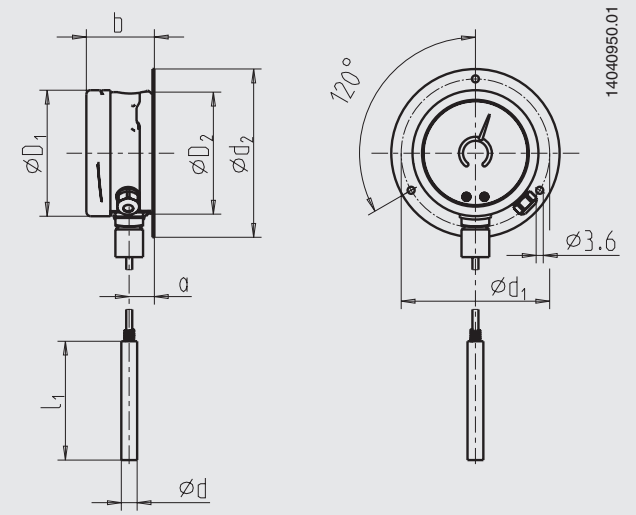
Legend:

G	Male thread	SW	Flats
i	Thread length	Ø d	Stem diameter
Ø d_4	Diameter of the sealing collar	IF	Capillary length

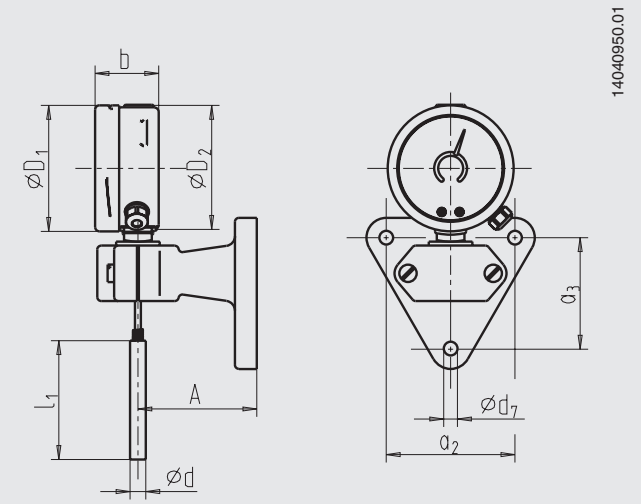
Dimensions in mm

NS 63

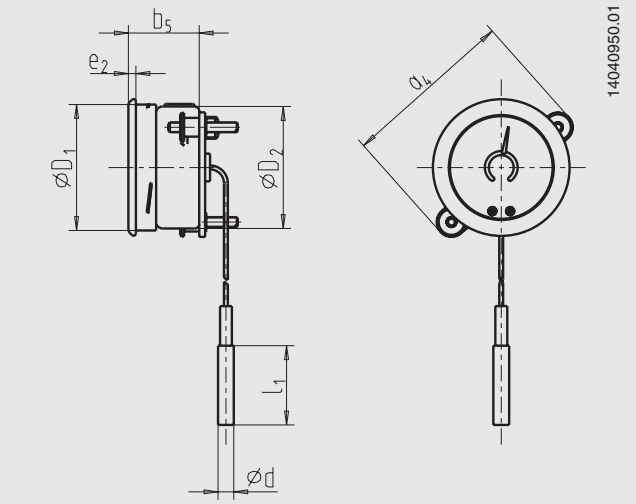
Version H



Version M



Version B

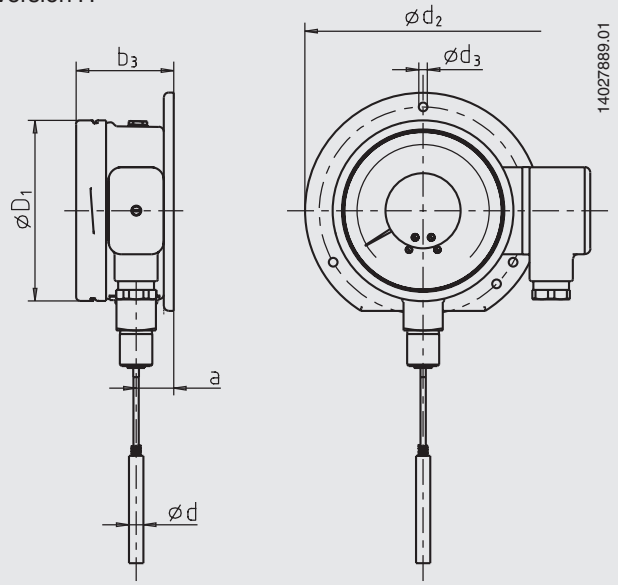


NS	Dimensions in mm														Weight in kg
	a	a_2	a_3	a_4	b	b_5	Ø D_1	Ø D_2	Ø d	Ø d_1	Ø d_2	Ø d_7	A	e_2	
63	12.5	65	56	87	32.5	35.7	63.5	62	8	75	85	7	60	4	0.4

Dimensions in mm

NS 100

Version H



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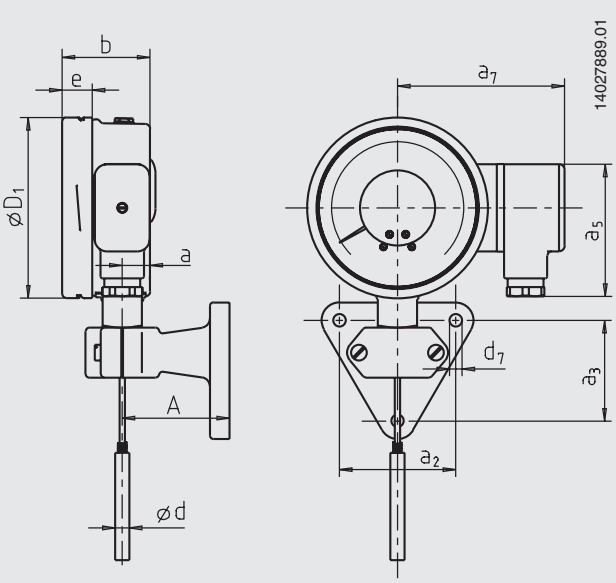

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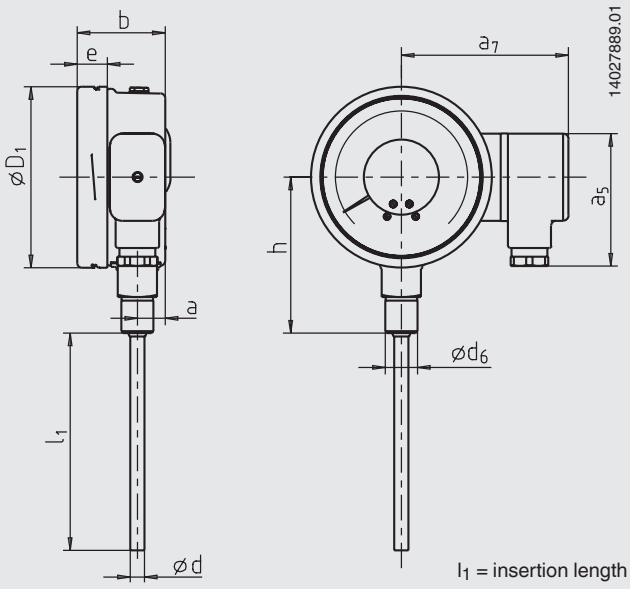

l1 = insertion length

NS	Dimensions in mm																Weight in kg
	a	a2	a3	a5	a7	b	b3	Ø D1	Ø d	Ø d2	Ø d3	Ø d6	d7	A	e	h	
100	15.5	65	56	74	94	49.5	54.6	101	8	132	4.8	18	7	60	16.8	87	0.6

CE conformity

EMC directive
2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy)
- 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)

Approvals and certificates, see website

Ordering information
Model / Nominal size / Mounting option / Connection design / Display range / Process connection / Output signal/ Electrical connection / Stem diameter / Insertion length / Capillary design and length / Options

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