Expansion thermometer with micro switch and capillary Model 70, stainless steel version

Applications

- General purpose instrument for gaseous, liquid and highly-viscous media.
- Refrigeration technology
- Machine building
- Transformers
- Food industry

Special features

- Case and stem from stainless steel
- Version per EN 13190
- High switching reliability and long service life
- Temperature controller and indicator in a single instrument
- One or two adjustable micro switches

Expansion thermometer with micro switch model M70.55.100

Description

Thermometers of this product range find their application whenever a local temperature display is needed at the same time as switching an electrical circuit.

Expansion thermometers can be fitted into or onto almost any point. Versions with capillaries are used in locations which are not easily accessible and where long distances have to be bridged. They can therefore be used in just about any application; such as in machine building, refrigeration and air-conditioning technology and other industrial applications.

The case, capillary, stem and process connection are made from stainless steel. To optimise the fitting to the measuring point, different insertion lengths and process connections are available.

Standard version

Nominal size in mm
100

Measuring principle
Bourdon tube system

Filling medium
Xylol, silicone oil or syltherm

Models

Model	Capillary entry	Mounting option
H70.55.100	lower mount	Surface mounting flange
M70.55.100	lower mount	Surface mounting bracket
V70.55.100	back mount	Panel mounting flange

Indication accuracy
Class 2

Rated operating ranges and conditions
EN 13190

Ingress protection
IP 44 per EN 60529 / IEC 529

Capillary entry
Lower mount or back mount

Case
Stainless steel

Bezel ring
Cam ring (bayonet type), stainless steel

Connection
Plain, stainless steel 1.4571

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

Stem
Ø 8 mm, stainless steel 1.4571

Active sensor length
Depends on Ød and scale range

Dial
Aluminium, white, black lettering

Pointer
Aluminium, black

Window
Laminated safety glass (adjustable contact)
Instrument glass (fixed contact)

Mounting options
- Surface mounting flange (H), stainless steel
- Surface mounting bracket (M), die cast aluminium
- Panel mounting flange (V), stainless steel

Types of contact
- 1 fixed changeover switch
- 2 fixed changeover switches
- 1 adjustable changeover switch
- 2 adjustable changeover switches

Options

- Scale range °F, °C/°F (dual scale)
- Accuracy class 1.0
- Thermowell to DIN or customer specification
- Surface mounting bracket from other material or another length (A)
- Other connection threads
- Designs for customer-specific applications on request

Scale and measuring ranges

Scale range in °C	Measuring range [1] in °C	Error limit ±°C	Scale spacing in °C
-60 ... +40	-50 ... +30	2	1
-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

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.

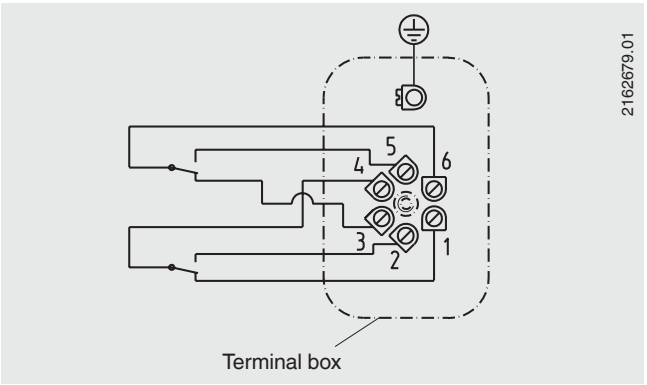
Other scale ranges on request

Electrical contact

Type of contact	Contact functions	
Micro switch	Single changeover contact (SPDT)	Double changeover contact (DPDT)
Model	850.3	850.3.3

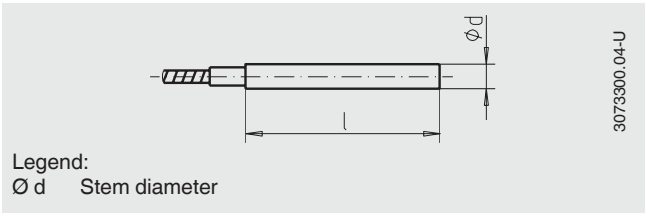
	Voltage AC	Voltage DC
Load data		
U_{max}	48 V	30 V
I_{max}	5 A	0.4 A
P_{max}	240 VA	10 W
Switch point adjustment	adjustable from outside with setting key or fixed	
Setting range	from 10 % to 90 % of the full scale value	
Standard switch differential	< 2 % of scale range, other switch differentials on request	
Electrical connection	via cable terminal box	

Electrical connection diagram



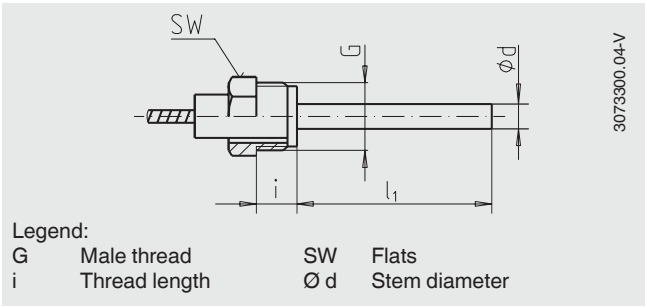
Connection design

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



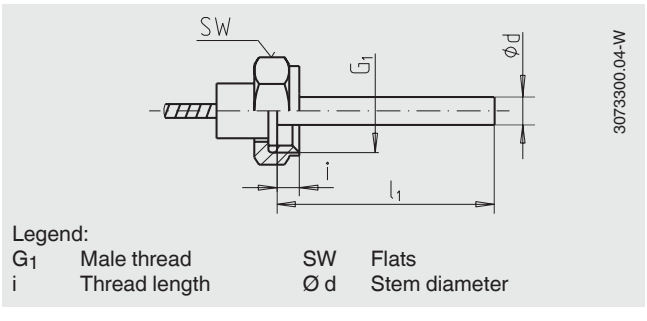
Design 2, male nut
Process connection: G ½ B
Insertion length l_1 = 80, 140, 180, 230 mm

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



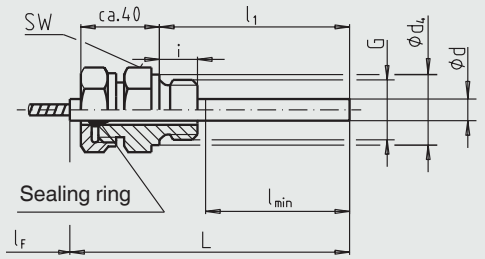
Design 3, union nut
Process connection: G ½, G ¾, M24 x 1.5
Insertion length l_1 = 89, 126, 186, 226, 276 mm

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



Design 4, compression fitting (sliding on stem)
Process connection: G ½ B, G ¾ B, M18 x 1.5 and
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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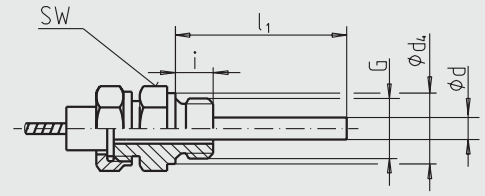
Legend:
G Male thread
i Thread length
Ø d_4 Diameter of the sealing collar
SW Flats
Ø d Stem diameter
L Overall length
l_F Capillary length

Design 5, union nut with fitting
Union nut (female): G ½
Process connection: G ½ B, G ¾ B and ½ NPT, ¾ NPT
Union nut (female): 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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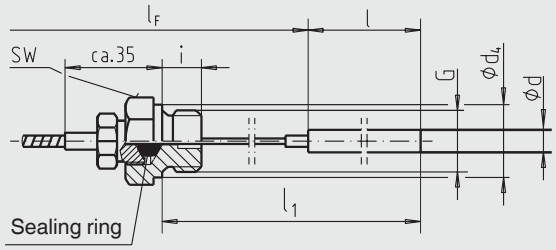
Legend:
G Male thread
i Thread length
Ø d_4 Diameter of the sealing collar
SW Flats
Ø d Stem diameter

Design 6, compression fitting (sliding on capillary)
Process connection: G ½ B, G ¾ B and 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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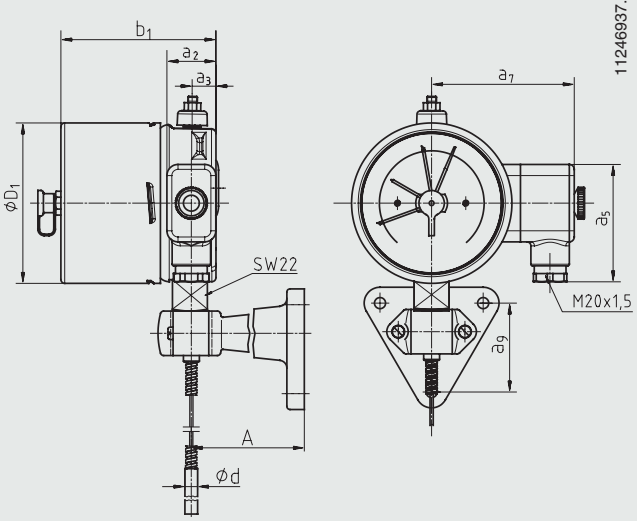
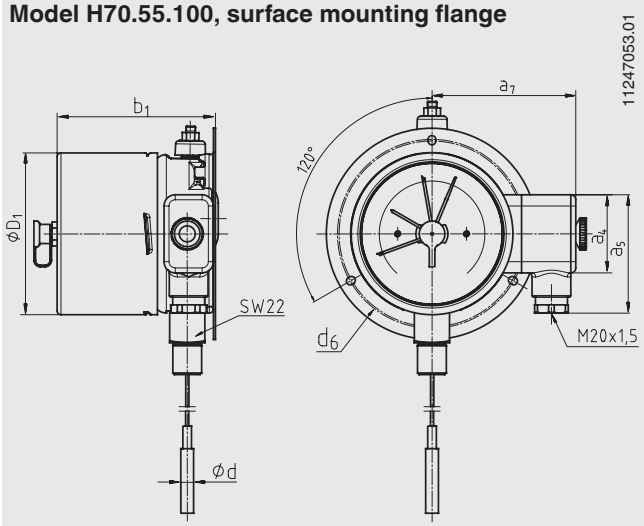
Legend:
G Male thread
i Thread length
Ø d_4 Diameter of the sealing collar
SW Flats
Ø d Stem diameter
l_F Capillary length

Dimensions in mm

Model M70.55.100, with surface mounting bracket



Model H70.55.100, surface mounting flange



NS	Dimensions in mm																Weight in kg
	a	a_1	a_2	a_3	a_4	a_5	a_7	a_8	a_9	b_1	Ød	d_4	d_5	d_6	A	$ØD_1$	
100	15.5	14.5	31	14.5	49	74	94	65	56	98	8	16	7	120	60	101	1.4

Ordering information

Model / Nominal size / Mounting option / Connection design / Scale range / Type of contact / Switching points / Process connection / Stem diameter / Insertion length / Capillary design and length / Options

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