

Gas Actuated Thermometers Stainless Steel Series, Model 73

WIKA Data Sheet TM 73.01

Applications

- For aggressive media in the chemical, petrochemical and process engineering industries
- Universally suitable for plant, machinery, tank, apparatus construction and the food industry
- Temperature measurement without any contact with the medium
- Mounting in instrument boards, control cabinets, control panels

Special Features

- Instruments meet the highest standards of measurement technology
- Housing and stem from stainless steel
- For external mounting on pipes and tanks
- Various connection and case mounting designs
- Versions also available with adjustable stem and dial, with capillary, with contact bulb or panel mounting design (square)

Description

This series of thermometers is universally suitable for machinery, plant and apparatus construction. Gas actuated thermometers with capillaries are used in locations which are not easily accessible and where long distances have to be bridged.

The stem, the process connection and the case of the instrument ¹⁾ are made from stainless steel. Various insertion lengths and process connections are available to match the requirements of each process optimally. The thermometers have a high, IP 65 ingress protection and can be used in outdoor applications even at negative temperatures. With liquid damping they are capable of being used under high-vibration conditions.



Gas Actuated Thermometers

Fig. left: Lower mount (LM) Model R73.100

Fig. centre: With capillary and surface mounting bracket Model F73.100

Fig. right: Adjustable stem and dial Model S73.100

Due to the wide variety of possible designs the Model 73 gas actuated thermometers can be perfectly adapted to any process connection or location. The adjustable stem and dial version can be adjusted to any angle to allow easy reading. With the contact bulb version, temperature measurements are possible without any contact with the medium, even when the pipe diameter is extremely small. The contact bulb is intended for external mounting on pipes and tanks. When mounting this design of thermometer, it must be ensured that the contact bulb is in contact with the measuring point over its complete length.

1) Not with Model Q73.144, panel mounting case galvanised steel.

Standard features

Temperature element

Inert gas expansion system (non-toxic)

Nominal size in mm

100, 160, 144 x 144

Design of connection

- S Standard (male thread connection)
- 1 Plain stem (without thread)
- 2 Male nut
- 3 Union nut
- 4 Compression fitting (sliding on stem)
- 5 Union nut with fitting
- 6 Compression fitting (sliding on capillary or armoured capillary, see Pages 10 and 11)

Instrument version

- A73.XXX back mount (axial)
- R73.XXX lower mount (radial)
- S73.XXX back mount (adjustable stem and dial)
- F73.XXX instruments with capillaries
- Q73.144 instruments in panel mounting design

Accuracy class

Class 1 per DIN EN 13 190

Working range

Normal (1 year): measuring range per DIN EN 13 190
Short time (24 h max.): scale range per DIN EN 13 190

Nominal use

DIN EN 13 190

Case, bezel ring, stem, process connection

Stainless steel

Adjustable Stem and Dial

Stainless steel
Rotatable on stem 360°
Stem adjustable to any angle

Panel mounting case and panel frame

Galvanised steel

Contact bulb

120 x 22 x 12 mm, stainless steel 1.4571

Capillary

2 mm diameter, stainless steel 1.4571, bending radius no less than 6 mm, length to user specifications

Dial

Aluminium, white, black lettering

Window

Laminated safety glass
(panel mounting series: shatterproof plastic)

Pointer

Adjustable black aluminium pointer

Temperature limits for storage and transport

- 50 °C ... +70 °C (DIN EN 13 190) without liquid damping
- 20 °C ... +60 °C (DIN EN 13 190) with food-compatible liquid damping
- 50 °C ... +60 °C (DIN EN 13 190) with liquid damping

Ambient temperature limit at the case

0 °C ... +40 °C max. (others on request)

Pressure rating of stem

25 bar max., static

Ingress protection

IP 65 per EN 60 529
Exception with Model Q73.144: IP 65 at the front
IP 40 at the back

Mounting options with F73.XXX

- Surface mounting flange, stainless steel
- Surface mounting bracket, die cast aluminium
- Panel mounting flange, stainless steel
- Triangular bezel with bracket, stainless steel

Options

- Scale range °F, °C/°F (dual scale)
- Case with liquid damping
- Case with food-compatible liquid damping
- Armoured or coated capillary: armoured capillary Ø 7 mm, flexible or capillary with PVC coating
- Stem diameter 6, 10, 12 mm (others on request)
- Ingress protection IP 66
- Thermometers with switch contacts (Data Sheet TV 27.01)
- Special temperature range or dial printing to customer specifications (on request)

Scale, measuring ranges ¹⁾, error limit (DIN EN 13 190)

Scale graduation per WIKA standard

Scale range in °C	Measuring range in °C	Scale spacing in °C	Error limit ± °C
-80 ... +60	-60 ... +40	2	2
-60 ... +40	-50 ... +30	1	1
-40 ... +60	-30 ... +50	1	1
-30 ... +50	-20 ... +40	1	1
-20 ... +60	-10 ... +50	1	1
-20 ... +80	-10 ... +70	1	1
0 ... 60	+10 ... +50	1	1
0 ... 80	+10 ... +70	1	1
0 ... 100	+10 ... +90	1	1
0 ... 120	+10 ... +110	2	2
0 ... 160	+20 ... +140	2	2
0 ... 200	+20 ... +180	2	2
0 ... 250	+30 ... +220	5	2.5
0 ... 300	+30 ... +270	5	5
0 ... 400	+50 ... +350	5	5
0 ... 500	+50 ... +450	5	5
0 ... 600	+100 ... +500	10	10
0 ... 700	+100 ... +600	10	10

¹⁾ The measuring range is indicated on the dial by two triangular marks.
Only within this range the stated error limit is valid per DIN EN 13 190.

Models

Model	NS	Location of stem
A73.100	100	back mount
A73.160	160	back mount
R73.100	100	lower mount
R73.160	160	lower mount
S73.100	100	adjustable stem and dial
S73.160	160	adjustable stem and dial
F73.100	100	with capillary
F73.160	160	with capillary
Q73.144	144	panel mounting version

Dimensions in mm

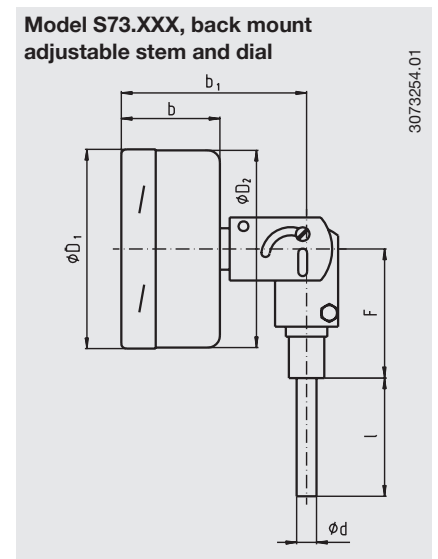
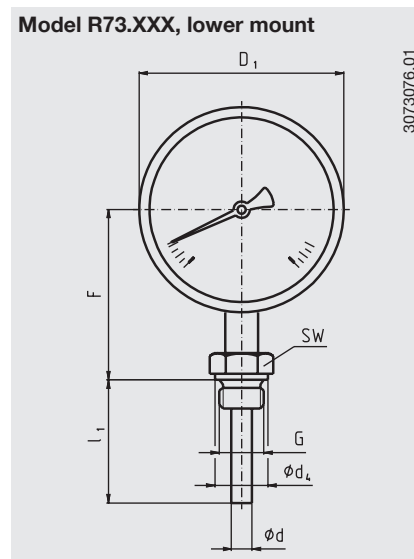
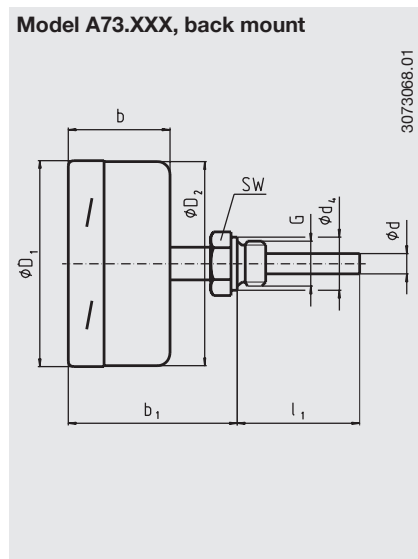


Table of dimensions for Model A73.XXX and R73.XXX

Nominal size	Dimensions in mm								Weight in kg	
	NS	b	b ₁ ¹⁾	d	d ₄	D ₁	D ₂	F ¹⁾		G
100	50	83	8 ²⁾	26	101	99	83	G ½ B	27	1.1
160	50	83	8 ²⁾	26	161	159	113	G ½ B	27	1.4

- 1) For scale ranges ≥ 0 ... 500 °C the dimensions are 40 mm larger.
 2) Option: stem diameter 6, 10, 12 mm

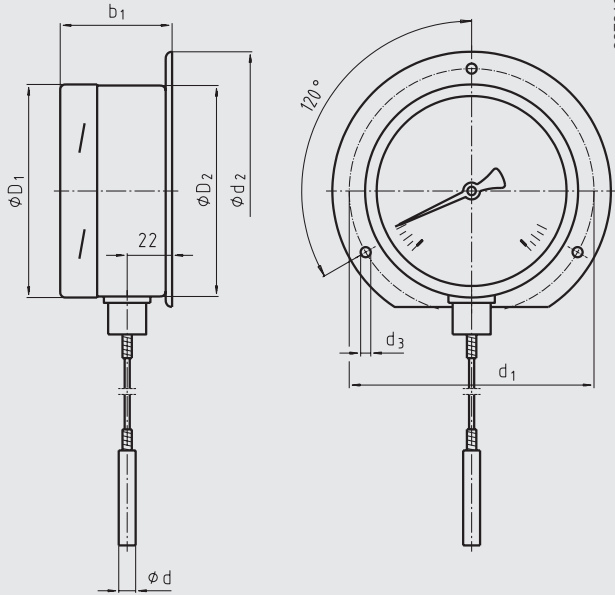
Table of dimensions for Model S73.XXX

Nominal size	Dimensions in mm						Weight in kg
	NS	b	b ₁	d	D ₁	D ₂	
100	50	93	8 ²⁾	101	99	68	1.3
160	50	93	8 ²⁾	161	159	68	1.6

- 2) Option: stem diameter 6, 10, 12 mm

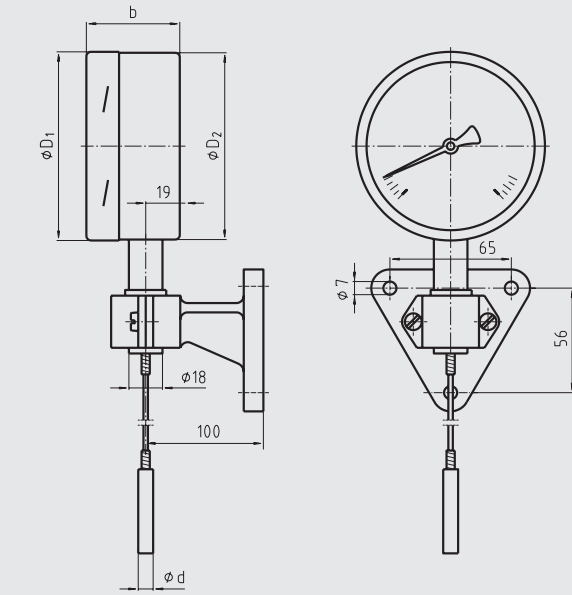
Model F73.XXX, with capillary and surface mounting flange

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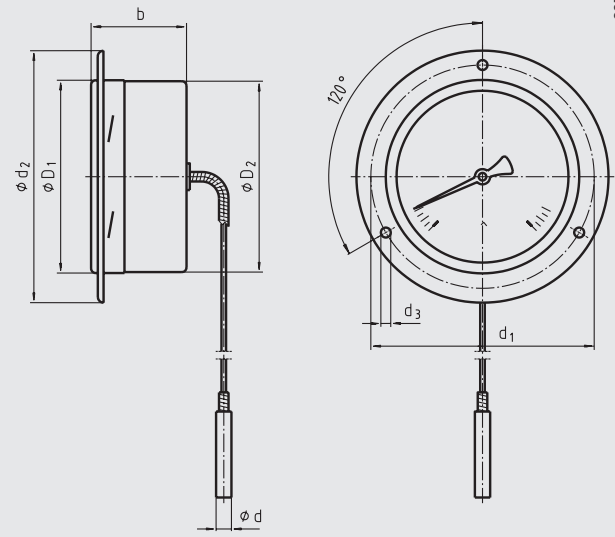
Model F73.XXX, with capillary and surface mounting bracket

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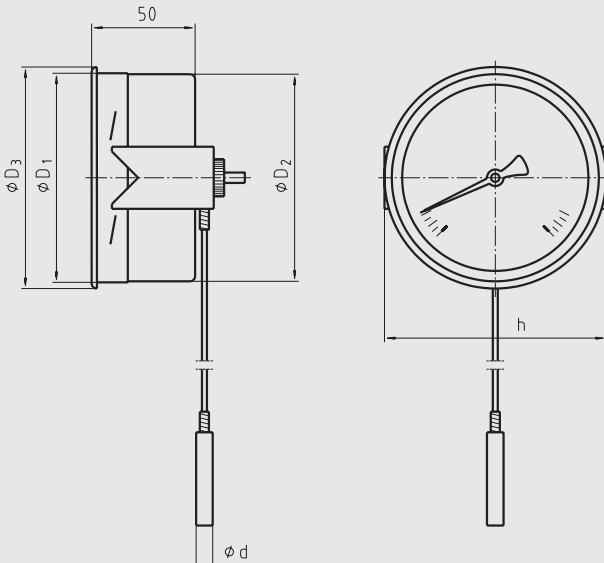
Model F73.XXX, with capillary and panel mounting flange

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Model F73.XXX, with capillary and triangular bezel with bracket ¹⁾

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1) Not suitable for alarm contacts.

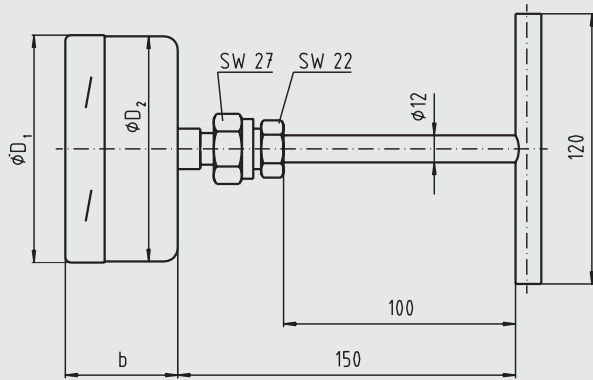
Table of dimensions for Model F73.XXX (with capillary)

Nominal size	Dimensions in mm										Weight in kg
	NS	b	b ₁	d	d ₁	d ₂	d ₃	D ₁	D ₂	D ₃	
100	50	53	8 ¹⁾	116	132	4.8	101	99	107	107	1.4
160	50	53	8 ¹⁾	178	196	4.8	161	159	166	172	1.8

1) Option: stem diameter 6, 10, 12 mm

**Model A73.XXX, with contact bulb
back mount**

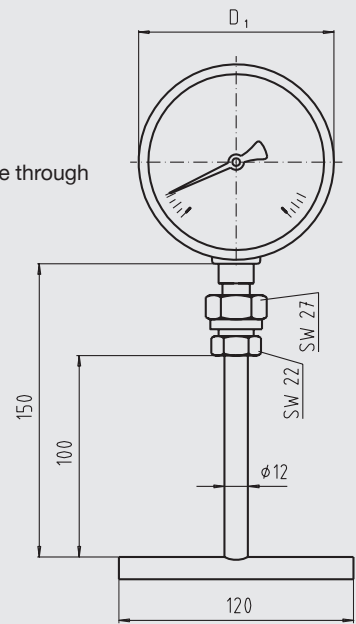
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**Model R73.XXX, with contact bulb
lower mount**

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Case rotatable through
approx. 350 °



**Model S73.XXX, with contact bulb
back mount,
adjustable stem and dial**

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Case rotatable
through approx 350 °
and tiltable through 90 °

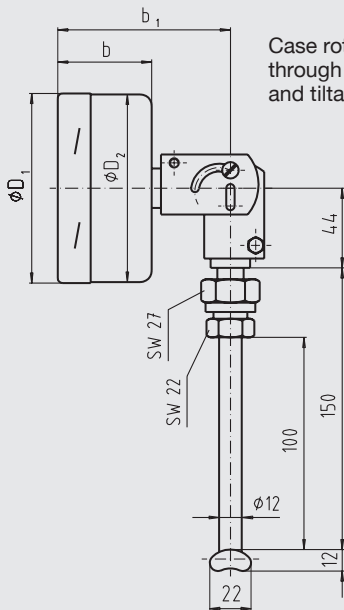
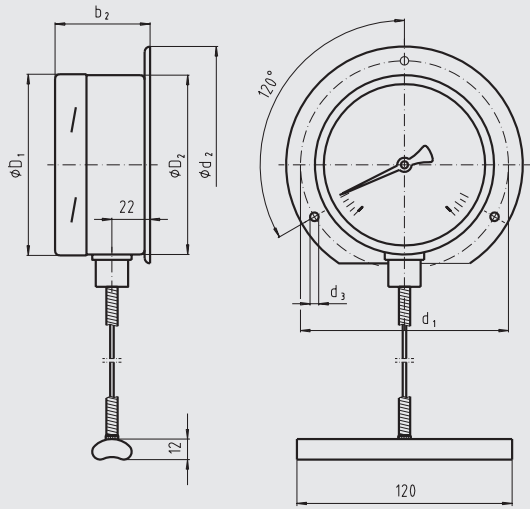


Table of dimensions for Model A73.XXX, R73.XXX and S73.XXX (with contact bulb)

Model	Nominal size	Dimensions in mm				Weight in kg
	NS	b	b ₁	D ₁	D ₂	
A73.100	100	50	-	101	99	0.8
A73.160	160	50	-	161	159	0.9
R73.100	100	50	-	101	99	0.8
R73.160	160	50	-	161	159	0.9
S73.100	100	50	93	101	99	0.9
S73.160	160	50	93	161	159	1.0

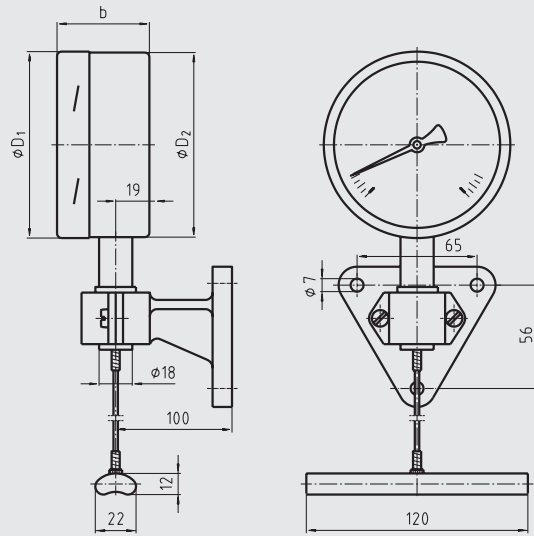
Model F73.XXX, with contact bulb capillary and surface mounting flange

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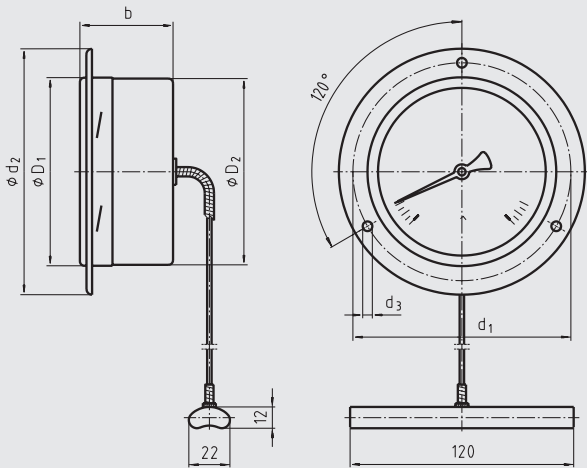
Model F73.XXX, with contact bulb capillary and surface mounting bracket

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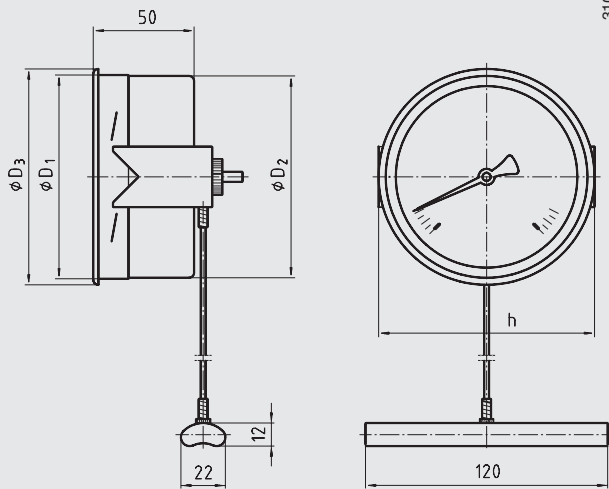
Model F73.XXX, with contact bulb capillary and panel mounting flange

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Model F73.XXX, with contact bulb capillary and triangular bezel with bracket ¹⁾

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1) Not suitable for alarm contacts.

Table of dimensions for Model F73.XXX (with contact bulb and capillary)

Nominal size	Dimensions in mm									Weight in kg
	NS	b	b ₁	d ₁	d ₂	d ₃	D ₁	D ₂	D ₃	
100	50	53	116	132	4.8	101	99	107	107	1.4
160	50	53	178	196	5.8	161	159	166	172	1.8

Mounting instructions for contact bulb

General

The contact bulb has been designed for mounting on a tube or tank skin. The contact bulb is to be mounted so that its full length is in contact with the measuring point. The basic requirements to ensure perfect measurement results are good thermal contact between the skin mounted contact bulb and the outside wall of the pipe or tank with minimal heat loss to ambient from the skin mounted contact bulb and measuring point.

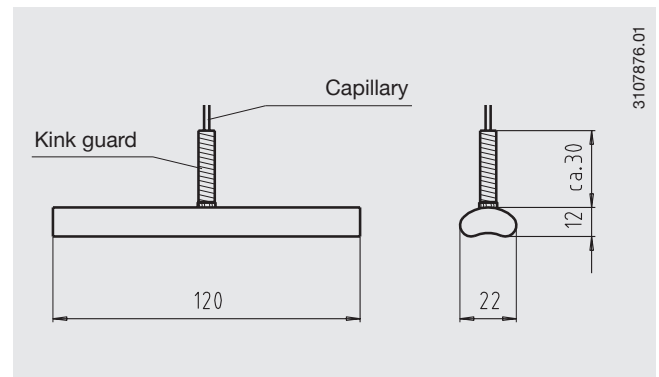
Mounting on pipes

The geometry of the contact bulb has been designed for pipes with external diameters between 20 and 160 mm. Pipe clips are adequate for fastening the skin mounted contact bulb to the pipe. The skin mounted contact bulb should have direct metallic contact with the measuring point and have firm contact with the surface of the pipe. Where temperatures under 200 °C are to be expected a heat conducting paste can be used to optimise the heat transmission between skin mounted contact bulb and pipe. Lagging must be applied where the skin mounted contact bulb has been mounted, in order to avoid error due to heat loss. This lagging must have sufficient temperature resistance and is not provided with the instrument.

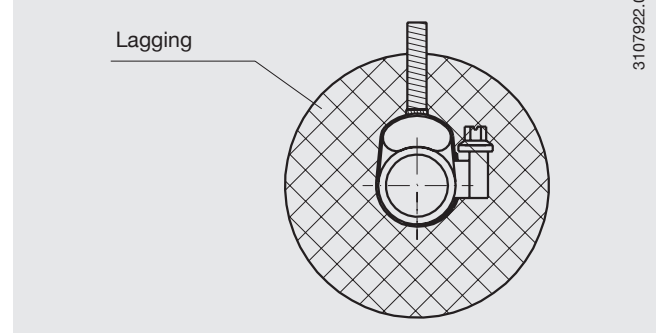
Mounting on tanks

The geometry of the contact bulb has been designed for tanks with an external radius up to 80 mm. If the mounting point of the skin mounting contact bulb on the tank has an external radius greater than 80 mm, we recommend the use of an intermediate piece designed for the respective tank diameter made of a material with good thermal conductivity. The contact bulb should be fastened to the tank by means of an angle bracket with clamping screws, or any similar method.

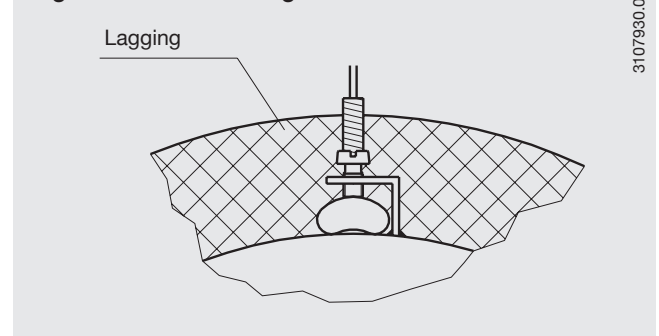
The skin mounted contact bulb should have direct metallic contact with the measuring point and have firm contact with the surface of the tank. A heat conducting paste can be used to optimise the heat transmission between skin mounted contact bulb and tank, where temperatures under 200 °C are to be expected. Lagging must be applied where the skin mounted contact bulb has been mounted in order to avoid error due to heat loss. This lagging must have sufficient temperature resistance and is not provided with the instrument.



Pipe clip mounting

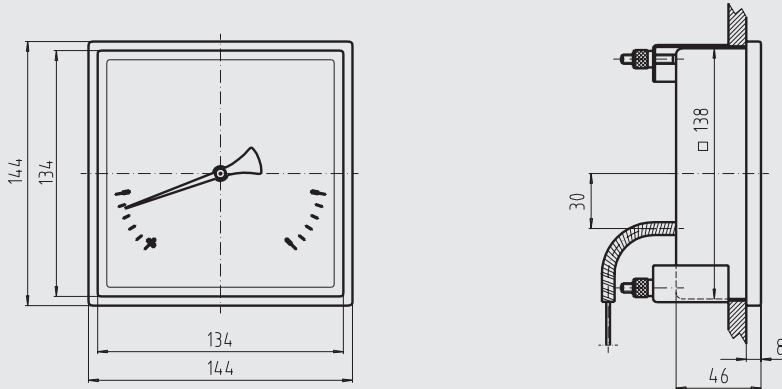


Angle bracket mounting

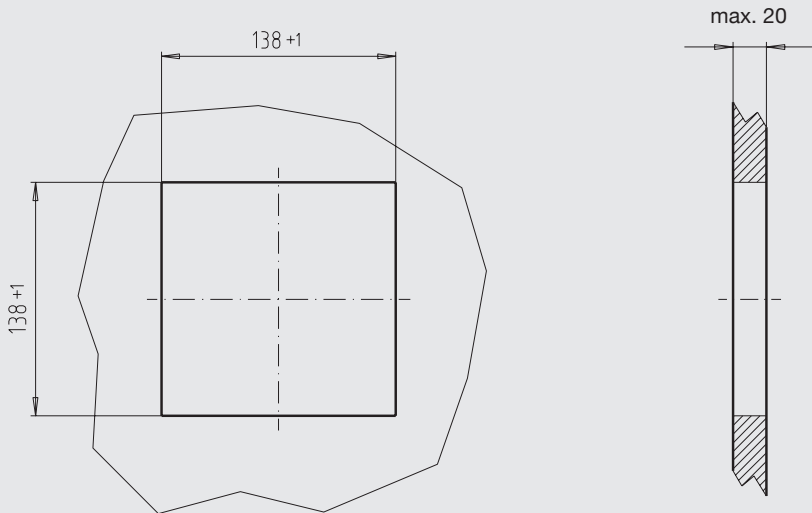


Model Q73.144, panel mounting series

Panel mounting case, 144 x 144 mm, lower back capillary entry



Panel cutout in mm



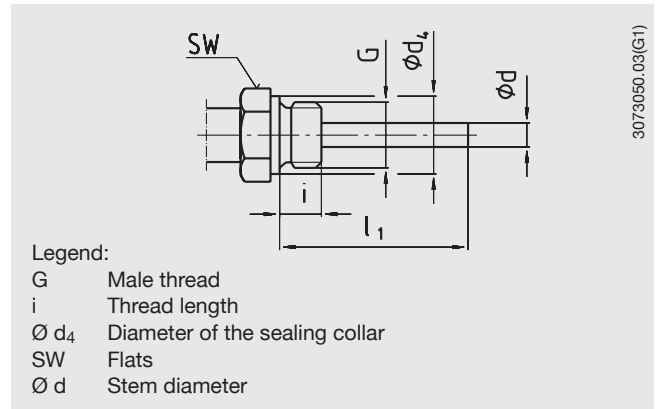
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Design of connection

Design standard (male thread connection)

Standard stem lengths: $l_1 = 63, 100, 160, 200, 250$ mm
(not with F73.XXX and Q73.144)

Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	d_4	$\varnothing d$
100, 160	G 1/2 B	14	27	26	8
	G 3/4 B	16	32	32	8
	1/2 NPT	19	22	-	8
	3/4 NPT	20	30	-	8

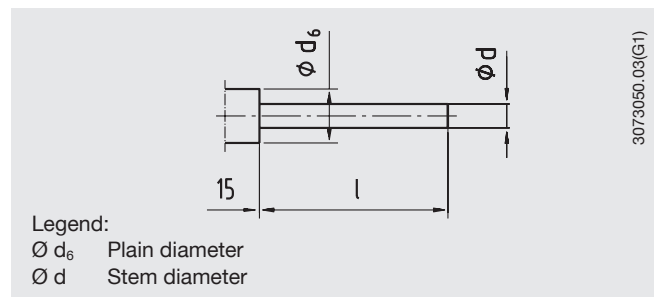


Design 1, plain stem (without thread)

Standard stem lengths: $l = 100, 140, 200, 240, 290$ mm
Basis for design 4, compression fitting

Nominal size NS	Dimensions in mm	
	$d_6^{1)}$	$\varnothing d$
100, 160, 144 x 144	18	8

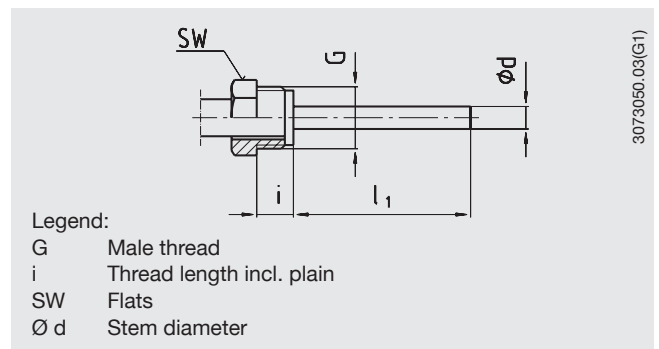
1) Not applicable to version with capillary



Design 2, male nut

Standard stem lengths: $l_1 = 80, 140, 180, 230$ mm

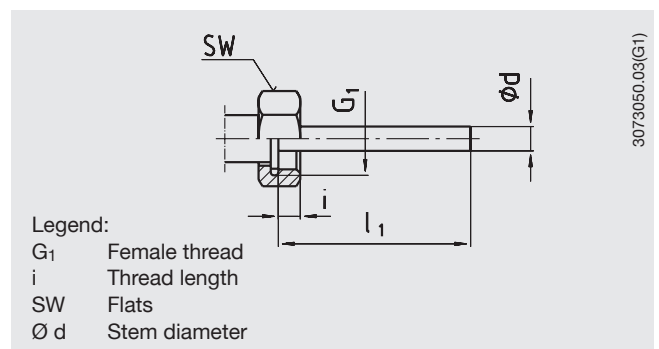
Nominal size NS	Process connection		Dimensions in mm	
	G	i	SW	$\varnothing d$
100, 160, 144 x 144	G 1/2 B	20	27	8
	M20 x 1.5	15	22	8



Design 3, union nut

Standard stem lengths: $l_1 = 89, 126, 186, 226, 276$ mm

Nominal size NS	Process connection		Dimensions in mm	
	G1	i	SW	$\varnothing d$
100, 160, 144 x 144	G 1/2	8.5	27	8
	G 3/4	10.5	32	8
	M24 x 1.5	13.5	32	8

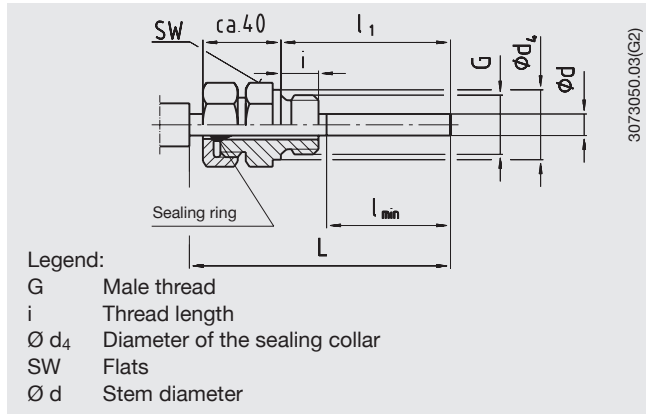


Design 4, compression fitting (sliding on stem)

Stem length: $l_1 = \text{variable}$

Length $L = l_1 + 40 \text{ mm}$

Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	14	27	26	8	
	G 3/4 B	16	32	32	8	
	M18 x 1.5	12	24	23	8	
	1/2 NPT	19	22	-	8	
	3/4 NPT	20	30	-	8	

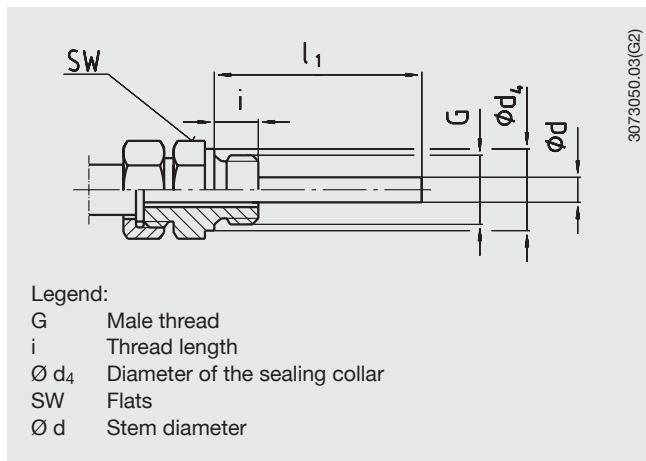


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Design 5, union nut with fitting

Standard stem lengths: $l_1 = 63, 100, 160, 200, 250 \text{ mm}$

Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	14	27	26	8	
	G 3/4 B	16	32	32	8	
	M18 x 1.5	12	24	23	8	
	1/2 NPT	19	22	-	8	
	3/4 NPT	20	30	-	8	



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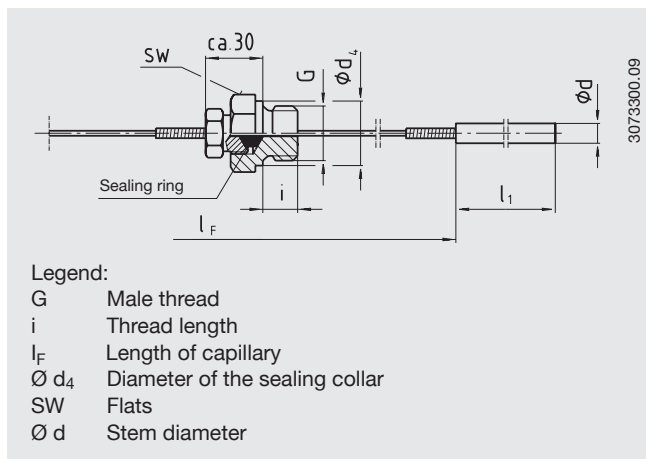
Option: Union nut M24 x 1.5 with fitting M18 x 1.5

Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160	M18 x 1.5	12	32	23	8	

Design 6.1, compression fitting sliding on capillary (compression fitting is leak-proof)

Standard stem lengths: $l_1 = 100 \text{ mm}$ (others on request)

Nominal size NS	Process connection			Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$	
100, 160, 144 x 144	G 1/2 B	14	27	26	8	
	G 3/4 B	16	32	32	8	
	1/2 NPT	19	22	-	8	
	3/4 NPT	20	30	-	8	

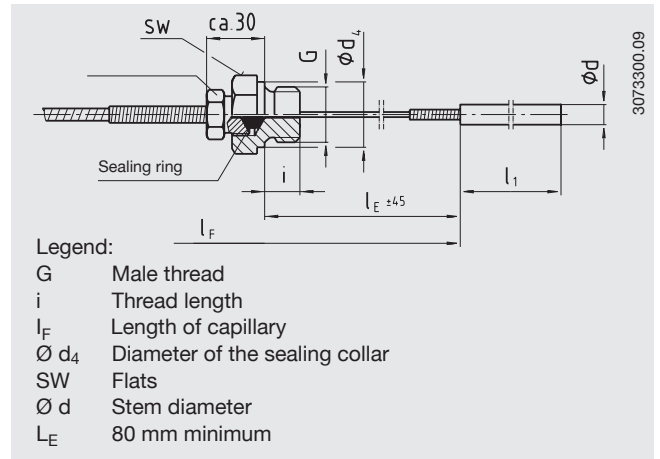


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Design 6.2, compression fitting sliding on capillary with spiral protecting hose (compression fitting is leak-proof)

Standard stem lengths: $l_1 = 100$ mm (others on request)

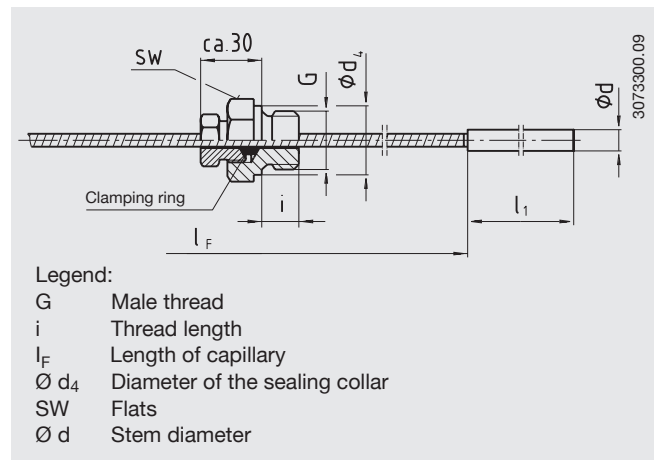
Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	d_4	$\varnothing d$
100, 160, 144 x 144	G 1/2 B	14	27	26	8
	G 3/4 B	16	32	32	8
	1/2 NPT	19	22	-	8
	3/4 NPT	20	30	-	8



Design 6.3, compression fitting sliding on spiral protecting hose (compression fitting is not leak-proof)

Standard stem lengths: $l_1 = 100$ mm (others on request)

Nominal size NS	Process connection			Dimensions in mm	
	G	i	SW	d_4	$\varnothing d$
100, 160, 144 x 144	G 1/2 B	14	27	26	8
	G 3/4 B	16	32	32	8
	1/2 NPT	19	22	-	8
	3/4 NPT	20	30	-	8



Ordering information

Model / Nominal size / Scale range / Design of connection / Process connection / Length l , l_1 / Length of capillary l_F / Options

Modifications may take place and materials specified may be replaced by others without prior notice.
Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.



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