

## Expansion thermometer Model 70, stainless steel version

WIKA data sheet TM 81.01



for further approvals  
see page 8

### Applications

- General-purpose temperature measuring instruments for gaseous, liquid and highly-viscous process media in harsh working environments
- Refrigeration industry
- Machine building

### Special features

- Case and stem made of stainless steel
- Design per EN 13190
- Different designs of connection and mounting
- With capillary
- With various fixed connections



Fig. left: expansion thermometer model M70.50.100  
Fig. right: expansion thermometer model B70.50.063

### Description

This series of thermometers is universally suitable for machine building, refrigeration and air-conditioning industry. Expansion thermometers can be installed in or mounted at nearly all locations. Versions with capillaries are used in locations which are not easily accessible and where long distances have to be bridged.

Case, capillary, stem and process connection are made from stainless steel. Various insertion lengths and process connections are available to match the requirements of each measuring location optimally.

## Standard version

### Measuring principle

Bourdon tube system

### Nominal size in mm

63, 100, 160

### Design of 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)

### Instrument version and type of mounting

- B Instruments with capillary; centre back mount triangular bezel with bracket
- H Instruments with capillary; lower mount (radial) surface mounting flange
- M Instruments with capillary; lower mount (radial) surface mounting bracket, aluminium die cast
- V Instruments with capillary; back mount <sup>1)</sup> panel mounting flange
- A Back mount <sup>1)</sup>, fix plain stem, threaded connection or thermowell
- R Lower mount (radial), fix plain stem, threaded connection or thermowell
- S Back mount <sup>1)</sup>, fix plain stem, threaded connection or thermowell; swivelling approx. 90 °

1) eccentric; NS 63: centric

### Fill medium measuring system

Xylol or silicon oil

### Accuracy class

Class 2

### Rated operating ranges and conditions

EN 13190

### Capillary entry

Lower or back

### Case

Stainless steel

### Bezel ring

Stainless steel

### Connection

Stainless steel 1.4571

### Capillary

Length to customer specifications (max. 10 m), Ø 2 mm, stainless steel 1.4571, bending radius not less than 6 mm

### Stem

Ø 8 mm, stainless steel 1.4571

### Active length of sensor

Depending on Ø d and scale range

### Dial

Aluminium, white, black lettering

### Pointer

Aluminium, black

### Window

NS 100, 160: Instrument glass

NS 63: Transparent plastic

### Temperature limits for storage and transport

-50 ... +70 °C (EN 13190) without liquid damping

-20 ... +60 °C (EN 13190) with food-compatible liquid damping

-50 ... +60 °C (EN 13190) with liquid damping

### Ambient temperature limit at the case

0 ... 40 °C max. (others on request)

### Pressure rating of stem

25 bar max., static

### Ingress protection

IP 65 per EN 60529 / IEC 529

## Options

- Scale range °F, °C/°F (dual scale)
- Laminated safety glass, clear plastic
- Ambient temperature compensation
- Accuracy class 1.0
- Thermowell per DIN or to customer specification
- Surface mounting bracket from other materials and in other lengths (A)
- Liquid filling case with
  - NS 63: Model X70.53.063
  - NS 100: Model X70.53.100
  - NS 160: Model X70.53.160
  - Filling medium: glycerine
- Spiral protecting hose stainless steel
- Designs per DIN EN ISO 13485, medical applications on request
- Model 70 with micro switch see WIKA data sheet TV 28.01
- Stem diameter 6, 10 mm

## Scale ranges, measuring ranges 1)

Scale range in °C	Measuring range in °C	Limit error ±°C	Scale division 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
0 ... 300	30 ... 270	10	10
0 ... 400	50 ... 350	10	10

Other scale ranges on request.

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

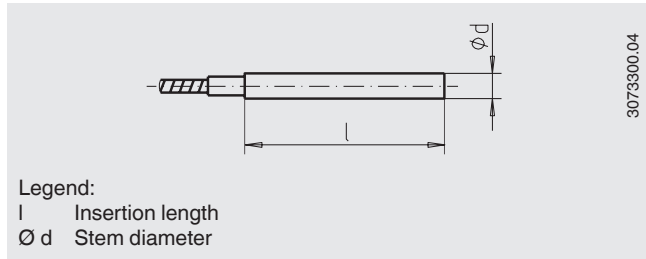
## Models

Model	NS	Connection location	Type of mounting
<b>B70.50</b> (instruments without liquid filling) <b>B70.53</b> (instruments with liquid filling)	063	Centre back mount	Triangular bezel with bracket
<b>H70.50</b> (instruments without liquid filling) <b>H70.53</b> (instruments with liquid filling)	063 100 160	Lower mount (radial)	Surface mounting flange
<b>M70.50</b> (instruments without liquid filling) <b>M70.53</b> (instruments with liquid filling)	063 100 160	Lower mount (radial)	Surface mounting bracket
<b>V70.50</b> (instruments without liquid filling) <b>V70.53</b> (instruments with liquid filling)	063 100 160	Centre back mount Lower back mount	Panel mounting flange
<b>A70.50</b> (instruments without liquid filling) <b>A70.53</b> (instruments with liquid filling)	063 100	Centre back mount, fix Lower back mount, fix	via connection (plain stem), threaded connection or thermowell
<b>R70.50</b> (instruments without liquid filling) <b>R70.53</b> (instruments with liquid filling)	063 100	Lower mount (radial), fix	via connection (plain stem), threaded connection or thermowell
<b>S70.50</b> (instruments without liquid filling) <b>S70.53</b> (instruments with liquid filling)	063 100	Centre back mount, fix Lower back mount, fix	via connection (plain stem), threaded connection or thermowell; swivelling approx. 90° ↺

## Connection designs

### Design 1, plain connection (without thread)

Insertion length  $l = 140, 200, 240, 290$  mm  
 Basis for design 4, compression fitting



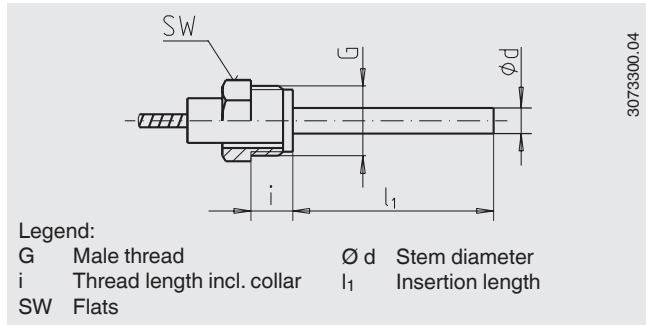
Legend:  
 $l$  Insertion length  
 $\text{Ø } d$  Stem diameter

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### Design 2, male nut

Process connection: G 1/2 B  
 Insertion length  $l_1 = 80, 140, 180, 230$  mm

Process connection	Dimensions in mm	
	SW	i
G 1/2 B	27	20



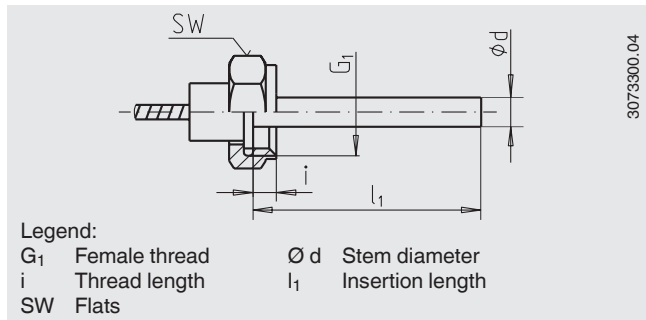
Legend:  
 $G$  Male thread                       $\text{Ø } d$  Stem diameter  
 $i$  Thread length incl. collar       $l_1$  Insertion length  
 SW Flats

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### Design 3, union nut

Process connection: G 1/2, G 3/4, M24 x 1.5  
 Insertion length  $l_1 = 89, 126, 186, 226, 276$  mm

Process connection	Dimensions in mm	
	SW	i
G 1/2	27	8.5
G 3/4	32	10.5
M24 x 1.5	32	13.5



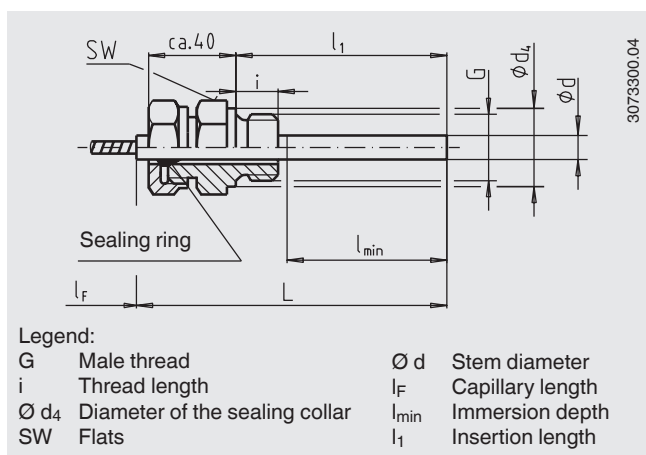
Legend:  
 $G_1$  Female thread                       $\text{Ø } d$  Stem diameter  
 $i$  Thread length                       $l_1$  Insertion length  
 SW Flats

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### Design 4, compression fitting (sliding on stem)

Process connection: G 1/2 B, G 3/4 B, M18 x 1.5, 1/2 NPT, 3/4 NPT  
 Insertion length  $l_1 = 100, 160, 200, 250$  mm  
 (the insertion length used can be reduced to a minimum immersion length of  $l_{\text{min}} = 60$  mm)

Process connection	Dimensions in mm		
	SW	$d_4$	i
G 1/2 B	27	26	14
G 3/4 B	32	32	16
M18 x 1.5	24	23	12
1/2 NPT	22	-	19
3/4 NPT	30	-	20



Legend:  
 $G$  Male thread                       $\text{Ø } d$  Stem diameter  
 $i$  Thread length                       $l_F$  Capillary length  
 $\text{Ø } d_4$  Diameter of the sealing collar       $l_{\text{min}}$  Immersion depth  
 SW Flats                       $l_1$  Insertion length

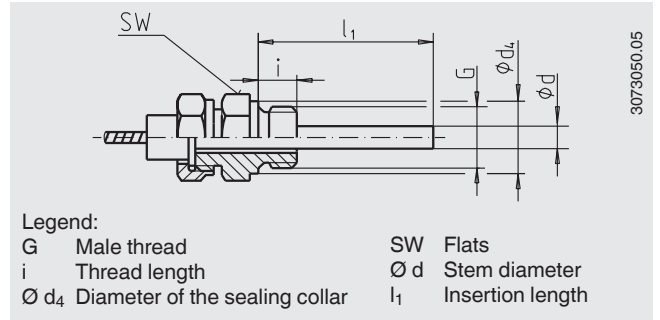
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### Design 5, union nut with fitting

Union nut: G 1/2  
 Process connection: G 1/2 B, G 3/4 B or 1/2 NPT, 3/4 NPT

Option:  
 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	$d_4$
G 1/2 B	27	26	14
G 3/4 B	32	32	16
M18 x 1.5	24	23	12
1/2 NPT	22	-	19
3/4 NPT	30	-	20

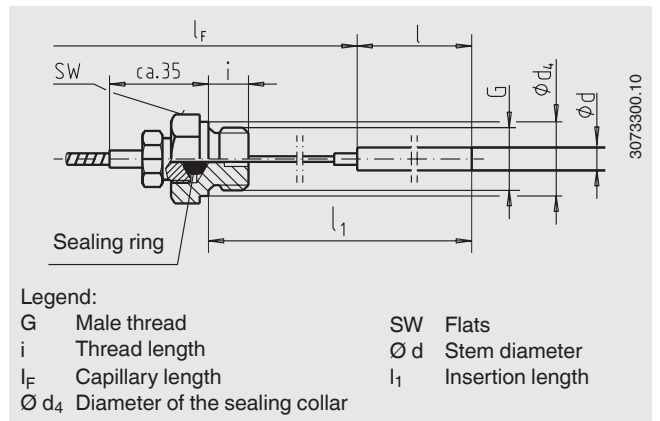


Legend:  
 G Male thread  
 i Thread length  
 $\phi d_4$  Diameter of the sealing collar  
 SW Flats  
 $\phi d$  Stem diameter  
 $l_1$  Insertion length

### Design 6, compression fitting (sliding on capillary)

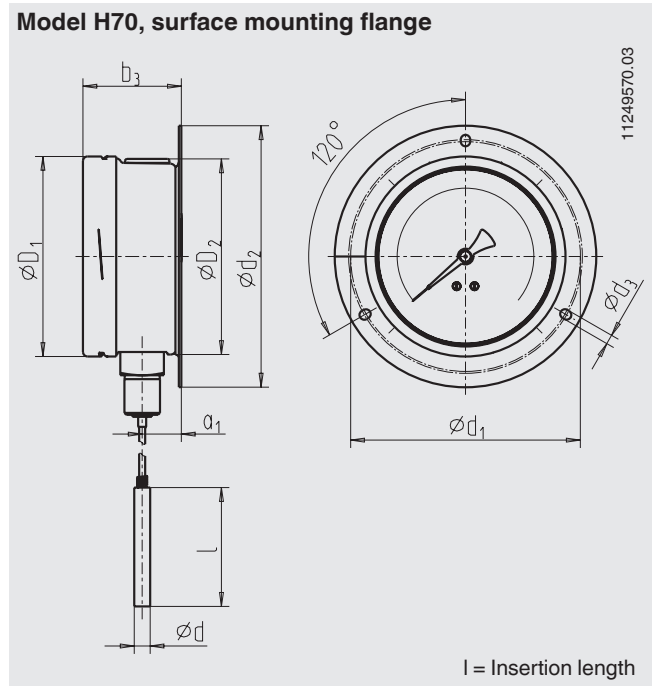
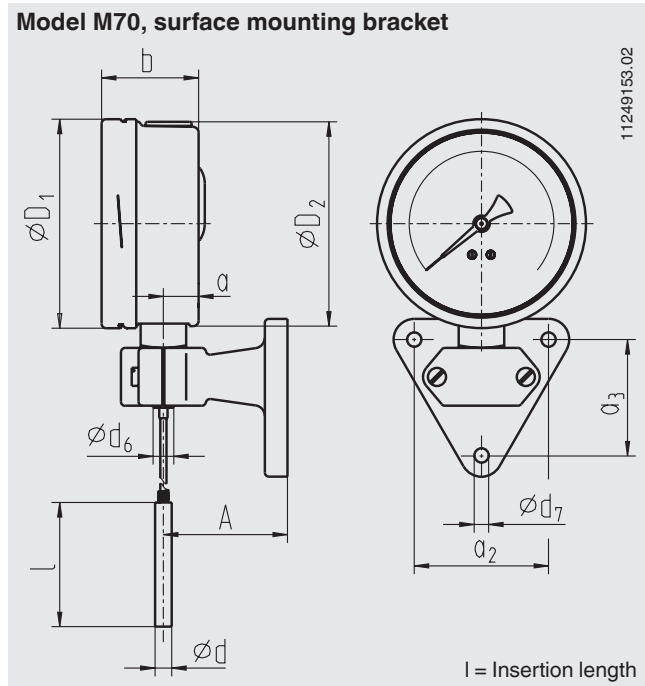
Process connection: G 1/2 B, G 3/4 B or 1/2 NPT, 3/4 NPT  
 Insertion length  $l = 100, 140, 200, 240, 290$  mm

Process connection	Dimensions in mm		
	G	SW	$d_4$
G 1/2 B	27	26	14
G 3/4 B	32	32	16
1/2 NPT	22	-	19
3/4 NPT	30	-	20



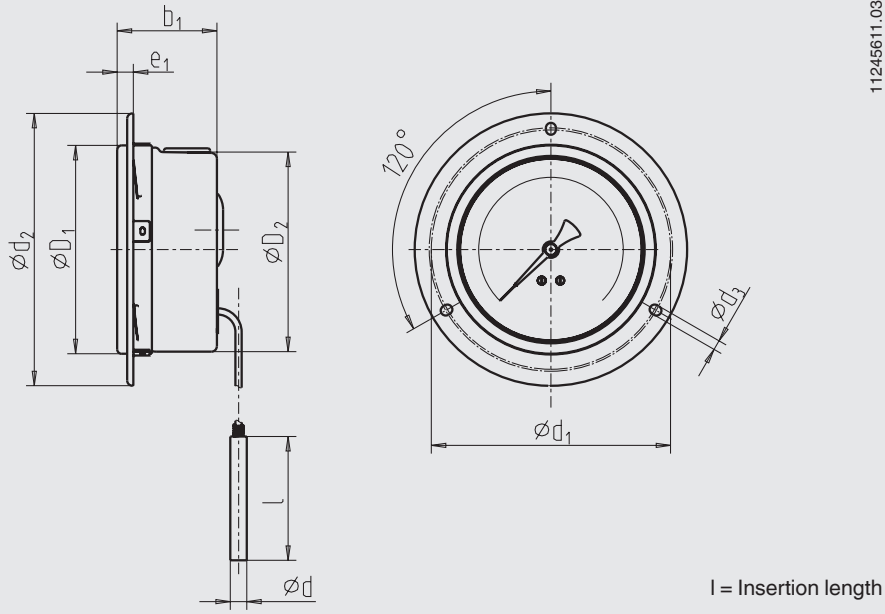
Legend:  
 G Male thread  
 i Thread length  
 $l_F$  Capillary length  
 $\phi d_4$  Diameter of the sealing collar  
 SW Flats  
 $\phi d$  Stem diameter  
 $l_1$  Insertion length

## Dimensions in mm



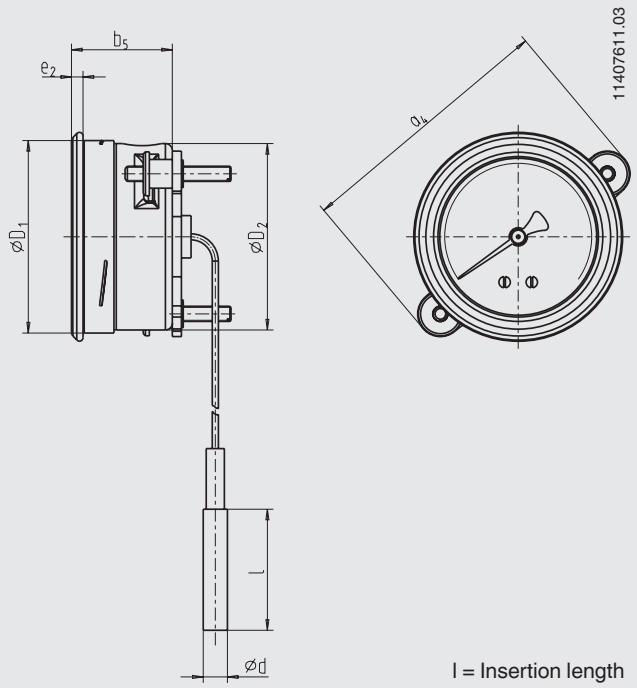
NS	Dimensions in mm															Weight in kg	
	a	a <sub>1</sub>	a <sub>2</sub>	a <sub>3</sub>	b	b <sub>1</sub>	b <sub>3</sub>	$\phi d$	$\phi d_1$	$\phi d_2$	$\phi d_3$	$\phi d_6$	$\phi d_7$	A	$\phi D_1$		$\phi D_2$
63	10.5	13	65	56	32.5	32.5	34.5	8	75	85	3.6	14	7	60	63.5	62	0.4
100	15.5	22	65	56	49.5	49.5	50.0	8	116	132	4.8	18	7	60	101.0	99	0.9
160	15.5	22	65	56	49.5	-	50.0	8	178	196	6.0	18	7	60	161.0	159	1.40

**Model V70, panel mounting flange**



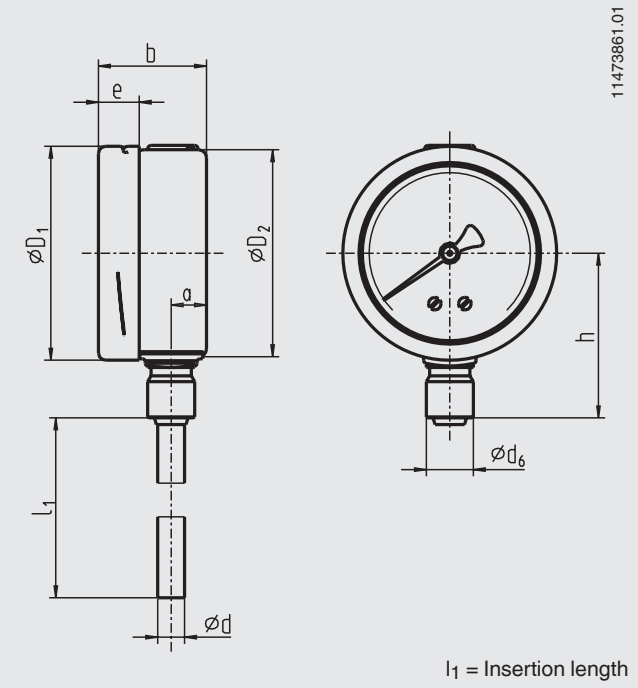
NS	Dimensions in mm								Weight in kg
	b <sub>1</sub>	Ø d	Ø d <sub>1</sub>	Ø d <sub>2</sub>	Ø d <sub>3</sub>	e <sub>1</sub>	Ø D <sub>1</sub>	Ø D <sub>2</sub>	
63	32.5	8	75	85	3.6	5	63.5	62	0.4
100	49.5	8	116	132	4.8	8	101.0	99	0.9
160	-	8	178	196	6.0	8	161.0	159	1.40

**Model B70, triangular bezel with bracket**



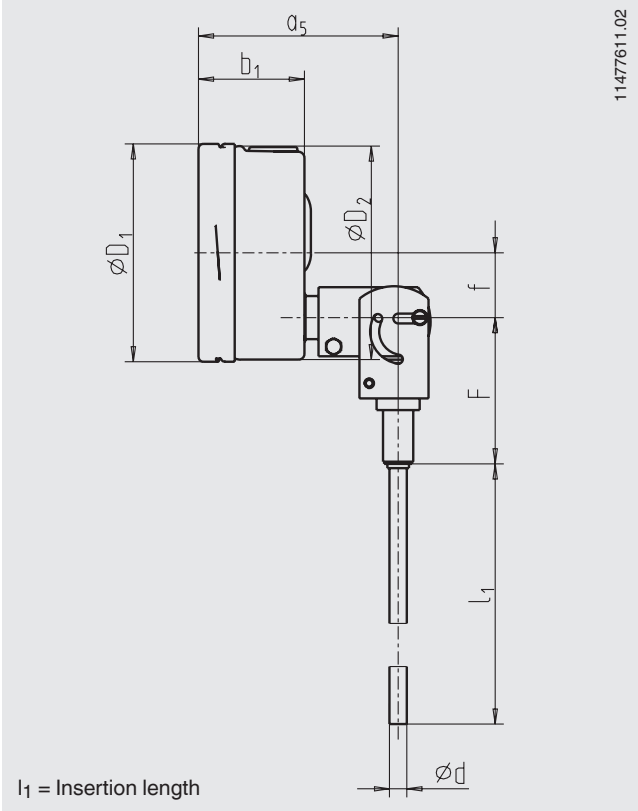
NS	Dimensions in mm						Weight in kg
	a <sub>4</sub>	b <sub>5</sub>	Ø d	e <sub>2</sub>	Ø D <sub>1</sub>	Ø D <sub>2</sub>	
63	87	33.5	8	4	63.5	62	0.4

**Model R70, lower mount**



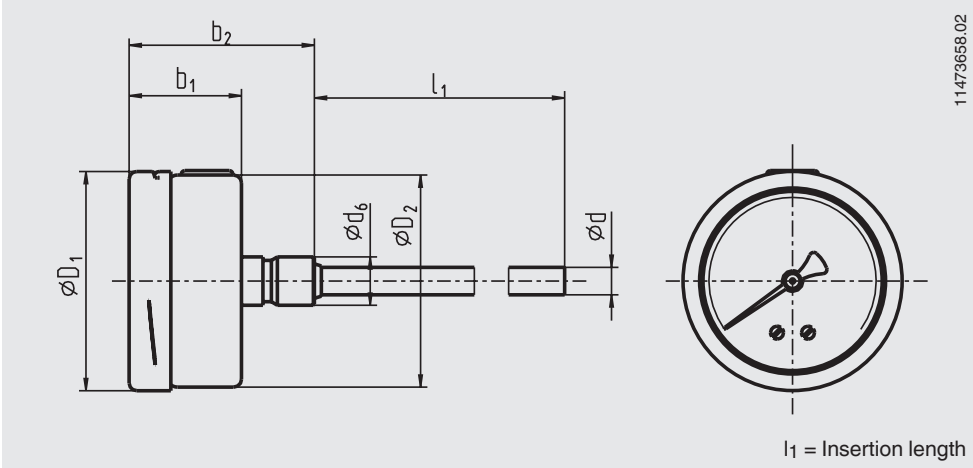
NS	Dimensions in mm								Weight in kg
	a	b	Ø d	Ø d <sub>6</sub>	e	h	Ø D <sub>1</sub>	Ø D <sub>2</sub>	
63	10.5	32.5	8	14	12.2	49.0	63.5	62	0.4
100	15.5	49.5	8	18	16.8	68.5	101.0	99	0.9

**Model S70, case swivelling approx. 90 °**



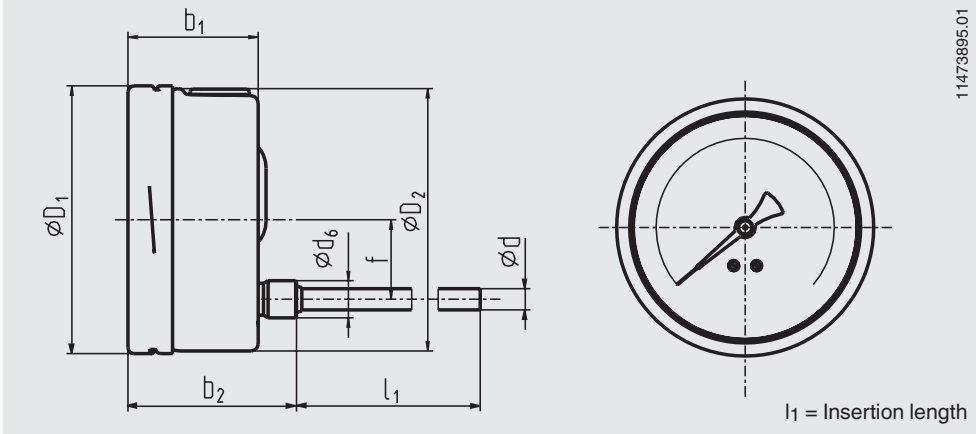
NS	Dimensions in mm							Weight in kg
	$a_5$	$b_1$	$\varnothing d$	f	$\varnothing D_1$	$\varnothing D_2$	F	
63	83	32.5	8	0	63.5	62	68	0.4
100	93	49.5	8	30	101.0	99	68	0.9

**Model A70, back mount (NS 63)**



NS	Dimensions in mm						Weight in kg
	$b_1$	$b_2$	$\varnothing d$	$\varnothing d_6$	$\varnothing D_1$	$\varnothing D_2$	
63	32.5	54.0	8	14	63.5	62	0.4

**Model A70, back mount (NS 100)**



NS	Dimensions in mm							Weight in kg
	$b_1$	$b_2$	$\varnothing d$	$\varnothing d_6$	$f$	$\varnothing D_1$	$\varnothing D_2$	
100	49.5	63.5	8	18	30	101.0	99	0.9

## Approvals

- GOST-R, import certificate, Russia
- GOST, metrology/measurement technology, Russia
- CRN, safety (e.g. electr. safety, overpressure, ...), Canada,

Approvals and certificates, see website

## Ordering information

Model / Nominal size / Type of mounting / Design of connection / Scale range / Process connection / Stem diameter / Insertion length / Capillary design and length / Options

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