

Expansion thermometer Model 70, stainless steel version

WIKA data sheet TM 81.01



For further approvals,
see Seite 6

Applications

- For reliable temperature measurement with gaseous, liquid and highly viscous media – even under mechanical stress
- Optimal for HVAC systems – robust, maintenance-free and flexible installation
- Suitable for machine building – compact, durable and easy to integrate
- Versatile in standard industrial applications with medium requirements

Special features

- Durability and corrosion protection through the use of stainless steel 316
- Stand-alone measurement without energy supply
- Flexible integration through various connection designs and mounting options
- Measurement also from a distance



Fig. left: with capillary and instrument mounting bracket, model M70.50.100

Fig. right: with capillary, model B70.50.063

Configurator



Description

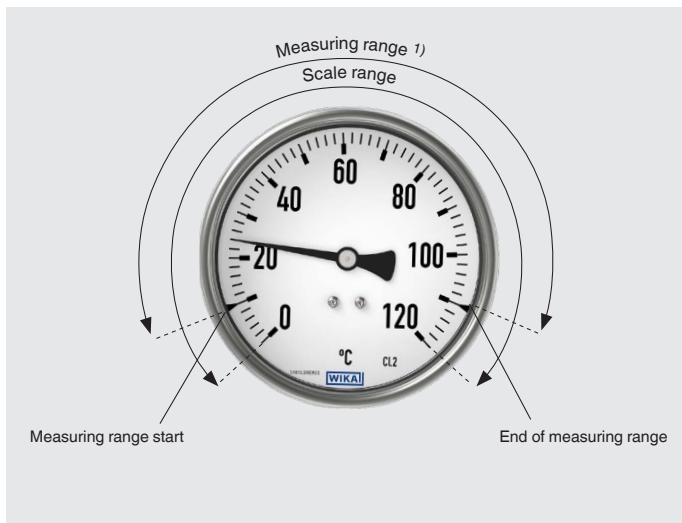
The model 70 expansion thermometer is a versatile temperature measuring instrument for gaseous, liquid and highly viscous media and is particularly suitable for standard industrial applications with increased mechanical stress. It offers a reliable and robust solution for temperature monitoring in refrigeration and air-conditioning technology, in machine building and in numerous other application areas. Due to its compact design and the available variants with capillaries, the model 70 can be installed flexibly at almost any measuring point – even in difficult-to-access installation locations or for bridging long distances.

The case, capillary, stem and process connection are made of high-quality stainless steel and ensure a long service life even under demanding conditions.

Various insertion lengths and process connections enable an optimal adaptation to the respective measuring point. The model 70 is the cost-efficient solution for applications where solid technology and an attractive price-performance ratio are paramount.

Specifications

Detail view

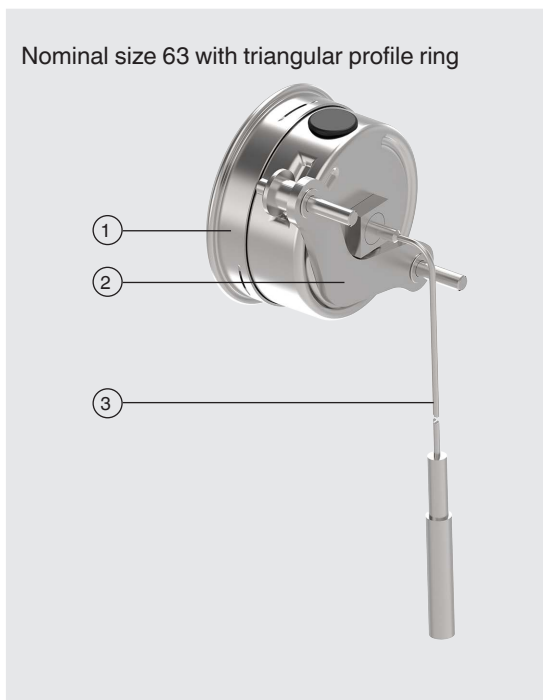


1) Only within the measuring range will the printed accuracy class (class 2) be guaranteed.



Legend

- ① Instrument mounting bracket
- ② Capillary



Legend

- ① Triangular profile ring
- ② Mounting bracket
- ③ Capillary

Overview of versions			
Model	NS	Connection location	Mounting option
B70.50 (case without liquid filling) B70.53 (case with liquid filling)	63	Back mount	Triangular profile ring with mounting bracket
H70.50 (case without liquid filling) H70.53 (case with liquid filling)	63	Lower mount (radial)	Surface mounting flange
	100		
	160		
M70.50 (case without liquid filling) M70.53 (case with liquid filling)	63	Lower mount (radial)	Instrument mounting bracket, aluminium die-casting
	100		
	160		
V70.50 (case without liquid filling) V70.53 (case with liquid filling)	63	Back mount	Panel mounting flange
	100	Lower back mount	
	160		

Basic information		
Standard	EN 13190	
Nominal size in mm ["]	<ul style="list-style-type: none"> ■ 63 [2.5] ■ 100 [4] ■ 160 [6] 	
Window	<ul style="list-style-type: none"> ■ Instrument glass ■ Laminated safety glass ■ Acrylic glass ■ Plastic, crystal-clear 	
Connection location and mounting option		
B70.5x.xxx	Back mount (axial)	Triangular profile ring with mounting bracket
H70.5x.xxx	Lower mount (radial)	Surface mounting flange
M70.5x.xxx	Lower mount (radial)	Instrument mounting bracket, aluminium die-casting
V70.5x.xxx	Back mount	Panel mounting flange
Connection designs		
1	Plain stem (without thread)	
2	Male nut	
3	Union nut	
4	Compression fitting (sliding on stem)	
6	Compression fitting (sliding on either capillary or spiral protective sleeve)	
Damping	With liquid damping (glycerine)	
Filling medium	<ul style="list-style-type: none"> ■ Xylene ■ Silicone oil 	
Materials (non-wetted)		
Case, bayonet bezel	Stainless steel	
Pointer	Aluminium, black, micro adjustment	
Dial	Aluminium (white)	

Measuring element		
Type of measuring element	Bourdon tube system	
Working range		
Constant loading (1 year)	Measuring range per EN 13190	
Short time (max. 24 h)	Scale range per EN 13190	
Capillary		
Diameter	Ø 2 mm [0.08 in]	
Spiral protective sleeve		
Length of capillary	Capillary without spiral protective sleeve	Max. 10 m [19.7 ft]
	Capillary with spiral protective sleeve	
Minimum bending radius	Capillary without spiral protective sleeve	6 mm [0.24 in]
	Capillary with spiral protective sleeve	20 mm [0.79 in]
Material	Stainless steel 316	
Mounting options for instruments with remote capillary	<ul style="list-style-type: none"> ■ Surface mounting flange, stainless steel ■ Instrument mounting bracket, aluminium die-casting ■ Panel mounting flange, stainless steel ■ Triangular profile ring with clamp, stainless steel 	

Accuracy specifications	
Accuracy class	Class 2 per EN 13190 at 23 °C ±10 °C ambient temperature

Scale range in °C	Measuring range in °C	Scale interval in °C	Error limit per EN 13190 ±°C
-60 ... +40	-50 ... +30	1	2
-40 ... +60	-30 ... +50	1	2
-30 ... +50	-20 ... +40	1	2
-20 ... +60	-10 ... +50	1	2
-20 ... +80	-10 ... +70	1	2
0 ... 60	10 ... 50	1	2
0 ... 80	10 ... 70	1	2
0 ... 100	10 ... 90	1	2
0 ... 120	10 ... 110	2	4
0 ... 160	20 ... 140	2	4
0 ... 200	20 ... 180	2	4
0 ... 250	30 ... 220	5	5
0 ... 300	30 ... 270	10	10
0 ... 400	50 ... 350	10	10

→ Other scale ranges on request


Further details on: scale range		
Unit	<ul style="list-style-type: none"> ■ °C ■ °C/°F (dual scale) 	
Dial		
Scale graduation	<ul style="list-style-type: none"> ■ Single scale ■ Dual scale 	
Scale colour	Single scale	Black
	Dual scale	Red
		→ Other colours on request

Process connection	
Thread size	<ul style="list-style-type: none"> ■ G ½ B ■ G ¾ B ■ M18 x 1.5 ■ M24 x 1.5 ■ ½ NPT ■ ¾ NPT <p>→ Other threads on request</p>
Materials (wetted)	Stainless steel 1.4571
Stem	
Diameter	<ul style="list-style-type: none"> ■ 6 mm [0.24 in] ■ 8 mm [0.32 in] ■ 10 mm [0.39 in] ■ 12 mm [0.47 in]
Thermowell	<p>In principle, the operation of a mechanical thermometer is possible without a thermowell / protection tube with low process-side loading (low pressure, low viscosity and low flow rates).</p> <p>However, in order to enable exchanging the thermometer during operation (e.g. instrument replacement or calibration) and to ensure a better protection of the instrument and also the plant and the environment, it is advisable to use a thermowell / protection tube from the extensive WIKA thermowell / protection tube portfolio.</p> <p>→ For further information on the wake frequency calculation of the thermowell / protection tube, see technical information IN 00.15.</p>

Operating conditions	
Ambient temperature range (at the case)	-40 ... +60 °C [-40 ... +140 °F]
Storage temperature range	
Without liquid damping	-50 ... +70 °C [-58 ... +158 °F]
With liquid damping	-50 ... +60 °C [-58 ... +140 °F]
Max. operating pressure at stem	Max. 25 bar [363 psi], static
Ingress protection per IEC/EN 60529	IP65

Approvals

Optional approvals

Logo	Description	Region
	PAC Kazakhstan Metrology, measurement technology	Kazakhstan
	PAC Uzbekistan Metrology, measurement technology	Uzbekistan
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

Certificates

Description	
Certificates	<ul style="list-style-type: none">■ 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 (indication accuracy)

→ For approvals and certificates, see website

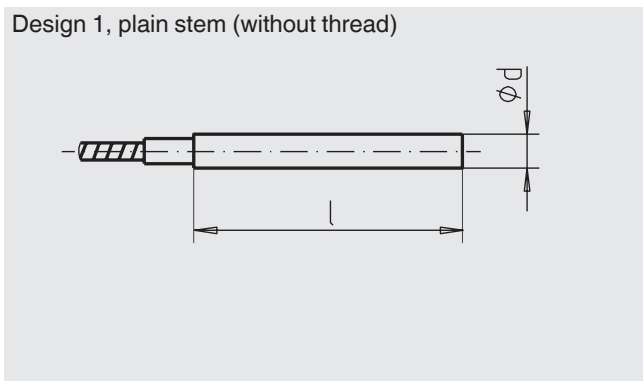
Connection locations

Legend

- G Connection thread
- i Thread length (incl. collar)
- $\varnothing d_4$ Diameter of the sealing collar
- SW Spanner width
- $\varnothing d$ Stem diameter
- l_1 Insertion length
- l_2 Active length
- F xx Clearance to stem
- L_F Capillary length

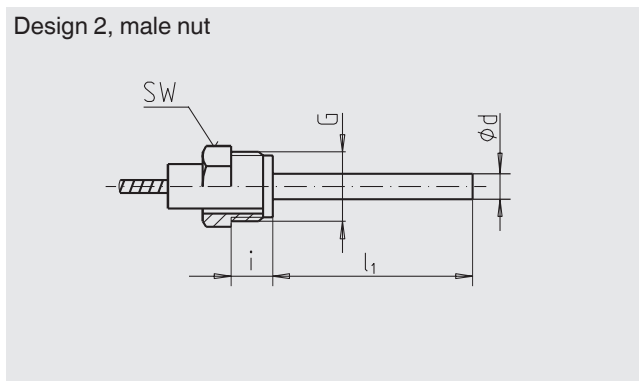
Connection designs for back mount, lower mount and back mount adjustable stem and dial

Design 1, plain stem (without thread)



Standard insertion length l_1 = 140, 200, 240, 290 mm
 [284, 392, 464, 554 in]
 Stem diameter $\varnothing d$ = 8 mm [0.32 in]
 Basis for design 4, compression fitting

Design 2, male nut

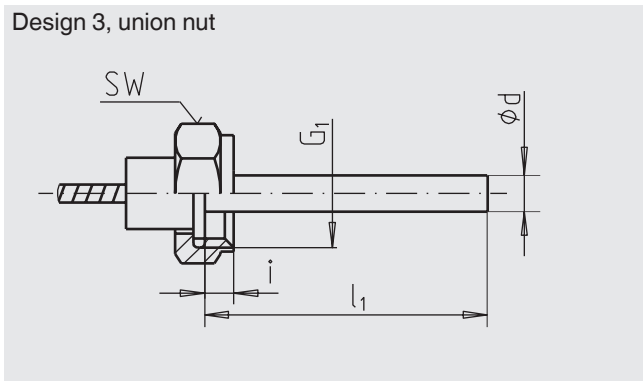


Dimensions in mm [in]

G	SW	i	$\varnothing d$
G ½ B	27 [1.06]	20 [0.79]	8 [0.31]

Standard insertion length l_1 = 80, 140, 180, 230 mm
 [3.15, 5.51, 7.09, 9.06 in]

Design 3, union nut

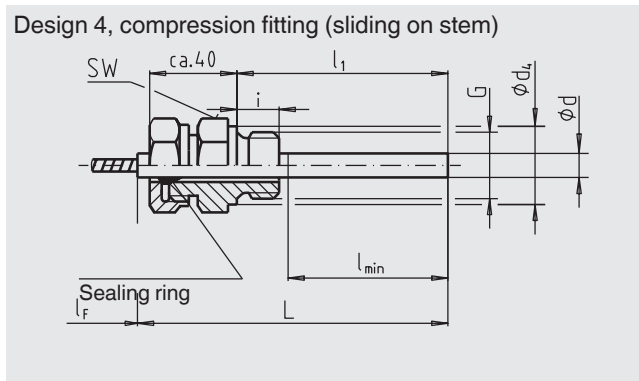


Dimensions in mm [in]

G	SW	i	$\varnothing d$
G ½ B	27 [1.06]	8.5 [0.33]	8 [0.31]
G ¾ B	32 [1.26]	10.5 [0.41]	
M24 x 1.5	32 [1.26]	13.5 [0.53]	8 [0.31]

Standard insertion length l_1 = 89, 126, 186, 226, 276 mm
 [3.50, 4.96, 8.90, 10.87 in]

Design 4, compression fitting (sliding on stem)

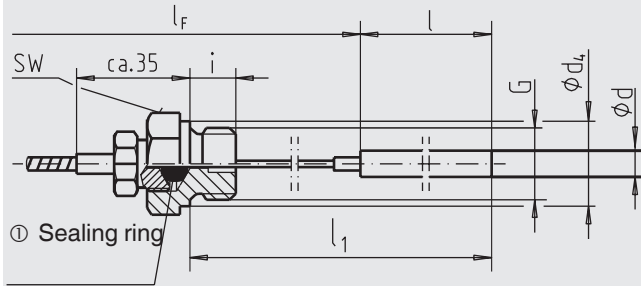


Dimensions in mm [in]

G	SW	$\varnothing d_4$	i	$\varnothing d$
G ½ B	27 [1.06]	26 [1.02]	14 [0.55]	8 [0.31]
G ¾ B	32 [1.26]	32 [1.26]	16 [0.63]	8 [0.31]
M18 x 1.5	24 [0.94]	23 [0.91]	12 [0.47]	8 [0.31]
½ NPT	22 [0.87]	-	19 [0.75]	8 [0.31]
¾ NPT	30 [1.18]	-	20 [0.79]	8 [0.31]

Standard insertion length l_1 = 100, 160, 200, 250 mm
 [3.94, 6.30, 7.87, 9.84 in]

Design 6, compression fitting (sliding on capillary)



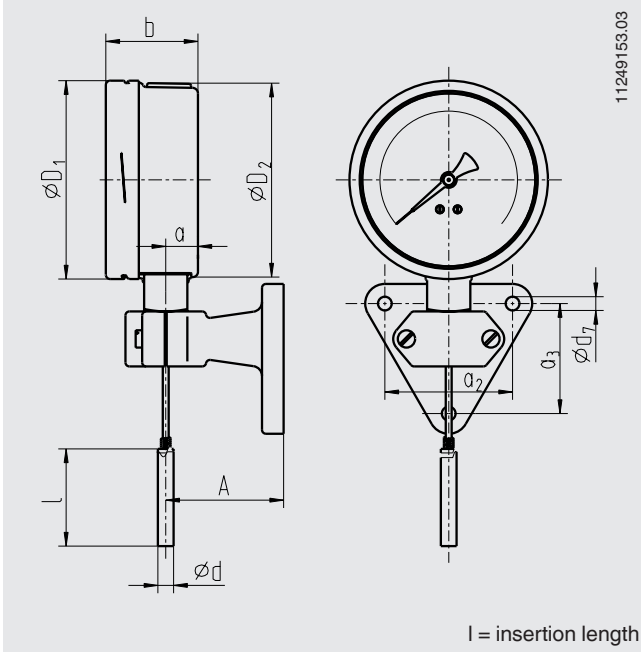
Dimensions in mm [in]

G	SW	Ø d ₄	i	Ø d
G ½ B	27 [1.06]	26 [1.02]	14 [0.55]	8 [0.31]
G ¾ B	32 [1.26]	32 [1.26]	16 [0.63]	8 [0.31]
½ NPT	22 [0.87]	-	19 [0.75]	8 [0.31]
¾ NPT	30 [1.18]	-	20 [0.79]	8 [0.31]

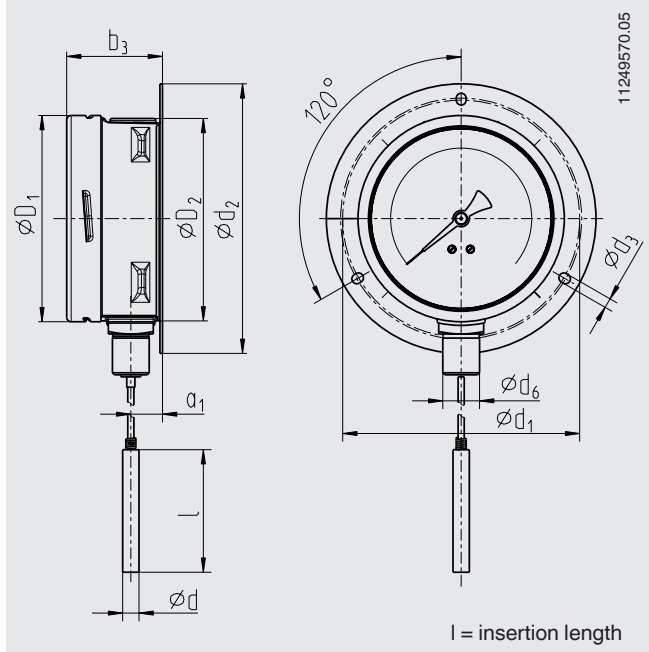
Insertion length $l_1 = 100, 140, 200, 240, 290$ mm [3.94, 5.51, 7.87, 9.45, 11.42 in]

Dimensions in mm [in]

Model M70, instrument mounting bracket



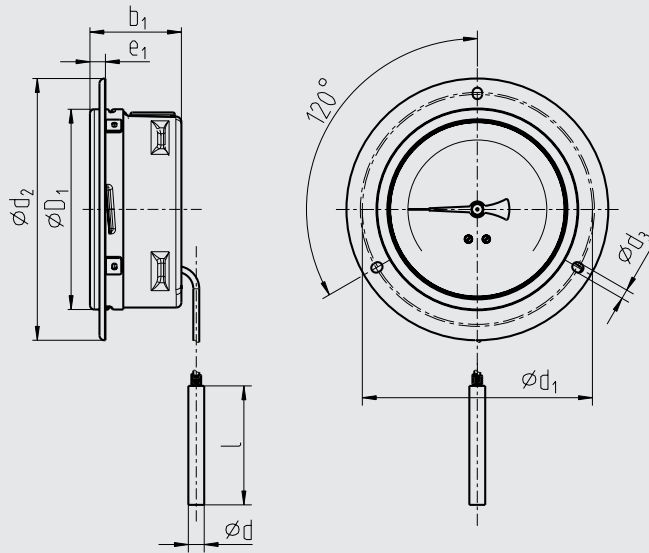
Model H70, surface mounting flange



NS	Dimensions in mm [in]																Weight in kg
	a	a ₁	a ₂	a ₃	b	b ₁	b ₃	Ø d	Ø d ₁	Ø d ₂	Ø d ₃	Ø d ₆	Ø d ₇	A	Ø D ₁	Ø D ₂	
63	10.5 [0.41]	13 [0.51]	65 [2.56]	56 [2.20]	32.5 [1.28]	32.5 [1.28]	34.5 [1.36]	8 [0.31]	75 [2.95]	85 [3.35]	3.6 [0.14]	14 [0.55]	7 [0.28]	60 [2.36]	63.5 [2.50]	62 [2.44]	0.4
100	15.5 [0.61]	22 [0.87]	65 [2.56]	56 [2.20]	49.5 [1.95]	49.5 [1.95]	50.0 [1.97]	8 [0.31]	116 [4.57]	132 [5.20]	4.8 [0.19]	18 [0.71]	7 [0.28]	60 [2.36]	101.0 [3.98]	99 [3.90]	0.9
160	15.5 [0.61]	22 [0.87]	65 [2.56]	56 [2.20]	49.5 [1.95]	-	50.0 [1.97]	8 [0.31]	178 [7.01]	196 [7.72]	6.0 [0.24]	18 [0.71]	7 [0.28]	60 [2.36]	161.0 [6.34]	159 [6.26]	1.40

Model V70, panel mounting flange

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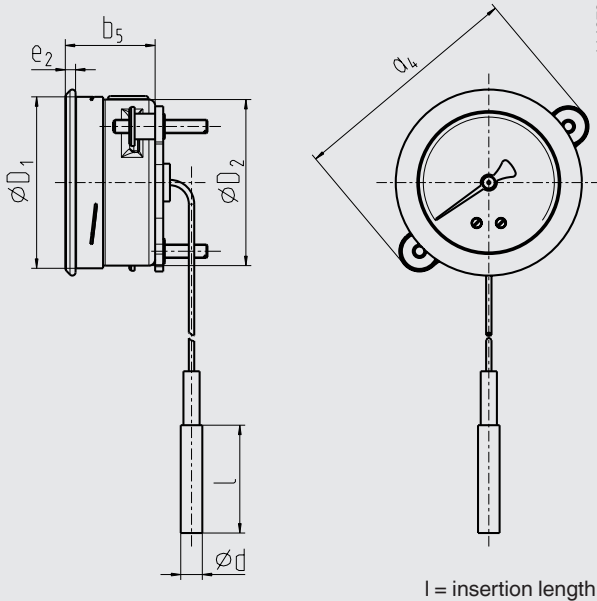


l = insertion length

NS	Dimensions in mm [in]								Weight in kg
	b ₁	Ø d	Ø d ₁	Ø d ₂	Ø d ₃	e ₁	Ø D ₁	Ø D ₂	
63	32.5 [1.28]	8 [0.31]	75 [2.95]	85 [3.35]	3.6 [0.14]	5 [0.20]	63.5 [2.50]	62 [2.44]	0.4
100	49.5 [1.95]	8 [0.31]	116 [4.57]	132 [5.20]	4.8 [0.19]	8 [0.31]	101.0 [3.98]	99 [3.90]	0.9
160	-	8 [0.31]	178 [7.01]	196 [7.72]	6.0 [0.24]	8 [0.31]	161.0 [6.34]	159 [6.26]	1.40

Model B70, triangular profile ring with mounting bracket

11407611.04



l = insertion length

NS	Dimensions in mm [in]						Weight in kg
	a ₄	b ₅	Ø d	e ₂	Ø D ₁	Ø D ₂	
63	86.8 [3.42]	33.3 [1.31]	8 [0.31]	3.7 [0.15]	63.6 [2.50]	61.6 [2.43]	0.4

Ordering information

Model / Nominal size / Mounting option / Connection design / Scale range / Process connection / Stem diameter / Insertion length / Capillary design and length / Options

Configurator



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