

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

WIKA data sheet TV 18.01

**intelliTHERM®**

## 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 [2 ½"], 100 [4"]
- Scale range -40 ... +250 °C [-40 ... +482 °F]
- Easy-to-read analogue display
- Electrical output signal e.g. 4 ... 20 mA

## Description

Wherever the process temperature has to be indicated on-site and, at the same time, a signal transmission to the central control or remote centre is desired, 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 reliably, even if the voltage 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 model 70 expansion thermometers (see data sheet TM 81.01).

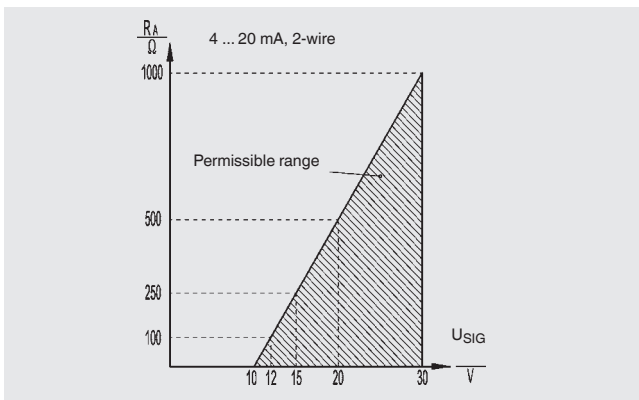


Fig. left: Model TGT70.063  
Fig. right: Model TGT70.100

# Specifications

Gas-actuated thermometer, model TGT70			
Measurement principle	Bourdon tube system		
Nominal size in mm	<ul style="list-style-type: none"> <li>■ 63 [2 ½"]</li> <li>■ 100 [4"]</li> </ul>		
<b>Instrument version</b>			
Version H	<ul style="list-style-type: none"> <li>■ 63 [2 ½"]</li> <li>■ 100 [4"]</li> </ul>	Lower mount (radial)	Instrument with remote capillary, rear surface mounting flange
Version M	<ul style="list-style-type: none"> <li>■ 63 [2 ½"]</li> <li>■ 100 [4"]</li> </ul>	Lower mount (radial)	Instrument with remote capillary, instrument mounting bracket
Version B	63 [2 ½"]	Back mount (axial)	Instrument with remote capillary, triangular profile ring and mounting clamp
Version R	100 [4"]	Lower mount (radial)	Direct connection without remote capillary
Connection design	<ul style="list-style-type: none"> <li>■ 1 Plain stem (without thread)</li> <li>■ 2 Male nut</li> <li>■ 3 Union nut</li> <li>■ 4 Compression fitting (sliding on stem)</li> <li>■ 5 Union nut and loose threaded connection</li> <li>■ 6 Compression fitting (sliding on remote capillary)</li> </ul> Further connection designs on request		
Unit (scale range)	<ul style="list-style-type: none"> <li>■ °C</li> <li>■ °F</li> <li>■ °C/°F (dual scale)</li> </ul>		
Process connection	Plain		
Indication accuracy	Class 2, EN 13190		
Stem diameter	8 mm [0.31 in]		
Window	Laminated safety glass		
Active probe length	Depending on Ø d and scale range		
Remote capillary	Ø 2 mm [0.08 in], stainless steel 1.4571, bending radius no less than 6 mm [0.24 in] Length to customer specification (max. 10 m [32.81 ft])		
Connection location	<ul style="list-style-type: none"> <li>■ Lower mount (radial)</li> <li>■ Back mount (axial)</li> </ul>		
Remote capillary mounting	Take care that the mounting is free from vibration		
<b>Materials (wetted)</b>			
Process connection	Stainless steel 1.4571		
Stem	Stainless steel 1.4571		
<b>Materials (in contact with the environment)</b>			
Case, bayonet ring	Stainless steel		
Dial	Plastic, white, black lettering		
Dial sticker	Plastic, white with logo		
Pointer	Aluminium, black		
Fill fluid of measuring system	<ul style="list-style-type: none"> <li>■ Xylene</li> <li>■ Silicone oil</li> </ul>		
Thermowell/protection tube	<ul style="list-style-type: none"> <li>■ Without</li> <li>■ Per DIN</li> <li>■ To customer specification</li> </ul>		
Ingress protection per IEC/EN 60529	IP65		
<b>Permissible temperatures</b>			
Ambient temperature at case	Max. 0 ... 40 °C [32 ... 104 °F] (others on request)		
Storage and transport per EN 13190	-20 ... +60 °C [-4 ... +140 °F]		
Permissible operating pressure at the stem	Max. 25 bar [362.59 psi], static		

Electrical specifications	Gas-actuated thermometer, model TGT70
<b>Electrical connection</b>	<ul style="list-style-type: none"> <li>■ Lateral cable socket</li> <li>■ Cable gland</li> <li>■ Cable outlet</li> <li>■ M12 connector</li> </ul>
<b>Output signal</b>	
Voltage signal	<ul style="list-style-type: none"> <li>■ For <math>U_s = DC\ 5\ V</math>, ratiometric: 0.5 ... 4.5 V</li> <li>■ For <math>U_s = DC\ 12\ \dots\ 32\ V</math> not ratiometric (NS 100 [4"] only): 0.5 ... 4.5 V</li> </ul>
Current output	4 ... 20 mA, 2-wire
Accuracy of electrical output signal	Mechanical $\pm 1\ %$ of measuring span
<b>Supply voltage <math>U_s</math></b>	DC 5 V / DC 12 ... 32 V
<b>Electromagnetic compatibility</b>	Per test standards EN 61000-4-6 / EN 61000-4-3
<b>Output signal and permissible load</b>	
Voltage output (3-wire)	$R_A > 5\ k\Omega$
Current output (2-wire) 4 ... 20 mA	$R_A \leq (U_{SIG} - 10\ V) / 0.02\ A$ with $R_A$ in $\Omega$ and $U_{SIG}$ in DC V



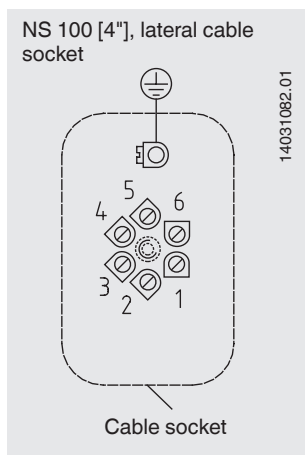
**Scale ranges, measuring ranges <sup>1)</sup>, error limits (EN 13190)  
Scale marking per WIKA factory standard**

Scale range in °C	Measuring range in °C	Error limit $\pm$ °C	Scale interval 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.

## Designation of connection terminals



Output signal	UB+	UB-	Signal
2-wire (current output)	1	2	-
3-wire (voltage output)	1	2	3
Colour	Red	Black	Orange

## Approvals

Logo	Description	Country
CE	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ RoHS directive</li> </ul>	European Union

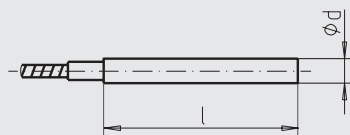
## Certificates (option)

- 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)

→ For approvals and certificates, see website

## Connection designs

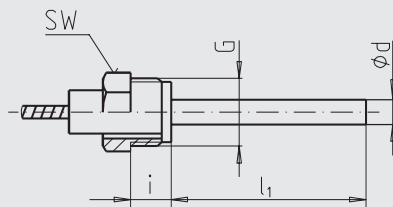
**Design 1, plain stem (without thread)**



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

**Design 2, male nut**

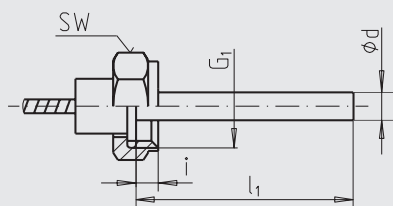


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Process connection: G 1/2 B  
Insertion length  $l_1 = 80, 140, 180, 230$  mm

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

**Design 3, union nut**

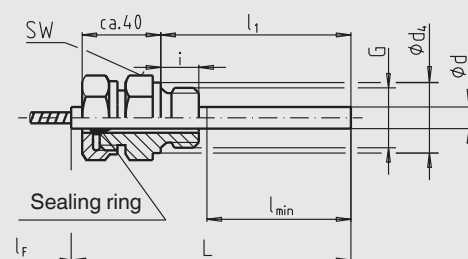


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Process connection: G 1/2, G 3/4, M24 x 1.5  
Insertion length  $l_1 = 89, 126, 186, 226, 276$  mm

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

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



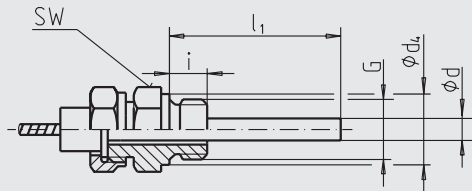
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Process connection: G 1/2 B, G 3/4 B, M18 x 1.5 as well as 1/2 NPT, 3/4 NPT

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

Process connection	Dimensions in mm		
G	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

### Design 5, union nut and loose threaded connection



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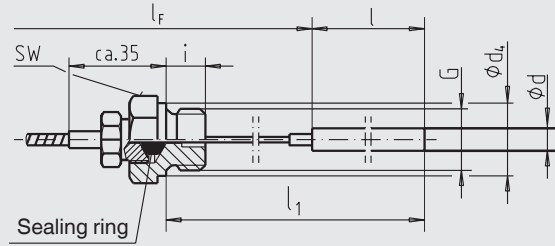
Union nut: G 1/2  
 Process connection: G 1/2 B, G 3/4 B as well as 1/2 NPT, 3/4 NPT  
 Union nut: M24 x 1.5  
 Process connection: M18 x 1.5  
 Insertion length  $l_1 = 63, 100, 160, 200, 250$  mm

Process connection	Dimensions in mm		
G	SW	d <sub>4</sub>	Ø d
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  
 G<sub>1</sub> Male thread  
 i Thread length  
 Ø d<sub>4</sub> Diameter of the sealing collar  
 SW Spanner width  
 Ø d Stem diameter  
 L Overall length  
 l<sub>F</sub> Remote capillary length

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



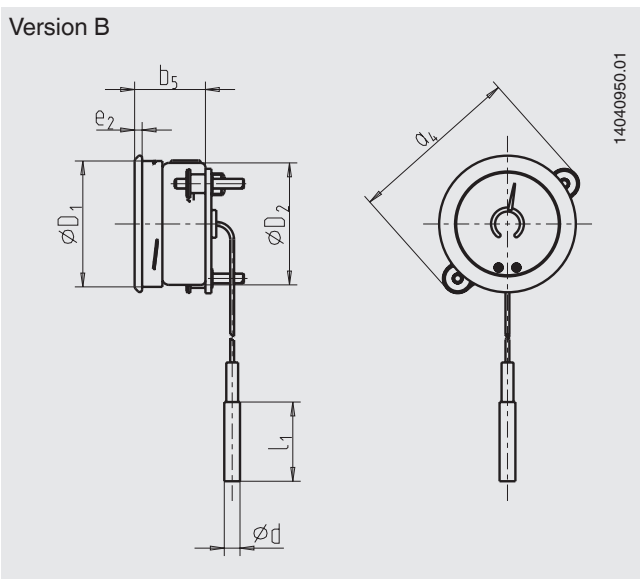
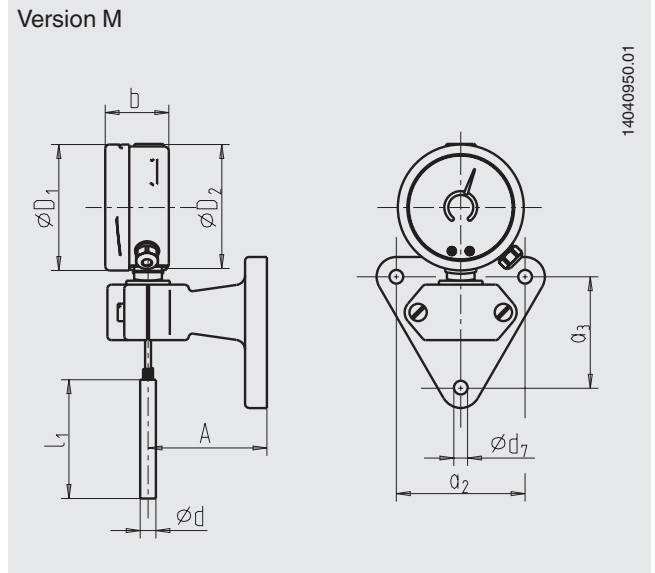
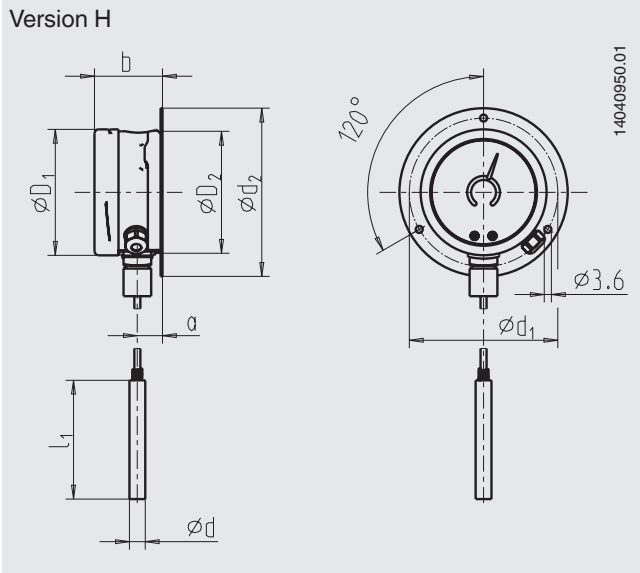
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Process connection: G 1/2 B, G 3/4 B as well as 1/2 NPT, 3/4 NPT  
 Insertion length  $l = 100, 140, 200, 240, 290$  mm

Process connection	Dimensions in mm		
G	SW	d <sub>4</sub>	Ø d
G 1/2 B	27	26	14
G 3/4 B	32	32	16
1/2 NPT	22	-	19
3/4 NPT	30	-	20

# Dimensions in mm

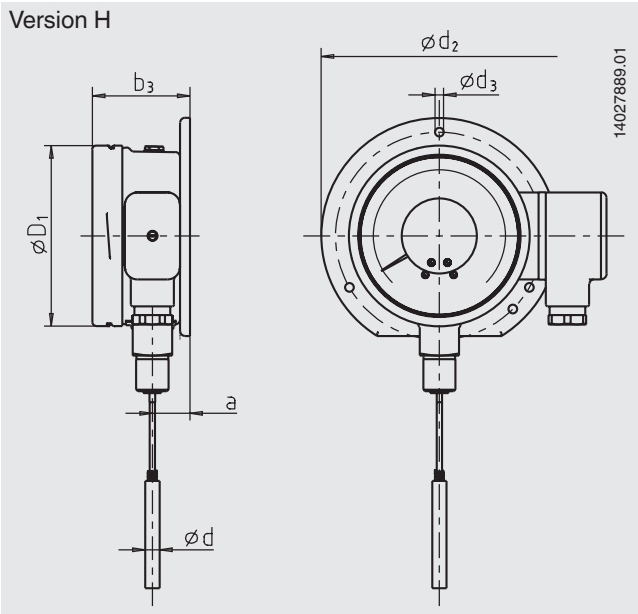
## NS 63 [2 1/2"]



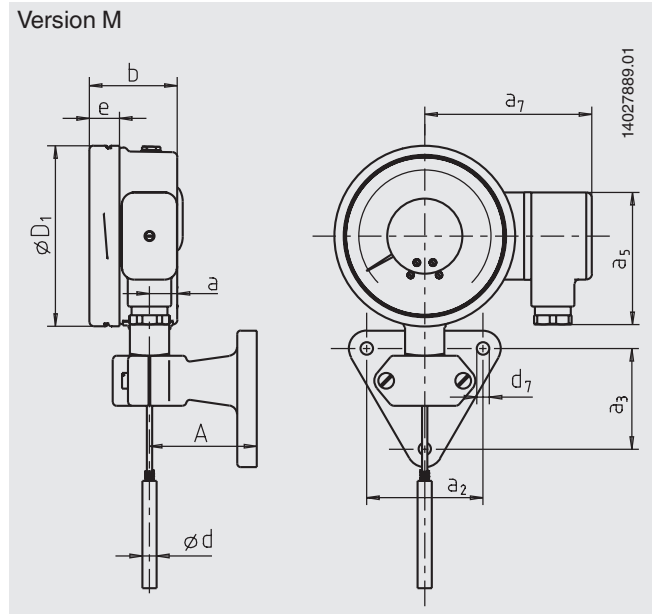
NS	Dimensions in mm														Weight in kg
	a	a <sub>2</sub>	a <sub>3</sub>	a <sub>4</sub>	b	b <sub>5</sub>	Ø D <sub>1</sub>	Ø D <sub>2</sub>	Ø d	Ø d <sub>1</sub>	Ø d <sub>2</sub>	Ø d <sub>7</sub>	A	e <sub>2</sub>	
63 [2 1/2"]	12.5	65	56	87	32.5	35.7	63.5	62	8	75	85	7	60	4	0.4

# NS 100 [4"]

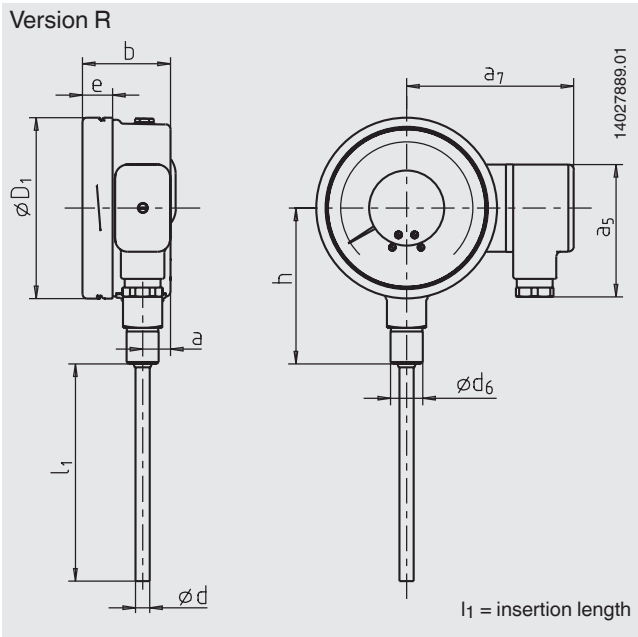
Version H



Version M



Version R



NS	Dimensions in mm															Weight in kg	
	a	a <sub>2</sub>	a <sub>3</sub>	a <sub>5</sub>	a <sub>7</sub>	b	b <sub>3</sub>	Ø D <sub>1</sub>	Ø d	Ø d <sub>2</sub>	Ø d <sub>3</sub>	Ø d <sub>6</sub>	d <sub>7</sub>	A	e		h
100 [4"]	15.5	65	56	74	94	49.5	54.6	101	8	132	4.8	18	7	60	16.8	87	0.6



## Ordering information

Model / Nominal size / Mounting option / Connection design / Scale range / Process connection / Output signal / Electrical connection / Stem diameter / Insertion length / Remote capillary design and length / Options

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