

Gas-actuated combi-thermometer with Pt100 electrical output signal Model 76, stainless steel version

WIKA data sheet TV 17.01



for further approvals
see page 6

Applications

- Control and regulation of industrial processes
- Monitoring of plants and switching of electric circuits
- Universally suitable for machine building, plant, vessel, apparatus construction and food industry

Special features

- Instruments meet the highest standards of measurement technology
- Housing and sheath from stainless steel
- Two independent measuring systems in one instrument
- Various connection designs possible

Description

This series of thermometers is designed for installation in pipes, vessels, plant and machinery. The gas-actuated thermometer enables the local visualisation of measured values, while, in addition, the integrated Pt100 resistance sensor provides an electrical output signal for further processing.

The gas-actuated combi-thermometer with capillary is intended for bridging longer distances and, with its flexible capillary, this version can be used in locations which are not easily accessible.

Optional electrical switch contacts

The model 76 gas-actuated thermometer can be delivered with integrated switch contacts.

For switch contacts, sliding and magnetic snap-action contacts, inductive contacts or electronic contacts for PLC switching are available.



Fig. left: with electrical output signal and switch contact
Fig. right: with electrical output signal

The set pointer can be adjusted via the window using a removable adjustment key (mounted on the terminal box).

For further information on the different switch contacts please see data sheet AC 08.01.

Optional temperature transmitter

A temperature transmitter, with a 4 ... 20 mA or 0 ... 10 V (machine building) output signal, programmable via software, can be mounted into the model 76 gas-actuated thermometer. Thus the measured temperature values can be transmitted safely and simply.

Notes on the WIKA transmitter program, see page 3.

Standard version

Measuring principle

mechanical: Inert gas expansion system, non-toxic
 electrical: Pt100, 3-wire connection (DIN IEC 751)

Nominal size in mm

100, 160

Connection type

- S Standard (male thread connection)
- 1 Plain stem (without thread)
 - 2 Male nut
 - 3 Union nut (female)
 - 4 Compression fitting (sliding on stem)
 - 5 Union nut with fitting
- 6.3 Compression fitting (sliding on spiral protection hose)

Instrument version

Model	NS	Version
R76.100	100	Lower mount
R76.160	160	
F76.100	100	Lower mount, with capillary and surface mounting bracket
F76.160	160	

Accuracy class

mechanical: Class 1 per EN 13190
 with switch contact: class 1 per DIN 16196
 electrical: Class B per DIN IEC 751
 at 23 °C ±10 °C ambient temperature

Working pressure

Normal (1 year): Measuring range (EN 13190)
 Short time (24 h max.): Scale range (EN 13190)

Rated operating ranges and conditions

per EN 13190

Case, bezel ring, stem, process connection

Stainless steel 1.4571

Dial

Aluminium, white, black lettering

Window

Laminated safety glass

Pointer

Aluminium, black, micro adjustment

Capillary (connection design 6.3)

Ø 2 mm, stainless steel 1.4571, bending radius no less than 6 mm

Spiral protection hose Ø 7 mm, flexible

Length to user specifications

Electrical connection

Junction box

Temperature limits for storage and transport

-50 ... +70 °C without liquid damping
 -40 ... +70 °C with liquid damping

Permissible ambient temperature

-20 ... +60 °C without/with liquid damping

Permissible pressure rating of stem

25 bar max., static

Ingress protection

IP 65 per EN/IEC 60529

Options

- Scale range °F, °C/°F (dual scale)
- Case with liquid damping
- Case with food-compatible liquid damping
- Pt100 class A
- Radial connection other than lower (i.e. 9/12/3 hours)
- Window of clear plastic
- Special measuring ranges or dial printing to customer specifications (on request)
- Switch contacts (data sheet AC 08.01)
- Analogue or digital temperature transmitters from WIKA transmitter range

Scale, measuring ranges ¹⁾, error limits (EN 13190 or DIN 16196)

Scale graduation per WIKA standard

Scale range in °C	Measuring range in °C	Scale spacing in °C	Error limit ±°C	
			EN 13190	DIN 16196
-80 ... +60	-60 ... +40	2	2.0	3.00
-60 ... +40	-50 ... +30	1	1.0	1.50
-40 ... +60	-30 ... +50	1	1.0	1.50
-30 ... +50	-20 ... +40	1	1.0	1.50
-20 ... +60	-10 ... +50	1	1.0	1.50
-20 ... +80	-10 ... +70	1	1.0	1.50
0 ... 60	10 ... 50	1	1.0	1.50
0 ... 80	10 ... 70	1	1.0	1.50
0 ... 100	10 ... 90	2	1.0	1.50
0 ... 120	10 ... 110	2	2.0	3.00
0 ... 160	20 ... 140	2	2.0	3.00
0 ... 200	20 ... 180	2	2.0	3.00
0 ... 250	30 ... 220	5	2.5	3.75
0 ... 300	30 ... 270	5	5.0	7.50

1) The measuring range is indicated on the dial by two triangular marks. Only within this range is the stated error limit valid in accordance with EN 13190 or DIN 16196 (with switch contact).

WIKA transmitter range

Model	Description	Data sheet
T19	Analogue temperature transmitter, configurable measuring ranges for Pt100 resistance thermometer	TE 19.03
T24	Analogue temperature transmitter, PC-configurable for Pt100 resistance thermometer	TE 24.01
T32	Digital temperature transmitter, configurable, HART® protocol	TE 32.04
T53	Digital temperature transmitter FOUNDATION™ fieldbus and PROFIBUS® PA	TE 53.01

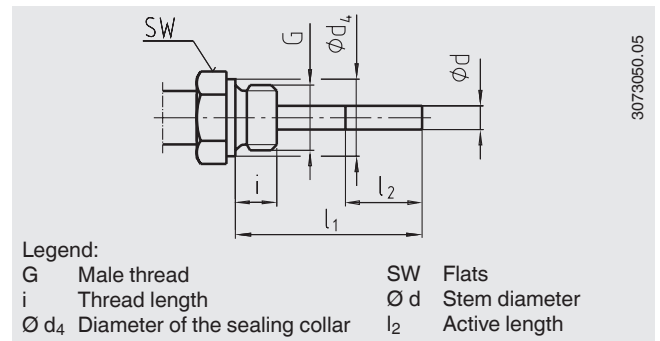
Connection design

Design S, standard (male thread connection) ¹⁾

Standard insertion lengths $l_1 = 200, 210, 310, 410$ mm

Nominal size	Process connection		Dimensions in mm		
	G	i	SW	d_4	$\varnothing d$
100, 160	G 1/2 B	14	27	26	10
	G 3/4 B	16	32	32	10
	1/2 NPT	19	22	-	10
	3/4 NPT	20	30	-	10

1) Not applicable to version with capillary



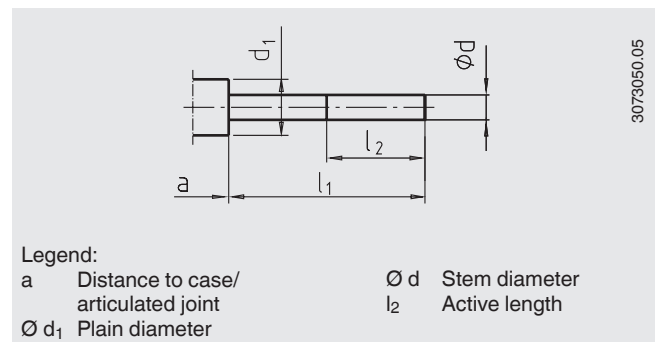
Design 1, plain stem (without thread)

Standard insertion length $l_1 = 200, 210, 250, 310, 400, 500$ mm

Basis for design 4, compression fitting

Nominal size	Dimensions in mm		
NS	d_1 ²⁾	$\varnothing d$	a
100, 160	18	10	15

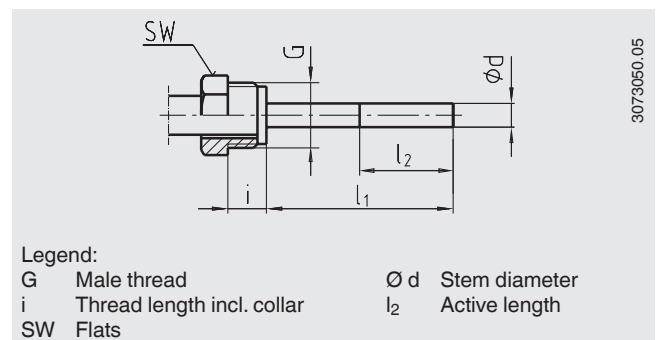
2) Not applicable to version with capillary



Design 2, male nut

Standard insertion lengths $l_1 = 200, 210, 250, 310, 400$ mm

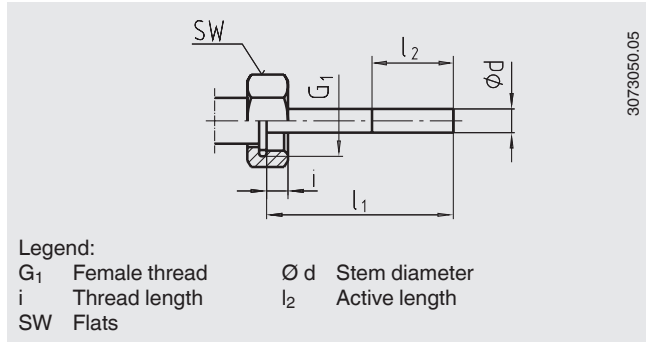
Nominal size	Process connection		Dimensions in mm	
NS	G	i	SW	$\varnothing d$
100, 160	G 1/2 B	20	27	10
	M20 x 1.5	15	22	10



Design 3, union nut

Standard insertion lengths $l_1 = 200, 210, 250, 310, 400$ mm

Nominal size	Process connection		Dimensions in mm	
	NS	G	i	SW
100, 160	G 1/2 B	8,5	27	10
	G 3/4 B	10,5	32	10
	M24 x 1,5	13,5	32	10

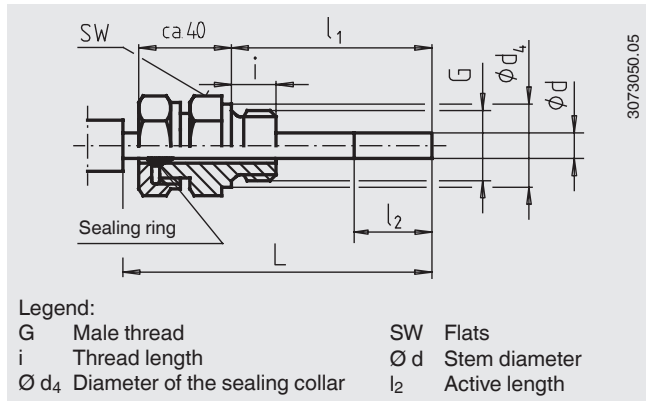


Design 4, compression fitting (sliding on stem)

Insertion length $l_1 =$ variable

Length $L = l_1 + 40$ mm

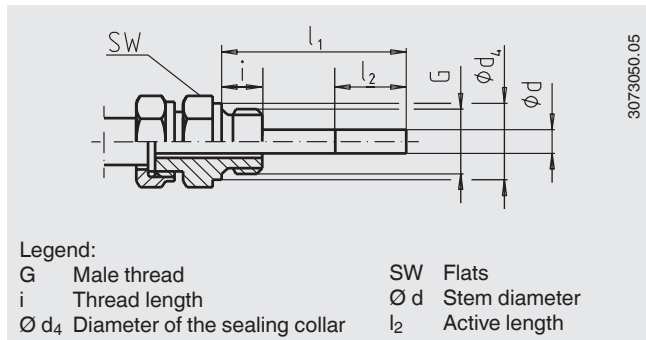
Nominal size	Process connection		Dimensions in mm		
	NS	G	i	SW	d_4
100, 160	G 1/2 B	14	27	26	10
	G 3/4 B	16	32	32	10
	1/2 NPT	19	22	-	10
	3/4 NPT	20	30	-	10



Design 5, union nut with fitting

Standard insertion lengths $l_1 = 200, 210, 250, 310, 400$ mm

Nominal size	Process connection		Dimensions in mm		
	NS	G	i	SW	d_4
100, 160	G 1/2 B	14	27	26	10
	G 3/4 B	16	32	32	10
	1/2 NPT	19	22	-	10
	3/4 NPT	20	30	-	10



Option: Connection with union nut M24 x 1.5 with fitting M18 x 1.5

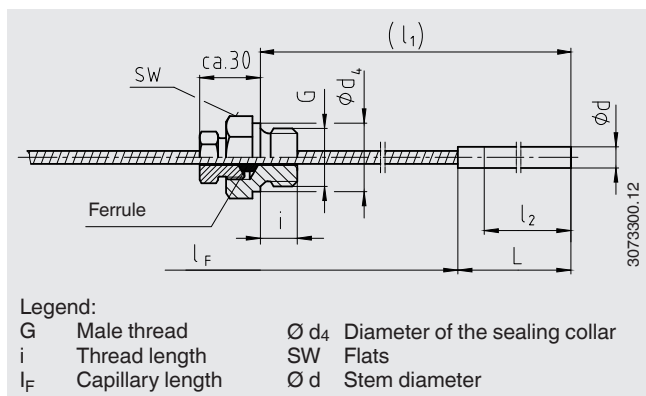
Nominal size	Process connection		Dimensions in mm		
	NS	G	i	SW	d_4
100, 160	M18 x 1,5	12	32	23	10

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

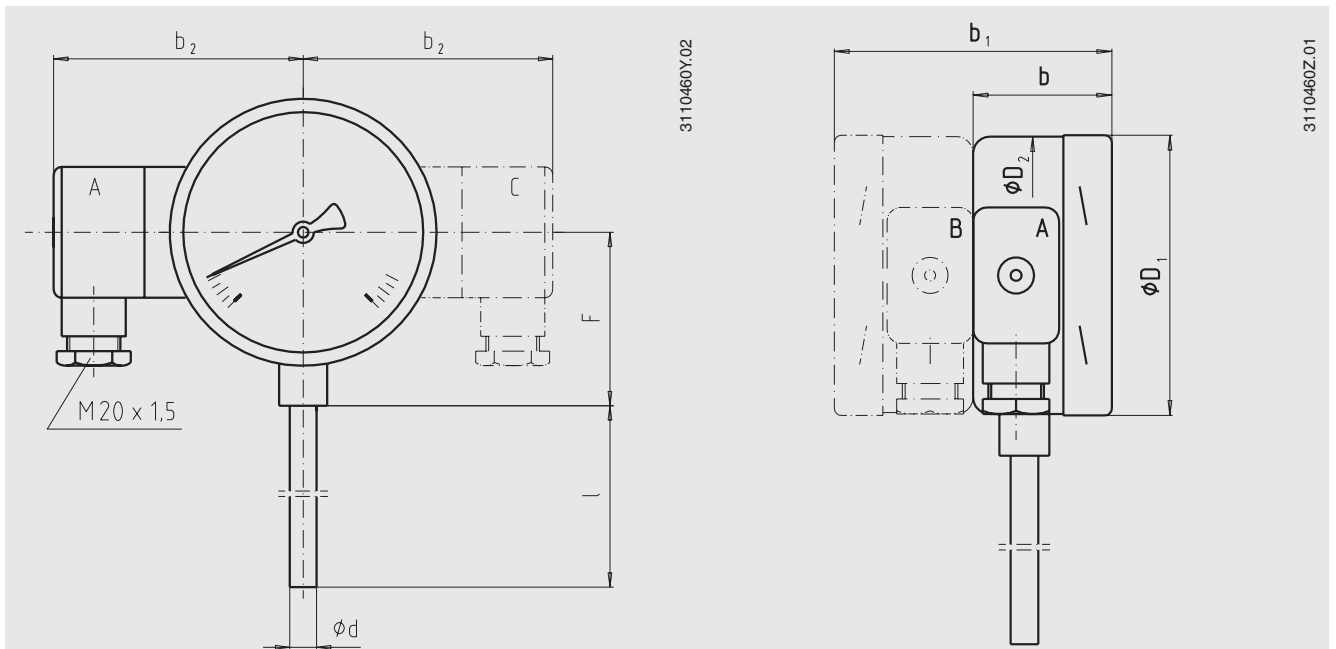
Insertion length $l_1 =$ variable

Active length L : standard 130 mm at $\varnothing d \geq 10$ mm

Nominal size	Process connection		Dimensions in mm		
	NS	G	i	SW	d_4
100, 160	G 1/2 B	14	27	26	10
	G 3/4 B	16	32	32	10
	1/2 NPT	19	22	-	10
	3/4 NPT	20	30	-	10



Dimensions in mm



Use of terminal boxes (A, B and C in the above drawing)

- Standard version: A for Pt100
- Transmitter option: B for transmitter
- Switch contact option: A for switch contact and C for Pt100
- Switch contact and transmitter option: A for switch contact and B for transmitter

Nominal size	Dimensions in mm											Weight in kg
	Without transmitter			With transmitter								
	Switch contact			Switch contact								
	without	1 or 2	3	without	1 or 2	3	b ₂	d	D ₁	D ₂	F	
NS	b	b	b	b ₁	b ₁	b ₁	b ₂	d	D ₁	D ₂	F	
100	50	88	-	100	138	-	92	10	101	99	83	approx. 1.2
160	50	88	96	50	88	96	122	10	161	159	113	approx. 1.4

Designation of terminal connectors

Pt100 with 3-wire connection (standard)

Connection with temperature transmitter (option)

4 ... 20 mA loop
Terminal 1: +
Terminal 2: -

Switch contact (option)

see data sheet AC 08.01

Thermowell

In principle, the operation of a mechanical thermometer without a thermowell with low process-side loading (low pressure, low viscosity and low flow velocities) is possible.

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 from the extensive WIKA thermowell portfolio.

For further information on the calculation of the thermowell, see Technical information IN 00.15.

Approvals (options)

- **GOST**, metrology, measurement technology, Russia
- **CRN**, safety (e.g. electr. safety, overpressure, ...), Canada

Certificates (options)

- 2.2 Test report
- 3.1 inspection certificate
- DKD/DAkkS calibration certificate

Approvals and certificates, see website

Ordering information

Model / Nominal size / Scale range / Design of connection / Process connection / Length l_1 / Capillary length l_f / Options

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