

Pipe surface resistance thermometer for clamping Model TR57-M, miniature design

WIKA data sheet TE 60.57



for further approvals,
see page 3

Applications

- Sanitary applications
- Food and beverage industry
- Bio and pharmaceutical industry, production of active ingredients

Special features

- No intrusion into the pipeline
- Compact design for space-saving mounting
- Simple and fast electrical connection using an M12 x 1 plug connection
- Measuring insert removable and calibratable



Pipe surface resistance thermometer, model TR57-M

Description

Pipe surface resistance thermometers of the TR57-M series are used for non-invasive temperature measurement on pipelines.

These resistance thermometers can be retrofitted at any time to an existing pipe, without opening or interrupting the process. The resistance thermometers can be used in a temperature range from -20 ... +150 °C [-4 ... 302 °F].

The fixing of the measuring insert onto the pipeline is achieved using a pipe adapter. The measuring insert is spring-loaded and the sensor tip is isolated against the ambient temperature through the silicon lining of the pipe adapter.

The measuring insert can be removed for calibration.

All electrical components are protected against humidity (IP67).

The resistance thermometer is available with direct sensor output or integrated transmitter.

Through the compact design, this resistance thermometer is designed specifically for operation in applications with limited mounting space.

Process connection, sensor and connection method can each be selected for the respective application from the ordering information. The electrical connection is made via an M12 x 1 circular connector.

Specifications

Thermometer with transmitter and 4 ... 20 mA output signal		
Process temperature range	Standard	-20 ... +100 °C [-4 ... +212 °F], max. 150 °C [302 °F] for 30 min. ¹⁾
	Extended	-20 ... +150 °C [-4 ... +302 °F] ¹⁾ , only with transmitter measuring range 0 ... 150 °C [32 ... 302 °F]
Connection method	3-wire	
Measurement accuracy of the overall instrument	2.5 % of full scale ²⁾	
Measurement accuracy of the overall instrument with thermal compound	1.0 % of full scale ²⁾	
Measuring range of the transmitter	<ul style="list-style-type: none"> ■ -10 ... +50 °C [14 ... 122 °F] ■ 0 ... 100 °C [32 ... 212 °F] ■ 0 ... 150 °C [32 ... 302 °F] The measuring range is fixed.	
Analogue output	4 ... 20 mA, 2-wire	
Supply voltage U_B	DC 10 ... 30 V	
Response time	Approx. $t_{90} = 10$ s ²⁾	
Switch-on delay, electrical	Max. 1 s (time before the first measured value)	
Current value for error signalling	Upscale approx. 22 mA	
Load R_A	$R_A \leq (U_B - 10 \text{ V}) / 23 \text{ mA}$ with R_A in Ω and U_B in V	
Electrical connection	Circular connector M12 x 1 (4-pin)	
Supply voltage input	Protected against reverse polarity	

1) The temperature transmitter should therefore be protected from temperatures over 60 °C [140 °F]

2) Measuring results are dependent upon the individual mounting situation.

Thermometer with direct sensor output with Pt100	
Process temperature range	-20 ... +150 °C [-4 ... +302 °F]
Measuring element	Pt100 (measuring current max. 10 mA, 0.3 ... 1 mA recommended)
Temperature at the connector	Max. 85 °C [185 °F]
Connection method	3-wire
Tolerance value of the measuring element per IEC 60751	Class A ²⁾
Measurement accuracy of the overall instrument	2.5 % of full scale ²⁾
Measurement accuracy of the overall instrument with thermal compound	1.0 % of full scale ²⁾
Response time	approx. $t_{90} = 10$ s ²⁾
Electrical connection	Circular connector M12 x 1 (4-pin)

2) Measuring results are dependent upon the individual mounting situation.

For detailed specifications for Pt sensors, see Technical information IN 00.17 at www.wika.com.

Ambient conditions		
Ambient/storage temperature range	Without transmitter	-20 ... +85 °C [-4 ... +185 °F]
	With transmitter	-20 ... +60 °C [-4 ... +140 °F]
Maximum permissible humidity per IEC 60068-2-30 var. 2	70 % r. h. ³⁾	
Ingress protection	IP67 per IEC/EN 60529	

3) Only with M12 circular connector fitted or during storage with M12 protective cap fitted.

For detailed specifications for Pt sensors, see Technical information IN 00.17 at www.wika.com.

Readings in % refer to the measuring span

Measuring insert	
Spring	Stainless steel 1.4310
Probe insert	PEEK
Sensor tip	935 silver
Circular connector M12	PA / gold-plated contacts
Weight	20 g


Process connection		
Pipe adapter	Stainless steel 1.4405	
Weight	Adapter designation 120 ... 190	120 g
	Adapter designation 213 ... 337	170 g
	Adapter designation 350 ... 530	395 g
	Adapter designation 603 ... 889	955 g
Case	Stainless steel 1.4305	
Adapter insert	Silicone HTV/PTFE	

Approvals

Logo	Description	Region
	EU declaration of conformity	European Union
	EMC directive ¹⁾	
	EN 61326 emission (group 1, class B) and immunity (industrial application)	
	RoHS directive	

1) Only for built-in transmitter

Optional approvals

Logo	Description	Region
	EAC	Eurasian Economic Community
	EMC directive	
-	PAC Ukraine Metrology, measurement technology	Ukraine

For approvals and certificates, see website

Dimensions in mm

With transmitter
 Process temperature range -20 ... +150 °C [-4 ... +302 °F]

Technical drawings showing the dimensions of the probe with transmitter. The front view shows a circular base with diameter DN and width B. The side view shows a probe with diameter D and height H, with a 20mm section above the base. The detail view shows the probe with a 102.5mm length and an M12x1 thread at the top.

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With transmitter
 Process temperature range -20 ... +100 °C [-4 ... +212 °F], max. 150 °C [302 °F] for 30 min.

Without transmitter
 Process temperature range -20 ... +150 °C [-4 ... +302 °F]

Technical drawings showing the dimensions of the probe without transmitter. The front view shows a circular base with diameter DN and width B. The side view shows a probe with diameter D and height H, with a 20mm section above the base. The detail view shows the probe with a 66.5mm length and an M12x1 thread at the top. The bottom view shows a circular base with diameter SW18.

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Overview of pipe adapters with pipe diameter

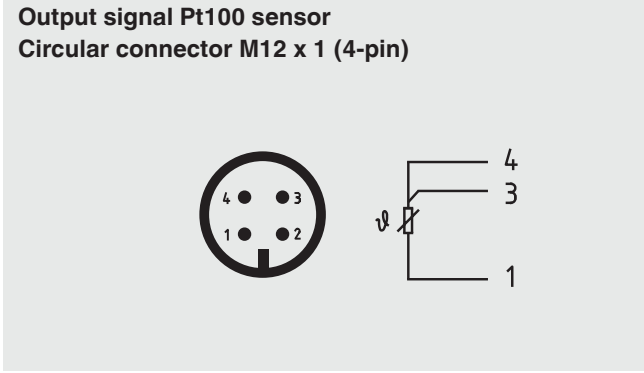
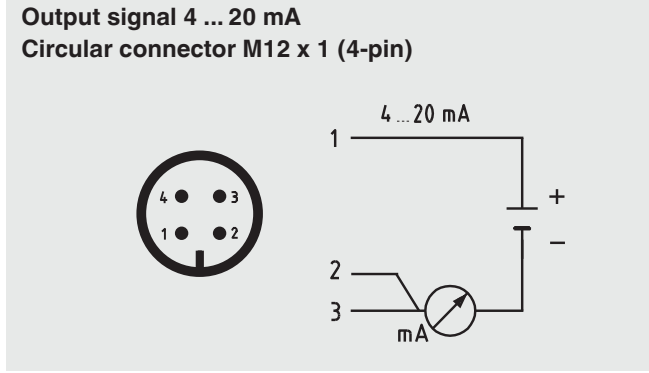
Adapter designation	Pipe outer Ø in mm	Nominal width of pipe in mm/in	Standard	Dimensions in mm [in]							
				B		SW		D		H	
120	12.0	DN 10	EN 10357 series B	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
130	13.0	DN 10	EN 10357 series A	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
130	12.7	½"	DIN 11866 row C / ASME BPE	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
135	13.5	DN 8	DIN 11866 row B (ISO 1127)	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
172	17.2	DN 10	DIN 11866 row B (ISO 1127)	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
180	18.0	DN 15	EN 10357 series B	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
190	19.0	DN 15	EN 10357 series A	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
190	19.0	¾"	DIN 11866 row C / ASME BPE	51	[2.01]	11	[0.43]	15.5	[0.61]	43	[1.69]
213	21.3	DN 15	DIN 11866 row B (ISO 1127)	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
230	23.0	DN 20	EN 10357 series A	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
254	25.4	1"	DIN 11866 row C / ASME BPE	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
269	26.9	DN 20	DIN 11866 row B (ISO 1127)	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
280	28.0	DN 25	EN 10357 series B	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
290	29.0	DN 25	EN 10357 series A	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
337	33.7	DN 25	DIN 11866 row B (ISO 1127)	64	[2.52]	11	[0.43]	15.5	[0.61]	55	[2.17]
337	34.0	DN 32	EN 10357 series B	64	[2.52]	11	[0.43]	18.5	[0.73]	81	[3.19]
350	35.0	DN 32	EN 10357 series A	64	[2.52]	11	[0.43]	18.5	[0.73]	81	[3.19]
381	38.1	1 ½"	DIN 11866 row C / ASME BPE	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
400	40.0	DN 40	EN 10357 series B	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
410	41.0	DN 40	EN 10357 series A	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
424	42.4	DN 32	DIN 11866 row B (ISO 1127)	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
483	48.3	DN 40	DIN 11866 row B (ISO 1127)	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
508	50.8	2"	DIN 11866 row C / ASME BPE	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
520	52.0	DN 50	EN 10357 series B	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
530	53.0	DN 50	EN 10357 series A	92	[3.62]	14	[0.55]	18.5	[0.73]	81	[3.19]
603	60.3	DN 50	DIN 11866 row B (ISO 1127)	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]
635	63.5	2 ½"	DIN 11866 row C / ASME BPE	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]
700	70.0	DN 65	EN 10357 series A	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]
761	76.1	DN 65	DIN 11866 row B (ISO 1127)	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]
761	76.2	3"	DIN 11866 row C / ASME BPE	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]
850	85.0	DN 80	EN 10357 series A	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]
889	88.9	DN 80	DIN 11866 row B (ISO 1127)	133	[5.24]	14	[0.55]	21.5	[0.85]	125	[4.92]

Legend:

D = Clamp width in mm, ±0.5 mm unassembled

H = Clamp height without cover component in mm, ±1 mm unassembled

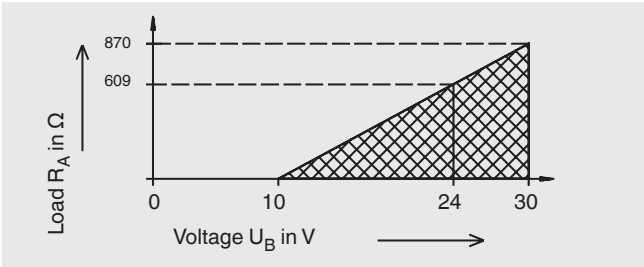
Electrical connection



Pin	Signal	Description
1	L+	10 ... 30 V
2	L-	0 V
3	L-	0 V
4	C	Do not use

Load diagram

The permissible load depends on the loop supply voltage.



Accessories

Model	Special features	Cable length	Order number
Connection cable M12	Cable socket straight, 4-pin, ingress protection IP67 Temperature range -20 ... +80 °C [-4 ... +176 °F]	2 m [6.56 ft]	14086880
		5 m [16.40 ft]	14086883
	Cable socket straight, 4-pin, ingress protection IP69K, hygienic design Temperature range -40 ... +80 °C [-40 ... +176 °F]	3 m [9.84 ft]	14137167
		5 m [16.40 ft]	14137168
	Angled socket, 4-pin, ingress protection IP67 Temperature range -20 ... +80 °C [-4 ... +176 °F]	2 m [6.56 ft]	14086889
		5 m [16.40 ft]	14086891
	Angled socket, 4-pin, ingress protection IP69K, hygienic design Temperature range -40 ... +80 °C [-40 ... +176 °F]	3 m [9.84 ft]	14137169
		5 m [16.40 ft]	14137170

Ordering information

Model / Output signal / Process temperature / Transmitter configuration / Process connection / Size / Certificates / Options

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Your WIKA Sales Partner



ICS Schneider Messtechnik GmbH
Briesestrasse 59
D-16562 Hohen Neuendorf / OT Bergfelde
Tel.: +49 3303 5040-66
Fax: +49 3303 5040-68
E-Mail: info@ics-schneider.de



WIKAL Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.de
www.wika.de