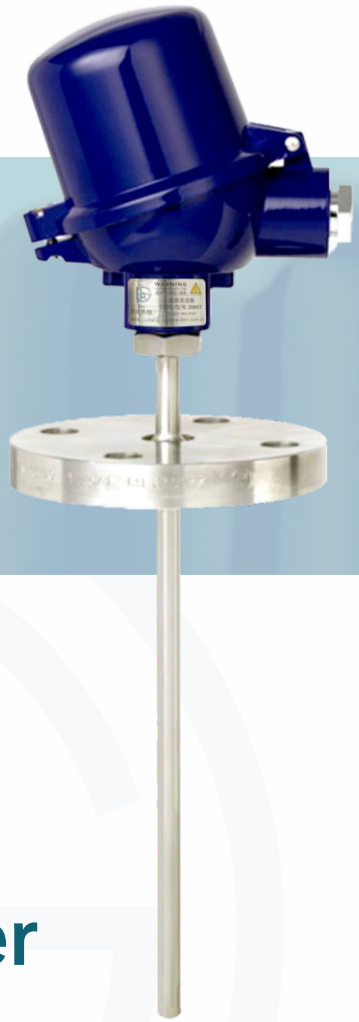
The selection is detailed on page 12



DB07

Small Flange Thermal Resistance Thermometer

Working principle

Thermal resistance is a temperature measuring element commonly used in low and medium temperature areas, using the resistance of the substance itself to measure the temperature when the temperature changes. The heated part of the thermal resistance (temperature sensing element) is evenly wound on the skeleton made of insulating material with a thin metal wire. When there is a temperature gradient in the measured medium, the measured temperature is the average temperature in the medium layer within the range of the temperature sensing element.

Product description

This series of resistance thermometers is suitable for use in containers and pipes. Available with DIN EN or ASME standard flanges.
The thermometer probe is suitable for use in liquid or gaseous media under moderate mechanical loads. The sheath is fully welded and threaded to the junction box. Under normal chemical conditions, a sheath of stainless steel material is used. Corrosion resistant coatings are recommended for aggressive chemical media. Wear-resistant coating is used for wear resistant media.
Replaceable rods do not require the thermometer to be completely removed from the process during replacement. You can check and replace the device during operation or directly during operation.

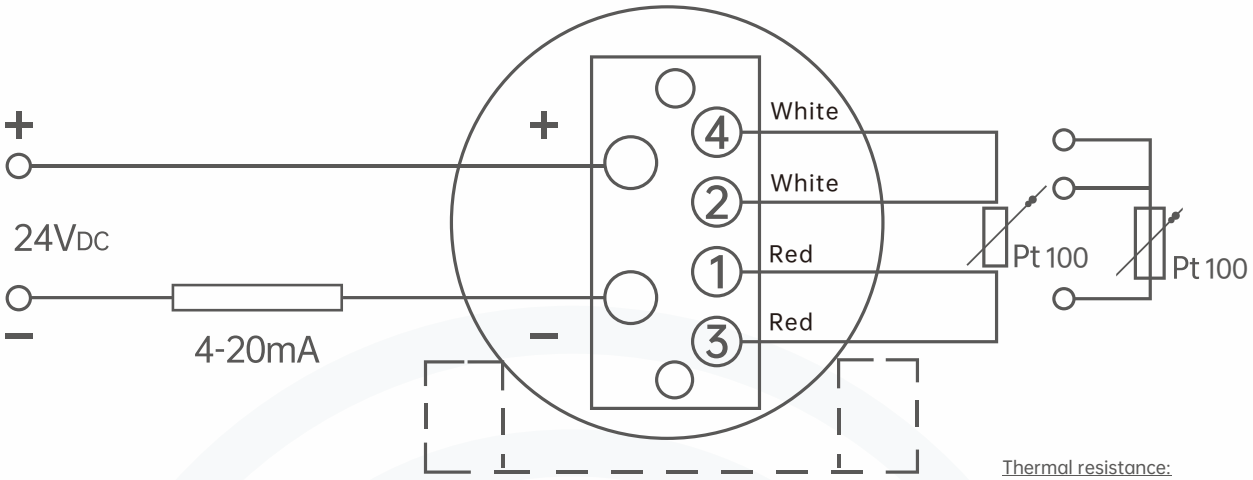
Product application

Machinery industry
Factory and tank manufacturing
Energy technology and power plants
Chemical and petrochemical industries
The food and beverage industry
Heating and cooling technology

Functional characteristics

Sensor temperature range: -196... +600 ℃
Integrated assembly jacket
Probe rod with spring (replaceable)
Explosion proof type

Working principle Analytic table



Thermal resistance:
three or four wire system

Sensor

The table shows the temperature ranges listed in the corresponding standard, where the tolerance values (accuracy grades) are valid.

Measuring element

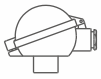
Connection mode	
unitware	1 x 2 Wire system
	1 x 3 Wire system
	1 x 4 Wire system
two-element	2 x 2 Wire system
	2 x 3 Wire system
	2 x 4 Wire system[2)]

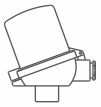
Effective range of accuracy levels, according to EN 60751		
category	Sensor structure	
	Winding form	Film type
B level	-196 ... +600℃	-50 ... +500℃
	-196 ... +450℃	-50 ... +250℃
A level[3)]	-100 ... +450℃	-30 ... +300℃
AA level[3)]	-50 ... +250℃	0 ... 150℃

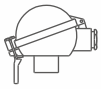
Connector

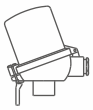
Connector material and specification


DBM


DBM-A


DBM-B


DBM-C


DBM-D


DBM-E

material	Cable inlet thread specification	Protection level (Max)	Protective cap	Surface	The connection to the neck tube
aluminum	M20×1.5 or 1/2NPT[1)]	IP65	Flat top cover with 2 screws	Blue finish	M24×1.5, 1/2 NPT
aluminum	M20×1.5 or 1/2NPT[1)]	IP65	Spherical hinged cover with cylinder head screws	Blue finish	M24×1.5, 1/2 NPT
aluminum	M20×1.5 or 1/2NPT[1)]	IP65	Raised hinged cover with cylinder head screws	Blue finish	M24×1.5, 1/2 NPT
aluminum	M20×1.5 or 1/2NPT[1)]	IP65	Spherical hinged cover with clamping handle	Blue finish	M24×1.5, 1/2 NPT
aluminum	M20×1.5 or 1/2NPT[1)]	IP65	Raised hinged cover with clamping handle	Blue finish	M24×1.5, 1/2 NPT
Stainless steel	M20×1.5[1)]	IP65	Precision cast nut	Natural color, electric polishing	M24×1.5

1) Standard (other available on demand);
2) Levels of protection can be provided upon request, describing temporary or prolonged immersion

Explosion protection

There is no	Ex i (Gas) Zones 0, 1, 2	Ex i (dust) Precincts 20, 21, 22	Ex eb (Gas) Zone 1	Ex tb (Dust) Zone 21	Ex ec (Gas) Zone 2	Ex nA (Gas) Zone 2	Ex tc (Dust) Zone 22
x	x	x	-	-	-	-	-
x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x
x	x	-	-	-	-	-	-
x	x	-	-	-	-	-	-
x	x	-	-	-	-	-	-

Cable inlet

Standard

Plastic

Plastic

Nickel-plated brass

Stainless steel

Optical thread

Sealing plug for transport

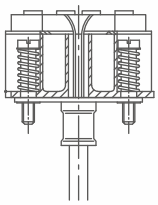
Cable inlet material and specification

Cable inlet	Cable inlet thread specification	Minimum/maximum ambient temperature
Standard cable inlet [1]	M20×1.5 or 1/2NPT	-40 ... +80℃
Plastic cable head (Cable diameter 6... 10 mm)[1]	M20×1.5 or 1/2NPT	-40 ... +80℃
Plastic cable head (Cable diameter 6... 10 mm), Ex e[1]	M20×1.5 or 1/2NPT	-20 ... +80℃ (Standard)
		-40 ... +70℃ (Selectable)
Nickel-plated brass cable joint (Cable diameter 6... 12 mm)	M20×1.5 or 1/2NPT	-60[2]/-40 ... +80℃
Stainless steel cable connector (Cable diameter 7... 12 mm)	M20×1.5 or 1/2NPT	-60[2]/-40 ... +80℃
Optical thread	M20×1.5 or 1/2NPT	-
Sealing plug for transport	M20×1.5 or 1/2NPT	-40 ... +80 ℃

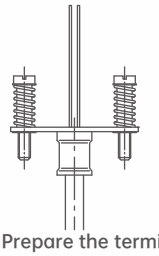
Cable inlet	colour	Protection level (Max) Comply with IEC/EN 60529 standard	Explosion protection							
			There is no	Ex i (gas) 0, 1, Zone 2	Ex i (Dust) 20, 21, Zone 22	Ex eb (Gas) Zone 1	Ex tb (Dust) Zone 21	Ex ec (Gas) 2, 21, Zone 22	Ex nA (Gas) Zone 2	Ex tc (Dust) Zone 22
Standard cable inlet [1]	Natural quality	IP65	x	x	-	-	-	-	-	-
Plastic cable head [1]	Black or grey	IP66[3]	x	x	-	-	-	-	-	-
Plastic cable head,Ex e[1]	Baby blue	IP66[3]	x	x	x	-	-	-	-	-
Plastic cable head,Ex e[1]	black	IP66[3]	x	x	x	x	x	x	x	x
Nickel-plated brass cable joint	Natural quality	IP66[3]	x	x	x	-	-	-	-	-
Nickel plated brass cable head,Ex e	Natural quality	IP66[3]	x	x	x	x	x	x	x	x
Stainless steel cable joint	Natural quality	IP66[3]	x	x	x	x	x	x	x	x
Stainless steel cable head,Ex e	Natural quality	IP66[3]	x	x	x	x	x	x	x	x
Optical thread	-	IP00	x	x	x[4]	x[4]	x[4]	x[4]	x[4]	x[4]
Sealing plug for transport	transparent	-	Not applicable, only for protection during transport							

1) Not applicable to DBM-E connectors;
2) Special versions (only with special permission) and other temperatures are available on request;
3) A level of protection can be provided upon request, describing temporary or prolonged immersion;
4) Suitable cable connectors for operation

transmitter



The terminal board for the transmitter is installed



Prepare the terminal board for installing the transmitter

Mount to measuring rod

When the transmitter is mounted to the measuring rod, the transmitter replaces the terminal and is fixed directly to the terminal panel of the measuring rod.

Install it in the protective cap of the connection head

Instead of mounting the transmitter on the measuring rod, it is recommended to install it in the connection head protective cap. Because this installation ensures better insulation, in addition, it simplifies the replacement and installation operations required for maintenance.

Transmitter

Transmitter model number

Output signal 4... 20 mA HART® protocol, FOUNDATION™ Fieldbus and PROFIBUS® PA standard cable entry			
Transmitter	S10 type	S20 type	S30 type
Exportation			
▪ 4 ... 20 mA	×	×	-
▪ HART® Agreement	-	×	-
▪ FOUNDATION™ PROFIBUS® PA	-	-	×
Connection mode			
▪ 1 x 2 wire, 3 wire or 4 wire system	×	×	×
Measuring current	< 0.2mA	< 0.3mA	< 0.2mA
Explosion protection	Selectable	Selectable	Standard

Transmitter model number

Connector	S10 type	S20 type	S30 type
DBM	○	-	○
DBM-A	○	○	○
DBM-B	●	●	●
DBM-C	○	○	○
DBM-D	●	●	●
DBM-E	○	○	○

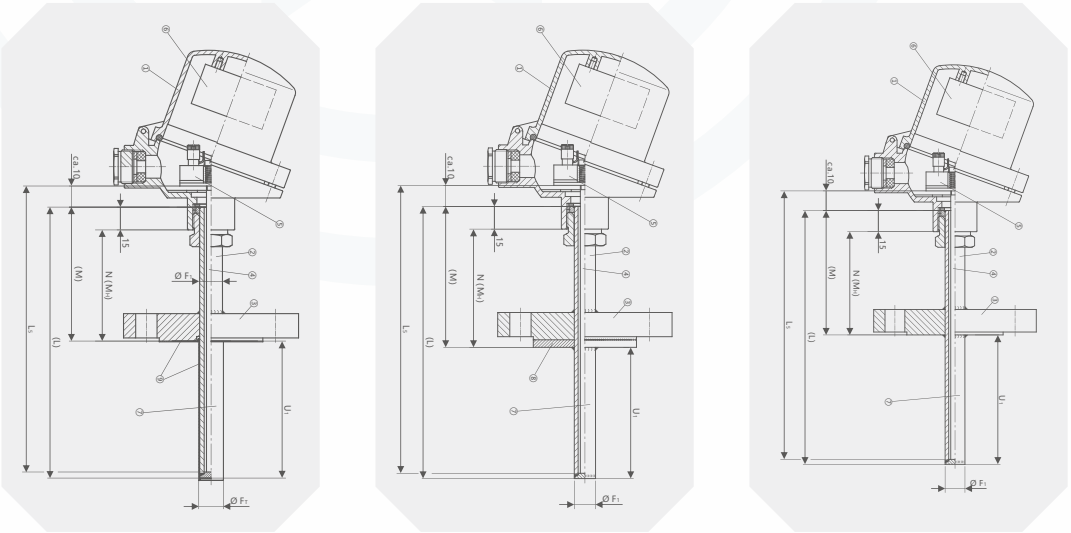
○ Install the wiring terminal instead ● Install the connector in the protective cap – Cannot install

For all the connectors listed here, they can be used to mount the transmitter on the measuring rod. 2 transmitters can be installed as required.
In order to correctly determine the overall measurement error, the measurement error of the sensor and transmitter must be increased.

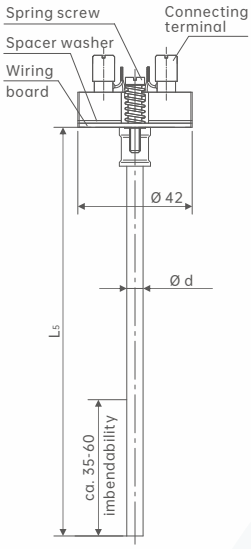
Module

Legend:

①	Junction box
②	Cervical canal
③	Francois
④	Measuring rod
⑤	Terminal board/ Transmitter (optional)
⑥	Transmitter (optional)
⑦	Protective tube
⑧	Flanges of special material
⑨	Tantalum cover
(L)	Total length of the protective tube
L5	Measure the length of the probe
U1	Protective tube insertion length, According to DIN 43772
Ø F1	Protective tube diameter
Ø FT	Tantalum outer diameter
N (MH)	Neck length
(M)	Neck length

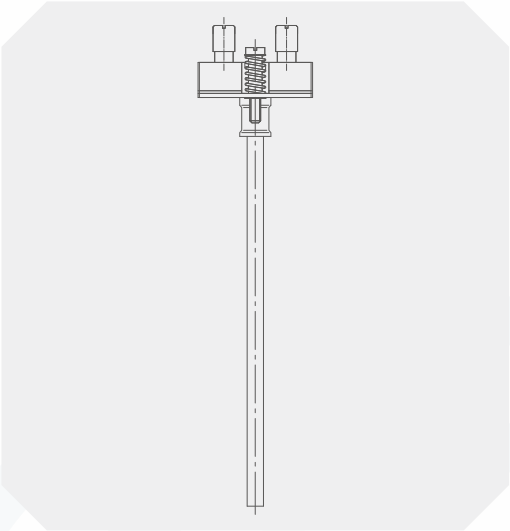


Size mm

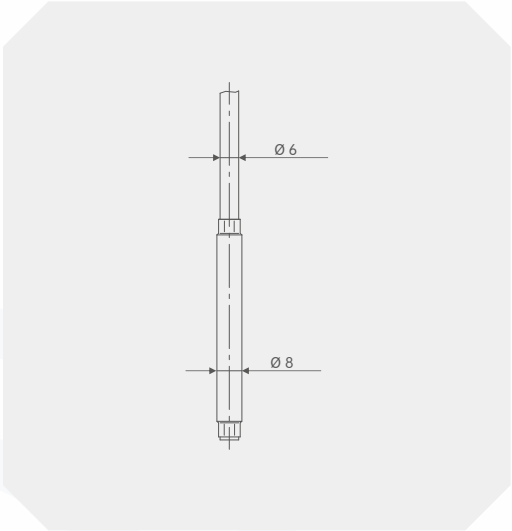


Legend:
L_5 Measure the length of the probe
Ød Measure rod diameter

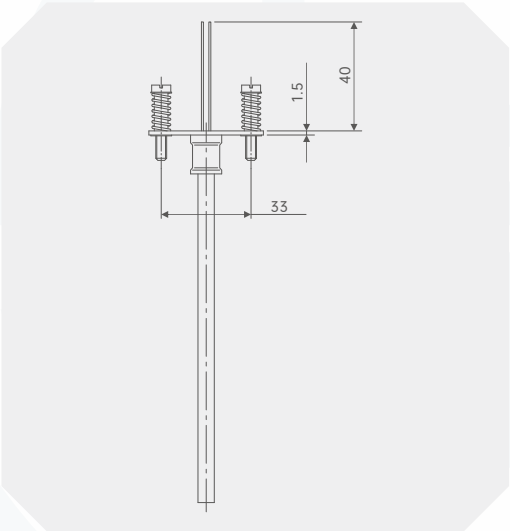
Socket design with recessed welded lugs



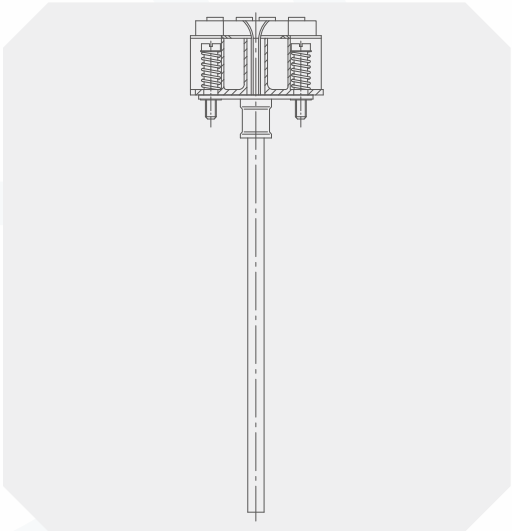
A measuring rod with casing in the sensor area



Prepare the transmitter design for installation



A transmitter design is installed



Specification and material

Measuring rod diameter Ød (Unit: mm)		Index basis DIN 43735	Tolerance (mm)	Sheath material	
				Standard design	Recessed welded lugs
3[1)]	Standard	30	$3_{\pm 0.05}$	1.4571, 316L[1) 2)]	1.4571
6	Standard	60	$6\ ^{0}_{-0.1}$	1.4571, 316L[1) 2)]	1.4571
8 (6mm, thimble)	Standard	-	$8\ ^{0}_{-0.1}$	1.4571	1.4571
8	Standard	80	$8\ ^{0}_{-0.1}$	1.4571, 316L[1) 2)]	1.4571

1) Not available for 2 x 4 wire version; 2) Not applicable to socket designs with recessed welded lugs

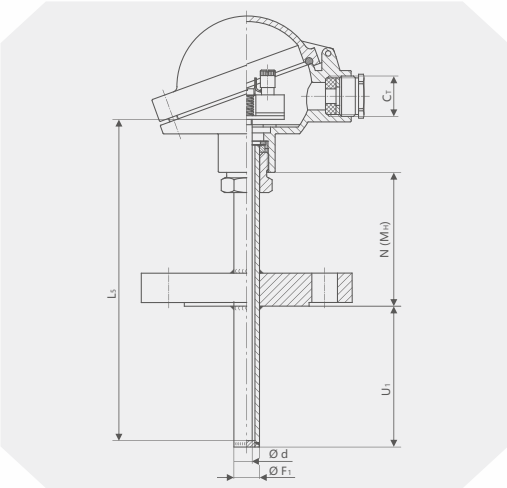
Protection tube design

Protective tube, conforming to DIN43772 Standard

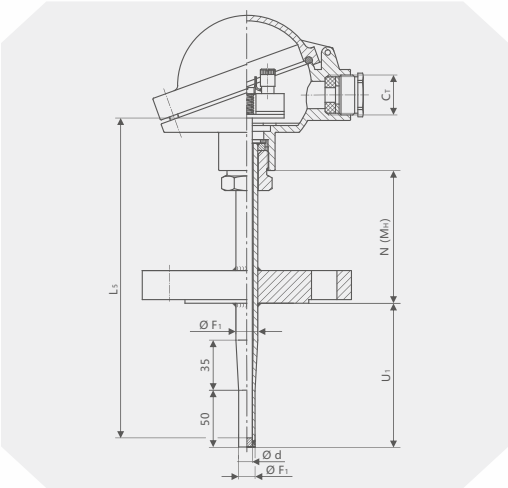
Legend:

U1	Insertion length
L5	Measure the length of the probe
N (MH)	Neck length
CT	Threaded cable inlet
ØF1	Protective tube diameter
ØF3	Protective tube end diameter
ØFT	Tantalum outer diameter
(L)	Total length of the protective tube
Ød	Measure rod diameter

Protective tube, straight, 2F (DIN 43772)



Protective tube, conical, 3F (DIN 43772)



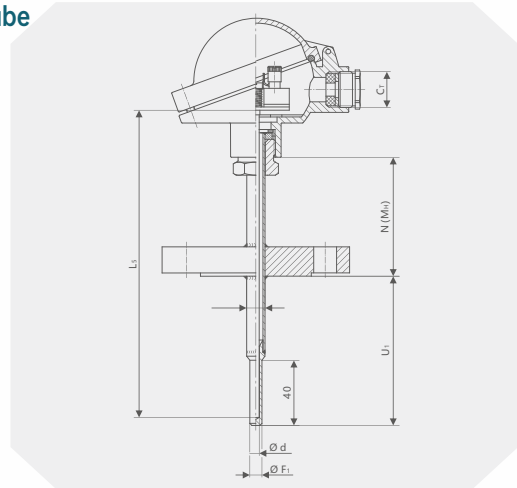
Protection tube design

Cylindrical protective tube (DIN 43772 standard)

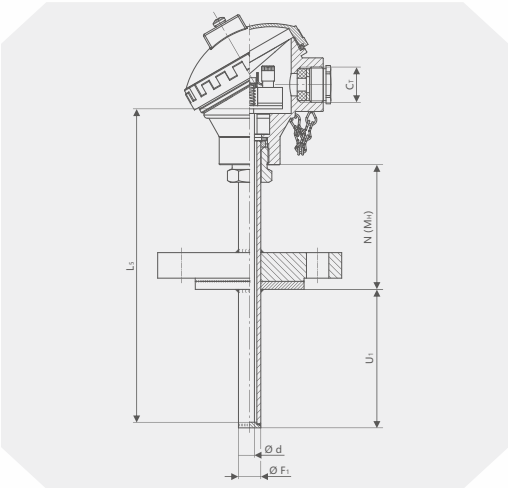
Legend:

U1	Insertion length
L5	Measure the length of the probe
N (MH)	Neck length
CT	Threaded cable inlet
ØF1	Protective tube diameter
ØF3	Protective tube end diameter
ØFT	Tantalum outer diameter
(L)	Total length of the protective tube
Ød	Measure rod diameter

Protective tube, conical (solid welded end)



Protection tube, straight, cylindrical, 2F, non-standard design (liquid parts: special material, beam flange: stainless steel)



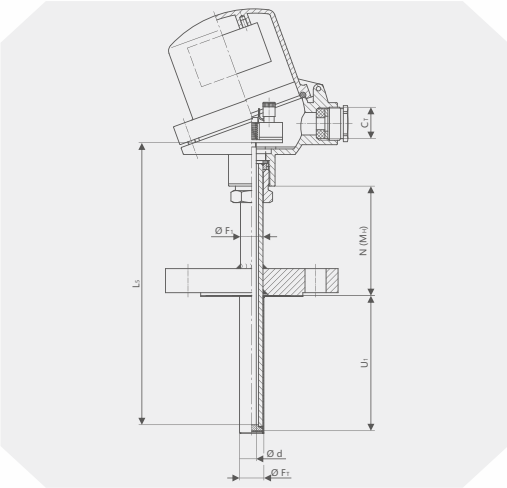
Protection tube design

Cylindrical protective tube(DIN 43772 standard)

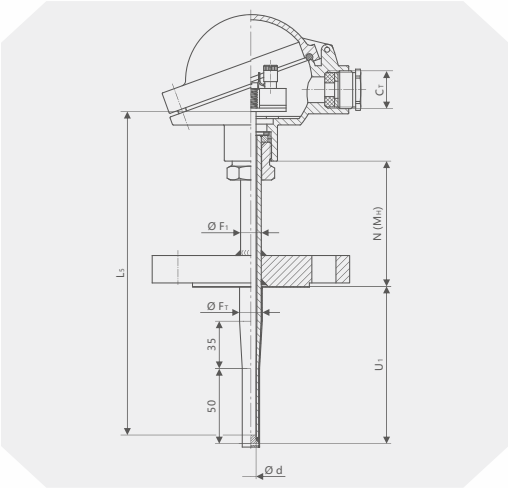
Legend:

U1	Insertion length
L5	Measure the length of the probe
N (MH)	Neck length
CT	Threaded cable inlet
ØF1	Protective tube diameter
ØF3	Protective tube end diameter
ØFT	Tantalum outer diameter
(L)	Total length of the protective tube
Ød	Measure rod diameter

Protective tube, straight, cylindrical, 2F, non-standard design (Tantalum covered flange sealing surface, support protection tube: stainless steel)



Protective tube, cone, cylinder, 3F, non-standard design



Sealing surface

Flange material: 1.4571 stainless steel

Rated flange width	Grade	sealing face	Protective tube diameter	
			9×1 mm	11×2 mm 12×2.5 mm 14×2.5mm
EN 1092-1, DN 25 EN 1092-1, DN 40	PN 6	B1 form	×	×
		B2 form	×	×
		C shape (needle shape)	×	×
		D-shape (trough)	×	×
	PN 10 ... 40	B1 form	×	×
		B2 form	×	×
		C shape (needle shape)	×	×
		D-shape (trough)	×	×
	PN 63 ... 100	B1 form	-	×
		B2 form	-	×
		C shape (needle shape)	-	×
		D-shape (trough)	-	×
EN 1092-1, DN 50	PN 6	B1 form	×	×
		B2 form	×	×
		C shape (needle shape)	×	×
		D-shape (trough)	×	×
	PN 10 ... 16	B1 form	×	×
		B2 form	×	×
		C shape (needle shape)	×	×
		D-shape (trough)	×	×
	PN 25 ... 40	B1 form	×	×
		B2 form	×	×
		C shape (needle shape)	×	×
		D-shape (trough)	×	×
	PN 63	B1 form	-	×
		B2 form	-	×
		C shape (needle shape)	-	×
		D-shape (trough)	-	×
	PN 100	B1 form	-	×
		B2 form	-	×
		C shape (needle shape)	-	×
		D-shape (trough)	-	×
DIN 2526/2527, DN 25 DIN 2526/2527, DN 40	PN 6	C-shape	×	×
		e-shape	×	×
		N-shape (groove)	×	×
		F-shape (needle shape)	×	×

Sealing surface

Flange material:
1.4571 stainless steel

Rated flange width	Grade	Sealing surface	Protective tube diameter	
			9×1 mm	11×2 mm 12×2.5 mm 14×2.5mm
DIN 2526/2527, DN 25 DIN 2526/2527, DN 40	PN 10 ... 16	C-shape	×	×
		e-shape	×	×
		N-shape (groove)	×	×
		F-shape (needle shape)	×	×
	PN 25 ... 40	C-shape	×	×
		e-shape	×	×
		N-shape (groove)	×	×
		F-shape (needle shape)	×	×
	PN 64 ... 100	C-shape	-	×
		e-shape	-	×
		N-shape (groove)	-	×
		F-shape (needle shape)	-	×
DIN 2526/2527, DN 40	PN 6	C-shape	×	×
		e-shape	×	×
		N-shape (groove)	×	×
		F-shape (needle shape)	×	×
	PN 10 ... 16	C-shape	×	×
		e-shape	×	×
		N-shape (groove)	×	×
		F-shape (needle shape)	×	×
	PN 25 ... 40	C-shape	×	×
		e-shape	×	×
		N-shape (groove)	×	×
		F-shape (needle shape)	×	×
DIN 2526/2527, DN 40	PN 64	C-shape	-	×
		e-shape	-	×
		N-shape (groove)	-	×
		F-shape (needle shape)	-	×
	PN 100	C-shape	-	×
		e-shape	-	×
		N-shape (groove)	-	×
		F-shape (needle shape)	-	×
ASME 1 inch ASME 1 1/2 inch ASME 2 inch	150 lbs	RF (convex)	×	×
		RFSF (raised, surface polished)	×	×
		FF (Flat surface)	×	×
		RTJ (Ring connection surface)	×	×

Sealing surface

Flange material: 1.4571 stainless steel

Rated flange width	Grade	Sealing surface	Protective tube diameter	
			9×1 mm	11×2 mm 12×2.5 mm 14×2.5mm
ASME 1 inch ASME 1 1/2 inch ASME 2 inch	300 lbs	RF (convex)	×	×
		RFSF (raised, surface polished)	×	×
		FF (Flat surface)	×	×
		RTJ (Ring connection surface)	×	×
	600 lbs	RF (convex)	-	×
		RFSF (raised, surface polished)	-	×
		FF (Flat surface)	-	×
		RTJ (Ring connection surface)	-	×
	1500 lbs	RF (convex)	-	×
		RFSF (raised, surface polished)	-	×
		FF (Flat surface)	-	×
		RTJ (Ring connection surface)	-	×

Sealing surface

Special material

Beam flanges and connecting elements: stainless steel

Rated flange width	Grade	Sealing surface	
		Flange material	
		2.4360 (Montloy 400), 2.4819 (Hastelloy C276), 2.4610 (Hastelloy C4) and 3.7035 (Grade 2 titanium)	tantalum
EN 1092-1, DN 25	PN 6	B1, B2, C and D shapes	B2 form
EN 1092-1, DN 40	PN 10 ... 40		
EN 1092-1, DN 50	PN 6		
	PN 10 ... 16		
	PN 25 ... 40		
DIN 2526/2527, DN 25	PN 6	C, E, N and F shapes	e-shape
DIN 2526/2527, DN 40	PN 10 ... 16		
	PN 25 ... 40		
DIN 2526/2527, DN 50	PN 6		
	PN 10 ... 16		
	PN 25 ... 40		
ASME 1 inch	150 lbs	RF shape (convex)	RFSF form
ASME 1 1/2 inch	300 lbs	RFSF shape (convex, polished surface)	
ASME 2 inch	600 lbs		

Sealing surface roughness

Flange standard	Grade	AARH (µinch)	Ra (µm)	Rz (µm)
ASME B16.5	finishing	125 ... 250	3.2 ... 6.3	-
	Surface polishing	< 125	<3.2	-
	Ring joint	< 63	<1.6	-
	Needle shape/trough shape	< 125	<3.2	-
EN 1092-1	B1 form	-	3.2 ... 12.5	12.5 ... 50
	B2 form	-	0.8 ... 3.2	3.2 ... 12.5
DIN 2527	C-shape	-	-	40 ... 160
	e-shape	-	-	< 16

Insertion length

Protective tube design	Standard insertion length	Minimum/maximum insertion length
Straight, 2F (DIN 43772)	225, 315, 465 mm	50 mm / 3,000 mm
Tapered, 3F (DIN 43772)	225, 285, 345 mm	85 mm / 3,000 mm
Conical, solid welded ends, cylindrical (DIN 43772)	160, 250, 400 mm	75 mm / 3,000 mm
Straight, 2F (DIN 43772), cylindrical, special material	225, 315, 465 mm	50 mm / 3,000 mm
Straight, 2F (DIN 43772), cylindrical, tantalum housing	225, 315, 465 mm	50 mm / 1,000 mm
Tapered, 3F (DIN 43772), cylindrical, tantalum housing	225, 285, 345 mm	85 mm / 1,000 mm

Neck length

In accordance with DIN 43772 Protection tube design

Protection tube design	Standard neck length	Shortest/longest neck length				
		PN 6...PN 40 (DN 25...DN 50)	PN 63...PN 100 (DN 25...DN 50)	150...300 lbs (1"... 2")	600 lbs (1"... 2")	900...1,500 lbs (1"... 2")
Straight, 2F-shaped (DIN 43772 standard)	65 mm	40/900 mm	50/900 mm	45/900 mm	55/900 mm	65/900 mm
Tapered, 3F shaped (DIN 43772 standard)	67 mm	40/900 mm	50/900 mm	45/900 mm	55/900 mm	67/900 mm
Tapered, solid welded End, cylindrical (DIN 43772 standard), Non-standard design	130 mm	40/900 mm	50/900 mm	45/900 mm	55/900 mm	65/900 mm

Neck length

Liquid parts: special materials

Protective tube design	Standard neck length	Shortest/longest neck length				
		PN 6...PN 40 (DN 25...DN 50)	PN 63...PN 100 (DN 25...DN 50)	150...300 lbs (1"... 2")	600 lbs (1"... 2")	900...1,500 lbs (1"... 2")
Straight, cylindrical (DIN 43772 standard) Non-standard design	65 mm	50/150 mm	60/150 mm	55/150 mm	65/150 mm	75/150 mm

Neck length

Tantalum housing with tantalum flange

Protection tube design	Standard neck length	Shortest/longest neck length				
		PN 6...PN 40 (DN 25...DN 50)	PN 63...PN 100 (DN 25...DN 50)	150...300 lbs (1"... 2")	600 lbs (1"... 2")	900...1,500 lbs (1"... 2")
Straight, cylindrical (DIN 43772 standard) Non-standard design	65 mm	40/900 mm	50/900 mm	45/900 mm	55/900 mm	65/900 mm
Conical, cylindrical shape (DIN 43772 standard) Non-standard design	67 mm	40/900 mm	50/900 mm	45/900 mm	55/900 mm	67/900 mm

The neck tube can be screwed into the junction box. Neck length depends on the intended use. Usually the neck tube can act as a bridge isolation. In many cases, the neck tube can also be used as an extended cooling element between the junction box and the medium, providing protection for the built-in transmitter at high medium temperatures.

Other models are available on request

DB07-Selection composition

Selection example
Flange connection type **DB07** B S G L V B G N V D G X F N
1 2 3 4 5 6 7 8 9 10 11 12 13 14

1.Selection description	A	All-in-one transmitter
	B	Flange casing
	C	Intrinsically safe explosion-proof type
	D	Flameproof type
	T( )	Other types
2.Flange connection	S	20592 Standard flange
	F	ANSI standard flange
3.Insert probe design	G	Fixed installation
	H	Spring-fixed terminal block (replaceable ferrule)
4.Junction box	K	Aluminum
	L	Stainless steel
	M	With digital temperature display
	T( )	Other types of junction boxes
5.Electrical interface	U	1/2NPT
	V	M20×1.5
6.Wiring block/sensor	A	Crastin Terminal block
	B	Ceramic connection block
	C	S10 (4-20mA transmitter)
	D	S20 (HART transmitter)
	E	S30 (Fieldbus transmitter)
7.Wire system	G	Single 3-wire system
	H	Double branch 6-wire system
	T( )	Other wire system
8.Flange connection size	N	DN25
	O	DN50
	P	DN80
	Q	DN100
	R	ANSI 1"
	S	ANSI 2"
	T	ANSI 3"
	U	ANSI 4"
	T( )	Other flange types
9.Thermal resistance element	V	Pt100, B level
	W	Pt100, A level
	X	Pt1000, B level
	Y	Pt1000, A level
10.Rod diameter	A	3mm
	B	4mm
	C	5mm
	D	6mm
	E	8mm
	F	10mm

DB07-Selection composition

Selection example
Flange connection type DB07

B	S	G	L	V	B	G	N	V	D	G	X	F	N
1	2	3	4	5	6	7	8	9	10	11	12	13	14

11.Rod length (mm)	G	50	
	O	100	
	P	150	
	Q	200	
	R	250	
	S	300	
	T	350	
	U	400	
	V	450	
	W	500	
	T( )	Other lengths	
12.Probe rod material	X	304SS	
	Y	316/316L (1.4401/1.4435)	
	Z	Other materials	
13.Temperature range (℃)	A	-50...+250	
	B	-50...+450	
	C	-200...+250	
	D	-200...+450	
	E	-200...+600	
	F	0...+400	
	G	0...+500	
	T( )	Other measured temperatures	
14.Safety certification	X	Intrinsic safety	
	Y	Flameproof	
	Z	Non-explosion proof	
15.Additional order information	V	Additional information	
	N	There is no	

Instructions:

It means that the DB07 thermal resistance is a thermometer with flanged sleeve, the connection mode is 20592 standard flange, the probe rod design is fixed installation, the connection box is stainless steel, the electrical interface is M20*1.5, the sensor is ceramic connecting block, the single three-wire system, the flange specification is DN25, the thermal resistance element is Pt100, the class B, the diameter of the probe rod is 6mm. The length of the rod is 50mm, the material of the rod is 304SS, and the temperature range is 0... 400℃, no explosion-proof, 15 items are not required.

Product certification

Compliance and approval; Rodwig thermometers meet key standards and certifications for process measurement technology; Thus guaranteeing the highest reliability in such Settings;

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