- → Dial thermometers
- → Diesel engine thermometers
- → Low temperature dial thermometers
- → Remote reading dial thermometers
- → Remote reading diesel engine thermometers
- → Remote reading low temperature thermometers
- → Bi-metal dial thermometers

DIAL THERMOMETERS

GAS FILLED SYSTEM AND BI-METAL

Dial thermometers

SIKA types 341 - 347, 6312 - 1372 and 301 - 302

Type 341 – 347 dial thermometers operate on the expansion principle. The non-toxic gas (primarily nitrogen) in the measuring system expands with rising temperature. This causes an increase in pressure, which deforms the bourdon tube. This deformation is converted into pointer rotation by mechanical components and an instrument mechanism. The resulting pointer deflection is proportional to the temperature change.

Dial thermometer types 341 to 347 are the tried and tested industrial solution for local temperature measurement of fluids and gases in the industrial sector. They are ideal for installation in pipelines, containers, machines and plants, have a long service life and do not require any external power.
Diesel engine thermometer types 6312 to 1372 are the ideal solution for local temperature measurement of fluids and gases on large diesel engines, e.g. for marine propulsion or in the diesel electric power generation area. Depending on the display range, they are useful for measuring exhaust gas, cooling water, lubricating oil and charge air temperatures. All models of our dial thermometers conform to EN 13190 Class 1.

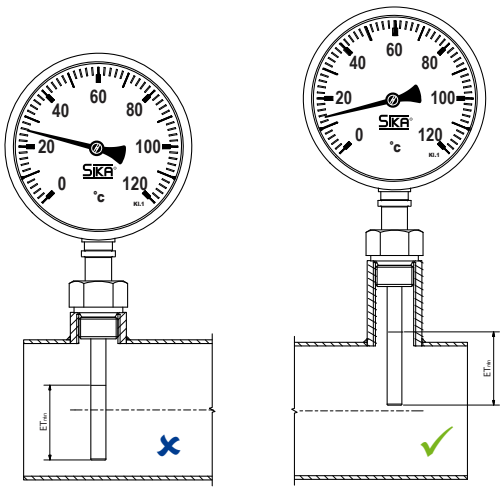
Selection of a suitable instrument

With dial thermometers there is a distinction between the scale range and the measuring range. The scale range is the range covered by the scale, such as 0...300 °C. The measuring range is a restricted portion of the scale range, such as 30...270 °C. Specifications and error limits always refer to operation within the measuring range. The measuring range is indicated on the dial plate by triangular markings.

Additional errors due to ambient conditions may occur with gas-filled thermometers if the case temperature differs from the reference temperature (23 ± 2 °C). The effect of the ambient temperature on the measurements can be minimised by keeping the active gas volume (bulb volume) very large relative to the inactive gas volume (capillary and bourdon tube).

On request, we can produce versions with bulb volume tailored to specific use cases. At high ambient temperatures, a SIKA precision bi-metal dial thermometer may be preferable.

Immersion tube length and diameter



Correct mounting Incorrect mounting

The entire length of the temperature sensor should be immersed in the medium to be measured. In any case, it must be ensured that the active length ET of the expansion bulb is fully immersed in the medium to be measured. Please see the table on the Connection Types page for the ET length. Precision dial thermometers can be produced as standard with immersion tube diameters 8, 10 and 12 mm, and some versions also with 6 mm. Immersion tube lengths up to 2.5 m are possible.

Use of protection tubes

An additional protection tube should be used when the immersion tube is exposed to high stress, such as may result from high static or dynamic pressures, high temperatures, aggressive media, high flow rates, or particles or foreign objects in the media stream. Protection tubes provide an additional benefit: they allow the thermometer to be exchanged without interrupting the process, since the protection tube is sealed and remains in the process equipment.

For more information, see chapter „Protection tubes“.

Shock and vibration

Vibration acting on the thermometer case has a detrimental effect on the operation and lifetime of the instrument. For this reason, thermometers should be mounted in a manner that achieves the lowest possible vibration level. If this is not possible, a device with a more robust construction (such as a filled case) should be used.

Integrated contact devices

We can fit our precision dial thermometers with electrical contact devices on request. They are available in different versions. Contact devices are also available for pressure gauges and are therefore described separately in the limit switches section.

Dial thermometers, industrial version

Type 341 - 347 for measuring ranges -40...600°C

Measuring system

Nitrogen filled

Accuracy (EN 13190)

Class 1

Case

Crimped-on ring, stainless steel 1.4301

Degree of protection according to EN 60529

IP65

Nominal sizes

63, 80, 100, 160 mm

Mechanical design

Rigid connection with neck tube (Types 341 - 346)
Universally adjustable (Type 347)

Connection position:

Bottom, central back, 90° to the rear, 90° to the right, 90° to the left, 135° to the rear (Types 341 - 346)
Central back, universally adjustable (Type 347)

Mounting flange:

None, optional rear mounting flange for Type 342

Display range (EN 13190)

Measuring ranges 80 to 600 K

Immersion tube

Stainless steel 1.4571
Max. static working pressure: 25 bar
Connection types: A, AK, B, Da, DN, SN
Immersion tube diameter: 8, 10 or 12 mm
Immersion tube length: up to max. 2.50 m

Window

Instrument glass

Pointer movement

German silver / brass

Dial

Aluminium, white with black scale markings

Pointer

Aluminium, black

Display correction (±6 %)

Adjustable pointer, externally accessible screw

Type 341

Special versions

- Case filling (silicone oil)
- Other immersion tube diameters, connection types and materials available on request
- Other scale ranges and / or special scales, e.g. double scale °C / °F, coloured zones or ranges, dial labelling, etc.
- Connection position radial at 3 o'clock, 9 o'clock or 12 o'clock. Others on request or installation position differing from immersion tube outlet at bottom (90°)

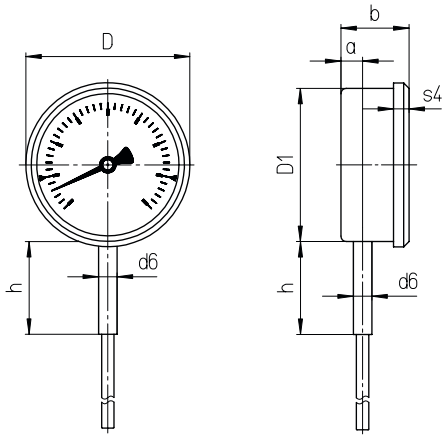
Accessories

Mechanical: see chapter "protection tubes"

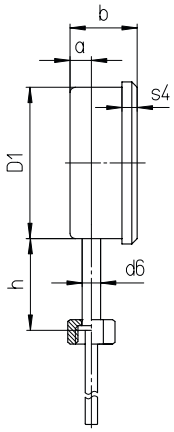
Please observe the relationship between the minimum immersion tube length and the active length (ET) and connection type.

Dimensions and weights

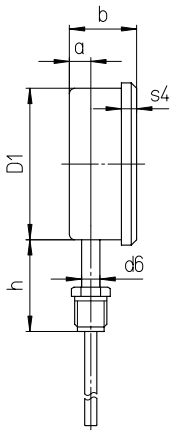
Type 341 (bottom)



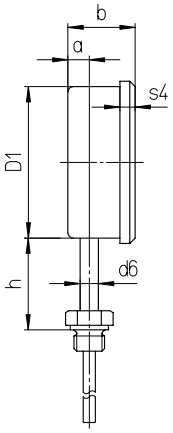
Connection types A + AK



Connection types Da and DN



Connection type SN



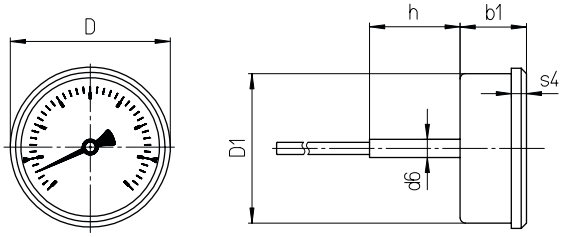
Connection type B

Dimensions [mm]								Weight [kg] (approx.)	
NS	**a**	**b**	**D**	**D1**	**d6**	**h***	**s4**	**unfilled**	**filled**
63	12	39	67	62	12	60	8	0.23	0.30
80	15	42	86	79	12	60	8	0.32	0.46
100	15	43	106	99	12	60	10	0.43	0.63
160	15	51	167	159	12	60	11	0.75	1.46

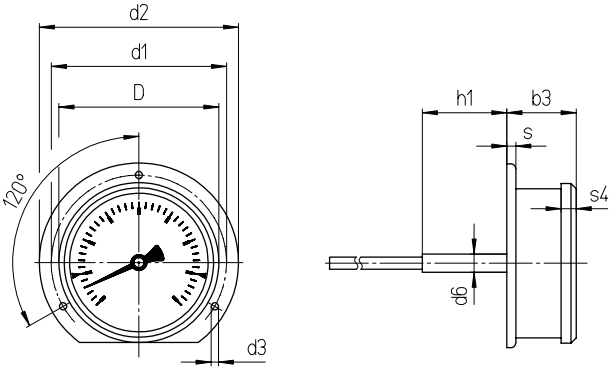
* For scale range > 500 °C: +20 mm
Display ranges ≥400 °C require an extended neck tube

This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm.

Type 342 (central back)



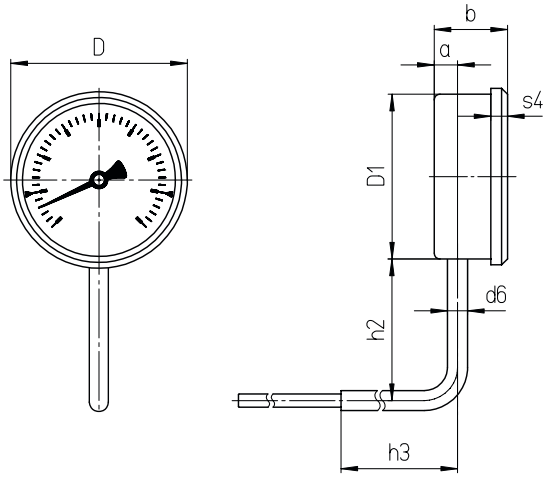
Type 342 (rear mounting flange)



Dimensions [mm]													Weight [kg] (approx.)	
NS	**b1**	**b3**	**D**	**D1**	**d1**	**d2**	**d3**	**d6**	**h***	**h1***	**s**	**s4**	**unfilled**	**filled**
63	39	42	67	62	75	85	3.6	12	60	57	5	8	0.23	0.30
80	42	45	86	79	95	110	4.8	12	60	56.5	6	8	0.32	0.46
100	43	46.5	106	99	116	132	4.8	12	60	57	6	10	0.43	0.63
160	51	54	167	159	178	196	5.8	12	60			11	0.75	1.46

* Scale range > 500 °C: +20 mm
Display ranges ≥400 °C require an extended neck tube

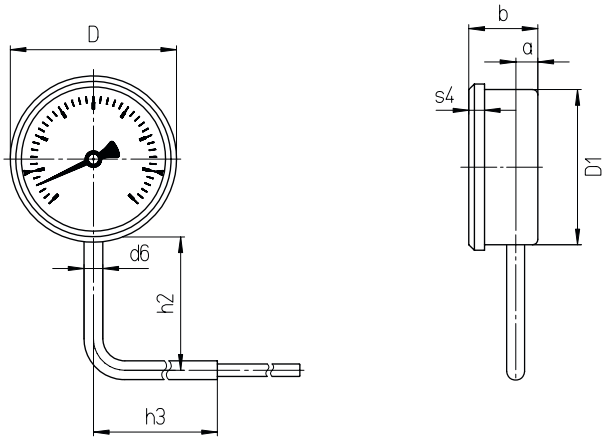
Type 343 (90° to the rear)



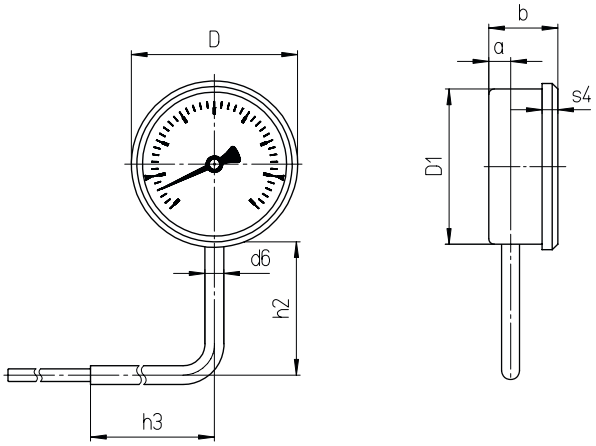
Dimensions [mm]									Weight [kg] (approx.)	
NS	**a**	**b**	**D**	**D1**	**d6**	**h2**	**h3**	**s4**	**unfilled**	**filled**
63	12	39	67	62	12	85	120	8	0.23	0.30
80	15	42	86	79	12	85	120	8	0.32	0.46
100	15	43	106	99	12	85*	120	10	0.43	0.63
160	15	51	167	159	12	109	120	11	0.75	1.46

* Filled: h2 = 109 mm

Type 344 (90° to the right)



Type 345 (90° to the left)

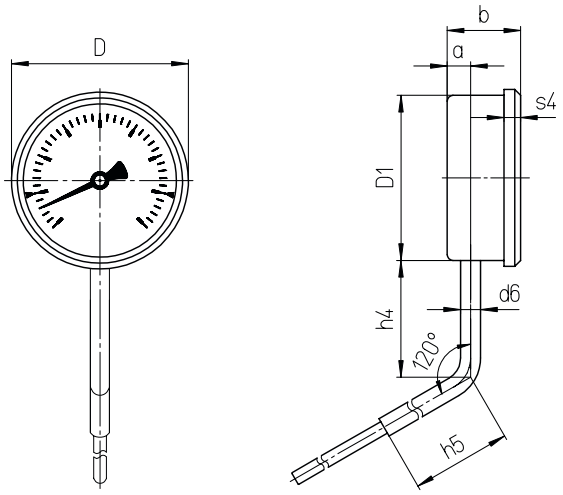


Dimensions [mm]									Weight [kg] (approx.)	
NS	a	b	D	D1	d6	h2	h3	s4	unfilled	filled
63	12	39	67	62	12	85	120	8	0.23	0.30
80	15	42	86	79	12	85	120	8	0.32	0.46
100	15	43	106	99	12	85*	120	10	0.43	0.63
160	15	51	167	159	12	109	120	11	0.75	1.46

* Filled: h2 = 109 mm

This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm.

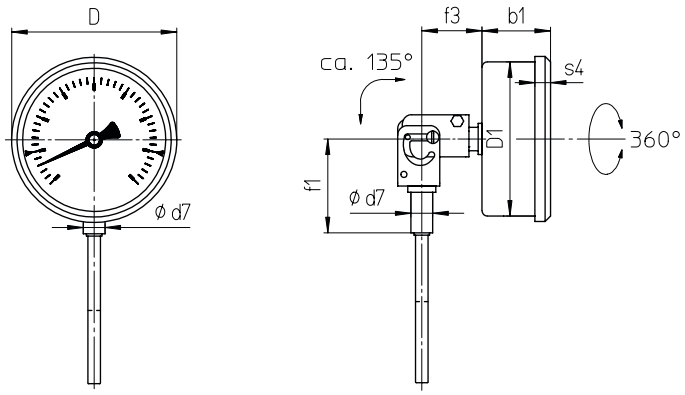
Type 346 (135° to the rear)



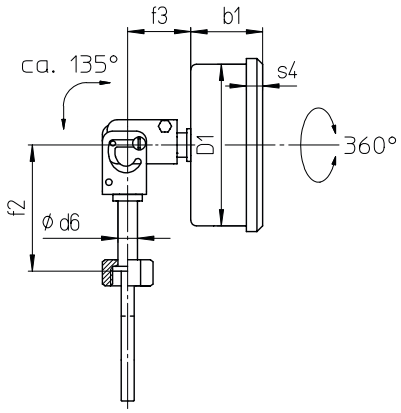
Dimensions [mm]									Weight [kg] (approx.)	
NS	a	b	D	D1	d6	h4	h5	s4	unfilled	filled
63	12	39	67	62	12	70	120	8	0.23	0.30
80	15	42	86	79	12	70	120	8	0.32	0.46
100	15	43	106	99	12	70*	120	10	0.43	0.63
160	15	51	167	159	12	70	120	11	0.75	1.46

* Filled: h4 = 94 mm

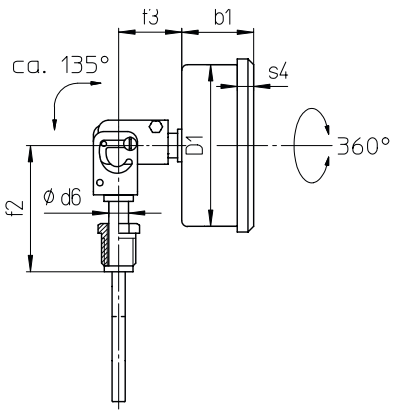
Type 347 (universally adjustable)



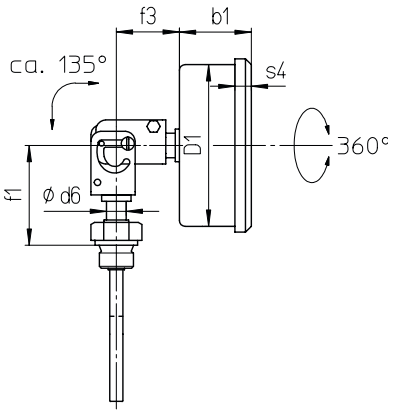
Connection types A + AK



Connection types Da and DN



Connection type SN



Connection type B

Dimensions [mm]									Weight [kg] (approx.)	
NS	b1	D	D1	d7	f1	f2	f3	s4	unfilled	filled
63	39	67	62	14	63	80	40	8	0.35	0.43
80	42	86	79	14	63	80	40	8	0.44	0.58
100	43	106	99	14	63	80	40	10	0.55	0.75
160	51	167	159	14	63	80	40	11	0.88	1.60

This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm.

Standard connection types

Our precision dial thermometers are available with various connection options. The immersion tube lengths of SIKA-specific connections are based on the corresponding standardised protection tubes.

Other connection types, immersion tubes lengths and immersion tube diameters are available on request.

Connection type A: Plain immersion tube, general purpose.
Connection type AK: With adjustable compression fitting, for direct installation or use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.
Connection type B: Fixed male thread for direct installation or use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 and DIN 16179.
Connection type Da: Union nut, for use with protection tubes compliant with DIN 43772, Form 8, 9 or DIN 16179 CS.

Connection type DN: Rotatable male thread with double threaded adapter, for use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.
Connection type SN*: Rotatable male thread, for use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.

Connection type AK - Dimensions [mm]

G	SW1	SW2	i	Lk
G½ B	27	22	14	42
G¾ B	32	22	16	42
½ NPT	27	22	19	42
¾ NPT	27	22	19	42
M20 x 1.5	27	22	14	42

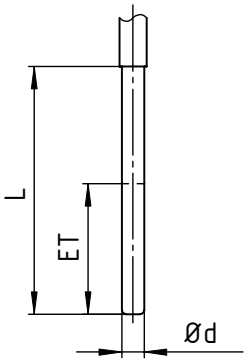
Connection type B - Dimensions [mm]

G	SW	i
G½ B	27	14
G¾ B	32	16
½ NPT	27	19
¾ NPT	27	19
M18 x 1.5	24	14
M20 x 1.5	27	14

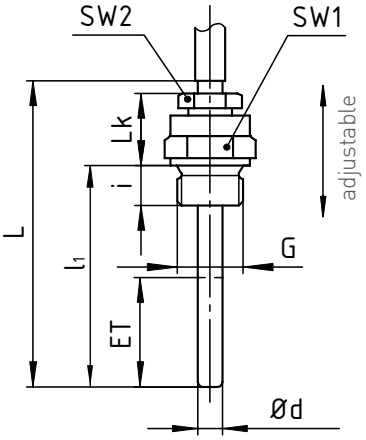
Connection type Da - Dimensions [mm]

G	SW	i
G½ B	27	10
G¾ B	32	12
M20 x 1.5	27	10
M27 x 2	32	12

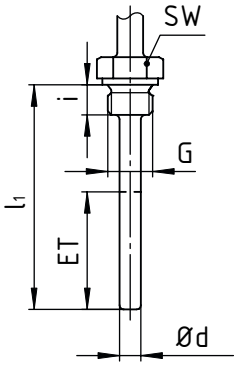
Connection type A



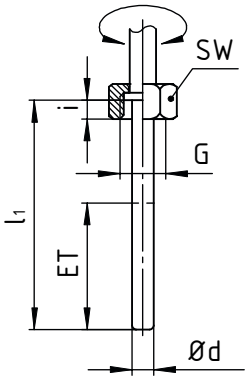
Connection type AK



Connection type B



Connection type Da



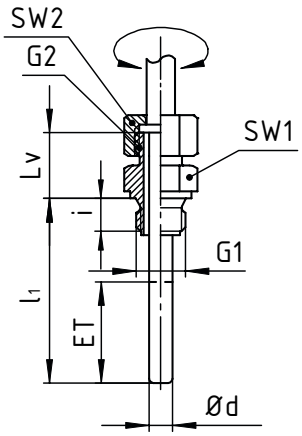
Connection type DN - Dimensions [mm]					
G	G2	SW1	SW2	i	Lv
G½ B	G½ B	27	27	14	28
G¾ B	G½ B	32	27	16	28
½ NPT	G½ B	27	27	19	28
¾ NPT	G½ B	27	27	19	28
M20 x 1.5	M20 x 1.5	27	27	14	28
M27 x 2	M20 x 1.5	32	27	16	28

Connection type SN* - Dimensions [mm]		
G	SW	i
G½ B	27	20
G¾ B	32	23
M20 x 1.5	27	20
M27 x 2	32	23

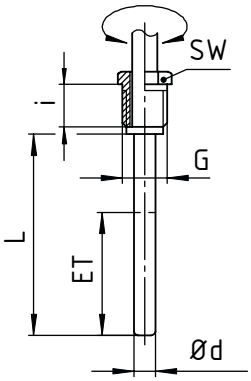
* Not sealed; protection tube necessary.

Connection type DN

Based on connection type Da, with double threaded adapter



Connection type SN*



Active length (ET) and minimum feasible immersion tube length

The active length ET of a precision dial thermometer must be fully immersed in the medium to be measured. It depends on the scale range and the immersion tube diameter. The active length ET and the connection type determine the minimum immersion tube length necessary for engineering purposes.

Connection type	Length	Thread	Up to max 0...500 °C Immersion tube diameter Ød			Over 0...500 °C Immersion tube diameter Ød		
			12	10	8	12	10	8
All types	ET		35	45	75	75	105	165
A	Lmin		55	65	95	95	125	185
AK	l1min	All general threads	48	58	88	88	118	178
B	l1min	G½, M18 x 1.5, M20 x 1.5	49	59	89	89	119	179
		G¾	51	61	91	91	121	181
		½ NPT, ¾ NPT	54	64	94	94	124	184
Da	l1min	All general threads	55	65	95	95	125	185
DN	l1min	G½, M20 x 1.5	49	59	89	89	119	179
		G¾, M27 x 2	51	61	91	91	212	181
		½ NPT, ¾ NPT	54	64	94	94	124	184
SN	Lmin	All general threads	55	65	95	95	125	185

The minimum length Lmin / $l_1$min of the immersion tube is the shortest possible immersion tube length for a given active length ET (bulb) and connection type. The active length ET of the immersion tube (bulb) must be fully immersed in the substance to be measured in order to obtain measurements corresponding to the stated accuracy class. The maximum feasible immersion tube length is 2.5 m.

Order code

Order example		Z	341	3	2	12	1002233
Thermometer type							
Bottom			341				
Central back			342				
90° to the rear			343				
90° to the right			344				
90° to the left			345				
135° to the rear			346				
Universally adjustable			347				
Nominal size							
63 mm	unfilled			1			
	filled			A			
80 mm	unfilled			2			
	filled			B			
100 mm	unfilled			3			
	filled			C			
160 mm	unfilled			4			
	filled			D			
Case material							
Stainless steel 1.4301					2		
Scale range							
-40...40 °C						44	
-40...60 °C						46	
-30...50 °C						35	
-20...60 °C						26	
-20...80 °C						28	
0...80 °C						08	
0...100 °C						10	
0...120 °C						12	
0...160 °C						16	
0...200 °C						20	
0...250 °C						25	
0...300 °C						30	
0...400 °C						40	
0...500 °C						50	
0...600 °C						60	
Connection type / immersion tube length							
Please see next page and insert here							xxxxxxx

Connection types						
Connection type A, plain immersion tube Ø10 mm						
Length L [mm]	**Plain**					
108	0631033					
145	1001033					
205	1601033					
295	2501033					
445	4001033					
Connection type AK, adjustable compression fitting with immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**½ NPT**	**¾ NPT**	
63	0639233	0639333	0639733	0639B33	0639C33	
100	1009233	1009333	1009733	1009B33	1009C33	
160	1609233	1609333	1609733	1609B33	1609C33	
250	2509233	2509333	2509733	2509B33	2509C33	
400	4009233	4009333	4009733	4009B33	4009C33	
Connection type B, fixed male thread with immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M18 x 1.5**	**M20 x 1.5**	**½ NPT**	**¾ NPT**
63	0632233	0632333	0632633	0632733	0632B33	0632C33
100	1002233	1002333	1002633	1002733	1002B33	1002C33
160	1602233	1602333	1602633	1602733	1602B33	1602C33
250	2502233	2502333	2502633	2502733	2502B33	2502C33
400	4002233	4002333	4002633	4002733	4002B33	4002C33
Connection type Da, union nut with immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**		
89* / 93**	0893233	0933333	0893733	0933933		
126* / 130**	1263233	1303333	1263733	1303933		
186* / 190**	1863233	1903333	1863733	1903933		
276* / 280**	2763233	2803333	2763733	2803933		
426* / 430**	4263233	4303333	4263733	4303933		
Connection type DN, rotatable male thread with double threaded adapter and immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**	**½ NPT**	**¾ NPT**
63	0634233	0634333	0634733	0634933	0634B33	0634C33
100	1004233	1004333	1004733	1004933	1004B33	1004C33
160	1604233	1604333	1604733	1604933	1604B33	1604C33
250	2504233	2504333	2504733	2504933	2504B33	2504C33
400	4004233	4004333	4004733	4004933	4004B33	4004C33
Connection type SN, rotatable male thread with immersion tube Ø10 mm						
Length L [mm]* **	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**		
80 / 86 / 77	0806233	0776333	0806733	0776933		
140 / 146 / 137	1406233	1376333	1406733	1376933		
230 / 236 / 227	2306233	2276333	2306733	2276933		
380 / 386 / 377	3806233	3776333	3806733	3776933		

* With G½ or M20 x 1.5 ** With G¾ or M27 x 2 *** Installation length „L" in depends on thread

On this page mentioned lengths are subject to technical feasibility; please observe the minimum immersion tube lengths in the two-page listing of standard connection types.

Diesel engine dial thermometers

Type 6312 - 1372 for measuring ranges 0...650°C

Diesel engine dial thermometer types 6312 to 1372 are the ideal solution for local temperature measurement of fluids and gases on large diesel engines, e.g. for marine propulsion or in the diesel electric power generation area. Depending on the display range, they are useful for measuring exhaust gas, cooling water, lubricating oil and charge air temperatures.

Type 1312

Measuring system
Nitrogen filled

Accuracy (EN 13190)
Class 1

Case
Crimped-on ring, stainless steel 1.4301
Case filling (silicone oil)

Degree of protection according to EN 60529
IP65

Nominal sizes
63, 80, 100 mm

Mechanical design
Rigid connection with neck tube
Connection position:
Bottom, central back
Mounting flange:
None

Display range (EN 13190)
0...100 °C, 0...120 °C, 0...160 °C, 0...250 °C, 50...650 °C

Immersion tube
Stainless steel 1.4571
Max. static working pressure: 25 bar
Connection type: A, AK
Immersion tube diameter: 10 (not for NS 100 mm), 12 or 13 mm
Immersion tube length: up to max. 400 mm
Active length (ET): 80 mm

Window
Instrument glass

Pointer movement
German silver / brass

Dial
Aluminium, silver with black scale markings

Pointer
Aluminium, black

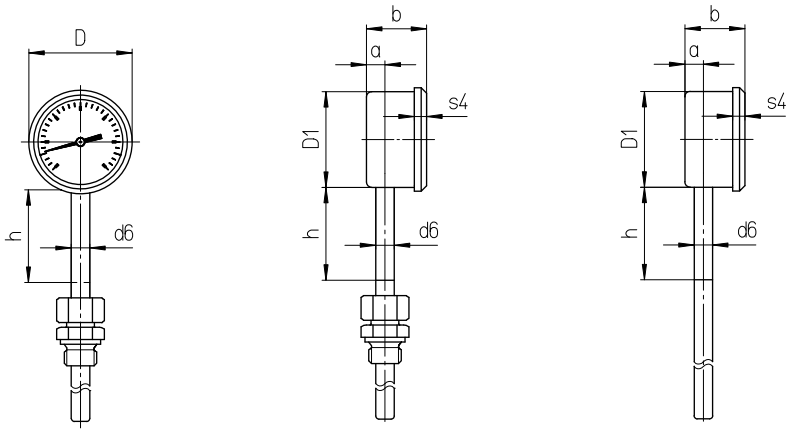
Display correction (±6 %)
Adjustable pointer, externally accessible screw

Special versions
- Other connection types on request
- Other scale ranges and / or special scales, e.g. double scale °C / °F, coloured zones or ranges, dial labelling, etc.
- Off-centered back connection (not for NS 63 mm)

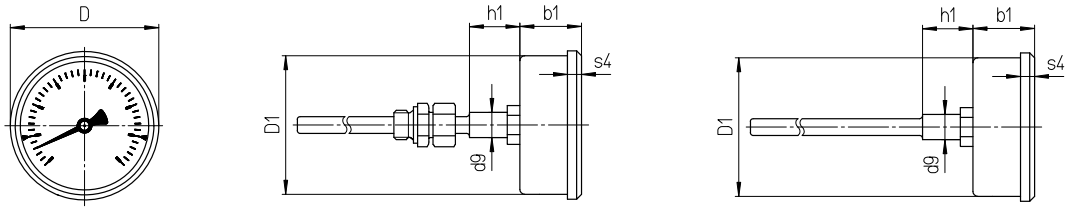
Accessories
Mechanical: see chapter "protection tubes"

Dimensions and weights

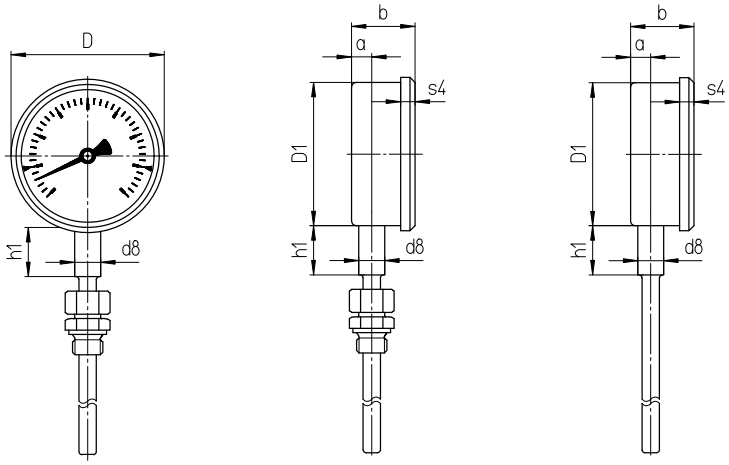
Type 6312



Type 6372, 8372 and 1372



Type 8312 and 1312



Dimensions [mm]											Weight [kg]
NG	a	b	D	D1	d6	d8	d9	h	h1	s4	
63	12	39	67	62	12		18	60		8	0.33
80	15	42	86	79	12	18	18		34	8	0.50
100	15	43	106	99	12	18	18		34	10	0.70

This information is provided as an example and relates to the version with connection type A Ø 10 mm and immersion tube length 200 mm.

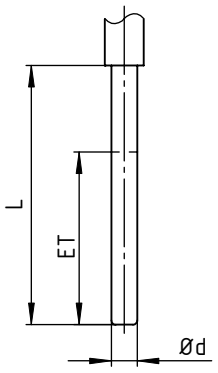
Standard connection types

Connection type A: Plain immersion tube, general purpose.
Connection type AK: With adjustable compression fitting, for direct installation or use with protection tubes.

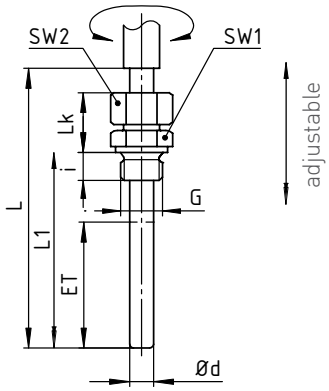
Connection type AK [mm]			
G	**SW1**	**i**	**Lk**
G½ B	27	14	35
G¾ B	32	16	37
M20 x 1.5	27	14	35
M27 x 2	32	16	37

Stem diameter [mm]	
Ø	**SW2**
10	19
12	22
13	24

Connection type A



Connection type AK



Other connection types, immersion tubes lengths and immersion tube diameters are available on request.

The minimum length Lmin / $l_1$min of the immersion tube is the shortest possible immersion tube length for a given active length ET (bulb) and connection type. The active length ET of the immersion tube (bulb) must be fully immersed in the substance to be measured in order to obtain measurements corresponding to the stated accuracy class. The maximum realisable stem length is 400 mm.

Active length (ET) and minimum feasible immersion tube length

The active length ET of a precision dial thermometer must be fully immersed in the medium to be measured. It depends on the scale range and the immersion tube diameter. The active length ET and the connection type determine the minimum immersion tube length necessary for engineering purposes.

Connection type	Length [mm]	
	ET	Lmin
A	80	150
AK	80	150

Order code

Order example	Z	63	12	A	10	1	100	0	0	3
Nominal size										
63 mm		63								
80 mm		83								
100 mm		13								
Type										
Bottom connection			12							
Central back connection			72							
Connection type										
Connection type A, plain immersion tube				A						
Connection type Ak, adjustable compression fitting				M						
Scale range										
0...100 °C					10					
0...120 °C					12					
0...160 °C					16					
0...250 °C					25					
50...650 °C					56					
Temperature unit										
°C*						1				
Immersion tube length l_1	**Nominal length L = l_1 + 45 mm**									
100 mm	145 mm						100			
135 mm	180 mm						135			
160 mm	205 mm						160			
200 mm	245 mm						200			
250 mm	295 mm						250			
300 mm	345 mm						300			
400 mm	445 mm						400			
Connection thread										
Without - plain immersion tube, type A								0		
G½								2		
G¾								3		
½ NPT								B		
¾ NPT								C		
M20 x 1.5								7		
Connection thread material										
Without - plain immersion tube, type A									0	
Steel									2	
Immersion tube diameter										
10 mm (for NS 63 and NS 80 mm only)										3
12 mm										4
13 mm										6

* Double scale °C and °F available on request.

Low temperature dial thermometers

Type 301 - 302 for measuring ranges -200...100 °C

This product group was developed to monitor temperature critical cooling applications. By using high quality materials and a proven as well as safe measuring system with nitrogen filling, our low temperature thermometers are suitable for the use on e.g. liquid gas transport ships. These measuring instruments are adapted to the specific needs of the industry and are available in several versions.

Typical Applications

- Gas transport for LNG, CNG, LPG, etc.
- Cooling ships and other cooling vehicles

Similar to our well-known diesel engine thermometers, which were specially designed for high operating temperatures on large and marine diesel engines, our low temperature dial thermometers have a mechanical design which was adapted to the harsh operating conditions in cooling applications.

- Very good readability of the shown measured value
- Protection of the measuring system by a vibration absorbing case filling
- Stable, durable housing design made of stainless steel
- Extensive product range with different measuring ranges and housing sizes
- Easy installation by variable compression fitting in numerous thread sizes

Type 301

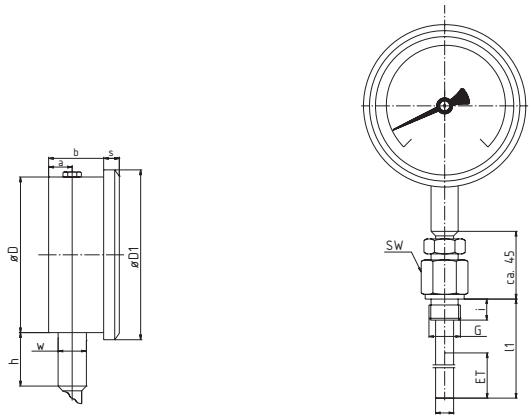
Technical data	
Display range*	-200...100 °C -150...100 °C -50...10 °C -100...50 °C
Nominal size, material	63, 80 or 100 mm, stainless steel 1.4301
Dial	Silver coloured, black markings
System	Nitrogen filled system
Immersion tube	Stainless steel
Standard immersion tube lengths (l_1)	100, 135, 160, 200, 250, 300, 400 mm
Thread connection	Adjustable compression fitting
Thread size	G½, G¾
Accuracy (EN 13190)	Class 1.0

* Double scale °C and °F available on request

Dimensions

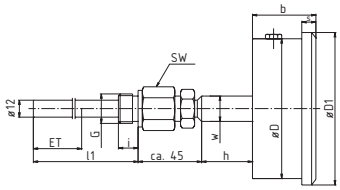
Bottom connection

Type 301



Central back connection

Type 302



Dimensions [mm]							
NS	**a**	**b**	**D**	**D1**	**h**	**s**	**w**
Type 301							
63	12	39	62	67	60	8	12
Type 302							
63	12	39	62	67	34	8	18
Type 301, 302							
80	15	42	79	86	34	8	18
Type 301, 302							
100	15	43	99	106	34	10	18

Order code

Order example	Z	301	A2	F2	100	0	0	0	3
Type									
Bottom connection		301							
Central back connection		302							
Nominal size									
63 mm			A2						
80 mm			B2						
100 mm			C2						
Scale range									
-200...100 °C				F2					
-200...50 °C				A2					
-150...100 °C				E4					
-50...100 °C				F1					
-100...50 °C				95					
Immersion tube length l_1	**Nominal length L = l_1 + 45 mm**								
100 mm	145 mm				100				
135 mm	180 mm				135				
160 mm	205 mm				160				
200 mm	245 mm				200				
250 mm	295 mm				250				
300 mm	345 mm				300				
400 mm	445 mm				400				
Connection type									
Connection type A, plain immersion tube						0			
Connection type Ak, adjustable compression fitting						9			
Connection thread									
Without - plain immersion tube, type A							0		
G½							2		
G¾							3		
½ NPT							B		
¾ NPT							C		
M20 x 1.5							7		
Connection thread material									
Without - plain immersion tube, type A								0	
Steel								2	
Immersion tube diameter									
10 mm (for NS 63 and NS 80 mm only)									3
12 mm									4
13 mm									6

* Double scale °C and °F available on request.
Please use our order numbers for standard types or provide full technical specification in case of special non-standard thermometers

Remote reading dial thermometers

SIKA types 313 - 334, 311 - 332 and 310 - 340

Our remote reading versions also operate on the expansion principle. The technical information regarding local reading dial thermometers is therefore basically applicable to them as well.

Dial thermometers types 313, 323, 333 and 334 are the tried and tested industrial solution for local temperature measurement of fluids and gases in the industrial sector. They are ideal for installation in pipelines, containers, machines and plants, have a long service life and do not require any external power.

Diesel engine remote thermometer types 311 to 332 are the ideal solution for local temperature measurement of fluids and gases on large diesel engines, e.g. for marine propulsion or in the diesel electric power generation area. Depending on the display range, they are useful for measuring exhaust gas, cooling water, lubricating oil and charge air temperatures. All models of our dial thermometers conform to EN 13190 Class 1.

Selection of a suitable instrument

Capillary length and protection

We can supply remote reading dial thermometers with capillary lengths up to 15 m. The capillary is made from stainless steel and is optionally available with capillary protection. Standard versions are supplied with plain stainless steel capillaries fitted with spiral anti-kink sleeves on both ends.

We offer two different versions for protection against mechanical damage: with a plastic jacket or with a stainless steel spiral protection. We strongly recommend the stainless steel spiral protection for applications where the capillary can be easily damaged due to exposed routing. Damage to the capillary effectively requires the replacement of the entire instrument.

If there is a high risk of damage to the capillary, a SIKA digital thermometer with a remote temperature sensor is a good alternative because it is relatively easy to repair a damaged sensor cable.

Avoiding of ambient temperature errors

Just as with local reading gas-filled thermometers, additional errors can occur due to the measuring principle when the temperature of the case or the capillary differs from the reference temperature (23 ±2 °C). With remote reading dial thermometers, longer capillaries always require larger bulb volumes. Guideline values for minimum feasible immersion tube length, active length ET and capillary length are provided in the two-page listing of connection types. The effect of ambient temperatures on measurements can be minimised by using a bulb with an active gas volume that is large compared to the inactive gas volume (capillary and bourdon tube). On request, we can produce versions with bulb volume tailored to specific use cases.

When planning the installation of the capillary, bear in mind that it should not be routed close to hot or cold objects. In cases where this is necessary, thermal insulation of the capillary is advisable. The minimum bending radius is 30 mm.

Integrated contact devices

On request, we can equip our remote reading precision dial thermometers with limit switches. These are available in various versions. The technical feasibility depends on several factors. Please request contact devices for remote reading dial thermometers on an individual basis in all cases. Limit switches are described in a separate section.

Remote reading dial thermometers, industrial version

Type 313 - 334 for measuring ranges -40...600 °C

Measuring system

Nitrogen filled

Accuracy (EN 13190)

Class 1

Case

Crimped-on ring, stainless steel 1.4301

Degree of protection according to EN 60529

IP65

Nominal sizes

63, 80, 100, 160 mm

Mechanical design

Thermometer with capillary line

Connection position:

Bottom, central back

Mounting flange:

With wall bracket, rear mounting flange, front mounting flange, with U bracket

Capillary

Stainless steel Ø 2 mm, with spiral anti-kink sleeves at both ends
Capillary length selectable from 1 m to 15 m

Display ranges (EN 13190)

Measuring ranges 80 to 600 K

Immersion tube

Stainless steel 1.4571
Max. static working pressure: 25 bar
Connection types: A, AK, Da, DN, SN
Immersion tube diameter: 8, 10 or 12 mm
Immersion tube length: up to max. 2.50 m

Window

Instrument glass

Pointer movement

German silver / brass

Dial

Aluminium, white with black scale markings

Pointer

Aluminium, black

Display correction (±6 %)

Externally accessible screw

Type 313 WH

Special versions

- Case filling (silicone oil)
- Other immersion tube diameters, connection types and materials available on request
- Capillary > 15 m on request
- Other scale ranges and / or special scales, e.g. double scale °C / °F, coloured zones or ranges, dial labelling, etc.

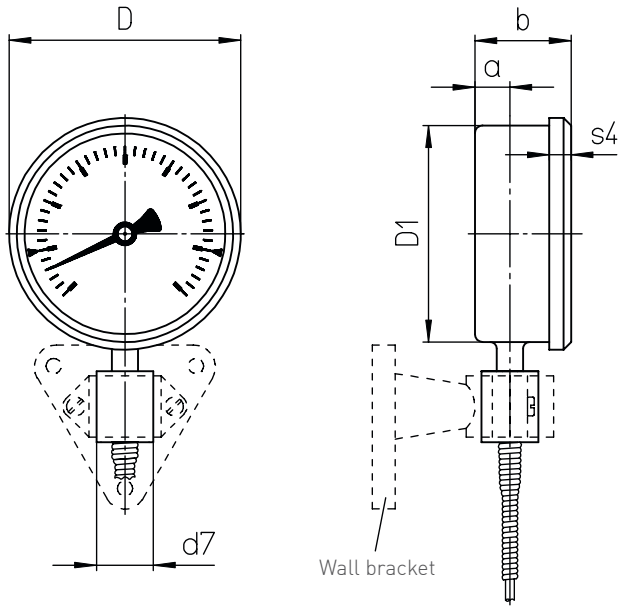
Accessories

Mechanical: see chapter "protection tubes"

Please observe the relationship between the minimum immersion tube length and the active length (ET) and connection type.

Dimensions and weights

Type 313 WH (with wall bracket)

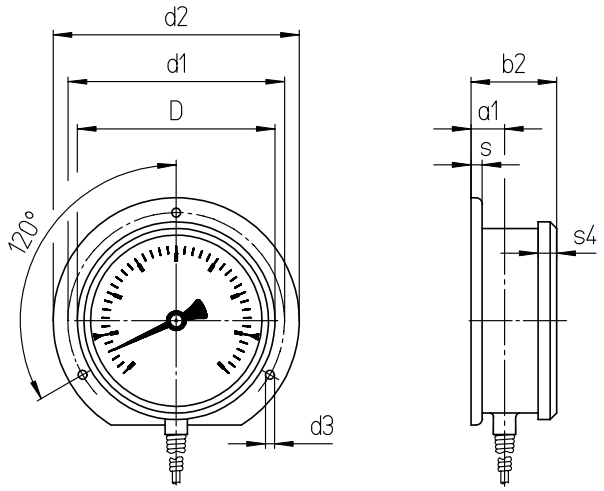


Dimensions [mm]							Weight [kg] (approx.)	
NS	**a**	**b**	**D**	**D1**	**d7**	**s4**	**unfilled**	**filled**
63	12	39	67	62	26	8	0.36	0.44
80	15	42	86	79	26	8	0.45	0.59
100	15	43	106	99	26	10	0.57	0.76
160	15	51	167	159	26	11	0.88	1.59

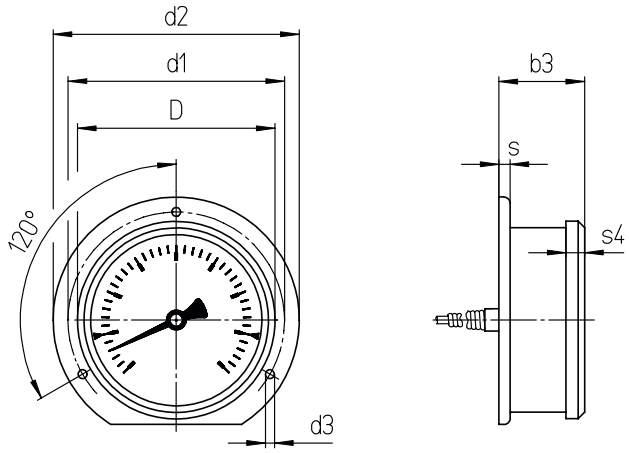
* Details concerning wall brackets can be found in the chapter „accessories".

This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm and capillary 1 m.

Type 323 TA (rear mounting flange, capillary outlet bottom)



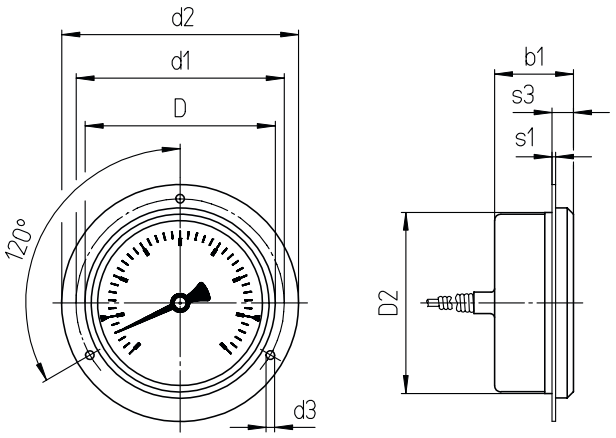
Type 323 (rear mounting flange, capillary outlet central back)*



Dimensions [mm]										Weight [kg] (approx.)	
NS	**a1**	**b2**	**b3**	**D**	**d1**	**d2**	**d3**	**s**	**s4**	**unfilled**	**filled**
63	15	42	42	67	75	85	3.6	5	8	0.36	0.44
80	18	45		86	95	110	4.8	5	8	0.45	0.59
100	18.5	46.5	46.5	106	116	132	4.8	6	10	0.57	0.76
160	18	54	54	167	178	196	5.8	6	11	0.88	1.59

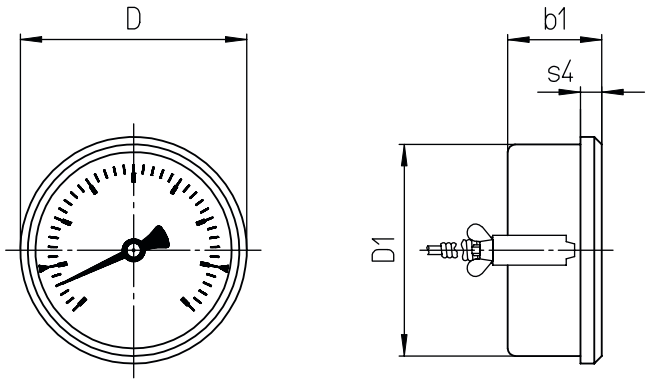
* Not available für NS 80 mm

Type 333 TE (front mounting flange, capillary outlet central back)



Dimensions [mm]									Weight [kg] (approx.)	
NS	b1	D	D2	d1	d2	d3	s1	s3	unfilled	filled
63	39	67	64	75	85	3.6	1	9	0.36	0.44
80	42	86	81	95	110	4.8	1	9	0.45	0.59
100	43	106	101	116	132	4.8	1	11.5	0.57	0.76
160	51	167		178	196	5.8			0.88	1.59

Type 334 KL (with U bracket, capillary outlet central back)



Dimensions [mm]					Weight [kg] (approx.)	
NS	b1	D	D1	s4	unfilled	filled
63	39	67	62	8	0.36	0.44
80	42	86	79	8	0.45	0.59
100	43	106	99	10	0.57	0.76
160	51	167	159	11	0.88	1.59

This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm and capillary length 1 m.

Standard connection types

Our precision dial thermometers are available with various connection options. The immersion tube lengths of SIKA-specific connections are based on the corresponding standardised protection tubes.

Connection type A: Plain immersion tube, general purpose.
Connection type AK: With adjustable compression fitting, for direct installation or use with protection tubes compliant with DIN 43772, Form 4, 5 and 6, or DIN 16179.
Connection type Da: Union nut, for use with protection tubes compliant with DIN 43772, Form 8 or 9, or DIN 16179 CS.

Connection type DN: Rotatable male thread with double threaded adapter, for use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.
Connection type SN*: Rotatable male thread, for use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.

Other connection types, immersion tubes lengths and immersion tube diameters are available on request.

Connection type AK - Dimensions [mm]

G	SW1	SW2	i	Lk
G½ B	27	22	14	42
G¾ B	32	22	16	42
½ NPT	27	22	19	42
¾ NPT	27	22	19	42
M20 x 1.5	27	22	14	42

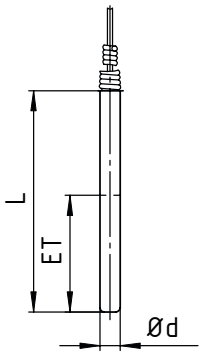
Connection type Da - Dimensions [mm]

G	SW	i
G½ B	27	10
G¾ B	32	12
M20 x 1.5	27	10
M27 x 2	32	12

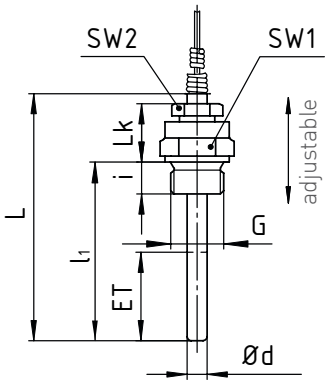
Connection type DN - Dimensions [mm]

G1	G2	SW1	SW2	i	Lv
G½ B	G½ B	27	27	14	28
G¾ B	G½ B	32	27	16	28
½ NPT	G½ B	27	27	19	28
¾ NPT	G½ B	27	27	19	28
M20 x 1.5	M20 x 1.5	27	27	14	28
M27 x 2	M20 x 1.5	32	27	16	28

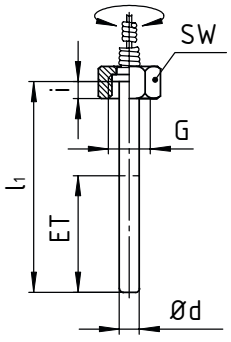
Connection type A



Connection type AK

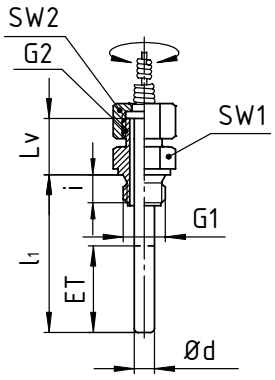


Connection type Da



Connection type DN

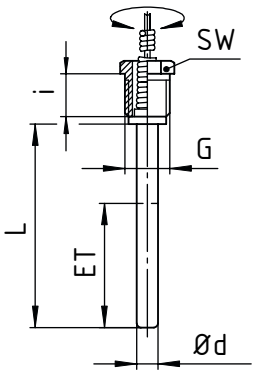
Based on connection type Da, with double threaded adapter



Connection type SN* - Dimensions [mm]		
G	**SW**	**i**
G½ B	27	20
G¾ B	32	23
M20 x 1.5	27	20
M27 x 2	32	23

* * Not sealed; protection tube necessary.

Connection type SN*



Active length (ET) and minimum feasible immersion tube length

The active length ET of a precision dial thermometer must be fully immersed in the medium to be measured. It depends on the scale range and the immersion tube diameter. The active length ET and the connection type determine the minimum immersion tube length necessary for engineering purposes.

Connection type	Length	Thread	Capillary length up to 5 m Immersion tube diameter Ød						Capillary length >5 m up to 15 m Immersion tube diameter Ød					
			Up to max 0...500 °C			Over 0...500 °C			Up to max 0...500 °C			Over 0...500 °C		
			12	10	8	12	10	8	12	10	8	12	10	8
All types	ET		35	45	75	75	105	165	53	80	115	150	200	320
A	Lmin		55	65	95	95	125	185	73	100	135	170	220	340
AK	l1min	All standard threads	48	58	88	88	118	178	73	100	135	170	220	340
Da	l1min	All standard threads	55	65	95	95	125	185	73	100	135	170	220	340
DN	l1min	G½, M20 x 1.5	49	59	89	89	119	179	69	96	131	166	216	336
		G¾, M27 x 2	51	61	91	91	121	181	72	99	134	169	219	339
		½ NPT, ¾ NPT	54	64	94	94	124	184	108	135	170	205	255	375
SN*	Lmin	All standard threads	55	65	95	95	125	185	73	100	135	170	220	340

The minimum length Lmin / $l_1$min of the immersion tube is the shortest possible immersion tube length for a given active length ET (bulb) and connection type. The active length ET of the immersion tube (bulb) must be fully immersed in the substance to be measured in order to obtain measurements corresponding to the stated accuracy class.

Order code

Order example		Z	313	3	2	12	27632B	5	C
Thermometer type									
With wall bracket			313						
With rear mounting flange			323						
With front mounting flange*			333						
With U bracket			334						
Nominal size									
63 mm	unfilled			1					
	filled			A					
80 mm	unfilled			2					
	filled			B					
100 mm	unfilled			3					
	filled			C					
160 mm	unfilled			4					
	filled			D					
Case material									
Stainless steel 1.4301					2				
Scale range									
-40...40 °C						44			
-40...60 °C						46			
-30...50 °C						35			
-20...60 °C						26			
-20...80 °C						28			
0...80 °C						08			
0...100 °C						10			
0...120 °C						12			
0...160 °C						16			
0...200 °C						20			
0...250 °C						25			
0...300 °C						30			
0...400 °C						40			
0...500 °C						50			
0...600 °C						60			
Connection type / immersion tube length									
Please see next page and insert here							27632B		
Capillary length									
Length in meter								_	
Capillary protection									
Without capillary protection (with spiral anti-kink sleeves at both ends)									B
With stainless steel spiral protection									C
With plastic protection									D

* Not available for NS 160 mm.

Connection types						
Connection type A, plain immersion tube Ø10 mm						
Length L [mm]	**Plain**					
108	06310B					
145	10010B					
205	16010B					
295	25010B					
445	40010B					
Connection type AK, adjustable compression fitting with immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**½ NPT**	**¾ NPT**	
63	06392B	06393B	06397B	0639BB	0639CB	
100	10092B	10093B	10097B	1009BB	1009CB	
160	16092B	16093B	16097B	1609BB	1609CB	
250	25092B	25093B	25097B	2509BB	2509CB	
400	40092B	40093B	40097B	4009BB	4009CB	
Connection type Da, union nut with immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**		
89* / 93**	08932B	09333B	08937B	09339B		
126* / 130**	12632B	13033B	12637B	13039B		
186* / 190**	18632B	19033B	18637B	19039B		
276* / 280**	27632B	28033B	27637B	28039B		
426* / 430**	42632B	43033B	42637B	43039B		
Connection type DN, rotatable male thread with double threaded adapter and immersion tube Ø10 mm						
Length l_1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**	**½ NPT**	**¾ NPT**
63	06342B	06343B	06347B	0634BB	0634BB	0634CB
100	10042B	10043B	10047B	1004BB	1004BB	1004CB
160	16042B	16043B	16047B	1604BB	1604BB	1604CB
250	25042B	25043B	25047B	2504BB	2504BB	2504CB
400	40042B	40043B	40047B	4004BB	4004BB	4004CB
Connection type SN, rotatable male thread with immersion tube Ø10 mm						
Length L [mm]* **	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**		
80	08062B	08063B	08067B	08069B		
140	14062B	14063B	14067B	14069B		
230	23062B	23063B	23067B	23069B		
380	38062B	38062B	38067B	38069B		

* With G½ or M20 x 1.5 ** With G¾ or M27 x 2 *** Installation length L depends on thread

On this page mentioned lengths are subject to technical feasibility; please observe the minimum immersion tube lengths in the two-page listing of standard connection types.

Remote reading diesel engine dial thermometers

Type 311 - 332 for measuring ranges 0...650 °C

Measuring system

Nitrogen filled

Accuracy (EN 13190)

Class 1

Case

Crimped-on ring, stainless steel 1.4301
Case filling (silicone oil)

Degree of protection according to EN 60529

IP65

Nominal sizes

80, 100 mm

Mechanical design

Thermometer with capillary line
Connection position:
Bottom, central back
Mounting flange:
With wall bracket, rear mounting flange, front mounting flange, with U bracket

Capillary

Stainless steel Ø 2 mm, with spiral anti-kink sleeves at both ends
Capillary length selectable from 1 m to 15 m

Display ranges (EN 13190)

0...100 °C, 0...120 °C, 0...160 °C, 0...250 °C, 50...650 °C

Immersion tube

Stainless steel 1.4571
Max. static working pressure: 25 bar
Connection types: A, AK, Da
Immersion tube diameter: 12 mm
Immersion tube length: up to max. 400 mm

Window

Instrument glass

Pointer movement

German silver / brass

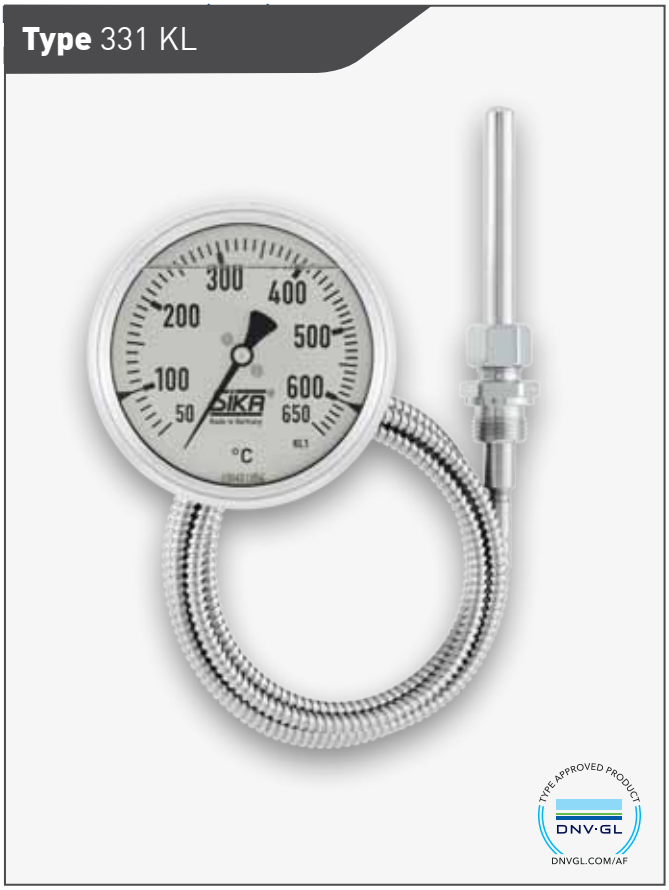
Dial

Aluminium, white with black scale markings
Aluminium, silver with black scale markings
(for scale range 50...650 °C)

Pointer

Aluminium, black

Type 331 KL



Special versions

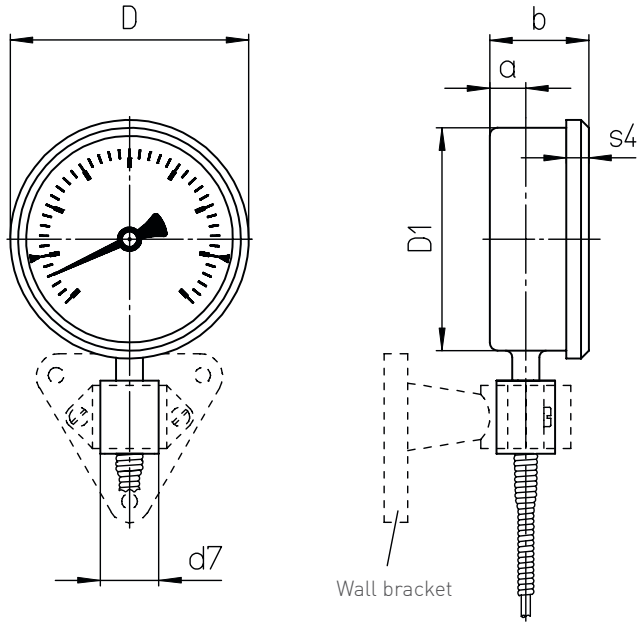
- Other immersion tube diameters and connection types on request
- Capillary >15 m on request
- Other scale ranges and / or special scales, e.g. double scale °C / °F, coloured zones or ranges, dial labelling, etc.

Accessories

Mechanical: see chapter "protection tubes"

Dimensions and weights

Type 311 WH (with wall bracket)

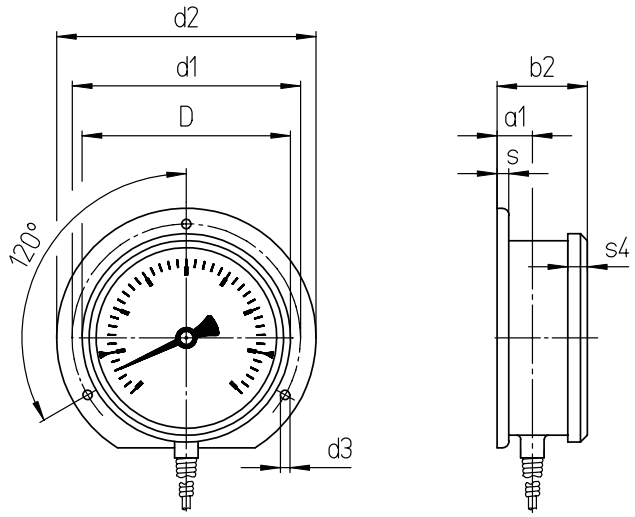


Dimensions [mm]							Weight [kg]
NS	**a**	**b**	**D**	**D1**	**d7**	**s4**	**filled**
80	15	42	86	79	26	8	0.60
100	15	43	106	99	26	10	0.78

* Details concerning wall brackets can be found in the chapter „accessories".

This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm and capillary 1 m.

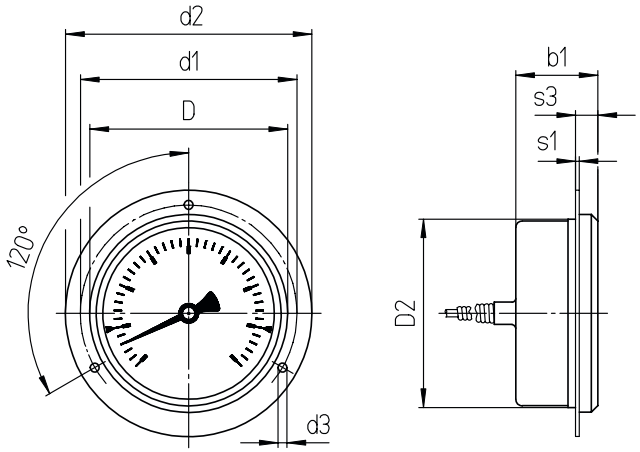
Type 321 TA (rear mounting flange, capillary outlet bottom)



Dimensions [mm]									Weight [kg]
NS	a1	b2	D	d1	d2	d3	s	s4	filled
80	18	45	86	95	110	4.8	5	8	0.60
100	18.5	46.5	106	116	132	4.8	6	10	0.78

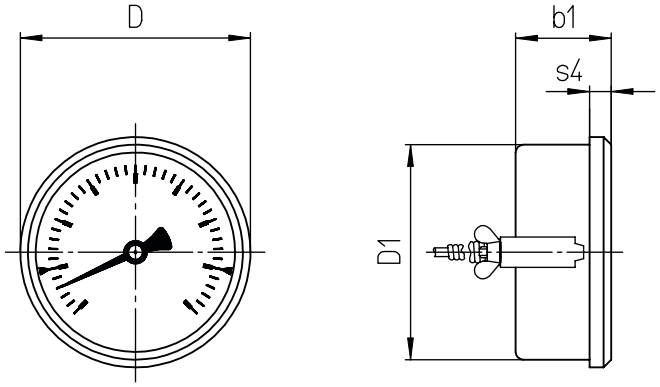
This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm and capillary 1 m.

Type 332 TE (front mounting flange, capillary outlet central back)



Dimensions [mm]									Weight [kg]
NS	b1	D	D2	d1	d2	d3	s1	s3	filled
80	42	86	81	95	110	4.8	1	9	0.60
100	43	106	101	116	132	4.8	1	11.5	0.78

Type 331 KL (with U bracket, capillary outlet central back)



Dimensions [mm]					Weight [kg]
NG	b1	D	D1	s4	filled
80	42	86	79	8	0.60
100	43	106	99	10	0.78

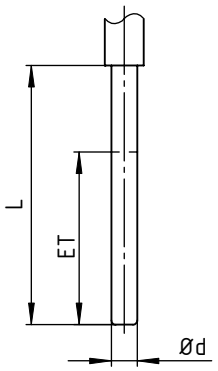
This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm and capillary length 1 m.

Standard connection types

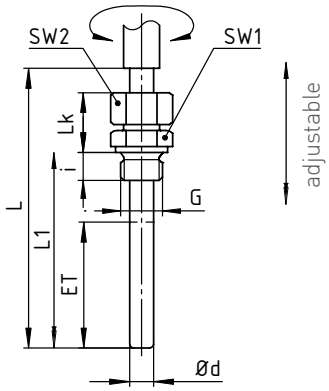
Connection type A: Plain immersion tube, general purpose.
Connection type AK: With adjustable compression fitting, for direct installation or use with protection tubes.

Connection type AK [mm]				
G	**SW1**	**SW2**	**i**	**Lk**
G½ B	27	22	14	42
G¾ B	32	22	16	42
½ NPT	27	22	19	42
¾ NPT	27	22	19	42
M20 x 1.5	27	22	14	42

Connection type A



Connection type AK



Other connection types, immersion tubes lengths and immersion tube diameters are available on request.

The minimum length Lmin / $l_1$min of the immersion tube is the shortest possible immersion tube length for a given active length ET (bulb) and connection type. The active length ET of the immersion tube (bulb) must be fully immersed in the substance to be measured in order to obtain measurements corresponding to the stated accuracy class.

Active length (ET) and minimum feasible immersion tube length

The active length ET of a precision dial thermometer must be fully immersed in the medium to be measured. It depends on the scale range and the immersion tube diameter. The active length ET and the connection type determine the minimum immersion tube length necessary for engineering purposes.

	Capillary length < 5 m		Capillary length > 5 m	
Connection type	**Length**		**Length**	
	ET	**Lmin**	**ET**	**Lmin**
A	80	150	120	175
AK	80	150	120	175

Order code

Order example		Z	311	B2	10	135	1	0	2	1	C
Type											
With wall bracket			311								
With rear mounting flange			321								
With front mounting flange*			331								
With U bracket			332								
Nominal size											
80 mm				B2							
100 mm				C2							
Scale range											
0...100 °C					10						
0...120 °C					12						
0...160 °C					16						
0...250 °C					25						
50...650 °C					56						
Immersion tube length l_1	**Nominal length l_1 + 45 mm**										
100 mm	145 mm					100					
135 mm	180 mm					135					
160 mm	205 mm					160					
200 mm	245 mm					200					
250 mm	295 mm					250					
300 mm	345 mm					300					
400 mm	445 mm					400					
Connection type											
Connection type A, plain immersion tube							1				
Connection type AK, adjustable compression fitting							9				
Connection thread											
Without - plain immersion tube								0			
G½								2			
G¾								3			
½ NPT								B			
¾ NPT								C			
M20 x 1.5								7			
Immersion tube diameter											
Ø 12 mm									2		
Capillary length											
1 m										1	
3 m										3	
5 m										5	
Length in meter										_	
Capillary material, protection											
Stainless steel, stainless steel spiral protection											C

* Double scale °C and °F available on request.

Remote reading low temperature dial thermometers

Type 310 - 340 for measuring ranges -200...100 °C

This product group was developed to monitor temperature critical cooling applications. By using high quality materials and a proven as well as safe measuring system with nitrogen filling, our low temperature thermometers are suitable for the use in various cooling applications. These measuring instruments are adapted to the specific needs of the industry and are available in several versions.

Typical Applications

- Gas transport for LNG, CNG, LPG, etc.
- Cooling ships and other cooling vehicles

Our remote reading low temperature dial thermometers were specifically developed for measuring points which are not directly accessible. The capillary of these measuring devices is protected by a stainless steel spiral tube and therefore always adapted to the demanding operating conditions on the high seas.

- Very good readability of the shown measured value
- Protection of the measuring system by a vibration absorbing case filling
- Stable, durable housing design made of stainless steel
- Extensive product range with different measuring ranges and housing sizes
- Easy installation by variable compression fitting in numerous thread sizes

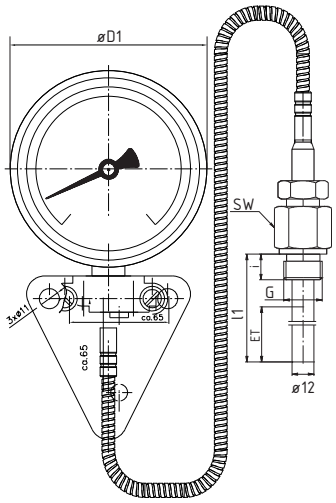
Type 320

Technical data	
Display range*	-200...100 °C -150...100 °C -50...10 °C -100...50 °C
Nominal size, material	80 or 100 mm, stainless steel 1.4301
Dial	Silver coloured, black markings
System	Nitrogen filled system
Immersion tube	Stainless steel
Standard immersion tube length (l_1)	100, 135, 160, 200, 250, 300, 400 mm
Thread connection	Adjustable compression fitting
Thread size	G½, G¾
Accuracy (EN 13190)	Class 1.0, Limits of error acc. DIN EN 13190

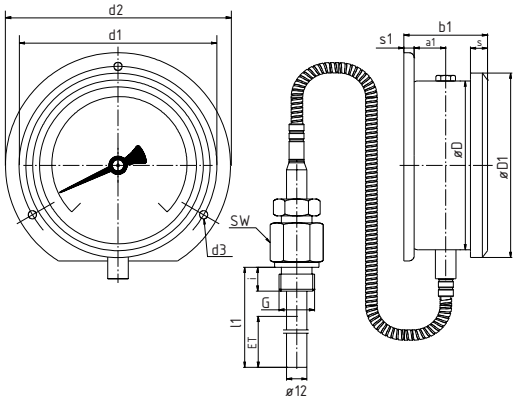
* Double scale °C and °F available on request

Dimensions

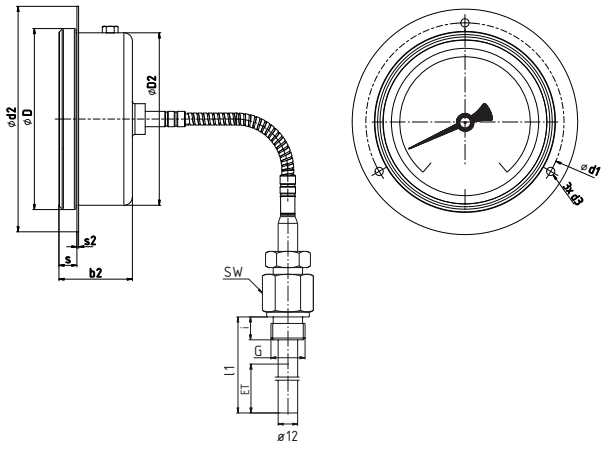
Type 310 WH
with wall bracket



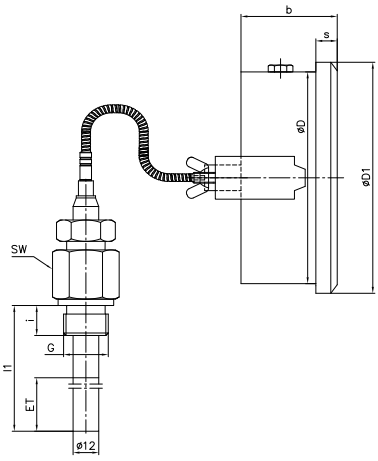
Type 320 TA
with rear mounting flange



Type 330 TE
with front mounting flange



Type 340 KL
U-clamp for panel mounting



Dimensions [mm]

NS	a1	b1	b2	D	D1	d1	d2	d3	s	s1	s2
80	18	48	42	79	86	95	110	4,8	8	5	1
100	18.5	49	43	99	106	116	132	4,8	10	6	1

Order code

Oder example	Z	310	B2	10	100	1	0	2	1	C
Type										
With wall bracket		310								
With rear mounting flange		320								
With front mounting flange		330								
With U bracket		340								
Nominal size										
80 mm			B2							
100 mm			C2							
Scale range										
-200...100 °C				F2						
-200...50 °C				A2						
-150...100 °C				E4						
-50...10 °C				F1						
-100...50 °C				95						
Immersion tube length l_1	**Nominal length L = l_1 +45 mm**									
100 mm	145 mm				100					
135 mm	180 mm				135					
160 mm	205 mm				160					
200 mm	245 mm				200					
250 mm	295 mm				250					
300 mm	345 mm				300					
400 mm	445 mm				400					
Connection type										
Connection type A, plain immersion tube						1				
Connection type Ak, adjustable compression fitting						9				
Connection thread										
Without - plain immersion tube							0			
G½							2			
G¾							3			
½ NPT							B			
¾ NPT							C			
M20 x 1.5							7			
Immersion tube diameter										
Ø 12 mm								2		
Capillary length										
1 m									1	
3 m									3	
5 m									5	
Length in meter									_	
Capillary material, protection										
Stainless steel, stainless steel spiral protection										C

* Double scale °C and °F available on request.

Please use our order numbers for standard types or provide full technical specification in case of special non-standard thermometers

Bi-metal dial thermometers

SIKA types 621-681

Our local reading industrial thermometers operate on the bi-metal coil principle. The bi-metal coil is enclosed in a stainless steel immersion tube and exposed to the temperature of the measured medium. The coil twist varies with rising or falling temperature. This twist acts directly on the pointer via an axle. The resulting pointer deflection is therefore proportional to the change in temperature.

All models of SIKA precision bi-metal dial thermometers conform to EN 13190 Class 1.

Selection of a suitable instrument

Immersion tube length and diameter

The entire length of the immersion tube should be immersed in the medium to be measured. In any case, it must be ensured that the active length ET is fully immersed in the medium to be measured. Please see the table on the connection types page for the ET length. Bi-metal dial thermometers can be produced with immersion tube diameters of 6 and 8 mm (optionally 10 mm) and lengths up to 800 mm.

Use of protection tubes

An additional thermometer protection tube should be used when the immersion tube is exposed to high stress, such as may result from high static or dynamic pressures, high temperatures, aggressive media, high flow rates, or particles or foreign objects in the media stream. They are described in the Thermometer Protection Tubes section. Protection tubes provide an additional benefit: they allow the thermometer to be exchanged without interrupting the process, since the protection tube is sealed and remains in the process equipment.

Scale range, measuring range and error limits

With dial thermometers there is a distinction between the scale range and the measuring range. The scale range is the range covered by the scale, such as 0...300 °C. The measuring range is a restricted portion of the scale range, such as 30...270 °C in this example. Specifications and error limits always refer to operation within the measuring range. The measuring range is indicated on the dial plate by triangular markings.

A significant advantage of bi-metal dial thermometers is their lack of sensitivity to ambient temperatures. The only temperature-dependent element is the bi-metal coil. Bi-metal dial thermometers can be used, transported and stored over an ambient temperature range of -40 to +60 °C, or -20 to +60 °C with case filling. Bi-metal dial thermometers are therefore also suitable for outdoor use, e.g. with direct exposure to sunlight.

Shock and vibration

Vibration acting on the thermometer case has a detrimental effect on the operation and lifetime of the instrument. For this reason, thermometers should be mounted in a manner that achieves the lowest possible vibration level. If this is not possible, a device with a construction that is more resistant to vibration (e.g. with case filling) should be used. Due to their mechanical structure, filled versions of bi-metal dial thermometers are only available with scale ranges up to 250 °C.

Bi-metal dial thermometer, crimped-on ring case

Type 621 - 681 for measuring ranges -40...600 °C

Measuring system

Bi-metal coil

Accuracy (EN 13 190)

Class 1

Case

Crimped-on ring, stainless steel 1.4301

Degree of protection according to EN 60529

IP65

Nominal sizes

63, 80, 100, 125, 160 mm

Mechanical design

Rigid connection with neck tube (Types 621 - 631)
Universally adjustable (Type 681)
Connection position:
Bottom (NS 63, 80, 100 mm only) or central back
Option central back, without neck tube, for connection type A, AK and B (Type 621)
Central back, universally adjustable (Type 681)
Mounting flange:
None

Scale ranges (EN 13 190)

Measuring ranges 60 to 600 K

Immersion tube

Stainless steel 1.4571
Max. static working pressure: 25 bar
Connection types: A, AK, B, Da, Dc, SN, DN (only types 621 - 631)
Immersion tube diameter: 6 or 8 mm (option 10 mm)
Immersion tube length: up to max. 800 mm

Window

Instrument glass

Dial

Aluminium, white with black scale markings

Pointer

Adjustable pointer aluminium black

Display correction (±4 %)

Externally accessible screw

Type 631

Special versions

- Case filling (silicone oil)
- Other connection types and materials available on request
- Other scale ranges and / or special scales, e.g. double scale °C / °F, coloured zones or ranges, dial labelling, etc.
- Connection position radial at 3 o'clock, 9 o'clock or 12 o'clock
- Others on request or installation position differing from immersion tube outlet at bottom

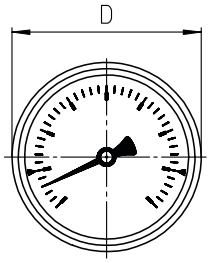
Accessories

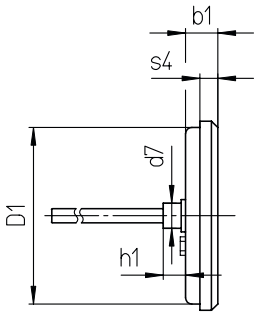
Mechanical: see chapter "protection tubes"

Please observe the relationship between the minimum immersion tube length and the active length (ET) and connection type.

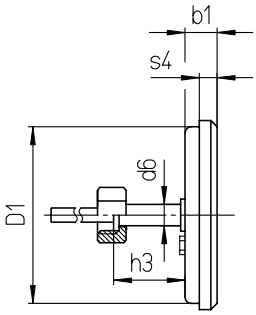
Dimensions and weights

Type 621 (central back)

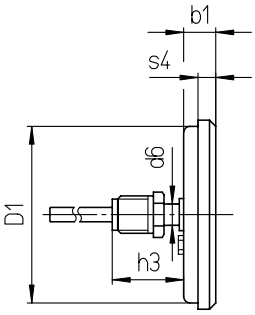




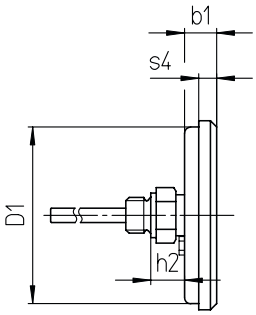
Connection types A + AK



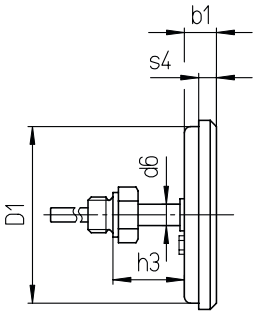
Connection types Da / Dc and DN



Connection type SN



Connection type B
without neck tube (standard)



Connection type B
with neck tube (option)

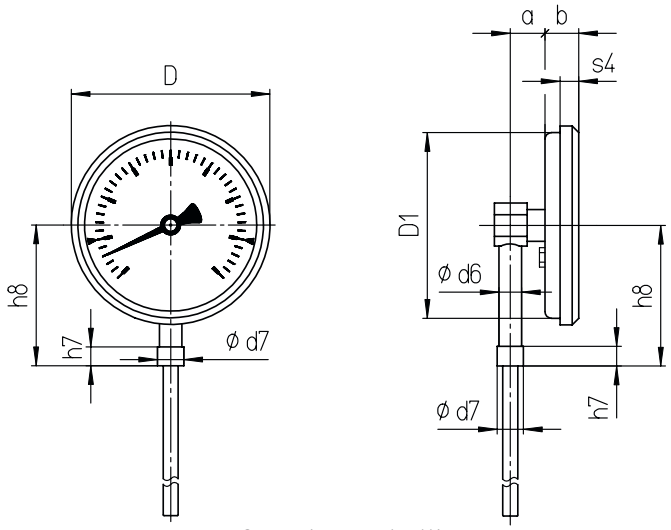
Dimensions [mm]										Weight [kg] (approx.)	
NS	**b1**	**D**	**D1**	**d6**	**d7**	**h1***	**h2***	**h3*/****	**s4**	**unfilled**	**filled**
63	17	67	62	12	14	12.5	19	40	8	0.18	0.20
80	18	86	79	12	14	12.5	19	40	8	0.22	0.27
100	18	106	98	12	14	12.5	19	40	10	0.29	0.37
125	20	136	125	12	14	12.5	19	40	11	0.36	0.47
160	21	167	159	12	14	12.5	19	40	11	0.46	0.66

* For connection type SN with thread G¾ B: h3 = 50 mm

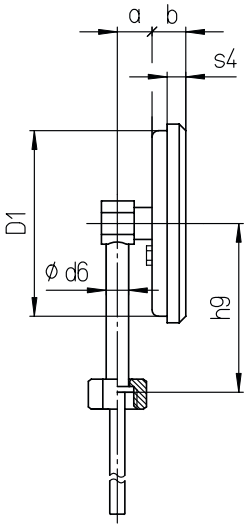
**Display ranges ≥400 °C require an extended neck tube at small sensor lengths

This information is provided as an example and relates to the version with connection type A, Ø 8 mm and immersion tube length 100 mm.

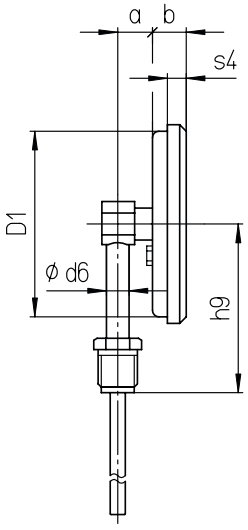
Type 631 (bottom)



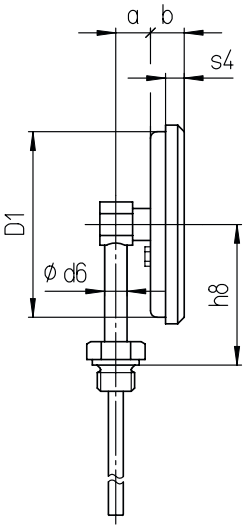
Connection types A + AK



Connection types Da / Dc and DN



Connection type SN

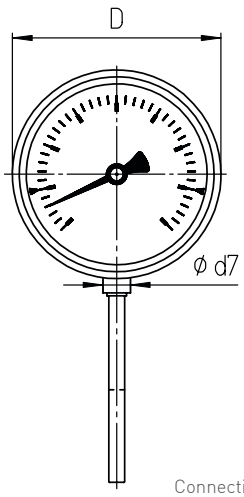


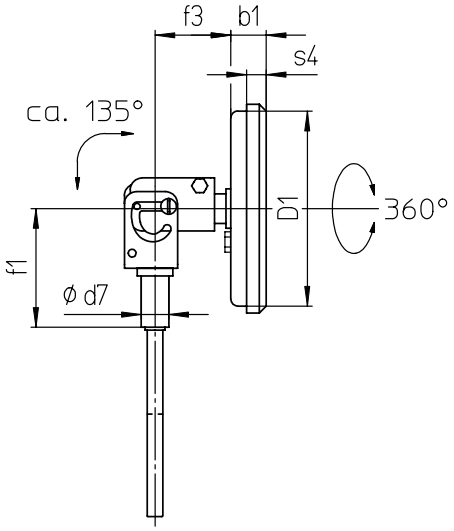
Connection type B

Dimensions [mm]											Weight [kg] (approx.)	
NS	**a**	**b**	**D**	**D1**	**d6**	**d7**	**h7**	**h8***	**h9***	**s4**	**unfilled**	**filled**
63	18.5	17	67	62	12	14	10.5	55	70	8	0.18	0.20
80	18.5	18	86	79	12	14	10.5	65	80	8	0.22	0.27
100	18.5	18	106	98	12	14	10.5	75	90	10	0.29	0.37
125	18.5	20	136	125	12	14	10.5	85	102	11		
160			167	159	12	14				11		

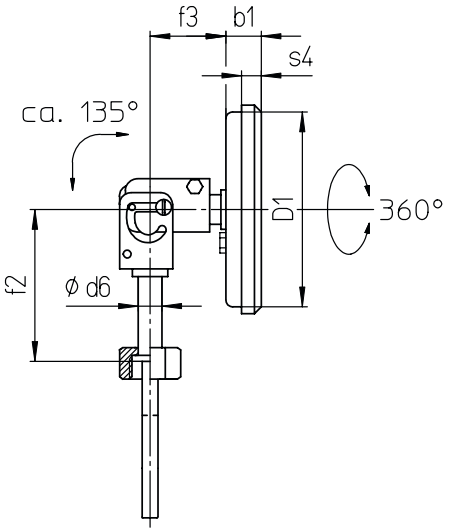
*Display ranges ≥400 °C require an extended neck tube at small sensor lengths

Type 681 (universally adjustable)

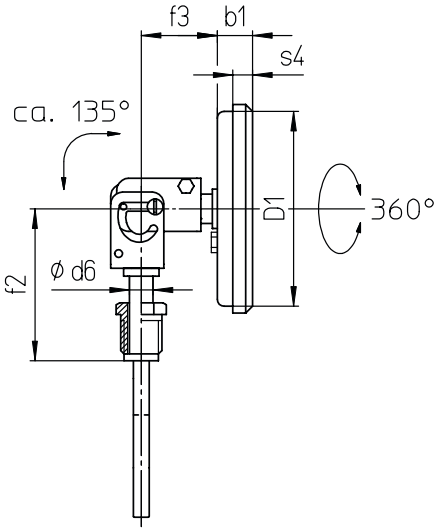




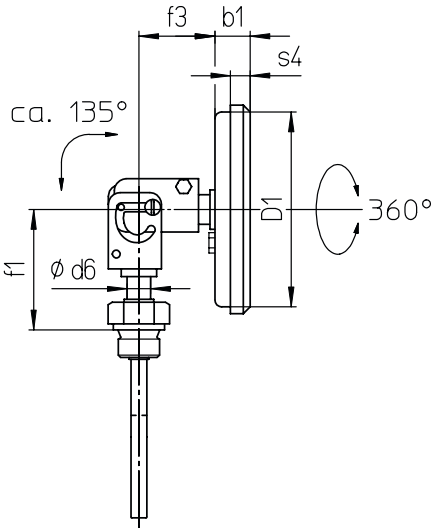
Connection types A + AK



Connection types Da / Dc and DN



Connection type SN



Connection type B

Dimensions [mm]										Weight [kg] (approx.)	
NS	b1	D	D1	d6	d7	f1*	f2*	f3	s4	unfilled	filled
63	17	67	62	12	14	63	80	40	8	0.28	0.31
80	18	86	79	12	14	63	80	40	8	0.32	0.37
100	18	106	98	12	14	63	80	40	10	0.39	0.46
125	20	136	125	12	14	63	80	40	11	0.49	0.65
160	21	167	159	12	14	63	80	40	11	0.64	0.84

*Display ranges ≥400 °C require an extended neck tube at small sensor lengths

This information is provided as an example and relates to the version with connection type A, Ø 8 mm, and immersion tube length 100 mm.

Standard connection types

Our precision bi-metal dial thermometers are available with various connection options. The immersion tube lengths of SIKA-specific connections are based on the corresponding standardised protection tubes.

Connection type A: Plain immersion tube, general purpose.
Connection type AK: With adjustable compression fitting, for direct installation or use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.
Connection type B: Fixed male thread for direct installation or use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 and DIN 16179.
Connection type Da: Union nut, for use with protection tubes compliant with DIN 43772, Form 8, 9 or DIN 16179 CS.
Connection type Dc: Union nut, specifically for use with weld-in protection tubes compliant with DIN 43772, Form 4 (in combination with neck tube or double threaded adapter).
Connection type DN: Rotatable male thread with double threaded adapter, for use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.
Connection type SN*: Rotatable male thread, for use with protection tubes compliant with DIN 43772, Form 4, 5 and 6 or DIN 16179.

Other connection types, immersion tubes lengths and immersion tube diameters are available on request.

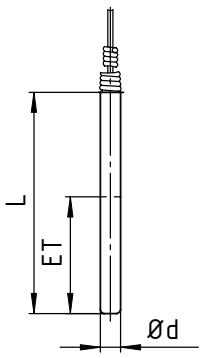
Connection type AK - Dimensions [mm]				
G	**SW1**	**SW2**	**i**	**Lk**
G½ B	27	22	14	42
G¾ B	32	22	16	42
½ NPT	27	22	19	42
¾ NPT	27	22	19	42
M20 x 1.5	27	22	14	42

Connection type B - Dimensions [mm]		
G	**SW**	**i**
G½ B	27	14
G¾ B	32	16
½ NPT	27	19
¾ NPT	27	19
M18 x 1.5	24	14
M20 x 1.5	27	14

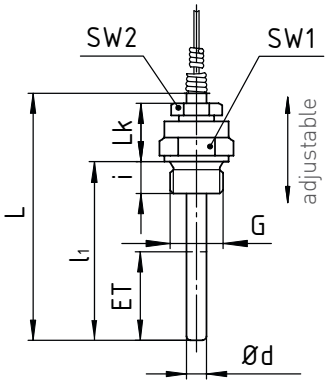
Connection type Da - Dimensions [mm]		
G	**SW**	**i**
G½ B	27	10
G¾ B	32	12
M20 x 1.5	27	10
M27 x 2	32	12

Connection type Dc - Dimensions [mm]		
G	**SW**	**i**
M24 x 1.5	32	12

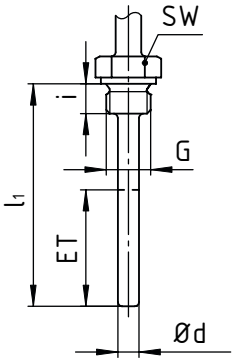
Connection type A



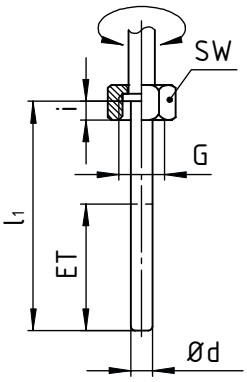
Connection type AK



Connection type B



Connection types Da / Dc



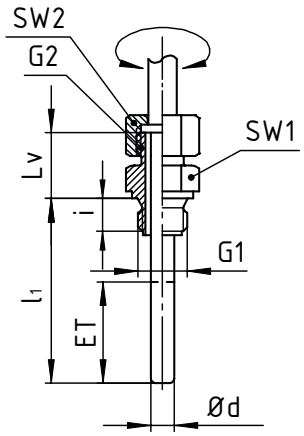
Connection type DN - Dimensions [mm]					
G1	G2	SW1	SW2	i	Lv
G½ B	G½ B	27	27	14	28
G¾ B	G½ B	32	27	16	28
½ NPT	G½ B	27	27	19	28
¾ NPT	G½ B	27	27	19	28
M20 x 1.5	M20 x 1.5	27	27	14	28
M27 x 2	M20 x 1.5	32	27	16	28

Connection type SN* - Dimensions [mm]		
G	SW	i
G½ B	27	20
G¾ B	32	23
M20 x 1.5	27	20
M27 x 2	32	23

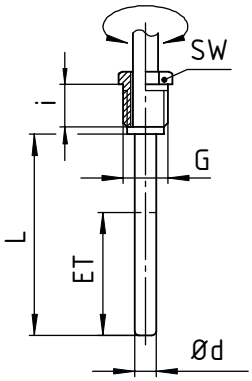
* Not sealed; protection tube necessary

Connection type DN

Based on connection type Da, with double threaded adapter



Connection type SN*



Active length (ET) and minimum feasible immersion tube length

The active length ET of a precision dial thermometer must be fully immersed in the medium to be measured. It depends on the scale range and the immersion tube diameter. The active length ET and the connection type determine the minimum immersion tube length necessary for engineering purposes.

Connection	Length	Thread	Immersion tube diameter Ød = 6 mm Display range ΔT			Immersion tube diameter Ød = 8 mm Display range ΔT	
			⩾ 100 K	= 80 K	= 60 K	⩾ 80 K	= 60 K
All types	ET		40	60	70	40	60
A	Lmin		45	65	75	45	65
AK	$l_1$min	All general threads	53	73	83	53	73
B	$l_1$min	All general threads	60	80	90	60	80
Da	$l_1$min	All general threads	52	72	82	52	72
Dc	$l_1$min	All general threads	52	72	82	Not available	
DN	$l_1$min	All general threads	60	80	90	60	80
SN*	Lmin	All general threads	45	65	75	45	65

The minimum length Lmin / $l_1$min of the immersion tube is the shortest possible immersion tube length for a given active length ET (bulb) and connection type. The active length ET of the immersion tube (bulb) must be fully immersed in the substance to be measured in order to obtain measurements corresponding to the stated accuracy class. The maximum feasible immersion tube length is 0.8 m.

Order code

Order example		Z	631	3	2	12	1002232
Thermometer type							
Bottom			631				
Central back			621				
Universally adjustable			681				
Nominal size							
63 mm	unfilled			1			
	filled*			A			
80 mm	unfilled			2			
	filled*			B			
100 mm	unfilled			3			
	filled*			C			
125 mm	unfilled			5			
	filled*			E			
160 mm	unfilled			4			
	filled*			D			
Case material							
Stainless steel 1.4301					2		
Scale range							
-40...40 °C						44	
-40...60 °C						46	
-30...50 °C						35	
-30...70 °C						37	
-20...40 °C						24	
-20...60 °C						26	
-20...80 °C						28	
0...60 °C						06	
0...80 °C						08	
0...100 °C						10	
0...120 °C						12	
0...160 °C						16	
0...200 °C						20	
0...250 °C						25	
0...300 °C						30	
0...400 °C						40	
0...500 °C						50	
0...600 °C						60	
Connection type / immersion tube length							
Please see next page and insert here							xxxxxxx

* Only available up to scale range 0...250 °C

Connection types						
Connection type A, plain immersion tube Ø8 mm						
Length L [mm]	**Plain**					
108	0631032					
145	1001032					
205	1601032					
295	2501032					
445	4001032					
Connection type AK, adjustable compression fitting with immersion tube Ø 8 mm						
Length l1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**½ NPT**	**¾NPT**	
63	0639232	0639332	0639732	0639B32	0639C32	
100	1009232	1009332	1009732	1009B32	1009C32	
160	1609232	1609332	1609732	1609B32	1609C32	
250	2509232	2509332	2509732	2509B32	2509C32	
400	4009232	4009332	4009732	4009B32	4009C32	
Connection type B, fixed male thread with immersion tube Ø 8 mm						
Length l1 [mm]	**G½**	**G¾**	**M18 x 1.5**	**M20 x 1.5**	**½ NPT**	**¾ NPT**
63	0632232	0632332	0632632	0632732	0632B32	0632C32
100	1002232	1002332	1002632	1002732	1002B32	1002C32
160	1602232	1602332	1602632	1602732	1602B32	1602C32
250	2502232	2502332	2502632	2502732	2502B32	2502C32
400	4002232	4002332	4002632	4002732	4002B32	4002C32
Connection type Da, union nut with immersion tube Ø 8 mm						
Length l1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**		
89* / 93**	0893232	0933332	0893732	0933932		
126* / 130**	1263232	1303332	1263732	1303932		
186* / 190**	1863232	1903332	1863732	1903932		
276* / 280**	2763232	2803332	2763732	2803932		
426* / 430**	4263232	4303332	4263732	4303932		
Connection type Dc, union nut with immersion tube Ø 6 mm						
Length l1 [mm]	**M24 x 1.5**					
155	1555831					
215	2155831					
275	2755831					
295	2955831					
355	3555831					
415	4155831					
Connection type DN, rotatable male thread with double threaded adapter and immersion tube Ø 8 mm						
Length l1 [mm]	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**	**½ NPT**	**¾ NPT**
63	0634232	0634332	0634732	0634932	0634B32	0634C32
100	1004232	1004332	1004732	1004932	1004B32	1004C32
160	1604232	1604332	1604732	1604932	1604B32	1604C32
250	2504232	2504332	2504732	2504932	2504B32	2504C32
400	4004232	4004332	4004732	4004932	4004B32	4004C32
Connection type SN, rotatable male thread with immersion tube Ø 8 mm						
Length L [mm]* **	**G½**	**G¾**	**M20 x 1.5**	**M27 x 2**		
80 / 86 / 77	0806232	0776332	0806732	0776932		
140 / 146 / 137	1406232	1376332	1406732	1376932		
230 / 236 / 227	2306232	2276332	2306732	2276932		
380 / 386 / 377	3806232	3776332	3806732	3776932		

* With G½ or M20 x 1.5 ** With G¾ or M27 x 2 *** Installation length L depends on thread