

Dial thermometer // gas filled // for diesel engines // with capillary line


Type 311 WH // 321 TA // 332 TE // 331 KL



Highlights

- Suitable for outdoor use - closed system (IP65)
- Completely stainless steel - high-quality version
- Without electrical auxiliary power

Technical data

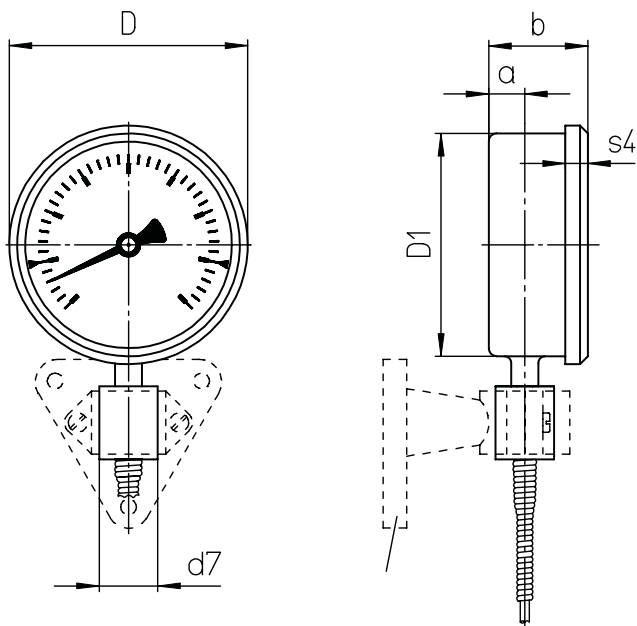
Type	311 WH	321 TA	332 TE	331 KL
Version	With wall bracket	Rear mounting flange	Front mounting flange	With U bracket
Nominal size	Ø 80 or 100 mm			
Display ranges according to EN 13190	0...100 °C 0...120 °C 0...160 °C 0...250 °C 50...650 °C			
Accuracy according to EN 13190	Class 1			
Medium / Application area	Liquid and gaseous media			
Capillary line connection	Bottom		Central back	
Immersion tube length	Between 100...400 mm			
Immersion tube diameter	Ø 12 mm			
Capillary line	with Stainless steel-spiral protection, 1...15 m Length			
Process connection	Connection types: A, AK			
Nominal pressure	Max. 25 bar			
Measuring system	Nitrogen filled			
Degree of protection according to EN 60529	IP65			
Medium temperature	See selected display range			
Ambient temperature	-20...60 °C (only indoors)			
Storage temperature	-40...60 °C			
Nominal service temperature (EN 13190)	23 °C ±2 °C			
Approvals				
				

Options

Options	
For type	On request
311 WH / 321 TA / 332 TE / 331 KL	Other immersion tube diameter and connection types. Other display ranges and / or special scales, e.g. double scale °C / °F. Capillary line > 15 m

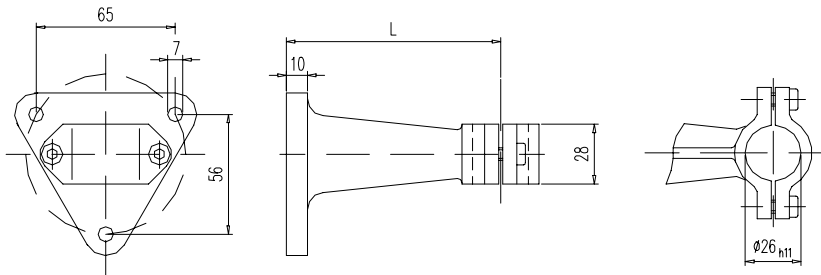
Technical drawings // Dimensions

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

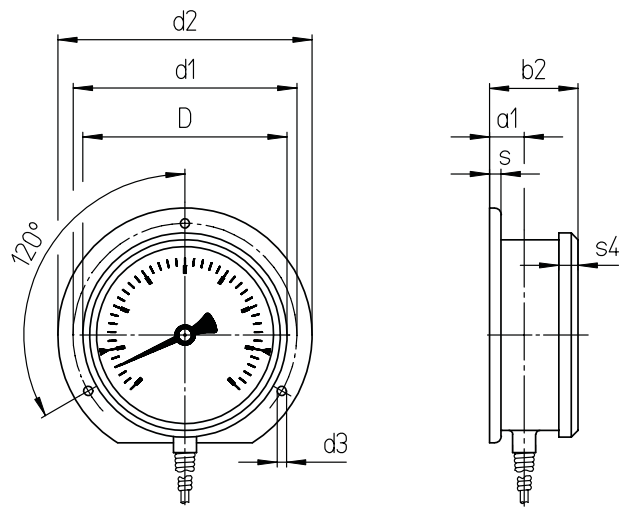
This information is provided as an example and relates to the version with connection type A, Ø 10 mm, and immersion tube length 200 mm and capillary 1 m.



Wall bracket compliant with DIN 16 281			
Material	Surface finish	L	Form
Aluminium	Black painted	100	H

Technical drawings // Dimensions

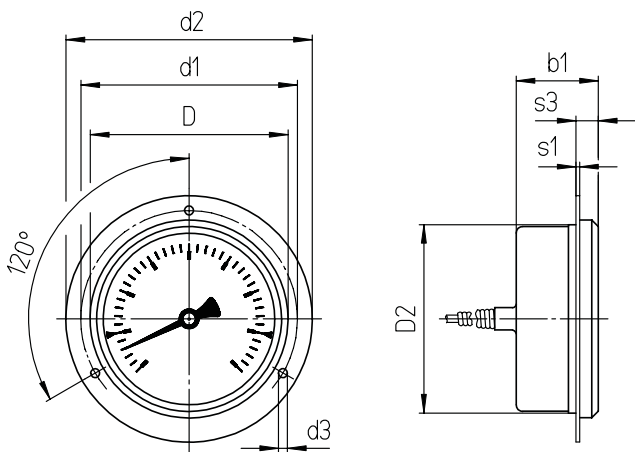
Type 321 TA rear mounting flange



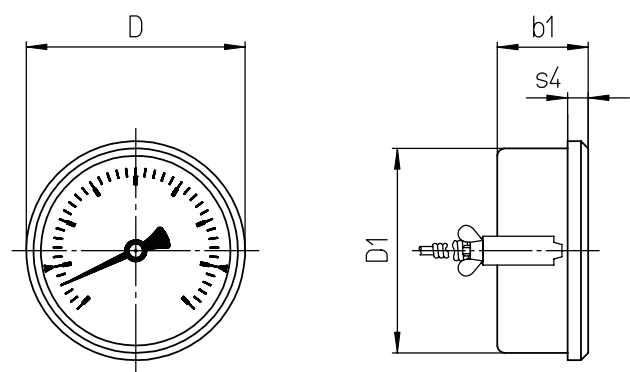
Dimensions [mm]									Weight [kg]
NS	a1	b2	D	d1	d2	d3	s	s4	filled
80	18	45	86	95	110	4.8	5	8	0.60
100	18.5	46.5	106	116	132	4.8	6	10	0.78

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



Type 331 KL with U bracket



Dimensions [mm]											Weight [kg]
NS	b1	D	D1	D2	d1	d2	d3	s1	s3	s4	filled
80	42	86	79	81	95	110	4.8	1	9	8	0.60
100	43	106	99	101	116	132	4.8	1	11.5	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.

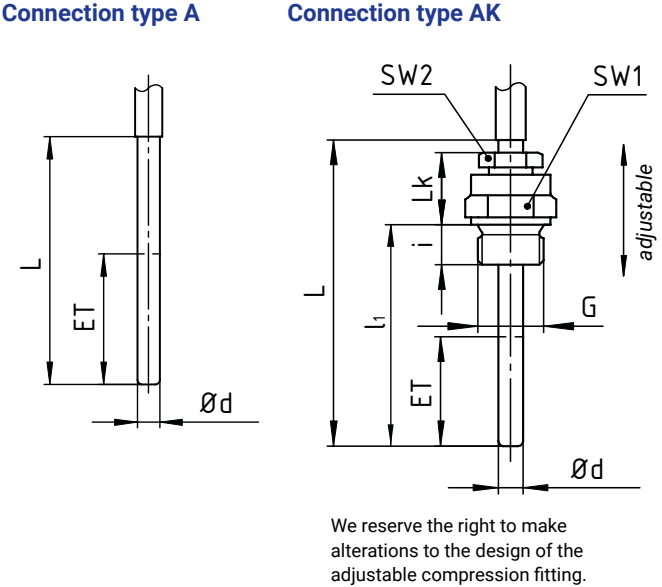
Material

Material	
Housing	Crimped-on ring, Stainless steel 1.4301, filled with silicone oil
Window	Instrument glass
Pointer movement	German silver / brass
Dial	Aluminium white with black scale markings Aluminium silver with black scale markings (Display range 50...650 °C)
Pointer	Aluminium black
Capillary line	Stainless steel 1.4571
Material in contact with media	
Process connection	Stainless steel 1.4571
Immersion tube	Stainless steel 1.4571

Standard connection types // Immersion tube // for type 311 to 332

Connection type A
Plain immersion tube, universally usable.

Connection type AK [mm]		
With adjustable compression fitting, for direct installation or use with protection tubes		
G	SW1	SW2
G½ B	27	22
G¾ B	32	22
½ NPT	27	22
¾ NPT	27	22
M20 x 1.5	27	22


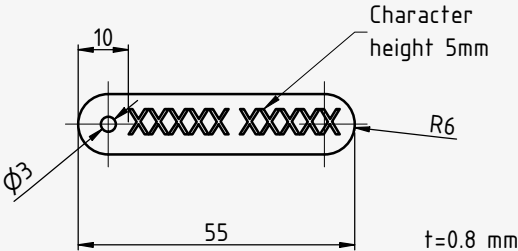


Connection type	Capillary line length incl. sensor ≤ 5m		Capillary line length incl. sensor > 5m	
	Length ET	Lmin	Length ET	Lmin
A	80	150	120	175
AK	80	150	120	175

The minimum length Lmin / l1min 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.

Article numbers

Order code																		
Thermometer version																		
With wall bracket	Z	311																
With Rear mounting flange	Z	321																
With U bracket	Z	331																
With Front mounting flange	Z	332																
Nominal size			B2	C2														
80 mm																		
100 mm			Display range								10	12	16	25	56			
0...100 °C																		
0...120 °C																		
0...160 °C																		
0...250 °C																		
50...650 °C			Immersion tube length l ₁		Nominal length L = l ₁ + 45 mm		100	135	160	200								
100 mm		145 mm			250	300					400							
135 mm		180 mm																
160 mm		205 mm																
200 mm		245 mm																
250 mm		295 mm																
300 mm		345 mm																
400 mm		445 mm										Connection type			1	9		
Connection type A, Plain immersion tube																		
Connection type AK, adjustable compression fitting						Process connection			0	2								
Without - Plain immersion tube																		
G½						3	B	C			7							
G¾																		
½ NPT																		
¾ NPT																		
M20 x 1.5												Immersion tube diameter			2			
Ø 12 mm									Capillary line length			1						
1 m									3	5			–					
3 m																		
5 m																		
Other length (choose in meters)						Capillary line material and protection					C							
Stainless steel, stainless steel-spiral protection						Example order number			Z	311		B2	10	100	1	0	2	1

Accessories	Article number
<div><div><div>Measuring point designation</div><div>Laser-inscribed stainless steel plate with fixing wire for easy attachment to measuring points</div><div><div>→ Scope of delivery: Designation plate inscribed according to specification and enclosed fixing wire (sealing wire)</div><div>→ Fastening: Wire (included in delivery), alternatively sealing, cable ties or similar (not included in delivery)</div><div>→ Materials: Plate stainless steel 1.4571, wire stainless steel</div><div>→ Dimensions: Plate 55 x 10 x 0.8 mm, wire length 180 mm</div><div>→ Inscription: one-sided, single-line, max. 11 characters, character height 5 mm, designation width max. 40 mm, letters, numbers, symbols, barcodes, QR codes</div><div>→ Transmission of designations: digital list, file formats Excel, Word or CSV</div></div><div><div></div><div></div></div></div></div>	ONSITETAG