

BIHERMA[®]

Franz Wagner & Sohn GmbH

PRODUCTS

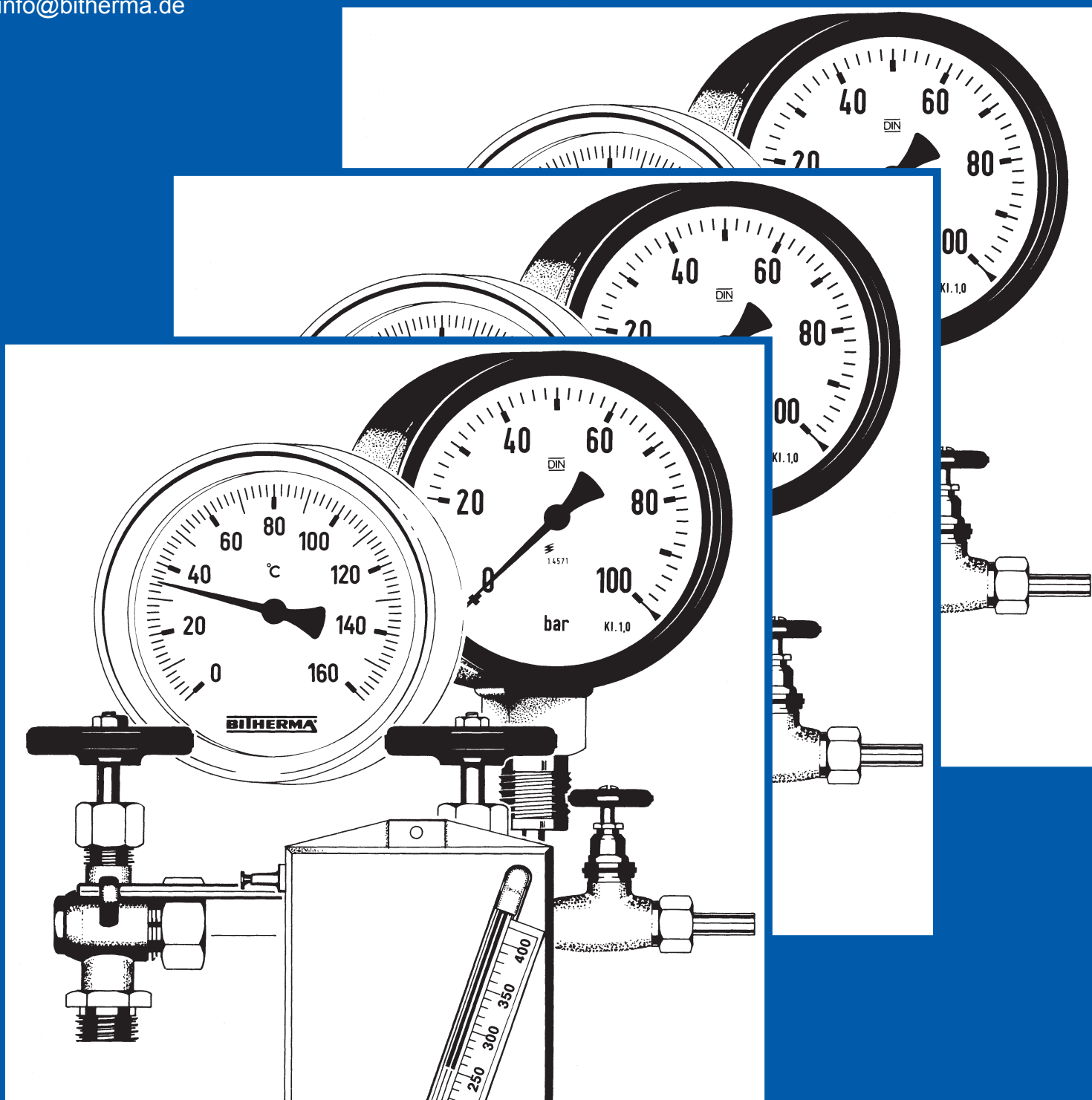
Großer Stein 72
32657 Lemgo
Germany

Fon +49 (0) 52 61 6 80 04

Fax +49 (0) 52 61 6 80 06

www.bitherma.de

info@bitherma.de

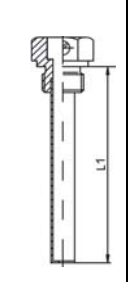
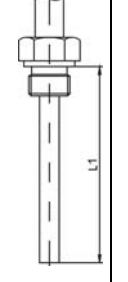
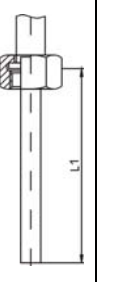
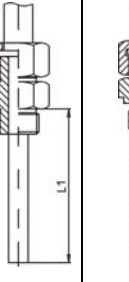
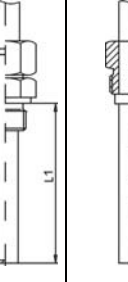
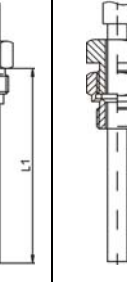
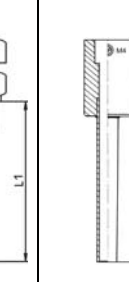
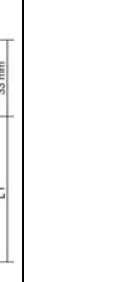


Bimetal thermometer	
- Connectivities	001
- Standard, axial	002
- Standard, vertical	003
- Industrial version, axial, complete stainless steel	004
- Process industry series, axial	005
- Process industry series, vertical	006
- Process industry series, 90° adjustable every angle	007
- With flange for ventilation and air-conditioning	008
- With surface mounting flange for ventilation and air-conditioning, light-weight version	009
- With surface mounting flange for ventilation and air-conditioning, heavy-weight version	010
- For heating systems, standard version	011
- For heating systems	012
- For surface mounting	013
- For insertion, for underfloor heating, control fittings and valves	014
- With tip for insertion, for food	015
- For exhaust gas measurements	017
- With bar magnets	018
- As surface thermometer for concrete and floors	019
- Bimetal stand-up thermometer for interior measurements	020
Gas actuated thermometer, process industry series	021
Remote-reading thermometer, alcohol filled, standard version	022
Bimetal stack thermometer, for silos and clamps	023
Hygrometer for moisture measurements with stem	030
Hygrometer for dewpoint and indoor climate	031
Hygrometer for surface measurements Fig. 36	032
Hygrometer for surface measurements Fig. 37+38	033
Hygrometer with stem for pricking	034
V-shaped machine glass thermometer	040-048
Industrial machine glass thermometer, DIN 16167, DIN 16168, short version	050
Industrial machine glass thermometer, DIN 16174, DIN 16175, long version	051
Glass thermometer for control measurements	060
Thermometer scoops in brass	060
Chemical glass thermometer for laboratory measurements	060
Thermowells screw-in type DIN 43772 Form 5/6/8 and 9	070
Thermowells weld-in type DIN 43772 Form 4	072
Flange Thermowells DIN 43772 Form 2/3/4F, clamp-flange, slotted ring nut	073
Resistance thermometer Pt 100	075
Conversion tables, tolerances	089
Electrical alarm contacts for temperature and pressure gauges	090
Differential pressure gauge "MAGNEHELIC" for filter control	092
U-tube manometer, U-tube manometer rollable	093
Pressure gauge cock	095
Pressure gauge valve, Push-button stopcock	096
Manometer accessories	098
Pressure gauge siphon	099

Manometers

Type	System	Version	filled	connection	
111.10	bourdon	standard	no	bottom	120
111.12	bourdon	standard	no	back	130
212.20	bourdon	industrial series	no	bottom, back	200
212.20	bourdon	industrial series with contact	no	bottom, back	210
010.	bourdon	standard	yes	bottom, back	220
183.	bourdon	standard, stainless steel	yes	bottom, back	230
232.50	bourdon	process industry	no	bottom, back	250
233.50	bourdon	process industry	yes	bottom, back	260
232.30	bourdon	process industry, safety	no	bottom, back	270
233.30	bourdon	process industry, safety	yes	bottom	280
312.20	bourdon	test gauge	no	bottom, back	300
422.20	diaphragm	industrial series	no	bottom	410
432.50	diaphragm	process industry	no	bottom	420
612.20	capsule	industrial series	no	bottom, back	610
711.12	bourdon	differential, parallel-entry	no	bottom	710
711.13	diaphragm	differential, parallel-entry	no	bottom	720

Connection type:

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw
							

Standard stem diam.
of brass: [mm]
of stainless steel:

12	9	9	9	12	9	-	-
10/12	8	8	8	10/12	8	8	10/12

Other diam. possible:

4 mm	-	X	X	X	-	X	-	-
6 mm	X	X	X	X	X	X	X	X
8 mm	X	X	X	X	X	X	X	X
9 mm	X	X	X	X	X	X	X	X
10 mm	X	X	X	X	X	X	X	X
12 mm	X	X	X	X	X	X	X	X

Thread sealing face
DIN 3852 form A

Standard for gauges with brass connection from 160°C on.
Otherwise available with surcharge.
Standard for all temperatur gauges with stainless steel connection.

Cases:

Steel zined, st. st. AISI 304, with crimped ring, bayonet st.st. AISI 304

Windows:

Instrument glass, perspex windows, laminated safety glass

Thread types:

M / MF / G / BSPT / NPT / PG

Further connections:

Hygienic coupling DN 25 / DN 50

Tapered thread and slotted ring nut DIN 11 851 DN 15 - DN 50

Flange thermowells for all requirements e.g. DIN 2527 form B / T / E
ND 6 / 10 / 16 / 25 / 40 / 64 / 100
NW 10 / 15 / 20 / 25 / 32

Other types on request!



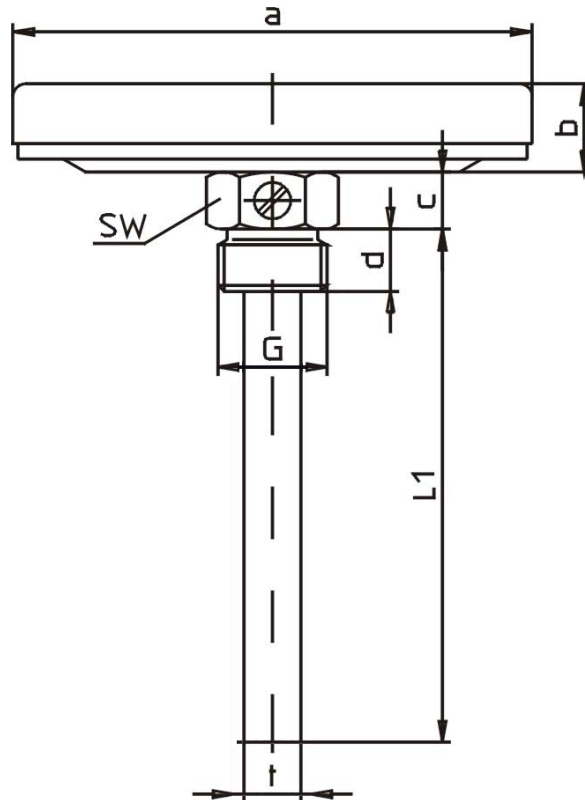
Case:	Steel zinced - Stainless steel AISI 304
Bezel:	Steel nickel plated - Stainless steel AISI 304
Protection class:	IP 43
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Max. drag pointer (diam. 63-160) - Max./Min. drag pointer (diam. 63-160) - Red mark pointer (diam. 63-160)
Stem:	G 1/2 B brass detachable with fixing screw L = 28 / 45 / 50 / 63 / 100 mm solid A/F 21 Other lengths multi part soldered A/F 21 - Further connections see overleaf resp. 001
Connection:	Backwards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1,6 - Accuracy class 1 (then the article number changes from 2XXX into 3XXX) - Works test certificate - OPTIONS

		Article number:					
Diam.:	mm	34	50	63	80	100	160
Stem	28 mm	2030	2050	2060	2080	2100	2160
	45 mm	2031	2051	2061	2081	2101	2161
	50 mm	2032	2052	2062	2082	2102	2162
	63 mm	2033	2053	2063	2083	2103	2163
	80 mm	2034	2054	2064	2084	2104	2164
	100 mm	2035	2055	2065	2085	2105	2165
	120 mm	2036	2056	2066	2086	2106	2166
	160 mm	2037	2057	2067	2087	2107	2167
	200 mm	2038	2058	2068	2088	2108	2168
	250 mm	2039	2059	2069	2089	2109	2169

Measuring-range	Graduation
-40 +40°C	1°
-30 +50°C	
-20 +60°C	
-20 +40°C	
-15 +45°C	
-10 +60°C	
-10 +50°C	
1) 0 -40°C	
1) 0 -50°C	
0 -60°C	
0 -80°C	2°
0 -100°C	
0 -120°C	
0 -160°C	
0 -200°C	5°
0 -250°C	
0 -300°C	10°
0 -400°C	
2) 0 -500°C	
2) 0 -600°C	

Other lengths are available! Stem 28 mm only 0-100 and 0-120°C available!
Stem 45 mm shortest measuring span = 60°C!

1) shortest stem length 63 mm
2) stem stainless steel needed



Type	a	b	c	d	SW	G	t
2030	34	9	11	12	21	½ B	12
2050	50	12	11	12	21	½ B	12
2060	63	13	11	12	21	½ B	12
2080	80	13	11	12	21	½ B	12
2100	100	15	11	12	21	½ B	12
2160	160	19	11	12	21	½ B	12

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

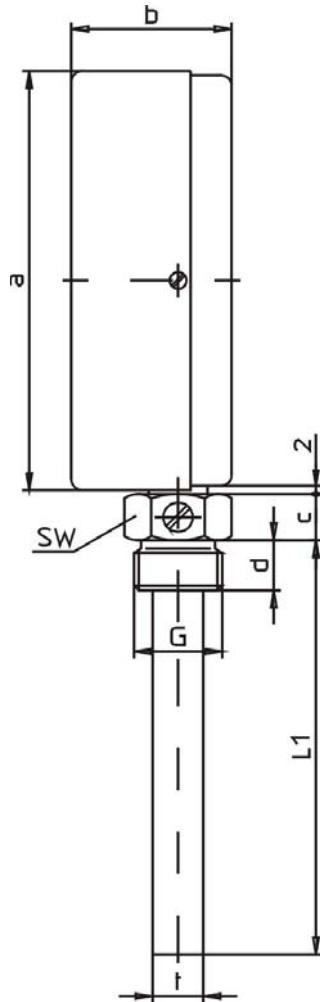
Case:	Steel zinced - Stainless steel AISI 304 (diam. 63 and 100)
Bezel:	Steel chromed - Stainless steel AISI 304 (diam. 63 and 100)
Protection class:	IP 43
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Red mark pointer (diam. 63-160)
Stem:	G 1/2 B brass detachable with fixing screw L = 28 / 45 / 50 / 63 / 100 mm solid A/F 21 other lengths multi part soldered A/F 21 - Further connections see overleaf resp. 001
Connection:	Vertical entry - Sidewards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1,6 - Accuracy class 1 (then the article number changes from 2XXX into 3XXX) - Works test certificate - OPTIONS



		Article number:					Measuring-range	Graduation
Diam.:	mm	50	63	80	100	160		
Stem	28 mm	2250	2260	2280	2300	2360	-40 +40°C	1°
	45 mm	2251	2261	2281	2301	2361	-30 +50°C	
	50 mm	2252	2262	2282	2302	2362	-20 +60°C	
	63 mm	2253	2263	2283	2303	2363	-20 +40°C	
	80 mm	2254	2264	2284	2304	2364	-15 +45°C	
	100 mm	2255	2265	2285	2305	2365	-10 +60°C	
	120 mm	2256	2266	2286	2306	2366	-10 +50°C	
	160 mm	2257	2267	2287	2307	2367	0 -50°C	
	200 mm	2258	2268	2288	2308	2368	0 -60°C	
	250 mm	2259	2269	2289	2309	2369	0 -80°C	
							0 -100°C	2°
							0 -120°C	
							0 -160°C	
							0 -200°C	
							0 -250°C	5°
							0 -300°C	
							0 -400°C	10°
							1) 0 -500°C	
							1) 0 -600°C	

1) stem stainless steel needed

Other lengths are available! Stem 28 mm only 0-100 and 0-120°C available!
Measuring span 50 and 60°C shortest stem = 100 mm max. 200 mm!

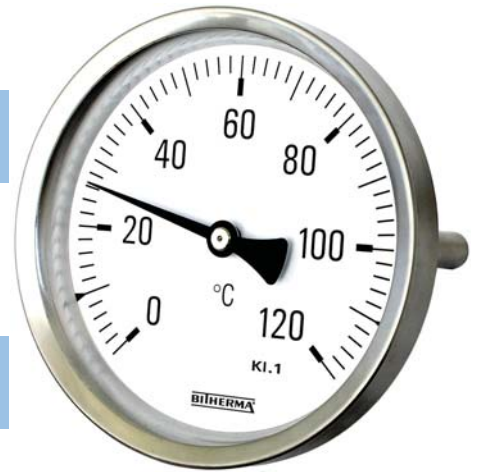


Type	a	b	c	d	SW	G	t
2250	50	35	11	12	21	½ B	12
2260	63	36	11	12	21	½ B	12
2280	80	36	11	12	21	½ B	12
2300	100	38	11	12	21	½ B	12
2360	160	38	11	12	21	½ B	12

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case:	Stainless steel AISI 304
Bezel:	Stainless steel AISI 304 - Diam. 80 and diam. 100 mm with crimped ring - Diam. 80 and diam. 100 mm with crimped ring and liquid filling (IP 65)
Protection class:	IP 43
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass (diam. 63-160) - Max. drag pointer (diam. 63-160) - Max./Min. drag pointer (diam. 63-160) - Red mark pointer (diam. 63-160)
Stem:	G 1/2 A stainless steel AISI 303, A/F 27, with fixing screw multi part welded, tube Ø 10 mm of AISI 316 Ti - Thread of AISI 316 Ti - Further connections see overleaf resp. 001
Connection:	Backwards - Bottom, case diam. 63 mm and 100 mm
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1 - Works test certificate - OPTIONS

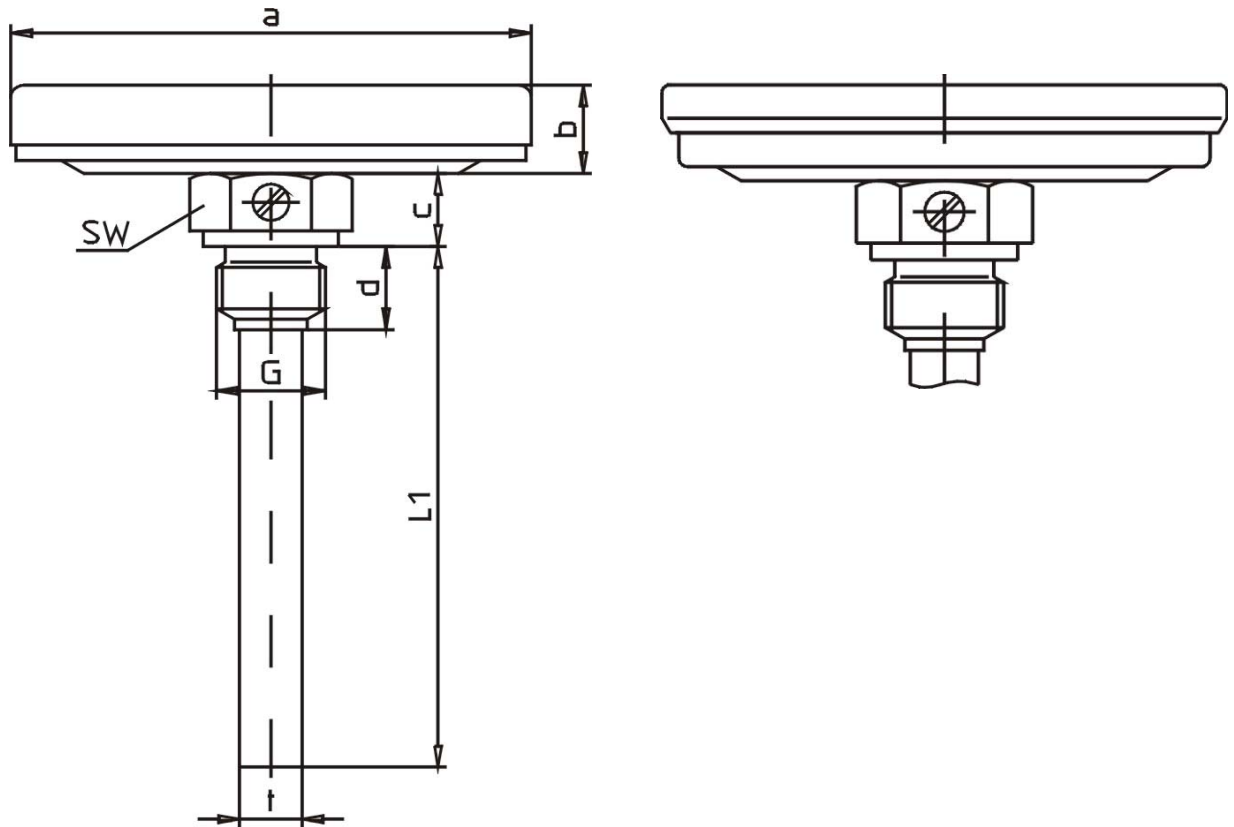


Diam.:		Article number:					
mm		34	50	63	80	100	160
Stem	28 mm	2930	2950	2960	2980	3000	3040
	45 mm	2931	2951	2961	2981	3001	3041
	50 mm	2932	2952	2962	2982	3002	3042
	63 mm	2933	2953	2963	2983	3003	3043
	80 mm	2934	2954	2964	2984	3004	3044
	100 mm	2935	2955	2965	2985	3005	3045
	120 mm	2936	2956	2966	2986	3006	3046
	160 mm	2937	2957	2967	2987	3007	3047
	200 mm	2938	2958	2968	2988	3008	3048
	250 mm	2939	2959	2969	2989	3009	3049

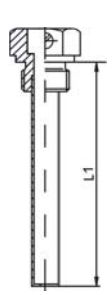
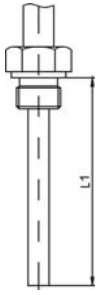
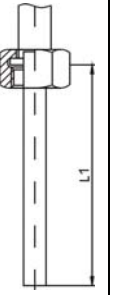
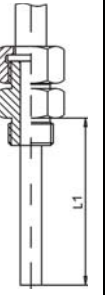
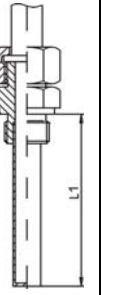
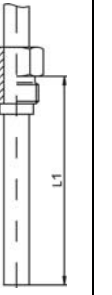
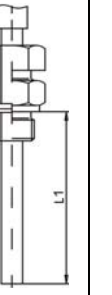
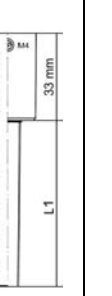
Measuring-range	Graduation
-40 +40°C	1°
-30 +50°C	
-20 +60°C	
-20 +40°C	
-15 +45°C	
-10 +60°C	
-10 +50°C	
1) 0 -40°C	
1) 0 -50°C	
0 -60°C	
0 -80°C	2°
0 -100°C	
0 -120°C	
0 -160°C	
0 -200°C	5°
0 -250°C	
0 -300°C	10°
0 -400°C	
0 -500°C	
0 -600°C	

1) shortest stem length 63 mm

Other lengths are available! Stem 28 mm only 0-100 and 0-120°C available!



Type	a	b	c	d	SW	G	t
2930	34	9	14	14	27	½ A	10
2950	50	12	14	14	27	½ A	10
2960	63	13	14	14	27	½ A	10
2980	80	13	14	14	27	½ A	10
3000	100	15	14	14	27	½ A	10
3040	160	19	14	14	27	½ A	10

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw
							

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet fitted, stainless steel AISI 304 - With liquid filling (IP 65)
Bezel:	Bayonet fitted, stainless steel AISI 304 - With front flange for panel mounting
Protection class:	IP 54
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass - Max. drag pointer - Max./Min. drag pointer - Red mark pointer
Stem:	G 1/2 A stainless steel AISI 303, A/F 27, with fixing screw multi part welded, tube Ø 10 mm of AISI 316 Ti - Thread of AISI 316 Ti - Further connections see overleaf resp. 001
Connection:	Backwards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1 - Works test certificate - OPTIONS



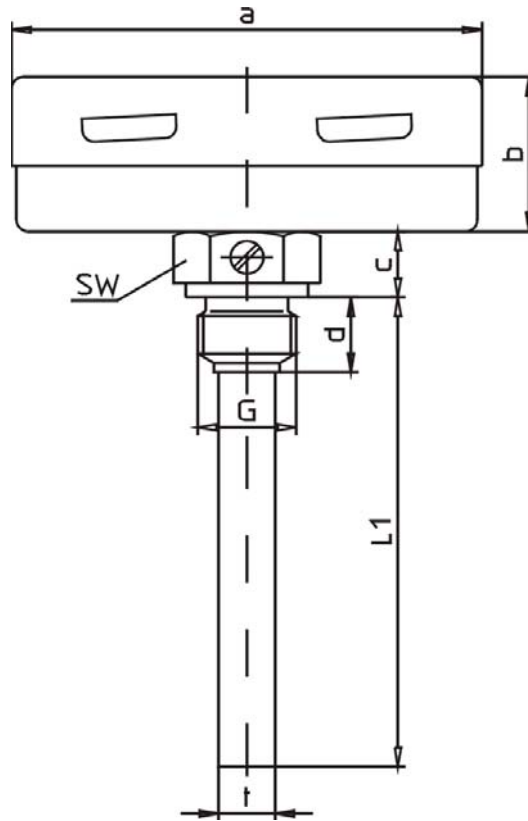
Specials: Instruments with sliding contacts

Diam.:		Article number:			
mm		63	80	100	160
Stem	28 mm	2460	2480	2500	2560
	45 mm	2461	2481	2501	2561
	50 mm	2462	2482	2502	2562
	63 mm	2463	2483	2503	2563
	80 mm	2464	2484	2504	2564
	100 mm	2465	2485	2505	2565
	120 mm	2466	2486	2506	2566
	160 mm	2467	2487	2507	2567
	200 mm	2468	2488	2508	2568
	250 mm	2469	2489	2509	2569

Measuring-range	Graduation
-40 +40°C	1°
-30 +50°C	
-20 +60°C	
-20 +40°C	
-15 +45°C	
-10 +60°C	
-10 +50°C	
1) 0 -40°C	
1) 0 -50°C	
0 -60°C	
0 -80°C	2°
0 -100°C	
0 -120°C	
0 -160°C	
0 -200°C	5°
0 -250°C	
0 -300°C	10°
0 -400°C	
0 -500°C	
0 -600°C	

Other lengths are available! Stem 28 mm only 0-100 and 0-120°C available!

1) shortest stem length 63 mm



Type	a	b	c	d	SW	G	t
2460	63	27	14	14	27	½ A	10
2480	80	27	14	14	27	½ A	10
2500	100	27	14	14	27	½ A	10
2560	160	29	14	14	27	½ A	10

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw

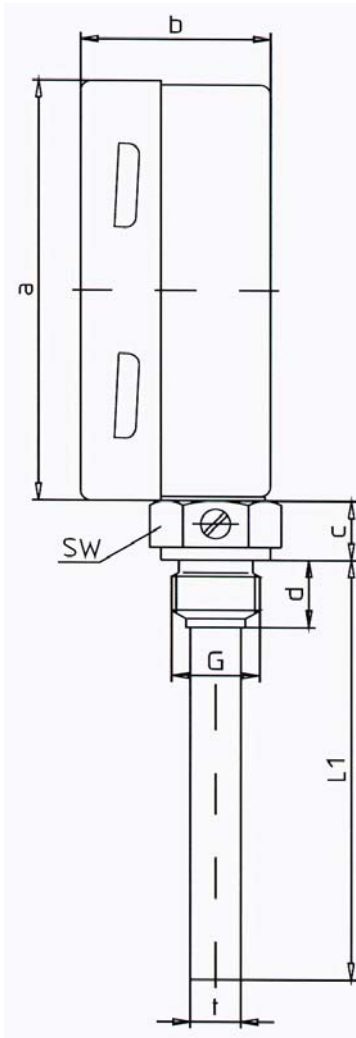
Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.



Case:	Bayonet fitted, stainless steel AISI 304 - with liquid filling (IP 65)
Bezel:	Bayonet fitted, stainless steel AISI 304
Protection class:	IP 54
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass - Red mark pointer
Stem:	G 1/2 A stainless steel AISI 303, A/F 27, with fixing screw multi part welded, tube Ø 10 mm of AISI 316 Ti - Thread of AISI 316 Ti - Further connections see overleaf resp. 001
Connection:	Vertical entry - Sidewards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1 - Works test certificate - OPTIONS

		Article number:				Measuring-range	Graduation	
Diam.:	mm	63	80	100	160			
Stem	28 mm	2660	2680	2700	2760	-40 +40°C	1°	
	45 mm	2661	2681	2701	2761	-30 +50°C		
50 mm		2662	2682	2702	2762	-20 +60°C		
	63 mm	2663	2683	2703	2763	-20 +40°C		
80 mm						-15 +45°C		
	100 mm	2664	2684	2704	2764	-10 +60°C		
120 mm						-10 +50°C		2°
	160 mm	2665	2685	2705	2765	0 -50°C		
200 mm						0 -60°C		
	250 mm	2666	2686	2706	2766	0 -80°C		
250 mm						0 -100°C	5°	
		2667	2687	2707	2767	0 -120°C		
Other lengths are available!						0 -160°C	10°	
						0 -200°C		
						0 -250°C		
						0 -300°C		
						0 -400°C		
						0 -500°C		
						0 -600°C		

Other lengths are available! Stem 28 mm only 0-120°C available!
Measuring span 50 and 60°C shortest stem = 100 mm max. 200 mm!



Type	a	b	c	d	SW	G	t
2660	63	47	14	14	27	½ A	10
2680	80	46	14	14	27	½ A	10
2700	100	49	14	14	27	½ A	10
2760	160	48	14	14	27	½ A	10

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

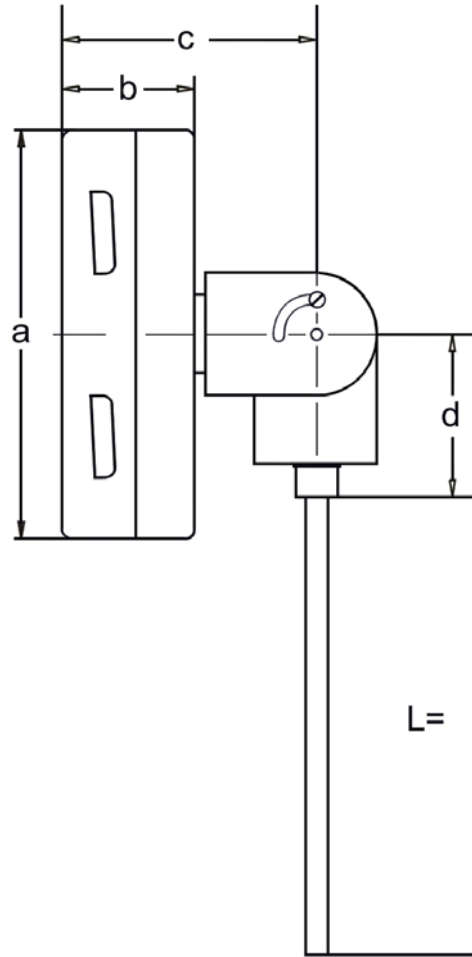
Case:	Bayonet fitted, stainless steel AISI 304 - With liquid filling (IP 65)
Bezel:	Bayonet fitted, stainless steel AISI 304 - Diam. 80 and diam. 100 mm with crimped ring
Protection class:	IP 54
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black
Window:	Instrument glass - Perspex window - Laminated safety glass - Red mark pointer
Stem:	Plain without thread Ø 6, 8 or 10 mm made of stainless steel AISI 316 Ti - Further connections see overleaf resp. 001
Connection:	Backwards, 90° adjustable every angle
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1 - Works test certificate - OPTIONS



Diam.:	mm	Article number:			
		63	80	100	160
Stem	100 mm	31480	31490	31500	31510
	120 mm	31481	31491	31501	31511
	160 mm	31482	31492	31502	31512
	200 mm	31483	31493	31503	31513
	250 mm	31484	31494	31504	31514
	300 mm	31485	31495	31505	31515
	400 mm	31486	31496	31506	31516
	500 mm	31487	31497	31507	31517

Measuring-range	Graduation
-40 +40°C	1°
-40 +60°C	
-30 +50°C	
-20 +60°C	
-20 +40°C	
-15 +45°C	
-10 +50°C	2°
0 -60°C	
0 -80°C	
0 -100°C	
0 -120°C	5°
0 -160°C	
0 -200°C	10°
0 -250°C	
0 -300°C	
0 -400°C	
0 -500°C	
0 -600°C	

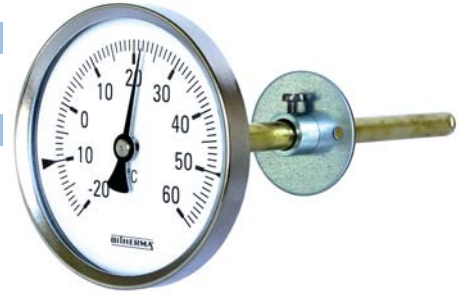
Other measuring ranges are available on request.
Max. stem length L = 1.000 mm!



Type	a	b	c	d	L
31480	63	37	70	47	
31490	80	27	60	47	
31500	100	27	60	47	
31510	160	29	62	77	

0	1	2	3	4	5	6	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	separate pocket for welding with fixing screw

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.



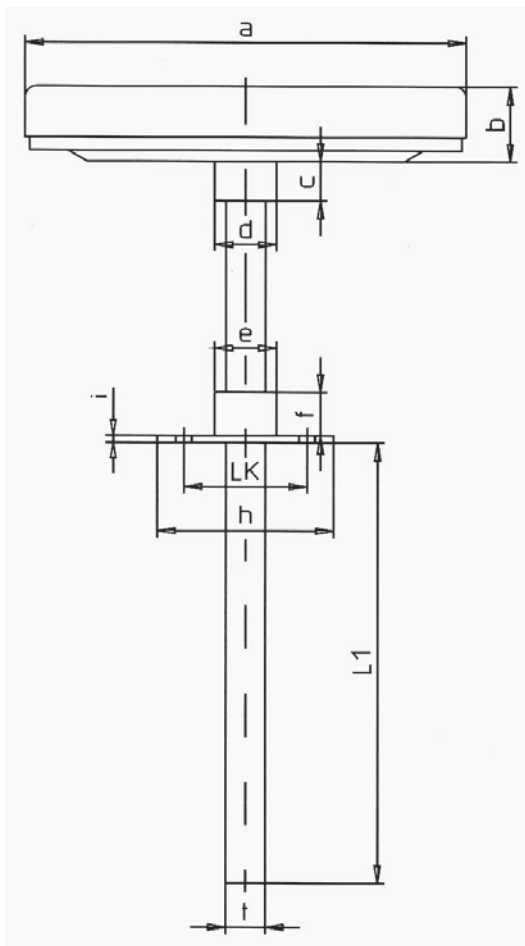
Case:	Steel zined - Stainless steel AISI 304
Bezel:	Steel nickel plated - Stainless steel AISI 304
Protection class:	IP 43
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass - Max. drag pointer - Max./Min. drag pointer - Red mark pointer
Stem:	Brass Ø 9 mm - Stainless steel of AISI 316 Ti
Mounting method:	Flange steel zined Ø 40 mm with fixing screw movable on stem diam. 160 mm, flange Ø 80 mm steel zined - Thread G ½ B brass with fixing screw - Flange Ø 80 steel zined - Flange Ø 80 stainless steel
Connection:	Backwards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	2 - Accuracy class 1 - Works test certificate - OPTIONS

Measuring-range	Graduation
-40 +40°C -30 +50°C -20 +60°C -20 +40°C -15 +45°C -10 +60°C -10 +50°C 0 -40°C 0 -50°C 0 -60°C 0 -80°C	1°
0 -100°C 0 -120°C 0 -160°C 0 -200°C	2°
0 -250°C 0 -300°C	5°
0 -400°C 1) 0 -500°C 1) 0 -600°C	10°

		Article number:			
Diam.:	mm	63	80	100	160
Stem	50 mm	1261	1281	1301	1361
Stem	100 mm	1262	1282	1302	1362
Stem	150 mm	1263	1283	1303	1363
Stem	200 mm	1264	1284	1304	1364
Stem	250 mm	1265	1285	1305	1365

Other lengths are available!

1) stem stainless steel needed



Type	a	b	c	d	e	f	LK	h	i	t
1260	63	13	9	14	14	10	28	40	1,5	9
1280	80	13	9	14	14	10	28	40	1,5	9
1300	100	15	9	14	14	10	28	40	1,5	9
1360	160	19	9	14	14	10	54	80	2,0	9

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.



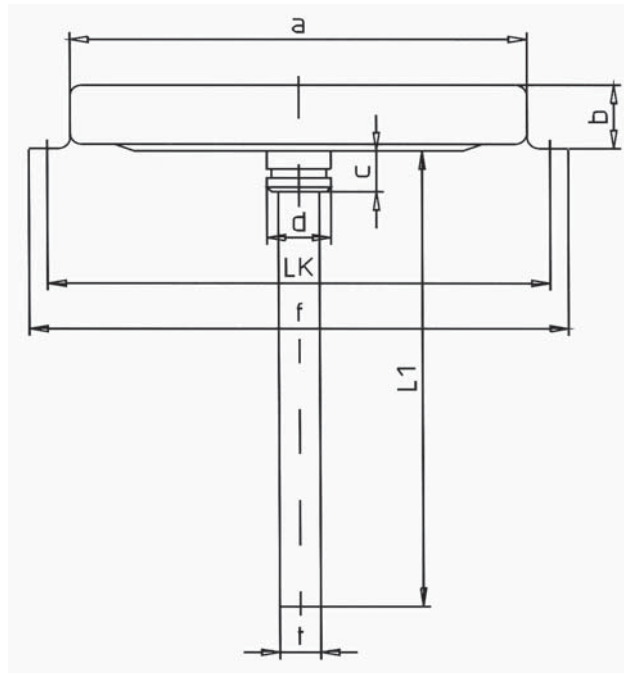
Case:	Steel zinced
Bezel:	Steel nickel plated
Protection class:	IP 34
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass - Max. drag pointer - Max./Min. drag pointer - Red mark pointer
Stem:	Brass Ø 9 mm - Stainless steel of AISI 316 Ti
Mounting method:	With back flange lightweight version, round for surface mounting on air duct
Connection:	Backwards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	2 - Accuracy class 1 - Works test certificate - OPTIONS

Measuring-range	Graduation
-40 +40°C	1°
-30 +50°C	
-20 +60°C	
-20 +40°C	
-15 +45°C	
-10 +60°C	
-10 +50°C	
0 -40°C	
0 -50°C	
0 -60°C	
0 -80°C	2°
0 -100°C	
0 -120°C	
0 -160°C	
0 -200°C	
0 -250°C	5°
0 -300°C	
0 -400°C	10°
1) 0 -500°C	
1) 0 -600°C	

		Article number:		
Diam.:	mm	63	80	100
Stem	50 mm	1661	1681	1701
Stem	100 mm	1662	1682	1702
Stem	150 mm	1663	1683	1703
Stem	200 mm	1664	1684	1704
Stem	250 mm	1665	1685	1705

Other lengths are available!

1) stem stainless steel needed



Type	a	b	c	d	f	LK	t
1660	63	14	9	14	82	74	9
1680	80	14	9	14	102	91	9
1700	100	14	9	14	118	110	9

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.



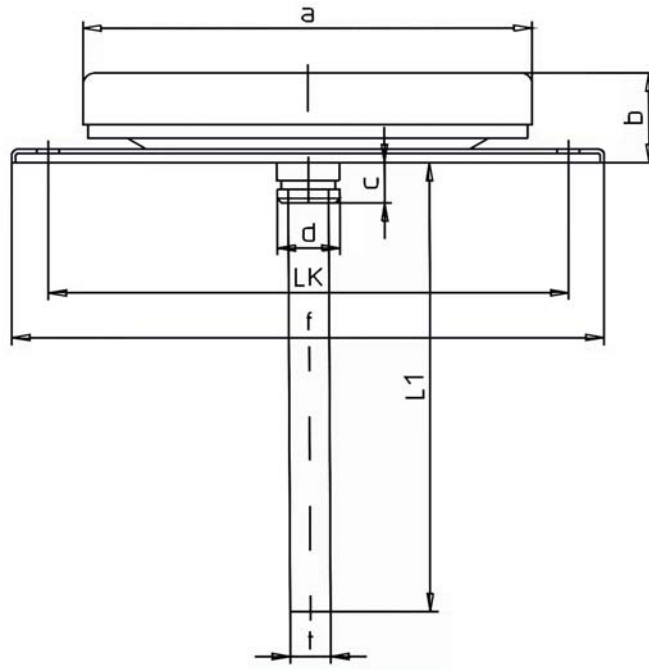
Case:	Steel zinced - Diam. 100 stainless steel AISI 304
Bezel:	Steel nickel plated - Diam. 100 stainless steel AISI 304
Protection class:	IP 43
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass - Max. drag pointer - Max./Min. drag pointer - Red mark pointer
Stem:	Brass Ø 9 mm - Stainless steel AISI 316 Ti
Mounting method:	With back flange heavy version, flattened design for surface mounting on air duct - Diam. 100 stainless steel, round design - With front flange chromed, for panel mounting
Connection:	Backwards
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	2 - Accuracy class 1 - Works test certificate - OPTIONS

		Article number:			
Diam.:	mm	63	80	100	160
Stem	50 mm	1461	1481	1501	1561
Stem	100 mm	1462	1482	1502	1562
Stem	150 mm	1463	1483	1503	1563
Stem	200 mm	1464	1484	1504	1564
Stem	250 mm	1465	1485	1505	1565

Measuring-range	Graduation
-40 +40°C	1°
-30 +50°C	
-20 +60°C	
-20 +40°C	
-15 +45°C	
-10 +60°C	
-10 +50°C	
0 -40°C	
0 -50°C	
0 -60°C	
0 -80°C	2°
0 -100°C	
0 -120°C	
0 -160°C	
0 -200°C	
0 -250°C	5°
0 -300°C	
0 -400°C	10°
1) 0 -500°C	
1) 0 -600°C	

1) stem stainless steel needed

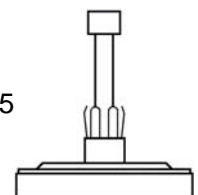
Other lengths are available!



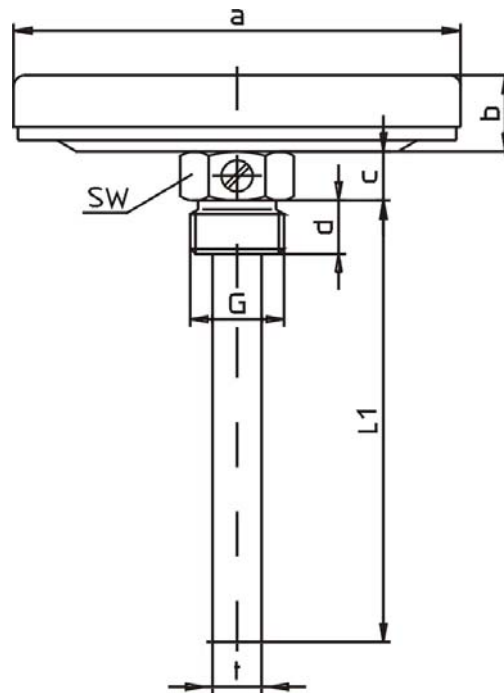
Type	a	b	c	d	f	LK	t
1460	63	17	7	14	85	76	9
1480	80	21	7	14	110	95	9
1500	100	22	7	14	132	116	9
1560	160	23	7	14	190	182	9

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Steel zinced		
Bezel:	Steel nickel plated		
Protection class:	IP 34		
Dial:	Plastic, white with raised edge lettering and graduation black - Imprint - Double scale °C/°F		
Pointer:	Plastic, black adjustable at end of stem - Aluminium, black		
Window:	Plastic - Instrument glass		
Stem:	G 1/2 B brass detachable with fixing screw L = 40 / 63 / 100 mm solid A/F 21 other lengths multi part soft soldered A/F 21 - Plug in version		
Connection:	Backwards		
Accuracy class:	2		
	- OPTIONS		
Measuring range:	0-120°C		
	Article number:		
Diam.: mm	63	80	100
Stem 40 mm	903	906	909
Stem 63 mm	904	907	910
Stem 100 mm	905	908	911
Stem 150 mm	915	916	917
Measuring range:	-20+60°C / -10+50°C / 0-60°C		Please quote the measuring range by order!
	Article number:		
Diam.: mm	63	80	100
Stem 40 mm	923	926	929
Stem 63 mm	924	927	930
Stem 100 mm	925	928	931
Stem 150 mm	935	936	937
Messbereich:	-30+50°C / -20+60°C / 0-120°C		Please quote the measuring range by order!
	Article number:		
Diam.: mm	63	80	100
Stem 50 mm	940	944	948
Stem 75 mm	941	945	949
Stem 100 mm	942	946	950
Stem 150 mm	943	947	951
Other lengths are available!			



Special version:
Stem with measuring-pot Ø 15
and plug-in socket.



Type	a	b	c	d	SW	G	t
903	63	12	7	12	21	½ B	12
906	80	14	7	12	21	½ B	12
909	100	15	7	12	21	½ B	12

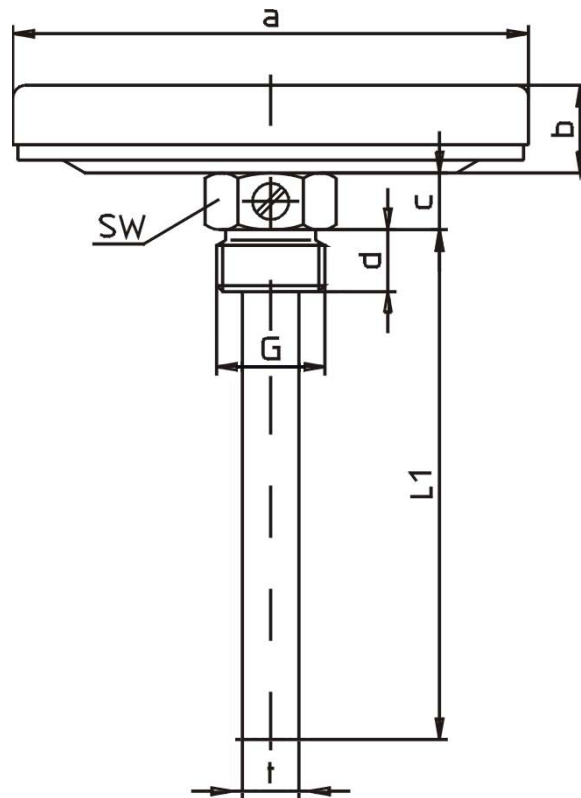
Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Steel zinced
Bezel:	Steel nickel plated
Protection class:	IP 43
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem - Silicone damped
Window:	Instrument glass
Stem:	G 1/2 B brass detachable with fixing screw L = 28 / 45 / 50 / 63 / 100 mm solid A/F 21 other lengths multi part soldered A/F 21 - Stainless steel welded
Connection:	Backwards
Measuring range:	- Resp. see below
Accuracy class:	2 - OPTIONS



Measuring range:	0-120°C				-30+50°C / -20+60°C / -20+40°C -10+50°C / 0-60°C / 0-80°C / 0-100°C Please quote the measuring range by order!			
	Article number:							
Diam.: mm	63	80	100	160	63	80	100	160
Stem 28 mm	1060	1080	1100	1160	-	-	-	-
45 mm	1061	1081	1101	1161	11061	11081	11101	11161
50 mm	1062	1082	1102	1162	11062	11082	11102	11162
63 mm	1063	1083	1103	1163	11063	11083	11103	11163
80 mm	1064	1084	1104	1164	11064	11084	11104	11164
100 mm	1065	1085	1105	1165	11065	11085	11105	11165
120 mm	1066	1086	1106	1166	11066	11086	11106	11166
160 mm	1067	1087	1107	1167	11067	11087	11107	11167
200 mm	1068	1088	1108	1168	11068	11088	11108	11168
250 mm	1069	1089	1109	1169	11069	11089	11109	11169

Stem 28 mm only 0-100 and 0-120°C available!
Maximum stem length is 400 mm!



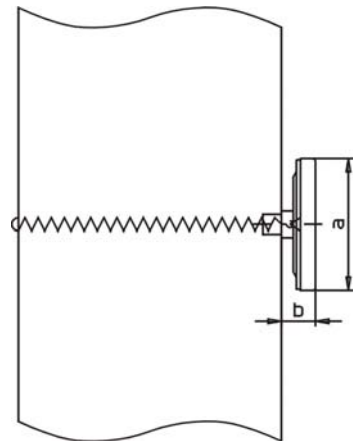
Type	a	b	c	d	SW	G	t
1060	63	13	11	12	21	½ B	12
1080	80	13	11	12	21	½ B	12
1100	100	15	11	12	21	½ B	12
1160	160	19	11	12	21	½ B	12

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

STANDARD VERSION	
Case:	Steel zinced
Bezel:	Steel nickel plated
Dial:	Plastic, white with raised edge lettering and graduation black - Double scale °C/°F - Imprint
Pointer:	Plastic, black, adjustable
Window:	Plastic
Stem:	At the back in brass Ø 15 x 10 mm high
Connection:	Backwards
Mounting method:	Spiral spring for pipes Ø 1" - 2" - Additional spiral springs for larger pipe diameters
Accuracy class:	2,5
Measuring range:	0-120°C
Diam.: mm	63 80
Articel number:	960 A 980 A
	-20+60°C / 0-60°C / 0-160°C Please quote the measuring range by order! 63 80 960 B 980 B



INDUSTRIAL VERSION	
Case:	Stainless steel AISI 304
Bezel:	Stainless steel AISI 304 Diam. 50 mm steel nickel-plated
Dial:	Aluminium, white varnished lettering and graduation black
Pointer:	Aluminium, black, adjustable
Window:	Instrument glass - Max. drag pointer
Connection:	Backwards
Mounting method:	Spiral spring for pipes Ø 1" - 2" - Additional spiral springs for larger pipe diameters
Accuracy class:	2
- OPTIONS	
Diam.: mm	50 63 80 100
Articel number:	400 A 420 A 440 A 460 A

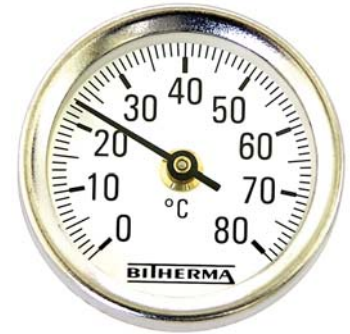


Type	a	b
960	63	26
980	80	26

Measuring range:	For diam. 50 up to 100 mm to be quoted by order			
	-50 +200°C	-20 +40°C	0 -60°C	0 -200°C
	-40 +40°C	-20 +60°C	0 -80°C	0 -250°C
	-40 +120°C	-20 +100°C	0 -100°C	0 -300°C
	-30 +70°C	-10 +60°C	0 -120°C	0 -400°C
	-30 +50°C	-10 +50°C	0 -160°C	

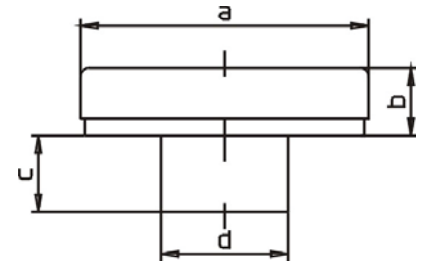
Dimensions and technical data are conform to current company standard. Changes to improve our instruments will be made without preannouncement.

Case: Diam. 34 mm, steel nickel plated
 Bezel: Steel nickel plated
 Protection class: IP 44
 Dial: Aluminium, white varnished
 lettering and graduation black
 - Imprint
 Pointer: Aluminium, black
 Window: Instrument glass
 Mounting method: Plug-in version, diam. 15 mm, brass nickel plated
 Connection: Backwards
 Accuracy class: 2



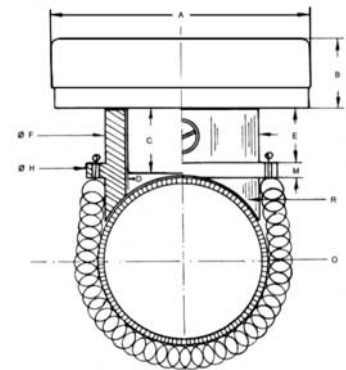
- OPTIONS

Measuring range:	0-80°C	0-50°C
Article number:	701	700



a	b	c	d
34	8	9	15



Accessories: Holder made of brass
 with spiral spring and fixing screw
 for pipes with 22 mm outer diam.
 - without thermometer -
 Article number: 730

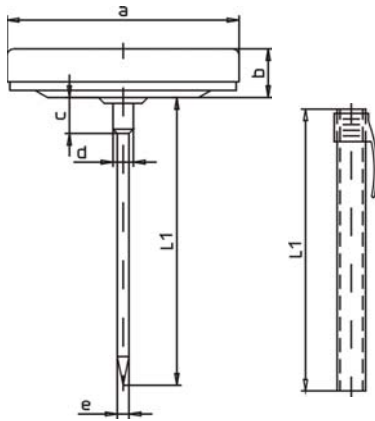


Accessories: Screw connection made of brass
 G 3/4 union nut and G 3/4 male thread
 with socket for the thermometer
 Article number: 731

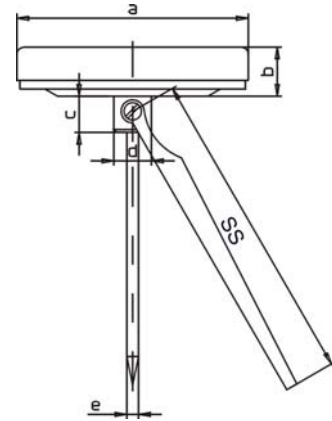


Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

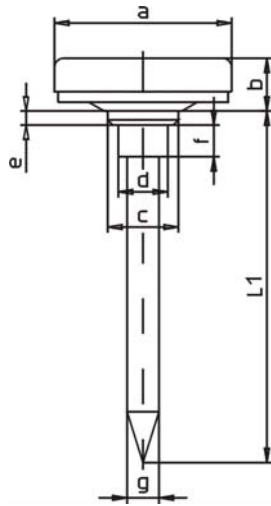
Case:	Stainless steel AISI 304 - Steel zinced					
Bezel:	Stainless steel AISI 304 - Steel nickel plated					
Protection class:	IP 43					
Dial:	Aluminium, white varnished lettering and graduation black					
Pointer:	Aluminium, black, not adjustable - Silicone damped					
Window:	Instrument glass					
Stem:	With tip for insertion					
Connection:	Backwards					
Measuring range:	0-120°C - Resp. opposite					
Accuracy class:	2 - Accuracy class 1 - Works test certificate - OPTIONS (others on request)					
Version:	Stem diam. 4 mm made of AISI 316 Ti with tip					
Diam.: mm	34	50	63	80		
stem 100 mm	1732	1752	1762	1782		
stem 200 mm	1734	1754	1764	1784		
stem 300 mm	1736	1756	1766	1786		
Accessories:	- PVC stem protection with clip					
Version:	Stem diam. 4 mm made of AISI 316 Ti with tip and foldable handle					
Diam.: mm	34	50	63			
stem 100 mm	1732-1	1752-1	1762-1			
stem 200 mm	1734-1	1754-1	1764-1			
stem 300 mm	1736-1	1756-1	1766-1			
Version:	Stem diam. 9 mm made of brass with tip, case steel zinced				Measuring-range	Graduation
Diam.: mm	50	63	80	100		
stem 100 mm	1752-2	1762-2	1782-2	1802-2		
stem 200 mm	1754-2	1764-2	1784-2	1804-2		
stem 300 mm	1756-2	1766-2	1786-2	1806-2	-40 +40°C -30 +50°C -20 +60°C -20 +40°C -15 +45°C -10 +50°C 0 -40°C 0 -60°C 0 -80°C	1°
Version:	Stem diam. 12 mm made of brass with tip, case steel zinced				Measuring-range	Graduation
Diam.: mm	63	80	100			
stem 750 mm	1762-3	1782-3	1802-3			
stem 1.000 mm	1764-3	1784-3	1804-3			
stem 1.250 mm	1766-3	1786-3	1806-3		0 -100°C 0 -120°C 0 -160°C 0 -200°C 0 -250°C 0 -300°C 0 -400°C	2° 5° 10°
Other lengths are available!	Advice: The gauges are NOT watertight and thus they are NOT suitable for permanent outdoor use.					



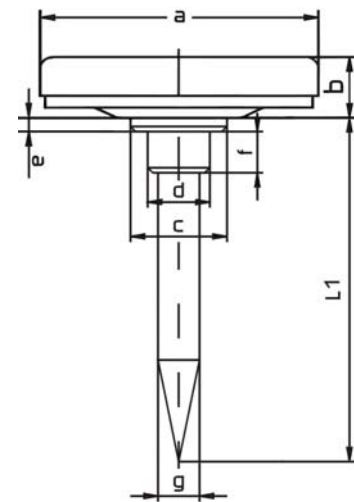
Type	a	b	c	d	e
1730	34	9	12,5	7	4
1750	50	12	12,5	7	4
1760	63	13	12,5	7	4
1780	80	13	12,5	7	4



Type	a	b	c	d	e	SS
1730-1	34	9	10	13	4	110
1750-1	50	12	10	13	4	110
1760-1	63	13	10	13	4	110



Type	a	b	c	d	e	f	g
1750-2	50	12	20	14	2	10	9
1760-2	63	13	20	14	2	10	9
1780-2	80	13	20	14	2	10	9
1800-2	100	15	20	14	2	10	9



Type	a	b	c	d	e	f	g
1760-3	63	13	20	14	2	10	12
1780-3	80	13	20	14	2	10	12
1800-3	100	15	20	14	2	10	12

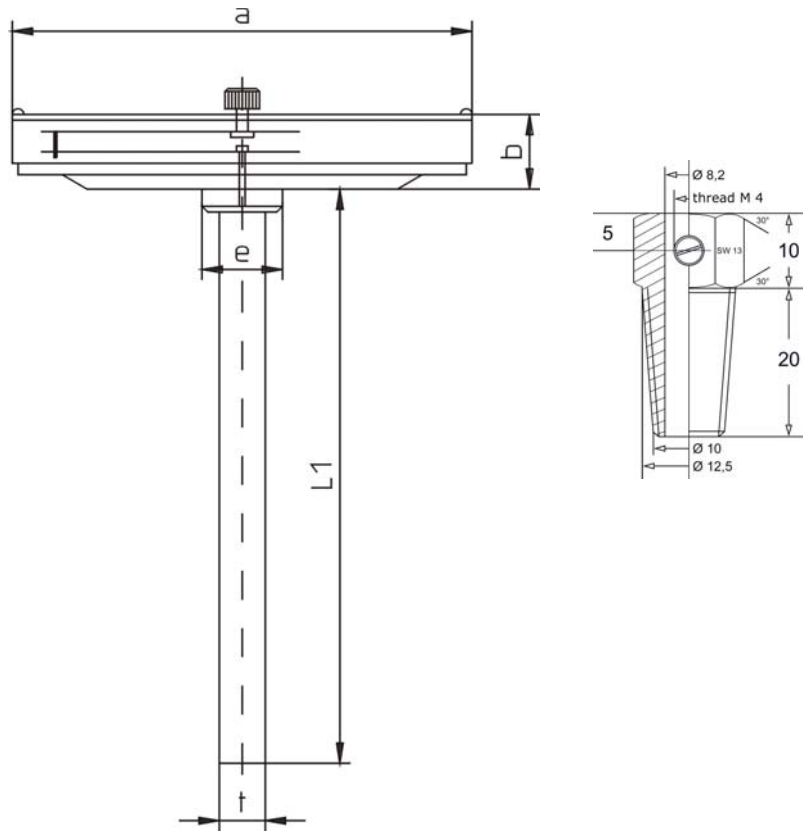
Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case:	Steel zined - Stainless steel AISI 304
Bezel:	Steel nickel plated - Stainless steel AISI 304
Protection class:	IP 34
Dial:	Aluminium, white varnished from 500°C blank aluminium lettering and graduation black - Red mark - Imprint - Double scale °C/°F
Pointer:	Aluminium, black adjustable at end of stem
Window:	Instrument glass - Max. drag pointer (diam. 63-100) - Max./Min. drag pointer (diam. 63-100)
Stem:	L = 200 x Ø 8 mm made of stainless steel AISI 316 Ti - Other lengths
Mounting method:	conical thread A/F 13 made of brass with fixing screw - Thread G ½ B brass with fixing screw
Connection:	Backwards
Accuracy class:	2 - Accuracy class 1 - Works test certificate - OPTIONS



Picture shows an instrument with max./min. drag pointer

Measuring range: Diam.: mm	Article number:			
	50	63	80	100
0-250°C	1851	1861	1881	1901
0-300°C	1852	1862	1882	1902
0-400°C	1853	1863	1883	1903
0-500°C	1854	1864	1884	1904



Type	a	b	e	t
1850	50	12	14	8
1860	63	13	14	8
1880	80	13	14	8
1900	100	15	14	8

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.



Case:	Diam. 50 mm steel nickel plated Diam. 63 and 80 mm stainless steel AISI 304 Diam. 100 mm steel zined
Bezel:	Diam. 50 mm steel nickel plated Diam. 63 and 80 mm stainless steel AISI 304 Diam. 100 mm AISI 304
Dial:	Aluminium, white varnished Diam. 80 at 0-500°C and 0-600°C steel enamels lettering and graduation black
Pointer:	Aluminium, black adjustable
Window:	Instrument glass - Max. drag pointer (diam. 63-100) - Max./Min. drag pointer (diam. 63-100)
Measuring element:	Bimetal spiral spring
Measuring range:	0-120°C - Resp. opposite
Mounting method:	With bar magnets
Connection:	Backwards
Accuracy class:	2,5

- Works test certificate
- OPTIONS

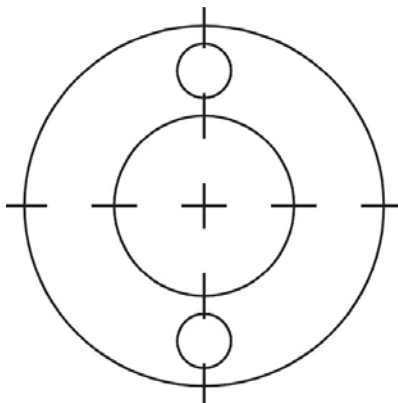
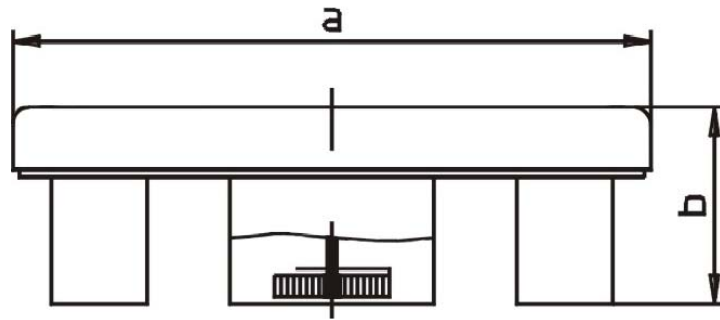
Features:	- Flexible bar magnets - As humidity gauge 0-100% rel. humidity - Protection case
-----------	---

Measuring-range for diam. 50-100	Graduation
-40 +40°C -30 +70°C -30 +50°C -20 +40°C -20 +60°C	1°
-20 +80°C -20 +100°C	2°
-10 +60°C -10 +50°C 0 -60°C 0 -80°C	1°
0 -100°C 0 -120°C 0 -160°C 0 -200°C	2°
0 -250°C 0 -300°C 0 -350°C	5°
0 -400°C	10°
and for diam. 80	
1) 0 -500°C 1) 0 -600°C	10°

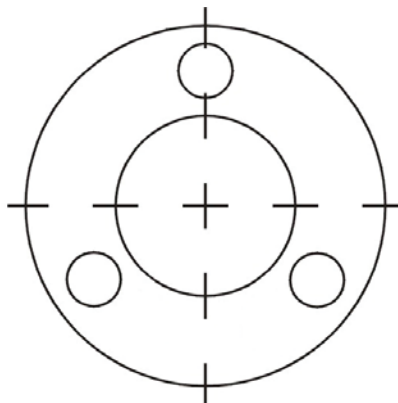
Magnets Diam.: mm	Article number:			
	50	63	80	100
2 simple	1951	1961	1981	-
3 simple	-	1962	1982	-
4 simple	-	1963	1983	-
2 strong	-	-	1984	-
3 strong	-	-	1985	-
4 strong	-	-	1986	2006

1) Dial in steel-enamels necessary!

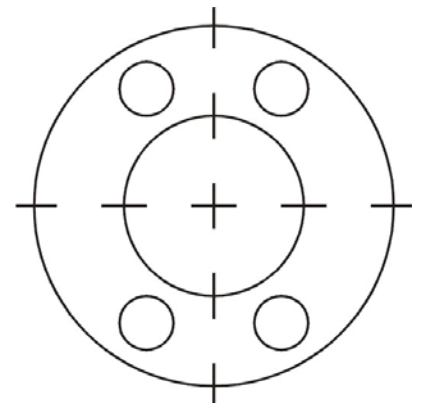
Annular magnets affect the measuring result because of the heat emission on the bimetal spiral spring. That's the reason why our gauges are fitted with bar magnets mounted as far as possible from the measuring element.



Layout of magnets
 2 pieces



Layout of magnets
 3 pieces



Layout of magnets
 4 pieces

Type	a	b	Number of magnets
1950	50	30	
1960	63	31	
1980	80	31	
2000	100	33	

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case:	Diam. 63 (68) plastic grey
Bezel:	Stainless steel AISI 304
Dial:	Aluminium, white varnished lettering and graduation black
Pointer:	Air: Aluminium, blue Ground: Aluminium, red
Window:	Instrument glass - Max./Min. drag pointer - Max. drag pointer (Fig. 25)
Handling:	To seat with total surface contact on concrete or the like
Measuring system:	Double chamber with bimetal spiral spring
Measuring range:	-20+80°C
Accuracy class:	Air: ± 1,0°C Ground: ± 1,5°C
Features:	Fig. 25 With single chamber system for ground measurements



Fig. 26

- OPTIONS

Diam.:	mm	Article number:
Fig. 25		63 1290001
Fig. 26		1290002

Fig. 25

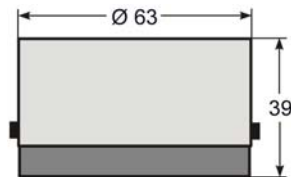
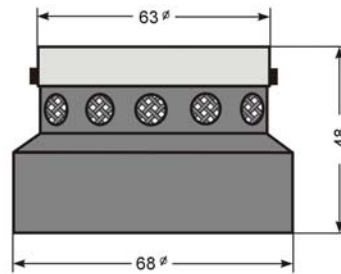


Fig. 26



FIELD OF USING

During the setting of concrete the so-called setting temperature arises, which can develop a higher or a lower temperature data depending on the manufactured materials. Especially on cold days this recorded temperature is necessary to assure further concrete working.

NOTE

Do not use on fresh, wet concrete, being conditioned by the construction of the gauge. Because of the open bottom side the concrete could possibly intrude into the gauge and destroy it. Then please use Fig. 25 (with closed bottom side).

FUNCTION TABLE

- ▷ The lower measuring chamber is protected by screen wire of st.st. The inner bimetallic system indicates the ground temperature, which can be read by the red instrument pointer.
- ▷ Another system is placed in a separate upper measuring chamber and indicates the surrounding air temperature. This temperature can be read by the blue instrument pointer.

To find out the highest ground and the lowest air temperature time-independent the thermometer additionally can be fitted with a minimum and maximum drag pointer.

The actual value pointer is fitted with a flag equally coloured as the drag pointer mounted in the glass window pulled to the highest resp. lowest temperature value according to temperature changes.



When both measuring systems have reached again the original position after finished measurement, the drag pointers can be readjusted to the actual value pointer by turning the buttons. Thereafter a new measurement can be made.

Dimensions and technical data are conform to current company standard. Changes to improve our instruments will be made without preannouncement.

Case:	Ø 63 stainless steel 1.4301 Ø 78 stainless steel 1.4301
Bezel:	Stainless steel 1.4301
Dial:	Aluminium, white varnished from measuring range 200°C on ALU-blank lettering and graduation black
Pointer:	Aluminium, black adjustable at the back
Window:	Ø 63 instrument glass Ø 78 instrument glass, domed - max. drag-pointer (flat glass)
Handling:	With tilt stand - with lug for wall mount
Measuring system:	Bimetal spiral spring
Measuring range:	0-300°C - resp. opposite
Accuracy class:	2
Special features:	Ø 78 with measuring range 0-500°C and 0-600°C dial made of enamelled steel

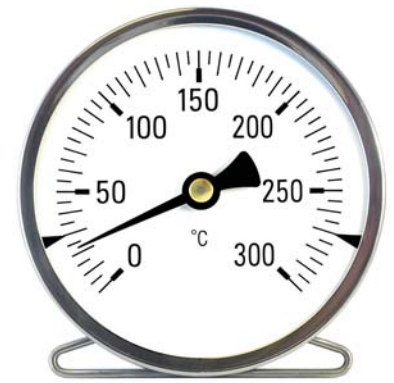


Fig. 16

Fig. 13 S: For mounting in oven door etc.
on the back of the case with 2 stem nuts M4,
center distance 36 mm, without fasteners

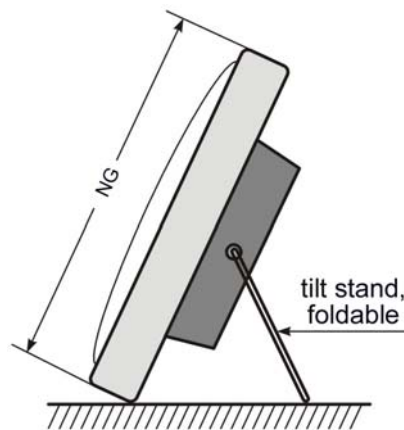
- OPTIONS

Measuring-range	Graduation
-30 +70°C	1°
-30 +50°C	
-20 +40°C	
-20 +60°C	
-20 +80°C	2°
-20 +100°C	
-10 +60°C	1°
-10 +50°C	
0 -60°C	
0 -80°C	
0 -100°C	2°
0 -120°C	
0 -160°C	
0 -200°C	
0 -250°C	5°
0 -300°C	
0 -350°C	
0 -400°C	10°

Article number:	1230011	1230012
Case Ø 63 mm	1230011	1230012
Case Ø 78 mm	1230011	1230012

1) 0 -500°C	10°
1) 0 -600°C	10°

1) dial steel enamelled



The thermometer is designed for interior measurements of all kind. It can be used in electronically controlled ovens as comparison tool and also in stone ovens as reference tool.

The device is position-insensitive and therefore as required it is used in standing or lying position.

A foldable tilt stand which is rear attached to the case cants the instrument to a good read-off position.

The rear vent in the case allows the ventilating air free access to the measuring element. This makes a display correction possible.

Attention:

Because of high risk of breakage water on the hot cover glass is to be avoided.

To prevent burns it should be noted that the case has still the displayed temperature when removing it from the oven.

Case:	Bayonet fitted, stainless steel AISI 304 - With liquid filling (IP 65)
Bezel:	Bayonet fitted, stainless steel AISI 304
Protection class:	IP 54
Dial:	Aluminium, white varnished lettering and graduation black - Double scale °C/°F
Pointer:	Aluminium, black, adjustable up in the case
Window:	Instrument glass - Perspex window - Laminated safety glass - Max. drag pointer - Max./Min. drag pointer - Red mark pointer
Stem:	Plain without thread, Standard up to 200 mm long Ø 6, 8 or 10 mm made of stainless steel AISI 316 Ti - Connections see overleaf
Measuring range:	0-120°C - Resp. opposite
Accuracy class:	1 - Works test certificate - OPTIONS
Specials:	Instruments with magnetic snap action contact
Version:	Back entry connection
Diam.: mm	63 80 100 160 250
Article number:	3364 3384 3404 3464 3554

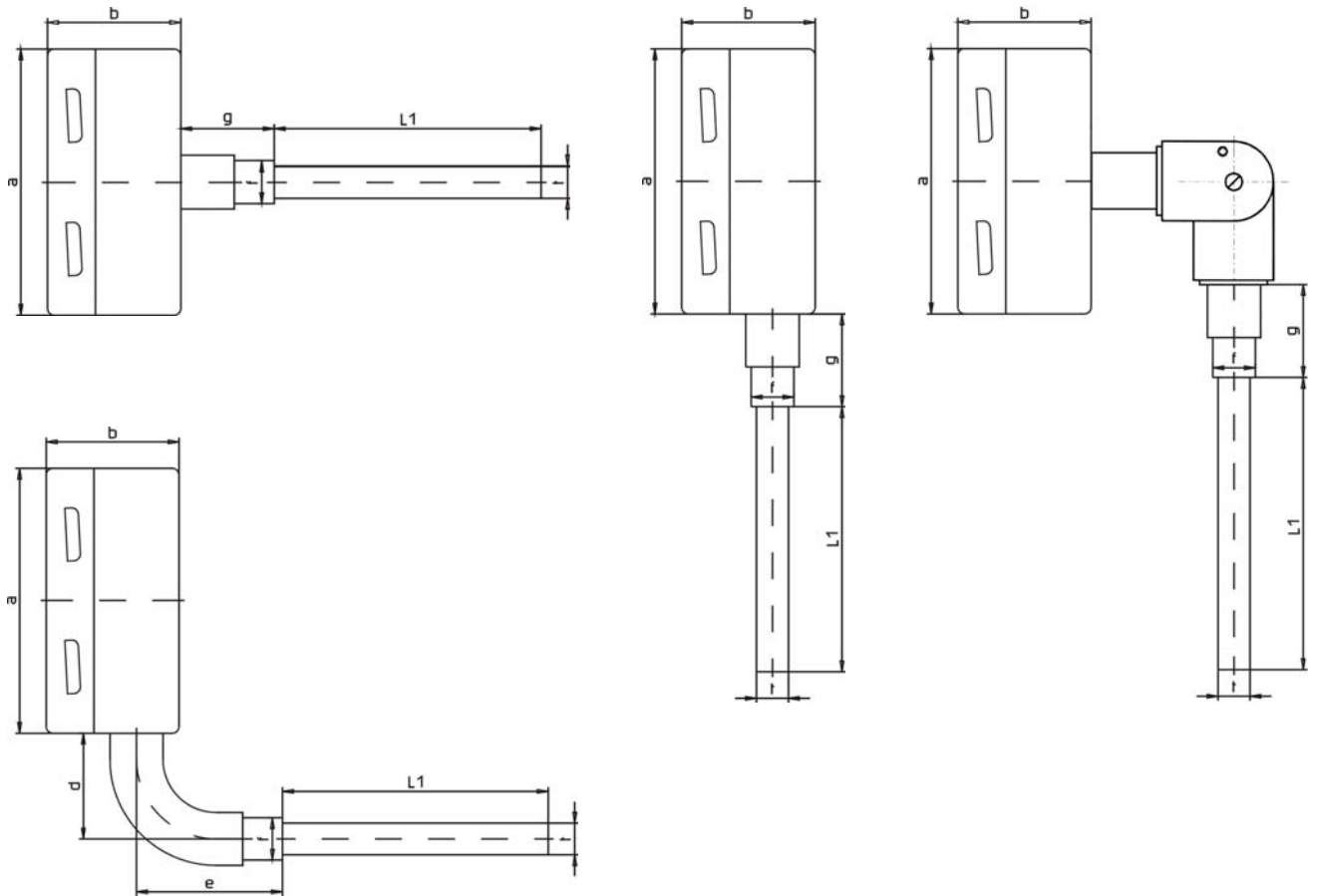


Picture shows an instrument with four magnetic contacts

Version:	bottom entry connection
Diam.: mm	63 80 100 160 250
Article number:	3364-1 3384-1 3404-1 3464-1 3554-1
Version:	Stem angular 90° / 135° bottom/back entry
Diam.: mm	63 80 100 160 250
Article number:	3364-2 3384-2 3404-2 3464-2 3554-2
Version:	Stem back entry - 90° adjustable every angle
Diam.: mm	63 80 100 160 250
Article number:	3364-3 3384-3 3404-3 3464-3 3554-3
Gauges with capillary (length please quote)	
Version:	With wall bracket made of aluminium black
Diam.: mm	63 80 100 160 250
Article number:	3664 3684 3704 3764 3854
Version:	With 3-hole front flange for panel mounting
Diam.: mm	63 80 100 160 250
Article number:	3664-1 3684-1 3704-1 3764-1 3854-1
Version:	With 3-hole back flange for surface mounting
Diam.: mm	63 80 100 160 250
Article number:	3664-2 3684-2 3704-2 3764-2 3854-2

Measuring-range	Graduation
-60 +40°C -50 +50°C	2°
-30 +30°C -30 +50°C -20 +60°C -20 +40°C -10 +50°C	1°
0 -60°C 0 -80°C	
0 -100°C 0 -120°C 0 -160°C 0 -200°C	2°
0 -250°C 0 -300°C	5°
0 -400°C 0 -500°C 0 -600°C 0 -700°C 0 -800°C	10°

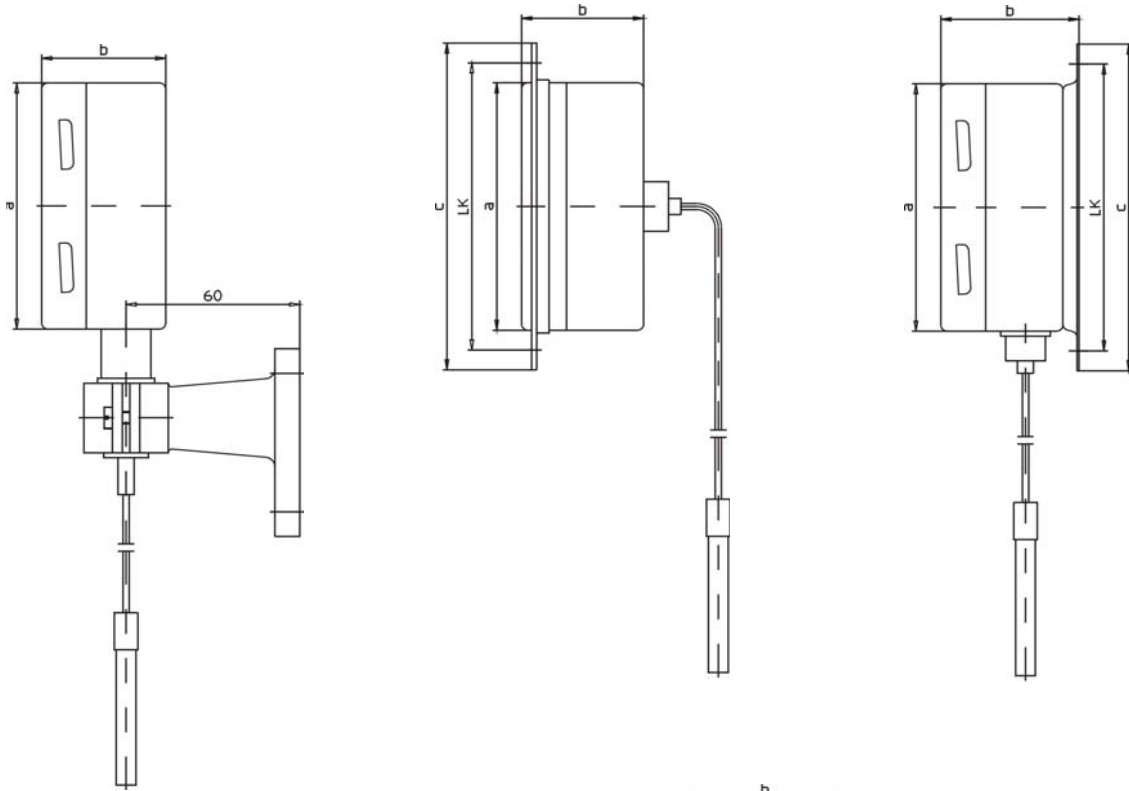
Other measuring ranges and executions available on request!



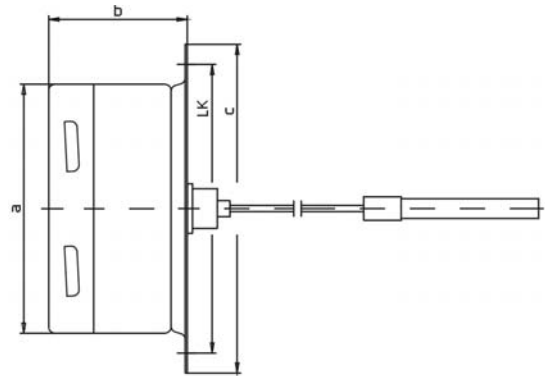
Type	a	b	d	e	f	g	t
3364	63	38	60	80	14	20	
3384	80	37	60	80	14	20	
3404	100	45	60	80	14	20	
3464	160	45	60	80	14	20	
3554	250	57	60	80	14	20	

0	1	2	3	4	5	6	7	8	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	with flange Ø 40 steel-zincd for air ducts	with helical air bulb	separate pocket for welding with fixing screw

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.



Type	a	b	c	LK			
3664	63	38	86	75			
3684	80	37	110	95			
3704	100	45	132	116			
3764	160	45	196	178			
3854	250	57	285	270			



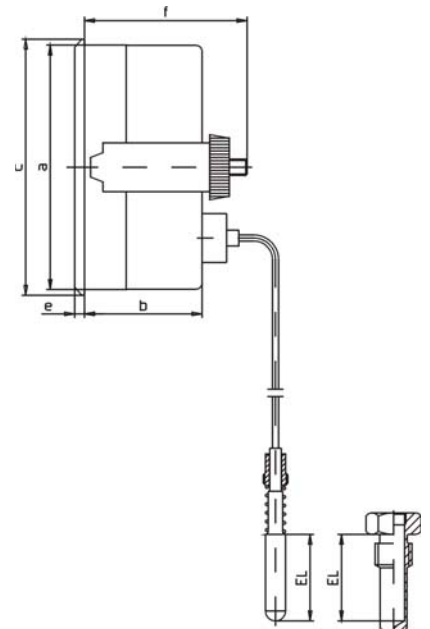
0	1	2	3	4	5	6	7	8	9
separate pocket with male thread and fixing screw	fixed connection male thread	union nut female thread	union nut with double nipple male thread	union nut with additional thermowell acc. to DIN 43 772 form 8	turnable male thread	movable clamp connection male thread	with flange Ø 40 steel-zincd for air ducts	with helical air bulb	separate pocket for welding with fixing screw

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

- Case: Diam. 60 mm steel zincd
- Diam. 50 / 80 / 100 mm
- Surface mounting flange
- Bezel: Triangular bezel, brass chromed
for panel mounting
- Panel mounting flange
- Dial: Aluminium, white varnished
lettering and graduation black
- Pointer: Aluminium, black
- Window: Instrument glass
- Capillary: PVC coated, black
- With copper spiral hose
- Mounting method: With u-clamp for panel mounting
- Connection: Backwards
- Stem: Cu-alloy, L = 36 x Ø 8,5 mm
with compression spring and round nut M 10 x 1
- other fittings and threads
- Measuring range: 0-120°C
- Others on request
- Accuracy class: 2
- OPTIONS



Type	a	b	c	e	f
3900	60	33	64	4	45



Capillary: [mtr]	Article number:			
	1	2	3	5
Case diam. 60 mm	3901	3902	3903	3905

Accessories:	Thermowells made of brass, connection G ½ B soft soldered					
Stem: L= [mm]	45	63	80	100	160	200

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.



Case:	Diam. 80 mm stainless steel AISI 304 - Steel zined
Bezel:	Stainless steel AISI 304 - Steel nickel plated
Protection class:	IP 34
Dial:	Aluminium, white varnished lettering and graduation black - Imprint - Double scale °C/°F
Pointer:	Aluminium, black - Silicone damped
Window:	Instrument glass - Perspex window - Laminated safety glass
Insertion stem:	L = 1.000 x Ø 13 up to L = 4.000 x Ø 20 tapered to Ø 16 mm
Handling:	2 solid handles made of brass
Connection:	Backwards
Measuring range:	0-120°C - Others on request
Accuracy class:	1 - OPTIONS

Diam:	80 mm	1.000	1.500	2.000	2.500	3.000	3.500	4.000	[mm]
Article number:		1110053	1110054	1110055	1110056	1110057	1110058	1110059	

Case steel zined, bezel steel nickel plated
stem made of brass Ø 13 x 1,5 mm with tip

Diam:	80 mm	500	750	1.000	1.250	1.500	1.750	2.000	[mm]
Article number:		1110081	1110082	1110083	1110084	1110085	1110086	1110087	

Case steel zined, bezel steel nickel plated
stem made of stainless steel Ø 13 x 1,5 mm with tip made of brass

Diam:	80 mm	500	750	1.000	1.250	1.500	1.750	2.000	[mm]
Article number:		1110091	1110092	1110093	1110094	1110095	1110096	1110097	

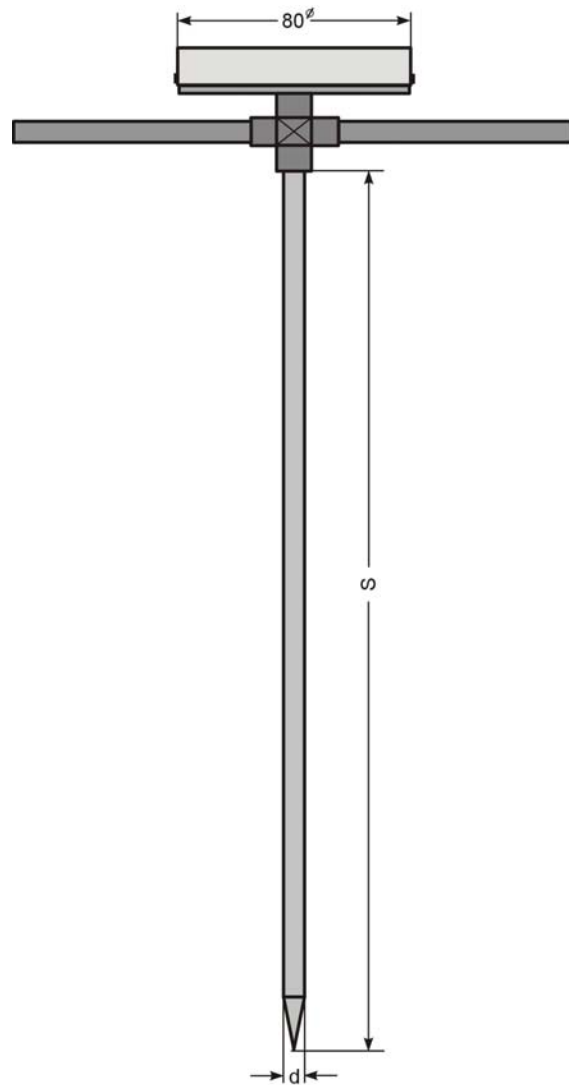
-light version-

Case steel zined, bezel steel nickel plated
stem made of brass Ø 12 x 1 mm with tip

Diam:	80 mm	500	750	1.000	1.250	1.500	1.750	2.000	[mm]
Article number:		1110101	1110102	1110103	1110104	1110105	1110106	1110107	

Case steel zined, bezel steel nickel plated
stem made of stainless steel Ø 12 x 0,9 mm with tip made of brass

Diam:	80 mm	500	750	1.000	1.250	1.500	1.750	2.000	[mm]
Article number:		1110111	1110112	1110113	1110114	1110115	1110116	1110117	



Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case: Diam. 100 steel zined
 - Diam. 160

Bezel: Stainless steel AISI 304

Dial: Aluminium, white varnished
 lettering and graduation black

Pointer: Aluminium, black
 adjustable at end of stem

Window: Instrument glass
 - Perspex window
 - Laminated safety glass

Stem: L = 100 x Ø 28 mm copper nickel plated
 - Other lengths are available

Measuring system: Double or fourfold for rel. humidity

Measuring range: 0-100% rel. humidity

Operating range: -30+80°C

Connection: Backwards
 - Bottom (not available with double stem)

Features:
 - With sliding contact for signalling
 - With double scale for humidity and temperature 0-60°C
 (2 stems backwards - Ø 160 only with surface mounting flange)

Mounting method: With back flange, steel zined, surface mount
 or with fixed connection thread G 1" made of brass
 - With back flange made of stainless steel AISI 304 (diam.100 only)
 - Stem with movable flange steel zined Ø 80 mm, surface mount

Accuracy class: ± 3% from 30-75% rel. humidity at 18-22°C

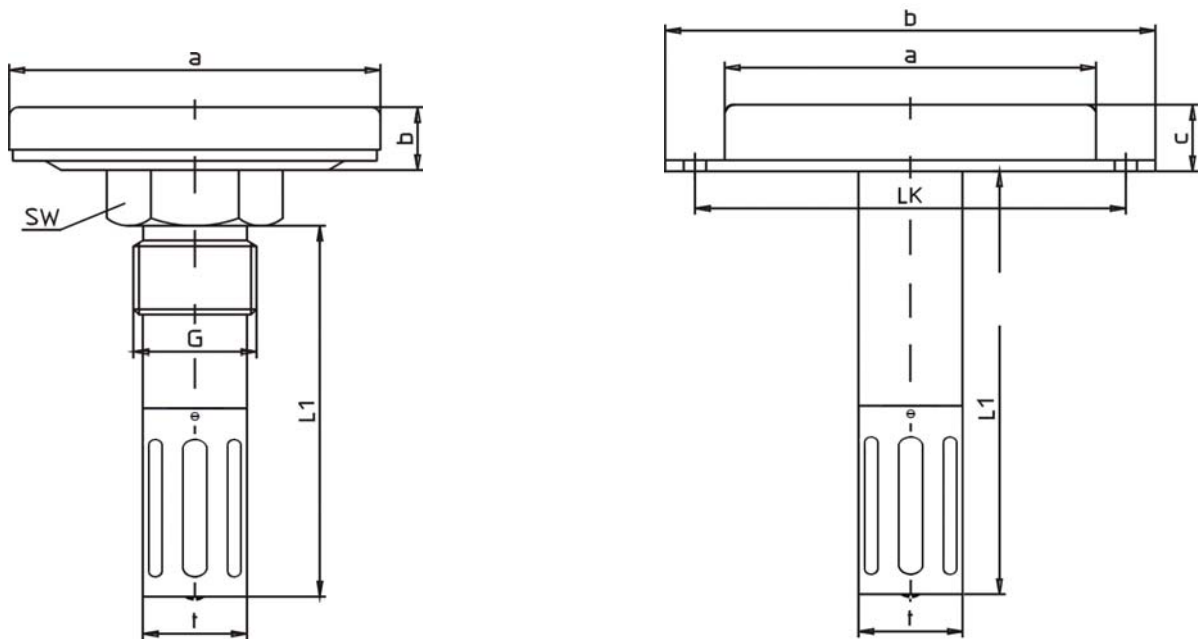
- Dial imprint in English

- OPTIONS



Mounting method: Article number:
 G 1" brass Back flange

Diam. 100 890 894



Type	a	b	t	G	SW
890	100	15	28	1"	36

Type	a	b	LK	c	t
894	100	132	116	18	28

These gauges are produced for air duct and climatic chamber installations. For good ventilation of the humidity measuring element the stem is fitted with air vents. The air vents are sealed with a stainless steel gauze inside the stem, in order to prevent the infiltration of dust and therefore the damage of the measuring element.

As such gauges are insensitive to their orientation, the instrument can be mounted axial, vertical or in oblique position.

The measuring element is suitable for a permanent temperature up to plus 80°C. A temporary max. load up to 120°C is acceptable.

If the gauge works at steady low humidity, an annual activation and a recalibration of the measuring element should be made.

The activation takes place by bandaging the perforation of the stem with a wet cloth (approx. 60 minutes). The gauge should then indicate approx. 96% rel. humidity. Perhaps the instrument can be recalibrated by using a screwdriver.

Air flow protection sleeve for high air velocity and/or additional dust filter are available accessories.

Dimensions and technical data are conform to current company standard. Changes to improve our instruments will be made without preannouncement.

Case: Diam. 130 mm stainless steel AISI 304

Bezel: Stainless steel AISI 304

Dial: Aluminium, white varnished
lettering and graduation black
with dewpoint scale

Pointer: Aluminium, black
adjustable

Window: Plastic, raised

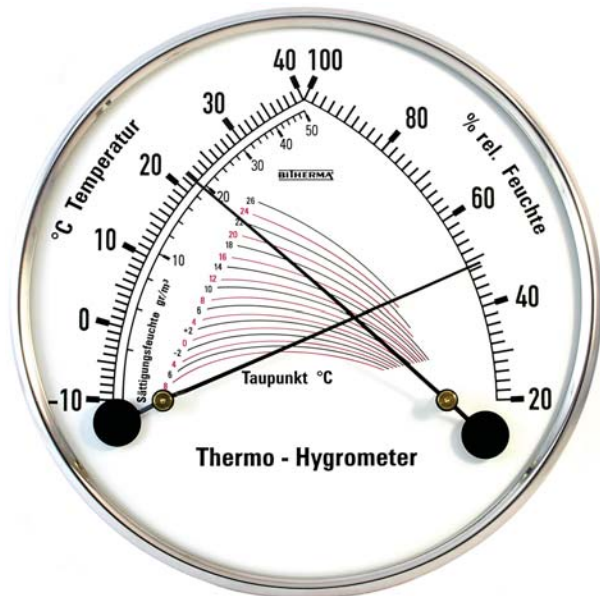
Measuring system: 1 x bimetal for temperature
1 x rel. humidity

Measuring range: Air: -10... +40°C
Rel. humidity: 20... 100%
Saturation moisture: 4... 50 gr./m³
Dewpoint temperature: -8... +26°C

Accuracy class: Temperature ± 1°C
Humidity ± 2,5%

Mounting method: With suspension

- Special versions:
- Fig. 35-Ta: With dewpoint scale
 - Fig. 35-K: With scale for indoor climate
 - Fig. 35-H: With scale for wood moisture
 - Dial imprint in English
 - OPTION

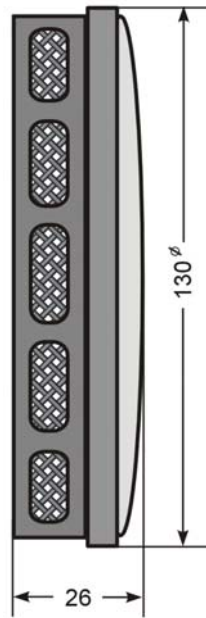


Article number:

Fig. 35-Ta: 1530001

Fig. 35-K: 1530002

Fig. 35-H: 1530003



The thermo-hygrometer contains a precision humidity meter and a bimetal measuring system. Here the temperature, the relative humidity, the saturation moisture and the dewpoint can be read off directly following the curves from the point of intersection of the surface temperature pointer and the relative surface humidity pointer.

Its field contains a series of possibilities as controlling the temperature, the rel. humidity and the dewpoint temperature in climatic chambers, storage rooms, living rooms, sheds, barns, in all industrial factories like the textile and clothing sector, powder and canning-factories, in paper, in the wood working industry and tobacco processing.

For the quality of such products it is very important to comply to special grades of humidity and temperature during production, storage and drying. Corrosive materials have to be protected against rust and oxidation. By all means it must be avoided that the temperature cools down to the dewpoint.

Saturation moisture = maximum absorbable humidity at the responsible temperature in g/m^3

Absolute humidity = substantial humidity in g/m^3
 $\% \text{ rel. humidity} : 100 \times \text{saturation moisture } \text{g/m}^3$

Look picture = $(49\% : 100 \times 19 \text{ g/m}^3) = 9,31 \text{ g/m}^3$ absolute humidity

Relative humidity = $\frac{\text{absolute humidity } \text{g/m}^3}{\text{saturation moisture } \text{g/m}^3} \times 100 = \% \text{ rel. humidity}$

Dewpoint = temperature in $^{\circ}\text{C}$, at which the water vapour included in the air just would condensate.

Saturation deficit = saturation moisture minus absolute humidity

The dewpoint temperature can be read off directly in $^{\circ}\text{C}$ by following the curves from the point of intersection of the pointers. Now you are able to calculate the saturation moisture deficit.

E.G. air temperature $21,5^{\circ}\text{C}$, saturation moisture = 19 g/m^3 , rel. humidity $49\% = 10^{\circ}\text{C}$ dewpoint can be read off at the intersection of the pointers.

Saturation deficit = $19 \text{ g/m}^3 - 9,31 \text{ g/m}^3 = 9,69 \text{ g/m}^3$.

So in this case the air is able to absorb further $9,69 \text{ g water / m}^3$ to condensate.

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case: Diam. 130 mm stainless steel AISI 304

Bezel: Stainless steel AISI 304

Dial: Aluminium, white varnished
lettering and graduation black
with dewpoint scale

Pointer: Aluminium, black
adjustable

Window: Plastic, raised

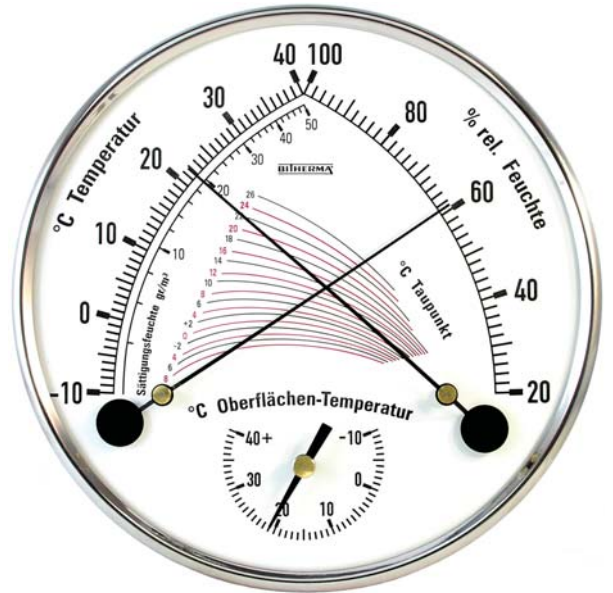
Measuring system: 2 x bimetal for temperature
1 x rel. humidity

Measuring range: Air: -10... +40°C
Rel. humidity: 20... 100%
Saturation moisture: 4... 50 gr./m³
Dewpoint temperature: -8... +26°C
Surface temperature: -10... +40°C

Features: Flexible measuring pot for surface temperature

Accuracy class: Temperature ± 1°C
Humidity ± 2,5%

Mounting method: With 3 bar magnets

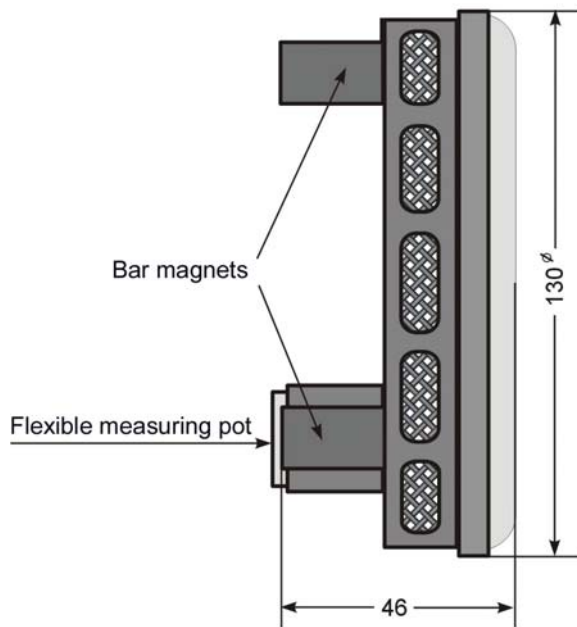


- Dial imprint in English

- OPTION

Article number:
1530011

Fig. 36



The thermo-hygrometer contains a precision humidity meter and two bimetal measuring systems. Here the temperature, the relative humidity, the saturation moisture and the dewpoint can be read off directly following the curves from the point of intersection of the surface temperature pointer and the relative surface humidity pointer. The back of the case is fitted with 3 strong bar magnets for steel part usage.

The instrument was developed for the requirements of the metallization and is normally used in the field of ship conservation, docks, bridges, steel constructions, mining and pipeline engineering. At work in such fields of application it is possible to define directly the dewpoint temperature on the surface of the steel girder. This measurement has to convey certainty, that there will be no dewpoint precipitation. In the coating technic difficulties often arise because the paint doesn't stay on a wet base coat.

If the ambient temperature is 3°C or more above the dew point, the conditions of *BSS 5493** are satisfied and the metal surfaces may be painted.

E.G. air temperature 22°C, rel. Humidity 61% = 14°C dewpoint at 21°C surface temperature.

The difference between surface temperature and dewpoint temperature is 7°C, so that the conserving works can begin, because it is higher than 3°C.

The air temperature shows 22°C. This indicates that the surface temperature sinks slowly and a dewpoint precipitation is possible.

For that reason the testing should be repeated in certain intervals.

**BSS 5493:*

1977 lays down a code of practice for the protective coating of iron and steel structures against corrosion. One of the most important provisions is that coatings should not be applied in conditions of excessive humidity, i.e. when the metal surface temperature is less than 3°C above the dew point.

Replaced by BS EN ISO 14713:1999

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case: Diam. 130 mm stainless steel AISI 304

Bezel: Stainless steel AISI 304

Dial: Aluminium, white varnished
lettering and graduation black
with dewpoint scale

Pointer: Aluminium, black
adjustable

Window: Plastic, raised

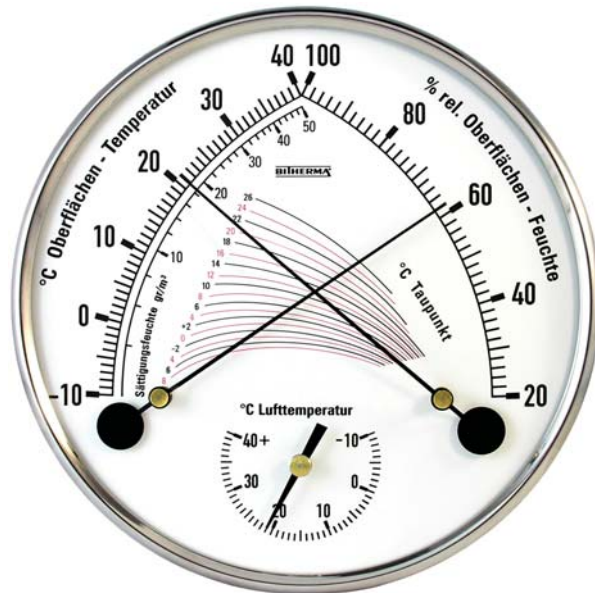
Measuring system: 2 x bimetal for temperature
1 x rel. humidity

Measuring range: Surface temperature: -10... +40°C
Rel. surface humidity: 20... 100%
Saturation moisture: 4... 50 gr./m³
Dewpoint temperature: -8... +26°C
Air temperature: -10... +40°C

Features: **Fig. 38**
With flexible measuring pots for a quick measuring value,
for surface temperature and surface humidity.
With these instruments you can reach highest precision.

Accuracy class: Temperature ± 1°C
Humidity ± 2,5%

Mounting method: With 3 bar magnets



- Dial imprint in English

- OPTION

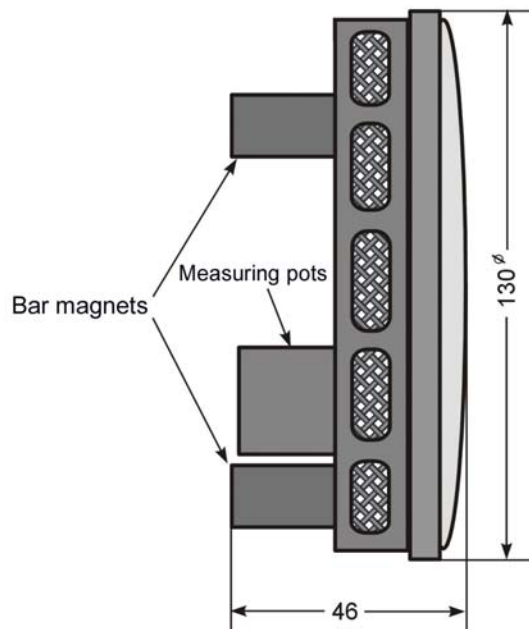
Article number:

Fig. 37

1530021

Fig. 38

1530023



The thermo-hygrometer contains a precision humidity meter and two bimetal measuring systems. Here the temperature, the relative humidity, the saturation moisture and the dewpoint can be read off directly following the curves from the point of intersection of the surface temperature pointer and the relative surface humidity pointer. The back of the case is fitted with 3 strong bar magnets for steel part usage.

The instrument was developed for the requirements of the metallization and is normally used in the field of ship conservation, docks, bridges, steel constructions, mining and pipeline engineering. At work in such fields of application it is possible to define directly the dewpoint temperature on the surface of the steel girder. This measurement has to convey certainty, that there will be no dewpoint precipitation. In the coating technic difficulties often arise because the paint doesn't stay on a wet base coat.

If the ambient temperature is 3°C or more above the dew point, the conditions of *BSS 5493** are satisfied and the metal surfaces may be painted.

E.G. air temperature 21°C, rel. Humidity 62% = 14°C dewpoint at 21°C surface temperature.

The difference between surface temperature and dewpoint temperature is 7°C, so that the conserving works can begin, because it is higher than 3°C.

The air temperature shows 21°C. This indicates that the surface temperature sinks slowly and a dewpoint precipitation is possible.

For that reason the testing should be repeated in certain intervals.

***BSS 5493:**

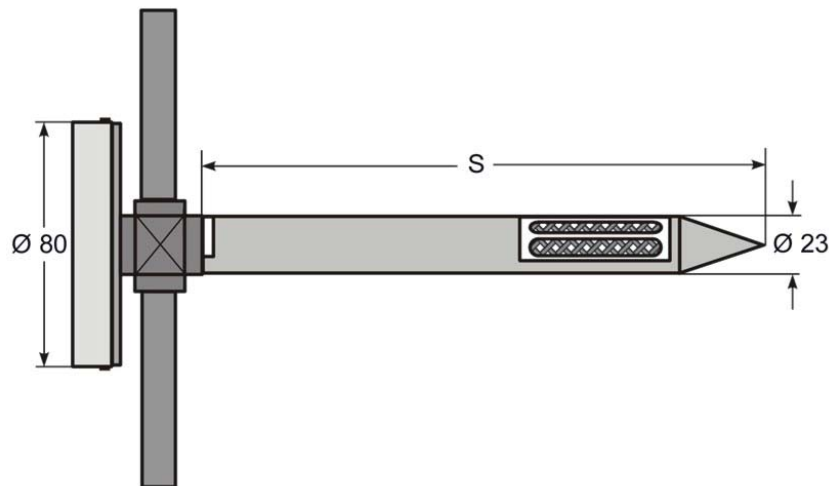
1977 lays down a code of practice for the protective coating of iron and steel structures against corrosion. One of the most important provisions is that coatings should not be applied in conditions of excessive humidity, i.e. when the metal surface temperature is less than 3°C above the dew point.

Replaced by BS EN ISO 14713:1999

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Diam. 80 mm stainless steel AISI 304
Bezel:	Stainless steel AISI 304
Dial:	Aluminium, white varnished lettering and graduation black
Pointer:	Aluminium, black
Window:	Instrument glass - Perspex window - Laminated safety glass
Insertion stem:	L = 500 x Ø 23 mm in brass chromed with tip - L = 1.000 mm
Features:	Measuring systems protected by st. steel gauze and by turnable double stem
Handling:	2 solid handles made of brass for pricking
Measuring system:	Tripple fold for humidity
Measuring range:	0-100% rel. humidity
Accuracy class:	± 3% from 30-75% rel. humidity at 18-22°C
	- Dial imprint in English
	- OPTION





The hygrometer for pricking is mainly used in agriculture to define the moisture content of corn. The hygrometer is insensible to its position and can be used axial, vertical or in oblique position.

The measuring element qualifies to a permanent temperature of 80°C. A temporary max. load up to 120°C is acceptable. There are two screwable handles installed beneath the case for inserting the stem into the stored goods.

Before insertion into the stored goods the outer stem has to be turned to close the perforation at the stem end. After reaching the measuring depth the perforation has to be opened by turning to the other direction. Now the measurement can begin.

The stem should stay in the stored goods for approx. 30 to 60 minutes. The ascertaining of the relative humidity follows by a scale 0...100%.

The water content of measured goods can be ascertained by curve charts.
 Please send us your request!

After finishing the measurement the perforation has to be closed again before the stem is pulled out again.

Disregarding this can cause damage to the measuring element.

The instrument is produced for the following stored goods:

field beans, cotton, cottonseed, peas, peanut kernels, barley, grass seed, oats, hay, millet, wood, industrial silk, leather, linseed, corn, milo, rapeseed, rice, rye, wheat, wool, sunflower seed, and real silk.

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised
Figures:	Beneath an anodic coating
Joint to measuring stem:	Thread M 18 x 1,5 with locknut
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round



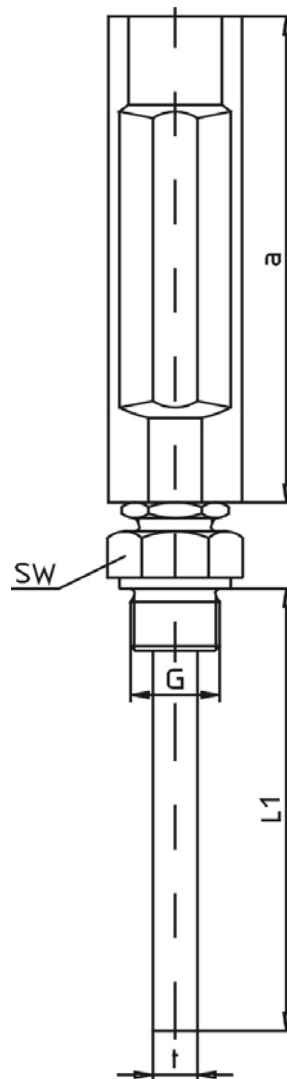
Version: **STRAIGHT**

Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4001	4002	4003	4004	4005	4006	4007
-10 +50°C	4011	4012	4013	4014	4015	4016	4017
0 -50°C	4021	4022	4023	4024	4025	4026	4027
0 -60°C	4031	4032	4033	4034	4035	4036	4037
0 -100°C	4041	4042	4043	4044	4045	4046	4047
0 -120°C	4051	4052	4053	4054	4055	4056	4057
0 -160°C	4061	4062	4063	4064	4065	4066	4067
0 -200°C	4071	4072	4073	4074	4075	4076	4077
0 -250°C	4081	4082	4083	4084	4085	4086	4087

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!



Type	a	SW	G	t
4000	110	27	½ A	10
4300	150	27	½ A	10
4600	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised
Figures:	Beneath an anodic coating
Joint to measuring stem:	Thread M 18 x 1,5 with locknut
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round

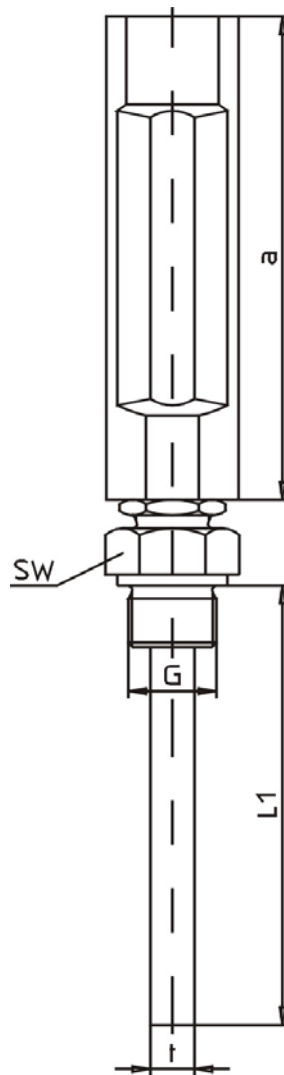


Version:	STRAIGHT						
Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4301	4302	4303	4304	4305	4306	4307
-10 +50°C	4311	4312	4313	4314	4315	4316	4317
0 -50°C	4321	4322	4323	4324	4325	4326	4327
0 -60°C	4331	4332	4333	4334	4335	4336	4337
0 -100°C	4341	4342	4343	4344	4345	4346	4347
0 -120°C	4351	4352	4353	4354	4355	4356	4357
0 -160°C	4361	4362	4363	4364	4365	4366	4367
0 -200°C	4371	4372	4373	4374	4375	4376	4377
0 -250°C	4381	4382	4383	4384	4385	4386	4387

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!



Type	a	SW	G	t
4000	110	27	½ A	10
4300	150	27	½ A	10
4600	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised
Figures:	Beneath an anodic coating
Joint to measuring stem:	Thread M 18 x 1,5 with locknut
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round

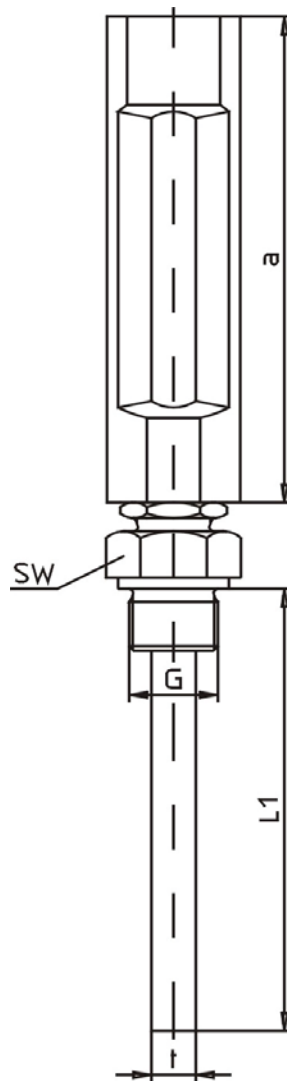


Version:	STRAIGHT						
	Length: [mm]						
Stem Ø 10 mm	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4601	4602	4603	4604	4605	4606	4607
-10 +50°C	4611	4612	4613	4614	4615	4616	4617
0 -50°C	4621	4622	4623	4624	4625	4626	4627
0 -60°C	4631	4632	4633	4634	4635	4636	4637
0 -100°C	4641	4642	4643	4644	4645	4646	4647
0 -120°C	4651	4652	4653	4654	4655	4656	4657
0 -160°C	4661	4662	4663	4664	4665	4666	4667
0 -200°C	4671	4672	4673	4674	4675	4676	4677
0 -250°C	4681	4682	4683	4684	4685	4686	4687

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!



Type	a	SW	G	t
4000	110	27	½ A	10
4300	150	27	½ A	10
4600	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.



Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised - 360° turnable
Figures:	Beneath an anodic coating
Joint to measuring stem:	Plug-in-type, with locking screw
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round

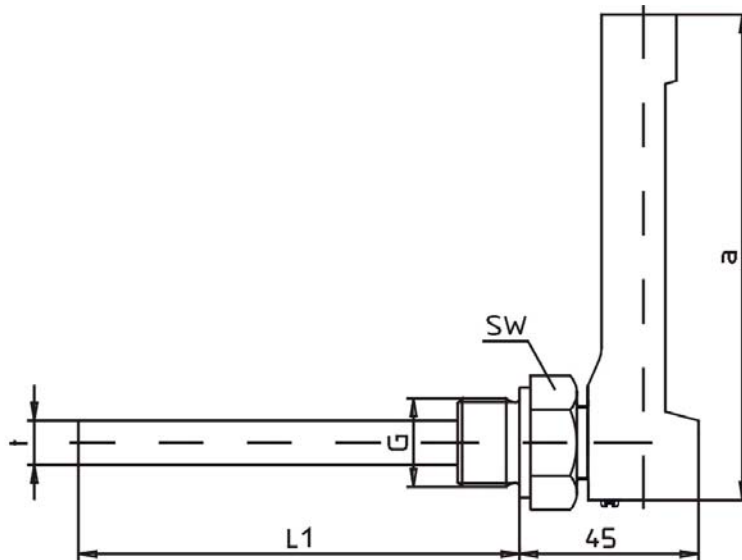
Version: **ANGLE 90° back entry**

Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4101	4102	4103	4104	4105	4106	4107
-10 +50°C	4111	4112	4113	4114	4115	4116	4117
0 -50°C	4121	4122	4123	4124	4125	4126	4127
0 -60°C	4131	4132	4133	4134	4135	4136	4137
0 -100°C	4141	4142	4143	4144	4145	4146	4147
0 -120°C	4151	4152	4153	4154	4155	4156	4157
0 -160°C	4161	4162	4163	4164	4165	4166	4167
0 -200°C	4171	4172	4173	4174	4175	4176	4177
0 -250°C	4181	4182	4183	4184	4185	4186	4187

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!



Type	a	SW	G	t
4100	110	27	½ A	10
4400	150	27	½ A	10
4700	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.



Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised - 360° turnable
Figures:	Beneath an anodic coating
Joint to measuring stem:	Plug-in-type, with locking screw
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round

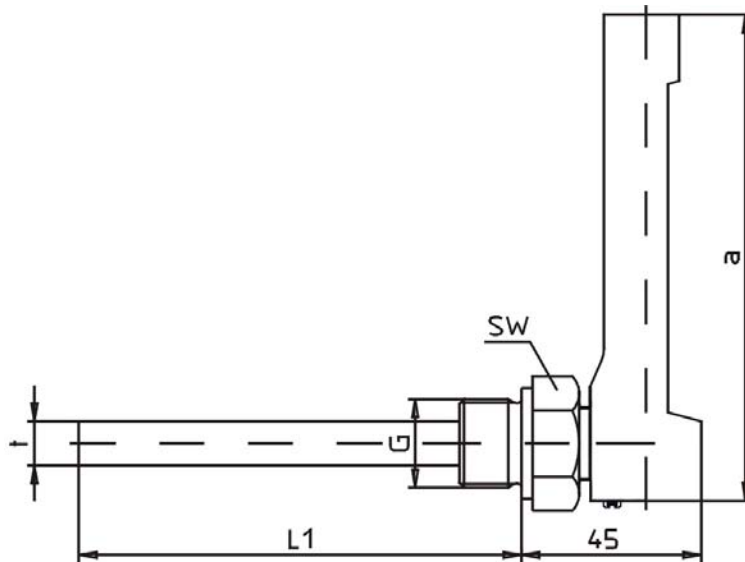
Version: **ANGLE 90° back entry**

Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4401	4402	4403	4404	4405	4406	4407
-10 +50°C	4411	4412	4413	4414	4415	4416	4417
0 -50°C	4421	4422	4423	4424	4425	4426	4427
0 -60°C	4431	4432	4433	4434	4435	4436	4437
0 -100°C	4441	4442	4443	4444	4445	4446	4447
0 -120°C	4451	4452	4453	4454	4455	4456	4457
0 -160°C	4461	4462	4463	4464	4465	4466	4467
0 -200°C	4471	4472	4473	4474	4475	4476	4477
0 -250°C	4481	4482	4483	4484	4485	4486	4487

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!

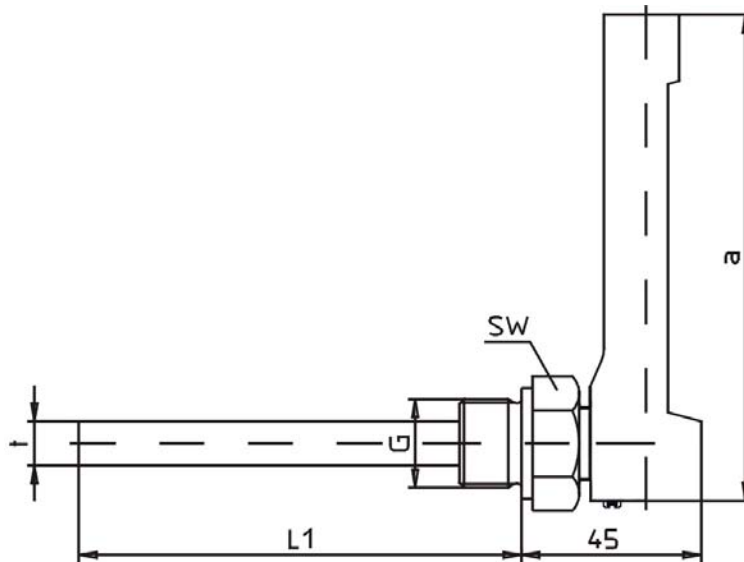


Type	a	SW	G	t
4100	110	27	½ A	10
4400	150	27	½ A	10
4700	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised - 360° turnable
Figures:	Beneath an anodic coating
Joint to measuring stem:	Plug-in-type, with locking screw
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round
Version:	ANGLE 90° back entry
Stem Ø 10 mm	Length: [mm] 40 63 75 100 120 160 200
Measuring range:	Article number:
-30 +50°C	4701 4702 4703 4704 4705 4706 4707
-10 +50°C	4711 4712 4713 4714 4715 4716 4717
0 -50°C	4721 4722 4723 4724 4725 4726 4727
0 -60°C	4731 4732 4733 4734 4735 4736 4737
0 -100°C	4741 4742 4743 4744 4745 4746 4747
0 -120°C	4751 4752 4753 4754 4755 4756 4757
0 -160°C	4761 4762 4763 4764 4765 4766 4767
0 -200°C	4771 4772 4773 4774 4775 4776 4777
0 -250°C	4781 4782 4783 4784 4785 4786 4787
Double scale:	- °C/°F - OPTIONS
Spare parts:	Glass tubes Immersion tubes Further measuring ranges and stem lengths on request!





Type	a	SW	G	t
4100	110	27	½ A	10
4400	150	27	½ A	10
4700	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised
Figures:	Beneath an anodic coating
Joint to measuring stem:	Thread M 18 x 1,5 with locknut
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round



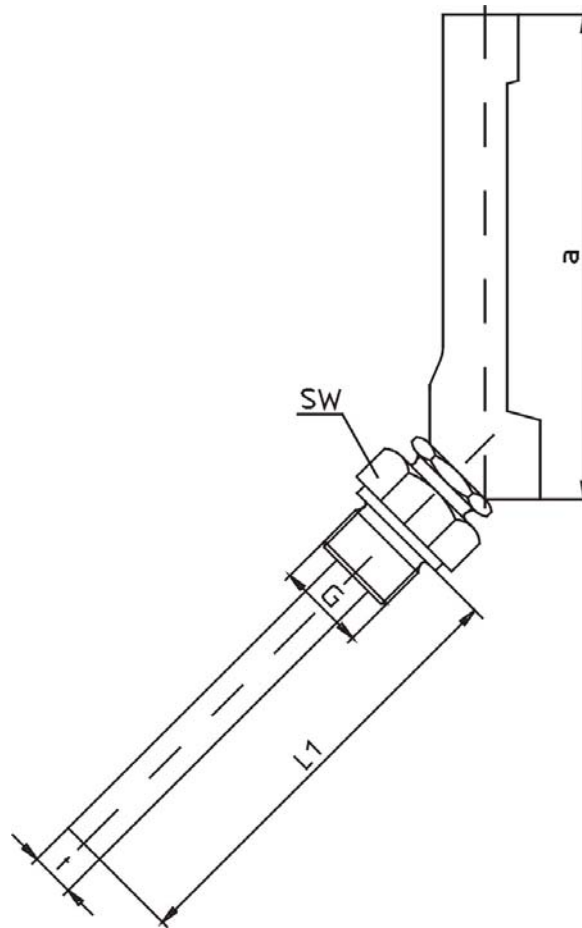
Version: **ANGLE 135° back entry**

Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4201	4202	4203	4204	4205	4206	4207
-10 +50°C	4211	4212	4213	4214	4215	4216	4217
0 -50°C	4221	4222	4223	4224	4225	4226	4227
0 -60°C	4231	4232	4233	4234	4235	4236	4237
0 -100°C	4241	4242	4243	4244	4245	4246	4247
0 -120°C	4251	4252	4253	4254	4255	4256	4257
0 -160°C	4261	4262	4263	4264	4265	4266	4267
0 -200°C	4271	4272	4273	4274	4275	4276	4277
0 -250°C	4281	4282	4283	4284	4285	4286	4287

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!



Type	a	SW	G	t
4200	110	27	½ A	10
4500	150	27	½ A	10
4800	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised
Figures:	Beneath an anodic coating
Joint to measuring stem:	Thread M 18 x 1,5 with locknut
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round



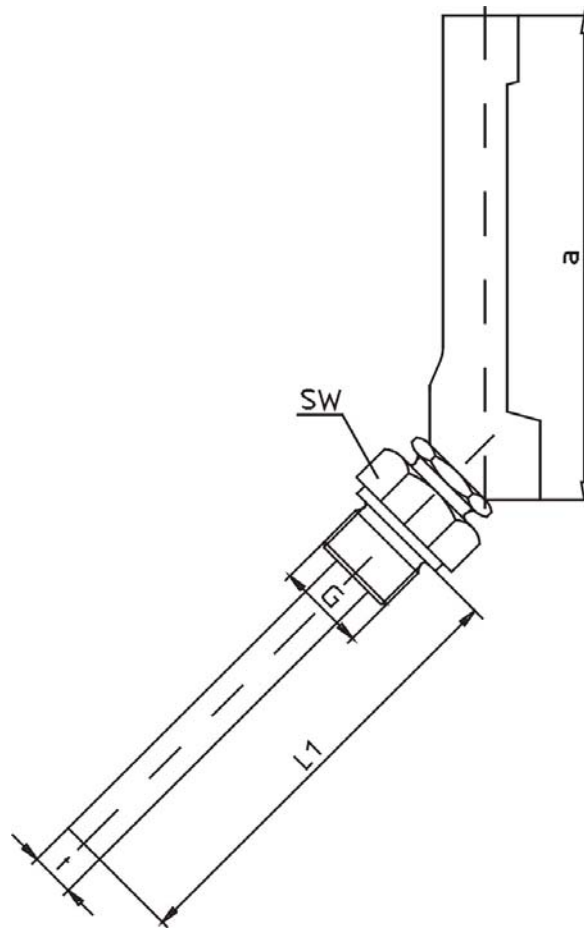
Version: **ANGLE 135° back entry**

Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4501	4502	4503	4504	4505	4506	4507
-10 +50°C	4511	4512	4513	4514	4515	4516	4517
0 -50°C	4521	4522	4523	4524	4525	4526	4527
0 -60°C	4531	4532	4533	4534	4535	4536	4537
0 -100°C	4541	4542	4543	4544	4545	4546	4547
0 -120°C	4551	4552	4553	4554	4555	4556	4557
0 -160°C	4561	4562	4563	4564	4565	4566	4567
0 -200°C	4571	4572	4573	4574	4575	4576	4577
0 -250°C	4581	4582	4583	4584	4585	4586	4587

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!



Type	a	SW	G	t
4200	110	27	½ A	10
4500	150	27	½ A	10
4800	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Aluminium, brass anodised, 36 mm wide - Aluminium, blank anodised
Figures:	Beneath an anodic coating
Joint to measuring stem:	Thread M 18 x 1,5 with locknut
Measuring stem:	G 1/2 A brass - Further threads on request - Special brass SoMs76 (resistant to seawater) - Steel - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	Elastic mounted, graduation acid-proof
Accuracy class:	1
Filling:	Alcohol blue - Alcohol red
Capillary form:	Prismatic or round



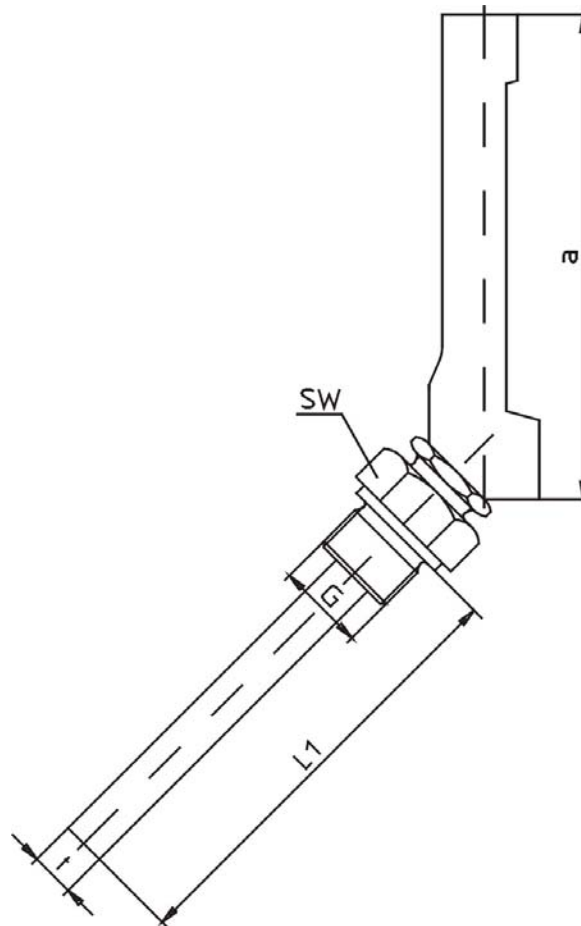
Version: **ANGLE 135° back entry**

Stem Ø 10 mm	Length: [mm]						
	40	63	75	100	120	160	200
Measuring range:	Article number:						
-30 +50°C	4801	4802	4803	4804	4805	4806	4807
-10 +50°C	4811	4812	4813	4814	4815	4816	4817
0 -50°C	4821	4822	4823	4824	4825	4826	4827
0 -60°C	4831	4832	4833	4834	4835	4836	4837
0 -100°C	4841	4842	4843	4844	4845	4846	4847
0 -120°C	4851	4852	4853	4854	4855	4856	4857
0 -160°C	4861	4862	4863	4864	4865	4866	4867
0 -200°C	4871	4872	4873	4874	4875	4876	4877
0 -250°C	4881	4882	4883	4884	4885	4886	4887

Double scale:	- °C/°F
	- OPTIONS

Spare parts: Glass tubes
Immersion tubes

Further measuring ranges and stem lengths on request!

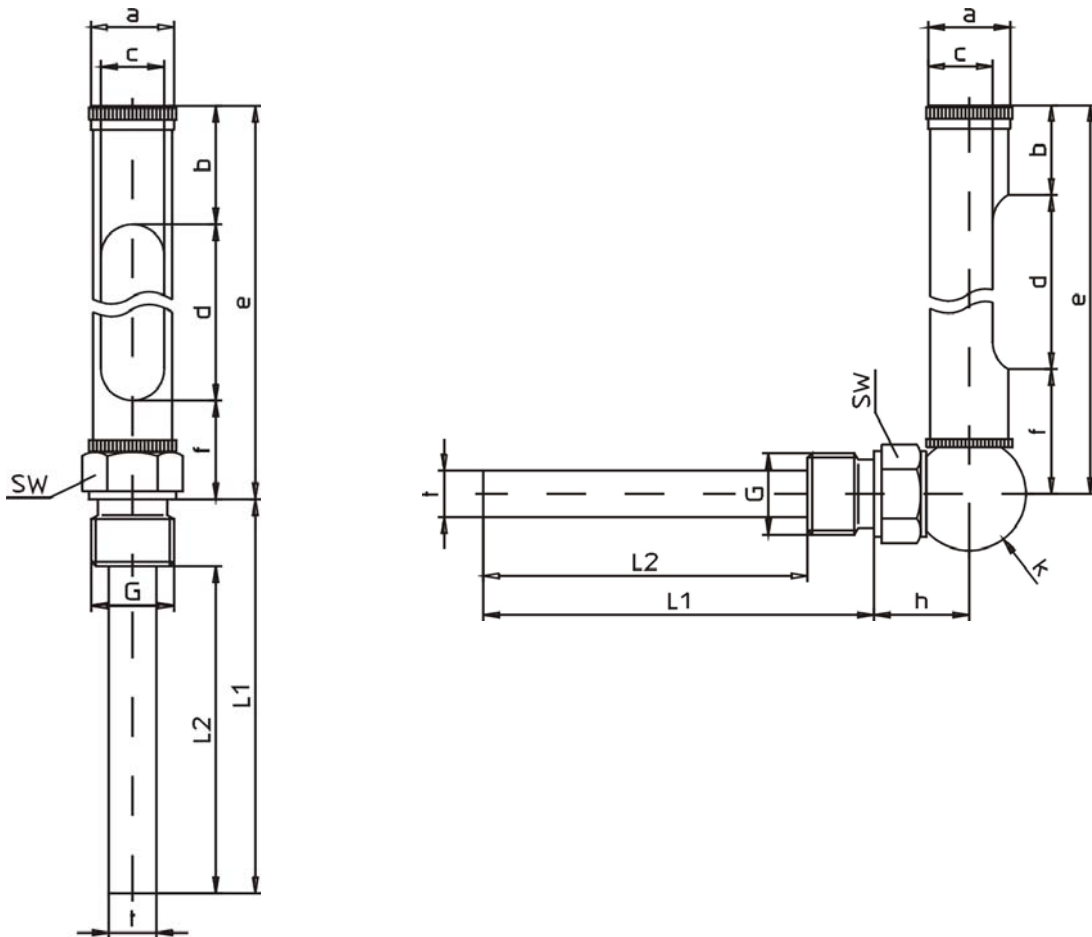


Type	a	SW	G	t
4200	110	27	½ A	10
4500	150	27	½ A	10
4800	200	27	½ A	10

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Upper section:	Brass clearly varnished 165 x Ø 20 mm - Stainless steel AISI 304
Measuring stem:	G 1/2 A brass - Further threads on request - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	With scale of milky glass lettering and graduation black closed by melting with clamp, mounted flexible
Accuracy class:	1
Filling:	Alcohol red - Alcohol blue
Capillary form:	Prismatic or round
Version:	STRAIGHT
Stem Ø 10 mm	Length: [mm] 45 63 80 100 120 160 200
Measuring range:	Article number:
-30 +50°C 1/1°	5000 5001 5002 5003 5004 5005 5006
0 -50°C 1/1°	5010 5011 5012 5013 5014 5015 5016
0 -100°C 1/1°	5020 5021 5022 5023 5024 5025 5026
0 -120°C 1/1°	5030 5031 5032 5033 5034 5035 5036
0 -160°C 2/1°	5040 5041 5042 5043 5044 5045 5046
0 -200°C 2/1°	5050 5051 5052 5053 5054 5055 5056
0 -250°C 5/1°	5060 5061 5062 5063 5064 5065 5066
Version:	ANGLE 90° back entry
Stem Ø 10 mm	Length: [mm] 45 63 80 100 120 160 200
Measuring range:	Article number:
-30 +50°C 1/1°	5100 5101 5102 5103 5104 5105 5106
0 -50°C 1/1°	5110 5111 5112 5113 5114 5115 5116
0 -100°C 1/1°	5120 5121 5122 5123 5124 5125 5126
0 -120°C 1/1°	5130 5131 5132 5133 5134 5135 5136
0 -160°C 2/1°	5140 5141 5142 5143 5144 5145 5146
0 -200°C 2/1°	5150 5151 5152 5153 5154 5155 5156
0 -250°C 5/1°	5160 5161 5162 5163 5164 5165 5166
Double scale:	- °C/°F - OPTIONS
Spare parts:	Glass tubes Immersion tubes Further measuring ranges and stem lengths on request!

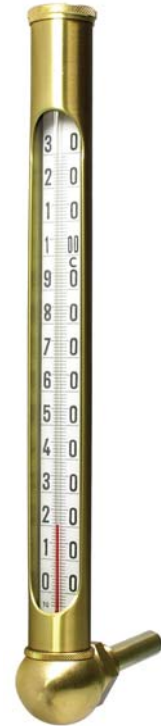




Type	a	b	c	d	e	f	h	SW	G	t	k
5000	20	27	16	115	165	23	-	27	½ A	10	-
5100	20	27	16	115	165	23	28	27	½ A	10	33

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

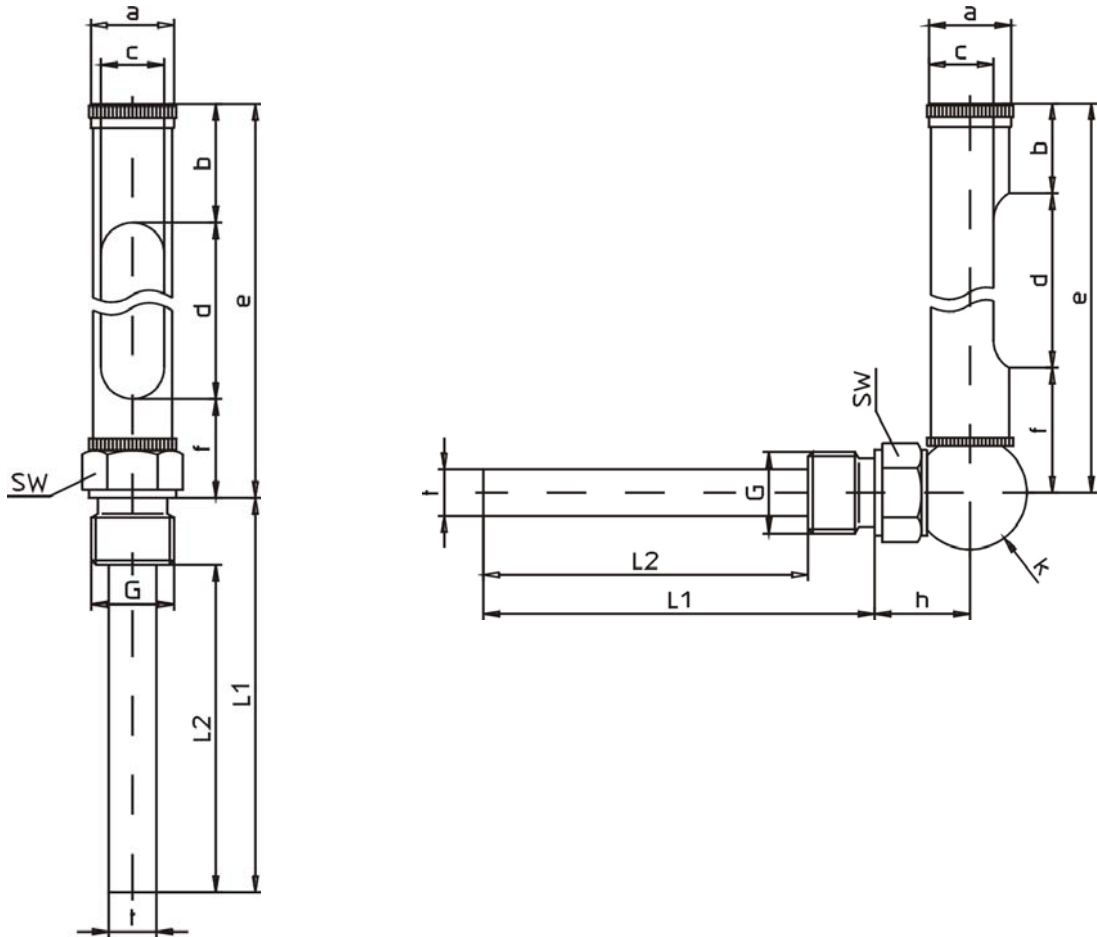
Upper section:	Brass clearly varnished 255 x Ø 25 mm - Stainless steel AISI 304
Measuring stem:	G 1/2 A brass - Further threads on request - Stainless steel AISI 316 Ti
Connection:	Form B - immersion tube with threaded socket - Form C - union nut
Glass tube:	With scale of milky glass lettering and graduation black closed by melting with clamp, mounted flexible
Accuracy class:	1
Filling:	Alcohol red - Alcohol blue
Capillary form:	Prismatic or round
Version:	STRAIGHT



Stem Ø 12 mm	Length: [mm]						
	45	63	80	100	120	160	200
Measuring range:	Article number:						
-30 +50°C 1/1°	5200	5201	5202	5203	5204	5205	5206
0 -50°C 1/1°	5210	5211	5212	5213	5214	5215	5216
0 -100°C 1/1°	5220	5221	5222	5223	5224	5225	5226
0 -120°C 1/1°	5230	5231	5232	5233	5234	5235	5236
0 -160°C 2/1°	5240	5241	5242	5243	5244	5245	5246
0 -200°C 2/1°	5250	5251	5252	5253	5254	5255	5256
0 -250°C 5/1°	5260	5261	5262	5263	5264	5265	5266

Version:	ANGLE 90° back entry						
Stem Ø 12 mm	Length: [mm]						
	45	63	80	100	120	160	200
Measuring range:	Article number:						
-30 +50°C 1/1°	5300	5301	5302	5303	5304	5305	5306
0 -50°C 1/1°	5310	5311	5312	5313	5314	5315	5316
0 -100°C 1/1°	5320	5321	5322	5323	5324	5325	5326
0 -120°C 1/1°	5330	5331	5332	5333	5334	5335	5336
0 -160°C 2/1°	5340	5341	5342	5343	5344	5345	5346
0 -200°C 2/1°	5350	5351	5352	5353	5354	5355	5356
0 -250°C 5/1°	5360	5361	5362	5363	5364	5365	5366

Double scale:	- °C/°F - OPTIONS
Spare parts:	Glass tubes Immersion tubes Further measuring ranges and stem lengths on request!



Type	a	b	c	d	e	f	h	SW	G	t	k
5200	25	40	16	180	255	35	-	32	½ A	12	-
5300	25	40	16	180	255	35	34	32	½ A	12	35

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Upper section:	L = 185 x Ø 15/16 mm closed				
Scale:	Glass overlay lettering and graduation black and red				
Stem:	L = ± 65 x Ø 6/7 mm				
Measuring liquid:	Alcohol red				
Graduation:	1/1° (1,0)				
Accuracy:	± 1°C				
Measuring range:	-30+50°C	0-50°C	0-100°C	0-120°C	
Filling	Article number:				
Alcohol red	6803	6806	6812	6815	
Accessories:	Article number:				
without thermometer	6880	6900	6910	6925	
CHEMICAL THERMOMETER					
Version:	Ø 7 ± 1 mm, inclosed type				
Accuracy:	1°C				
Graduation:	1/1° (1,0)				
Measuring range:	-35+50°C	-10+50°C	-10+110°C	-10+150°C	-10+200°C
Length:	260	200	260	260	300
Filling	Article number:				
Alcohol-red	5600	5601	5602	5603	5604
PROTECTIVE SLEEVES outer Ø 12 mm, inner Ø 10 mm					
Version:	Shining brass, perforated bottom, with cap and loop				
L = [mm]	210	260	270	290	310 330
Article number:	5700	5701	5702	5703	5704 5705



Typ 6815+6880



Typ 5601

Protective sleeves:

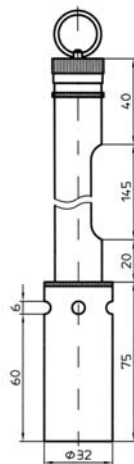
Typ: 6880

Ferrule of hot tinned wire (without thermometer)



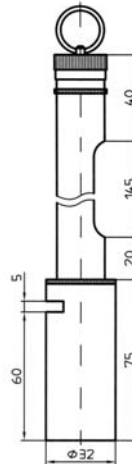
Typ: 6900

Scoop frame made of brass. With rotating scale protection. Perforated scoop vessel. With loop, without chain.



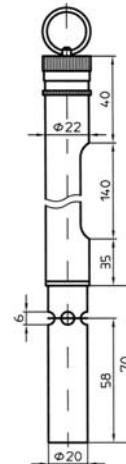
Typ 6910

Scoop frame made of brass. With rotating scale protection. Slotted scoop vessel. With loop, without chain.



Typ 6925

Protective frame made of brass. With rotating scale protection. Without scoop vessel. With loop, without chain.



Typ 5700ss

Protective Sleeves of brass outer Ø 12 mm inner Ø 10 mm



What does it mean:

DIN 43 772

Form 4F

Solid machined thermowells with welded flange.
Operating range and operating temperature according to needs and flange.
Instrument side with female thread.

Form 2F and 3F

Fabricated thermowells with welded flange.
Operating range and operating temperature according to needs and flange.
Instrument side with male thread.

Form 4

Solid machined weld-in thermowell.
Operating range up to PN 400. Operating temperature according to material.
Instrument side with female thread.

Form 5

Fabricated screw-in thermowell welded or soldered.
Operating range stainless steel welded PN 40, brass soldered PN 25.
Instrument side with female thread. Process connection with male thread.

Form 6

Solid machined screw-in thermowell.
Operating range up to PN 150. Operating temperature according to material.
Instrument side with female thread. Process connection with male thread.

Form 8

Fabricated screw-in thermowell welded or soldered.
Operating range stainless steel welded PN 40, brass soldered PN 25.
Instrument side with male thread. Process connection with male thread.

Form 9

Solid machined screw-in thermowell.
Operating range up to PN 150. Operating temperature according to material.
Instrument side with male thread. Process connection with male thread.

For which instrument the thermowells are used.

Design:

Instrument connection with:

Form 4 / 5 and 6

male thread

Form 4F

fixed male thread / turnable male thread / adjustable clamp connection

Form 8 and 9

female thread

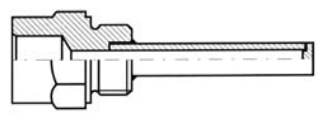
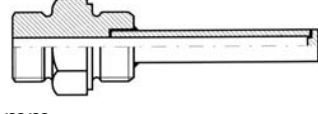
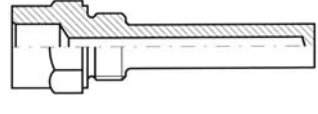
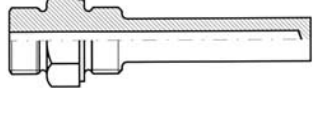
Form 2F and 3F

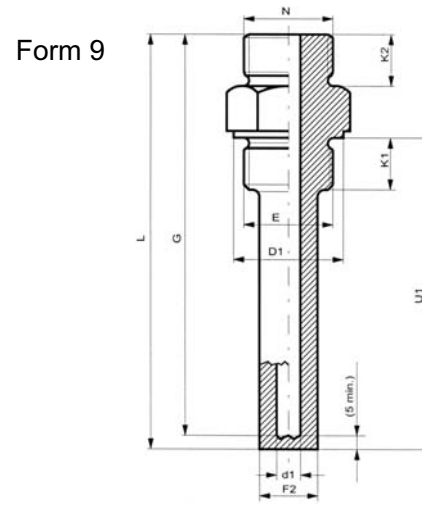
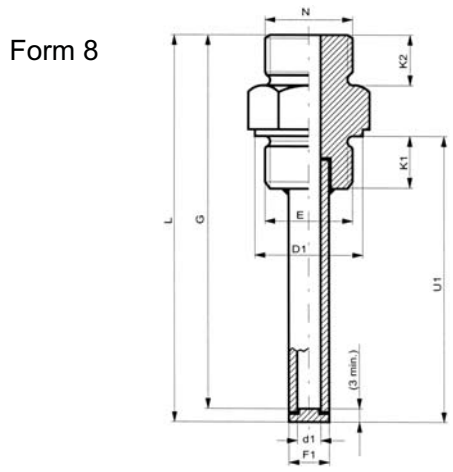
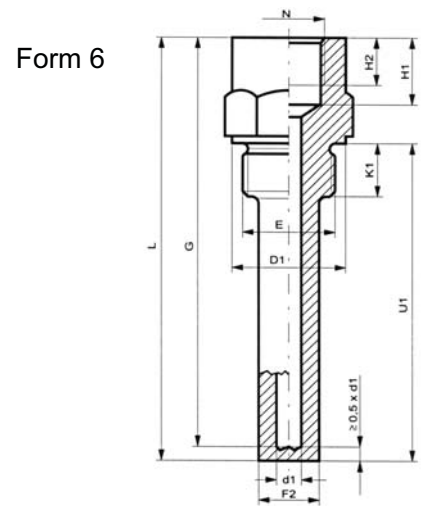
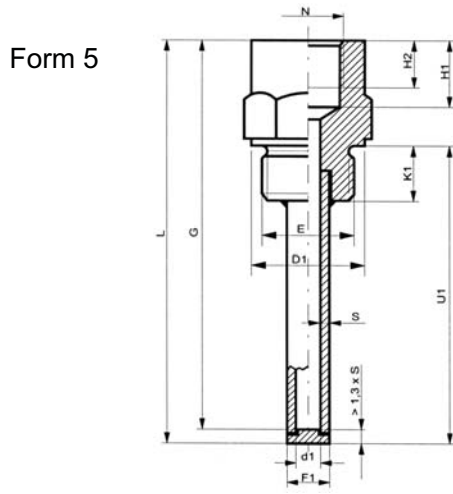
union nut

Material names and properties:

short	type of material	machining	Operating temp.
brass	Brass	solid / soldered	-40 up to +400°C
1.0037	ST 37	solid / welded	-40 up to +480°C
1.0460	C 22.8	solid	-40 up to +480°C
1.5415	15/16 Mo 3	solid	-40 up to +530°C
1.7335	13 CrMo 44	solid	-40 up to +570°C
1.4404	X2CrNiMo17-12-2	solid	-50 up to +550°C
1.4571	X6CrNiMoTi17-12-2	solid / welded	-50 up to +700°C
1.4903	X10CrMoVNbN9-1	solid	-50 up to +650°C

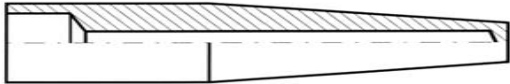

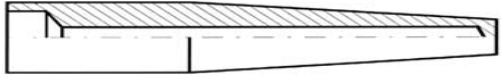
Others on request.

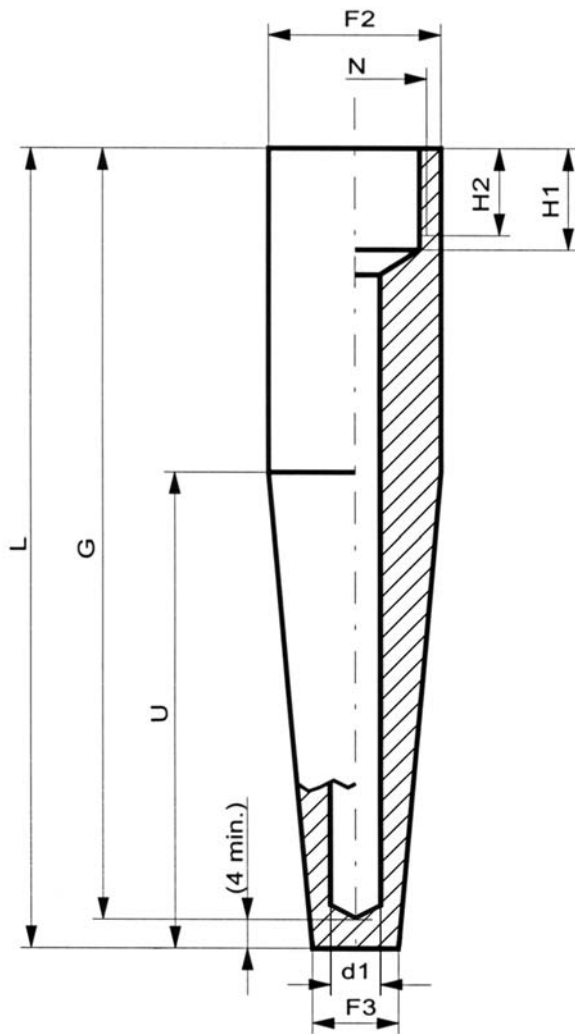
Form 5	<p>G 1/2 female thread / G 1/2 A male thread Brass A/F 27 multipiece soldered PN 25 Stainless steel welded PN 40 Material: brass, AISI 303, AISI 316 Ti Immersion tube according to needs: Ø 9 / 10 / 12 or 13 mm - NPT 1/2 - G 3/4 - M 18 x 1,5 - M 20 x 1,5 - others</p>																																													
Form 8	<p>G 1/2 male thread / G 1/2 A male thread Brass A/F 27 multipiece soldered PN 25 Stainless steel welded PN 40 Material: brass, AISI 303, AISI 316 Ti Immersion tube according to needs: Ø 9 / 10 / 12 or 13 mm - NPT 1/2 - G 3/4 - M 18 x 1,5 - M 20 x 1,5 - others</p>																																													
	<table border="1"> <tbody> <tr> <td>L1</td> <td>45</td> <td>63</td> <td>80</td> <td>100</td> <td>120</td> <td>160</td> <td>200</td> <td>250</td> <td>300</td> <td>400</td> </tr> <tr> <td>L</td> <td>55</td> <td>73</td> <td>90</td> <td>110</td> <td>130</td> <td>170</td> <td>210</td> <td>260</td> <td>310</td> <td>410</td> </tr> <tr> <td>U1</td> <td>27</td> <td>45</td> <td>62</td> <td>82</td> <td>102</td> <td>142</td> <td>182</td> <td>232</td> <td>282</td> <td>382</td> </tr> <tr> <td>G</td> <td>54</td> <td>72</td> <td>89</td> <td>109</td> <td>129</td> <td>169</td> <td>209</td> <td>259</td> <td>309</td> <td>409</td> </tr> </tbody> </table>	L1	45	63	80	100	120	160	200	250	300	400	L	55	73	90	110	130	170	210	260	310	410	U1	27	45	62	82	102	142	182	232	282	382	G	54	72	89	109	129	169	209	259	309	409	
L1	45	63	80	100	120	160	200	250	300	400																																				
L	55	73	90	110	130	170	210	260	310	410																																				
U1	27	45	62	82	102	142	182	232	282	382																																				
G	54	72	89	109	129	169	209	259	309	409																																				
Material	Article number:																																													
Brass	43.0000 43.0001 43.0002 43.0003 43.0004 43.0005 43.0006 43.0007 43.0008 43.0009																																													
AISI 303	43.0010 43.0011 43.0012 43.0013 43.0014 43.0015 43.0016 43.0017 43.0018 43.0019																																													
AISI 316 Ti	43.0020 43.0021 43.0022 43.0023 43.0024 43.0025 43.0026 43.0027 43.0028 43.0029																																													
Brass	43.0030 43.0031 43.0032 43.0033 43.0034 43.0035 43.0036 43.0037 43.0038 43.0039																																													
AISI 303	43.0040 43.0041 43.0042 43.0043 43.0044 43.0045 43.0046 43.0047 43.0048 43.0049																																													
AISI 316 Ti	43.0050 43.0051 43.0052 43.0053 43.0054 43.0055 43.0056 43.0057 43.0058 43.0059																																													
Form 6	<p>G 1/2 female thread / G 1/2 A male thread A/F 27 solid machined PN 150 Material: brass, 1.0715, AISI 303, AISI 316 Ti and others Bore size according to needs: Ø 7 / 9 / 11 or 13 mm - NPT 1/2 - G 3/4 - M 18 x 1,5 - M 20 x 1,5 - others</p>																																													
Form 9	<p>G 1/2 male thread / G 1/2 A male thread A/F 27 solid machined PN 150 Material: brass, 1.0715, AISI 303, AISI 316 Ti and others Bore size according to needs: Ø 7 / 9 / 11 or 13 mm - NPT 1/2 - G 3/4 - M 18 x 1,5 - M 20 x 1,5 - others</p>																																													
	<table border="1"> <tbody> <tr> <td>L1</td> <td>45</td> <td>63</td> <td>80</td> <td>100</td> <td>120</td> <td>160</td> <td>200</td> <td>250</td> <td>300</td> <td>400</td> </tr> <tr> <td>L</td> <td>55</td> <td>73</td> <td>90</td> <td>110</td> <td>130</td> <td>170</td> <td>210</td> <td>260</td> <td>310</td> <td>410</td> </tr> <tr> <td>U1</td> <td>27</td> <td>45</td> <td>62</td> <td>82</td> <td>102</td> <td>142</td> <td>182</td> <td>232</td> <td>282</td> <td>382</td> </tr> <tr> <td>G</td> <td>50</td> <td>68</td> <td>85</td> <td>105</td> <td>125</td> <td>165</td> <td>205</td> <td>255</td> <td>305</td> <td>405</td> </tr> </tbody> </table>	L1	45	63	80	100	120	160	200	250	300	400	L	55	73	90	110	130	170	210	260	310	410	U1	27	45	62	82	102	142	182	232	282	382	G	50	68	85	105	125	165	205	255	305	405	
L1	45	63	80	100	120	160	200	250	300	400																																				
L	55	73	90	110	130	170	210	260	310	410																																				
U1	27	45	62	82	102	142	182	232	282	382																																				
G	50	68	85	105	125	165	205	255	305	405																																				
Material	Article number:																																													
Brass	43.0060 43.0061 43.0062 43.0063 43.0064 43.0065 43.0066 43.0067 43.0068 43.0069																																													
1.0715	43.0070 43.0071 43.0072 43.0073 43.0074 43.0075 43.0076 43.0077 43.0078 43.0079																																													
AISI 303	43.0100 43.0101 43.0102 43.0103 43.0104 43.0105 43.0106 43.0107 43.0108 43.0109																																													
AISI 316 Ti	43.0110 43.0111 43.0112 43.0113 43.0114 43.0115 43.0116 43.0117 43.0118 43.0119																																													
Brass	43.0140 43.0141 43.0142 43.0143 43.0144 43.0145 43.0146 43.0147 43.0148 43.0149																																													
1.0715	43.0150 43.0151 43.0152 43.0153 43.0154 43.0155 43.0156 43.0157 43.0158 43.0159																																													
AISI 303	43.0180 43.0181 43.0182 43.0183 43.0184 43.0185 43.0186 43.0187 43.0188 43.0189																																													
AISI 316 Ti	43.0190 43.0191 43.0192 43.0193 43.0194 43.0195 43.0196 43.0197 43.0198 43.0199																																													
Thick walled tube:	<p>- Further materials on request - OPTIONS Made of AISI 316 Ti for form 5 and 8: Tube Ø 12 x 2,5 mm wall for instrument probe Ø 6 Tube Ø 14 x 2,5 mm wall for instrument probe Ø 8 Tube Ø 14 x 1,5 mm wall for instrument probe Ø 10</p>																																													
Certificates:	<p>DIN EN 10 204 2.1 and 2.2: Form 5 / 6 / 8 and 9 available. DIN EN 10 204 3.1 and 3.2: Form 6 and 9 available. For other materials on request!</p> <p>PTFE coating for high aggressive media on AISI 316 Ti available.</p>																																													



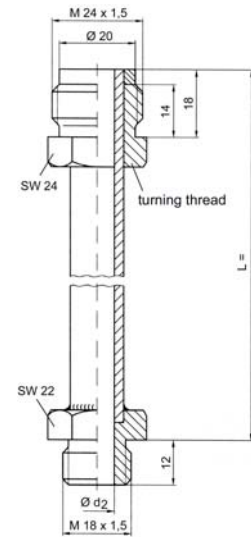
Material	Dimensions in [mm]																	
	E	N	Ø d1	Ø D1	Ø F1	Ø F2	H1	H2	K1	K2	A/F							
Stainless steel	G½A	G½	7	26	12	17	19	15	14	12	27							
			9		14													
			11		8													
			7		10													
			8,2		12													
			10,2		12													
	G¾A	G¾	7	32	14	17	22	17	16	14	32							
			9		19													
			11		8													
			7		10													
			8,2		12													
			10,2		14													
			7		19													
			11		8													
7	10																	
Brass	G½A	G½	8	26	10	17	19	15	14	12	27							
			9	32														
	G¾A	G¾	8	32								10	17	22	17	16	14	32
			9															

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

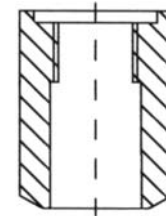
Form 4	Female thread M 18 x 1,5									
	Solid made of material: 1.0037 / 1.0460 / 1.7335 / 1.5415 / AISI 316 L / AISI 316 Ti or others on request Bore hole Ø 7, Ø 9, Ø 10 or Ø 11 mm according to order									
	L	110	110	140	170	200	200	260	410	
	F2	24								
	U	65	73	65	133	65	125	125	275	
	B	Bore hole Ø 7 / Ø 9 / Ø 10 oder Ø 11 mm								
	Material	Article number:								
	1.0037	ST 37 K	43.0402	43.0403	43.0404	43.0405	43.0406	43.0407	43.0408	43.0409
	1.0460	C 22.8	43.0412	43.0413	43.0414	43.0415	43.0416	43.0417	43.0418	43.0419
	1.7335	13 CrMo 44	43.0442	43.0443	43.0444	43.0445	43.0446	43.0447	43.0448	43.0449
1.5415	15/16 Mo 3	43.0452	43.0453	43.0454	43.0455	43.0456	43.0457	43.0458	43.0459	
1.4404	AISI 316 L	43.0422	43.0423	43.0424	43.0425	43.0426	43.0427	43.0428	43.0429	
1.4571	AISI 316 Ti	43.0432	43.0433	43.0434	43.0435	43.0436	43.0437	43.0438	43.0439	
Form 4	Female thread G 1/2									
	Solid made of material: 1.0037 / 1.0460 / 1.7335 / 1.5415 / AISI 316 L / AISI 316 Ti or others on request Bore hole Ø 7, Ø 9, Ø 10 or Ø 11 mm according to order									
	L	110	110	140	170	200	200	260	410	
	F2	26								
	U	65	73	65	133	65	125	125	275	
	B	Bore hole Ø 7 / Ø 9 / Ø 10 oder Ø 11 mm								
	Material	Article number:								
	1.0037	ST 37 K	43.0462	43.0463	43.0464	43.0465	43.0466	43.0467	43.0468	43.0469
	1.0460	C 22.8	43.0472	43.0473	43.0474	43.0475	43.0476	43.0477	43.0478	43.0479
	1.7335	13 CrMo 44	43.0502	43.0503	43.0504	43.0505	43.0506	43.0507	43.0508	43.0509
1.5415	15/16 Mo 3	43.0512	43.0513	43.0514	43.0515	43.0516	43.0517	43.0518	43.0519	
1.4404	AISI 316 L	43.0482	43.0483	43.0484	43.0485	43.0486	43.0487	43.0488	43.0489	
1.4571	AISI 316 Ti	43.0492	43.0493	43.0494	43.0495	43.0496	43.0497	43.0498	43.0499	
Form 4	Female thread M 14 x 1,5									
	Solid made of material: 1.0037 / 1.0460 / 1.7335 / 1.5415 / AISI 316 L / AISI 316 Ti or others on request Bore hole Ø 3,5 mm									
	L	110	110	140	170	200	200	260		
	F2	18								
	U	65	73	65	133	65	125	125		
	B	Bore hole Ø 3,5 mm								
	Material	Article number:								
	1.0037	ST 37 K	43.0522	43.0523	43.0524	43.0525	43.0526	43.0527	43.0528	
	1.0460	C 22.8	43.0532	43.0533	43.0534	43.0535	43.0536	43.0537	43.0538	
	1.7335	13 CrMo 44	43.0682	43.0683	43.0684	43.0685	43.0686	43.0687	43.0688	
1.5415	15/16 Mo 3	43.0692	43.0693	43.0694	43.0695	43.0696	43.0697	43.0698		
1.4404	AISI 316 L	43.0542	43.0543	43.0544	43.0545	43.0546	43.0547	43.0548		
1.4571	AISI 316 Ti	43.0552	43.0553	43.0554	43.0555	43.0556	43.0557	43.0558		
Accessories:	Extension neck L = 165 made of stainless steel Plug screws Suitable welding sleeves: bore hole Ø 18 / 24 or 26 mm. L = according to order.									
Certificates:	DIN EN 10 204 2.1 and 2.2 available. DIN EN 10 204 3.1 for 1.0460 / 1.7335 / 1.5415 / AISI 316 L and AISI 316 Ti. For other materials with certificate 3.1 or TÜV approval 3.2 on request!									



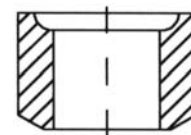
Extension neck L = 165 mm



Welding sleeves
with female thread



Welding sleeves
without thread for form 4

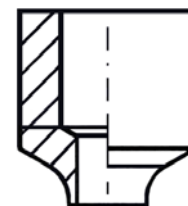


Dim. in mm					
N	Ø d1	Ø F2	Ø F3	H1	H2
M 14 x 1,5	3,5	18	9	16	13
M 18 x 1,5	7	24	12,5		
G ½	9	26	15	19	15
			17		
G ¾	11	32	17	22	17

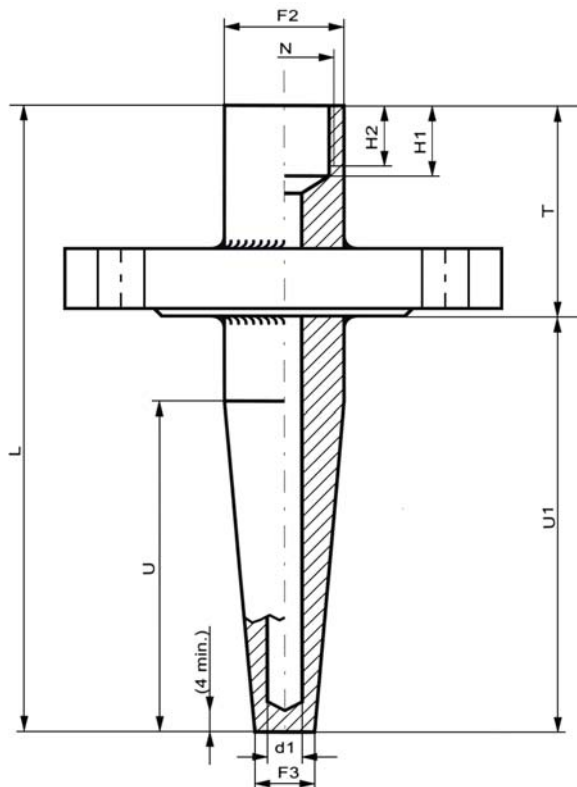
Dim. in mm	
L	U
110	65
	73
140	65
170	133
200	65
260	125
410 *	275

*not bore hole Ø 3,5 mm

without thread for form 4
with weld-on radius chamfer



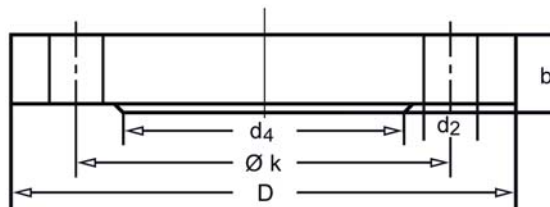
Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.



Dimensions in mm					
N	Ø d1	Ø F2	Ø F3	H1	H2
M 14 x 1,5	3,5	18	9	16	13
M 18 x 1,5	7	24	12,5		
G ½	9	26	15	19	15
	7		12,5		
NPT ½	9	26	15	21	16
	7		12,5		
G ¾	11	32	17	22	17

Dimensions in mm			
L	U	U1	T
110	65	65	45
140	65	70	70
170	65	100	70
200	65	130	70
200	125	130	70
260	125	190	70
410 *	275	340	70

* not with bore hole Ø 3,5 mm



Flanges per DIN 2527 Form C with sealing legde e.g. ND/PN 40

New norm: EN 1092-1/B1 Typ 05

NW DN	Flange			Screws		
	D	b	d4	Quantity	d2 Ø	k
10	90	16	40	4	14	60
25	115	18	68	4	14	85

Flanges per ASME B 16.5 150 lbs

DN	Flange			Screws		
	D	b	d4	Quantity	d2 Ø	k
1 ½"	127,0	17,5	73,2	4	15,7	98,6
2"	152,4	19,1	91,9	4	19,1	120,7

Flanges per ASME B 16.5 300 lbs

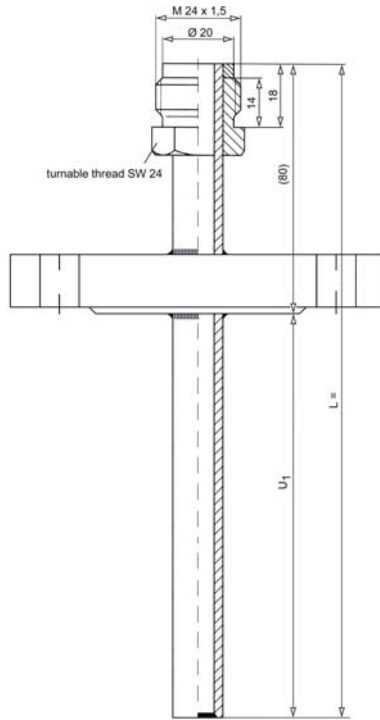
DN	Flange			Screws		
	D	b	d4	Quantity	d2 Ø	k
1 ½"	155,4	20,6	73,2	4	22,4	114,3
2"	165,1	22,4	91,9	8	19,1	127,0

All other Flanges are available on request!

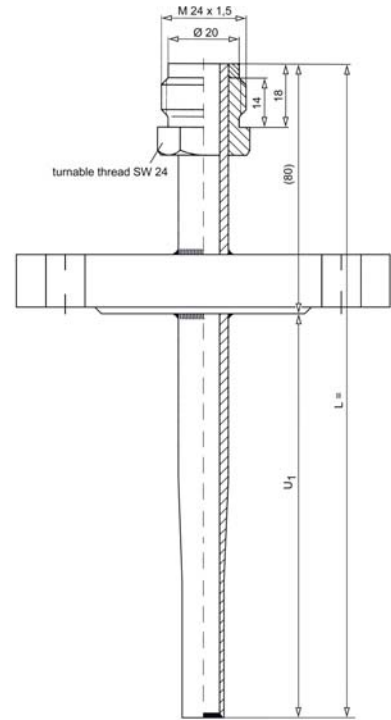
Works test certificate per DIN EN 10 204 3.1 for material 1.4571 is available.

Flange Thermowell

DIN 43772 Form 2F



DIN 43772 Form 3F



Clamp flange
(TRI-CLAMP)

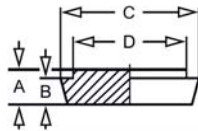
Can be attached to all temperature measuring instruments with stainless steel stem.



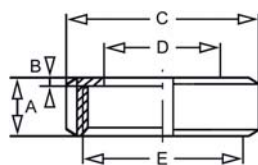
Größe	DN	A	E
¼ - ¾	6/8/10	5	25,0
1"	8/10/15	6	50,5
1 ½"	20/25	6	50,5
2"	32/40	6	64,0
2 ½"	50	6	77,5
3"	65	6	91,0

Round slotted nut
DIN 11 851 and
conical coupling

Can be attached to all temperature measuring instruments with stainless steel stem.



15	9	6	28	24
20	11	8	36	30
25	13	10	44	35
32	13	10	50	41
40	13	10	56	48
50	14	11	68	61



DN	A	B	C	D	size
15	18	3	44	25	
20	20	3	54	31	
25	21	3	63	36	1"
32	21	3	70	42	
40	21	3	78	49	1 ½"
50	22	3	92	62	2"

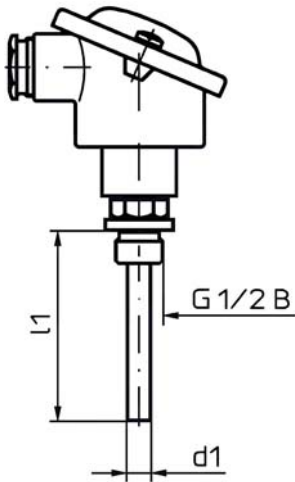
Certificates:

Works certificates per DIN EN 10 204 2.1 and 2.2 are available.
Per DIN EN 10 204 3.1 on request.

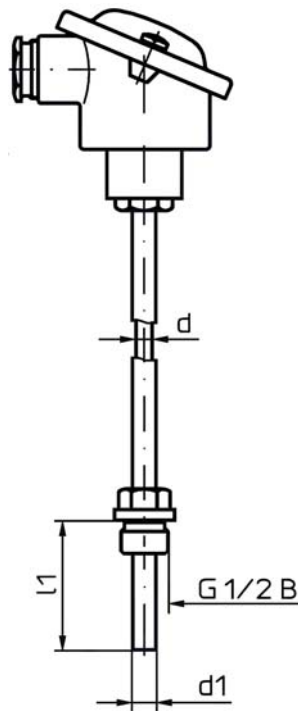
Type:	B and D - Others available on request
DIN:	43 765 and 43 767
Measuring element:	Pt 100 / Pt 1000 (2-, 3- or 4-wire) - NiCr-Ni (type K) -20+1150°C - Built-in temperature transmitter 4-20 mA
Stem:	Ø 6 or 9 mm made of AISI 316 Ti - Ø 3, 4, 5 or 8 mm
Mounting method:	Thread G 1/2 made of AISI 316 Ti - M 18 x 1,5 / G ¼ / others
Connection head:	DIN 43 729 form B made of aluminium varnished (max. 200°C) - Made of stainless steel - Type B with extension neck
Measuring temp. up to:	+400°C (type B) / +550°C (type D)
Version:	Type B: Stem incl. thread, direct mounted below case
Immersion length:	Article number:
Up to 160 mm	Stem: Ø 6 mm Ø 9 mm* 3206 3206-1
Up to 250 mm	3207 3207-1
Up to 400 mm	3208 3208-1
	*Measuring insert changeable
	Type D: With fixed extension neck 165 mm made of AISI 316 Ti. Suitable for thermowell DIN 43 772 form 4.
Immersion length:	Article number:
140/65	Stem: Ø 6 mm 3211
200/65	3212
200/125	3213
260/125	3214
	Thermowells for type D see on page 072. - OPTIONS



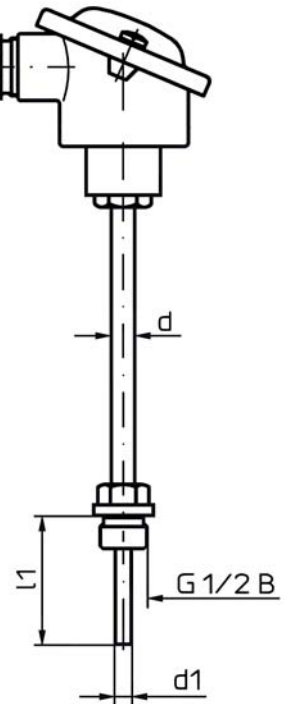
DIN 43 765 - Typ B
 without extension neck



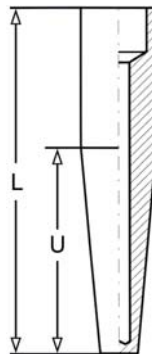
DIN 43 765 - Typ B
 with extension neck



DIN 43 767 - Typ D



Weld-in thermowell DIN 43 772
 form 4
 (see in page 072)



DIN 43 765			DIN 43 767				
d	d1	l1	d	d1	l1	L	U
6	9	63	-	-	-	-	-
		80	-	-	-	-	-
		100	9	6	100	110	65
		130	9	6	130	140	65
		160	9	6	160	170	133
		200	9	6	190	200	65
			9	6	190		125
		250	9	6	250	260	125
		300	-	-	-	-	-
		400	9	6	400	410	275

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Temperature °C / °F / °K											
°C	°F	°K	°C	°F	°K	°C	°F	°K	°C	°F	°K
-273	-459,4	0,15	110	230	383,15	500	932	773,15	900	1652	1173,15
-270	-454	3,15	120	248	393,13	510	950	783,15	920	1688	1193,15
-260	-436	13,15	130	266	403,15	520	968	793,15	940	1724	1213,15
-250	-418	23,15	140	284	413,15	530	986	803,15	960	1760	1233,15
-240	-400	33,15	150	302	423,15	540	1004	813,15	980	1796	1253,15
-230	-382	43,15	160	320	433,15	550	1022	823,15	1000	1832	1273,15
-220	-364	53,15	170	338	443,15	560	1040	833,15	1020	1868	1293,15
-210	-346	63,15	180	356	453,15	570	1058	843,15	1040	1904	1313,15
-200	-328	73,15	190	374	463,15	580	1076	853,15	1060	1940	1333,15
-190	-310	83,15	200	392	473,15	590	1094	863,15	1080	1976	1353,15
-180	-292	93,15	210	410	483,15	600	1112	873,15	1100	2012	1373,15
-170	-274	103,15	220	428	493,15	610	1130	883,15	1120	2048	1393,15
-160	-256	113,15	230	446	503,15	620	1148	893,15	1140	2084	1413,15
-150	-238	123,15	240	464	513,15	630	1166	903,15	1160	2120	1433,15
-140	-220	133,15	250	482	523,15	640	1184	913,15	1180	2156	1453,15
-130	-202	143,15	260	500	533,15	650	1202	923,15	1200	2192	1473,15
-120	-184	153,15	270	518	543,15	660	1220	933,15	1220	2228	1493,15
-110	-166	163,15	280	536	553,15	670	1238	943,15	1240	2264	1513,15
-100	-148	173,15	290	554	563,15	680	1256	953,15	1260	2300	1533,15
-90	-130	183,15	300	572	573,15	690	1274	963,15	1280	2336	1553,15
-80	-112	193,15	310	590	583,15	700	1292	973,15	1300	2372	1573,15
-70	-94	203,15	320	608	593,15	710	1310	983,15	1320	2408	1593,15
-60	-76	213,15	330	626	603,15	720	1328	993,15	1340	2444	1613,15
-50	-58	223,15	340	644	613,15	730	1346	1003,15	1360	2480	1633,15
-40	-40	233,15	350	662	623,15	740	1364	1013,15	1380	2516	1653,15
-30	-22	243,15	360	680	633,15	750	1382	1023,15	1400	2552	1673,15
-20	-4	253,15	370	698	643,15	760	1400	1033,15	1420	2588	1693,15
-10	+14	263,15	380	716	653,15	770	1418	1043,15	1440	2624	1713,15
0	32	273,15	390	734	663,15	780	1436	1053,15	1460	2660	1733,15
+10	50	283,15	400	752	673,15	790	1454	1063,15	1480	2696	1753,15
20	68	293,15	410	770	683,15	800	1472	1073,15	1500	2732	1773,15
30	86	303,15	420	788	693,15	810	1490	1083,15	1550	2822	1823,15
40	104	313,15	430	806	703,15	820	1508	1093,15	1600	2912	1873,15
50	122	323,15	440	824	713,15	830	1526	1103,15	1650	3002	1923,15
60	140	333,15	450	842	723,15	840	1544	1113,15	1700	3092	1973,15
70	158	343,15	460	860	733,15	850	1562	1123,15	1750	3182	2023,15
80	176	353,15	470	878	743,15	860	1580	1133,15	1800	3272	2073,15
90	194	363,15	480	896	753,15	870	1598	1143,15	1850	3362	2123,15
100	212	373,15	490	914	763,15	880	1616	1153,15	1900	3452	2173,15

-17,77...	0	255,37
-----------	---	--------

- 100°F = how much °C "Calculation": (-100-32) : 1,8 = - 73,33...°C

+ 100°F = how much °C "Calculation": (+100-32) : 1,8 = + 37,77...°C

- 100°C = how much °F "Calculation": - 100 x 1,8 + 32 = - 148°F

+ 100°C = how much °F "Calculation": +100 x 1,8 + 32 = + 212°F

if the total measuring span has to be calculated e.g.:

-100+400°F = 500°F : 1,8 = 277,77...°C (-73,33...°C + 204,44...°C)

Pressure									
Unit	bar	mbar	mWS	mmWS	Pa	KPa	MPa	PSI	
1 bar	1	1.000	10	10.000	100.000	100	0,1	14,5	
1 mbar	0,001	1	0,01	10	100	0,1	0,0001	0,0145	
1 mWS	0,1	100	1	1.000	10.000	10	0,01	1,45	
1 mmWS	0,0001	0,1	0,001	1	10	0,01	0,00001	0,00145	
1 Pa	0,00001	0,01	0,0001	0,1	1	0,001	0,000001	0,000145	
1 KPa	0,01	10	0,1	100	1.000	1	0,001	0,145	
1 MPa	10	10.000	100	100.000	1.000.000	1.000	1	145	

Nominal range °C	Graduation °C	Measuring range °C	Tolerances in °C for accuracy class	
			1	2
-20+40	1,0	-10+30	1	2
-20+60	1,0	-10+50	1	2
-30+50	1,0	-20+40	1	2
-30+70	1,0	-20+60	1	2
-40+40	1,0	-30+30	1	2
-40+60	1,0	-30+50	1	2
0-60	1,0	+10+50	1	2
0-80	1,0	+10+70	1	2
0-100	1,0	+10+90	1	2
0-120	2,0	+10+110	2	4
0-160	2,0	+20+140	2	4
0-200	2,0	+20+180	2	4
0-250	5,0	+30+220	2,5	5
0-300	5,0	+30+270	5	10
0-400	5,0	+50+350	5	10
0-500	10,0	+50+450	5	10
0-600	10,0	+100+500	10	15

Degree of protection e.g. IP 54

First index figure		Foreign bodies protection	Second index figure		Water protection
0	No protection against accidental contact, no protection against solid foreign bodies		1	Protection against vertical water drops	
1	Protection against contact with any large area by hand and against solid foreign bodies with $\varnothing > 50$ mm		2	Protection against diagonal water drops up to a 15° angle	
2	Protection against contact with any large area by hand and against solid foreign bodies with $\varnothing > 12$ mm		3	Protection against diagonal water drops up to a 60° angle	
3	Protection against tools, wires or similar objects with $\varnothing > 2,5$ mm, protection against foreign solid bodies with $\varnothing > 2,5$ mm		4	Protection against splashed water from all directions	
4	Protection against tools, wires or similar objects with $> 1,0$ mm, protection against foreign solid bodies with $\varnothing > 1,0$ mm		5	Protection against water (out of a nozzle) from all directions	
5	Full protection against contact, protection against interior injurious dust deposit		6	Protection against strong jets of water (out of a nozzle) from all directions	
6	Total protection against contact, protection against penetration of dust		7	Protection against ingress of water in case of temporary immersion (approx. 30 minutes)	

Highest working pressure in "bar" for pressure gauge siphons (page 099)

Tube dimensions	Material	AISI	Highest working temperature in °C						
			200	250	300	350	400	450	500
20,0 x 2,60	ST 35.8 I		183	157	133	113	100		
21,3 x 3,20	ST 35.8 I		196	173	140	117	106		
21,3 x 3,20	15/16 Mo 3						183	172	108
21,3 x 3,20	13 CrMo 44						218	206	179
21,3 x 3,20	10 CrMo 910						218	206	162
20,0 x 2,50	1.4571	316 Ti	242	235	227	220	214	205	
21,3 x 2,60	1.4541	321	202	196	186	180	173	164	
21,3 x 2,60	1.4571	316 Ti	248	240	232	225	218	209	

The above mentioned values are only benchmarks. An accurate determination should follow according to DIN 2413. Tabular values apply to seamless, plain tubes in as new condition. The reduction of material's tubular cross-section caused by cutted threads and bends as well as welding factors are not considered. Above mentioned values corresponding to material data sheets of our tube suppliers.

Service intended:

Electrical alarm contacts make or brake an electric control circuit relative to the position of the instrument pointer. They are built into case Ø 100 and 160.

General features:

Points of contact actuation are adjustable over the full extension of the scale graduation and will usually be arranged below the dial plate (on top of the dial plate sometimes possible).

Pointer deflection is not obstructed by the contact mechanism.

Wiring depends on the model and is made by either a flying lead of 1 metre cable (cross-section 0,75 mm²) or by means of a junction box at side of the case (clamps for cross-section max. 2,5 mm²).

Contact setting:

The cases feature a hub in the window into which a key inserts. Normally all contacts may set at exactly the same scale value. Contact actuation is made when the instrument pointer sweeps the contact indicator from either side.

TYPES OF CONTACTS

Sliding contacts of type: S

Application:

The sliding contact provides for accurate switching with almost no hysteresis and very little force required.

However, this type is rather sensitive to vibration and not suitable for liquid filled instruments.

Very slowly changing indication may also involve the risk of excessive electric arcing. For this we recommend inductive alarm contacts type I.

Technical data:

Maximum voltage:

DC/AC 250V

Maximum load:

10W / 18VA

Current rating:

0,7A (ohmic load)

Contact material:

Silver-nickel alloy (80% Ag / 20% Ni)

Operating temp.:

TMIN -20°C, TMAX +70°C

Number of contacts:

(max.) 4



Magnetic snap-action contacts

of type: M

This is the universal type of contacts to provide reliable service also with liquid filled instruments.

Technical data:

Maximum voltage: DC/AC 250V
 Maximum load: 30W / 50VA
 Current rating: 1A (ohmic load)
 Contact material: Silver-nickel alloy (80% Ag / 20% Ni)
 Operating temperature: TMIN -20°C
 TMAX +70°C
 Number of contacts: (max.) 4

The magnetically assisted contact features a small magnet attached to the setting hand. The magnet provides for a snap-action characteristic which considerably improves contact rating and service life, and also makes this typeless sensitive to vibration. The force required to break the attraction of the magnet results in a certain hysteresis of the switch point when the same contact is alternatively approached with rising and falling pressure (or temperature). The value of this hysteresis reflects a minimum of 2% and a maximum of 5% depending on scale range and instrument.

Type S - sliding contacts

V	ohmic load DC	ohmic load AC	inductive load cos. φ > 0,7
220 / 230	40 mA	45 mA	25 mA
110	80 mA	90 mA	45 mA
48	120 mA	170 mA	70 mA
24	200 mA	350 mA	100 mA

Type M - magnetic snap-action contacts

V	ohmic load DC		ohmic load AC		inductive load cos. φ > 0,7	
	dry	liquid filled	dry	liquid filled	dry	liquid filled
220 / 230	100 mA	65 mA	120 mA	90 mA	65 mA	40 mA
110	200 mA	130 mA	240 mA	180 mA	130 mA	85 mA
48	300 mA	190 mA	450 mA	330 mA	200 mA	130 mA
24	400 mA	250 mA	600 mA	450 mA	250 mA	150 mA

Contact points of special material

Contacts made of special materials are available to either improve resistance against wear failure or corrosion failure in long-term service.

Optionally available are:

Silver-nickel alloy (80% silver, 20% nickel)
 This is the standard material used and features:

- Excellent hardness and strength
- Good resistance against formation of arcs
- Good resistance against contact welding
- Low contact resistance

Gold-silver alloy (80% gold / 20% silver)

This alloy is particularly resistant against long-term corrosion and surface oxydation.

Special features and optional extras

Double throw (SPDT) function.
 Switch point calibrated and immobilised.
 Two contacts linked at a specified distance.
 Contacts with "live zero" shunt to monitor circuit continuity.
 Thyristor to improve rating (max. 65VA).
 Self cleaning contacts.
 Contact setting mechanism with provisions to attach a lead seal.
 Contact setting knob non-detachable.
 Wiring by means of plug and socket instead of junction box or flying lead.
 Contact points of special materials (see below).

Approval documents of a variety of instruments are existing to be used within intrinsically safe circuits in hazardous or fire damp areas.

Contact ratings

The contact rating values are given in consideration of many years of reliable service. Unlimited power switching may be obtained by using the instrument contacts to trip a relay or contactor of appropriate size (type MSR). Ratings below 24 V line voltage are to be individually established upon inquiry.

Contact resistance is very low. Contacts made of this material are preferred for fail-safe circuits where the alarm condition only occasionally occurs at low current rating.

Platinum-iridium alloy

(75% platinum / 25% iridium)
 This alloy is very hard with excellent resistance against formation of arcs and excellent performance in corrosive environments. It is preferred where switching of rather high current rating frequently occurs as part of regular process control. In order to maintain acceptable mean - time - between - failure rating it is recommended to maintain a line voltage no less than the values given below:
 Silver - nickel alloy and platinum - iridium alloy
 Gold-silver alloy

Contact functions of sliding contacts type: S
resp. magnetic snap-action contacts type: M
with index

Index 3 Contact breaks first and makes second
circuit when the instrument pointer
approaches the set point in clockwise
direction. (SPDT contact)

Generally the functions of contact type S
resp. type M are:

Index 1 contact makes when the instrument
pointer approaches the set point in
clockwise direction. (NO contact)

BITHERMA-contacts are identified by a type code.
The capital letter indicates the type of contacts
whereas the number indicates the contact function
with rising pressure (or temperature), respectively
clockwise pointer motion.

Index 2 contact breaks when the instrument
pointer approaches the set point in
clockwise direction. (NC contact)

If pointer moves towards clockwise the contact
function will turn.

SINGLE CONTACTS			
Wiring scheme	clockwise pointer motion	Type code function and index of contacts	
	Contact funktion	Sliding contact	Magnetic snap-action
	Contact makes when pointer reaches set point	S 1	M 1
	Contact breaks when pointer reaches set point	S 2	M 2
DOUBLE CONTACTS			
	1st and 2nd contact make when pointer reaches set point	S 11	M 11
	1. contact makes 2. contact breaks when pointer reaches set point	S 12	M 12
	1. contact breaks 2. contact makes when pointer reaches set point	S 21	M 21
	1st and 2nd contact break when pointer reaches set point	S 22	M 22
TRIPPLE CONTACTS			
	1. contact breaks 2. contact makes 3. contact breaks when pointer reaches set point	S 212	M 212

Wiring terminals are identified as per above wiring schemes.
Earth (ground) lead is identified green-yellow.

Inductive alarm sensor contacts of typ I

BITHERMA inductive contacts are certified for use in hazardous areas of Zone 1 and Zone 2. Power supply must be made by means of a power source certified intrinsically safe such as model 904.15.

Inductive contacts are also recommended for critical non-hazardous applications where an utmost of fail-safe heavy duty operation is required.

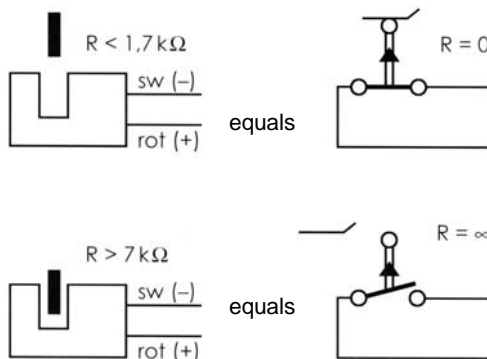
In combination with liquid filled instruments these contacts are particularly suited for process control circuits in the chemical and petroleum industry.

Operating principle

Heart of the inductive contact system is a non-contact sensor attached to an indicating device. Both sensor and indicator are adjustable over the full length of the scale.

Contact actuation is achieved by means of a metal flag linked to the pointer of the instrument. The metal flag affects the electric field of the sensor when the instrument pointer overlaps with the contact indicator. Contact actuation is made without any mechanical force that would affect accuracy of the instrument.

Below scheme reflects the operating principle in comparison with conventional mechanical contacts:



Dimensions of the basic instrument and provisions for contact adjustment are identical to contacts of type S and M.

Operating temperature:
 TMIN -25°C, TMAX + 70°C

Components of the inductive contact system

Operation of the inductive contact system requires an appropriate electronic power supply and control unit.

- The control unit consists of
- Line transformer
 - Amplifier circuit
 - Relay to switch external circuits

The isolated line transformer provides for power supply whereas the amplifier conditions the signal of the inductive sensor to energize the output relay.

- Available are two versions:
- Ex-approved intrinsic safety
 - Standard for non-certified service

The intrinsically safe version is offered with PTB certificate of conformity to EN 50 014 and EN 50 020 to be used with inductive contacts installed in hazardous areas of Zone 1 or Zone 2.

It may be noted that the control unit itself must be installed outside the hazardous area.

The characteristic of the relay excitation may be changed by means of jumpers on the circuit board:

- **Open circuit causes alarm**
 Flag matches sensor
 Flag outside sensor
- **Closed circuit causes alarm**
 Flag matches sensor
 Flag outside sensor
- **Open circuit alarm with continuity detector**
 Relay excitation as with open circuit alarm characteristic. In addition, continuity of the sensor circuit is monitored. Interrupted circuit will de-energize the relay.

The standard non-intrinsically safe version is equipped with permanently fixed operating characteristic.

The relay is de-energized when the flag matches the sensor or when the circuit is interrupted. This unit additionally provides a 24V/20mA DC power source for auxiliary use.

The differential pressure gauges TM 200 and TMP 2000 are intended to indicate positive, negative and differential pressure in ranges 60 Pa to 100 kPa; also with zero-point in the middle of the ranges 200 Pa to 10 kPa.

Instruments can be mounted axial or vertical (then zero-point has to be adjusted) instead of ranges 0-60 Pa to 0-100 Pa.

The instruments are fitted with a magnetic coupling between pressure diaphragm (made of silicone) and reading. Pressure pulses, fast pressure turn and also change of the pressure connections by mistake causes no instrument damage.

Uses: ventilators, blowers, filters etc.



TMP 2000

Technical data:

Accuracy: ± 2% FS at 20°C over 100 Pa
(± 3% at range 0-100 Pa,
± 4% at range 0-60 Pa)

Operating

pressure: 100 kPa standard version
240 kPa MP-version (TMP 2000 only)
550 kPa HP-version (TMP 2000 only)

Ambient

temperature: -7°C to +60°C
(to -54°C as LT-option)

Medium: Air and neutral gases

Standard

accessories: **For TMP 2000 only**
2 tube-nipples, 2 shut-nipples,
2 nozzles with union nut and washers
for panel mounting

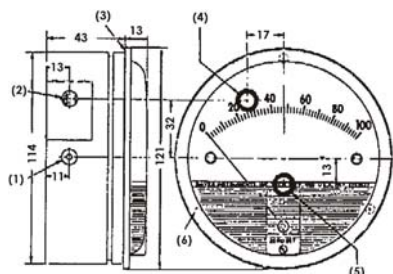
Special

accessories: **For TM 200 and TMP 2000 only**
Adjustable signal pointer - ASF
For TMP 2000 only
Plastic case with mounting accessories

Range	Plastic case (ABS) Article number:	For panel mounting Article number:
0 - 60 Pa	TM 200 - 60 Pa	TMP 2000 - 60 Pa
0 - 125 Pa	TM 200 - 125 Pa	TMP 2000 - 125 Pa
0 - 250 Pa	TM 200 - 250 Pa	TMP 2000 - 250 Pa
0 - 500 Pa	TM 200 - 500 Pa	TMP 2000 - 500 Pa
0 - 750 Pa	TM 200 - 750 Pa	TMP 2000 - 750 Pa
0 - 1 kPa	TM 200 - 1 kPa	TMP 2000 - 1 kPa
0 - 1,5 kPa	TM 200 - 1,5 kPa	TMP 2000 - 1,5 kPa
0 - 2 kPa	TM 200 - 2 kPa	TMP 2000 - 2 kPa
0 - 3 kPa	TM 200 - 3 kPa	TMP 2000 - 3 kPa
0 - 4 kPa	TM 200 - 4 kPa	TMP 2000 - 4 kPa
0 - 5 kPa	TM 200 - 5 kPa	TMP 2000 - 5 kPa
0 - 8 kPa	TM 200 - 8 kPa	TMP 2000 - 8 kPa
0 - 10 kPa	TM 200 - 10 kPa	TMP 2000 - 10 kPa
0 - 15 kPa	TM 200 - 15 kPa	TMP 2000 - 15 kPa
0 - 20 kPa	TM 200 - 20 kPa	TMP 2000 - 20 kPa
0 - 25 kPa	TM 200 - 25 kPa	TMP 2000 - 25 kPa
0 - 30 kPa	TM 200 - 30 kPa	TMP 2000 - 30 kPa
125 - 0 - 125 Pa	TM 200 - 125 Pa	TMP 2300 - 250 Pa
250 - 0 - 250 Pa	TM 200 - 250 Pa	TMP 2300 - 500 Pa
0,5 - 0 - 0,5 kPa	TM 200 - 0,5 kPa	TMP 2300 - 1 kPa
1,5 - 0 - 1,5 kPa	TM 200 - 1,5 kPa	TMP 2300 - 3 kPa

Dimensions TMP 2000:

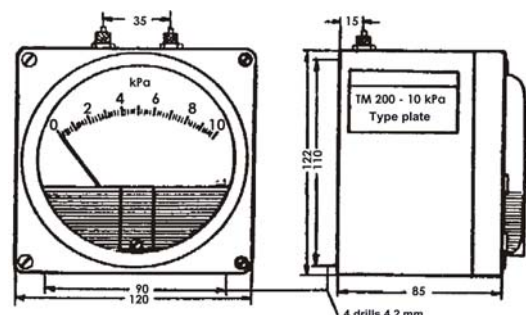
- Panel cut-out Ø 115
- MP-HP-version dimensions a little different
- (1) connection negative, 1/8" NPT
- (2) connection positive, 1/8" NPT
- (3) edge for panel cut-out
- (4) 12 mm hole in panel for positive connection as surface mounting
- (5) as (4) for negative pressure resp. nozzles for one hole surface mounting
- (6) 4 mm holes (3 pieces) at 105 mm circle for surface mounting



With contact for signalling on request!

Other ranges and parts on request!

Dimensions Type: TM 200



U-tube manometer D 116 F

The instrument consists of a U-tube made of aluminium, with 2 bores of 6 mm Ø for flat mounting on plain surfaces. The measuring tube is made of unbreakable acrylic glass of 7 mm Ø, with plain pre-bent ends to push on the hose easily. The adjustable scale is made of aluminium, for density 1,0 kg/dm³, suitable for +80°C.

U-tube manometer D 116/8

This is a nearly unbreakable operating execution, for warm (max. +60°C) and wet applications. This gauge is mounted on a base made of aluminium of 2 mm thickness and 64 mm width. Because of the raised side edges an optimal protection of the measuring tube is guaranteed. The measuring U-tube is made of unbreakable acrylic glass of 10 mm outer Ø with pre-bent ends and with screwed-on hose olives to push on hose easily. For adjusting the zero point the 40 mm wide scale is movable with black lettering. The measuring accuracy is better than one scale mark.

density 1 kg/dm³: water or fluid "Delalk" blue, frost-resistant

density 1,92 kg/dm³: PTFE-oil green (practically no evaporation)

Other fluids destroy the acrylic glass measuring tubes!



Measuring ranges

Scale
mbar
mmWS

NL 200	NL 300	NL 400	NL 500	NL 600	NL 800	NL 1000	NL 1200	NL 1500	NL 2000
10-0-10	15-0-15	20-0-20	25-0-25	30-0-30	40-0-40	50-0-50	60-0-60	75-0-75	100-0-100
100-0-100	150-0-150	200-0-200	250-0-250	300-0-300	400-0-400	500-0-500	600-0-600	750-0-750	1000-0-1000

Rollable pocket U-tube manometer D 119

Measuring tubes made of clear plastic (PVC) hose and graduation in between with continuously affixed "mbar" scale. Measuring range 120 mbar, graduation 60-0-60 mbar, scale lines 0,1:0,1 mbar. 2 special hose nozzles which can be closed for transport so that the measuring fluid can stay in the gauge. With 2 top and bottom magnets for plain steel surfaces and an additional profiled sheet with bore hole for wall mounting. Including 50 ml frost-resistant measuring fluid (to -50°C) "Delalk" of density 1,0 kg/dm³. Instrument rolled up with accessories in plastic case 22 x 16 x 6,5 cm.



Inclined tube manometers on request!

Pressure gauge cock

Pressure gauge cocks are intended to isolate the gauges from the medium in order to enable inspection or replacement of the gauge where the pressure is continually pulsating. These cocks are suitable up to 25 bar and a temperature span from -20°C to +50°C. For higher pressure and temperature, valves have to be used.

Design

Per DIN 16 261 and 16 262.

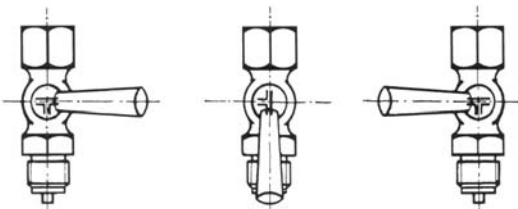
Connection

G 1/2 according to DIN 16 288 both sides

Body and cone

Material: brass

Operation, indicated by symbol on top of handle:



1. Isolate and vent pressure gauge into the atmosphere
2. Operate pressure gauge (standard position)
3. Isolate pressure gauge and vent pressure system into the atmosphere

Pressure gauge cock with test connector

The test connector enables simultaneous connection of a test gauge to test performance of the gauge in service.

Design

Per DIN 16 263

Pressure connection

G 1/2 according to DIN 16 288 both sides

Test connector

Male thread M 20 x 1.5
or test flange 60 x 25 x 10 mm or Ø 40 x 5 mm

Body and cone

Material: brass

The handle features a fourth position in addition to the 3 standard positions. In the fourth position both pressure gauge and test gauge are connected to the medium.

Pressure rating

25 bar

Optional extras

Materials: chromed brass; carbon steel; stainless steel AISI 316 Ti; thread other than G 1/2 degreased for oxygen

Pressure gauge valve

Pressure gauge valves are intended to isolate the gauge from the medium or to provide a means of throttling and damping pressure pulses.

Design

Plain valves DIN 16 270

Valves with test connector DIN 16271

Valves with test connector and extra shut-off device DIN 16272

Valves with test connector enable simultaneous connection of a test gauge to test performance of the pressure gauge in service. The test connector is normally closed by a sealing cap (DIN 16271) or by an extra shut-off device (DIN 16272).

Connection

G 1/2 according to DIN 16 288 both sides

Hand wheel

Thermoset plastic

Body

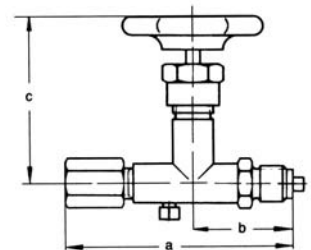
Material	Brass	Steel	AISI 316 Ti
Max. pressure PN in bar	250	400	400
Max. temperature in °C	120	200	200

Needle and seating

Corrosion resistant stainless steel

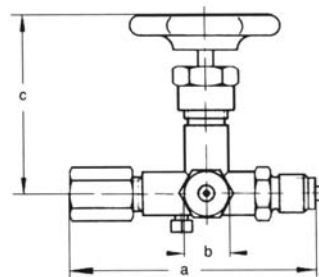
Valve per DIN 16 270

LH/RH -union - male thread

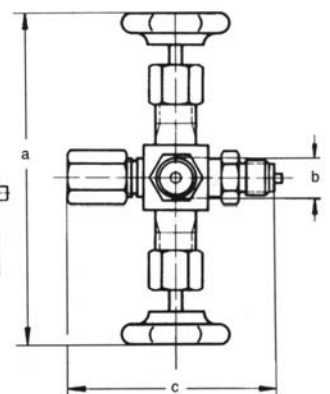


Dimensions and weight

Design	According to DIN 16 288	Dimensions in [mm]			Weight in [kg] ca.		
		a	b	c	Brass	Steel	316 Ti
Plain valve	G 1/2	114	50	87	0,55	0,50	0,53



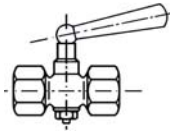
Valve per DIN 16271
LH/RH union - male thread
with test connector M 20 x 1.5



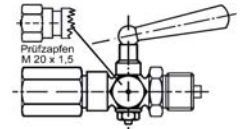
Valve per DIN 16272
LH/RH union - male thread
with test connector M 20 x 1.5
and extra shut-off device

Design	Dimensions in [mm]			Weight in [kg] ca.		
	a	b	c	Brass	Steel	316 Ti
Valve per DIN 16 271 with test connector M 20 x 1,5	114	M 20 x 1,5	90	0,67	0,65	0,65
Valve per DIN 16 272 with test connector M 20 x 1,5 and extra shut-off device	190	M 20 x 1,5	105	0,92	0,92	0,94

Female / female



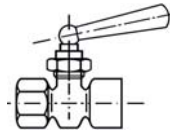
Male / union nut L/H
With test connector
M 20 x 1,5
DIN 16 263



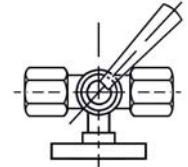
Thread	Material	PN	Max.temp	Art.no.
G ¼	Brass	6	50°C	7200
G ½	Brass	10	50°C	7202

Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7235
G ½	316 Ti	25	50°C	7236

Female / female
With stuffing box



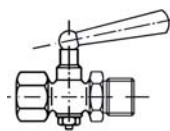
Female / female
With test flange
60 x 25 mm



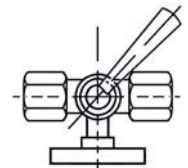
Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	10	50°C	7207

Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7248

Male / female



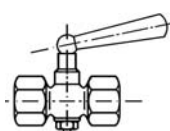
Female / female
With test flange
60 x 25 mm
With stuffing box



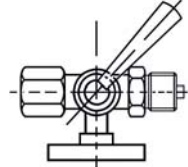
Thread	Material	PN	Max.temp	Art.no.
G ¼	Brass	6	50°C	7208
G ½	Brass	10	50°C	7210

Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	80°C	7249

Female / female
DIN 16 261 Form A



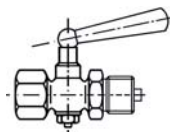
Male / female
With test flange
60 x 25 mm



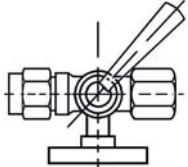
Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7212
G ½	316 Ti	25	50°C	7216

Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7241

Male / female
DIN 16 261 Form B



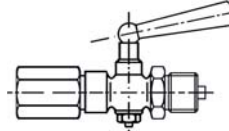
Female / union nut
With test flange
60 x 25 mm
With stuffing box



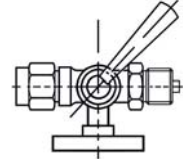
Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7219
G ½	316 Ti	25	50°C	7223

Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	80°C	7253

Male / union nut L/H
DIN 16 262 Form A



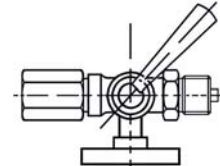
Male / union nut
With test flange
60 x 25 mm



Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7233
G ½	316 Ti	25	50°C	7237

Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7250

Male / union nut L/H
With test flange
60 x 25 mm
DIN 16 263

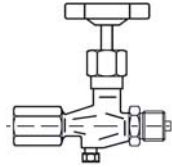


Thread	Material	PN	Max.temp	Art.no.
G ½	Brass	25	50°C	7255
G ½	316 Ti	25	50°C	7247

Special designed types
will be surcharged:

Test flange not 60 x 25 mm but round Ø 40 x 5 mm.
Oxygen, oil and grease-free

DIN 16270
Form A
Male / union nut L/H

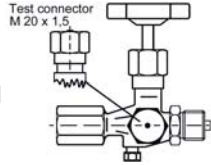


Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7258
G 1/2	Steel	400	120°C	7259
G 1/2	316 Ti	400	200°C	7260

DIN 16270
Form B with adapter for instrument holder
Male / union nut

Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7273
G 1/2	Steel	400	120°C	7274
G 1/2	316 Ti	400	200°C	7275

DIN 16271
Form A
Male / union nut L/H
With test connector
M 20 x 1,5

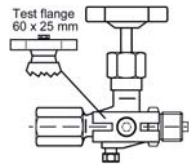


Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7261
G 1/2	Steel	400	120°C	7262
G 1/2	316 Ti	400	200°C	7263

DIN 16271
Form B with adapter for instrument holder
Male / union nut
With test connector
M 20 x 1,5

Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7276
G 1/2	Steel	400	120°C	7277
G 1/2	316 Ti	400	200°C	7278

DIN 16271
Form A
Male / union nut L/H
With test flange
60 x 25 mm

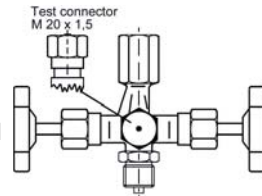


Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7264
G 1/2	Steel	400	120°C	7265
G 1/2	316 Ti	400	200°C	7266

DIN 16271
Form B with adapter for instrument holder
Male / union nut
With test flange
60 x 25 mm

Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7279
G 1/2	Steel	400	120°C	7280
G 1/2	316 Ti	400	200°C	7281

Double valve
DIN 16272
Form A
Male / union nut L/H
With test connector
M 20 x 1,5

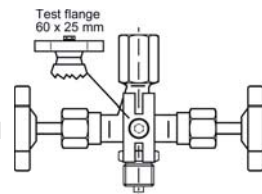


Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7267
G 1/2	Steel	400	120°C	7268
G 1/2	316 Ti	400	200°C	7269

Double valve
DIN 16272
Form B with adapter for instrument holder
Male / union nut
With test connector
M 20 x 1,5

Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7282
G 1/2	Steel	400	120°C	7283
G 1/2	316 Ti	400	200°C	7284

Double valve
DIN 16272
Form A
Male / union nut L/H
With test flange
60 x 25 mm



Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7270
G 1/2	Steel	400	120°C	7271
G 1/2	316 Ti	400	200°C	7272

Double valve
DIN 16272
Form B with adapter for instrument holder
Male / union nut
With test flange
60 x 25 mm

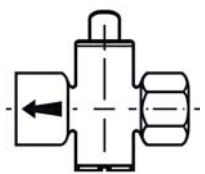
Thread	Material	PN	Max.temp	Art.no.
G 1/2	Brass	250	120°C	7285
G 1/2	Steel	400	120°C	7286
G 1/2	316 Ti	400	200°C	7287

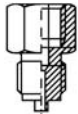
Special designed types
will be surcharged:

Oxygen, oil and grease-free
Test flange not 60 x 25 mm but round Ø 40 x 5 mm.

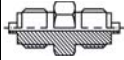
PUSH BUTTON STOPCOCK made of brass nickel plated


For media:	Mineral oil, fats, natural gas	Hot water	Aggressive media
Article number:	7242	7256	7257
Thread:	G 1/2	G 1/2	G 1/2
Washer:	NBR	EPDM	VITON
PN:	4	10	10
Max. temperature	-5+60°C	-5+100°C	-5+150°C



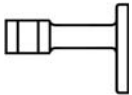
	Thread		Material	Article no.
	inner	outer		
 Female-Male	G 1/8	G 1/4	brass	7342
		G 1/2	brass	7343
	G 1/4	G 1/8	brass	7387
		G 3/8	brass	7388
		G 1/2	brass	7389
		G 1/2	316 Ti	7390
		1/4 NPT	brass	7391
	G 3/8	M12x1,5	brass	7393
		G 1/4	brass	7394
	G 1/2	G 1/2	brass	7395
		G 1/4	brass	7396
		G 1/4	316 Ti	7397
		G 3/8	brass	7400
		G 3/8	316 Ti	7401
		G 1/2	316 Ti	7402
		1/2 NPT	brass	7404
		1/2 NPT	316 Ti	7403
		G 3/4	brass	7337
		M12x1,5	brass	7338
	M20x1,5	M20x1,5	brass	7408
M20x1,5		316 Ti	7344	
M12x1,5	G 1/4	brass	7327	
M20x1,5	G 1/2	brass	7329	


 Female-Female	both sides female		Material	Art.no.
	G 1/4 x G 1/4	brass		
	G 1/4 x G 1/4	316 Ti	7455	
	G 1/2 x G 1/2	brass	7457	
	G 1/2 x G 1/2	316 Ti	7456	
	G 1/2 x M 20 x 1,5	brass	7458	
G 1/2 x M 20 x 1,5	316 Ti	7460		

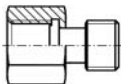
 Male-Male	both sides male		Material	Art.no.
	G 1/4 x G 1/4	brass		
	G 1/2 x G 1/2	brass	7461	
		316 Ti	7462	
G 1/2 x 1/2 NPT	316 Ti	7463		


 Self-sealing nipples (SS)	inner	outer	Material	Art.no.
	G 1/4	G 3/8		
		G 3/8	316 Ti	7470
		G 1/2	brass	7472
		G 1/2	316 Ti	7473


Instrument mounting brackets


 Bracket for wall mounting DIN 16 281 Form H	Extension mm	Material	Art.no.
	60		
	100	black	7406
	160	varnished	7407
	60	316 Ti	7410
	100		7411
	160		7412


 Adapter (for above brackets)	Thread	Material	Art.no.
	G 1/2		
	G 1/2	steel	7416
	G 1/2	316 Ti	7417
	1/2 NPT	316 Ti	7418

	Thread	Material	Art.no.
	G 1/2 female/male		

 LH/RH union DIN 16 283	Connection		Material	Art.no.
	G 1/2 left x G 1/2	brass		
		steel	7426	
	G 1/2 left x G 1/2	316 Ti	7427	
	G 1/2 x M20x1,5 left	brass	7428	
G 1/2 x M20x1,5 left	steel	7429		

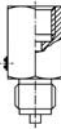
 Union nut DIN 16 284	Connection	PN	Material	Art.no.
	G 1/4	250		
		400	steel	7436
	G 1/2	250	brass	7437
		400	steel	7438
		400	316 Ti	7439
	M20x1,5	400	steel	7441

 Nipple DIN 16 284	Connection		Material	Art.no.
	for G 1/4	brass		
		steel	7431	
	for G 1/2	brass	7432	
		steel	7533	
		316 Ti	7434	


 Compression fitting with ferrule 1)	Connection	PN/Tube Ø	Material	Art.no.
	G 1/4	250 / 6		
		600 / 6	316 Ti	7444
		600 / 8	316 Ti	7446
	G 1/2	600 / 10	316 Ti	7448
		600 / 12	316 Ti	7450

1) incl. Sealing washer

Pressure gauge snubber, adjustable

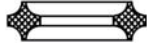

	Connection	max. working temp. °C	Material	Art.no.
	G 1/2	120		
		200	steel	8661
		200	316 Ti	8662

Manometer rubber cover

	Diam.	Colour	Art.no.
	63	red	
	63	blue	7421
	100 2)	blue	7423

2) Diam. 100 only for pressure gauge type series 2 and 6

Sealing washers

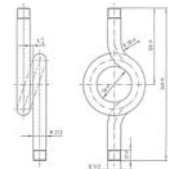
	for thread	Material	Art.no.	
	G 1/8			copper
 for self-centering by centering spigot (in accordance with EN 837-1)	G 1/4	ALU	7483	
	M12x1,5	copper	7484	
	G 1/4		316 Ti	7485
	M12x1,5	copper	7486	
	G 3/8, G 1/2		316 Ti	7487
	M20x1,5	copper	7488	
	G 3/8, G 1/2		316 Ti	7489
	 for self-centering by centering spigot (in accordance with EN 837-1)	G 1/4	copper	7492
		G 1/4	BA-CF 500	7493
		G 1/2	copper	7494
G 1/2		BA-CF 500	7495	
G 1/2		ALU	7496	
Thickness of 1,5 mm		G 1/4	PTFE	7481
Thickness of 2,0 mm		G 1/2	PTFE	7499
Thickness of 0,5 mm		G 1/4	PTFE	7497
		G 1/2	PTFE	7498

U-form
Made of seamless carbon steel
Both sides male thread



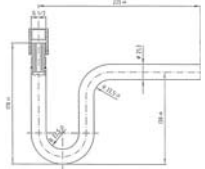
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	21,3	2,65	ST 37	8732
G ½	21,3	3,20	ST 35.8-I	8733
G ½	21,3	2,60	316 Ti	8735

Trumpet form
Made of seamless carbon steel
Both sides male thread



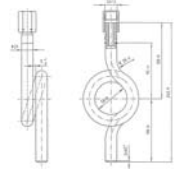
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	21,3	2,65	ST 37	8832
G ½	21,3	3,20	ST 35.8-I	8833
G ½	21,3	2,60	316 Ti	8835

U-form
Made of seamless carbon steel
Entry: butt welding
Gauge side: LH/RH union



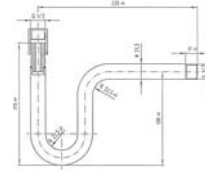
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8741
G ½	21,3	3,20	ST 35.8-I	8742
G ½	20,0	2,50	316 Ti	8744

Trumpet form
Made of seamless carbon steel
Entry: butt welding
Gauge side: LH/RH union
DIN 16 282 form D



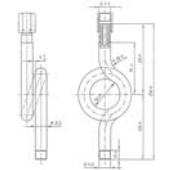
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8841
G ½	21,3	3,20	ST 35.8-I	8842
G ½	20,0	2,50	316 Ti	8844

U-form
Made of seamless carbon steel
Entry: male thread
Gauge side: LH/RH union



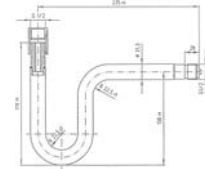
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	21,3	2,65	ST 37	8753
G ½	21,3	3,20	ST 35.8-I	8754
G ½	21,3	2,60	316 Ti	8756

Trumpet form
Made of seamless carbon steel
Entry: male thread
Gauge side: LH/RH union



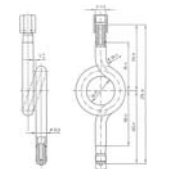
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	21,3	2,65	ST 37	8853
G ½	21,3	3,20	ST 35.8-I	8854
G ½	21,3	2,60	316 Ti	8856

U-form
Made of seamless carbon steel
Entry: male thread form 4 G 1/2
Gauge side: LH/RH union



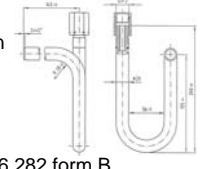
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8757
G ½	21,3	3,20	ST 35.8-I	8758
G ½	20,0	2,50	316 Ti	8759

Trumpet form
Made of seamless carbon steel
Entry: male thread form 4 G 1/2
Gauge side: LH/RH union
DIN 16 282 form C



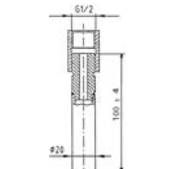
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8845
G ½	21,3	3,20	ST 35.8-I	8846
G ½	20,0	2,50	316 Ti	8848

U-form made of seamless carbon steel, left angle
(right angle will be surcharged)
Entry: butt welding
Gauge side: LH/RH union, DIN 16 282 form B



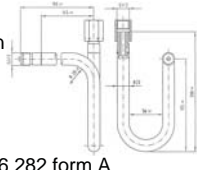
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8749
G ½	21,3	3,20	ST 35.8-I	8750
G ½	20,0	2,50	316 Ti	8752

Pipe connectors made of carbon steel, straight form
Entry: butt welding
Gauge side: LH/RH union



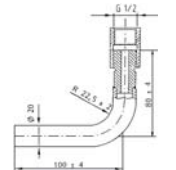
Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8860
G ½	21,3	3,20	ST 35.8-I	8861
G ½	20,0	2,50	316 Ti	8863

U-form made of seamless carbon steel, left angle
(right angle will be surcharged)
Entry: male thread form 4 G 1/2
Gauge side: LH/RH union, DIN 16 282 form A



Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8745
G ½	21,3	3,20	ST 35.8-I	8746
G ½	20,0	2,50	316 Ti	8748

Pipe connectors made of carbon steel, angled form
Entry: butt welding
Gauge side: LH/RH union



Thread	Outer Ø	Thickness	Material	Art.no.
G ½	20,0	2,60	ST 35.8-I	8864
G ½	21,3	3,20	ST 35.8-I	8865
G ½	20,0	2,50	316 Ti	8867

These tubes are the standard versions!

Certificates DIN EN 10 204 3.1 or 3.2 available.
Threads differing from G 1/2 with other tube diameters.
Material: ST 35.8 III / 15/16 Mo 3 / 13 CrMo 44 / 10 CrMo 910 / AISI 321 / others on request.

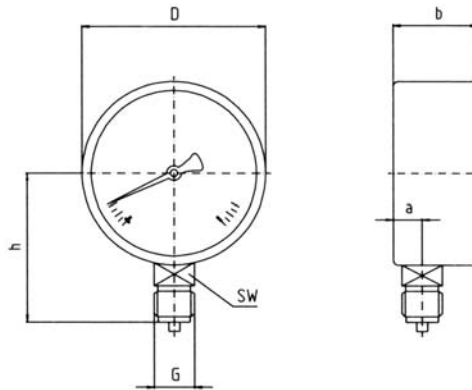
OPTIONS:

Case:	Steel, black varnished - Stainless steel AISI 304 - Surface mounting flange, steel black varnished
Bezel:	Without - Steel chromed ring, with glass window
Protection class:	IP 44 per EN 60529 / IEC 529
Dial:	Plastic, white, with stroke pin (diam. 40, 50, 63) Aluminium, white, with stroke pin (diam. 80, 100) lettering and graduation black - Red mark - Double scale bar/mWS (diam. 80, 100)
Pointer:	Plastic, black
Window:	Snap-fit window of clear plastic
Movement:	CU-alloy
Pressure element:	CU-alloy
Connection:	CU-alloy, male thread vertical entry (EN 837-1/7.3) G $\frac{1}{8}$, SW 14 (diam. 40) G $\frac{1}{4}$, SW 14 (diam. 50, 63) G $\frac{1}{2}$, SW 22 (diam. 80, 100)
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/400 bar -1,0 bar -0 bar ... -1,0 bar /+15 bar
Accuracy: (EN 837-1/6)	Class 1,6 - Class 1,0 (diam. 80, 100)
Working pressure:	Steady: $\frac{3}{4}$ x full scale value Fluctuating: $\frac{2}{3}$ x full scale value Short time: full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +60°C - System hard soldered for TMAX +150°C /+200°C
	- OPTIONS
Special versions:	For closed heating systems diam. 63, 80 with red mark-pointer and green flag measuring range 0 ... 4 bar, red mark at 2,5 bar For water level reading (hydrometer) diam. 80, 100 ranges 0 ... 1 bar to 0 ... 10 bar with 2. skale in "mWS"



Dimensions
 standard version

connection vertical entry



diam.	dimensions [mm]						weight [kg]
	a	b ± 0,5	D	G	h ± 1	SW	
40	9,5	26	39	1/8 B	36	14	0,08
50	10	27,5	49	1/4 B	45	14	0,10
63	9,5	27,5	62	1/4 B	53,5	14	0,13
80	11,5	30	79	1/2 B	72	22	0,18
100	11,5	30,5	99	1/2 B	83,5	22	0,21

Connection acc. to EN 837-1/7.3

type	111.10				
diam.	40	50	63	80	100
version					
-1-0	7500	7550	7601	7750	7801
-1+0,6	x	x	7563	x	7802
-1+1,5	x	x	7564	7751	7803
-1+3	x	x	7565	7752	7804
-1+5	x	x	7566	7753	7805
-1+9	x	x	7567	7754	7806
-1+15	x	x	7568	7755	7807
0-0,6	x	x	7602	7756	7808
0-1	x	7551	7603	7757	7809
0-1,6	7501	7552	7604	7758	7810
0-2,5	7502	7553	7605	7759	7811
0-4	7503	7554	7606	7760	7812
0-6	7504	7555	7607	7761	7813
0-10	7505	7556	7608	7762	7814
0-16	7506	7557	7609	7763	7815
0-25	7507	7558	7610	7764	7816
0-40	7508	7559	7611	7765	7817
0-60	x	7560	7612	7766	7820
0-100	x	7561	7613	x	7821
0-160	x	7562	7614	x	7822
0-250	x	x	7615	x	x
0-315	x	x	7616	x	x
0-400	x	x	7617	x	x

type	111.10	
diam.	80	100
version		
0 - 0,6	7900	7910
0 - 1	7901	7911
0 - 1,6	7902	7912
0 - 2,5	7903	7913
0 - 4	7904	7914
0 - 6	7905	7915
0 - 10	7906	7916

1) With red mark-pointer, 2. scale mWS

For closed systems -
 with red mark-pointer and green flag

type	111.10	
diam.	63	80
version		
connection	G 1/4	
0-2,5-4 bar	7700	x
connection	G 3/8	G 1/2
0-2,5-4 bar	7710	7720

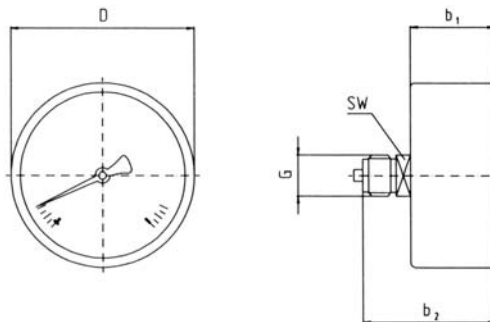
Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case:	Steel, black varnished - Stainless steel AISI 304
Bezel:	Without - Steel chromed ring, with glass window - Panel mounting flange, steel black - Narrow panel ring, steel-chromed, with clamp
Protection class:	IP 44 per EN 60529 / IEC 529
Dial:	Plastic, white, with stroke pin (diam. 40, 50, 63) Aluminium, white, with stroke pin (diam. 80, 100) lettering and graduation black - Red mark
Pointer:	Plastic, black
Window:	Snap-fit window of clear plastic
Movement:	CU-alloy
Pressure element:	CU-alloy
Connection:	CU-Alloy, male thread back entry (EN 837-1/7.3) G $\frac{1}{8}$, SW 14 (diam. 40) G $\frac{1}{4}$, SW 14 (diam. 50, 63, 80, 100)
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/400 bar -1,0 bar -0 bar ... -1,0 bar /+15 bar
Accuracy: (EN 837-1/6)	Class 1,6
Working pressure:	Steady: $\frac{3}{4}$ x full scale value Fluctuating: $\frac{2}{3}$ x full scale value Short time: full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +60°C - System hard soldered for TMAX +150°C /+200°C
	- OPTIONS
Special versions:	For closed heating systems diam. 63, 80 with red mark-pointer and green flag measuring range 0 ... 4 bar, red mark at 2,5 bar



Dimensions
standard version

connection back entry



diam.	dimensions [mm]					weight [kg]
	b1 ± 0,5	b2 ± 1	D	G	SW	
40	26	42	39	1/8 B	14	0,60
50	29,5	47,5	49	1/4 B	14	0,07
63	29	47	62	1/4 B	14	0,08
80	32	49	79	1/4 B	14	0,11
100	31	49	99	1/4 B	14	0,26

Connection acc. to EN 837-1/7.3

type		111.12				
diam.		40	50	63	80	100
version						
-1-0	bar	7510	7570	7680	7775	7825
-1+0,6		x	x	x	x	x
-1+1,5		x	x	x	x	x
-1+3		x	x	x	x	x
-1+5		x	x	x	x	x
-1+9		x	x	x	x	x
-1+15		x	x	x	x	x
0-0,6		x	x	7681	x	x
0-1		x	7571	7682	7776	7826
0-1,6		7511	7572	7683	7777	7827
0-2,5		7512	7573	7684	7778	7828
0-4		7513	7574	7685	7779	7829
0-6		7514	7575	7686	7780	7830
0-10		7515	7576	7687	7781	7831
0-16		7516	7577	7688	7782	7832
0-25	7517	7578	7689	7783	7833	
0-40	7518	7579	7690	7784	7834	
0-60	bar	x	7580	7691	7785	x
0-100		x	7581	7692	x	x
0-160		x	x	7693	x	x
0-250		x	x	7694	x	x
0-315		x	x	7695	x	x
0-400		x	x	7696	x	x

For closed systems -
with red mark-pointer and green flag

type		111.12	
diam.		63	80
version			
connection		G 1/4	
0-2,5-4	bar	7701	x
connection		G 3/8	G 1/2
0-2,5-4	bar	7711	7721 1)

1) With valve G 1/4 inside x DIN 2999 G 1/2 outside.

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

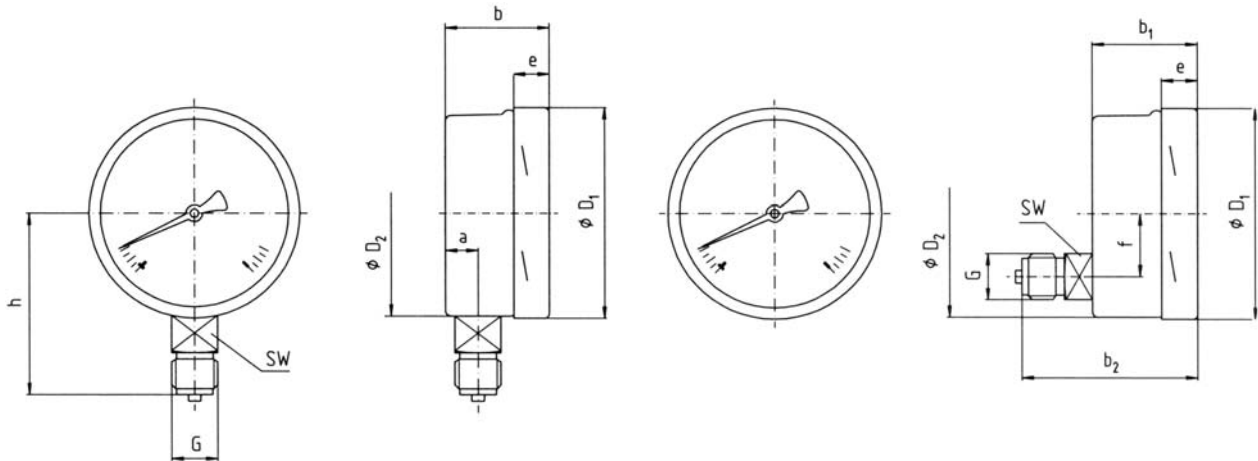
Case:	Bayonet, stainless steel AISI 304 - Surface mounting flange
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange - Narrow panel ring, with clamp
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer
Pointer:	Aluminium, black
Window:	Instrument glass - Laminated safety glass - Max. drag pointer - Red mark pointer
Movement:	CU-alloy, wear parts argentan
Pressure element:	CU-alloy, >= 100 bar stainless steel AISI 316 L
Connection:	CU-Alloy, male thread (EN 837-1/7.3) vertical or lower back entry G ½, SW 22
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/1600 bar (diam. 100, 160) 0/0,6 bar ... 0/1000 bar (diam. 250) -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +80°C - System hard soldered for TMAX +150°C /+200°C
	- OPTIONS
Special versions:	For freezing systems diam. 100: with temp. scale in °C (for R 744, R 764, R 40, R 22 or R 134a)



Dimensions
standard version

connection
vertical entry

connection
lower back entry



diam.	dimensions [mm]											weight [kg]
	a	b	b1	b2	D1	D2	e	f	G	h ± 1	SW	
100	15	49	49	85	101	100	17,5	30	½ B	86	22	0,6
160	15	51	51	86	160	159	17,5	50	½ B	118	22	1,0
250	16	55	55	93	250	249	17,5	50	½ B	165	22	2,2

Connection acc. to EN 837-1/7.3

type		212.20					
diam.		100		160		250	
version							
-1-0	bar	8001	8050	8101	x	x	x
-1+0,6		8024	x	x	x	x	x
-1+1,5		8002	8025	8102	x	x	x
-1+3		8003	x	8103	x	x	x
-1+5		8004	x	8104	x	x	x
-1+9		8005	x	8105	x	x	x
-1+15		8006	x	8106	x	x	x
-1+24		x	x	x	x	x	x
0-0,6		8007	x	8107	x	8150	x
0-1		8008	8051	8108	x	8151	x
0-1,6		8009	8052	8109	x	8152	x
0-2,5		8010	8053	8110	x	8153	x
0-4		8011	8054	8111	x	8154	x
0-6		8012	8055	8112	x	8155	x
0-10		8013	8056	8113	8124	8156	x
0-16	8014	8057	8114	8125	8157	x	
0-25	8015	8058	8115	8126	8158	x	
0-40	8016	8059	8116	x	8159	x	
0-60	bar	8017	8060	8117	x	8160	x
0-100		8018	8061	8118	x	8161	x
0-160		8019	8062	8119	x	8162	x
0-250		8020	8063	8120	x	8163	x
0-400		8021	8064	8121	x	8164	x
0-600		8022	8065	8122	x	x	x
0-1000	bar	8026	x	8127	x	x	x
0-1600		x	x	8128	x	-	-

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet, stainless steel AISI 304 - Surface mounting flange - Oil filled
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black
Pointer:	Aluminium, black
Window:	Polycarbonat
Movement:	CU-alloy, wear parts argentan
Pressure element:	CU-alloy, >= 100 bar stainless steel AISI 316 L
Connection:	CU-alloy, male thread G 1/2, SW 22 (EN 837-1/7.3) vertical entry - Lower back entry
Contact version:	M1, M2, M11, M12, M21, M22 with junction box at left or right side of the case Further contact descriptions on page 090
Measuring range: (EN 837-1/5)	0/1 bar ... 0/1600 bar -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +80°C - System hard soldered for TMAX +150°C - OPTIONS

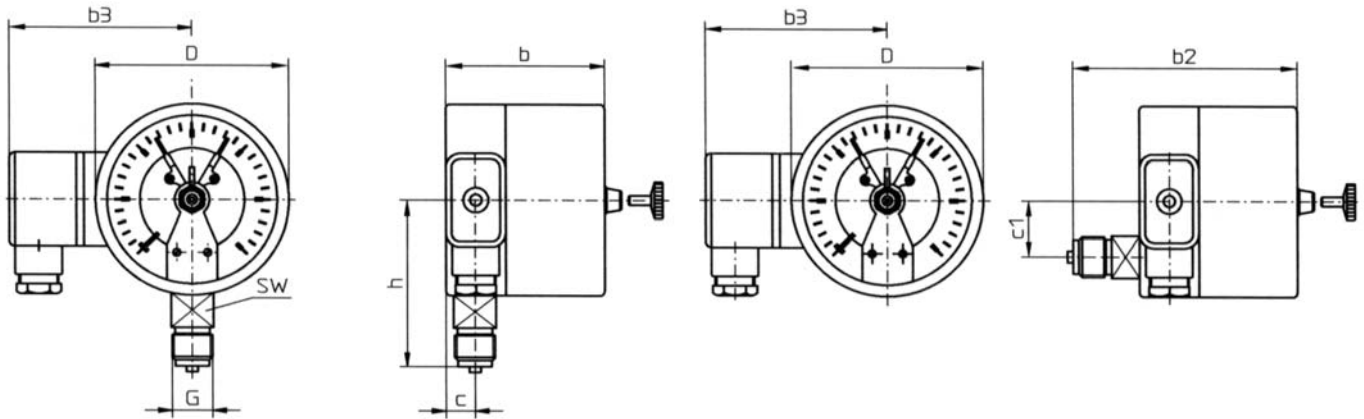


Picture shows an instrument with two inductive contacts

Dimensions
standard version

connection
vertical entry

connection
lower back entry



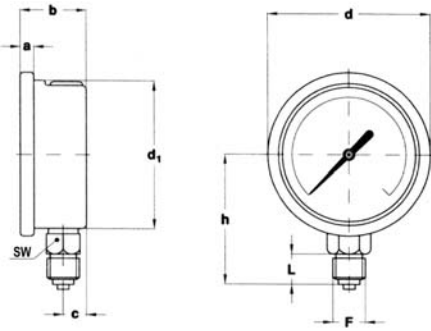
diam.	dimensions [mm]										weight [kg]
	b	b2	b3	c	c1	D	G	h	SW		
100	78	113	88	15	30	101	½ B	86	22	0,9	
160	97	132	118	15	50	160	½ B	118	22	1,8	

type	212.20											
	100						160					
diam.	[Icons of gauge versions]											
version	M1	M2	M11	M12	M21	M22	M1	M2	M11	M12	M21	M22
-1-0	8210	x	x	x	x	x	x	x	8361	x	8556	x
-1+0,6	x	x	x	x	8284	x	x	x	x	x	x	x
-1+1,5	x	x	x	x	x	x	x	x	x	x	8557	8577
-1+3	x	x	x	x	x	x	x	x	x	x	x	x
-1+5	x	x	x	x	x	x	x	x	x	8386	8559	x
-1+9	x	x	x	x	x	x	x	x	x	x	x	x
-1+15	x	x	x	x	x	x	x	x	x	x	x	x
-1+24	x	x	x	x	x	x	x	x	x	x	x	x
0-1	8215	x	x	x	x	x	x	x	x	x	8562	x
0-1,6	x	x	x	x	8221	x	x	x	x	x	8563	x
0-2,5	8211	x	x	8260	8285	x	x	x	x	x	8564	x
0-4	8216	x	x	x	8286	x	x	x	x	x	8565	x
0-6	8212	8220	x	8262	8287	8542	x	x	x	8387	8566	8578
0-10	8213	8238	x	8263	8288	8543	8313	x	8362	8388	8567	8590
0-16	8214	8239	x	8264	8289	8544	x	x	x	8389	8568	8591
0-25	x	x	x	x	8290	x	x	x	x	x	8569	x
0-40	x	x	x	x	8291	x	x	x	x	x	8570	x
0-60	8217	x	x	x	8292	x	x	x	x	x	8571	x
0-100	8218	x	x	x	8293	x	x	x	x	x	8572	x
0-160	8219	x	x	x	8294	x	x	x	x	x	8573	x
0-250	x	x	x	x	8295	x	x	x	x	x	8574	x
0-400	x	x	x	x	8296	x	x	x	x	x	8575	x
0-600	x	x	x	x	8297	x	x	x	x	x	8576	x
0-1000	x	x	x	x	x	x	x	x	x	x	x	x
0-1600	x	x	x	x	x	x	x	x	x	x	x	x

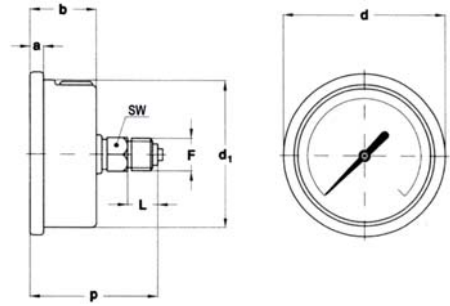
Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Stainless steel AISI 304 with blow up relief - Surface mounting flange
Bezel:	Rolled in (diam. 63, 100) Bayonet (diam. 160) Stainless steel AISI 304 - Panel mounting flange - Narrow panel ring with clamp
Protection class:	IP 65 per EN 60529 / IEC 529
Filling:	Glycerine 98% - Silicon oil (down to -45°C)
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - 2nd scale in psi, inwards red
Pointer:	Aluminium, black
Window:	Plastic
Movement:	CU-alloy, wear parts brass
Pressure element:	Phosphorus-bronze respectively stainless steel \geq 600 bar (diam. 63) 60 bar (diam. 100, 160)
Connection:	Brass, male thread vertical and back entry (EN 837-1/7.3) G ¼, SW 14 (diam 63) G ½, SW 22 (diam. 100, 160) - NPT ¼ (diam. 63) NPT ½ (diam. 100, 160)
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/400 bar (diam. 63) 0/0,6 bar ... 0/1000 bar (diam. 100, 160) -1,0 bar -0 bar ... -1,0 bar /+15 bar
Accuracy: (EN 837-1/6)	Class 1,6 (diam. 63) Class 1,0 (diam. 100, 160) - Class 1,6 (diam. 100 type 043.1)
Working pressure:	Steady: up to 60 bar 1,3 x full scale value up to 100 bar 1,25 x full scale value more than 100 bar 1,15 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +60°C - System hard soldered for TMAX +150°C / +200°C - OPTIONS





Dimensions
standard version

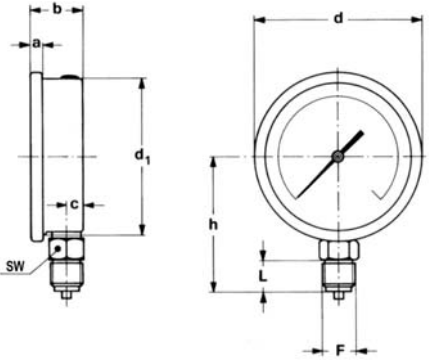


diam. 63 vertical entry - type 010.1

a	b	c	d	d1	h	L	F	SW	weight [kg]
5,6	28	10	68	62,6	54,3	13	G¼	14	0,2

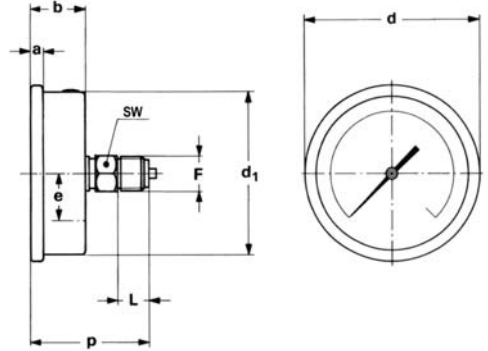
diam. 63 back entry - type 010.2

a	b	d	d1	p	L	F	SW	weight [kg]
5,6	28	68	62,6	53,8	13	G¼	14	0,21



diam. 100 vertical entry - type 010.1

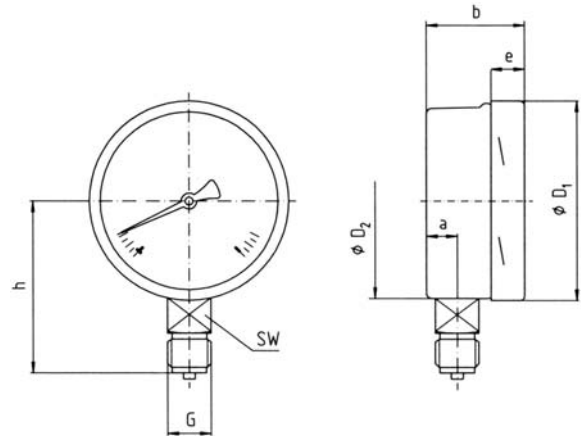
a	b	c	d	d1	h	L	F	SW	weight [kg]
12	37	10,5	100	98,5	83	19	G½	22	0,58



diam. 100 back entry - type 010.2

a	b	d	d1	p	L	F	SW	weight [kg]
12	37	100	98,5	66	19	G½	22	0,59

type	010.1.	010.2.	010.3.	010.4.	043.1.	010.1.	010.2.	010.1.
diam.	63				100	100		160
version								
-1-0	9830	9851	x	x	9772	9871	9893	9909
-1+0,6	x	x	x	x	x	x	x	x
-1+1,5	9831	x	x	x	x	9872	x	
-1+3	9832	x	x	x	9773	9873	x	
-1+5	9833	9852	x	x	x	9874	x	
-1+9	9834	9853	x	x	x	x	x	
-1+15	x	9854	x	x	x	x	x	
0-0,6	x	x	x	x	x	x	x	x
0-1	9835	9855	x	x	9774	9876	9894	9910
0-1,6	9836	9856	x	x	9775	9877	9895	9911
0-2,5	9837	9857	x	x	9776	9878	9896	9912
0-4	9838	9858	x	x	9777	9879	9897	9913
0-6	9839	9859	x	x	9778	9880	9898	9914
0-10	9840	9860	x	x	9779	9881	9899	9915
0-16	9841	9861	x	x	9780	9882	9900	9916
0-25	9842	9862	x	x	9781	9883	9901	9917
0-40	9843	9863	x	x	9782	9884	9902	9918
0-60	9844	9864	x	x	9783	9885	9903	9919
0-100	9845	9865	x	x	9784	9886	9904	9920
0-160	9846	9866	x	x	9785	9887	9905	9921
0-250	9847	9867	x	x	9786	9888	9906	9922
0-315	x	x	x	x	x	x	x	x
0-400	9848	9868	x	x	9787	9889	9907	9923
0-600	-	-	-	-	x	9890	9908	9924
0-1000	-	-	-	-	x	9891	x	9995



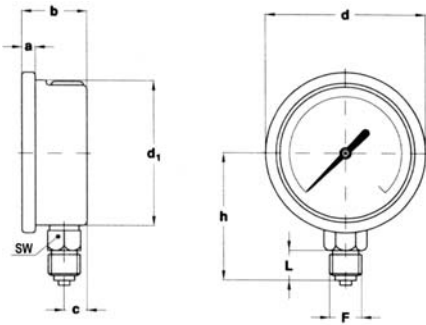
diam. 160 vertical entry - type 010.1

a	b	e	h	D1	D2	G	SW	weight [kg]
15	51	15	118	160	158	G½	22	2,0

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Stainless steel AISI 304 with blow-up relief - Surface mounting flange - Without filling
Bezel:	Rolled-in (diam. 63, 100) Bayonet (diam. 160) Stainless steel AISI 304 - Panel mounting flange - Narrow panel ring with clamp
Protection class:	IP 65 per EN 60529 / IEC 529
Filling:	Glycerine 98% - Silicon oil (down to -45°C)
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - 2nd scale in psi, inwards red
Pointer:	Aluminium, black
Window:	Plastic - Laminated safety glass
Movement:	Stainless steel
Pressure element:	Stainless steel AISI 316 L
Connection:	Stainless steel AISI 316 L male thread vertical or lower back entry (EN 837-1/7.3) G ¼, SW 14 (diam 63) G ½, SW 22 (diam. 100, 160) - NPT ¼ (diam. 63) NPT ½ (diam. 100, 160) - Diam. 63 thread centrally backwards arranged
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/400 bar (diam. 63) 0/0,6 bar ... 0/1000 bar (diam. 100, 160) -1,0 bar -0 bar ... -1,0 bar /+15 bar
Accuracy: (EN 837-1/6)	Class 1,6 (diam. 63) Class 1,0 (diam. 100, 160)
Working pressure:	Steady: up to 60 bar 1,3 x full scale value up to 100 bar 1,25 x full scale value more than 100 bar 1,15 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C
	- OPTIONS

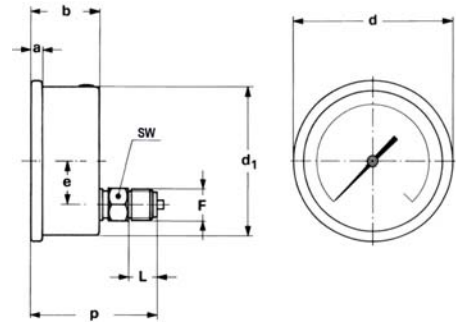




Dimensions
 standard version

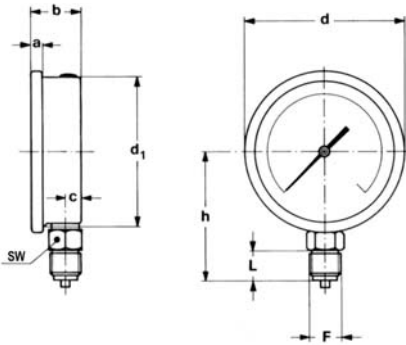
diam. 63 vertical entry - type 183.1

a	b	c	d	d1	h	L	F	SW	weight [kg]
5,6	28	10	68	62,6	54,3	13	G¼	14	0,2



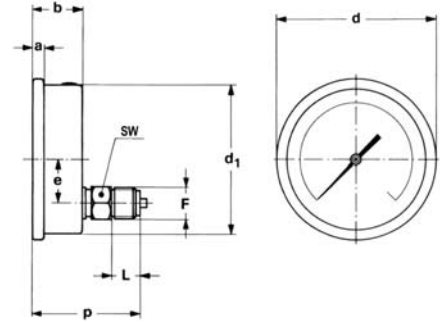
diam. 63 lower back entry - type 183.2

a	b	d	d1	p	L	F	SW	weight [kg]
5,6	28	68	62,6	53,8	13	G¼	14	0,21



diam. 100 vertical entry - type 183.1

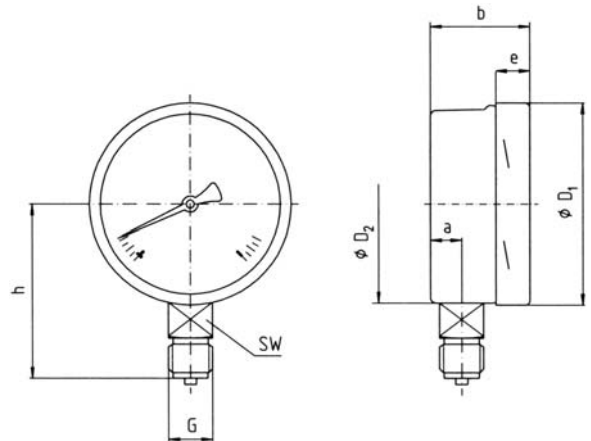
a	b	c	d	d1	h	L	F	SW	weight [kg]
12	37	10,5	100	98,5	83	19	G½	22	0,58



diam. 100 lower back entry - type 183.2

a	b	d	d1	p	L	F	SW	weight [kg]
12	37	100	98,5	66	19	G½	22	0,59

type	183.1.	183.2.	183.3.	183.4.	183.1.	183.2.	183.1.	
diam.	63				100			160
version								
-1-0	9926	9941	x	x	9956	x	9975	
-1+0,6	x	x	x	x	9957	x	x	
-1+1,5	x	x	x	x	x	x	x	
-1+3	x	x	x	x	x	x	x	
-1+5	x	x	x	x	x	x	x	
-1+9	x	x	x	x	x	x	x	
-1+15	x	x	x	x	x	x	x	
0-0,6	x	x	x	x	x	x	x	
0-1	9927	9942	x	x	9958	x	9976	
0-1,6	9928	9943	x	x	9959	x	x	
0-2,5	9929	9944	x	x	9960	x	9977	
0-4	9930	9945	x	x	9961	x	9978	
0-6	9931	9946	x	x	9962	x	9979	
0-10	9932	9947	x	x	9963	x	9980	
0-16	9933	9948	x	x	9964	x	9981	
0-25	9934	9949	x	x	9965	x	9982	
0-40	9935	9950	x	x	9966	x	9983	
0-60	9936	9951	x	x	9967	x	9984	
0-100	9937	9952	x	x	9968	x	9985	
0-160	9938	9953	x	x	9969	x	9986	
0-250	9939	9954	x	x	9970	x	9987	
0-315	x	x	x	x	x	x	x	
0-400	9940	9955	x	x	9971	x	9988	
0-600	-	-	-	-	9972	x	9989	
0-1000	-	-	-	-	9973	x	9990	



diam. 160 vertical entry - type 183.1

a	b	e	h	D1	D2	G	SW	weight [kg]
15	51	15	118	160	158	G½	22	2,0

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

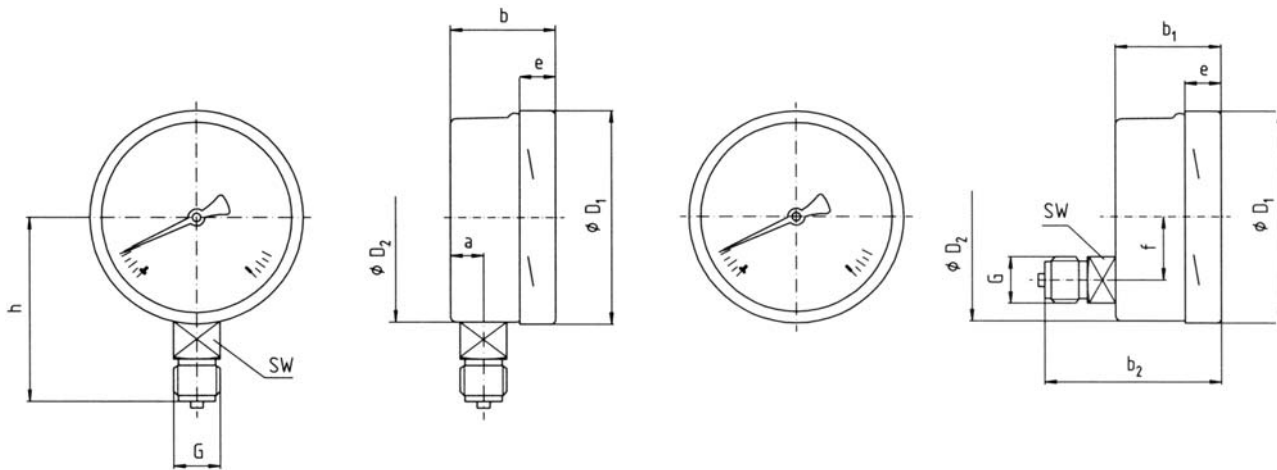
Case:	Bayonet, stainless steel AISI 304, with pressure relief - Surface mounting flange - Contacts (diam. 100, 160)
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange - Narrow panel ring, with clamp
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer (diam. 100, 160)
Pointer:	Aluminium, black
Window:	Laminated safety glass - Red mark pointer (diam. 100, 160) - Max. drag pointer (diam. 100, 160)
Movement:	Stainless steel
Pressure element:	Stainless steel AISI 316 L
Connection:	Stainless steel AISI 316 L, male thread vertical or lower back entry (EN 837-1/7.3) G ¼, SW 14 (diam 63) G ½, SW 22 (diam. 100, 160) - NPT ¼ (diam. 63) NPT ½ (diam. 100, 160)
Measuring range: (EN 837-1/5)	0/1,0 bar ... 0/1000 bar (diam. 63) 0/0,6 bar ... 0/1600 bar (diam. 100, 160) -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1,6 (diam. 63) Class 1,0 (diam. 100, 160) Class 2,5 (diam. 63 0-600 / 0-1000 bar)
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +200°C - OPTIONS



Dimensions
 standard version

connection
 vertical entry

connection
 lower back entry



diam.	dimensions [mm]											weight [kg]
	a	b	b1	b2	D1	D2	e	f	G	h ± 1	SW	
63	9,5	31	31	60	68,5	63	16	16	¼ B	53	14	0,2
100	15	49	49	85	101	100	17,5	30	½ B	86	22	0,6
160	15	51	51	86	160	159	17,5	50	½ B	118	22	1,0

Connection acc. to EN 837-1/7.3

type		232.50					
diam.		63		100		160	
version							
-1-0	bar	9739	9771	9620	x	9660	x
-1+0,6		9740	x	9621	x	9661	x
-1+1,5		9741	x	9622	x	9662	x
-1+3		9742	x	9623	x	9663	x
-1+5		9743	x	9624	x	9664	x
-1+9		9744	x	9625	x	9665	x
-1+15		x	x	9626	x	9666	x
-1+24		x	x	x	x	x	x
0-0,6			-	-	9643	x	9667
0-1		9745	9798	9627	x	9668	x
0-1,6		9746	9799	9628	x	9669	x
0-2,5		9747	9800	9629	9648	9670	x
0-4		9748	9801	9630	9649	9671	x
0-6	bar	9788	9802	9631	9650	9672	x
0-10		9789	9803	9632	9651	9673	x
0-16		9790	9804	9633	9652	9674	x
0-25		9791	9805	9634	9653	9675	x
0-40		9792	9806	9635	9654	9676	x
0-60	bar	9793	9807	9636	9655	9677	x
0-100		9794	9808	9637	x	9678	x
0-160		9795	9809	9638	x	9679	x
0-250		9796	9810	9639	x	9680	x
0-400		9797	x	9640	x	9681	x
0-600		x 1)	x 1)	9641	x	9682	x
0-1000	bar	x 1)	x 1)	x	x	9683	x
0-1600		-	-	x	x	x	x

1) only class 2,5

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

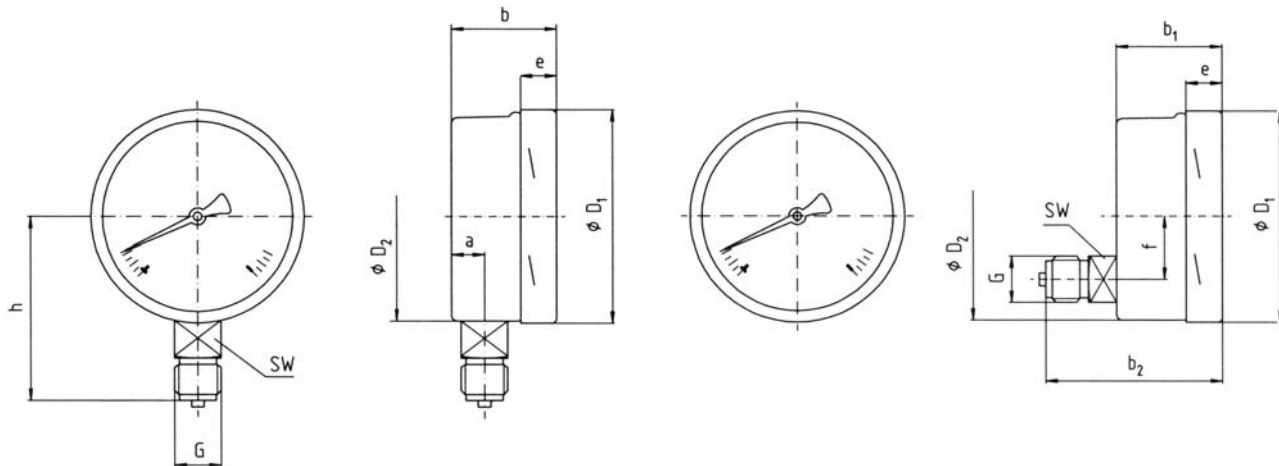
Case:	Bayonet, stainless steel AISI 304, with pressure relief - Surface mounting flange - Contacts (diam. 100, 160)
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange - Narrow panel ring, with clamp
Protection class:	IP 65 per EN 60529 / IEC 529
Filling:	Glycerine 98% - Silicon oil (down to -45°C)
Dial:	Aluminium, white varnished lettering and graduation black - Fixed red mark
Pointer:	Aluminium, black
Window:	Laminated safety glass - Red mark pointer (diam. 100, 160) - Max. drag pointer (diam. 100, 160)
Movement:	Stainless steel
Pressure element:	Stainless steel AISI 316 L
Connection:	Stainless steel AISI 316 L, male thread vertical or lower back entry (EN 837-1/7.3) G ¼, SW 14 (diam 63) G ½, SW 22 (diam. 100, 160) - NPT ¼ (diam. 63) NPT ½ (diam. 100, 160)
Measuring range: (EN 837-1/5)	0/1,0 bar ... 0/1000 bar (diam. 63) 0/0,6 bar ... 0/1600 bar (diam. 100, 160) -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1,6 (diam. 63) Class 1,0 (diam. 100, 160) Class 2,5 (diam. 63 0-600 / 0-1000 bar)
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C - OPTIONS



Dimensions
 standard version

connection
 vertical entry

connection
 lower back entry



diam.	dimensions [mm]											weight [kg]
	a	b	b1	b2	D1	D2	e	f	G	h ± 1	SW	
63	9,5	31	31	60	68,5	63	16	16	¼ B	53	14	0,26
100	15	49	49	85	101	100	17,5	30	½ B	86	22	0,9
160	15	51	51	86	160	159	17,5	50	½ B	118	22	2,0

Connection acc. to EN 837-1/7.3

type		233.50					
diam.		63		100		160	
version							
-1-0	bar	9360	9361	9223	9334	9213	x
-1+0,6		x	x	9316	x	x	x
-1+1,5		x	x	9317	x	x	x
-1+3		x	x	9318	x	x	x
-1+5		x	x	9319	x	9214	x
-1+9		x	x	9303	x	x	x
-1+15		x	x	x	x	x	x
-1+24		x	x	x	x	x	x
0-0,6		-	-	9332	x	x	x
0-1	x	x	9224	x	x	x	
0-1,6	x	x	9269	x	x	x	
0-2,5	9362	9375	9270	9335	9215	x	
0-4	9363	9376	9271	x	9216	x	
0-6	bar	9364	9377	9272	9336	9217	x
0-10		9367	9378	9273	9337	9218	x
0-16		9368	9379	9274	9338	9219	x
0-25		9369	9380	9275	x	9220	x
0-40		9370	9381	9276	x	9357	x
0-60	bar	9371	x	9277	x	9221	x
0-100		9372	9382	9278	x	9222	x
0-160		9373	x	9279	x	x	x
0-250		9374	9333	9280	9339	x	x
0-400		x	x	9281	x	x	x
0-600	x 1)	x 1)	9282	x	x	x	
0-1000	bar	x 1)	x 1)	9333	x	9299	x
0-1600		-	-	x	x	x	x

1) only class 2,5

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet, stainless steel AISI 304, with solid baffle wall and blow-out back - Surface mounting lugs - Contacts (diam. 100, 160)
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer (diam. 100, 160)
Pointer:	Aluminium, black
Window:	Laminated safety glass - Red mark pointer (diam. 100, 160) - Max. drag pointer (diam. 100, 160)
Movement:	Stainless steel
Pressure element:	Stainless steel AISI 316 L
Connection:	Stainless steel AISI 316 L, male thread vertical or lower back entry (EN 837-1/7.3) G ¼, SW 14 (diam 63) G ½, SW 22 (diam. 100, 160) - NPT ¼ (diam. 63) NPT ½ (diam. 100, 160)
Measuring range: (EN 837-1/5)	0/1,0 bar ... 0/1000 bar (diam. 63) 0/0,6 bar ... 0/1600 bar (diam. 100, 160) -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1,6 (diam. 63) Class 1,0 (diam. 100, 160) Class 2,5 (diam. 63 0-600 / 0-1000 bar)
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +200°C

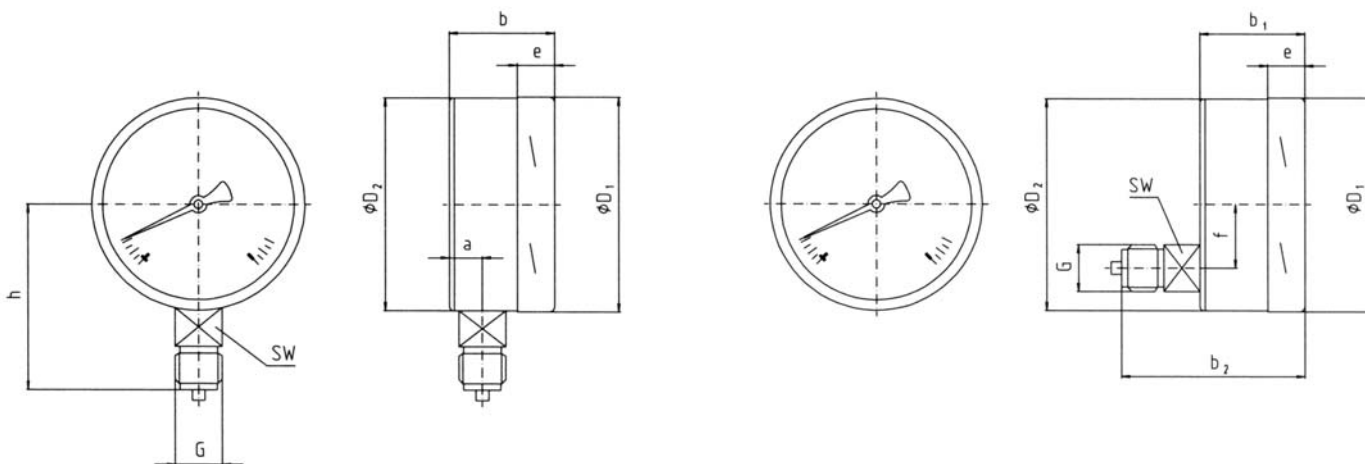


- OPTIONS

Dimensions
standard version

connection
vertical entry

connection
lower back entry



diam.	dimensions [mm]											weight [kg]
	a	b	b1	b2	D1	D2	e	f	G	h ± 1	SW	
63	18	41	41	63	64	63	16	16	¼ B	53	14	0,2
100	33	60	60	93	101	100	17,5	30	½ B	87	22	0,6
160	33	60	60	93	160	159	17,5	50	½ B	118	22	1,1

Connection acc. to EN 837-1/7.3

type		232.30				
diam.		63		100		160
version						
-1-0	bar	9600	x	9700	x	x
-1+0,6		x	x	9701	x	x
-1+1,5		x	x	9702	x	x
-1+3		9644	x	9703	x	x
-1+5		x	x	9704	x	x
-1+9		x	x	9705	x	x
-1+15		9599	x	9706	x	x
-1+24		x	x	x	x	x
0-0,6		-	-	9722	x	x
0-1		9645	x	9707	x	9727
0-1,6	9601	9611	9708	x	9728	
0-2,5	9602	9612	9709	x	9729	
0-4	9603	9613	9710	x	9730	
0-6	bar	9604	9614	9711	x	9731
0-10		9605	9615	9712	x	9732
0-16		9606	9616	9713	x	9733
0-25		9607	9617	9714	x	9734
0-40		9608	9618	9715	x	9735
0-60	bar	9609	9619	9716	x	9736
0-100		9610	x	9717	x	9737
0-160		9597	x	9718	x	9738
0-250		9598	x	9719	x	x
0-400		x	x	9720	x	x
0-600	9646 1)	x 1)	9721	x	x	
0-1000	bar	x 1)	x 1)	x	x	x
0-1600		-	-	x	x	x

1) only class 2,5

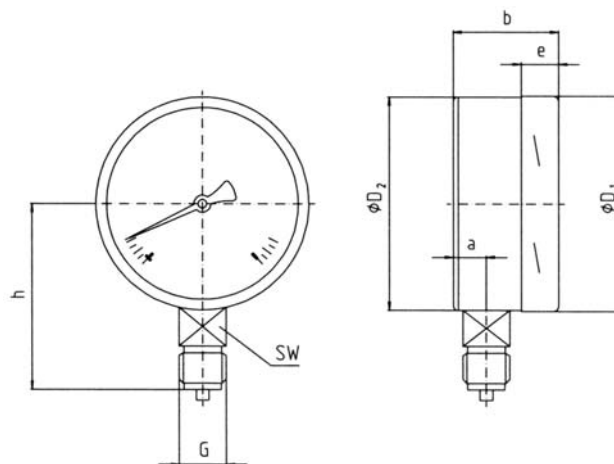
Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet, stainless steel AISI 304, with solid baffle wall and blow-out back - Surface mounting lugs - Contacts (diam. 100, 160)
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange
Protection class:	IP 65 per EN 60529 / IEC 529
Filling:	Glycerine 98% - Silicon oil (down to -45°C)
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer (diam. 100, 160)
Pointer:	Aluminium, black
Window:	Laminated safety glass - Red mark pointer (diam. 100, 160) - Max. drag pointer (diam. 100, 160)
Movement:	Stainless steel
Pressure element:	Stainless steel AISI 316 L
Connection:	Stainless steel AISI 316 L, male thread vertical entry (EN 837-1/7.3) G ¼, SW 14 (diam 63) G ½, SW 22 (diam. 100, 160) - NPT ¼ (diam. 63) NPT ½ (diam. 100, 160)
Measuring range: (EN 837-1/5)	0/1,0 bar ... 0/1000 bar (diam. 63) 0/0,6 bar ... 0/1600 bar (diam. 100, 160) -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1,6 (diam. 63) Class 1,0 (diam. 100, 160) Class 2,5 (diam. 63 0-600 / 0-1000 bar)
Working pressure:	Diam. 63 / 100, 160 Steady: ¾ x / 1,0 x full scale value Fluctuating: ⅔ x / 0,9 x full scale value Short time: 1,0 x / 1,3 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C
	- OPTIONS



Dimensions
 standard version

connection vertical entry



diam.	dimensions [mm]								weight [kg]
	a	b	D1	D2	e	G	h ± 1	SW	
63	18	41	64	63	16	¼ B	53	14	0,26
100	33	60	101	99	17,5	½ B	87	22	1,1
160	33	60	160	159	17,5	½ B	118	22	2,3

Connection acc. to EN 837-1/7.3

type		233.30		
diam.		63	100	160
version				
-1-0	bar	9200	9225	9250
-1+0,6		9247	9226	9769
-1+1,5		9248	9227	9251
-1+3		x	9228	9252
-1+5		x	9229	9253
-1+9		x	9230	9254
-1+15		x	9767	x
-1+24		x	x	x
0-0,6		-	9768	x
0-1		9765	9231	9255
0-1,6		9766	9232	9256
0-2,5		9201	9233	9257
0-4		9202	9234	9258
0-6		bar	9203	9235
0-10	9204		9236	9260
0-16	9205		9237	9261
0-25	9206		9238	9262
0-40	9207		9239	9263
0-60	bar	9208	9240	9264
0-100		9209	9241	9265
0-160		9210	9242	9266
0-250		9211	9243	9267
0-400		9212	9244	9268
0-600	x 1)	9245	9770	
0-1000	bar	9771 1)	9246	x
0-1600	-	x	9249	

1) only class 2,5

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet, stainless steel AISI 304 - Surface mounting flange - Liquid filled - Contacts
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black
Pointer:	Knife edge pointer Aluminium, black
Window:	Instrument glass - Laminated safety glass
Movement:	CU-alloy, wear parts argentan
Pressure element:	<= 40 bar CuSn8 - 2.1030 >= 40 bar stainless steel AISI 316 L
Connection:	CU-Alloy, male thread (EN 837-1/7.3) vertical or lower back entry G 1/2, SW 22 - Stainless steel AISI 316 L
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/1600 bar -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 0,6
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -40°C, TMAX +60°C Medium: TMAX +60°C
	- OPTIONS
Special:	Type 332.30 Safety version with solid baffle wall and blow-out back (only connection vertical)

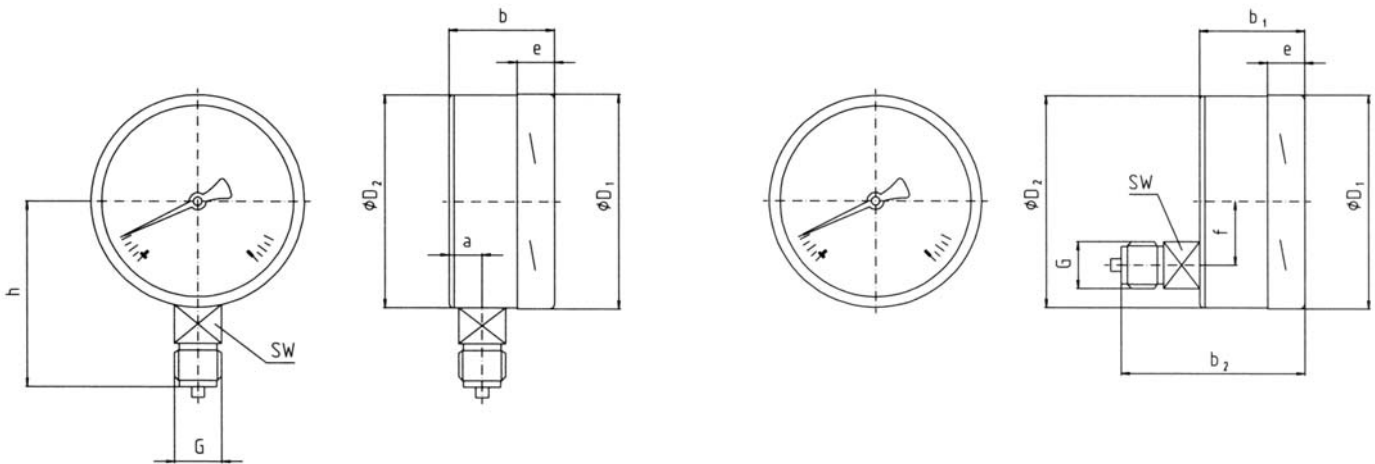


Picture shows an instrument with max. drag pointer

Dimensions
standard version




connection
vertical entry

connection
lower back entry



diam.	dimensions [mm]											weight [kg]
	a	b	b1	b2	D1	D2	e	f	G	h ± 1	SW	
160	15	51	51	86	161	160	17,5	50	½ B	118	22	1,0

Connection acc. to EN 837-1/7.3

type		312.20		
diam.		160		
version				
-1-0	bar	9401 1)	x 1)	x 1)
-1+0,6		9402 1)	x 1)	x 1)
-1+1,5		9403 1)	x 1)	x 1)
-1+3		9404	x	x
-1+5		9405	x	x
-1+9		9406	x	x
-1+15		9423	x	x
-1+24		x	x	x
0-0,6		9407 1)	x 1)	x 1)
0-1		9408 1)	x 1)	x 1)
0-1,6	9409 1)	x 1)	9424 1)	
0-2,5	9410 1)	x 1)	9425 1)	
0-4	9411	x	x	
0-6	bar	9412	x	9426
0-10		9413	x	9427
0-16		9414	x	9428
0-25		9415	x	9429
0-40		9416	x	x
0-60	bar	9417	x	x
0-100		9418	x	9430
0-160		9419	x	9431
0-250		9420	x	9432
0-400		9421	x	9433
0-600	9422	x	x	
0-1000	bar	x	x	x
0-1600		x	x	x

1) only without filling

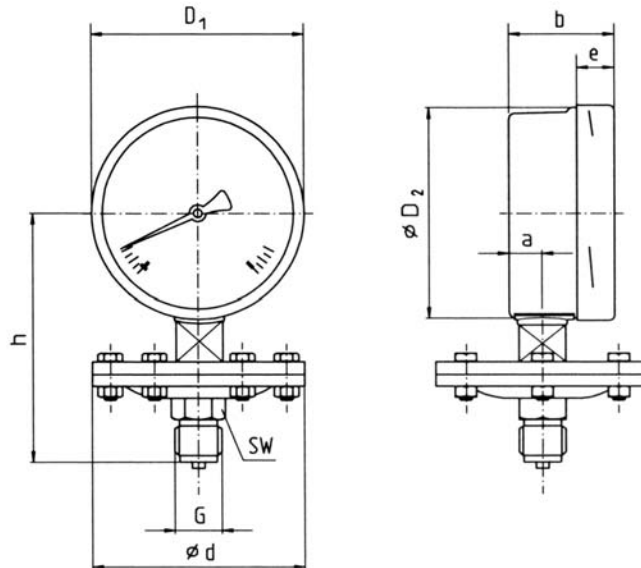
Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet, stainless steel AISI 304 - Liquid filled - Contacts
Bezel:	Bayonet, stainless steel AISI 304
Protection class:	IP 54 per EN 60529 / IEC 529 - IP 65 with liquid filling
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer
Pointer:	Aluminium, black
Window:	Instrument glass - Laminated safety glass - Red mark pointer - Max. drag pointer
Movement:	Cu-alloy, wear parts nickel-silver
Pressure element:	Upper and lower flange, aluminium Diaphragm stainless steel Diaphragm sealing ring, NBR
Connection:	Brass male thread vertical entry (EN 837-1/7.3) G 1/2, SW 27 - With open flange
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/40 bar 0/10 mbar ... 0/400 mbar -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1,6 - Class 1,0
Working pressure:	Steady: 1,0 x full scale value Fluctuating: 0,9 x full scale value Short time: 5,0 x full scale value, max. 40 bar - Overload safe, 10 times, but max. 40 bar
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C - Medium safe TMAX +200°C - OPTIONS



Picture shows an instrument with magnetic contact

Dimensions
standard version



dimensions [mm]										weight [kg]	
D1	D2	a	b	e	d [0,6..40 bar]	d [10..400 mbar]	G	h ± 1	SW	d 100	d 160
100	99	15	50	17,5	100	160	½ B	129,5	27	1,1	1,7
160	159	14,5	50	17,5	100	160	½ B	168	27	1,6	2,2
250	249	16	55	17,5	100	160	½ B	209	27	2,8	3,4

Connection acc. to EN 837-1/7.3

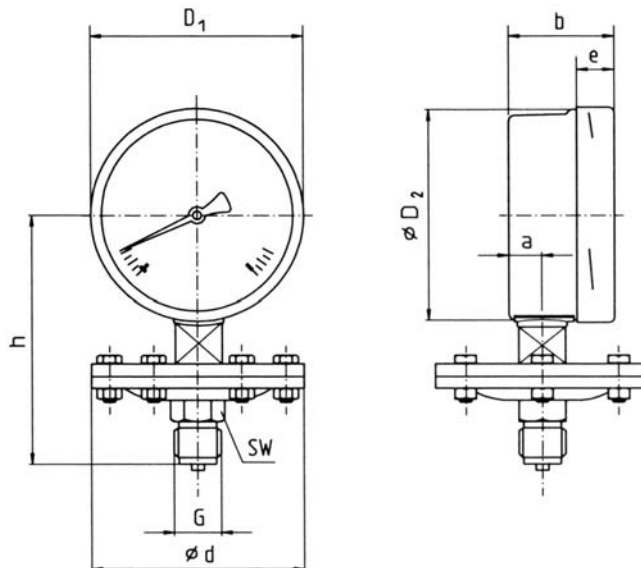
type	422.20		
diam.	100	160	250
version			
-0,6-0	x	x	x
-1-0	8401	8421	x
-0,6+1	x	x	x
-1+0,6	x	x	x
-1+1,5	8402	8422	x
-1+3	8403	8423	x
-1+5	8404	8424	x
-1+9	8405	8425	x
-1+15	x	x	x
-1+24	x	x	x
0-0,6	8406	8426	x
0-1	8407	8427	x
0-1,6	8408	8428	x
0-2,5	8409	8429	x
0-4	8410	8430	x
0-6	8411	8431	x
0-10	8412	8432	x
0-16	8413	8433	x
0-25	8414	8434	x
0-40	x	x	x
0-10	x	x	x
0-16	x	x	x
0-25	x	x	x
0-40	8415	8435	x
0-60	8416	8436	x
0-100	8417	8437	x
0-160	8418	8438	x
0-250	x	x	x
0-400	8419	8439	x

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Bayonet, stainless steel AISI 304, with pressure relief - Liquid filled - Contacts
Bezel:	Bayonet, stainless steel AISI 304,
Protection class:	IP 54 per EN 60529 / IEC 529 - IP 65 with liquid filling
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer
Pointer:	Aluminium, black
Window:	Laminated safety glass - Red mark pointer - Max. drag pointer
Movement:	Stainless steel
Pressure element:	Upper and lower flange, stainless steel AISI 316 L Diaphragm stainless steel Diaphragm sealing ring, FPM - Special materials
Connection:	Stainless steel AISI 316 L male thread vertical entry (EN 837-1/7.3) G ½, SW 27 - With open flange
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/40 bar 0/10 mbar ... 0/400 mbar -1,0 bar -0 bar ... -1,0 bar /+24 bar
Accuracy: (EN 837-1/6)	Class 1,6 - Class 1,0
Working pressure:	Steady: 1,0 x full scale value Fluctuating: 0,9 x full scale value Short time: 5,0 x full scale value, max. 40 bar - Overload safe, 10 times, but max. 40 bar
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C - Medium safe TMAX +200°C - OPTIONS



Dimensions
standard version



dimensions [mm]										weight [kg]	
D1	D2	a	b	e	d [0,6..40 bar]	d [10..400 mbar]	G	h ± 1	SW	d 100	d 160
100	99	15	50	17,5	100	160	½ B	129,5	27	1,8	4,0
160	159	14,5	50	17,5	100	160	½ B	168	27	2,3	4,5
250	249	16	55	17,5	100	160	½ B	209	27	3,5	5,7

Connection acc. to EN 837-1/7.3

type	432.50		
diam.	100	160	250
version			
-0,6-0	x	x	x
-1-0	8500	8520	x
-0,6+1	x	x	x
-1+0,6	x	x	x
-1+1,5	8501	8521	x
-1+3	8502	8522	x
-1+5	8503	8523	x
-1+9	8504	8524	x
-1+15	x	x	x
-1+24	x	x	x
0-0,6	8505	8525	x
0-1	8506	8526	x
0-1,6	8507	8527	x
0-2,5	8508	8528	x
0-4	8509	8529	x
0-6	8510	8530	x
0-10	8511	8531	x
0-16	8512	8532	x
0-25	8513	8533	x
0-40	x	x	x
0-10	x	x	x
0-16	x	x	x
0-25	x	x	x
0-40	8620	8630	x
0-60	8621	8631	x
0-100	8622	8632	x
0-160	8623	8633	x
0-250	8624	8634	x
0-400	8534	8535	x

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

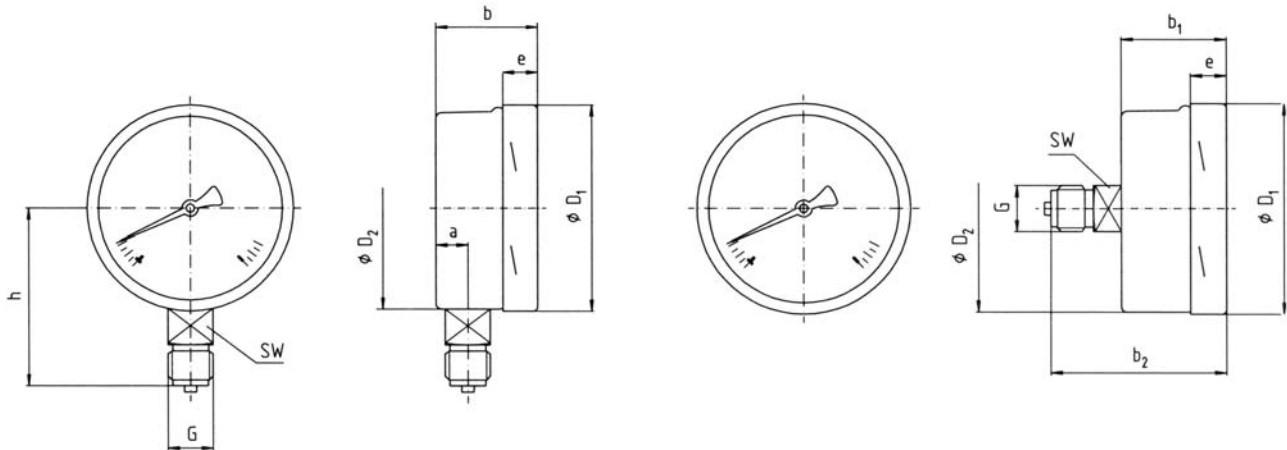
Case:	Bayonet, stainless steel AISI 304 - Surface mounting flange
Bezel:	Bayonet, stainless steel AISI 304 - Panel mounting flange - Narrow panel ring, with clamp
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black - Red mark - Red mark pointer
Zero adjustment:	Adjusting screw in dial
Pointer:	Aluminium, black
Window:	Instrument glass - Laminated safety glass - Red mark pointer
Movement:	Type 612.20 CU-alloy, wear parts argentan Type 632.50 stainless steel
Pressure element:	Type 612.20 CU-alloy Type 632.50 stainless steel AISI 316 L
Connection:	Male thread (EN 837-1/7.3) vertical or back entry G ¼, SW 14 (NG 63) G ½, SW 22 (NG 100, 160) Type 612.20 CU-Alloy Type 632.50 stainless steel AISI 316 L
Measuring range: (EN 837-1/5)	0/25 ... 0/600 mbar (diam. 63) 0/10 ... 0/600 mbar (diam. 100) 0/6 0/600 mbar (diam. 160) or equivalent other units of pressure or vacuum
Accuracy: (EN 837-1/6)	Class 1,6
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value - Overpressure < 25 mbar 6 x full scale value > 25 mbar 10 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C - OPTIONS



Dimensions
standard version

connection
vertical entry

connection
back entry



diam.	dimensions [mm]										weight [kg]
	a	b	b1	b2	D1	D2	e	G	h ± 1	SW	
63	9,5	39	39	66	68,5	63	16	¼ B	53	14	0,22
100	15	49	49	85	101	99	17,5	½ B	86	22	0,6
160	15	51	51	86	160	159	17,5	½ B	118	22	1,0

Connection acc. to EN 837-1/7.3

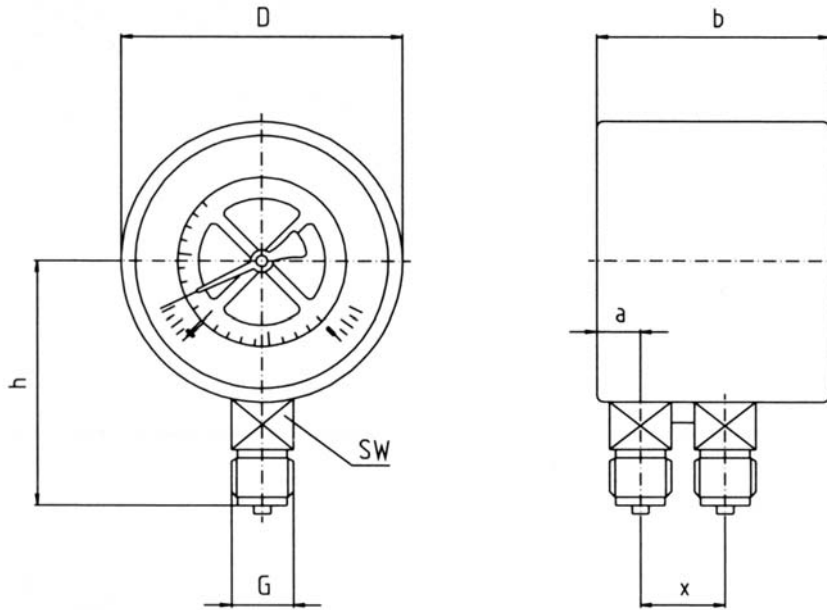
type	612.20						632.50					
series	INDUSTRIAL						PROCESS-INDUSTRY					
diam.	63		100		160		63		100		160	
version												
-600-0	x	x	x	x	x	x	x	x	x	x	x	x
-400-0	9358	x	x	x	x	x	x	x	x	x	x	x
-250-0	x	x	9359	x	x	x	x	x	x	x	x	x
-160-0	9300	x	9320	x	x	x	x	x	x	x	x	x
-100-0	9301	x	9321	x	x	x	x	x	x	x	x	x
-60-0	9302	x	9322	x	x	x	x	x	x	x	x	x
-40-0	x	x	9349	x	x	x	x	x	x	x	x	x
-25-0	x	x	x	x	x	x	x	x	x	x	x	x
-16-0	-	-	x	x	x	x	-	-	x	x	x	x
-10-0	-	-	x	x	x	x	-	-	x	x	x	x
-6-0	-	-	-	-	x	x	-	-	-	-	x	x
-25+15	x	x	9323	x	x	x	x	x	x	x	x	x
-20+40	x	x	x	x	x	x	x	x	x	x	x	x
-40+20	x	x	9324	x	x	x	x	x	x	x	x	x
0-6	-	-	-	-	x	x	-	-	-	-	x	x
0-10	-	-	9365	x	x	x	-	-	x	x	x	x
0-16	-	-	x	x	x	x	-	-	x	x	x	x
0-25	x	x	9325	9340	9350	x	x	x	x	x	x	x
0-40	9304	9310	9326	9341	9351	x	x	x	9383	x	x	x
0-60	9305	9311	9327	9342	9352	x	x	x	9384	x	x	x
0-100	9306	9312	9328	9343	9353	x	x	x	9385	x	x	x
0-160	9307	9313	9329	9344	9354	x	x	x	9386	x	x	x
0-250	9308	9314	9330	9345	9355	x	x	x	9387	x	x	x
0-400	9309	9315	9331	9346	9356	x	x	x	x	x	x	x
0-600	x	x	9366	x	x	x	x	x	x	x	x	x

Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Steel, black varnished - Stainless steel AISI 304 - Surface mounting flange
Bezel:	Slip-on ring, steel, black varnished - Stainless steel AISI 304 - Panel mounting flange
Protection class:	IP 33 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black
Pointer:	1st pointer: aluminium, black 2nd pointer: Rotating pointer scale, aluminium white Red pointer, scale with ± 50% of indicating range of + and - differential pressure scale
Window:	Instrument glass - Laminated safety glass - Red mark pointer
Movement:	CU-alloy, wear parts argentan
Pressure element:	CU-alloy
Connection:	CU-alloy, 2 x G 1/2, SW 22 male thread (EN 837-1/7.3) parallel indicated with [+] and [-] - Pressure system of stainless steel AISI 316 L TMAX +200°C
Design:	2 independant bourdon tube pressure elements, pressure entries in-line
Measuring range: (EN 837-1/5)	0/0,6 bar ... 0/250 bar with 2nd scale in "mWS" Scale ranges must be selected in consideration of the highest static pressure applied. The pressure differential to be indicated should be no less than 1/6 of the full scale range.
Accuracy: (EN 837-1/6)	Class 1,6
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value Short time: 1,3 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +60°C - System hard soldered for TMAX +100°C
Special:	Type 721.12 complete stainless steel -with liquid filling



Dimensions
standard version



diam.	dimensions [mm]							weight [kg]
	a	b	D	G	h ± 1	x	SW	
100	15,5	82	100	½ B	91	32	22	1,0
160	15,5	86,5	160	½ B	120	32	22	1,6

Connection acc. to EN 837-1/7.3

type	711.12		721.12	
series	INDUSTRIAL		PROCESS INDUSTRY	
diam.	100	160	100	160
version				
0-0,6	x	x	x	x
0-1	bar	8971	8981	x
0-1,6		8972	8982	x
0-2,5		8973	8983	x
0-4		8974	8984	x
0-6		8975	8985	x
0-10	bar	8976	8986	x
0-16		8977	x	x
0-25		x	x	x
0-40		x	x	x
0-60	bar	x	x	x
0-100		x	x	x
0-160		x	x	x
0-250		x	x	x

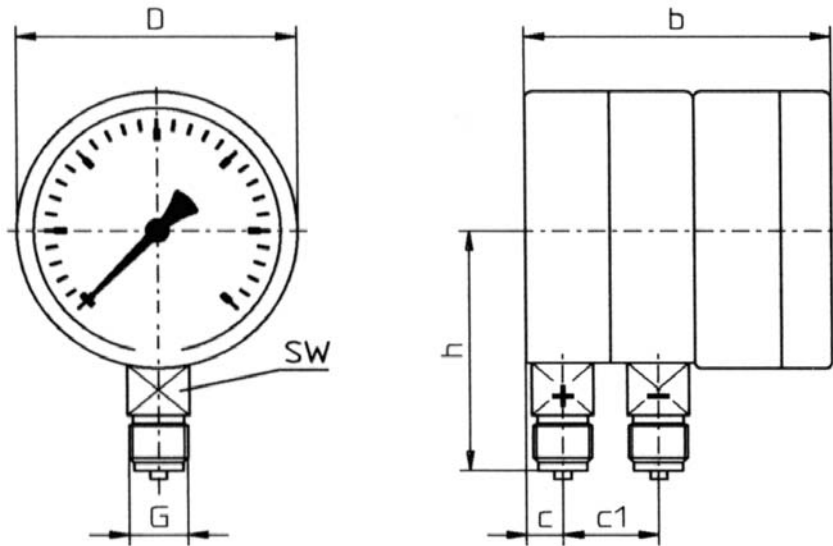
Dimensions and technical data are conform to current company standard.
Changes to improve our instruments will be made without preannouncement.

Case:	Stainless steel AISI 304 - Surface mounting flange - Contacts
Bezel:	Stainless steel AISI 304 - Panel mounting flange
Protection class:	IP 54 per EN 60529 / IEC 529
Dial:	Aluminium, white varnished lettering and graduation black - Red mark pointer
Pointer:	Aluminium, black
Window:	Instrument glass - Laminated safety glass - Red mark pointer - Max. drag pointer
Zero adjustment:	Adjust-screw in dial
Movement:	CU-alloy, wear parts argentan
Pressure element:	Diaphragm element of stainless steel FPM, PTFE, NBR/PA Pressure chambers: AlCuMg-alloy
Connection:	CU-alloy, 2 x G 1/2, SW 22 male thread (EN 837-1/7.3) parallel indicated with [+] and [-] - Pressure system of stainless steel
Design:	2 independant diaphragm pressure elements, pressure entries in-line
Measuring range: (EN 837-1/5)	0/60 mbar ... 0/400 mbar 0/0,6 bar ... 0/25 bar
Accuracy: (EN 837-1/6)	Class 1,6 / 2,5
Working pressure:	Steady: full scale value Fluctuating: 0,9 x full scale value
Operating temp.:	Ambient: TMIN -20°C, TMAX +60°C Medium: TMAX +100°C
Static pressure rating:	[+] and [-] side Diam. 100 max. 40 bar Diam. 100 range 0-400 mbar and 0-0,6 bar only max.10 bar Diam. 160 max. 30 bar - OPTIONS
Special:	Type 721.13 complete stainless steel -with liquid filling



Picture shows an instrument with surface mounting flange

Dimensions
 standard version



diam.	dimensions [mm]							weight [kg]
	D	b	c	c1	G	h ± 1	SW	
100	100	100	13	32	½ B	86	22	1,8
160	160	110	13	32	½ B	115	22	4,0

Connection acc. to EN 837-1/7.3

type	711.13		721.13	
Series	INDUSTRIAL		PROCESS-INDUSTRY	
diam.	100	160	100	160
version				
0-60	x	x	x	x
0-100	8926	8942	x	x
0-160	8927	8943	x	x
0-250	8928	8944	x	x
0-400	8929	8945	x	x
0-0,6	8930	8946	x	x
0-1	8931	8947	x	x
0-1,6	8932	8948	x	x
0-2,5	8933	8949	x	x
0-4	8934	8950	x	x
0-6	8935	8940	x	x
0-10	8936	8941	x	x
0-16	x	x	x	x
0-25	x	x	x	x

Dimensions and technical data are conform to current company standard.
 Changes to improve our instruments will be made without preannouncement.

GENERAL TERMS AND CONDITIONS OF BUSINESS (Effective from: March 2017)

BITHERMA FRANZ WAGNER & SOHN GMBH

1. Area and Scope of Application

- (1) Our Terms and Conditions of Business exclusively apply to companies within the meaning of Section 14 of the German Civil Code, legal entities governed by public law or special funds governed by public law within the meaning of Section 310 subsection 1 of the German Civil Code.
- (2) All orders and deliveries, work and services undertaken by Bitherma GmbH are performed solely in accordance with the following General Terms and Conditions of Business. We do not acknowledge General Terms and Conditions of Business that contradict and diverge from the following terms and conditions, unless Bitherma GmbH has expressly approved the client's General Terms and Conditions of Business in a particular case. The following terms and conditions also apply if we unconditionally execute the order in the knowledge that the client has contradictory or divergent terms and conditions.
- (3) In the event of repeat business it suffices if the client has been made aware of the General Terms and Conditions of Business of Bitherma GmbH on commencement of the business relationship.

2. Quotes and Conclusion of Contracts

- (1) Our quotes for prices, quantities, delivery deadline and delivery options are not binding. Orders are not binding until we have issued a written order confirmation.
- (2) Our prices are quoted exclusive of the respective value added tax and apply ex works, excluding packaging, dispatch and insurance costs, unless the confirmation order states otherwise.
- (3) Prices for dealers are subject to change, if material and payroll costs change after this date. The same applies to continuous obligations and to delivery within 4 months from the date of conclusion of the contract. In this case the client may rescind the contract if the price increase substantially exceeds the general cost of living in the period between placing the order and delivery.
- (4) Subsequent changes made at the instigation of the client, including machine downtime that is caused as a result will be charged to the client. Sketches, drafts, samples and similar preparatory work that is performed at the instigation of the client will be charged, even if the order is not placed.
- (5) The measurements in our illustrations, drawings and documents are only approximate, and are subject to subsequent changes. We also reserve the right to make changes to our models, such as the design etc. If output samples are produced on the basis of the drawings or samples received, they will play a key role in the execution of the order. Requests for changes made on the telephone must be confirmed in writing.

3. Documents Submitted and Copyright

We retain title and copyrights to all documents, e.g. calculations, drawings, sketches, drafts etc. that are submitted to the client in connection with placing the order. These documents must not be made available to third parties, unless we give the orderer our express written consent. If a contract fails to materialise, the documents must be returned to us immediately. We do not accept any responsibility for proposals in respect of materials, if the material is not suitable for the intended aim of the orderer.

4. Delivery and Dispatch

- (1) The quantities to be delivered are stipulated in the order confirmation. A larger or smaller delivery of 10% for items manufactured to order is admissible. Adequate part deliveries are admissible.
- (2) Packaging and dispatch costs shall be borne by the client. We are at liberty to choose the type and method of dispatch, allowing for the wishes of the client. All consignments are sent at the risk of the orderer, even if the delivery is on a carriage paid basis. The orderer is responsible for taking out transport insurance.

5. Delivery Period

- (1) Information about delivery dates or deadlines that have not been expressly agreed as binding are invariably non binding.
- (2) The agreed delivery periods commence on the date the order confirmation is dispatched and end on the date on which the goods leave the company or are put into storage owing to the impossibility of dispatching them. However, they do not commence before the details of execution and all the conditions that the client is required to satisfy have been clarified. The loading date or alternatively, if dispatch is impossible, the date on which the goods are ready for dispatch, is deemed to be the delivery date. The delivery period is interrupted in each case for the duration of the inspection by the client, namely from the date of dispatch to the client until the date his observations are received. If the client requests changes that deviate from the contract, a new delivery period shall commence from the date the change is confirmed.
- (3) Compliance with our obligation to deliver requires timely and due proper performance of the client's obligations to cooperate.
- (4) If the delivery deadline is missed, the client is entitled to set a reasonable final deadline of at least one month. The client is not entitled to rescind the contract on the grounds of an undue delay in delivery or impossibility of delivery until the final deadline has expired. Claims for damages on the grounds of an undue delay in delivery or impossibility of delivery are – insofar as they are permitted by law – excluded. We are liable under the statutory provisions insofar as the contract is an expressly agreed fixed-date transaction or the undue delay in delivery is attributable to a wilful or grossly negligent breach of contract for which we are responsible. We are vicariously liable for any wrongdoing by our representatives or employees. If the undue delay in delivery is not attributable to a wilful breach of contract for which we are responsible, our liability to pay compensation is confined to the typical foreseeable loss that is incurred.
- (5) Unforeseeable events such as shutdowns, labour disputes, shortages of raw materials, official orders, traffic disruptions, natural disasters, war and other events of force majeure release us for the duration of the disruption and to the extent of its effects from our obligation to deliver. This also applies if the shutdown is due to machine downtime for which we are not responsible. If this causes the delivery period to be missed, it does not entitle the client to rescind the contract or to hold us responsible for any losses incurred. We are entitled to deliver before the end of the delivery period and to make partial deliveries.

6. Terms of Payment

- (1) The payment deadlines commence from the billing date. Payments must be made within 10 days by bank transfer or cheque minus 2% discount from the net value of the goods or within 30 days net. Payments will always be credited to the oldest outstanding invoice. Bitherma GmbH shall not be charged for the payments made.
- (2) Advance payments or appropriate part payments for the work done are required for larger orders.
- (3) If payment dates are missed, we are entitled to charge default interest of eight percentage points above the base rate. We reserve the right to bring claims for additional loss. A dunning charge of 5 euros will be made for each reminder.

- (4) In the event of arrears or a substantial deterioration in the financial circumstances of the client which arose or became known after the contract was concluded, we are entitled to insist on advance payment or security for deliveries or services that are still outstanding and to rescind the contract in the event of refusal.
- (5) Offsetting is only admissible against counterclaims by the client that are not disputed by us or are established as legally binding. The client is only authorised to exercise a right of retention if his counterclaim derives from the same contractual relationship.
- (6) The client may only assign his rights with the written consent of Bitherma GmbH. Bitherma GmbH is entitled to assign its counterclaims against the client. If Bitherma GmbH advises the client of this assignment, only payments made by the client to the assignee have the effect of discharging his debt.

7. Retention of Title

- (1) We reserve the right to retain title to all the products we have delivered, including proposals, drafts etc. until we receive all the payments arising from business relationship with the client. If the client behaves in a way that breaches the contract, we are entitled to take the property back.
- (2) The orderer is obliged, provided the property has not yet passed to him, to handle the property with care. If maintenance works and inspections are required, the client shall arrange for them to be performed in a timely manner at his own expense. If title has not yet passed to him, the client shall notify us in writing immediately if the property that has been delivered is pledged or is subject to other claims by third parties. If the third parties are not able to reimburse us for the judicial or extrajudicial costs of settling a claim pursuant to Section 771 of the Code of Civil Procedure, the client is liable for the loss that we incur.
- (3) The client is entitled to adapt and process as well as to sell the products in the course of his ordinary business activity, provided he has not fallen into arrears with his payments. Extraordinary pledges, orders, transfers of collateral etc. are not admissible, however. Our title covers the products that are created through adaptation and processing proportionate to the value of our joint ownership of the third-party product. To guarantee our claims against the client, the latter will also assign those claims to us that arise against a third party through the connection of the retained goods to land; we accept this assignment now.
- (4) The client shall assign the claim to the retained goods that arises through resale or on another legal ground (e.g. unauthorised act) to us now; we hereby accept the assignment. We irrevocably authorise the client to collect the claim assigned in his own name. This does not affect our authorisation to collect the claim ourselves. We undertake, however, not to collect the claim, provided the orderer meets his payment obligations, has not got into arrears and has in particular not made an application to commence bankruptcy proceedings or payments have ceased. But if this is the case we may require the orderer to disclose the assigned claim and his debtor to us, provide us with all the information that is required for collection, surrender the relevant documents and inform the debtors about the assignment.

8. Warranty

- (1) If the client is a dealer within the meaning of Section 377 of the Commercial Code, claims arising from a defect require him to have duly complied with his obligations to inspect the goods and notify defects under Section 377 of the Commercial Code. The business client is still subject to the relevant obligations to inspect the goods and notify defects even if the underlying contract is a contract for work.
- (2) If the complaints are justified, Bitherma GmbH shall initially be emitted to remedy the defect or to make a substitute delivery within a reasonable period. Bitherma GmbH is at liberty to choose the method of subsequent performance. If subsequent performance fails, the client is entitled under the statutory provisions to a price reduction or alternatively to rescind the contract. Subsequent performance is deemed to have failed after the second unsuccessful attempt, unless the subject matter of the contract means that further attempts to remedy the defect are reasonable and acceptable to the client.
- (3) Bitherma GmbH is liable for malice aforethought and gross negligence. It is moreover liable for the negligent breach of obligations, the fulfilment of which is crucial for the due performance of the contract, the breach of which jeopardizes the fulfilment of the purpose of the contract, compliance with which the orderer implicitly trusts. In the latter case our liability is limited to reasonably foreseeable typical contractual loss. Bitherma GmbH is not liable for the breach of other obligations as a result of ordinary negligence. The aforementioned exclusions of liability do not apply to breaches that result in death and personal injury. This does not affect liability under product liability law.
- (4) If we have given a quality guarantee and/or durability guarantee, we are liable under this Guarantee. However, in this case we are only liable for losses that are not directly connected to the goods if the risk of such a loss is manifestly covered by the guarantee.
- (5) Further liability is excluded, irrespective of the legal nature of the claim that is brought.
- (6) Warranty and guarantee claims by the client are statute barred one year after delivery of the goods, unless we have wilfully concealed the defect; the statutory provisions are applicable in this case.

9. Place of Performance, Competent Court and Applicable Law

- (1) The place of performance for deliveries and payments is the head office of Bitherma GmbH.
- (2) Any disputes arising out of this contractual relationship will be settled before the competent court in Lemgo, provided the client is a dealer or legal entity governed by public law or a special fund governed by public law within the meaning of Section 38 of the Code of Civil Procedure. We are, however, also entitled to sue the client at his place of residence or place of business.
- (3) The law of the Federal Republic of Germany shall apply, and to deliveries abroad as well. The application of the UN Convention on Contracts for the International Sale of Goods (CCISG) is excluded.

10. Other Agreements

- (1) Any verbal agreements are only binding if they are confirmed in writing. This also applies to an amendment to this written form requirement. All the agreements between the parties are contained in this contractual document and its annexes. No further agreements exist.
- (2) If difficulties of interpretation or other difficulties arise from other language versions of these Terms and Conditions, the German language version shall be authoritative.
- (3) If any of the provisions of these General Terms and Conditions of Business and/or of this contract are or become ineffective, this shall not affect the validity of the remaining provisions. The parties agree to replace the ineffective provision with a legally admissible provision that is as close as possible to the commercial aim of the ineffective provision or closes this loophole.

