

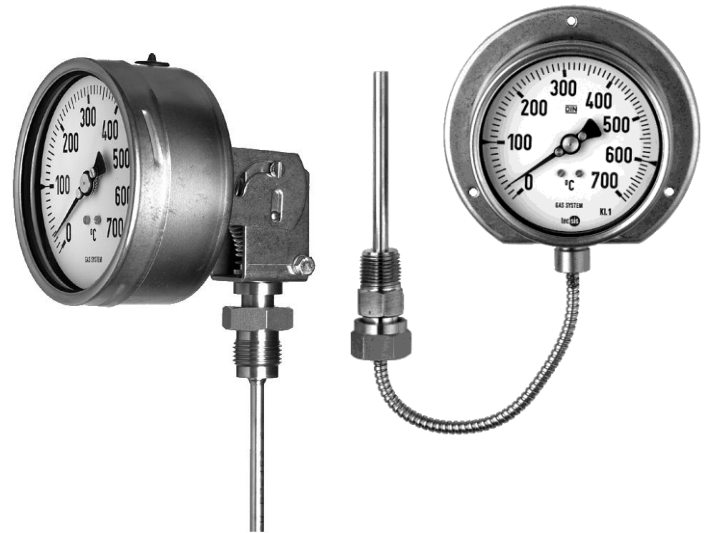
Gas actuated thermometer

Chemical type

Optional with capillary

Nominal size NS 100, 160

Accuracy class 1



Description

The Gas-actuated-thermometers are suitable for raw ambient conditions. Case, ring and stem are made of stainless steel. With a liquid filling, the thermometers can be used at measuring points with high vibrations. The thermometers with capillary facilitate separation of the display unit from the measuring point.

The measuring system in the gas thermometers consists of the stem, capillary and Bourdon tube in a case. The complete measuring system is filled with an inert gas under pressure. A temperature change causes the internal pressure in the stem to change. The deflection of the Bourdon tube thus caused is transmitted to the pointer by a movement.

A version with rotateable (360°) and turntable case (90°) allow the thermometers to be aligned as desired under all installation conditions.

In conjunction with a corresponding thermowell, these thermometers can also be used with aggressive media or high process-pressures.

Features

- Short response time
- Nominal sizes acc. to DIN
- Large selection of standard versions
- Customized versions available
- For aggressive media

Options

- Filled versions for measuring points with high vibrations
- Models with turnable and rotateable connection
- Capillary length: up to 50m

Measuring ranges

-200 ... 50 °C bup to 0 ... 700°C

Applications

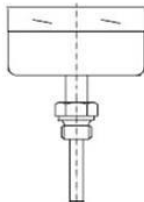
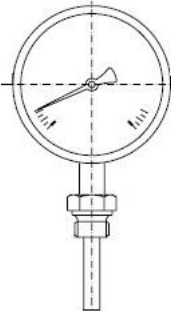
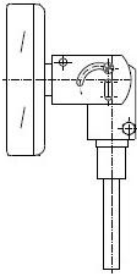
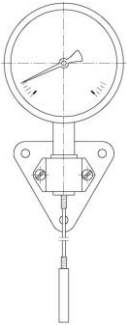
Chemical and petrochemical industry

Process engineering

Food industry

Model: TM350, TM360, TM370, TM390

Technical data

Model	TM350	TM360	TM370	TM390
				
Process connection	Back mount	Lower mount	Turnable / rotateable	With capillary
Nominal size (mm)	100 160	100 160	100 160	100 160
Weight (kg)				
without damping				
NG100	1,100	1,100	1,300	1,400
NG160	1,400	1,400	1,600	1,800
Accuracy	Class 1 acc.to EN13190			
Scale range	Scale range [°C]¹⁾		Measuring range [°C]	Limits of error [°C]
Measuring range	-80 ... 60		-60 ... 40	± 2
Limits of error	-30 ... 50		-20 ... 40	± 1
	-20 ... 60		-10 ... 50	± 1
	0 ... 60		10 ... 50	± 1
	0 ... 120		10 ... 110	± 2
	0 ... 160		20 ... 140	± 2
	0 ... 200		20 ... 180	± 2
	0 ... 250		30 ... 220	± 2,5
	0 ... 300		30 ... 270	± 5
	0 ... 400		50 ... 350	± 5
	0 ... 500		50 ... 450	± 5
	0 ... 600		100 ... 500	± 10
	0 ... 700		100 ... 600	± 10
Range of use	Constant load: Measuring range Short time (≤ 24h): Scale range			
Design of connection	Plain stem (without thread) Standard, male thread Male nut Union nut Compression fitting, sliding on stem			
Material case / ring / stem	Stainless steel			
Window	Laminated safety glass			
Dial	White aluminium, black marking and scale			
Measuring element	Gas actuated			
Pointer	Aluminium black, adjustable pointer			
Ingress protection	IP65 acc.to EN 60529			
Max pressure at stem	Max. 25 bar statical			

¹⁾ Other Measuring ranges are available on request

Thermometer with contact: see data sheet DE 1050

Options

- Scale unit °F; dual scale °C/°F
- Thermometers for external pipe mounting
- Liquid damping
- PVC-coating or stainless steel armour for capillary
- Special version for applications with high vibrations (see page 6)

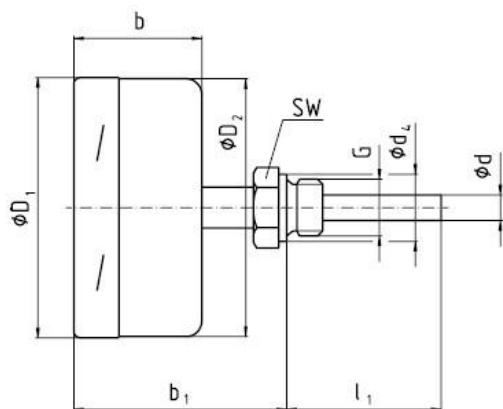
Design of connection

	Male thread	Plain stem	Male nut	Union nut	Compression fitting										
Stem-length l_1	63 mm 100 mm 160 mm 200 mm 250 mm	100 mm 140 mm 200 mm 240 mm 290 mm	80 mm 140 mm 180 mm 230 mm	89 mm 126 mm 186 mm 226 mm 276 mm	variable min. insertion length $l_{min} = 60 \text{ mm}$ length $l \geq l_1 + 35 \text{ mm}$										
Dimensions															
Stem diameter $\varnothing d$	Standard 8 mm Option: 6, 10, 12mm														
Thread and dimensions [mm]		SW	d4	i			SW	i		SW	d4	i			
	G 1/2	27	26	14		G 1/2	27	20	G 1/2	27	26	14			
	G 3/4	32	32	16		G 3/4	32	10,5	G 3/4	32	32	16			
	1/2 NPT	22	-	19		M20x1,5	22	15	M24x1,5	32	13,5	M18x1,5	24	23	12
	3/4 NPT	30	-	20								1/2 NPT	22	-	19
												3/4 NPT	30	-	20
	Not possible with models TM370 and TM390									At Model TM390 the compression fitting can be - sliding on stem - sliding on capillary					

Thermowells: see data sheet DE 1060, DE 1061, DE1062

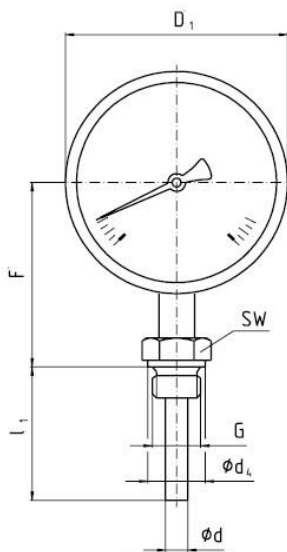
Dimensions (mm) Gas actuated thermometer without capillary

Back mount



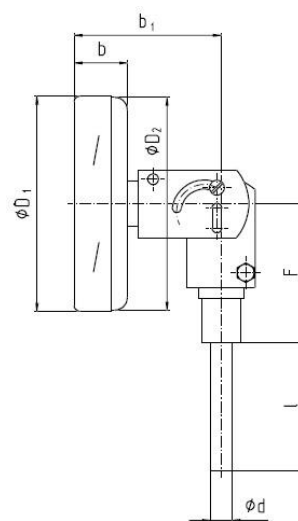
Model TM350

Lower mount



Model TM360

Turnable/rotateable



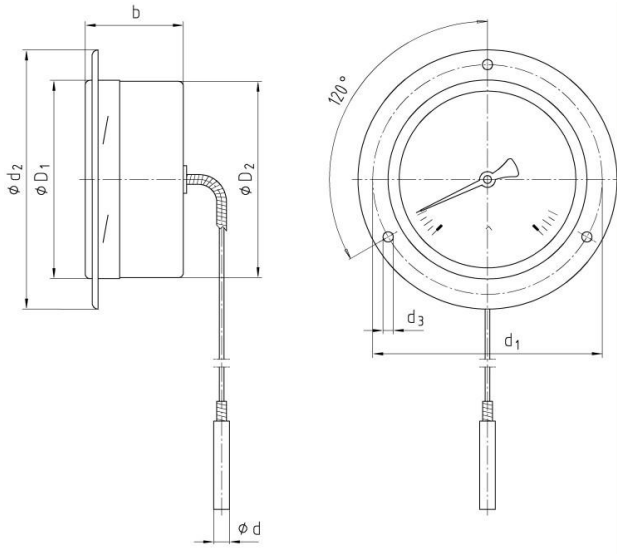
Model TM370

Model	Dimension (mm)					
	D (NG)	D_1	D_2	F	b	b_1
TM350	100	101	99	---	50	83 ¹⁾
	160	161	159	---		
TM360	100	101	99	83 ¹⁾	---	---
	160	161	159	113 ¹⁾	---	---
TM370	100	101	99	68	50	93
	160	161	159			

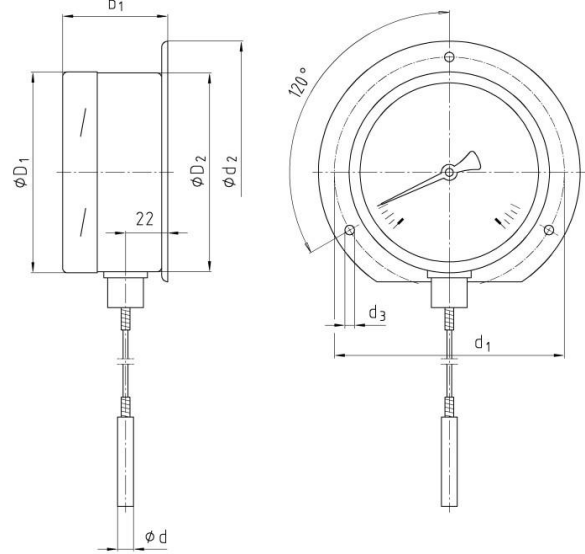
¹⁾ These dimensions are 40mm longer for measuring ranges 0 ... 500°C and higher

Dimensions (mm) Gas actuated thermometer with capillary (TM390)

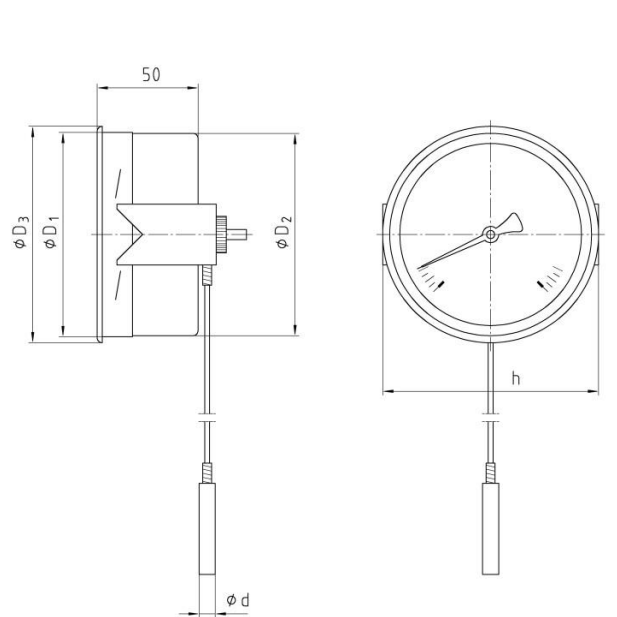
Panel mounting flange



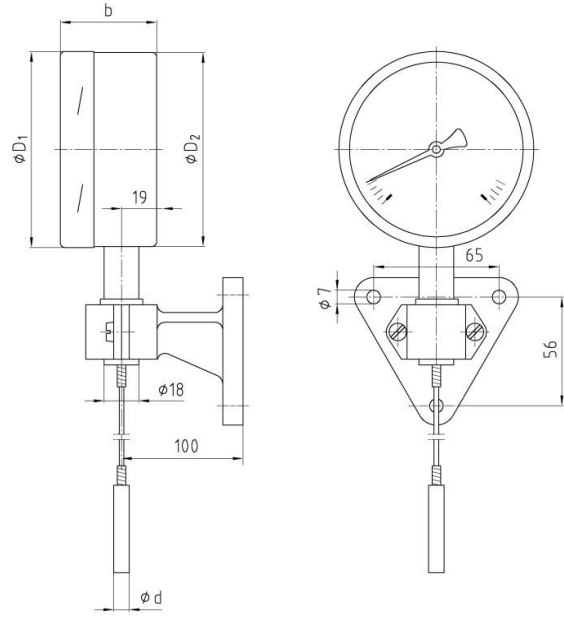
Surface mounting flange



Triangular bezel with bracket



Surface mounting bracket



Case mounting	Dimension (mm)							
	D (NG)	D ₁	D ₂	D ₃	d ₁	d ₂	d ₃	h
Surface mouting flange	100	101	99	---	116	132	4,8	---
	160	161	159	---	178	196	5,8	---
Panel mounting flange	100	101	99	---	116	132	4,8	---
	160	161	159	---	178	196	5,8	---
Triangular bezel with bracket	100	101	99	107	---	---	---	---
	160	161	159	166	---	---	---	---
Surface mounting bracket	100	101	99	---	---	---	---	107
	160	161	159	---	---	---	---	172

Special version for applications with high vibrations

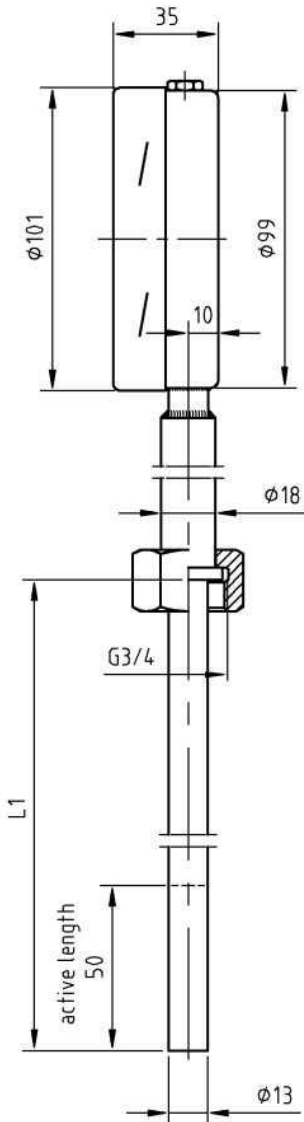
These thermometers are made for measuring exhaust gas temperatures or oil temperatures in diesel engines, turbines or compressors under strong vibrations.

Features:

- Nominal size 100
- Accuracy: class 1 acc. to EN13190
- Liquid damping with high viscosity
- Process connections: male nut, union nut, compression fitting
- Stem diameter: 13mm
- Protection class: IP66
- Scale ranges: 0 ... 500°C; 0 ... 600°C; +50 ... 650°C; 0 ... 700°C



Dimensions



	Male nut			Union nut			Compression fitting			
Stem-length l_1	120 mm 140 mm 180 mm 230 mm			89 mm 126 mm 186 mm 226 mm 276 mm			variable min. insertion length $l = 100$ mm length $l \geq l_1 + 40$ mm			
Dimensions										
Thread and dimensions [mm]		SW	i		SW	i		SW	d4	i
	G 1/2	27	20	G 1/2	27	8,5	G 1/2	27	26	14
	G 3/4	32	22	G 3/4	32	10,5	G 3/4	32	32	16
							1/2 NPT	22	-	19
							3/4 NPT	30	-	20

Subject to technical modifications