

Measuring Principles for Thermometers



Bimetallic Dial Thermometer

The measuring element consists of two metal tapes welded together. The tapes having different coefficients of thermal expansion. The coiled measuring element is fixed at the end of the stem; the other side being connected to the pointer axle.

The bimetal stretches or bends itself in case of change in temperature, causing the coiled element into a turning movement. This movement is proportional to the change in temperature and is indicated on a dial. Bimetal dial thermometers are used for temperatures from -50 °C up to + 600 °C .

It is recommended that the max working temperature does not exceed 60% of the full scale value.

Accuracy Class Bi-Metal

Range °C	Accuracy	Range °C	Accuracy
-20 to 60	+2%	-50 to 100	+2%
0 to 60	+2%	0 to 200	+2%
0 to 80	+2%	0 to 250	+2%
0 to 100	+2%	0 to 300	+2.5%
0 to 120	+2%	0 to 400	+3%
0 to 160	+2%	0 to 500	+3.5%

Gas-filled Dial Thermometers

The measuring principle is based on the volumetric temperature expansion of the gas filling in the measuring element.

The measuring element is firmly connected by a capillary tube with a measuring spring. The spring transfers the expansion of the gas filling by a movement on a dial. Gas-filled dial thermometers are used for temperatures from -120 °C to + 650 °C

Gas-filled dial thermometers can be supplied with an extension line between measuring element and measuring spring of up to 30 m length.

It is recommended that the max working temperature does not exceed 60% of the full scale value.

Accuracy Class Gas Filled

Nominal range °C	Measuring range °C	Limits of error °C	
		Class 1	Class 2
-20 to 40	-10 to 30	1	2
-20 to 60	-10 to 50	1	2
-20 to 120	-10 to 110	2	4
-30 to 30	-20 to 20	1	2
-30 to 50	-20 to 40	1	2
-30 to 70	-20 to 60	1	2
-40 to 40	-30 to 30	1	2
-40 to 60	-30 to 50	1	2
-100 to 60	-80 to 40	2	4
0 to 60	10 to 50	1	2
0 to 80	10 to 70	1	2
0 to 100	10 to 90	1	2
0 to 120	10 to 110	2	4
0 to 160	20 to 140	2	4
0 to 200	20 to 180	2	4
0 to 250	30 to 220	2.5	5
0 to 300	30 to 270	5	10
0 to 400	50 to 350	5	10
0 to 500	50 to 220	5	10
0 to 600	100 to 500	10	15
0 to 700	100 to 600	10	15
50 to 650	150 to 550	10	15
100 to 700	200 to 600	10	15

Note:- Other accuracies available on request (Consult our sales team for details)

STEWART-BUCHANAN GAUGES LTD

Sales Office & Manufacturing Facility - 7 Garrell Road, Burnside Industrial Estate, Kilsyth, Glasgow G65 9JX, SCOTLAND
Tel: +44 (0)1236 821533 | Fax: +44 (0)1236 824090 | E-mail: sales@stewarts-group.com | Web: stewarts-group.com

