

# Scale ranges of thermometers

## Scale spacing and numbering per EN 13190

WIKA data sheet IN 00.56

### General information

Scale range, nominal size (NS, case diameter) and accuracy class of a thermometer determine the design of the scale. The European EN 13190 standard contains the specifications about the layout of dials with concentric scales. In addition to the scales in accordance with EN 13190, all internationally common scale ranges, double and multiple scales, coloured scales etc. are, of course, also available.

#### Scale ranges of EN 13190

Degree Celsius, abbreviated by °C, is the preferred unit for temperature measurement.

Not all thermometer versions can be used for the temperature ranges indicated below or on the right.

#### Nominal sizes

For dial thermometers, the following nominal sizes (NS) are defined: NS 40, 50, 63, 80, 100 and 160

#### Accuracy classes

The following accuracy classes are specified: class 1 and class 2. Class 1 is intended for nominal sizes from 63 to 160, class 2 for nominal sizes 40 to 160.

The reference value of the ambient temperature is 23 °C. Other reference values deviating from 23 °C or a reference range are permissible and must be specified by the purchaser.

Scale range °C	Measuring range °C	Error limits ± °C	
		Class 1	Class 2
-20 ... +40	-10 ... +30	1	2
-20 ... +60	-10 ... +50	1	2
-20 ... +120	0 ... 100	2	4
-30 ... +30	-20 ... +20	1	2
-30 ... +50	-20 ... +40	1	2
-30 ... +70	-20 ... +60	1	2
-40 ... +40	-30 ... +30	1	2

Scale range °C	Measuring range °C	Error limits ± °C	
		Class 1	Class 2
-40 ... +60	-30 ... +50	1	2
-100 ... +60	-80 ... +40	2	4
0 ... 60	10 ... 50	1	2
0 ... 80	10 ... 70	1	2
0 ... 100	10 ... 90	1	2
0 ... 120	10 ... 110	2	4
0 ... 160	20 ... 140	2	4
0 ... 200	20 ... 180	2	4
0 ... 250	30 ... 220	2.5	5
0 ... 300	30 ... 270	5	10
0 ... 400	50 ... 350	5	10
0 ... 500	50 ... 450	5	10
0 ... 600	100 ... 500	10	15
0 ... 700	100 ... 600	10	15
50 ... 650	150 ... 550	10	15
100 ... 700	200 ... 600	10	15

Scale range in °F	Scale interval in °F
-100 ... +150	5
-80 ... +120	2
-80 ... +240	5
-40 ... +120	2
0 ... 140	2
0 ... 200	2
0 ... 250	5
30 ... 300	2
30 ... 400	5
50 ... 400	5
100 ... 800	10
150 ... 750	5
200 ... 1,000	10

The measuring range must be equal to at least 2/3 of the scale range.

Start and end of the measuring range must be marked through triangles on the edge of the scale. The marking is omitted if the measuring range is equal to the scale range. Further display or measuring ranges may be agreed.

### Scale angle

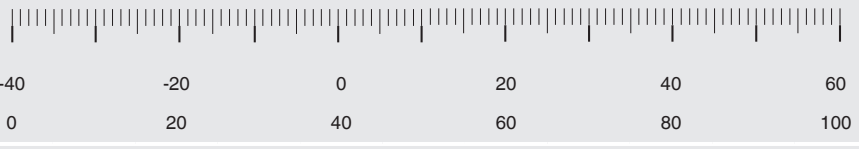
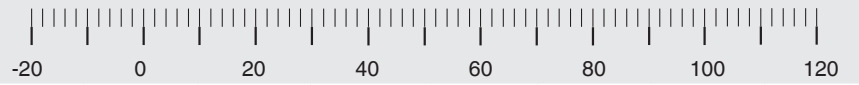
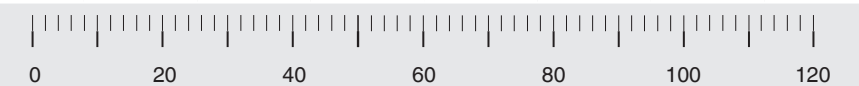
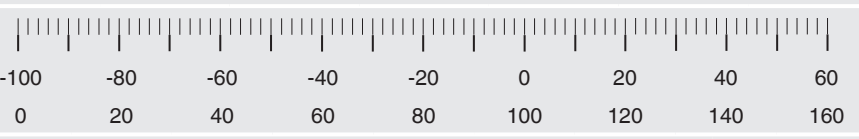
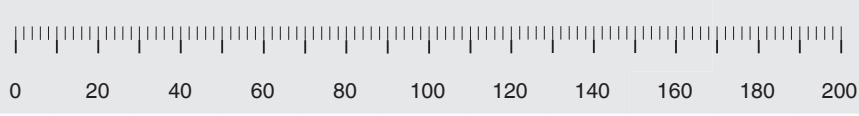
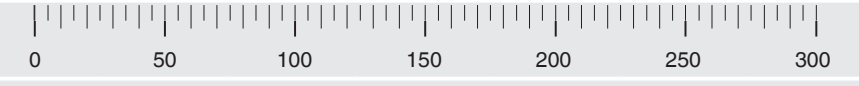

The scale angle is  $270^\circ \pm 20^\circ$





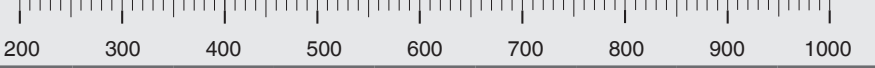

### Scale interval

The scale interval must be selected from the following values: 1 °C, 2 °C, 5 °C and 10 °C

## Examples for scale spacing and numbering of scales

### Examples for accuracy class 1 to 2

Scale range °C	Measuring range °C	Order of scale marks and numbering for dial thermometers	Scale interval	Number of scale mark intervals
-40 ... +60 0 ... 100	-30 ... +50 10 ... 90		1 1	100
-20 ... 120	0 ... 100		2	70
0 ... 120	10 ... 110		2	60
-100 ... 60 0 ... 160	-80 ... +40 20 ... 140		2 2	80
0 ... 200	20 ... 180		2	100
0 ... 300	30 ... 270		5	60
0 ... 400	50 ... 350		5	80
0 ... 600	100 ... 500		10	60

Scale range °F	Measuring range °F	Order of scale marks and numbering for dial thermometers	Scale interval	Number of scale mark intervals
0 ... +140	20 ... 120		2	70
0 ... 200	20 ... 180		2	100
-80 ... +120	-60 ... +100		2	
50 ... 400	100 ... 350		5	70
150 ... 750	250 ... 650		10	60
200 ... 1000	300 ... 900		10	80

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