

Pressure gauge scale ranges

Scale spacing and scale numbering per EN 837

WIKA data sheet IN 00.02

In general

The design of the scale depends on scale range, nominal size (NS, diameter of case) and accuracy class of a pressure gauge.

European norm EN 837-1 and EN 837-3 provide information about the design of dials with concentric scales. In addition to the scales which are in accordance with EN 837, of course all other scale ranges, double and multiple scales, as well as coloured scales, etc., which are customary abroad, are also available.

Scale ranges

The preferred unit of pressure is bar.

Pressure ranges in bar

0 ... 0.6	0 ... 1	0 ... 1.6	0 ... 2.5	0 ... 4
0 ... 6	0 ... 10	0 ... 16	0 ... 25	0 ... 40
0 ... 60	0 ... 100	0 ... 160	0 ... 250	0 ... 400
0 ... 600	0 ... 1000	0 ... 1600		

Pressure ranges in mbar

0 ... 1	0 ... 10	0 ... 100
0 ... 1.6	0 ... 16	0 ... 160
0 ... 2.5	0 ... 25	0 ... 250
0 ... 4	0 ... 40	0 ... 400
0 ... 6	0 ... 60	0 ... 600

Vacuum ranges in bar

Vacuum gauges have anti-clockwise pointer travel with increasing vacuum.

-0.6 ... 0	-1 ... 0
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Vacuum ranges in mbar

-1 ... 0	-10 ... 0	-100 ... 0
-1.6 ... 0	-16 ... 0	-160 ... 0
-2.5 ... 0	-25 ... 0	-250 ... 0
-4 ... 0	-40 ... 0	-400 ... 0
-6 ... 0	-60 ... 0	-600 ... 0

Combined pressure and vacuum ranges in bar

-1 ... +0.6	-1 ... +1.5	-1 ... +3	-1 ... +5	-1 ... +9
-1 ... +15	-1 ... +24			

as well as corresponding combined pressure and vacuum ranges in mbar.

Nominal sizes

Nominal sizes (NS) of gauges are as follows: 40, 50, 63, 80, 100, 160 and 250

Accuracy classes

The accuracy class stating the limits of permissible error is expressed as a percentage of the span.

The following accuracy classes are defined: 0.1, 0.25, 0.6, 1, 1.6, 2.5 and 4.

For gauges with a pointer stop the accuracy class will cover from 10 % to 100 % of the scale range.

For gauges with a free zero the accuracy class will cover from 0 % to 100 % of the scale range.

Assignment of accuracy classes to nominal sizes

Nominal Size NS	Accuracy class						
	0.1	0.25	0.6	1	1.6	2.5	4
40 and 50					x	x	x
63				x	x	x	x
80				x	x	x	x
100				x	x	x	
160		x	x	x	x		
250	x	x	x	x	x		

The total errors of indication at reference temperature 20 °C of the gauge shall not exceed the values given in the following table.

Accuracy class	Limits of permissible error (percentage of span)
0.1	± 0.1 %
0.25	± 0.25 %
0.6	± 0.6 %
1	± 1 %
1.6	± 1.6 %
2.5	± 2.5 %
4	± 4 %

Scale interval

The minimum number of minor scale divisions for each accuracy class and nominal size of gauge are shown in the following table:

Scale (pressure range)	Nominal Size (NS)	Minimum number of minor scale divisions Accuracy classes						
		0.1	0.25	0.6	1	1.6	2.5	4
0 to 100	40					20	20	20
	50					20	20	20
	63				20	20	20	20
	80				50	50	50	50
	100			100	50	50		
	160		200	100	50	50		
	250	500	200	100	50	50		
0 to 160	40					32	32	32
	50					32	32	32
	63				32	32	32	32
	80				32	32	32	32
	100			80	32	32		
	160		160	80	32	32		
	250	320	320	80	32	32		
0 to 250	40					25	25	25
	50					25	25	25
	63				25	25	25	25
	80				50	50	50	50
	100			125	50	50		
	160		125	125	50	50		
	250	500	250	125	50	50		
0 to 400	40					20	20	20
	50					20	20	20
	63				20	20	20	20
	80				40	40	40	40
	100			80	40	40		
	160		200	200	40	40		
	250	400	200	200	40	40		
0 to 600	40					30	30	30
	50					30	30	30
	63				30	30	30	30
	80				60	60	60	60
	100			120	60	60		
	160		120	120	60	60		
	250	300	300	120	60	60		




For illustrative examples of scale intervals, different kinds of scale marks or scale numbering for WIKA see page 3.

Scale spacing: ≥ 1 mm.

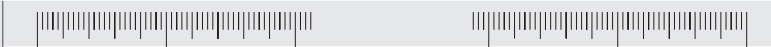
Thickness of the scale marks: $\leq 1/5$ of the scale spacing.

Examples of scale spacings and scale numberings


Example 1: accuracy classes from 1 to 4

Nominal Size (NS)	Scale (pressure range)	Scale spacing and scale numbering	Scale interval	Number of minor divisions
40 50 63	0 ... 1		0.05	20
	0 ... 10	0 0.2 0.4 0.6 0.8 1	0.5	
	0 ... 100	0 2 4 6 8 10	5	
	0 ... 1000	0 20 40 60 80 100	50	
	-1 ... 0	0 200 400 600 800 1000	0.05	
	-1 ... 0 ... +9	-1 -0.8 -0.6 -0.4 -0.2 0	0.5	
80 100 160 250	0 ... 2.5		0.05	50
	0 ... 25	0 0.5 1 1.5 2 2.5	0.5	
	0 ... 250	0 5 10 15 20 25	5	
	0 ... 2500	0 50 100 150 200 250	50	
	-1 ... 0 ... +1.5	0 500 1000 1500 2000 2500	0.05	
	-1 ... 0 ... +24	-1 -0.5 0 0.5 1 1.5	0.5	
80 100 160 250	0 ... 0.6		0.01	60
	0 ... 6	0 0.1 0.2 0.3 0.4 0.5 0.6	0.1	
	0 ... 60	0 1 2 3 4 5 6	1	
	0 ... 600	0 10 20 30 40 50 60	10	
	-0.6 ... 0	0 100 200 300 400 500 600	0.01	
	-1 ... 0 ... +5	-0.6 -0.5 -0.4 -0.3 -0.2 -0.1 0	0.1	

Example 2: accuracy class 0.6

160 250	0 ... 4		0.02	200
	0 ... 40	0 0.5 1 3 3.5 4	0.2	
	0 ... 400	0 5 10 30 35 40	2	
	0 ... 4000	0 50 100 300 350 400	20	
	-1 ... 0 ... +3	0 500 1000 3000 3500 4000	0.02	

Example 3: accuracy class 0.25

250	0 ... 1.6		0.005	320
	0 ... 16	0 0.1 0.2 1.3 1.4 1.5 1.6	0.05	
	0 ... 160	0 1 2 13 14 15 16	0.5	
	0 ... 1600	0 10 20 130 140 150 160	5	
	-1 ... 0 ... +0.6	0 100 200 1300 1400 1500 1600	0.005	
	-1 ... 0 ... +15	-1 -0.9 -0.8 0.3 0.4 0.5 0.6	0.05	

The specifications given in this document represent the state of engineering at the time of publishing.
We reserve the right to make modifications to the specifications and materials.



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