DIN 16003:2018-04 (E)

Mechanical pressure and temperature gauges - Differential pressure gauges - Dimensions, metrology, requirements and testing

Contents

Page

1	Scope	5
2	Normative references	5
3	Terms and definitions	6
4	Nominal sizes	6
5	Pressure ranges	6
6	Accuracy classes	7
7	Dimensions	8
7.1	General tolerances	8
7.2	Cases and flanges	8
7.3	Pressure connections	9
7.3.1	General	9
7.3.2	Centre-to-centre distances for the pressure connections	9
7.3.3	Gaskets	10
7.4	Type of mounting and position of the connection	10
8	Pressure connections and pressure ranges	13
9	Requirements	13
9.1	Measurement accuracy	13
9.2	Hysteresis	14
9.3	Effect of the static pressure	14
9.4	Temperature effect	14
9.5	Endurance	14
9.5.1	General	14
9.5.2	Steady pressure load	14
9.5.3	Over-pressure (one-sided exposure to pressure)	14
9.5.4	Cyclic pressure	14
9.6	Operating conditions	15
9.6.1	Operating temperature range	15
9.6.2	Temperature range for storage	15
9.6.3	Protection against ingress of water and foreign particles (degree of protection)	15
9.6.4	Effect of mechanical shock	15
9.6.5	Effect of mechanical vibration	15
9.6.6	Leak rate	15
9.6.7	Mounting position	15
9.7	Dials and pointers	15
9.7.1	Scale angle	15
9.7.2	Scale interval	15
9.7.3	Scale marks	15
9.7.4	Scale numbering	15
9.7.5	Pointer dimensions	16
9.7.6	Knife edge pointer	16
9.7.7	Information on the dial	16
9.7.8	Pointer stop	17
9.8	Safety	17

9.8.1 General 17
9.8.2 Pressure gauges with blow-out device 17
9.8.3 Safety pattern gauges 17
9.9 Pressure gauges for oxygen or acetylene 18
9.10 Liquid-filled pressure gauges 18
9.11 Additional design requirements for pressure gauges in legal metrology 18

10 Testing 18
10.1 General 18
10.2 Type approval and production piece tests 19
10.3 Accuracy, hysteresis and effect of static pressure 21
10.3.1 Accuracy and hysteresis 21
10.3.2 Effect of the static pressure 21
10.4 Temperature effect 21
10.5 Endurance 21
10.5.1 General 21
10.5.2 Exposure to static pressure and over-pressure 21
10.5.3 Cyclic pressure 21
10.6 Accuracy after endurance test 21
10.7 Operating temperature range 21
10.8 Temperature range for storage 22
10.9 Protection against ingress of water and foreign particles (degree of protection) 22
10.10 Effects of mechanical shock 22
10.11 Effects of mechanical vibration 22
10.12 Leak test 22
10.13 Mounting position 22
10.14 Safety 22
10.14.1 Pressure gauges with blow-out device 22
10.14.2 Safety pattern gauges 22

11 Packaging for transportation 23

12 Designation 24

Figures Figure 1 -- Dimensions 8

Figure 2 -- Pressure connections 10

Figure 3 -- Example of information on the dial (corresponds to the example in Clause 12) 16

Tables Table 1 -- Preferred pressure ranges for differential pressure 7

Table 2 -- Nominal size compared to the accuracy class 7

Table 3 -- Dimensions 9

Table 4 -- Preferred centre-to-centre distances 9

Table 5 -- Preferred type of mounting and position of connections 10

Table 6 -- Minimum length of pointer 16

Table 7 -- Type approval and production piece tests 20