

Bourdon Tube Pressure Gauge

Bayonet Ring Case Stainless Steel

with e-Gauge®

RCh / RChG
100/160-1/-3



Application

e-Gauge® is a revolutionary "Worldwide Patent Pending" sensor accessory for analogue dial instruments such as pressure gauges and thermometers.

By use of the latest absolute encoding inductance technique, e-Gauge® converts almost every gauge or thermometer into a switch and transmitter.

The e-Gauge® is a non-contact device and converts a „normal“ indicating gauge NCS 100/160 with 100 mm stainless steel bayonet ring DIN case into a multifunctional instrument with 2 digital limit switches and an analogue output signal of 4-20 mA.

New measuring principle

- non-contact device
- low moment of inertia, only a slight increased weight of the pointer by the electronic transponder
- no mechanical drag as in existing limit switches

Robustness and reliability

- no mechanical components and therefore no mechanical wear in the e-Gauge®
- tamper proof switch points - factory set

Technical Data e-Gauge®

Output signal

4...20 mA (3 wire)

Nominal rating

8...28 VDC, max. 50 mA, reverse polarity protection

Load impedance [Ω]

(UB-8 V) / 0.02 A

Accuracy of the output signal

± 1.0 % of full scale value

Repeatability

$< \pm 0.2$ % of full scale value

Resolution

12 bit

Temperature ranges for e-Gauge with pressure gauge

Storing temperature: -40 °C...+70 °C (-40 °F...+158 °F)
-20 °C...+70 °C (-4 °F...+158 °F)
for glycerine filling

Ambient temperature: -30 °C...+60 °C (-22 °F...+140 °F)
-20 °C...+60 °C (-4 °F...+140 °F)
for glycerine filling

Temperature influence

0.1% of full scale value / 10K
in design temperature range: 0...50 °C (32...122°F)

Switching outputs

2 NPN-outputs (Open Collector), short-circuit proof

Switching function

Opening or closing circuit
Please quote in order



Limit values

coloured marks at the limit values on the dial

breaking contact: red

making contact: green

Please quote in order

Both limit values of the e-Gauge® can be set at the same point.

Switching hysteresis

1% of span

Switching capacity

max. 28 VDC, max. 50 mA

Response time

0.1s default

Electrical connection

1.5 m cable, not insulated wire ends, 8xAWG24

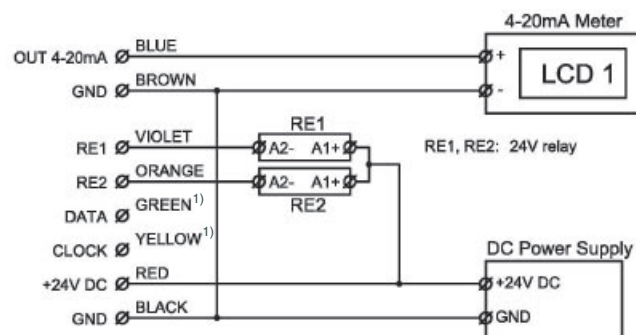
EMC

EN 61326:2006

CE mark

The instruments are CE-marked

Electrical Connection



¹⁾ green / yellow (DATA & CLOCK) do not connect - factory use only.

See page 3 for technical details of the pressure gauge



Sales and Export South, West, North

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manotherm.com • mail@manotherm.com

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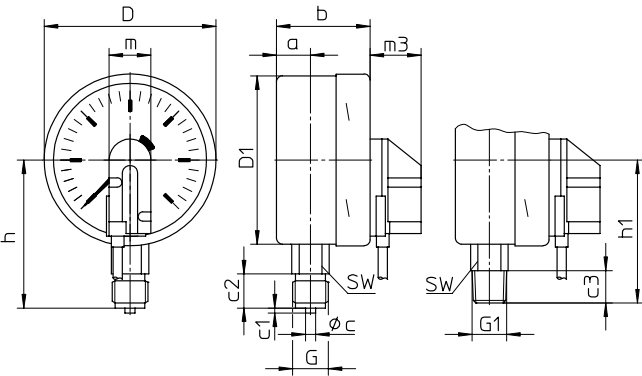
Case Configurations, Code Letters, Dimensional Data and Weights, Blow-out Device

Bottom connection

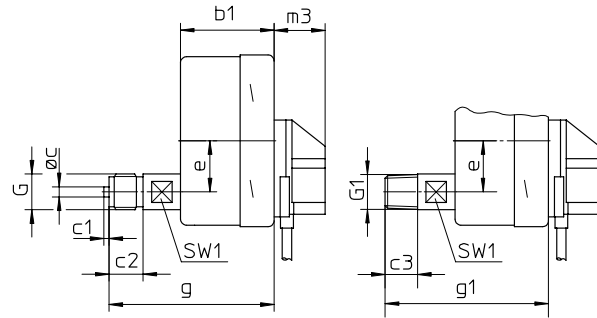
Lower back connection

No mounting device

(no additional code letter)

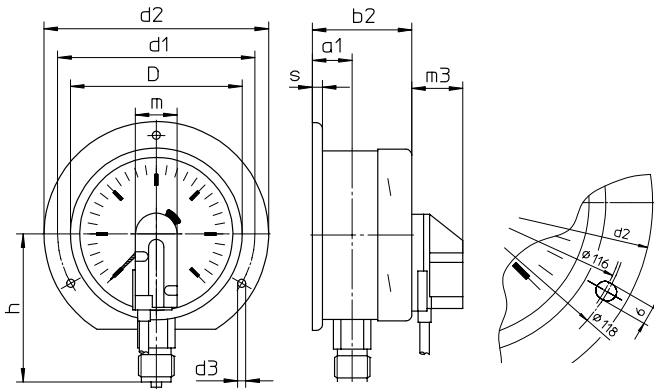


code letters: r



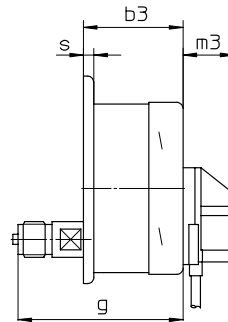
with mounting device

back flange for surface mounting
code letters: **Rh**



back flange for surface mounting
optional available with slotted
holes according to EN 837-1

back flange for surface mounting
code letters: **rRh**



(available upon request, but according to
EN 837-1 not recommended)

Dimensional data (mm / inches) and weights (kg / lb)

NCS	a	a1	b	b1	b2	b3	c	c1	c2	c3	D	D1	d1	d2	d3	e	G	G1	g	g1	h ^{±1}	h1 ^{±1}
100 4"	20 .79	23.5 .93	55 2.17	55 2.17	58.5 2.3	58.5 2.3	6 .24	3 .12	20 .79	19 .75	101 3.98	99 3.9	116 4.57	132 5.2	4.8 .19	30 1.18	G 1/2 B 1/2" BSP M 20 x 1.5	1/2" NPT	97 3.82	96 3.78	87 3.43	84 3.31
160 6"	15 .79	18 .71	50 1.97	55 2.17	53 2.09	58 2.28	6 .24	3 .12	20 .79	19 .75	161 6.34	159 6.26	178 7.01	196 7.72	5.8 .23	30 1.18	G 1/2 B 1/2" BSP M 20 x 1.5	1/2" NPT	92.5 3.64	91.5 3.60	115 4.53	114 4.49

m	m3	s	SW	SW1	approx. weight ¹⁾	
					RCh	RChG
24.5 .96	5.5 .22	6 .24	22 .87	17 .67	0.67 1.47	0.95 2.2
24.5 .96	30 1.18	6 .24	22 .87	17 .67	1.17 2.58	2.02 4.45

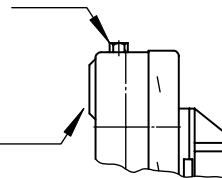
¹⁾ Information for version without mounting device

Blow-out device

Blow-out screw fitting for model RChG 160
pressure range ≤ 1.6 bar Blow-out Verschraubung Nr.5
≥ 2.5 bar Blow-out Verschraubung Nr.3

Blow-out plug

Ø 1" (25 mm) for model RCh 100, 160
Ø 1½" (40 mm) for model RChG 100
with pressure equalizing
membrane



Standard Versions Bourdon Tube Pressure Gauge

Standard Versions Bourdon Tube Pressure Gauge

Information on general and metrological features (load limits, temperature limitations) and standard pressure ranges / scale divisions of bourdon tube model RCh100/160 and RChG 100/160 can be found on general information leaflet 1000. Detailed descriptions can be found on data sheet 1201.

Technical Data Bourdon Tube Pressure Gauge

Accuracy (EN 837-1)

Class 1.0

Case

Bayonet ring, 1.4301 (304 stainless steel)

Case Protection Type (EN 60 529 / IEC 529)

IP 54

IP 55 for model RChG

Blow-out Device

Model RCh	Blow-out plug in the back of the case, 1" (Ø 25mm)
Model RChG 100	Blow-out plug in the back of the case, 1½" (Ø 40mm)
Model RChG 160	Blow-out screw fitting at the top of the case

Case Ventilation

Model RChG 100 without ventilation, but with internal pressure compensation by pressure equalizing membrane. Model RChG 160 by blow-out screw fitting.

Case Filling

for model RChG: glycerine

Nominal Case Size

100 (mm) (4"), 160 (mm) (6")

Wetted Parts

Type -3: Connection: 1.4571 (316 stainless steel)
Bourdon tube: 1.4571 (316 stainless steel), argon arc welding, ≤ 40 bar (600 psi) c-form, ≥ 60 bar (800 psi) helical, 1,600 bar (20,000 psi) NiFe-alloy, helical

Type -1: Connection: brass
Bourdon tube: ≤ 40 bar (600 psi) = bronze, c-form, soft-soldered, ≥ 60 bar (800 psi) = 1.4571 (316 stainless steel), silver brazed, helical

Case Configuration

Connection: screwed
Position of the connection: bottom connection, optional lower back connection (r)
Mounting device: without, optional back flange for surface mounting (**Rh**), see page 2

Pressure Ranges (EN 837-1)

0-0.6 bar (0-10 psi) to 0-1,600 bar (0-20,000 psi) for type -3
0-0.6 bar (0-10 psi) to 0-1,000 bar (0-15,000 psi) for type -1

Process Connection

G ½ B (½" BSP)

Window

Polycarbonate (PC)

Movement

Stainless steel for type -3
Brass / German silver for type -1

Dial

Aluminum, black figures, white background

Pointer

Aluminum, black

Reference Temperature

+ 20°C (68 °F)

If the operating temperatures of the measuring system (measuring unit and movement) deviate from the reference temperature, additional deviations of the indication could occur. According to EN 837-1 these can be up to 0.4 % of the span per 10 K.

Safety Category according to EN 837-1

NCS 100: S1 pressure gauges with blow-out device

Options

see page 4

Accessory

Chemical seals: see catalogue-heading 7
Other accessory : see catalogue-heading 11

Options

Options: e-Gauge®	
Marking of the switch points by coloured clips at the bayonet ring	
Accuracy of the output signal $\pm 0.5\%$ of full scale value	
Non linear scales, e. g. : flow measurement	
Output signal 20...4 mA	
Response time in 0.01s steps, from 0.01s to 20s	
Switching hysteresis deviating 1%, in 0.1% steps, from 0 to 25% of full scale value	
Deactivation of the switch points	
Programming provided by the customer	
e-Gauge calibrator, software CD and USB-cable	upon request
for connection to the PC, preferably laptop (provided by the customer),	
voltage source 24 VDC (provided by the customer)	

(order at the moment still as cleartext)

Options: Pressure Gauge	
Wetted parts model –6 connection and bourdon tube Monel	
0-0,6 bar to 0-1000 bar movement stainless steel, argon arc welding ≤ 40 bar c-form, ≥ 60 bar helical, bottom connection, optional r	
other process connections upon request, e. g. high pressure connection with external thread	
other pressure ranges and / or special scales, e. g. double scale bar/psi, coloured fields or areas, dial inscriptions, negative scales etc.	
version as refrigeration gauge with temperature scale	
receiver gauge 0.2-1 bar, scale 0-100%	linear
	square
indication accuracy grade 2A ($\pm 0.5\%$) according to ASME B 40.1	
special alignment (reference points = odd values, e. g. 100 KN = 8.735 bar)	
movement	stainless steel for type –1 (for –3 and –6 standard)
	silicone damped brass / polyacetal
case ventilation no. 22 for outdoor installation	
case parts 316 L (1.4404) upon request	
case polished	
bayonet ring polished	
density examination with helium-leak detection up to	
of the elastic element 10^{-9} mbar l/s for models –3 and –6	
wetted parts,	
free of grease and oil, up to 0-600 bar	adjustment ≤ 250 bar (3,000 psi) with dry air, ≥ 400 bar (5,000 psi) with distilled water, dial marking: symbol cancelled oil can
oxygen version, up to 0-600 bar ¹⁾	free of grease and oil, additional restrictor screw in the inlet port, orifice $\varnothing 0.3$ mm, dial inscription: oxygen no version according to EN 837-1 ²⁾
silicone-free version	
Position of the connection radial at 3:00, 9:00, 12:00 (others upon request) or position of installation deviating from vertical (90°)	
restrictor screw in the inlet port	orifice $\varnothing 0.8$ mm (0.03")
material: as process connection brass, stainless steel or Monel	orifice $\varnothing 0.6$ mm (not Monel) (0.02") orifice $\varnothing 0.3$ mm (not Monel) (0.01")
measuring point marking	stainless steel-plate 12 mm x 55 mm (0.47" x 2.17"), wire mounting or sticker on case coverage
Deflagration volume-protection	version 5 according to DS 11001
Adapt FS	
GOST-version for Russia, Ukraine, Kazakhstan	

(order at the moment still as cleartext)

Ordering Information (model construction)	
Please quote in your order:	basic model pressure gauge e.g. RChG 160-1, Rh, 0-6 bar, G $\frac{1}{2}$ B
	switching function e. g. eG 12
	limit values 1. limit value 1.5 bar 2. limit value 4.0 bar
	pressure gauge with e-gauge® e.g. RChG 160-1, Rh, 0-6 bar, G $\frac{1}{2}$ B eG 12

If you desire options, please quote these in the cleartext

¹⁾ for instruments without case filling

²⁾ EN 837-1 in connection with oxygen-version requires safety category S3

Technical changes, replacement of materials and errors excepted