

Bourdon Tube Pressure Gauges

Bayonet ring case stainless steel
With limit switch contact assembly

RCh
RChOe

This data sheet contains information on the maximum possible number of contacts, on electrical connections, ordering information and options concerning the models RCh and RChOe with limit switch contact assemblies (with low-action, magnetic, electronic or inductive contacts), as well as dimensional drawings with the position of the electrical connections.

Data sheet 1201 contains all details concerning the available versions of models RCh and RChG without limit switches. These details as well as the required ordering information apply also to the version with limit switches, unless otherwise stated below. Instead of glycerin, a special oil is used for liquid-filled pressure gauges with limit switches. The model code for instruments with case filling is RChOe.

Model overview 9.1000 contains general and detailed definitions, applications and operating principles for the respective limit switch types. It also provides detailed information on the selection, switching functions and minimum spans, on operating conditions, explosion protection, options and others.



Adjusting Mechanism Limit Setting Pointer

All instruments are equipped with an adjusting lock in the window. With the removable key, the limit setting pointer can be externally set to the value of the desired switch point.

Standard Versions

Available Limit Switch Contact Assemblies

1. **Direct** (electromechanical)
 - 1.1 Low-action contact **S**
 - 1.2 Magnetic contact **M**
2. **Indirect** (contact-free)
 - 2.1 Electronic contact **E**
 - 2.2 Inductive contact **I**
 - 2.3 Pneumatic contact **P** upon request

Maximum Possible Number of Contacts

	NCS 100 case filling		NCS 160 case filling	
	without	with	without	with
up to 3 x S 4 x S ¹⁾	○ upon request	- -	○ ○	- -
up to 3 x M 4 x M ¹⁾	○ upon request	○ -	○ ○	○ ○
up to 3 x E 4 x E	○ upon request	○ upon request	○ upon request	○ upon request
up to 3 x I 4 x I	○ upon request	○ upon request	○ upon request	○ upon request

○ = available

Degree of Protection (DIN EN 60529 / IEC 60529)

IP54

IP65 for model RChOe (span ≥ 2.5 bar)

Blow-out Device

Model RCh blow-out plug in the back of the case, 1" ($\varnothing 25$ mm)

Model RChOe blow-out device at the top of the case coverage

Case Ventilation

Model RChOe via blow-out device

Nominal Case Sizes

100, 160 mm (4, 6")

Window

Polycarbonate for type - 1

Laminated safety glass for types - 3 and - 6

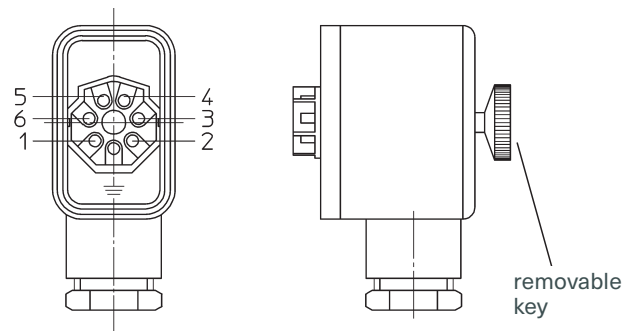
Electrical Connection

- for limit switch (S/M) only model RCh 100 - 1 plug connector PA6, black screwed cable gland M 12x1.5
- for limit switch (E) terminal box PA6, black
- for limit switch (I) terminal box PA6, blue for identification of an intrinsically safe circuit, anything else as E

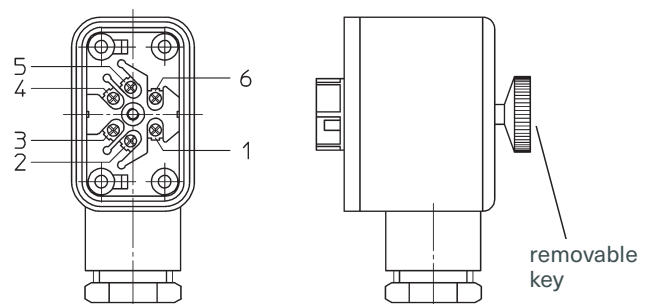
Plug Connector and Terminal Box

6-pin + PE, screwed cable gland M 20x1.5 with strain relief, IP65 according to VDE 0110 insulation group C/250, terminals numbered according to wiring diagram (on the device)

Plug Connector



Terminal Box



For the position of the electrical connection, please refer to the dimensional drawings, see pages 2 and 4 (cable entry).

¹⁾ optionally as double change-over contact

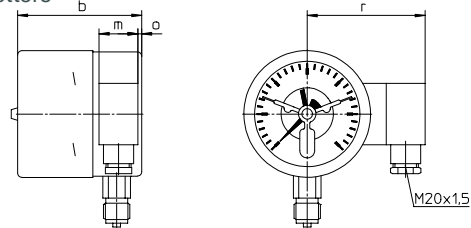
Case Configurations, Code Letters, Dimensional Data and Weight

Compared to the basic models, there are deviations in the front-to-back sizes, see table.
Please refer to data sheet 1201 for the other dimensional data.

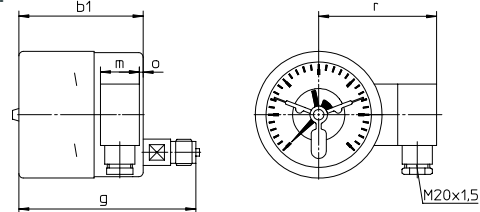
Bottom Connection Lower Back Connection

without mounting device

without code letters

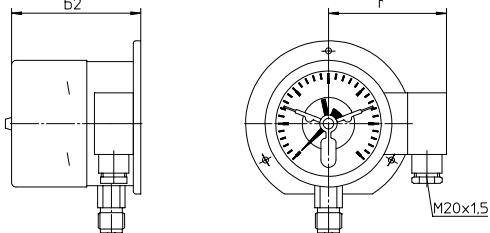


code letter r

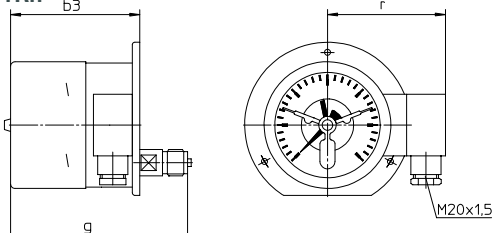


with back flange for surface mounting

code letters Rh

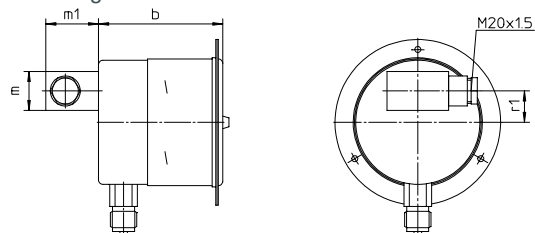


code letters rRh

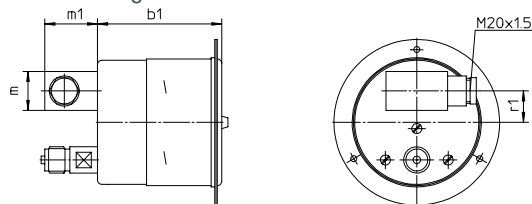


with front flange for panel mounting

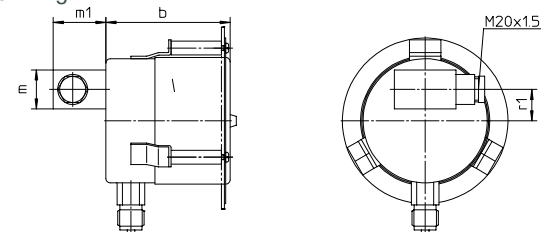
code letters Fr
without case filling



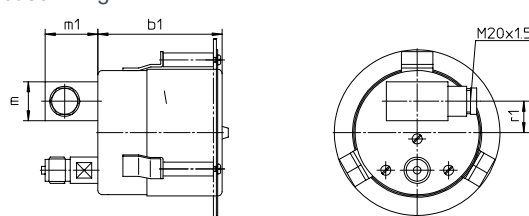
code letters rFr
without case filling



code letters Fr
with case filling



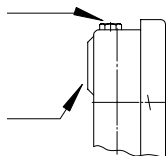
code letters rFr
with case filling



Blow-out Device

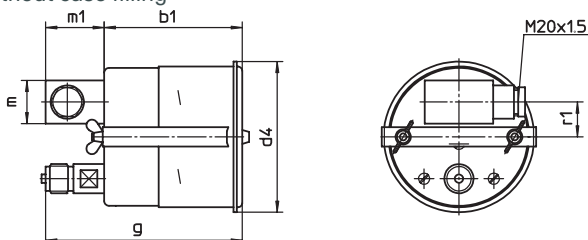
Blow-out device for model RChOe
pressure range ≤ 1.6 bar blow-out device no. 5
 ≥ 2.5 bar blow-out device no. 3

Blow-out plug $\varnothing 1''$ (25 mm) for models RCh when mounting plug connector, terminal box or PP/PE converter to the back of the case, for NCS 100 a blow-out plug in the back of the case is not possible.



with u-clamp for panel mounting

code letters rBFr
without case filling



Dimensional Data (mm / inch) and Weight (kg / lb)

NCS / type	b/b1	b2/b3	d4	g	m	m1	o	r	r1	approx. weight ¹⁾ RCh	RChOe
100 type - 1	99 3.9	103 4.06	108 4.25	141 5.55	31 1.22	42 1.65	3 0.12	94 3.7	25 0.98	1.65	2.54
100 types - 3 and - 6	103 4.06	107 4.21	108 4.25	145 5.71	31 1.22	42 1.65	3 0.12	94 3.7	25 0.98	1.65	2.54
160 all limit switches with 1 and 2 contacts (I11 and I22, see next row)	105 4.13	108 4.25	167 6.57	146.5 5.77	31 1.22	42 1.65	6 0.24	121 4.76	28 1.1	1.50 3.31	2.90 6.39
160 all limit switches with 3 and 4 contacts and I11 and I22	115 4.53	118 4.65	167 6.57	156.5 6.16	31 1.22	42 1.65	6 0.24	121 4.76	28 1.1	1.50 3.31	2.90 6.39

¹⁾ the data are based on the version with bottom connection and limit switches with 2 contacts

Ordering Information, Limit Setting Pointer

Basic Model	Bourdon Tube Pressure Gauge with Limit Switch Contact Assembly	RCh, RChOe
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	When installing limit switches, the order text of the basic device is supplemented by code letters		
	S	low-action contact	
	M	magnetic contact	e.g. M
	E	electronic contact	
	I	inductive contact	
	code number for the switching function (clockwise direction of action at rising pressure)		
	1	making contact	
	2	breaking contact	e.g. 2
	3	single change-over contact as low-action or magnetic contact	
	11	1 st and 2 nd making contact	
12	1 st making contact / 2 nd breaking contact		
21	1 st breaking contact / 2 nd making contact		
22	1 st and 2 nd breaking contact		
33	double change-over contact as low-action or magnetic contact		

Please note For an optimal function of the devices with limit switch, please specify in your order text:

- correct specification of the switching function
- switching pressures
- switching ranges, which are beyond the adjustment ranges defined by us
- if you require a counterclockwise switching direction

Information on limit switch contact assemblies with 3 or 4 contacts see below

Options	for all limit switch types	adjusting lock with non-removable key
		limit switch with pneumatic contact or with micro switch upon request
		switching distance fixing (2 contacts or more) upon request
	S/M contacts	separated circuits
		wire break control (parallel resistor for each contact)
		contact pins made of special materials upon request
	E contacts	PNP switching output as 2-wire connection
	I contacts	safety version SN or S1N (NCS 160 only)
		reactionless interval switching for NCS 160 with 2 contacts, interval relay required
		options for electrical connection see page 4
	other position of the electrical connection upon request	

Example RChOe 100, rFr, 0 – 16 bar, G½ B, M12

Information on Limit Switches with 3 and 4 Contacts

In contrast to pressure gauges with 2 contacts, pressure gauges with 3 or 4 contacts do not always allow the limit setting pointers to be adjusted one above the other.

Behaviour of the limit setting pointers to each other				
Type limit switch	3 limit setting pointers		4 limit setting pointers	
	NCS 100	NCS 160	NCS 100	NCS 160
S, M	adjustable one above the other		only 3 pointers adjustable one above the other	
E, I	only 2 pointers adjustable one above the other		only the two middle pointers adjustable one above the other	only 3 pointers adjustable one above the other

Switching functions

Those limit setting pointers with 3 and 4 contacts, which are not adjustable one above the other, are separated by a point when indicating the switching function.

Example: M 222.1 4-fold; 3rd and 4th limit setting pointer not adjustable one above the other
 E 1.22.1 4-fold; only the two middle pointers adjustable one above the other

Minimum distance of the limit setting pointers, which are not adjustable one above the other (in degree)

Type limit switch	NCS 100	NCS 160
S, M	15	10
E, I	35	28

Options

Electrical Connection

Cable entry

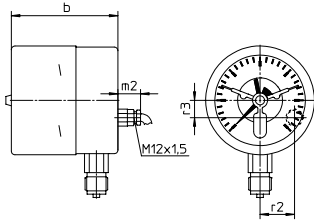
- For instruments without case filling
- IP65
- Cable entry M12x1.5 with strain relief and 1 m connection cable (connection cable longer than 1 m upon request)
- Available for types S / M

Bottom Connection

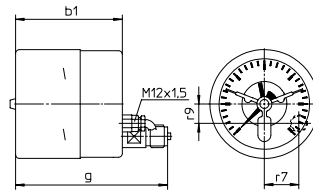
Lower Back Connection

without mounting device

without code letters

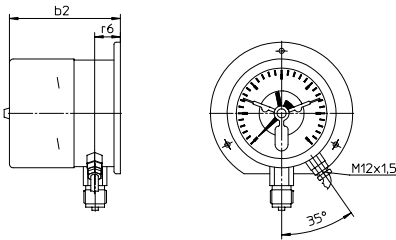


code letter r

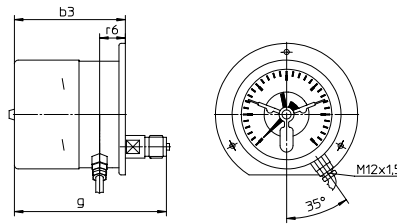


with back flange for surface mounting

code letters Rh

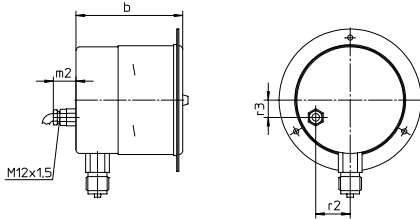


code letters rRh

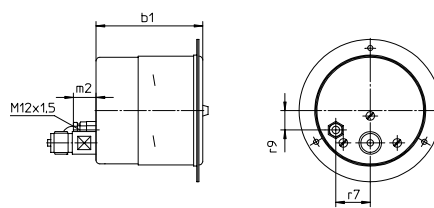


with front flange for panel mounting

code letters Fr

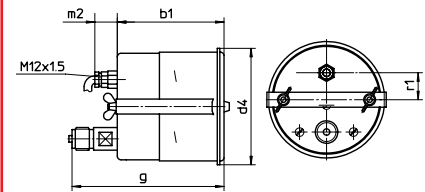


code letters rFr



with u-clamp for panel mounting

code letters rBFr



Dimensional Data (mm / inch) and Weight (kg / lb)

NCS / type	b/b1	b2/b3	d4	g	m2	r1	r2	r3	r6	r7	r9	approx. weight ¹⁾ RCh
100 type - 1 (standard)	99 3.9	103 4.06	108 4.25	141 5.55	21 0.83	25 0.98	32 1.26	18 0.71	24 0.94	32 1.26	18 0.71	0.75 1.65
100 types - 3 and - 6	103 4.06	107 4.21	108 4.25	145 5.71	21 0.83	25 0.98	32 1.26	18 0.71	24 0.94	32 1.26	18 0.71	0.75 1.65
160 all limit switches with 1 and 2 contacts (I11 and I22, see next row)	105 4.13	108 4.25	167 6.57	146.5 5.77	21 0.83	28 1.1	38 1.5	53 2.09	18 0.71	36 1.42	52 2.05	1.50 3.31
160 all limit switches with 3 and 4 contacts and I11 and I22	115 4.53	118 4.65	167 6.57	156.5 6.16	21 0.83	28 1.1	38 1.5	53 2.09	18 0.71	36 1.42	52 2.05	1.50 3.31

Plug connector DIN EN 175301-803

- IP65, 3-pin + PE and protective contact
- Available for max. 2 x S / M or 1 x E / I or 2 x E for option PNP switching output as 2-wire connection

The plug connectors DIN EN 175301-803 have the same position of connection as the plug connectors and terminal boxes, see page 2.

Construction type A



for instruments without case filling

Construction type C



for instruments without and with case filling

Circular plug connector

- For instruments without and with case filling
- IP67, 4-pin
- Available for max. 2 x E / I
- With 2 m die cast cable upon request

The circular plug connectors have roughly the same position of connection as the cable entries, see above.

Angular cable box



Straight cable box upon request



¹⁾ the data are based on the version with bottom connection and limit switches with 2 contacts