

# Bourdon Tube Pressure Gauges

Bayonet ring case stainless steel  
with limit switch contact assembly

**RCh**  
**RChOe**

This data sheet contains information on the number of the maximum possible contacts, the electrical connections, the ordering information and the options of the models RCh and RChOe with limit switch contact assembly with standard/magnetic, electronic or inductive contacts, furthermore dimensional drawings with the position of the electrical connections.

**Data sheet 1201** contains all details of the available versions of the models RCh resp. RChG without limit switch contact assembly. These information as well as the required ordering information are valid for the version with limit switch contact assembly, as far as not described differently.

For fluid filled pressure gauges with limit switch contact assembly as special oil is used instead of glycerine. The model code for instruments with case filling is RChOe.

In **model overview 9.1000** definitions, applications and functions of the particular models of the limit switch contact assemblies are described generally and in detail. It also contains comprehensive information on the selection, switching functions and minimum spans, operating conditions, Ex-protection, options and others.



## Adjusting Mechanism Limit Setting Pointer

All instruments have an adjustable lock in the window. The limit setting pointer is set to the value at which the switching operation should happen, externally by the removable key.

## Standard Versions

### Available limit switch contact assemblies

1. **Direct** (electromechanical)
  - 1.1 Standard contact **S**
  - 1.2 Magnetic contact **M**
2. **Indirect** (contactless)
  - 2.1 Electronic contact **E**
  - 2.2 Inductive contact **I**
  - 2.3 Pneumatic contact **P** upon request
  - 2.4 e-Gauge® **eG** see DS 1201.93

### Number of the maximum possible contacts

	NCS 100 case filling		NCS 160 case filling	
	without	with	without	with
up to 3 x S	○	—	○	—
4 x S <sup>1)</sup>	upon request	—	○	—
up to 3 x M	○	○	○	○
4 x M <sup>1)</sup>	upon request	—	○	○
bis 3 x E	○	○	○	○
4 x E	upon request	upon request	upon request	upon request
bis 3 x I	○	○	○	○
4 x I	upon request	upon request	upon request	upon request

○ = available

<sup>1)</sup> alternatively as double change-over contact

### Case Protection Type (EN 60 529 / IEC 529)

IP 54

IP 65 for model RChOe (span  $\geq$  2.5 bar and above)

### Blow-out Device

Model RCh

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

Model RChOe

Blow-out device at the top of the  
case coverage

### Case Ventilation

Model RChOe by blow-out device

### Nominal Case Size

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

### Window

Polycarbonate for model -1

Laminated safety glass for models -3 and -6

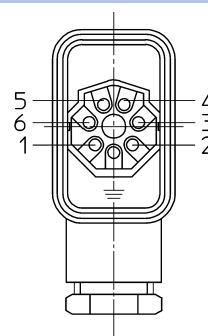
## Electrical Connection

- for limit switch contact assembly (S/M): plug connector  
only model RCh 100-1 cable entry
- for limit switch contact assembly (E) : cable connection box black
- for limit switch contact assembly (I) : cable connection box blue,  
for identification of an intrinsically  
safe circuitry, otherwise as E

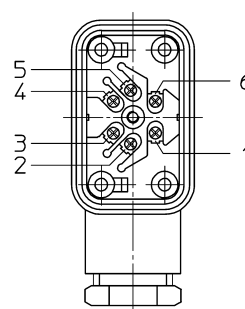
## Plug Connector and Cable Connection Box

IP 65, 6-pin, with M 20 x 1.5 screwed cable gland with pull relief, terminals numbered according to wiring diagram (at the instrument).

### Plug Connector



### Cable Connection Box



The position of the electrical connection can be seen in the dimensional drawings, see page 2 and page 4 (cable bushing).



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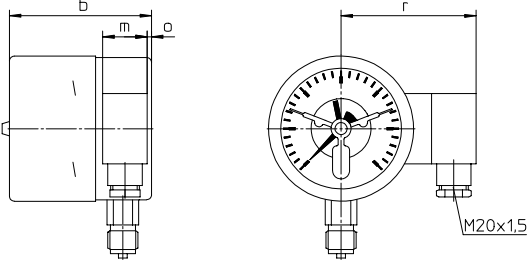
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# Case Configurations, Code Letters, Dimensional Data and Weights

Compared to the basic models there are deviations in the front-to-back sizes, see table.  
The remaining dimensions can be seen on data sheet 1201.

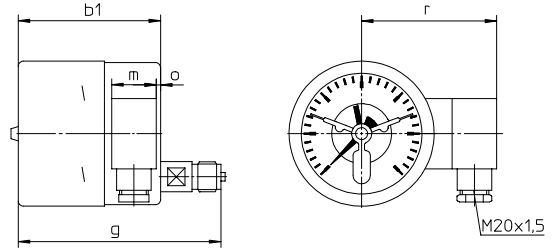
## Bottom connection

no additional code letter



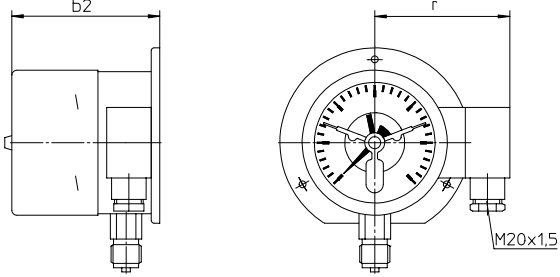
## Back connection

code letter: r

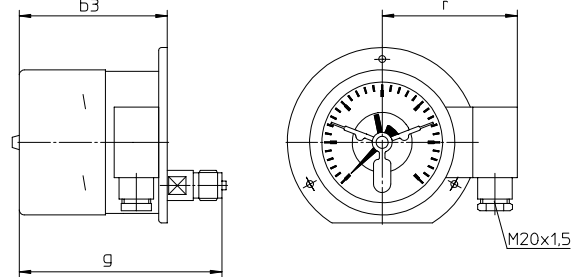


## Back flange for surface mounting

code letters: Rh

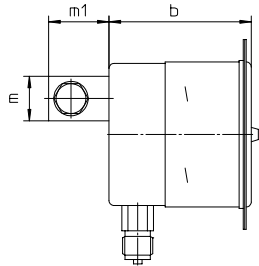


code letters: rRh



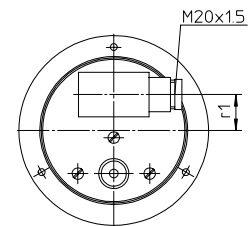
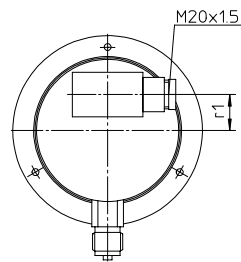
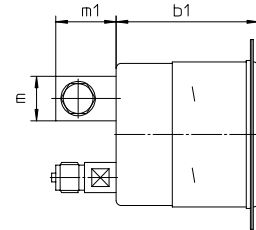
## Front flange for panel mounting

code letters: Fr

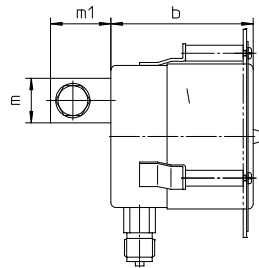


### Model RCh (without case filling)

code letters: rFr

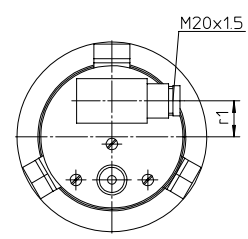
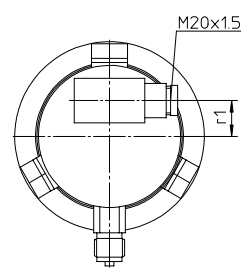
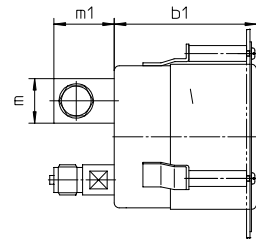


code letters: Fr



### Model RChOe (with case filling)

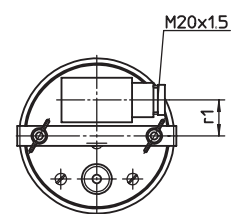
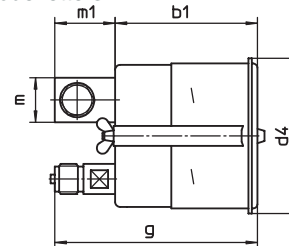
code letters: rFr



## U-clamp for panel mounting

### Model RCh (without case filling)

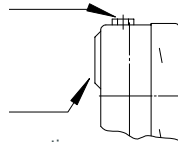
code letters: rBFr



## Blow-out device

Blow-out device for model RChOe

Pressure ranges  $\leq 1.6$  bar Blow-out device no.5  
 $\geq 2.5$  bar Blow-out device no.3



Blow-out plug  $\varnothing 1''$  (25 mm) for model RCh

When installing a plug connector, a cable connection box or PP/PE-converter in the back of the case a blow-out in the back of the case for NCS 100 is not possible.

## Dimensional Data (mm / inches) and Weights (kg / lb)

NCS/Model	b/b1	b2/b3	d4	g	m	m1	o	r	r1	approx. weight <sup>1)</sup>	
										RCh	RChOe
100 Model -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	0.75/1.65	1.15/2.5
100 Models -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	0.75/1.65	1.15/2.5
160 all limit switch contact assemblies with 1 and 2 contacts (I11 and I22, see next line)	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	28/1.10	1.50/3.3	2.90/6.4
160 all limit switch contact assemblies 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	28/1.10	1.50/3.3	2.90/6.4

<sup>1)</sup> This information relates on the version with bottom connection and limit switch contact assemblies with 2 contacts.

# Ordering Information, Information on limit switch contact assemblies with 3 and 4 contacts

<b>Basic Model:</b>	<b>Bourdon tube pressure gauges with limit switch contact assembly</b>	<b>RCh, RChOe</b>
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	When installing limit switch contact assemblies, the ordering code of the basic model is extended by	
	code letters	S standard contact M magnetic contact e.g. <b>M</b> E electronic contact I inductive contact
	code number	1 making contact
	for switching function	2 breaking contact e.g. <b>2</b>
	(clockwise direction of action, that means for pressure gauges at rising pressure)	3 single change-over contact as standard or magnetic contact
		11 1. and 2. making contact
		12 1. making contact / 2. breaking contact
		21 1. breaking contact / 2. making contact
		22 1. and 2. breaking contact
		33 double change-over contact as standard or magnetic contact
<b>Details</b>	For an optimal function of the instruments with limit switch contact assemblies you have to add the following to the ordering information: - switching temperature(s) - switching range(s) in which the limit values are adjusted if they are beyond the adjustment ranges that are defined by us - if an anticlockwise direction of action is requested Information on limit switch contact assemblies with 3 or 4 contacts see below	
<b>Options</b>	for all limit switch contact assembly models adjustable lock with non-removable key limit switch contact assembly with pneumatic contact or with micro switch upon request switching distance fixing (2 contacts and above) upon request S/M contacts separated circuitries wire break control (parallelly switched 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 interval switching reactionless for NCS160 with 2 contacts, interval relay required options for electrical connection see page 4 other position of electrical connection upon request	<i>(order at the moment still as cleartext)</i>

**Example:** RChOe 100, rFr, 0 - 16 bar, G ½ B, M 12

## Information on limit switch contact assemblies with 3 and 4 contacts

Compared to pressure gauges with 2 contacts the limit setting pointers of pressure gauges with 3 or 4 contacts are not adjustable one above the other in every case.

Model Limit switch contact assembly	3 limit setting pointers		4 limit setting pointers	
	NCS 100	NCS 160	NCS 100	NCS 160
S, M	adjustment one above the other		only 3 adjustable one above the other in each case	
E, I	only 2 adjustable one above the other in each case		only the two pointers in the middle adjustable one above the other	only 3 adjustable one above the other in each case

## Switching functions

The limit setting pointers, that are not adjustable one above the other for limit switch contact assemblies with 3 and 4 contacts 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 pointers in the middle are adjustable one above the other

Model Limit switch contact assembly	Minimum distance of the not adjustable (one above the other) pointers in angular degrees	
	NCS 100	NCS 160
S, M	15	10
E, I	35	28

# Options

## Electrical Connection

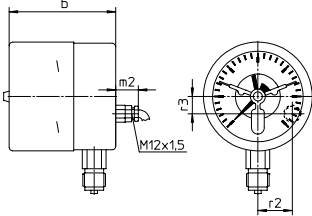
### Cable entry

- for instruments without case filling
- IP 65
- cable entry M 12 x 1.5 with pull relief and 1 m connection cable
- available for S / M

more than 1 m connection cable upon request

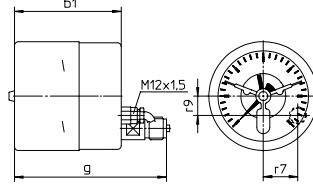
### Bottom Connection

no additional code letter



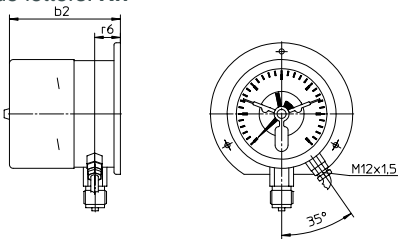
### Lower Back Connection

code letters: r

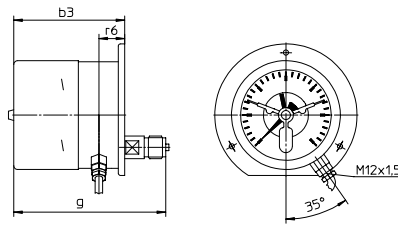


### Back flange for surface mounting

code letters: Rh

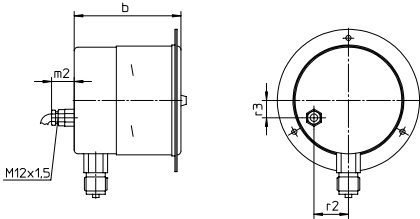


code letters: rRh

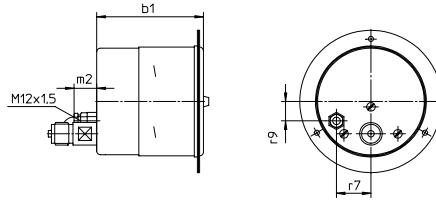


### Front flange for panel mounting

code letters: Fr

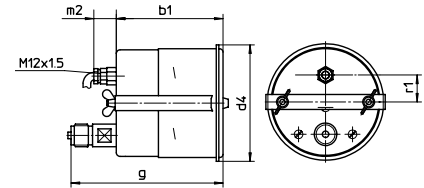


code letters: rFr



### U-clamp for panel mounting

code letters: rBFr



## Dimensional Data (mm / inches) and Weights (kg / lb)

NCS/Model	b / b1	b2/b3	d4	g	m2	r1	r2	r3	r6	r7	r9	app. weight <sup>1)</sup> RCh
100 types -1 (standard)	99/3.9	103/4.06	108/4.25	141/5.55	21/0.83	25/0.98	32/1.26	16/0.63	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	16/0.63	24/0.94	32/1.26	18/0.71	0.75/1.65
160 all limit switch contact assemblies with 1 and 2 contacts (I11 and I22, see next line)	105/4.13	108/4.25	167/6.57	146.5/ 5.77	21/0.83	28/1.10	38/1.5	53/2.09	18/0.71	36/1.42	52/2.05	1.50/3.3
160 all limit switch contact assemblies 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	28/1.10	38/1.5	53/2.09	18/0.71	36/1.42	52/2.05	1.50/3.3

## Plug connector DIN EN 17 5301-803

- IP 65, 3-pin and protective contact
- available for max. 2x S / M or 1x E / I
- resp. 2x E for option PNP switching output as 2-wire connection

The plug connectors DIN EN 17 5301-803 have approximately the same position of connection as the plug connectors, resp. the cable connection 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 M 12 x 1.5

- for instruments without and with case filling
- IP 67, 4-pin without protective contact
- available for max. 2 x E/I
- with 2 m die casted cable upon request

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

### angular cable box



### straight cable box upon request



<sup>1)</sup> The information relates to version with bottom connection and limit switch contact assembly with 2 contacts.

Technical changes, replacement of materials and errors excepted.