Chapter 11

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Pressure gauges and controllers

Chapter 11

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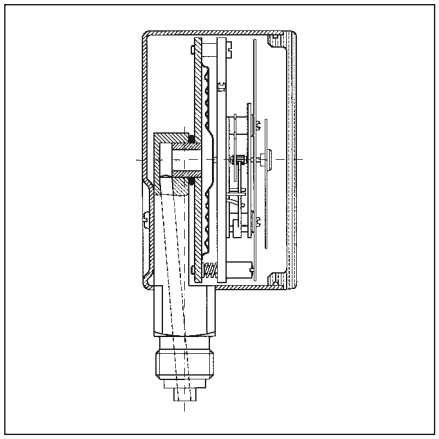
Standard capsule type pressure gauges EN 837-3



Application
For gaseous, dry media which do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Types
D 2/D 3

Nominal size
63 – 80 – 100

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
0/25 to 0/1,000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value
Overload safety:
1.3 x full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.6 %/10 K
falling temp. approx. ±0.6 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or centre back
NG 63 G¼B – spanner size 14
NG 80 – 100 G½B – spanner size 22
(EN 837-3/7.3)

Measuring element
Capsule element, CuBe alloy

Movement
Brass

Zero correction
From the front

Seal
„Perbunan“ nitrile rubber

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
D 2 – black sheet steel
D 3 – stainless steel 304

Front glass
Clip-in plastic

Options

- *Nominal size 50*
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Movement stainless steel (NG 100)*
- *Damping screw*
- *Reference pointer*
- *Special scales*

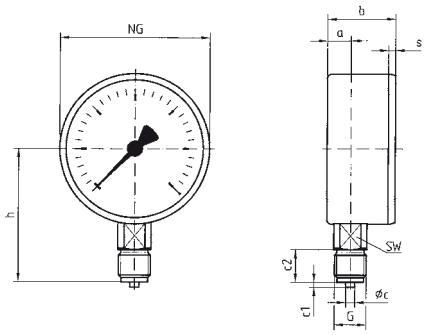
Refer to page 255–257 for prices

Standard capsule type pressure gauges

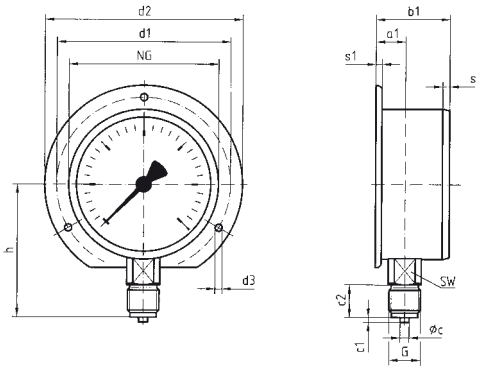
Type D 2/D 3 – NG 63/80/100

Housing types and dimensions

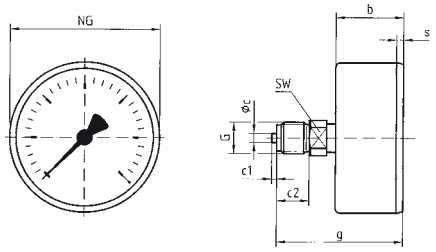
Bottom connection



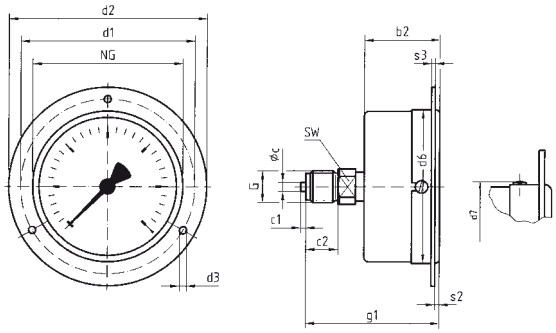
Bottom connection, back flange



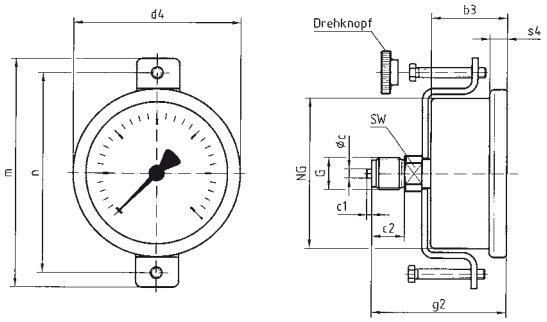
Centre back connection



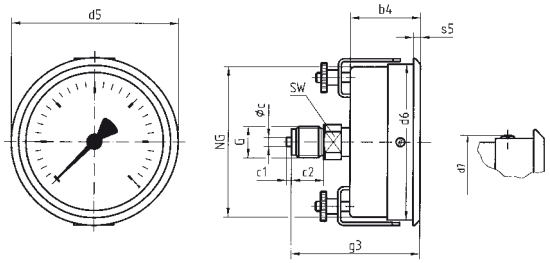
Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, crimped bezel housing with clamp fixing, NG 63, (version D351)



Centre back connection, panel mounting bezel for clamp fixing, NG 80/100

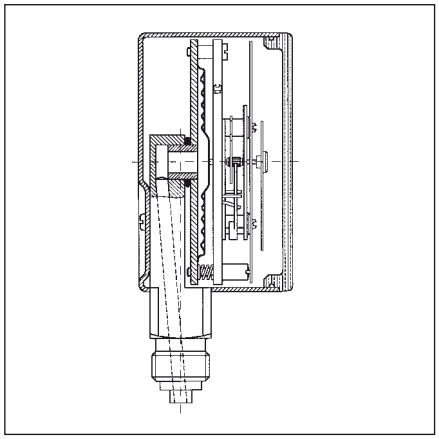


Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*b2*	*b3*	*b4*	*Øc*	*c1*	*c2*	*d1**	*d2*	*d3**	*d4*	*d5*	*d6*	*d7*	*G*	*g*	*g1*	*g2*
63	*9,5*	*12*	*33,7*	*36,2*	*35,7*	*30,5*	*-*	*5*	*2*	*13*	*75*	*85*	*3,5*	*68*	*68*	*64*	*66*	*G1/4B*	*56,7*	*58,7*	*53,5*
80	*14,8*	*17,8*	*43,3*	*46,3*	*44,6*	*-*	*46,5*	*6*	*3*	*20*	*95*	*110*	*4,8*	*-*	*86*	*81*	*83*	*G1/2B*	*75,3*	*76,6*	*-*
100	*15,6*	*19,1*	*44*	*47,5*	*45,6*	*-*	*47*	*6*	*3*	*20*	*116*	*132*	*4,8*	*-*	*107*	*101*	*105*	*G1/2B*	*76*	*77,6*	*-*
Nominal size (NG)	*g3*	*h*	*m*	*n*	*s*	*s1*	*s2*	*s3*	*s4*	*s5*	*SW*										
63	*-*	*52,7*	*94*	*82*	*3,7*	*5,5*	*3*	*2*	*7*	*4*	*14*										
80	*78*	*69*	*-*	*-*	*3,8*	*5,5*	*3,5*	*2*	*-*	*4,5*	*22*										
100	*79*	*87*	*-*	*-*	*3,5*	*5,5*	*3,5*	*2*	*-*	*4,5*	*22*										

** Dimensions for NG 100 according to DIN EN 837-3*

Standard capsule type pressure gauges EN 837-3



Application
For gaseous, dry media which do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
63 – 100 – 160

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
NG 63-100 0/25 to 0/1,000 mbar
NG 160 0/6 to 0/1,000 mbar
and all corresponding vacuum and compound ranges with over-pressure protection

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value
Overload safety:
1.3 x full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Additional error when the temperature of the measuring element deviates from +20 °C:
rising temp. approx. ±0.6 %/10 K
falling temp. approx. ±0.6 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or centre back
NG 63 G¼B – spanner size 14
NG 100 - 160 G½B – spanner size 22
(EN 837-3/7.3)

Measuring element
Capsule element, CuBe alloy

Movement
Brass

Zero correction
From the front

Seal
„Perbunan“ nitrile rubber

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Instrument glass

Options

- *Overpressure safety 10 x FSD*
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing panel mounting bezel*
- *Damping screw*
- *Reference pointer*
- *Special scales*

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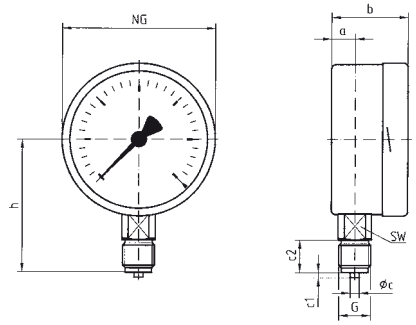
Refer to page 258/259 for prices

Standard capsule type pressure gauges

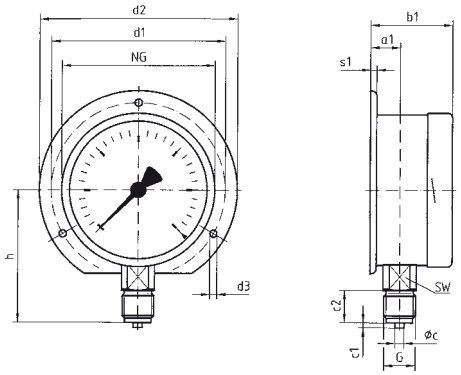
Type D 4 – NG 63/100/160

Housing types and dimensions

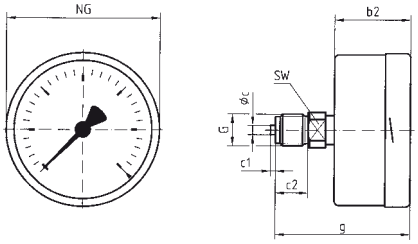
Bottom connection



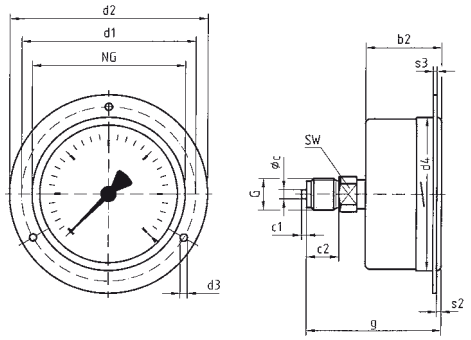
Bottom connection, back flange



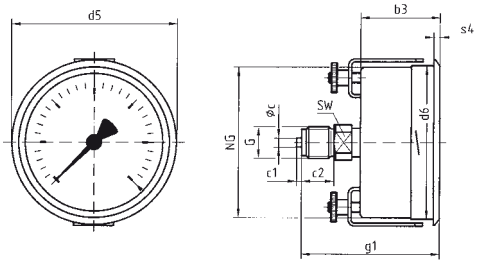
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, panel mounting bezel for clamp fixing

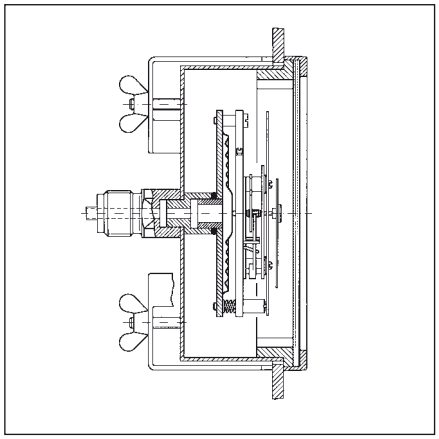


Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*b2*	*b3*	*Øc*	*c1*	*c2*	*d1**	*d2*	*d3**	*d4*	*d5*	*d6*	*G*	*g*	*g1*	*h*	*s1*	*s2*
63	*10,8*	*13,4*	*40*	*42,1*	*37*	*37*	*5*	*2*	*13*	*75*	*85*	*3,5*	*64*	*68*	*64*	*G1/4B*	*60*	*60*	*53*	*5,2*	*3*
100	*15,6*	*19,1*	*49*	*52,5*	*49*	*49*	*6*	*3*	*20*	*116*	*132*	*4,8*	*104*	*107*	*101*	*G1/2B*	*81*	*81*	*86*	*5,5*	*4*
160	*17,5*	*20,5*	*50*	*53*	*50*	*52*	*6*	*3*	*20*	*178*	*196*	*5,8*	*164*	*167*	*161*	*G1/2B*	*82*	*84*	*116*	*6*	*4*
Nominal size (NG)	*s3*	*s4*	*SW*																		
63	*2*	*3*	*14*																		
100	*2*	*4*	*22*																		
160	*2*	*4,5*	*22*																		

** Dimensions for NG 100 according to DIN EN 837-3*

Capsule type pressure gauge with square bezel for panel mounting



Application
For gaseous, dry media which do not attack copper alloys.
For panel mounting.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Typen
D 1/D 2/D 3

Nominal size
72 x 72, 96 x 96, 144 x 144

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
0/25 to 0/1,000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value
Overload safety:
1.3 x full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.6 %/10 K
falling temp. approx. ±0.6 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, centre back
NG 72 x 72, 96 x 96 G¼B – spanner size 14
NG 144 x 144 G½B – spanner size 22
(EN 837-3/7.3)

Measuring element
Capsule element, CuBe alloy

Movement
Brass

Zero correction
From the front

Seal
„Perbunan“ nitrile rubber

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
NG 72 D1 – plastic, black
NG 96 D3 – stainless steel 304
NG 144 D2 – sheet steel, black

Bezel
NG 72 plastic, black
NG 96 aluminium, black
NG 144 sheet steel, black

Front glass
Plastic

Options

- *Damping screw*
- *Reference pointer*
- *Special scales*

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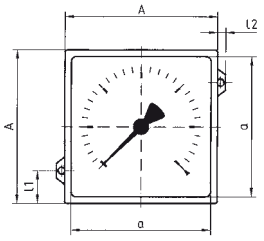
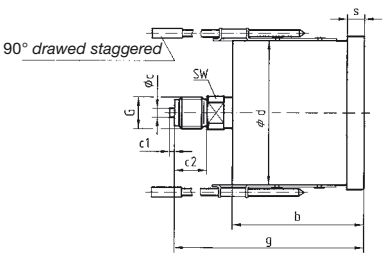
Refer to pages 259 for prices.

Capsule type pressure gauge with square bezel for panel mounting **NG 72 x 72 / 96 x 96 / 144 x 144**

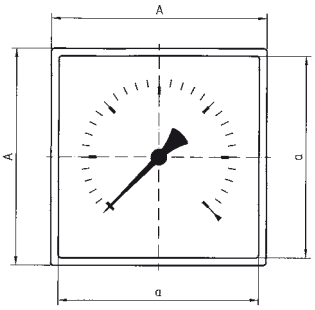
Housing types and dimensions

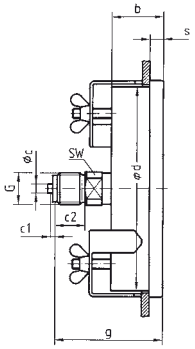
Type D1 – NG 72 x 72



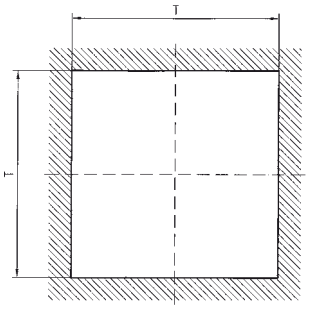


Type D3 / D2 – NG 96 x 96 / 144 x 144





Panel cut out

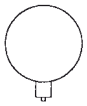
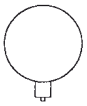


Dimensions (mm)

Nominal size (NG)	A	a	b	Øc	c_1	c_2	d	G	g	l_1	l_2	s	SW	T							
72 x 72	72	63	63,5	5	2	13	66	G1/4B	86,5	17	6,5	8	14	68							
96 x 96	96	88	32	5	2	13	88	G1/4B	55	-	-	6,5	14	90							
144 x 144	144	134	49	6	3	20	136	G1/2B	81	-	-	9	22	138							

Standard capsule type pressure gauges EN 837-3

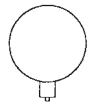
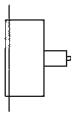
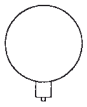
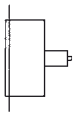
DG: M

Type	KP63,D201	KP63,D211			KP80,D201	KP80,D211		
Version								
Housing-Ø	63	63			80	80		
Housing	Sheet steel, clip in plastic front glass							
Meas. elem.	Capsule element, CuBe alloy							
Accuracy class	1,6	1,6			1,6	1,6		
Connection	G¼B	G¼B			G½B	G½B		
Range (mbar)	Part no.	Part no.			Part no.	Part no.		
Price €								
-25/0	35004201	35004211			35054201	35054211		
-40/0	35005201	35005211			35055201	35055211		
-60/0	35006201	35006211			35056201	35056211		
-100/0	35007201	35007211			35057201	35057211		
-160/0	35008201	35008211			35058201	35058211		
-250/0	35009201	35009211			35059201	35059211		
-400/0	35010201	35010211			35060201	35060211		
-600/0	35011201	35011211			35061201	35061211		
-1000/0	35012201	35012211			35062201	35062211		
Price €								
0/25	**35016201**	35016211			**35066201**	35066211		
0/40	**35017201**	35017211			**35067201**	35067211		
0/60	**35018201**	35018211			**35068201**	35068211		
0/100	**35019201**	35019211			**35069201**	35069211		
0/160	**35020201**	35020211			**35070201**	35070211		
0/250	**35021201**	35021211			**35071201**	35071211		
0/400	**35022201**	35022211			**35072201**	35072211		
0/600	**35023201**	35023211			**35073201**	35073211		
0/1000	**35024201**	35024211			**35074201**	35074211		

Refer to page 266 for additional costs

Standard capsule type pressure gauges EN 837-3

DG: M

Type	KP100,D201	KP100,D211	KP100,D221		KP63,D301	KP63,D311	KP63,D331	KP63,D351
Ausführung								
Housing-Ø	100	100	100		63	63	63	63
Housing	Sheet steel black, clip-in plastic front glass				Stainless steel 304, clip in plastic front glass			
Meas.elem.	Capsule element, CuBe alloy				Capsule element, CuBe alloy			
Accurary class	1,6	1,6	1,6		1,6	1,6	1,6	1,6
Connection	G1/2B	G1/2B	G1/2B		G1/4B	G1/4B	G1/4B	G1/4B
			mounting bezel, black				3-hole fixing, panel mounting bezel, stainless steel 304, polished	3-hole fixing, panel clamp fixing
Range (mbar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-25/0	35104201	35104211	35104221		35004301	35004311	35004331	35004351
-40/0	35105201	35105211	35105221		35005301	35005311	35005331	35005351
-60/0	35106201	35106211	35106221		35006301	35006311	35006331	35006351
-100/0	35107201	35107211	35107221		35007301	35007311	35007331	35007351
-160/0	35108201	35108211	35108221		35008301	35008311	35008331	35008351
-250/0	35109201	35109211	35109221		35009301	35009311	35009331	35009351
-400/0	35110201	35110211	35110221		35010301	35010311	35010331	35010351
-600/0	35111201	35111211	35111221		35011301	35011311	35011331	35011351
-1000/0	35112201	35112211	35112221		35012301	35012311	35012331	35012351
Price €								
0/25	**35116201**	35116211	35116221		**35016301**	35016311	35016331	35016351
0/40	**35117201**	35117211	35117221		**35017301**	35017311	35017331	35017351
0/60	**35118201**	35118211	35118221		**35018301**	35018311	35018331	35018351
0/100	**35119201**	35119211	35119221		**35019301**	35019311	35019331	35019351
0/160	**35120201**	35120211	35120221		**35020301**	35020311	35020331	35020351
0/250	**35121201**	35121211	35121221		**35021301**	35021311	35021331	35021351
0/400	**35122201**	35122211	35122221		**35022301**	35022311	35022331	35022351
0/600	**35123201**	35123211	35123221		**35023301**	35023311	35023331	35023351
0/1000	**35124201**	35124211	35124221		35024301	35024311	35024331	35024351

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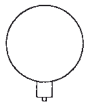
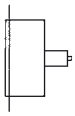
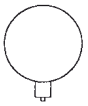
Refer to page 266 for additional costs

Standard capsule type pressure gauges EN 837-3

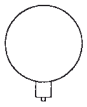
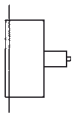
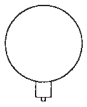
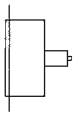
DG: M

Type	KP80,D301	KP80,D311	KP80,D331	KP80,D351		KP100,D301	KP100,D311	
Version								
Housing-Ø	80	80	80	80		100	100	
Housing	Stainless steel 304, clip-in plastic front glass							
Meas. elem.	Capsule element, CuBe alloy							
Accuracy class	1.6	1.6	1.6	1.6		1.6	1.6	
Connection	G1/2B	G1/2B	G1/2B	G1/2B		G1/2B	G1/2B	
			3-hole fixing, panel mounting bezel, chrome plated	Panel mounting bezel, chrome plated, clamp fixing				
Range (mbar)	Part no.	Part no.	Part no.	Part no.		Part no.	Part no.	
Price €								
-25/0	35054301	35054311	35054331	35054351		35104301	35104311	
-40/0	35055301	35055311	35055331	35055351		35105301	35105311	
-60/0	35056301	35056311	35056331	35056351		35106301	35106311	
-100/0	35057301	35057311	35057331	35057351		35107301	35107311	
-160/0	35058301	35058311	35058331	35058351		35108301	35108311	
-250/0	35059301	35059311	35059331	35059351		35109301	35109311	
-400/0	35060301	35060311	35060331	35060351		35110301	35110311	
-600/0	35061301	35061311	35061331	35061351		35111301	35111311	
-1000/0	35062301	35062311	35062331	35062351		35112301	35112311	
Price €								
0/25	**35066301**	35066311	35066331	35066351		**35116301**	35116311	
0/40	**35067301**	35067311	35067331	35067351		**35117301**	35117311	
0/60	**35068301**	35068311	35068331	35068351		**35118301**	35118311	
0/100	**35069301**	35069311	35069331	35069351		**35119301**	35119311	
0/160	**35070301**	35070311	35070331	35070351		**35120301**	35120311	
0/250	**35071301**	35071311	35071331	35071351		**35121301**	35121311	
0/400	**35072301**	35072311	35072331	35072351		**35122301**	35122311	
0/600	**35073301**	35073311	35073331	35073351		**35123301**	35123311	
0/1000	35074301	35074311	35074331	35074351		35124301	35124311	

Refer to pages 266 for additional costs

Standard capsule type pressure gauges EN 837-3

DG: M

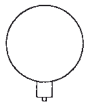
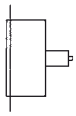
Type	KP63,D401	KP63,D411	KP63,D431	KP63,D451	KP100,D401	KP100,D411	KP100,D431	KP100,D451
Version								
Housing-Ø	63	63	63	63	100	100	100	100
Housing	Stainless steel 304 with bayonet type bezel, instrument grade front glass							
Meas.elem.	Capsule element, CuBe alloy							
Accurary class	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Connection	G1/4B	G1/4B	G1/4B	G1/4B	G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304, polished, clamp fixing			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel 304, polished, clamp fixing
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-25/0	35004401	35004411	35004431	35004451	35104401	35104411	35104431	35104451
-40/0	35005401	35005411	35005431	35005451	35105401	35105411	35105431	35105451
-60/0	35006401	35006411	35006431	35006451	35106401	35106411	35106431	35106451
-100/0	35007401	35007411	35007431	35007451	35107401	35107411	35107431	35107451
-160/0	35008401	35008411	35008431	35008451	35108401	35108411	35108431	35108451
-250/0	35009401	35009411	35009431	35009451	35109401	35109411	35109431	35109451
-400/0	35010401	35010411	35010431	35010451	35110401	35110411	35110431	35110451
-600/0	35011401	35011411	35011431	35011451	35111401	35111411	35111431	35111451
-1000/0	35012401	35012411	35012431	35012451	35112401	35112411	35112431	35112451
Price €								
0/25	35016401	35016411	35016431	35016451	35116401	35116411	35116431	35116451
0/40	35017401	35017411	35017431	35017451	**35117401**	35117411	35117431	35117451
0/60	35018401	35018411	35018431	35018451	**35118401**	35118411	35118431	35118451
0/100	35019401	35019411	35019431	35019451	**35119401**	35119411	35119431	35119451
0/160	35020401	35020411	35020431	35020451	**35120401**	35120411	35120431	35120451
0/250	35021401	35021411	35021431	35021451	**35121401**	35121411	35121431	35121451
0/400	35022401	35022411	35022431	35022451	**35122401**	35122411	35122431	35122451
0/600	35023401	35023411	35023431	35023451	35123401	35123411	35123431	35123451
0/1000	35024401	35024411	35024431	35024451	35124401	35124411	35124431	35124451

Refer to page 266 for additional costs

Standard capsule type pressure gauges EN 837-3

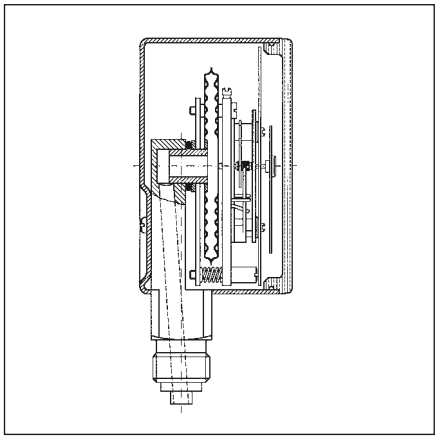
DG: M

Standard version | **Panel mounting version**

Type	KP160,D401	KP160,D411	KP160,D431	KP160,D451		KP72,D111	KP96,D311	KP144,D211
Version								
Housing-Ø	160	160	160	160		72 x 72	96 x 96	144 x 144
Housing	Stainless steel 304 with bayonet type bezel					Plastic	Stainless steel	Sheet steel
Meas.elem.	Capsule element, CuBe alloy					Capsule element, CuBe alloy		
Accurary class	1,6	1,6	1,6	1,6		1,6	1,6	1,6
Anschluss	G1/2B	G1/2B	G1/2B	G1/2B		G1/4B	G1/4B	G1/2B
			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel 304, polished, clamp fixing				
Range (mbar)	Part no.	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.
Price €								
-6/0	35151401	35151411	35151431	35151451		---	---	---
-10/0	35152401	35152411	35152431	35152451		---	---	---
-16/0	35153401	35153411	35153431	35153451		---	---	---
Price €								
-25/0	35154401	35154411	35154431	35154451		35304111	35354311	35404211
-40/0	35155401	35155411	35155431	35155451		35305111	35355311	35405211
-60/0	35156401	35156411	35156431	35156451		35306111	35356311	35406211
-100/0	35157401	35157411	35157431	35157451		35307111	35357311	35407211
-160/0	35158401	35158411	35158431	35158451		35308111	35358311	35408211
-250/0	35159401	35159411	35159431	35159451		35309111	35359311	35409211
-400/0	35160401	35160411	35160431	35160451		35310111	35360311	35410211
-600/0	35161401	35161411	35161431	35161451		35311111	35361311	35411211
-1000/0	35162401	35162411	35162431	35162451		35312111	35362311	35412211
Price €								
0/6	35163401	35163411	35163431	35163451		---	---	---
0/10	35164401	35164411	35164431	35164451		---	---	---
0/16	35165401	35165411	35165431	35165451		---	---	---
Price €								
0/25	35166401	35166411	35166431	35166451		35316111	35366311	35416211
0/40	35167401	35167411	35167431	35167451		35317111	35367311	35417211
0/60	35168401	35168411	35168431	35168451		35318111	35368311	35418211
0/100	35169401	35169411	35169431	35169451		35319111	35369311	35419211
0/160	35170401	35170411	35170431	35170451		35320111	35370311	35420211
0/250	35171401	35171411	35171431	35171451		35321111	35371311	35421211
0/400	35172401	35172411	35172431	35172451		35322111	35372311	35422211
0/600	35173401	35173411	35173431	35173451		35323111	35373311	35423211
0/1000	35174401	35174411	35174431	35174451		35324111	35374311	35424211

Refer to page 266 for additional costs

Capsule type pressure gauge for chemical applications *EN 837-3*



Application
For aggressive gaseous and dry media, also for use in aggressive environments.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
63 – 100 – 160

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
0/25 to 0/1,000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value
Overload safety:
1.3 x full scale value

Operating temperature range
Medium: T_{max} *=+100 °C*
Ambient: T_{min} *= -20 °C*
T_{max} *= +60 °C*

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.6 %/10 K
falling temp. approx. ±0.6 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom or centre back
NG 63 G¼B – spanner size 14
NG 100 – 160 G½B – spanner size 22
(EN 837-3/7.3)

Measuring element
Capsule element, stainless steel 316 Ti or 316 L

Movement
Stainless steel

Zero correction
From the front

Seal
FKM (Viton)

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 1.4301

Bayonet type bezel
Stainless steel 1.4301

Front glass
Laminated safety glass

Options

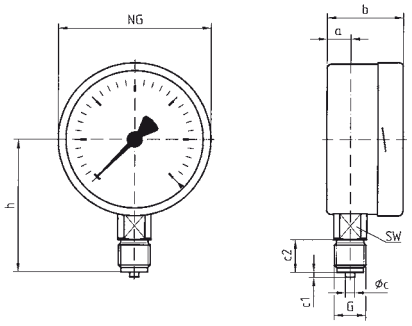
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*
- *Special scales*

Refer to page 264/265 for prices

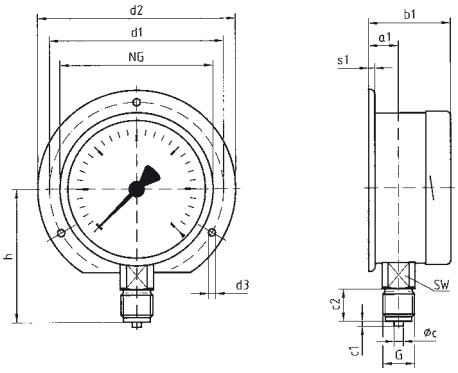
Capsule type pressure gauge for chemical applications **Type D 4 – NG 63/100/160**

Housing types and dimensions

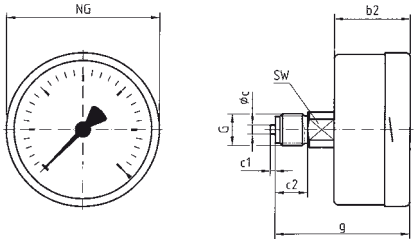
Bottom connection



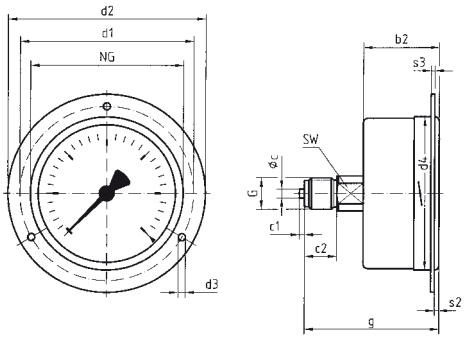
Bottom connection, back flange



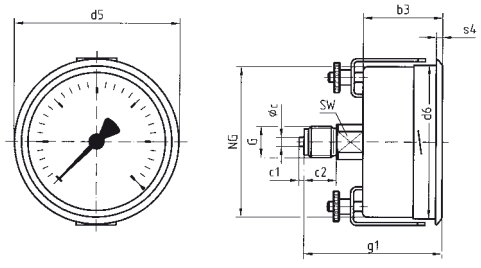
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, panel mounting bezel for clamp fixing



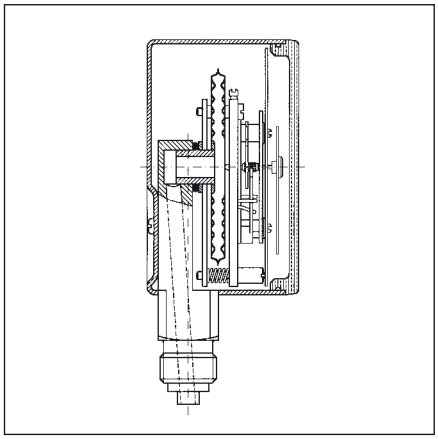
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2	d3*	d4	d5	d6	G	g	g1	h	s1	s2
63	10.8	13.4	40	42.1	37	37	5	2	13	75	85	3.5	64	68	64	G1/4B	60	60	53	5.2	3
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	G1/2B	81	81	86	5.5	4
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	G1/2B	82	84	116	6	4

Nominal size (NG)	s3	s4	SW
63	2	3	14
100	2	4	22
160	2	4.5	22

* Dimensions for NG 100 according to DIN EN 837-3

Precision capsule type pressure gauges class 0.6



Application
For gaseous, dry media which do not attack copper alloys. For high measuring accuracy.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
160

Accuracy class (EN 837-3/6)
0.6

Ranges (EN 837-3/5)
0/40 to 0/1,000 mbar and all corresponding vacuum and compound ranges with overpressure protection

Calibration medium
Air

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.6 %/10 K
falling temp. approx. ±0.6 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or centre back
G1/2B - spanner size 22
(EN 837-3/7.3)

Measuring element
Capsule element, CuBe alloy

Movement
Brass

Zero correction
From the front

Seal
„Perbunan“ nitrile rubber

Dial
Aluminium, white
Dial marking black

Pointer
Knife edge pointer
Aluminium, black

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Plastic (PMMA)

Options

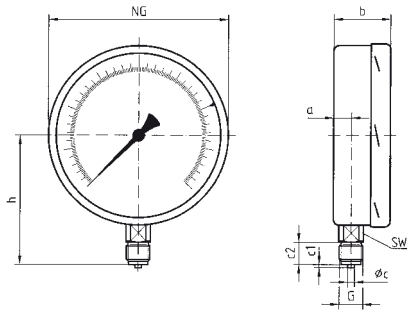
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*

Refer to page 265 for prices

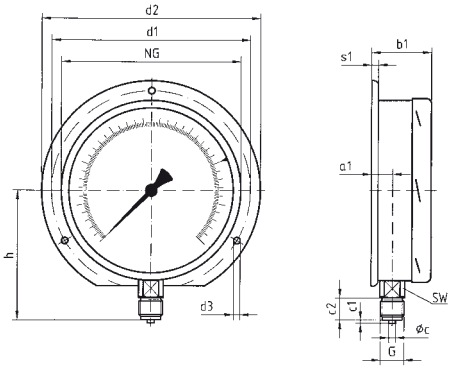
Precision capsule type pressure gauges class 0.6

Type D 4 – NG 160 – Housing types and dimensions

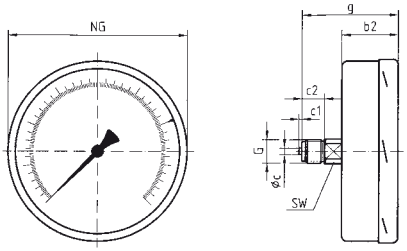
Bottom connection



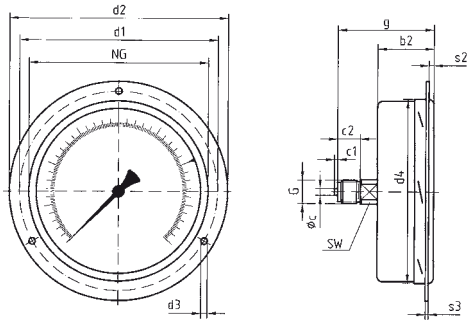
Bottom connection, back flange



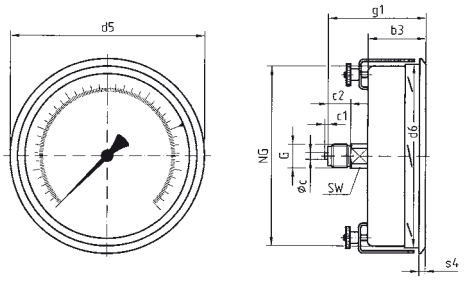
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, panel mounting bezel for clamp fixing



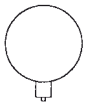
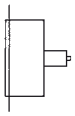
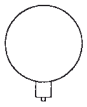
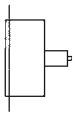
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1	d2	d3	d4	d5	d6	G	g	g1	h	s1	s2
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	G1/2B	82	84	116	6	4

Nominal size (NG)	s3	s4	SW																		
160	2	4.5	22																		

Capsule type pressure gauges for chemical applications EN 837-3

DG: M

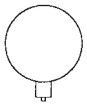
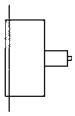
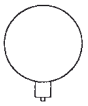
Type	KP63Ch,D402	KP63Ch,D412	KP63Ch,D432	KP63Ch,D452	KP100Ch,D402	KP100Ch,D412	KP100Ch,D432	KP100Ch,D452
Version								
Housing-Ø	63	63	63	63	100	100	100	100
Housing	Stainless steel 304 with bayonet type bezel, laminated safety front glass							
Meas. elem.	Capsule element, stainless steel 316 Ti or 316 L							
Accurary class	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6
Connection	G1/4B	G1/4B	G1/4B	G1/4B	G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel, 304, polished, clamp fixing			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel, 304, polished, clamp fixing
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-25/0	35004402	35004412	35004432	35004452	35104402	35104412	35104432	35104452
-40/0	35005402	35005412	35005432	35005452	35105402	35105412	35105432	35105452
-60/0	35006402	35006412	35006432	35006452	35106402	35106412	35106432	35106452
-100/0	35007402	35007412	35007432	35007452	35107402	35107412	35107432	35107452
-160/0	35008402	35008412	35008432	35008452	35108402	35108412	35108432	35108452
-250/0	35009402	35009412	35009432	35009452	35109402	35109412	35109432	35109452
-400/0	35010402	35010412	35010432	35010452	35110402	35110412	35110432	35110452
-600/0	35011402	35011412	35011432	35011452	35111402	35111412	35111432	35111452
-1000/0	35012402	35012412	35012432	35012452	35112402	35112412	35112432	35112452
Price €								
0/25	35016402	35016412	35016432	35016452	35116402	35116412	35116432	35116452
0/40	35017402	35017412	35017432	35017452	35117402	35117412	35117432	35117452
0/60	35018402	35018412	35018432	35018452	35118402	35118412	35118432	35118452
0/100	35019402	35019412	35019432	35019452	35119402	35119412	35119432	35119452
0/160	35020402	35020412	35020432	35020452	35120402	35120412	35120432	35120452
0/250	35021402	35021412	35021432	35021452	35121402	35121412	35121432	35121452
0/400	35022402	35022412	35022432	35022452	35122402	35122412	35122432	35122452
0/600	35023402	35023412	35023432	35023452	35123402	35123412	35123432	35123452
0/1000	35024402	35024412	35024432	35024452	35124402	35124412	35124432	35124452

Refer to page 266 for additional costs

Capsule type pressure gauges for chemical applications EN 837-3

DG: M

Precision capsule type pressure gauges

Type	KP160Ch,D402	KP160Ch,D412	KP160Ch,D432	KP160Ch,D452		KP160F,D401	KP160F,D411	
Version								
Housing-Ø	160	160	160	160		160	160	
Housing	Stainless steel 304 with bayonet type bezel					Stainless steel 304 with bayonet type bezel		
Meas. elem.	Capsule element, stainless steel 316 Ti or 316 L					Capsule element, CuBe alloy		
Accurary class	1,6	1,6	1,6	1,6		0,6	0,6	
Connection	G1/2B	G1/2B	G1/2B	G1/2B		G1/2B	G1/2B	
			3-hole fixing, panel mounting bezel, 304, polished	Panel mounting bezel, 304, polished, clamp fixing				
Range (mbar)	Part no.	Part no.	Part no.	Part no.		Part no.	Part no.	
Price €								
-25/0	35154402	35154412	35154432	35154452		---	---	
-40/0	35155402	35155412	35155432	35155452		35205401	35205411	
-60/0	35156402	35156412	35156432	35156452		35206401	35206411	
-100/0	35157402	35157412	35157432	35157452		35207401	35207411	
-160/0	35158402	35158412	35158432	35158452		35208401	35208411	
-250/0	35159402	35159412	35159432	35159452		35209401	35209411	
-400/0	35160402	35160412	35160432	35160452		35210401	35210411	
-600/0	35161402	35161412	35161432	35161452		35211401	35211411	
-1000/0	35162402	35162412	35162432	35162452		35212401	35212411	
Price €								
0/25	35166402	35166412	35166432	35166452		---	---	
0/40	35167402	35167412	35167432	35167452		35217401	35217411	
0/60	35168402	35168412	35168432	35168452		35218401	35218411	
0/100	35169402	35169412	35169432	35169452		35219401	35219411	
0/160	35170402	35170412	35170432	35170452		35220401	35220411	
0/250	35171402	35171412	35171432	35171452		35221401	35221411	
0/400	35172402	35172412	35172432	35172452		35222401	35222411	
0/600	35173402	35173412	35173432	35173452		35223401	35223411	
0/1000	35174402	35174412	35174432	35174452		35224401	35224411	

Refer to page 266 for additional costs

Additional costs for capsule type pressure gauges

DG: M

Housing diameter (mm)	**63**	**80**	**100**	**160**
Description	**Price €** Part no.	**Price €** Part no.	**Price €** Part no.	**Price €** Part no.
Overpressure safety 10x FSD for ranges ≥ 25 mbar (only for measuring element Ms/CuBe, only for gauges with bayonet type bezel)	38192	---	38194	38195
Overpressure and underpressure safety 10x FSD for ranges ≥ 25 mbar (only for measuring system Ms/CuBe, only for gauges with bayonet type bezel)	38197	---	38199	38200
Accuracy class 1.0	---	---	38180	38181
3-hole fixing, panel mounting bezel, stainless steel 304 (only for gauges with bayonet type bezel, also for bottom connection)	37608	---	37609	37610
Back flange, stainless steel 304, bare metal surface (only for gauges with stainless steel housing)	38048	38049	38050	38051
Housing gloss polished (only stainless steel housing)	37611	37612	37613	37614
Bayonet type bezel gloss polished	38052	---	38053	38055
Laminated safety front glass (only for gauges with bayonet type bezel)	38072	---	38074	38075
Connection socket nickel plated/polished	38084	38085	38086	38087
Connection socket with special thread	on request	on request	on request	on request
Damping screw brass - hole 0.3 - 0.5 - 0.7 mm (please specify)	38097	38098	38099	38100
Damping screw stainless steel - hole 0.3 - 0.5 - 0.7 mm (please specify)	38103	38104	38105	38106
Red mark on dial	38184	38185	38186	38187
1 reference pointer red - external screwdriver adjustment (front glass = plastic)	38115	38116	38117	---
1 reference pointer red - external knob adjustment (front glass = plastic)	38188	38189	38190	38191
Max pointer - for ranges greater than 0/250 mbar (only for gauges without glycerine filling, not possible for overpressure safety 10 x FSD or overpressure/underpressure safety 10 x FSD)	38127	38128	38129	38130
Knife edge pointer	38133	38134	38135	38136
Special mounting position	38147	38148	38149	38150
Oil and grease removed from wetted parts (not for oxygen!), label „Oil and grease free“ (only for stainless steel movement)	37615	37616	37617	37618
Glycerine filling (only for pressure gauges for chemical applications, for range 0/60 mbar and greater, accuracy class 2.5	37619	---	37620	37621
Higher protection IP 54 (only for gauges with bayonet type bezel)	---	---	38160	---
Printing block costs per scale and colour (scale design as per EN 837-3, others on request)	38153	38154	38155	38156
Printing costs per additional colour	38165	38166	38167	38168

Refer to „Accessories for panel mounting and wall mounting“ on page 403.

Bourdon tube pressure gauges for heating/plumbing applications with self-sealing connection thread

Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Nominal size
50 – 63 – 80 – 100

Accuracy class (EN 837-1/6)
NG 50-80: 2.5
NG 100: 1.6

Ranges (EN 837-1/5)
0/0.6 to 0/25 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Self-sealing thread with PTFE ring for safe and fast installation
(Attention: 60° chamfer required at female thread)
Brass, bottom or back
NG 50-63 G1/4B – spanner size 14
NG 80-100 G1/2B – spanner size 22

Measuring element
Bourdon tube element, copper alloy „C“ type bourdon tube

Movement
Brass

Dial
Plastic, white
Dial marking black

Pointer
Plastic, black

Housing
Black ABS, highly impact resistant and corrosion resistant

Front glass
Clip-in plastic
NG 80–100 with adjustable red reference pointer

Special versions

Pressure gauge for heating installations NG 50-63-80
for sealed heating systems
Range 0/4 bar
Connection NG 50 G1/4B bottom back
NG 63 G1/4B or G3/8B bottom or centre back
NG 80 G1/2B bottom or G1/4B centre back
(with valve G1/4 x G1/2)
Dial with red mark at 3 bar and green sector from 1.5 to 3 bar
Front glass with adjustable red reference pointer and green flag

Hydrometer NG 100
Water level indicator for standard heating systems
Ranges 0/0.6 to 0/10 bar
Connection G1/2B bottom
Dual scale, bar outer scale, black, metres water column inner scale, black
Front glass with adjustable red reference pointer

Accessories

Mounting valves
with self-sealing coating, automatically close during replacement of gauge to enable fast and cost effective servicing (refer to page 408 „Accessories for pressure gauges“).

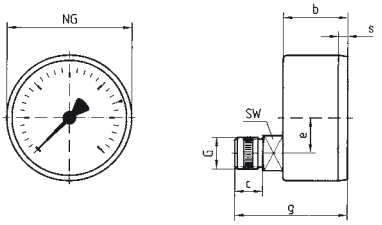
11

Refer to page 269 for prices

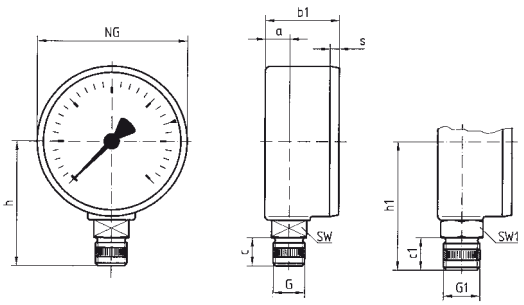
Bourdon tube pressure gauges for heating/plumbing applications with self-sealing connection thread

Housing types and dimensions

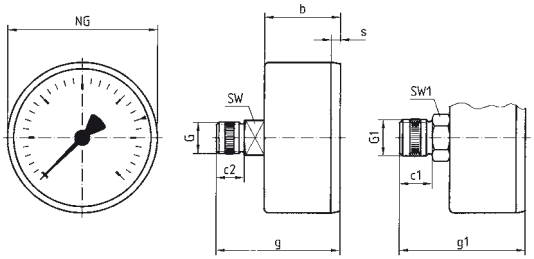
HZ 50 – bottom back connection



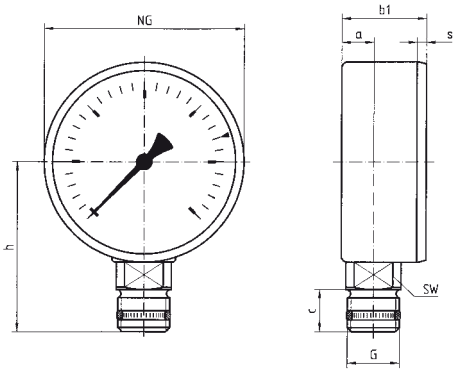
RF 63/HZ 63 – bottom connection



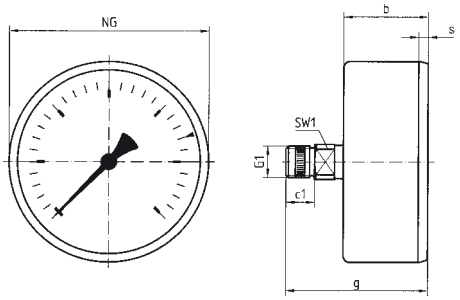
RF/HZ 63 – centre back connection



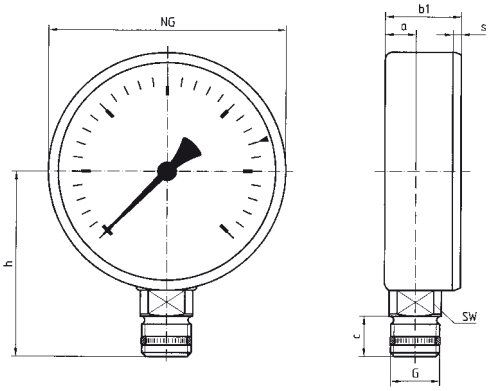
RF 80/HZ 80 – bottom connection



RF 80/HZ 80 – centre back connection



RF 100/HY 100 – bottom connection



Dimensions (mm)

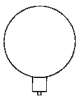
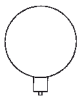
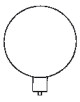
Nominal size (NG)	a	b	b_1	c	c_1	c_2	e	g	g_1	G*	G_1*	h	h_1	s	SW	SW_1
50	-	25.8	-	11.2	-	-	14	43	-	G¼B	-	-	-	3.8	14	-
63	9.8	30.4	29.7	11.2	13	11.5	-	49.9	50.4	G¼B	G⅜B	49	51.5	3.7	14	17
80	12.8	32.8	32.8	17	11.5	-	-	55.8	-	G½B	G¼B	68	-	2.8	22	14
100	15.5	34.5	-	17	-	-	-	-	-	G½B	-	78	-	3.5	22	-

* Attention: approx. 60° chamfer required at female thread

Bourdon tube pressure gauges for heating/ plumbing applications

DG: G

Type	RF 50 bottom	RF 50 back	RF 63 bottom	RF 63 back	RF 80 bottom	RF 100 bottom	HY 100 bottom
Version							
Housing-Ø	50	50	63	63	80	100	100
Housing	Black ABS, highly impact resistant and corrosion resistant						
Meas. elem.	Bourdon tube element, copper alloy						
Accuracy class	2.5	2.5	2.5	2.5	2.5	1.6	1.6
Connection	G1/4B	G1/4B	G1/4B	G1/4B	G1/2B	G1/2B	G1/2B
Thread	Self-sealing with PTFE sealing ring						
					mit verstellbarem roten Markenzeiger		Doppelskala bar/mWS
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	---	---	---	---	---	---	---
0/0,6	---	---	---	---	---	---	**63281**
0/1	---	---	---	---	---	---	**63282**
0/1,6	---	---	---	---	---	**63610**	**63283**
0/2,5	---	---	**63511**	**63536**	**63561**	**63611**	**63284**
0/4	---	---	**63512**	**63537**	**63562**	**63612**	**63285**
0/6	**63122**	**63127**	**63513**	**63538**	**63563**	**63613**	**63286**
0/10	**63123**	**63128**	**63514**	**63539**	**63564**	**63614**	**63287**
0/16	**63124**	**63129**	**63515**	**63540**	**63565**	**63615**	---
0/25	---	---	---	---	**63566**	**63616**	---

Type	HZ 50 back	HZ 63 bottom	HZ 63 back	HZ 63 bottom	HZ 63 back	HZ 80 bottom	HZ 80 back
Version							
Housing-Ø	50	63	63	63	63	80	80
Housing	Black ABS, highly impact resistant and corrosion resistant						
Meas. elem.	Bourdon tube element, copper alloy						
Range	0/4 bar						
Dial	with red mark at 3 bar and green sector from 1.5 to 3 bar						
Front glass	with adjustable red reference pointer and green flag						
Accuracy class	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Connection	G1/4B	G3/8B	G3/8B	G1/4B	G1/4B	G1/2B	G1/4 mit Ventil G1/4 x G1/2
Thread	Self-sealing with PTFE sealing ring						
Price €							
Part no.	**63927**	**63910**	**63914**	**63911**	**63915**	**63918**	**63919**
Dial	with red mark at 2.5 bar and green sector from 1.5 to 2.5 bar						
Price €							
Part no.	---	**63908**	**63909**	---	---	---	---

Combined thermometer – pressure gauge/ thermo-hydrometer

TM 63

TH 80

Application
For liquid media which are not highly viscous, do not crystallize and do not attack copper alloys. For combined measurement of pressure and temperature, especially in heating systems and heating boilers.

Description
The combined thermometer-pressure gauge/thermo-hydrometer consists of a Bourdon tube system for pressure measurement and a bimetal system for simultaneous temperature measurement. Both values are measured and displayed by a single gauge. A self-closing mounting valve enables easy replacement of the gauge without having to drain the system. An optional M 18 x 1 to G1/4 adapter is available if the combined thermometer-pressure gauge has to be mounted into an existing thermowell with M 18 x 1 female thread.

Type
D 1/D 2

Nominal size
63 – 80

Accuracy class
Pressure gauge/hydrometer:
2.5 (EN 837-1/6)
Thermometer:
2 (EN 13190)

Application area
Pressure gauge/hydrometer:
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value
Thermometer:
20/120 °C

Ranges
Pressure gauge/hydrometer:
0/4 bar and 0/6mWS to 0/60 mWS
Thermometer:
20/120 °C

Operating temperature range
Medium: T_{max} = +120 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Pressure gauge/hydrometer:
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, centre back G1/4B
with mounting valve G1/4 to R1/2

Measuring element
Pressure: Bourdon tube element, copper alloy
Temperature: bimetal element

Dial
Plastic, white
Dial marking black
with red/blue circular arcs

Pointer
Pressure gauge/hydrometer:
Plastic, black
Thermometer:
Plastic, red

Housing
D1 – plastic
D2 – black sheet steel

Front glass
Clip-in plastic with adjustable red mark

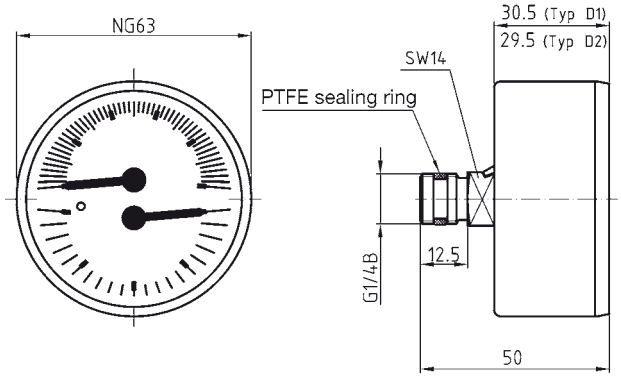
Options

- *Adapter M 18 x 1 to G1/4*
- *Special scales*

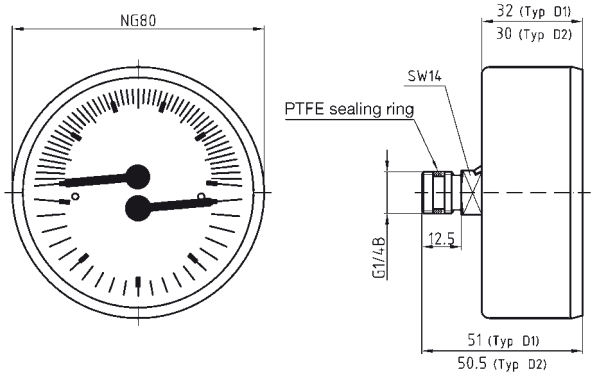
Refer to page 272 for prices

Combined thermometer – pressure gauge/ thermo-hydrometer

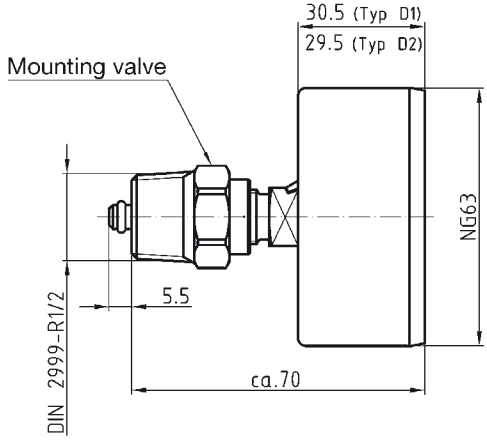
TM 63



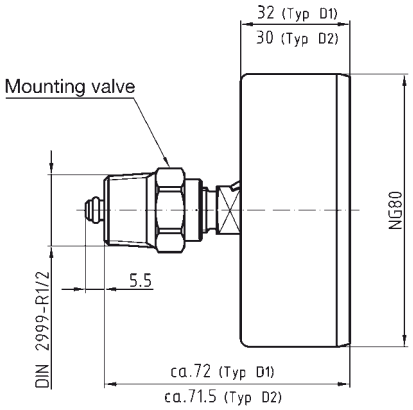
TM 80



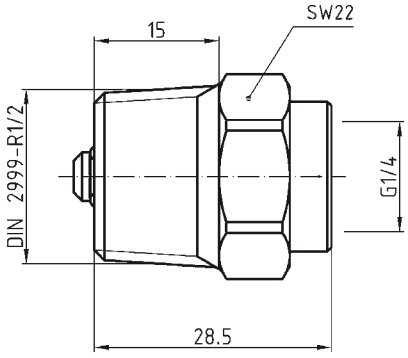
TM 63 with mounting valve



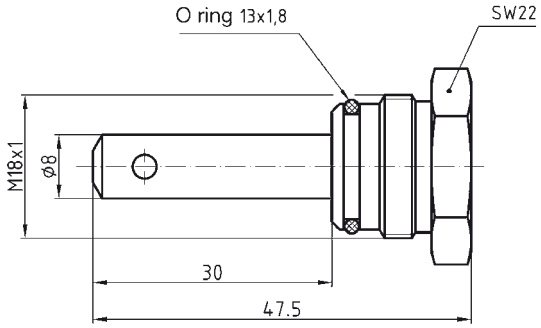
TM 63 with mounting valve



Mounting valve



Adapter



11

Combined thermometer – pressure gauge/ thermo-hydrometer

DG: G

Type	TM 63,D211	TM 63,D211		TM 80,D111	TM 80,D211	TM 80,D211	TH 80,D211
Version							
Housing-Ø	63	63		80	80	80	80
Housing	Black steel sheet			Plastic	Black steel sheet		
Accuracy class	Pressure gauge/hydrometer 2.5 – thermometer 2						
Connection	$G^1/_4B$ with mounting valve $G^1/_4$ to $R^1/_2$						
Adapter	without	with		without	without	with	without
Range	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €							
0/4 bar 20/120 °C	63318	**63346**		63317	**63341**	63348	---
Range							
0/6 mWS 20/120 °C	---	---		---	---	---	**63311**
0/10 mWS 20/120 °C	---	---		---	---	---	**63312**
0/16 mWS 20/120 °C	---	---		---	---	---	**63313**
0/25 mWS 20/120 °C	---	---		---	---	---	**63314**
0/40 mWS 20/120 °C	---	---		---	---	---	**63315**
0/60 mWS 20/120 °C	---	---		---	---	---	**63316**

Minimum order quantity for non-stock items = 100 pieces

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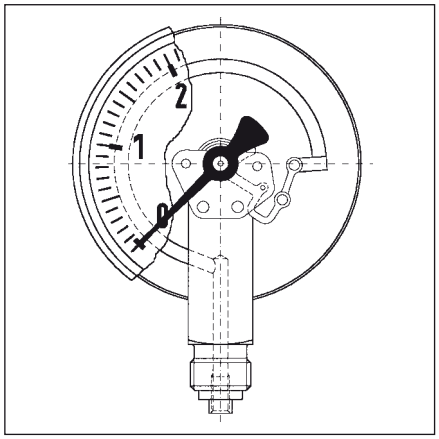
Spare parts

DG: G	Part no.	**Price €**
Mounting valve $G^1/_4$ to $R^1/_2$, brass	05 00 25 12	
Adapter $G^1/_4$ to M 18 x 1, brass	05 00 40 01	

Standard Bourdon tube pressure gauges EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 1

Nominal size
40 – 50 – 63 – 80 – 100

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or centre back
NG 40 G1/8B – spanner size 12
NG 50-63 G1/4B – spanner size 14
NG 80-100 bottom G1/2B – spanner size 22
NG 80-100 centre back G1/4B – spanner size 14 (EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Plastic, white
Dial marking black

Pointer
Plastic, black

Housing
Black ABS, highly impact resistant and corrosion resistant

Front glass
Clip-in plastic
NG 80-100 with adjustable red reference pointer

Options

- *Damping screw*
- *Reference pointer*

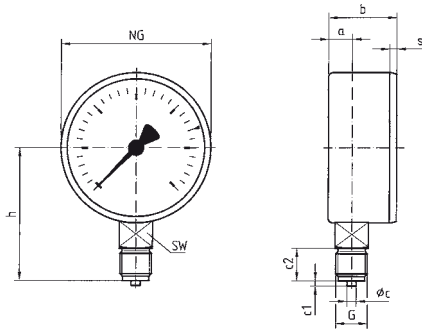
Refer to page 281 for prices

Standard Bourdon tube pressure gauges

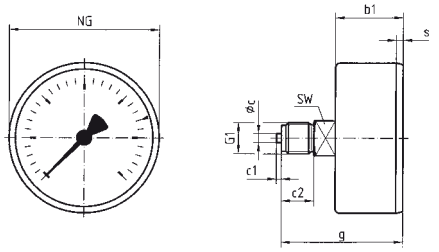
Type D 1 – NG 40/50/63/80/100

Housing types and dimensions

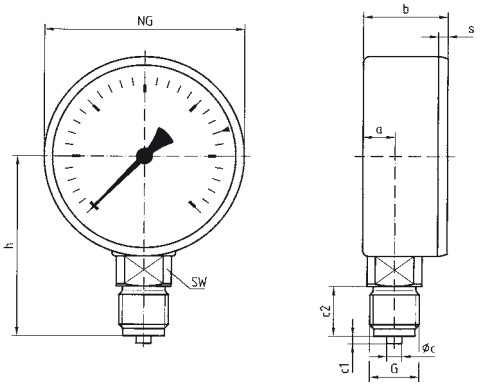
NG 40/50/63 – Bottom connection



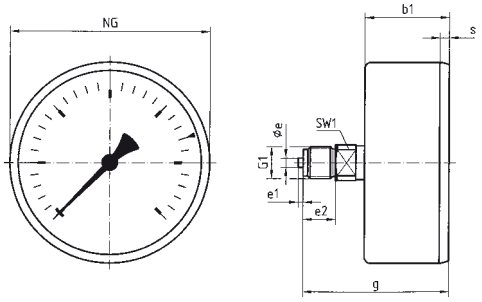
NG 40/50/63 – Centre back connection



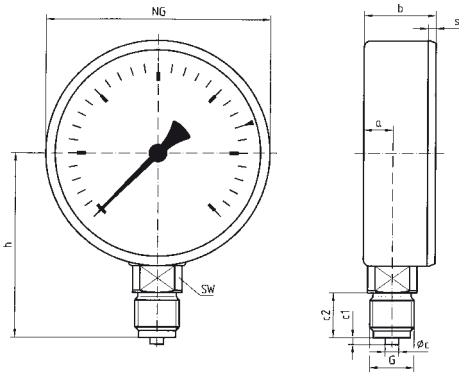
NG 80 – Bottom connection



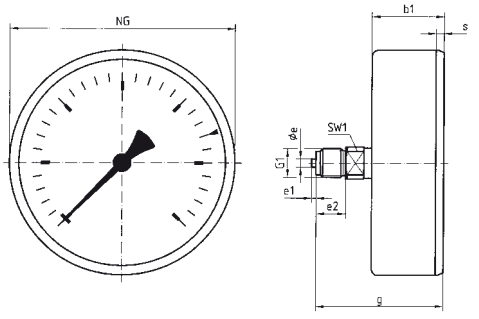
NG 80 – Centre back connection



NG 100 – Bottom connection



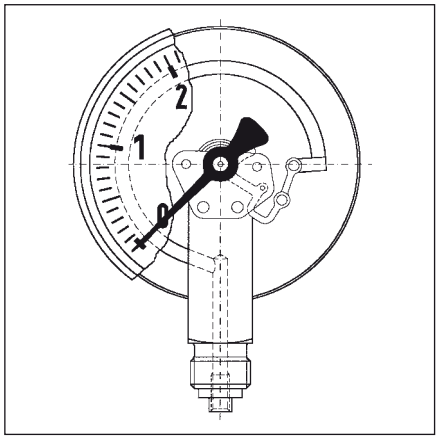
NG 100 – Centre back connection



Dimensions (mm)

Nominal size (NG)	*a*	*b*	*b1*	*Øc*	*c1*	*c2*	*Øe*	*e1*	*e2*	*g*	*G*	*G1*	*h*	*s*	*SW*	*SW1*
40	*9.5*	*25*	*25*	*4*	*2*	*10*	*-*	*-*	*-*	*41.5*	*G 1/8 B*	*G 1/8 B*	*36*	*3*	*12*	*-*
50	*10.3*	*26.8*	*27.1*	*5*	*2*	*13*	*-*	*-*	*-*	*47.1*	*G 1/4 B*	*G 1/4 B*	*45*	*3.8*	*14*	*-*
63	*9.8*	*29.7*	*30.4*	*5*	*2*	*13*	*-*	*-*	*-*	*50.4*	*G 1/4 B*	*G 1/4 B*	*51.5*	*3.7*	*14*	*-*
80	*12.8*	*32.8*	*32.8*	*6*	*3*	*20*	*5*	*2*	*13*	*55.8*	*G 1/2 B*	*G 1/4 B*	*72*	*2.8*	*22*	*14*
100	*15.5*	*34.5*	*32*	*6*	*3*	*20*	*5*	*2*	*13*	*55*	*G 1/2 B*	*G 1/4 B*	*82*	*3.5*	*22*	*14*

Standard Bourdon tube pressure gauges EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 2/D 3

Nominal size
40 - 50 - 63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ± 0,4 %/10 K
falling temp. approx. ± 0,4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60 529)

Standard version

Connection
Brass, bottom or centre back
NG 40 G1/8B – spanner size 12
NG 50-63 G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Plastic, white
Dial marking black

Pointer
Plastic, black

Housing
D 2 – black sheet steel
D 3 – stainless steel 304

Front glass
Clip-in plastic

Options

- *Panel mounting bezel for clamp fixing*
- *3-hole fixing panel mounting bezel*
- *Damping screw*
- *Reference pointer*

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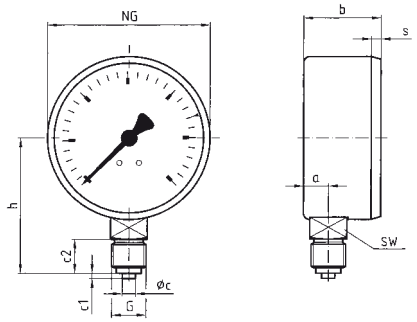
Refer to page 282/283 for prices

Standard Bourdon tube pressure gauges

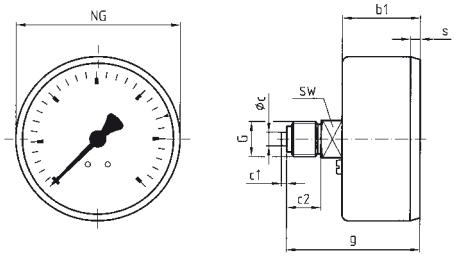
Type D 2/D 3 – NG 40/50/63

Housing types and dimensions

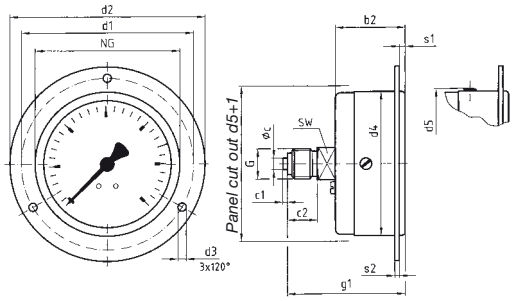
Bottom connection



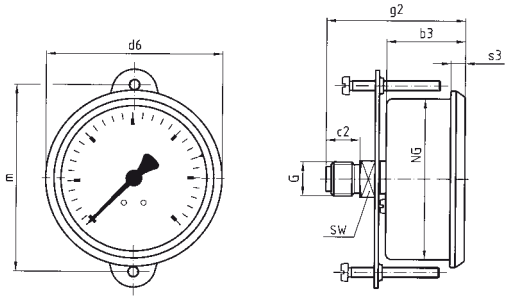
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



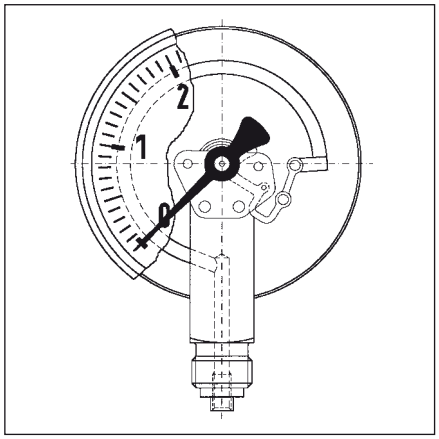
Centre back connection, panel mounting bezel for clamp fixing



Dimensions (mm)

Nominal size (NG)	a	b	b1	b2	b3	Øc	c1	c2	d1	d2	d3	d4	d5	d6	g	g1	g2	G	h	m
40	8.5	23.5	25	26	28	4	2	10	51	61	3.6	41	45	44	41.5	42.5	46.6	G1/8B	36	50
50	10.5	26	26	27.5	30.3	5	2	13	60	71	3.6	50	54	54	47	49	51.3	G1/4B	45	58
63	9.5	29.4	29.4	30.3	30.3	5	2	13	75	85	3.6	63	66.5	67.8	50.4	51.3	53.3	G1/4B	51.5	72
Nominal size (NG)	s	s1	s2	s3	SW															
40	3	2.5	2	5.2	12															
50	3.8	2.5	2	5.4	14															
63	3.7	2.5	2	5.6	14															

Rohrfeder-Standardmanometer EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 2

Nominal size
80 – 100

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ± 0.4 %/10 K
falling temp. approx. ± 0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom:
NG 80 – 100 G1/2B – spanner size 22
Brass, centre back
NG 80 – 100 G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Plastic, white
Dial marking black

Pointer
Plastic, black

Housing
Sheet steel, black

Front glass
Clip-in plastic with adjustable red reference pointer

Options

- *Stainless steel housing (NG 100)*
- *Push on bezel*
- *Instrument grade front glass*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*
- *Reference pointer*

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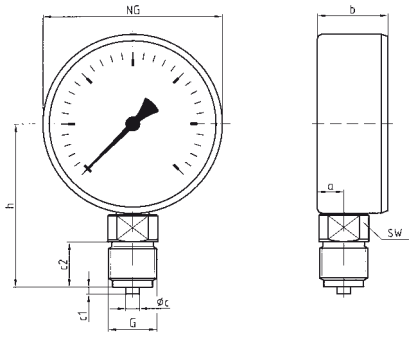
Refer to page 283 for prices

Standard Bourdon tube pressure gauges

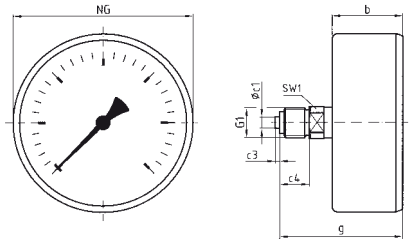
Type D 2 – NG 80/100

Housing types and dimensions (in mm)

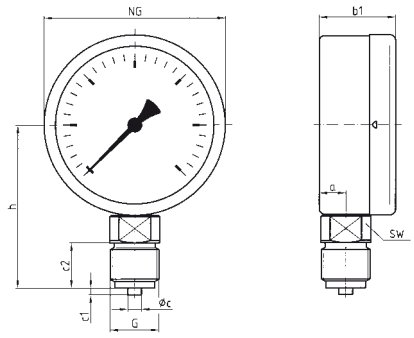
Bottom connection



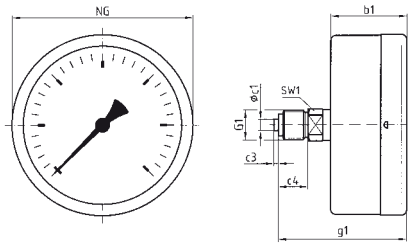
Centre back connection



Bottom connection, with push-on bezel



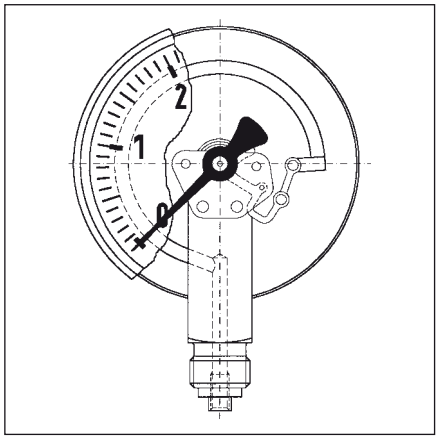
Centre back connection, with push-on bezel



Dimensions (mm)

Nominal size (NG)	*a*	*b*	*b1*	*Øc*	*c1*	*c2*	*Øc1*	*c3*	*c4*	*g*	*g1*	*G*	*G1*	*h*	*SW*	*SW1*
80	*11.7*	*31*	*33.5*	*6*	*3*	*20*	*5*	*2*	*13*	*54*	*56.5*	*G1/2B*	*G1/4B*	*72*	*22*	*14*
100	*11*	*29.5*	*34*	*6*	*3*	*20*	*5*	*2*	*13*	*52.5*	*57*	*G1/2B*	*G1/4B*	*82*	*22*	*14*

Rohrfeder-Standardmanometer EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 2

Nominal size
160

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom:
G1/2B – spanner size 22

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black
with adjustable red reference pointer

Pointer
Aluminium, black

Housing
Sheet steel, black

Push-on bezel
Sheet steel, black

Front glass
Instrument glass

Options

- *Damping screw*
- *Reference pointer*

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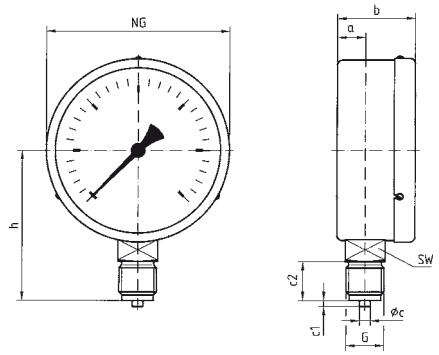
Refer to page 283 for prices

Standard Bourdon tube pressure gauges

Type D 2 – NG 160

Housing types and dimensions

Bottom connection

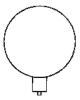
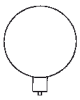
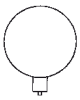
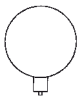
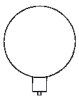


Dimensions (mm)

Nominal size (NG)	a	b	Øc	c1	c2	G	h	SW													
160	15.5	50	6	3	20	G½B	116	22													

Standard Bourdon tube pressure gauges EN 837-1

DG: M

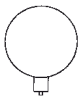
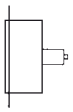
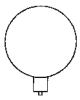
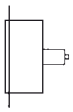
Type	RF40,D101	RF40,D111	RF50,D101	RF50,D111	RF63,D101	RF63,D111	RF80,D101	RF100,D101
Versions								
Housing-Ø	40	40	50	50	63	63	80	100
Housing	ABS highly impact resistant, clip-in plastic front glass							
Meas. elem.	Bourdon tube element, copper alloy							
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G 1/8 B	G 1/8 B	G 1/4 B	G 1/4 B	G 1/4 B	G 1/4 B	G 1/2 B	G 1/2 B
Packing unit*	100 pieces	100 pieces	100 pieces	100 pieces	100 pieces	100 pieces	50 pieces	50 pieces
							with adjustable red reference pointer in front glass	
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85001101**	**85001111**	**85051101**	**85051111**	**85101101**	**85101111**	85151101	85201101
-1/+0,6	---	---	---	---	85102101	85102111	85152101	85202101
-1/+1,5	---	---	---	---	**85103101**	**85103111**	85153101	85203101
-1/+3	---	---	---	---	**85104101**	**85104111**	85154101	85204101
-1/+5	---	---	---	---	**85105101**	**85105111**	85155101	85205101
-1/+9	---	---	---	---	85106101	85106111	85156101	85206101
-1/+15	---	---	---	---	**85107101**	85107111	85157101	85207101
Price €								
0/0,6	85009101	85009111	85059101	85059111	**85109101**	**85109111**	85159101	85209101
0/1	**85010101**	**85010111**	**85060101**	**85060111**	**85110101**	**85110111**	85160101	85210101
0/1,6	**85011101**	**85011111**	**85061101**	**85061111**	**85111101**	**85111111**	85161101	85211101
0/2,5	**85012101**	**85012111**	**85062101**	**85062111**	**85112101**	**85112111**	85162101	85212101
0/4	**85013101**	**85013111**	**85063101**	**85063111**	**85113101**	**85113111**	85163101	85213101
0/6	**85014101**	**85014111**	**85064101**	**85064111**	**85114101**	**85114111**	85164101	85214101
0/10	**85015101**	**85015111**	**85065101**	**85065111**	**85115101**	**85115111**	85165101	85215101
0/16	**85016101**	**85016111**	**85066101**	**85066111**	**85116101**	**85116111**	85166101	85216101
0/25	**85017101**	**85017111**	**85067101**	**85067111**	**85117101**	**85117111**	85167101	85217101
0/40	**85018101**	**85018111**	**85068101**	**85068111**	**85118101**	**85118111**	85168101	85218101
Price €								
0/60	85019101	85019111	**85069101**	**85069111**	**85119101**	**85119111**	85169101	85219101
0/100	85020101	85020111	**85070101**	**85070111**	**85120101**	**85120111**	85170101	85220101
0/160	85021101	85021111	**85071101**	**85071111**	**85121101**	**85121111**	85171101	85221101
0/250	85022101	85022111	85072101	85072111	**85122101**	**85122111**	85172101	85222101
0/400	---	---	85073101	85073111	**85123101**	**85123111**	85173101	85223101

Minimum order quantity for non-stock items = 100 pieces

Refer to page 284 for additional costs

Standard Bourdon tube pressure gauges EN 837-1

DG: M

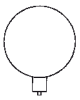
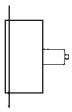
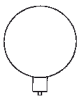
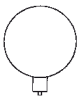
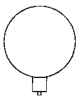
Type	RF40,D201	RF40,D211	RF40,D231*	RF40,D251*	RF50,D201	RF50,D211	RF50,D231*	RF50,D251*
Version								
Housing-Ø	40	40	40	40	50	50	50	50
Housing	Black sheet steel, plastic, clip-in front glass							
Meas. elem.	Bourdon tube element, copper alloy							
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G 1/8 B	G 1/8 B	G 1/8 B	G 1/8 B	G 1/4 B	G 1/4 B	G 1/4 B	G 1/4 B
			3-hole fixing, panel mounting bezel, chrome plated	Panel mounting bezel, chrome plated, clamp fixing			3-hole fixing, panel mounting bezel, chrome plated	Panel mounting bezel chrome plated, clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85001201**	**85001211**	85001231	85001251	85051201	85051211	85051231	**85051251**
-1/+0,6	---	---	---	---	---	---	---	---
-1/+1,5	---	---	---	---	---	---	---	---
-1/+3	---	---	---	---	---	---	---	---
-1/+5	---	---	---	---	---	---	---	---
-1/+9	---	---	---	---	---	---	---	---
-1/+15	---	---	---	---	---	---	---	---
Price €								
0/1	85010201	85010211	85010231	85010251	85060201	85060211	85060231	**85060251**
0/1,6	85011201	85011211	85011231	85011251	85061201	85061211	85061231	**85061251**
0/2,5	85012201	85012211	85012231	**85012251**	85062201	85062211	**85062231**	**85062251**
0/4	**85013201**	**85013211**	**85013231**	**85013251**	**85063201**	**85063211**	**85063231**	**85063251**
0/6	**85014201**	**85014211**	**85014231**	**85014251**	**85064201**	**85064211**	**85064231**	**85064251**
0/10	**85015201**	**85015211**	**85015231**	**85015251**	**85065201**	**85065211**	**85065231**	**85065251**
0/16	**85016201**	**85016211**	**85016231**	**85016251**	**85066201**	**85066211**	**85066231**	**85066251**
0/25	**85017201**	**85017211**	**85017231**	**85017251**	**85067201**	**85067211**	**85067231**	**85067251**
0/40	85018201	85018211	85018231	85018251	85068201	85068211	85068231	85068251
Price €								
0/60	85019201	85019211	85019231	85019251	85069201	85069211	85069231	85069251
0/100	85020201	85020211	85020231	85020251	85070201	85070211	85070231	85070251
0/160	85021201	85021211	85021231	85021251	85071201	85071211	85071231	85071251
0/250	85022201	85022211	85022231	85022251	85072201	85072211	85072231	85072251
0/400	---	---	---	---	85073201	85073211	85073231	85073251

* Dual scale, bar outer, black, psi inner, red
Minimum order quantity for non-stock items = 100 pieces

Refer to page 284 for additional costs

Standard Bourdon tube pressure gauges EN 837-1

DG: M

Type	RF63,D201	RF63,D211	RF63,D231*	RF63,D251*	RF80,D201	RF100,D201	RF100,D211	RF160,D201
Version								
Housing-Ø	63	63	63	63	80	100	100	160
Housing	Black sheet steel, plastic, clip-in front glass							Push on bezel
Meas. elem.	Bourdon tube element, copper alloy							
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1/4B	G1/4B	G1/4B	G1/4B	G1/2B	G1/2B	G1/4B	G1/2B
			3-hole fixing, panel mounting bezel, chrome plated	Panel mounting bezel, chrome plated, clamp fixing	with adjustable red reference pointer			
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85101201**	**85101211**	85101231	**85101251**	**85151201**	**85201201**	85201211	**85251201**
-1/+0,6	85102201	85102211	85102231	85102251	85152201	**85202201**	85202211	85252201
-1/+1,5	85103201	85103211	85103231	85103251	85153201	**85203201**	85203211	85253201
-1/+3	85104201	85104211	85104231	85104251	85154201	**85204201**	85204211	85254201
-1/+5	85105201	85105211	85105231	85105251	85155201	**85205201**	85205211	85255201
-1/+9	85106201	85106211	85106231	85106251	85156201	**85206201**	85206211	85256201
-1/+15	85107201	85107211	85107231	85107251	85157201	**85207201**	85207211	85257201
Price €								
0/0,6	85109201	85109211	85109231	85109251	85159201	**85209201**	85209211	**85259201**
0/1	**85110201**	85110211	85110231	**85110251**	**85160201**	**85210201**	85210211	**85260201**
0/1,6	**85111201**	85111211	85111231	**85111251**	**85161201**	**85211201**	85211211	**85261201**
0/2,5	**85112201**	**85112211**	**85112231**	**85112251**	**85162201**	**85212201**	85212211	**85262201**
0/4	**85113201**	**85113211**	**85113231**	**85113251**	**85163201**	**85213201**	**85213211**	**85263201**
0/6	**85114201**	**85114211**	**85114231**	**85114251**	**85164201**	**85214201**	**85214211**	**85264201**
0/10	**85115201**	**85115211**	**85115231**	**85115251**	**85165201**	**85215201**	**85215211**	**85265201**
0/16	**85116201**	**85116211**	**85116231**	**85116251**	**85166201**	**85216201**	**85216211**	**85266201**
0/25	**85117201**	**85117211**	85117231	**85117251**	**85167201**	**85217201**	85217211	**85267201**
0/40	85118201	85118211	85118231	85118251	**85168201**	**85218201**	85218211	**85268201**
Price €								
0/60	85119201	85119211	85119231	85119251	**85169201**	**85219201**	85219211	85269201
0/100	85120201	85120211	85120231	85120251	85170201	85220201	85220211	85270201
0/160	85121201	85121211	85121231	85121251	85171201	85221201	85221211	85271201
0/250	85122201	85122211	85122231	85122251	85172201	85222201	85222211	85272201
0/400	85123201	85123211	85123231	85123251	85173201	85223201	85223211	85273201

* Dual scale, bar outer, black, psi inner, red

Minimum order quantity for non-stock items = 100 pieces

Refer to page 284 for additional costs

Additional costs for standard Bourdon tube pressure gauges

DG: M

Housing diameter (mm)	40	50	63	80	100	160
Description	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Housing nickel/chrome plated (instead of steel housing)	38064	38065	38066	---	---	---
Push-on bezel nickel/chrome plated side screw fixing (NS 160, instead of black bezel)	38250	38251	38252	38253	38254	38255
Stainless steel 304 housing, vibration ground finish (instead of steel housing)	38256	38257	38258	---	38300	---
Stainless steel 304 housing, polished (instead of steel housing)	38259	38260	38261	---	38314	---
Push-on bezel stainless steel 304, polished side screw fixing	38262	38263	38264	---	---	---
3-hole fixing, panel mounting bezel, black, side screw fixing	---	---	---	---	38266	38267
3-hole fixing, panel mounting bezel, chrome plated, side screw fixing	---	---	---	---	38269	38270
Back flange, black sheet steel (only for steel housing)	---	---	---	---	38044	38045
Connection socket nickel/chrome plated	38082	38083	38084	38085	38086	38087
Connection socket with special thread	on request	on request	on request	on request	on request	on request
Damping screw brass – hole 0.3 – 0.5 – 0.7 mm (please specify)	38095	38096	38097	38098	38099	38100
Red mark on dial	38182	38183	38184	38185	38186	38187
1 reference pointer, red, printed on front glass	38315	38316	38109		Standard	Standard ---
2 reference pointers, red, on dial, adjustable	---	---	---	---	38123	---
Printing block costs per scale and colour (scale design as per EN 837-1, others on request)	38151	38152	38153	38154	38155	38156
Printing costs per additional colour	38163	38164	38165	38166	38167	38168

11

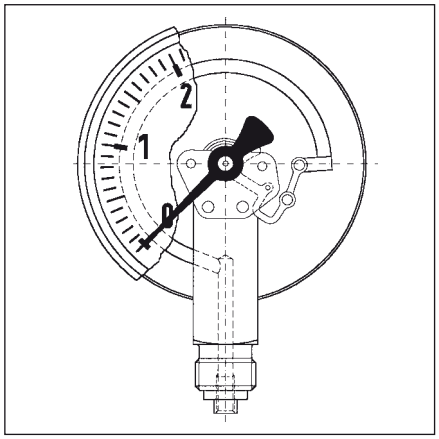
* Minimum order quantity for non-stock items = 100 pieces per version and per delivery

Spare front glass for standard Bourdon tube pressure gauges

DG: M

Housing diameter (mm)	40	50	63	80	100	160
Description	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.	Price € Part no.
Plastic front glass, clip-in, for plastic housing	38285	38271	38272	38273	38274	---
Plastic front glass, clip-in, for steel housing	38275	38276	38277	38317	38318	---
Instrument grade front glass for steel housing	---	---	---	38278	38279	38280

Bourdon tube pressure gauges for industrial applications EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For high measuring accuracy.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Types
D 2/D 3

Nominal size
100

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = 3/4 x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = 2/3 x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or bottom back
G1/2B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element,
≤ 60 bar „C“ type bourdon tube, copper alloy
> 60 bar helical tube, stainless steel 316 Ti or 316 L

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
D 2 – black sheet steel
D 3 – stainless steel 304

Front glass
Clip-in plastic

Options

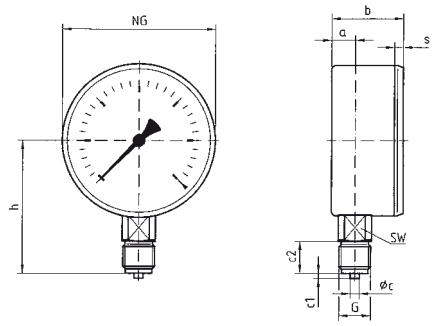
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*
- *Reference pointer*
- *Electrical contacts*

Refer to page 287 for prices

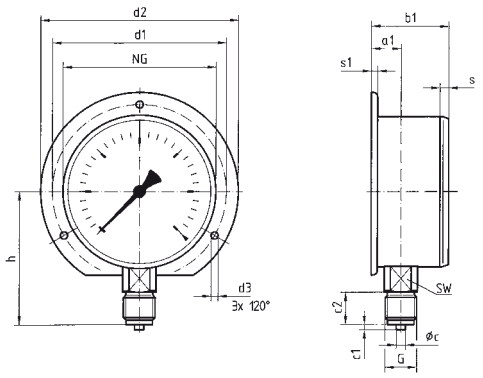
Bourdon tube pressure gauges for industrial applications ***Type D 2/D 3 – NG 100***

Housing types and dimensions

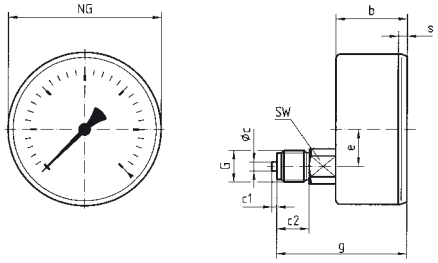
Bottom connection



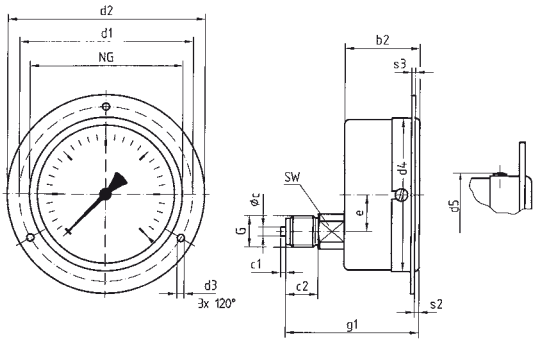
Bottom connection, back flange



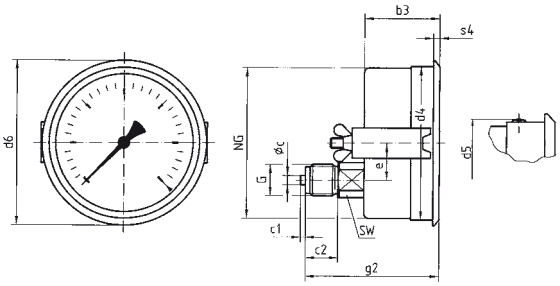
Bottom back connection



Bottom back connection, 3-hole fixing, panel mounting bezel



Bottom back connection, panel mounting bezel for clamp fixing



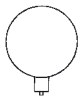
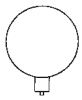
Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*b2*	*b3*	*Øc*	*c1*	*c2*	*d1*	*d2*	*d3*	*d4*	*d5*	*d6*	*e*	*G*	*g*	*g1*	*g2*	*h*
100	*15.6*	*19.1*	*44*	*47.5*	*45.6*	*47*	*6*	*3*	*20*	*116*	*132*	*4.8*	*101*	*105*	*107*	*26.5*	*G½B*	*76*	*77.6*	*79*	*86*

Nominal size (NG)	*s*	*s1*	*s2*	*s3*	*s4*	*SW*
100	*3.5*	*5.5*	*3.5*	*2*	*4.5*	*22*

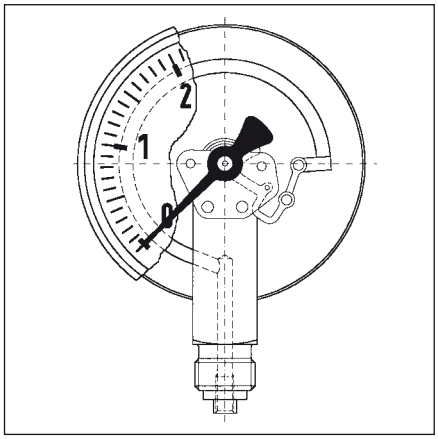
Bourdon tube pressure gauges for industrial applications EN 837-1

DG: M

Type	RF100 I,D201	RF100 I,D211	RF100 I,D221		RF100 I,D301	RF100 I,D311	RF100 I,D331	RF100 I,D351
Version								
Housing-Ø	100	100	100		100	100	100	100
Housing	Black sheet steel, plastic clip-in front glass				Stainless steel 304 plastic clip-in front glass			
Meas. elem.	Bourdon tube, copper alloy (> 60 bar stainless steel 316 Ti or 316 L)							
Accuracy class	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Connection	G1/2B	G1/2B	G1/2B		G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel, black				3-hole fixing, panel mounting bezel, chrome plated	Panel mounting bezel, chrome plated clamp fixing
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85301201	85301211	85301221		85301301	85301311	85301331	85301351
-1/+0,6	85302201	85302211	85302221		85302301	85302311	85302331	85302351
-1/+1,5	85303201	85303211	85303221		85303301	85303311	85303331	85303351
-1/+3	85304201	85304211	85304221		85304301	85304311	85304331	85304351
-1/+5	85305201	85305211	85305221		85305301	85305311	85305331	85305351
-1/+9	85306201	85306211	85306221		85306301	85306311	85306331	85306351
-1/+15	85307201	85307211	85307221		85307301	85307311	85307331	85307351
Price €								
0/0,6	85309201	85309211	85309221		85309301	85309311	85309331	85309351
0/1	85310201	85310211	85310221		85310301	85310311	85310331	85310351
0/1,6	85311201	85311211	85311221		85311301	85311311	85311331	85311351
0/2,5	85312201	85312211	85312221		85312301	85312311	85312331	85312351
0/4	85313201	85313211	85313221		85313301	85313311	85313331	85313351
0/6	85314201	85314211	85314221		85314301	85314311	85314331	85314351
0/10	85315201	85315211	85315221		85315301	85315311	85315331	85315351
0/16	85316201	85316211	85316221		85316301	85316311	85316331	85316351
0/25	85317201	85317211	85317221		85317301	85317311	85317331	85317351
0/40	85318201	85318211	85318221		85318301	85318311	85318331	85318351
Price €								
0/60	85319201	85319211	85319221		85319301	85319311	85319331	85319351
0/100	85320201	85320211	85320221		85320301	85320311	85320331	85320351
0/160	85321201	85321211	85321221		85321301	85321311	85321331	85321351
0/250	85322201	85322211	85322221		85322301	85322311	85322331	85322351
0/400	85323201	85323211	85323221		85323301	85323311	85323331	85323351
Price €								
0/600	85324201	85324211	85324221		85324301	85324311	85324331	85324351
0/1000	85325201	---	---		85325301	---	---	---

Refer to page 326 for additional costs

Bourdon tube pressure gauges for industrial applications *EN 837-1*



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For high accuracy measurement in arduous conditions.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/1000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = ¾ x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = ⅔ x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, bottom or bottom back
G½B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element,
≤ 60 bar „C“ type bourdon tube, copper alloy
> 60 bar helical tube, stainless steel 316 Ti or 316 L

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Instrument glass

Options

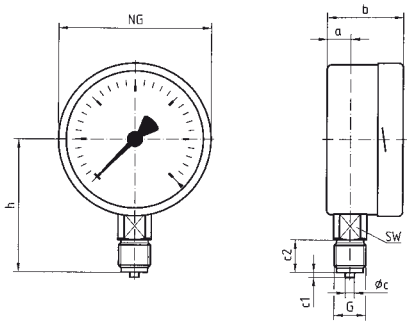
- *Nominal size 250 (bottom connection)*
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Safety front glass*
- *Damping screw*
- *Reference pointer*
- *Electrical contacts*

Refer to page 290 for prices

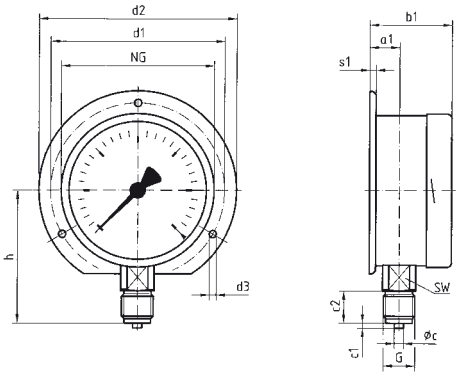
Bourdon tube pressure gauges for industrial applications **Type D 4 – NG 100/160**

Housing types and dimensions

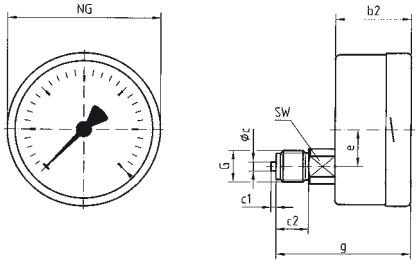
Bottom connection



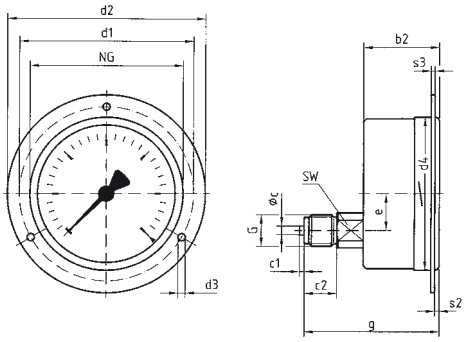
Bottom connection, back flange



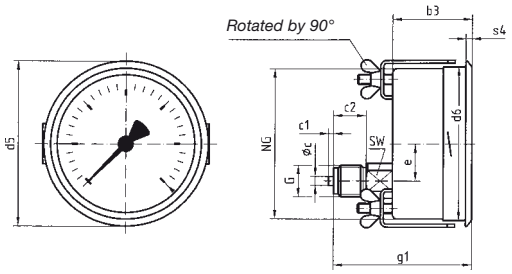
Bottom back connection



Bottom back connection, 3-hole fixing, panel mounting bezel



Bottom back connection, panel mounting bezel for clamp fixing



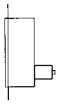
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2	d3*	d4	d5	d6	e	G	g	g1	h	s1
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	26.5	G1/2B	81	81	86	5.5
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	26.5	G1/2B	82	84	116	6
250	16	-	57	59	-	-	6	3	20	270	285	5.8	-	-	-	-	G1/2B	-	-	165	2
Nominal size (NG)	s2	s3	s4	SW																	
100	4	2	4	22																	
160	4	2	4.5	22																	
250	-	-	-	22																	

* Dimensions according to DIN 16064

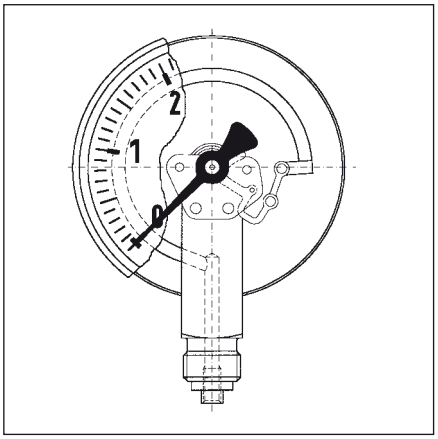
Bourdon tube pressure gauges for industrial applications EN 837-1

DG: M

Type	RF100 I,D401	RF100 I,D411	RF100 I,D431	RF100 I,D451	RF160 I,D401	RF160 I,D411	RF160 I,D431	RF160 I,D451
Version								
Housing-Ø	100	100	100	100	160	160	160	160
Housing	Stainless steel 304 with bayonet type bezel, Instrument grade front glass							
Meas. elem.	Bourdon tube, copper alloy (> 60 bar stainless steel 316 Ti or 316 L)							
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel 304 polished	Panel mounting bezel 304, clamp fixing			3-hole fixing, panel mounting bezel 304 polished	Panel mounting bezel 304, clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85301401**	85301411	85301431	85301451	85351401	85351411	85351431	85351451
-1/+0,6	85302401	85302411	85302431	85302451	85352401	85352411	85352431	85352451
-1/+1,5	**85303401**	85303411	85303431	85303451	85353401	85353411	85353431	85353451
-1/+3	**85304401**	85304411	85304431	85304451	85354401	85354411	85354431	85354451
-1/+5	**85305401**	85305411	85305431	85305451	85355401	85355411	85355431	85355451
-1/+9	85306401	85306411	85306431	85306451	85356401	85356411	85356431	85356451
-1/+15	85307401	85307411	85307431	85307451	85357401	85357411	85357431	85357451
Price €								
0/0,6	85309401	85309411	85309431	85309451	85359401	85359411	85359431	85359451
0/1	**85310401**	85310411	85310431	85310451	**85360401**	85360411	85360431	85360451
0/1,6	**85311401**	85311411	85311431	85311451	**85361401**	85361411	85361431	85361451
0/2,5	**85312401**	85312411	85312431	85312451	**85362401**	85362411	85362431	85362451
0/4	**85313401**	85313411	85313431	85313451	**85363401**	85363411	85363431	85363451
0/6	**85314401**	85314411	85314431	85314451	**85364401**	85364411	85364431	85364451
0/10	**85315401**	85315411	85315431	85315451	**85365401**	85365411	85365431	85365451
0/16	**85316401**	85316411	85316431	85316451	**85366401**	85366411	85366431	85366451
0/25	**85317401**	85317411	85317431	85317451	**85367401**	85367411	85367431	85367451
0/40	**85318401**	85318411	85318431	85318451	85368401	85368411	85368431	85368451
Price €								
0/60	**85319401**	85319411	85319431	85319451	85369401	85369411	85369431	85369451
0/100	**85320401**	85320411	85320431	85320451	85370401	85370411	85370431	85370451
0/160	**85321401**	85321411	85321431	85321451	85371401	85371411	85371431	85371451
0/250	**85322401**	85322411	85322431	85322451	85372401	85372411	85372431	85372451
0/400	**85323401**	85323411	85323431	85323451	85373401	85373411	85373431	85373451
Price €								
0/600	**85324401**	85324411	85324431	85324451	85374401	85374411	85374431	85374451
0/1000	85325401	85325411	85325431	85325451	85375401	85375411	85375431	85375451
Add. costs					**Price €**			
Nominal size 250	---	---	---	---		---	---	---

Refer to page 326 for additional costs

Glycerine filled Bourdon tube pressure gauges EN 837-1



Manometer mit Glyzerinfüllung bieten folgende Vorteile:

- *Einsetzbar bei starken Vibrationen und hohen dynamischen Druckbelastungen.*
- *Längere Lebensdauer durch geringeren Verschleiß und Korrosionsschutz des Messsystems.*
- *Kein Beschlagen der Sichtscheibe von innen bei Einsatz im Freien.*

Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For measurements in areas with high vibration levels and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 6

Nominal size
40

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
0/4 bar to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Additional error when the temperature of the measuring element deviates from +20 °C:
rising temp. approx. ± 0.4 %/10 K
falling temp. approx. ± 0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (< 25 bar)
IP 54

Standard version

Connection
Brass, centre back
G1/8B – spanner size 12
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Plastic, white
Dial marking black

Pointer
Plastic, black

Housing
Plastic (ABS), black, with pressure relief port

Front glass
Plastic, ultrasonically welded to housing

Filling liquid
Glycerine (99.5 %)

Options

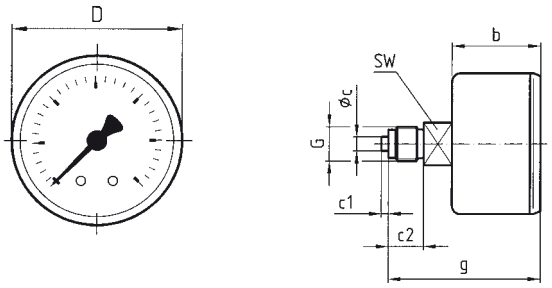
- *Special scales*
- *Damping screw*

Refer to page 295 for prices

Glycerine filled Bourdon tube pressure gauges ***Type D 6 – NG 40***

Housing types and dimensions

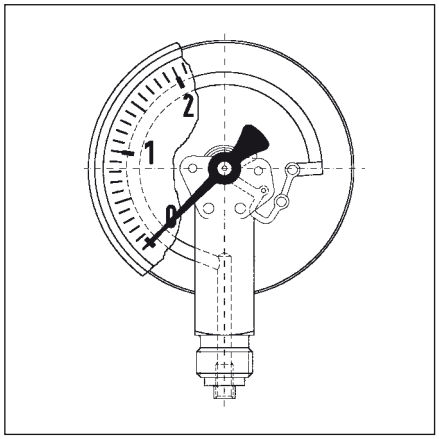
Centre back connection – NG 40



Dimensions (mm)

Nominal size (NG)	*b*	*Øc*	*c1*	*c2*	*D*	*G*	*g*	*SW*													
40	*25*	*4*	*2*	*10*	*40*	*G1/8B*	*43*	*12*													

Glycerine filled Bourdon tube pressure gauges *EN 837-1*



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For measurements in areas with high vibration level and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 6

Nominal size
50 – 63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Additional error when the temperature of the measuring element deviates from +20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (< 25 bar)
IP 54

Standard version

Connection
Brass, centre back
G1/8B – spanner size 12
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Plastic, black

Housing
Polyamide, black
with pressure relief port

Crimped bezel
Aluminium, black

Front glass
Plastic

Filling liquid
Glycerine (99.5 %)

Options

- *Back flange (NG 63)*
- *Clamp fixing*
- *3-hole fixing panel mounting bezel (NG 63)*
- *Damping screw*

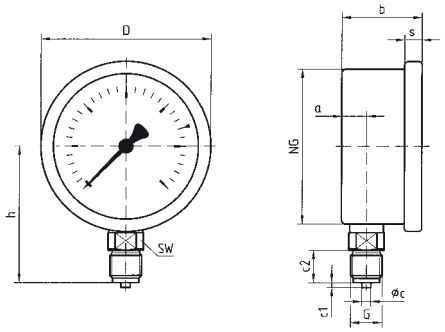
Refer to page 295 for prices

Glycerine filled Bourdon tube pressure gauges

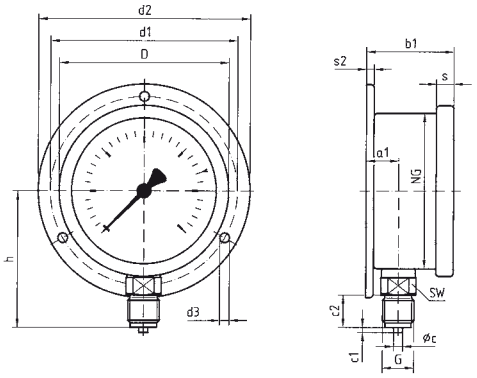
Type D 6 – NG 50/63

Housing types and dimensions

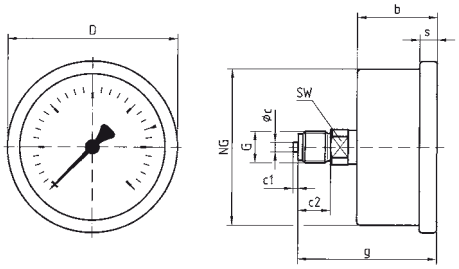
Bottom connection



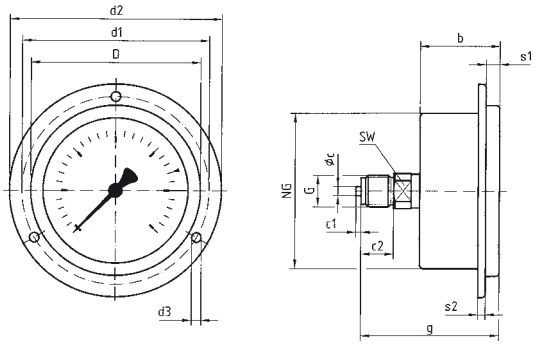
Bottom connection, back flange



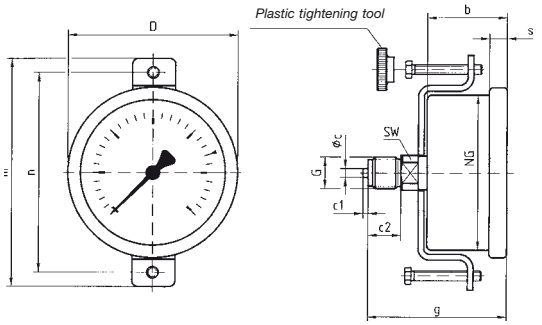
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, clamp fixing



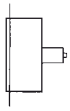
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	d1*	d2	d3*	D	G	g	h	m	n	s	s1	s2	SW	
50	12	-	31.5	-	5	2	13	-	-	-	53	G¼B	54.5	47	82	73	5	-	-	14	
63	10	13	32	35	5	2	13	75	85	3.6	68	G¼B	55	53	94	82	7	5.5	3	14	

* Dimensions according to DIN 16063

Glycerine filled Bourdon tube pressure gauges EN 837-1

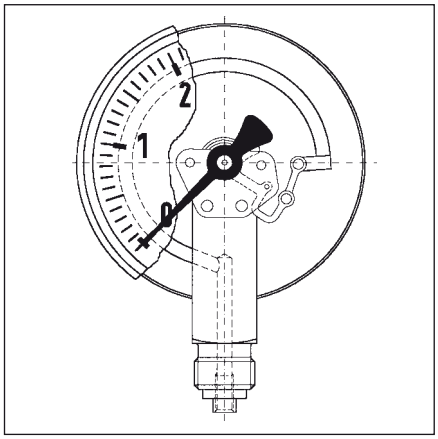
RK: M

Type	RF40Gly,D611	RF50Gly,D601	RF50Gly,D611	RF50Gly,D641	RF63Gly,D601	RF63Gly,D611	RF63Gly,D621	RF63Gly,D641
Version								
Housing-Ø	40	50	50	50	63	63	63	63
Housing	ABS black	Polyamide, black, with crimped bezel, black, plastic front glass						
Meas. elem.	Bourdon tube element, copper alloy							
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1/8B	G1/4B	G1/4B	G1/4B	G1/4B	G1/4B	G1/4B	G1/4B
				Clamp fixing			panel mounting bezel, schwarz	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	---	**85051601**	85051611	85051641	85101601	85101611	85101621	85101641
-1/+0,6	---	85052601	85052611	85052641	85102601	85102611	85102621	85102641
-1/+1,5	---	85053601	85053611	85053641	85103601	85103611	85103621	85103641
-1/+3	---	85054601	85054611	85054641	85104601	85104611	85104621	85104641
-1/+5	---	85055601	85055611	85055641	85105601	85105611	85105621	85105641
-1/+9	---	85056601	85056611	85056641	85106601	85106611	85106621	85106641
-1/+15	---	85057601	85057611	85057641	85107601	85107611	85107621	85107641
Price €								
0/0,6	---	85059601	85059611	85059641	85109601	85109611	85109621	85109641
0/1	---	85060601	85060611	85060641	85110601	85110611	85110621	85110641
0/1,6	---	85061601	85061611	85061641	85111601	85111611	85111621	85111641
0/2,5	---	85062601	85062611	85062641	85112601	85112611	85112621	85112641
0/4	85013611	85063601	85063611	85063641	85113601	85113611	85113621	85113641
0/6	**85014611**	85064601	85064611	85064641	85114601	85114611	85114621	85114641
0/10	**85015611**	85065601	85065611	85065641	85115601	85115611	85115621	85115641
0/16	**85016611**	85066601	85066611	85066641	85116601	85116611	85116621	85116641
0/25	85017611	**85067601**	85067611	85067641	85117601	85117611	85117621	85117641
0/40	85018611	85068601	85068611	85068641	85118601	85118611	85118621	85118641
Price €								
0/60	85019611	85069601	85069611	85069641	85119601	85119611	85119621	85119641
0/100	85020611	85070601	85070611	85070641	85120601	85120611	85120621	85120641
0/160	85021611	85071601	85071611	85071641	85121601	85121611	85121621	85121641
0/250	85022611	85072601	85072611	85072641	85122601	85122611	85122621	85122641
0/400	85023611	85073601	85073611	85073641	85123601	85123611	85123621	85123641

Minimum order quantity for non-stock items = 10 pieces

Refer to page 326 for additional costs

Glycerine filled Bourdon tube pressure gauges EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For measurement in areas with high levels of vibration and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 7

Nominal size
50 – 63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar
NG 63 to 0/600 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Brass, bottom or centre back
G1/4B - spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with pressure relief port

Crimped bezel
Stainless steel 304

Front glass
Plastic

Filling liquid
Glycerine (99.5 %)

Options

- *Filling liquid silicone oil*
- *Back flange (NG 63)*
- *Clamp fixing*
- *3-hole fixing, panel mounting bezel (NG 63)*
- *Crimped bezel, polished*
- *Special scales*
- *Damping screw*

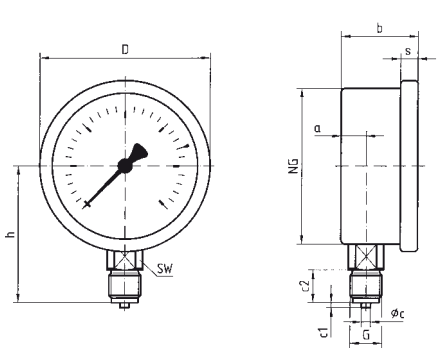
Refer to page 298 for prices

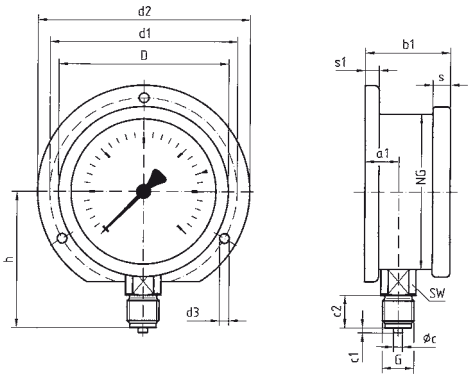
Glycerine filled Bourdon tube pressure gauges

Type D 7 – NG 50/63

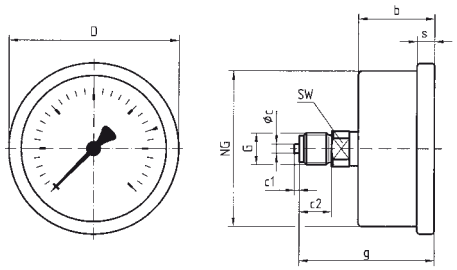
Housing types and dimensions

Bottom connection

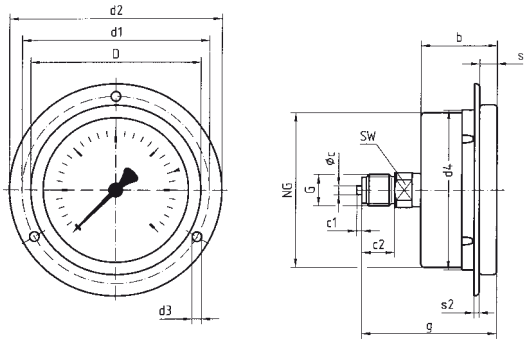




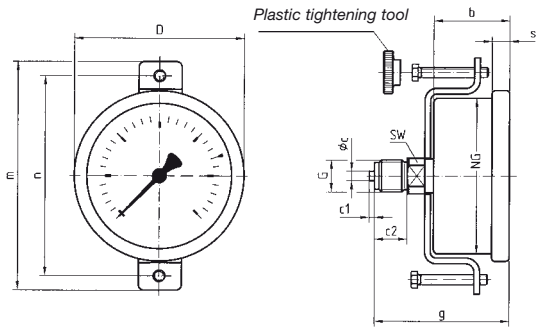
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel



Centre back connection, clamp fixing



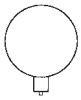
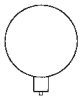
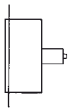
Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*Øc*	*c1*	*c2*	*d1**	*d2*	*d3**	*d4*	*D*	*G*	*g*	*h*	*m*	*n*	*s*	*s1*	*s2*	*SW*
50	*11*	-	*28*	-	*5*	*2*	*13*	-	-	-	-	*53*	*G¼B*	*51*	*45.5*	*82*	*73*	*4.5*	-	-	*14*
63	*9.5*	*13*	*30.5*	*34*	*5*	*2*	*13*	*75*	*85*	*3.6*	*64*	*68*	*G¼B*	*53.3*	*53*	*94*	*82*	*7*	*5.5*	*2*	*14*

** Dimensions according to DIN 16063*

Glycerine filled Bourdon tube pressure gauges EN 837-1

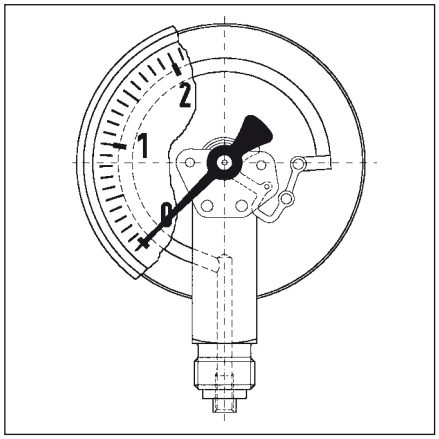
DG: M

Type	RF50Gly,D701	RF50Gly,D711	RF50Gly,D751		RF63Gly,D701	RF63Gly,D711	RF63Gly,D731	RF63Gly,D751
Version								
Housing-Ø	50	50	50		63	63	63	63
Housing	Stainless steel 1.4301 with crimped bezel 1.4301, plastic front glass							
Meas. elem.	Bourdon tube element, copper alloy							
Accuracy class	1.6	1.6	1.6		1.6	1.6	1.6	1.6
Connection	G1/4B	G1/4B	G1/4B		G1/4B	G1/4B	G1/4B	G1/4B
					* Dual scale, bar outer, black, psi inner, red			
			Clamp fixing				3-hole fixing, panel mounting bezel 304	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85051701	85051711	85051751		**85101701**	**85101711**	**85101731**	**85101751**
-1/+0,6	85052701	85052711	85052751		85102701	85102711	85102731	85102751
-1/+1,5	85053701	85053711	85053751		**85103701**	**85103711**	**85103731**	**85103751**
-1/+3	85054701	85054711	85054751		**85104701**	85104711	85104731	85104751
-1/+5	85055701	85055711	85055751		**85105701**	**85105711**	**85105731**	**85105751**
-1/+9	85056701	85056711	85056751		**85106701**	85106711	85106731	85106751
-1/+15	85057701	85057711	85057751		85107701	85107711	85107731	85107751
Price €								
0/0,6	85059701	85059711	85059751		**85109701**	**85109711**	**85109731**	**85109751**
0/1	85060701	85060711	85060751		**85110701**	**85110711**	**85110731**	**85110751**
0/1,6	85061701	85061711	85061751		**85111701**	**85111711**	**85111731**	**85111751**
0/2,5	85062701	85062711	85062751		**85112701**	**85112711**	**85112731**	**85112751**
0/4	85063701	85063711	85063751		**85113701**	**85113711**	**85113731**	**85113751**
0/6	85064701	85064711	85064751		**85114701**	**85114711**	**85114731**	**85114751**
0/10	85065701	85065711	85065751		**85115701**	**85115711**	**85115731**	**85115751**
0/16	85066701	85066711	85066751		**85116701**	**85116711**	**85116731**	**85116751**
0/25	85067701	85067711	85067751		**85117701**	**85117711**	**85117731**	**85117751**
0/40	85068701	85068711	85068751		**85118701**	**85118711**	**85118731**	**85118751**
Price €								
0/60	85069701	85069711	85069751		**85119701**	**85119711**	**85119731**	**85119751**
0/100	85070701	85070711	85070751		**85120701**	**85120711**	**85120731**	**85120751**
0/160	85071701	85071711	85071751		**85121701**	**85121711**	**85121731**	**85121751**
0/250	85072701	85072711	85072751		**85122701**	**85122711**	**85122731**	**85122751**
0/315					**86818701**	**86818711**	**86818731**	**86818751**
0/400	85073701	85073711	85073751		**85123701**	**85123711**	**85123731**	**85123751**
Price €								
0/600	---	---	---		**85124701**	**85124711**	**85124731**	**85124751**

* For single scales add the key code Z001 to Part No.!
Minimum order quantity for non-stock items = 10 pieces

Refer to page 326 for additional costs

Glycerine filled Bourdon tube pressure gauges EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For measurement in areas with high levels of vibration and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 7

Nominal size
80 – 100

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/1 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Brass, bottom
NG 80-100 G1/2B – spanner size 22
Brass, centre back
NG 80 G1/4B – spanner size 14
NG 100 G1/2B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with pressure relief port

Crimped bezel
Stainless steel 304

Front glass
Plastic (Makrolon)

Filling liquid
Glycerine (99.5 %)

Options

- *Filling liquid silicone oil*
- *Clamp fixing*
- *3-hole fixing, panel mounting bezel (NG 100)*
- *Crimped bezel, polished*
- *Stainless steel measuring system (up to 1,000 bar)*
- *Special scales*
- *Damping screw*

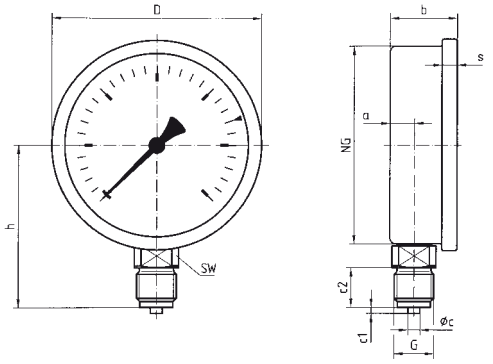
Refer to pages 301/302 for prices

Glycerine filled Bourdon tube pressure gauges

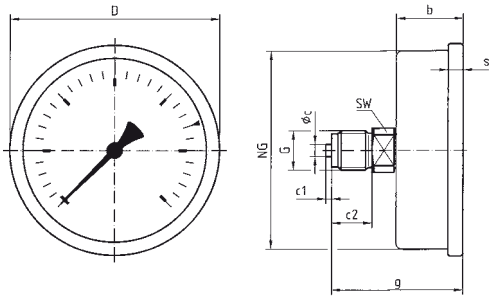
Type D 7 – NG 80/100

Housing types and dimensions

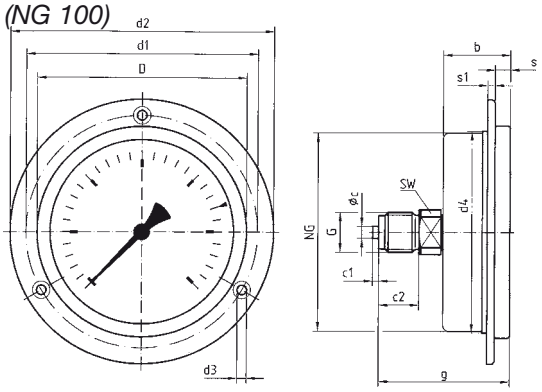
Bottom connection



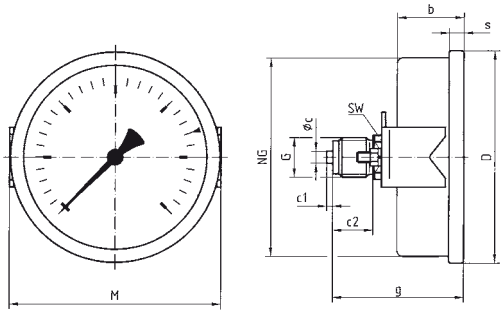
Centre back connection



Centre back connection, 3-hole fixing, panel mounting bezel (NG 100)



Centre back connection, clamp fixing



Dimensions (mm)

Nominal size (NG)	a	b	Øc	c1	c2	d1	d2	d3	d4	D	g	G	h	M	s	s1	SW
80 Ms back	-	33.5	5	2	13	-	-	-	-	85	56.5	G1/4B	-	82	7	-	14
80 VA back	-	33.5	5	2	13	-	-	-	-	85	59	G1/4B	-	82	7	-	14
80 Ms bottom	12.2	33.5	6	3	20	-	-	-	-	85	-	G1/2B	71	-	7	-	22
80 VA bottom	12.2	33.5	6	3	20	-	-	-	-	85	-	G1/2B	79.5	-	7	-	22
100 Ms	12.2	33.5	6	3	20	116	132	4.8	101	106	65.5	G1/2B	81	106	7	3.8	22
100 VA	11.8	33.5	6	3	20	116	132	4.8	101	106	76.5	G1/2B	90	106	7	3.8	22

Glycerine filled Bourdon tube pressure gauges EN 837-1

DG: M

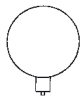
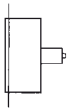
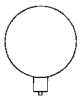
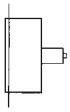
	Measuring system brass				Measuring system stainless steel			
Type	RF80Gly,D701	RF80Gly,D711	RF80Gly,D751		RF80EGly,D702	RF80EGly,D712	RF80EGly,D752	
Version								
Housing-Ø	80	80	80		80	80	80	
Housing	Stainless steel 304 with crimped bezel 304, plastic front glass							
Meas. elem.	Bourdon tube, brass				Bourdon tube, stainless steel 316 Ti or 316 L			
Accuracy class	1.6	1.6	1.6		1.6	1.6	1.6	
Connection	G 1/2 B	G 1/4 B	G 1/4 B		G 1/2 B	G 1/4 B	G 1/4 B	
			Clamp fixing				Clamp fixing	
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	
Price €								
-1/0	85151701	85151711	85151751		85151702	85151712	85151752	
-1/+0,6	85152701	85152711	85152751		85152702	85152712	85152752	
-1/+1,5	85153701	85153711	85153751		85153702	85153712	85153752	
-1/+3	85154701	85154711	85154751		85154702	85154712	85154752	
-1/+5	85155701	85155711	85155751		85155702	85155712	85155752	
-1/+9	85156701	85156711	85156751		85156702	85156712	85156752	
-1/+15	85157701	85157711	85157751		85157702	85157712	85157752	
Price €								
0/1	85160701	85160711	85160751		85160702	85160712	85160752	
0/1,6	85161701	85161711	85161751		85161702	85161712	85161752	
0/2,5	85162701	85162711	85162751		85162702	85162712	85162752	
0/4	85163701	85163711	85163751		85163702	85163712	85163752	
0/6	85164701	85164711	85164751		85164702	85164712	85164752	
0/10	85165701	85165711	85165751		85165702	85165712	85165752	
0/16	85166701	85166711	85166751		85166702	85166712	85166752	
0/25	85167701	85167711	85167751		85167702	85167712	85167752	
0/40	85168701	85168711	85168751		85168702	85168712	85168752	
Price €								
0/60	85169701	85169711	85169751		85169702	85169712	85169752	
0/100	85170701	85170711	85170751		85170702	85170712	85170752	
0/160	85171701	85171711	85171751		85171702	85171712	85171752	
0/250	85172701	85172711	85172751		85172702	85172712	85172752	
0/400	85173701	85173711	85173751		85173702	85173712	85173752	
Price €								
0/600	---	---	---		85174702	85174712	85174752	
0/1000	---	---	---		85175702	85175712	85175752	
Add. costs					**Price €**	**Price €**	**Price €**	
class 1.0	---	---	---					

Refer to page 326 for additional costs.

Minimum order quantity = 10 pieces

Glycerine filled Bourdon tube pressure gauges EN 837-1

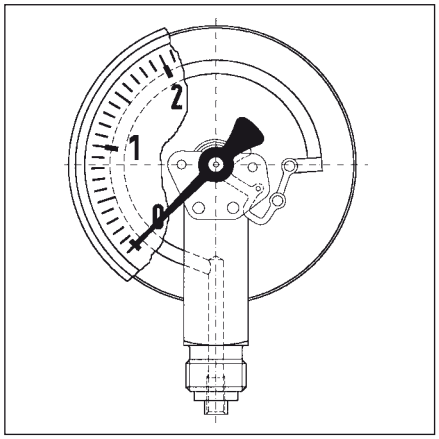
DG: M

	Measuring system brass				Measuring system stainless steel			
Type	RF100Gly,D701	RF100Gly,D711	RF100Gly,D731	RF100Gly,D751	RF100EGly,D702	RF100EGly,D712	RF100EGly,D732	RF100EGly,D752
Version								
Housing-Ø	100	100	100	100	100	100	100	100
Housing	Stainless steel 304 with crimped bezel 304, plastic front glass							
Meas. elem.	Bourdon tube, brass				Bourdon tube, stainless steel 316 Ti or 316 L			
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel, 304	Clamp fixing			3-hole fixing, panel mounting bezel, 304	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85201701**	85201711	85201731	85201751	85201702	85201712	85201732	85201752
-1/+0,6	85202701	85202711	85202731	85202751	85202702	85202712	85202732	85202752
-1/+1,5	85203701	85203711	85203731	85203751	85203702	85203712	85203732	85203752
-1/+3	85204701	85204711	85204731	85204751	85204702	85204712	85204732	85204752
-1/+5	85205701	85205711	85205731	85205751	85205702	85205712	85205732	85205752
-1/+9	85206701	85206711	85206731	85206751	85206702	85206712	85206732	85206752
-1/+15	85207701	85207711	85207731	85207751	85207702	85207712	85207732	85207752
Price €								
0/1	**85210701**	85210711	85210731	85210751	85210702	85210712	85210732	85210752
0/1,6	**85211701**	85211711	85211731	85211751	85211702	85211712	85211732	85211752
0/2,5	**85212701**	85212711	85212731	85212751	85212702	85212712	85212732	85212752
0/4	**85213701**	85213711	85213731	85213751	**85213702**	85213712	85213732	85213752
0/6	**85214701**	85214711	85214731	85214751	**85214702**	85214712	85214732	85214752
0/10	**85215701**	85215711	85215731	85215751	**85215702**	85215712	85215732	85215752
0/16	**85216701**	85216711	85216731	85216751	**85216702**	85216712	85216732	85216752
0/25	**85217701**	85217711	85217731	85217751	**85217702**	85217712	85217732	85217752
0/40	**85218701**	85218711	85218731	85218751	85218702	85218712	85218732	85218752
Price €								
0/60	**85219701**	85219711	85219731	85219751	85219702	85219712	85219732	85219752
0/100	**85220701**	85220711	85220731	85220751	85220702	85220712	85220732	85220752
0/160	**85221701**	85221711	85221731	85221751	85221702	85221712	85221732	85221752
0/250	**85222701**	85222711	85222731	85222751	85222702	85222712	85222732	85222752
0/400	**85223701**	85223711	85223731	85223751	85223702	85223712	85223732	85223752
Price €								
0/600	---	---	---	---	85224702	85224712	85224732	85224752
0/1000	---	---	---	---	85225702	85225712	85225732	85225752
Add. costs					**Price €**	**Price €**	**Price €**	**Price €**
class 1.0	---	---	---	---				

Minimum order quantity for non-stocks items = 10 pieces

Refer to page 326 for additional costs

Glycerine filled Bourdon tube pressure gauges EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For measurements in areas with high levels of vibration and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 8

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = ¾ x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = ⅔ x full scale value
Short-term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Brass, bottom or bottom back:
G½B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element,
≤ 60 bar „C“ type bourdon tube, copper alloy
> 60 bar helical tube, stainless steel 316 Ti or 316 L

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Instrument glass

Filling liquid
Glycerine (99.5 %)

Options

- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Special scales*

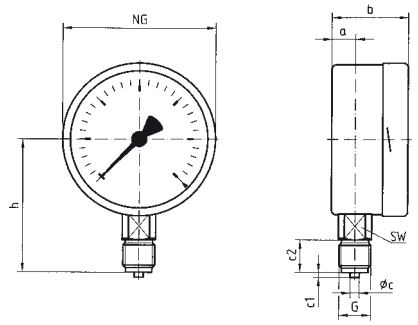
Preise s. Seite 305

Glycerine filled Bourdon tube pressure gauges

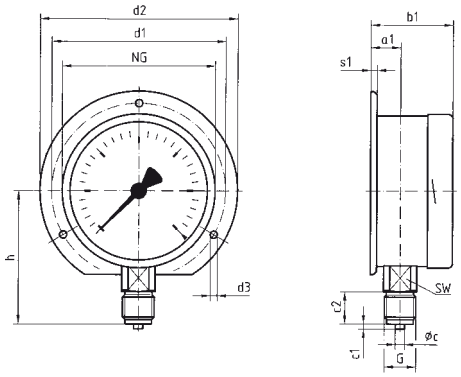
Type D 8 – NG 100/160

Housing types and dimensions

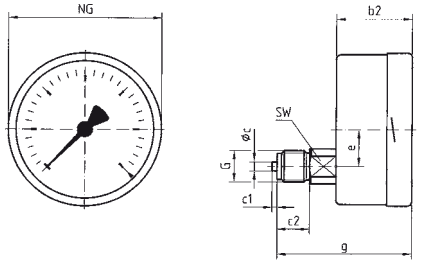
Bottom connection



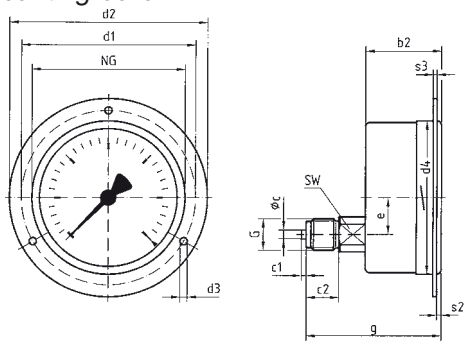
Bottom connection, back flange



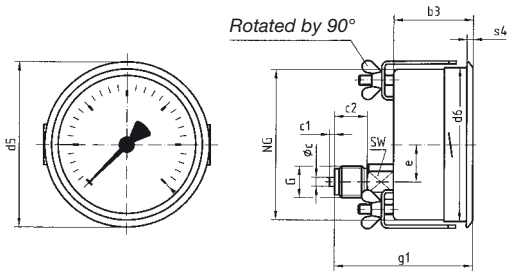
Bottom back connection



Bottom back connection, 3-hole fixing, panel mounting bezel



Bottom back connection, panel mounting bezel for clamp fixing



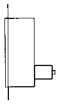
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2	d3*	d4	d5	d6	e	G	g	g1	h	s1
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	26.5	G½B	81	81	86	5.5
160	17.5	20	50	53	50	52	6	3	20	178	196	5.8	164	167	161	26.5	G½B	82	84	116	6
Nominal size (NG)	s2	s3	s4	SW																	
100	4	2	4	22																	
160	4	2	4.5	22																	

* Dimensions according to DIN EN 16064

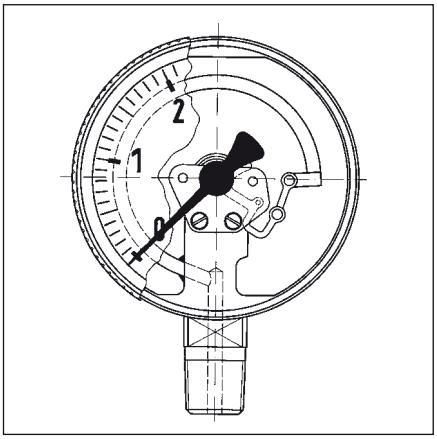
Glycerine filled Bourdon tube pressure gauges EN 837-1

DG: M

Type	RF100Gly,D801	RF100Gly,D811	RF100Gly,D831	RF100Gly,D851	RF160Gly,D801	RF160Gly,D811	RF160Gly,D831	RF160Gly,D851
Version								
Housing-Ø	100	100	100	100	160	160	160	160
Housing	Stainless steel 304, Instrument grade front glass							
Meas. elem.	Bourdon tube, copper alloy (> 60 bar stainless steel 316 Ti or 316 L)							
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304, clamp fixing			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304 clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85201801**	85201811	85201831	85201851	85251801	85251811	85251831	85251851
-1/+0,6	85202801	85202811	85202831	85202851	85252801	85252811	85252831	85252851
-1/+1,5	85203801	85203811	85203831	85203851	85253801	85253811	85253831	85253851
-1/+3	85204801	85204811	85204831	85204851	85254801	85254811	85254831	85254851
-1/+5	85205801	85205811	85205831	85205851	85255801	85255811	85255831	85255851
-1/+9	85206801	85206811	85206831	85206851	85256801	85256811	85256831	85256851
-1/+15	85207801	85207811	85207831	85207851	85257801	85257811	85257831	85257851
Price €								
0/0,6	85209801	85209811	85209831	85209851	85259801	85259811	85259831	85259851
0/1	**85210801**	85210811	85210831	85210851	85260801	85260811	85260831	85260851
0/1,6	**85211801**	85211811	85211831	85211851	85261801	85261811	85261831	85261851
0/2,5	**85212801**	85212811	85212831	85212851	85262801	85262811	85262831	85262851
0/4	**85213801**	**85213811**	85213831	85213851	85263801	85263811	85263831	85263851
0/6	**85214801**	**85214811**	85214831	85214851	85264801	85264811	85264831	85264851
0/10	**85215801**	**85215811**	85215831	85215851	85265801	85265811	85265831	85265851
0/16	**85216801**	**85216811**	85216831	85216851	85266801	85266811	85266831	85266851
0/25	**85217801**	85217811	85217831	85217851	85267801	85267811	85267831	85267851
0/40	**85218801**	85218811	85218831	85218851	85268801	85268811	85268831	85268851
Price €								
0/60	**85219801**	85219811	85219831	85219851	85269801	85269811	85269831	85269851
0/100	**85220801**	85220811	85220831	85220851	85270801	85270811	85270831	85270851
0/160	**85221801**	85221811	85221831	85221851	85271801	85271811	85271831	85271851
0/250	**85222801**	85222811	85222831	85222851	85272801	85272811	85272831	85272851
0/400	**85223801**	85223811	85223831	85223851	85273801	85273811	85273831	85273851
Price €								
0/600	**85224801**	85224811	85224831	85224851	85274801	85274811	85274831	85274851
0/1000	85225801	85225811	85225831	85225851	85275801	85275811	85275831	85275851

Refer to page 326 for additional costs

Glycerine filled Bourdon tube pressure gauges with hot pressed brass housing EN 837-1



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys.
For measurements in areas subject to extreme levels of vibration.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 0

Nominal size
63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/600 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Brass, bottom or centre back
1/4-18 NPT (EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Hot pressed brass 2.0401, lacquered with brass colour, with pressure relief port

Screw type bezel
Brass, bare metal surface, lacquered with transparent lacquer

Front glass
Laminated safety front glass

Filling liquid
Glycerine (99.5 %)

Options

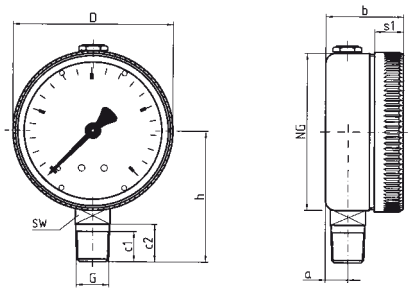
- *Filling liquid silicone oil*
- *Bezel chrome plated, clamp fixing*
- *Special scales*
- *Damping screw*

Refer to page 308 for prices

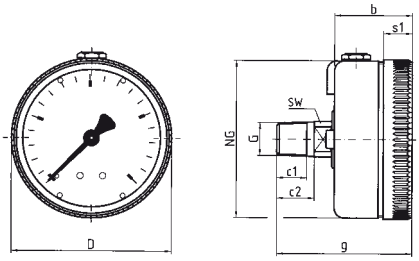
Glycerine filled Bourdon tube pressure gauges with hot pressed brass housing ***Type D 0 – NG 63***

Housing types and dimensions

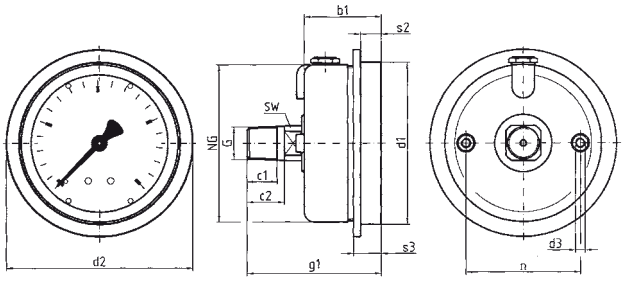
Bottom connection



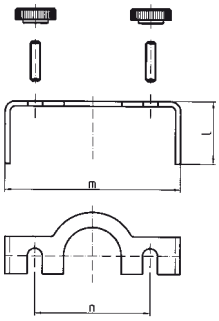
Centre back connection



Centre back connection, for clamp fixing



Clamp fixing

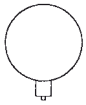


Dimensions (mm)

Nominal size (NG)	*a*	*b*	*b1*	*c1*	*c2*	*D*	*d1*	*d2*	*d3*	*G*	*g*	*g1*	*h*	*l*	*m*	*n*	*s1*	*s2*	*s3*
63	*9*	*31*	*31*	*12*	*15*	*64*	*65*	*75*	*M4*	*1/4-18 NPT*	*54*	*54*	*52.5*	*25*	*70*	*46*	*11.5*	*8.2*	*11.2*
Nominal size (NG)	*SW*																		
63	*14*																		

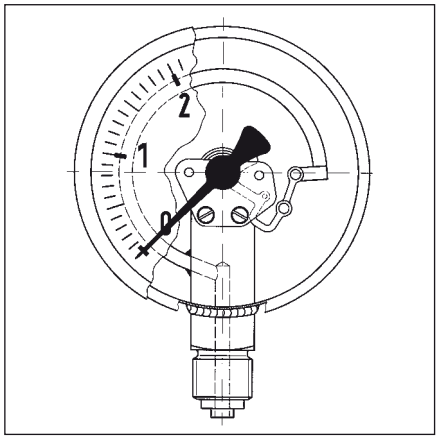
Glycerine filled Bourdon tube pressure gauges with hot pressed brass housing ***EN 837-1***

DG: M

Type	*RF63Gly,D001*	*RF63Gly,D011*	*RF63Gly,D051*
Version			
Housing-Ø	*63*	*63*	*63*
Housing	*Hot pressed brass 2.0401, lacquered with brass-coloured lacquer, laminated safety front glass*		
Meas. elem.	*Bourdon tube element, copper alloy*		
Accuracy class	*1.6*	*1.6*	*1.6*
Connection	*1/4-18NPT*	*1/4-18NPT*	*1/4-18NPT*
			Bezel chrome plated and clamp fixing
Range (bar)	*Part no.*	*Part no.*	*Part no.*
Price €			
-1/0	*85101001*	*85101011*	*85101051*
-1/+0,6	*85102001*	*85102011*	*85102051*
-1/+1,5	*85103001*	*85103011*	*85103051*
-1/+3	*85104001*	*85104011*	*85104051*
-1/+5	*85105001*	*85105011*	*85105051*
-1/+9	*85106001*	*85106011*	*85106051*
-1/+15	*85107001*	*85107011*	*85107051*
Price €			
0/0,6	*85109001*	*85109011*	*85109051*
0/1	*85110001*	*85110011*	*85110051*
0/1,6	*85111001*	*85111011*	*85111051*
0/2,5	*85112001*	*85112011*	*85112051*
0/4	*85113001*	*85113011*	*85113051*
0/6	*85114001*	*85114011*	*85114051*
0/10	*85115001*	*85115011*	*85115051*
0/16	*85116001*	*85116011*	*85116051*
0/25	*85117001*	*85117011*	*85117051*
0/40	*85118001*	*85118011*	*85118051*
Price €			
0/60	*85119001*	*85119011*	*85119051*
0/100	*85120001*	*85120011*	*85120051*
0/160	*85121001*	*85121011*	*85121051*
0/250	*85122001*	*85122011*	*85122051*
0/400	*85123001*	*85123011*	*85123051*
Price €			
0/600	*85124001*	*85124011*	*85124051*

Minimum order quantity = 10 pieces

Bourdon tube pressure gauges for chemical applications EN 837-1



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 9

Nominal size
50 – 63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
NG 50:
-1/0 to -1/+15 bar
0/0.6 to 0/600 bar
NG 63:
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Stainless steel 316 Ti or 316 L
NG 50 bottom or bottom back
NG 63 bottom or centre back
G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (EN 837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304 with pressure relief port

Crimped bezel
Stainless steel 304

Front glass
NG 50 plastic
NG 63 laminated safety glass

Options

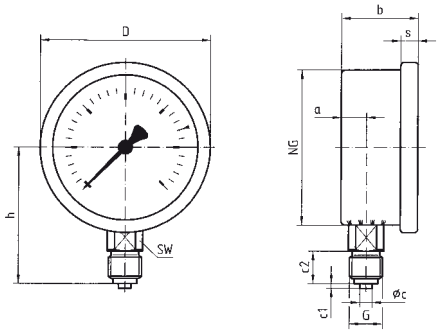
- *Plastic front glass (NG 63)*
- *Brass movement*
- *Back flange (NG 63)*
- *Clamp fixing*
- *3-hole fixing, panel mounting bezel (NG 63)*
- *Crimped bezel, polished*
- *Special scales*

Refer to page 311 for prices

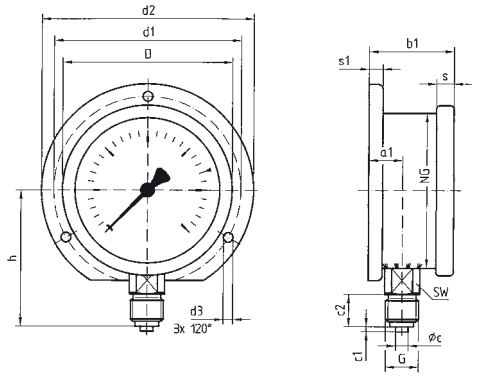
Bourdon tube pressure gauges for chemical applications **Type D 9 – NG 50/63**

Housing types and dimensions

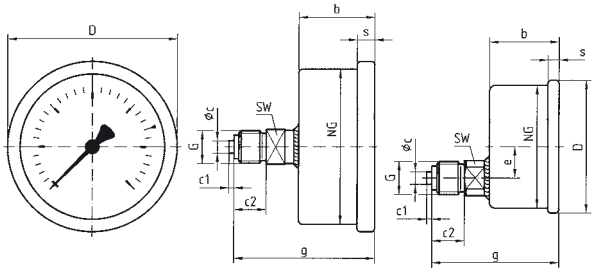
Bottom connection NG 50/63



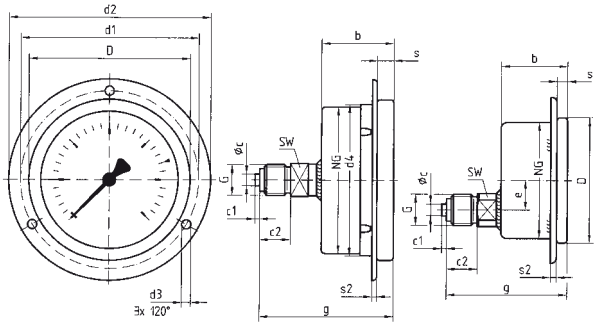
Bottom connection, back flange, NG 63



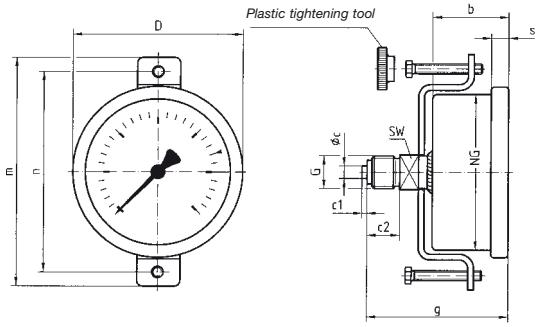
Bottom back connection NG 63 NG 50



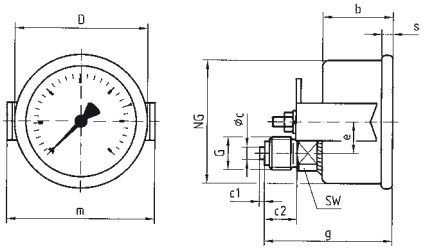
Bottom back connection, 3-hole fixing, panel mounting bezel NG 63 NG 50



Bottom back connection, clamp fixing, NG 63



Bottom back connection, clamp fixing, NG 50



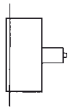
Dimensions (mm)

Nominal size (NG)	a	a_1	b	b_1	Øc	c_1	c_2	d_1*	d_2*	d_3*	d_4	D	e	G	g	h	m	n	s	s_1	s_2
50	10.5	-	28	-	5	2	13	60	70	3.6	-	53	12.5	G¼B	51	46	59	-	4.5	-	2.5
63	9.5	13	30.5	34	5	2	13	75	85	3.6	64	68	-	G¼B	56	53	94	82	7	5.5	2
Nominal size (NG)	SW																				
50	14																				
63	14																				

* Dimensions according to DIN 16063

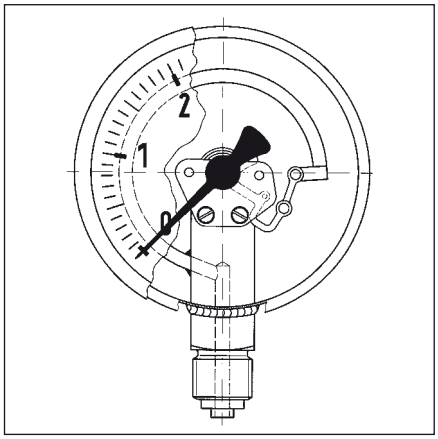
Bourdon tube pressure gauges for chemical applications EN 837-1

DG: M

Type	RF50Ch,D902	RF50Ch,D912	RF50Ch,D952		RF63Ch,D902	RF63Ch,D912	RF63Ch,D932	RF63Ch,D952
Version								
Housing-Ø	50	50	50		63	63	63	63
Housing	Stainless steel 304 with crimped bezel 304							
Meas. elem.	Bourdon tube, stainless steel 316 Ti or 316 L							
Accuracy class	1.6	1.6	1.6		1.6	1.6	1.6	1.6
Connection	G1/4B	G1/4B	G1/4B		G1/4B	G1/4B	G1/4B	G1/4B
			Clamp fixing				3-hole fixing, panel mounting bezel 304, bare metal surface	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85051902	85051912	85051952		**85101902**	85101912	85101932	85101952
-1/+0,6	85052902	85052912	85052952		85102902	85102912	85102932	85102952
-1/+1,5	85053902	85053912	85053952		85103902	85103912	85103932	85103952
-1/+3	85054902	85054912	85054952		85104902	85104912	85104932	85104952
-1/+5	85055902	85055912	85055952		85105902	85105912	85105932	85105952
-1/+9	85056902	85056912	85056952		85106902	85106912	85106932	85106952
-1/+15	85057902	85057912	85057952		85107902	85107912	85107932	85107952
Price €								
0/0,6	85059902	85059912	85059952		85109902	85109912	85109932	85109952
0/1	85060902	85060912	85060952		**85110902**	85110912	85110932	85110952
0/1,6	85061902	85061912	85061952		**85111902**	85111912	85111932	85111952
0/2,5	85062902	85062912	85062952		**85112902**	85112912	85112932	85112952
0/4	85063902	85063912	85063952		**85113902**	85113912	85113932	85113952
0/6	85064902	85064912	85064952		**85114902**	**85114912**	**85114932**	**85114952**
0/10	85065902	85065912	85065952		**85115902**	**85115912**	**85115932**	**85115952**
0/16	85066902	85066912	85066952		**85116902**	**85116912**	**85116932**	**85116952**
0/25	85067902	85067912	85067952		**85117902**	**85117912**	**85117932**	**85117952**
0/40	85068902	85068912	85068952		**85118902**	85118912	85118932	85118952
Price €								
0/60	85069902	85069912	85069952		85119902	85119912	85119932	85119952
0/100	85070902	85070912	85070952		85120902	85120912	85120932	85120952
0/160	85071902	85071912	85071952		85121902	85121912	85121932	85121952
0/250	85072902	85072912	85072952		85122902	85122912	85122932	85122952
0/400	85073902	85073912	85073952		85123902	85123912	85123932	85123952
Price €								
0/600	85074902	85074912	85074952		85124902	85124912	85124932	85124952
0/1000	---	---	---		85125902	85125912	85125932	85125952

Refer to page 326 for additional costs

Bourdon tube pressure gauges for chemical applications ***EN 837-1***



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
NG 100 0/0.6 to 0/1,000 bar
NG 160 0/0.6 to 0/1,600 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = ¾ x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = ⅔ x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom or bottom back
G½B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (EN 837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

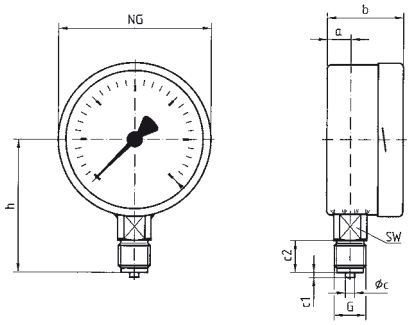
- *Brass movement*
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Special scales*
- *Electrical contacts*

Refer to page 314 for prices

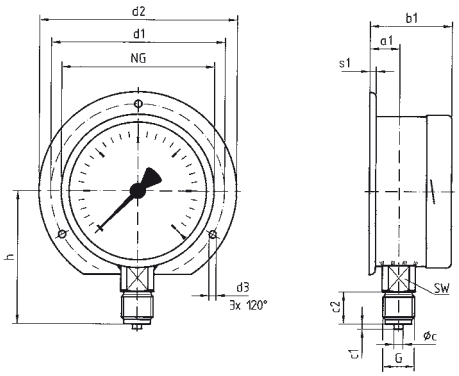
Bourdon tube pressure gauges for chemical applications **Type D 4 – NG 100/160**

Housing types and dimensions

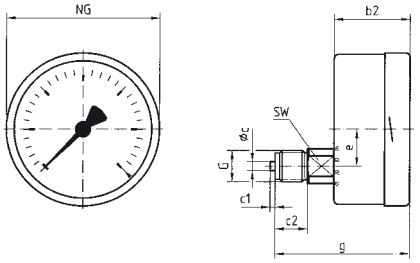
Bottom connection



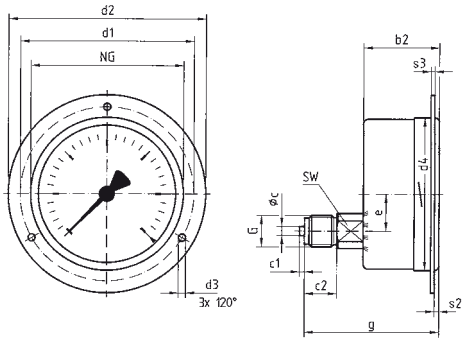
Bottom connection, back flange



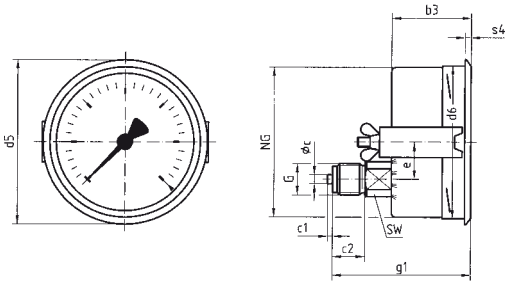
Bottom back connection



Bottom back connection, 3-hole fixing, panel mounting bezel



Bottom back connection, panel mounting bezel for clamp fixing



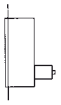
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2*	d3*	d4	d5	d6	e	G	g	g1	h	s1
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	34.5	G½B	83	83	86	5.5
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	34.5	G½B	84	86	116	6
Nominal size (NG)	s2	s3	s4	SW																	
100	4	2	4	22																	
160	4	2	4.5	22																	

* Dimensions according to DIN 16064

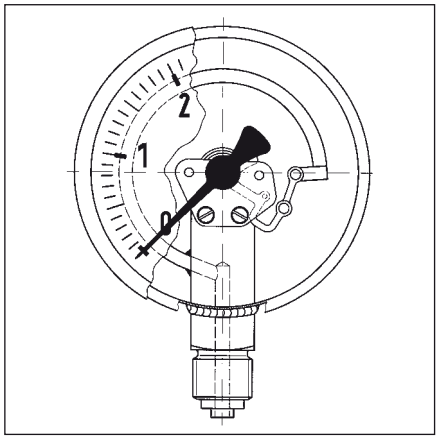
Bourdon tube pressure gauges for chemical applications EN 837-1

DG: M

Type	RF100Ch,D402	RF100Ch,D412	RF100Ch,D432	RF100Ch,D452	RF160Ch,D802	RF160Ch,D412	RF160Ch,D432	RF160Ch,D452
Version								
Housing-Ø	100	100	100	100	160	160	160	160
Housing	Stainless steel 304 with bayonet type bezel, laminated safety front glass							
Meas. elem.	Bourdon tube, stainless steel 316 Ti or 316 L							
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B
			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304 polished, clamp fixing			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304 polished, clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85201402**	85201412	85201432	85201452	85251402	85251412	85251432	85251452
-1/+0,6	85202402	85202412	85202432	85202452	85252402	85252412	85252432	85252452
-1/+1,5	85203402	85203412	85203432	85203452	85253402	85253412	85253432	85253452
-1/+3	85204402	85204412	85204432	85204452	85254402	85254412	85254432	85254452
-1/+5	85205402	85205412	85205432	85205452	85255402	85255412	85255432	85255452
-1/+9	85206402	85206412	85206432	85206452	85256402	85256412	85256432	85256452
-1/+15	85207402	85207412	85207432	85207452	85257402	85257412	85257432	85257452
Price €								
0/0,6	**85209402**	85209412	85209432	85209452	85259402	85259412	85259432	85259452
0/1	**85210402**	85210412	85210432	85210452	85260402	85260412	85260432	85260452
0/1,6	**85211402**	85211412	85211432	85211452	85261402	85261412	85261432	85261452
0/2,5	**85212402**	85212412	85212432	85212452	85262402	85262412	85262432	85262452
0/4	**85213402**	**85213412**	85213432	85213452	**85263402**	85263412	85263432	85263452
0/6	**85214402**	**85214412**	85214432	85214452	**85264402**	85264412	85264432	85264452
0/10	**85215402**	**85215412**	85215432	85215452	**85265402**	85265412	85265432	85265452
0/16	**85216402**	85216412	85216432	85216452	**85266402**	85266412	85266432	85266452
0/25	**85217402**	85217412	85217432	85217452	**85267402**	85267412	85267432	85267452
0/40	**85218402**	85218412	85218432	85218452	85268402	85268412	85268432	85268452
Price €								
0/60	**85219402**	85219412	85219432	85219452	85269402	85269412	85269432	85269452
0/100	**85220402**	85220412	85220432	85220452	85270402	85270412	85270432	85270452
0/160	**85221402**	85221412	85221432	85221452	85271402	85271412	85271432	85271452
0/250	**85222402**	85222412	85222432	85222452	**85272402**	85272412	85272432	85272452
0/400	**85223402**	85223412	85223432	85223452	85273402	85273412	85273432	85273452
Price €								
0/600	**85224402**	85224412	85224432	85224452	85274402	85274412	85274432	85274452
0/1000	85225402	85225412	85225432	85225452	85275402	85275412	85275432	85275452
0/1600	---	---	---	---	85276402	85276412	85276432	85276452

Refer to page 326 for additional costs.

Bourdon tube pressure gauges with glycerine filling, for chemical applications EN 837-1



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres.
For measurement in areas subject to high vibration levels and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 7

Nominal size
50 – 63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
NG 50:
-1/0 to -1/+15 bar
0/0.6 to 0/600 bar
NG 63:
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Stainless steel 316 Ti or 316 L
NG 50 bottom or bottom back
NG 63 bottom or centre back
G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (EN 837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with pressure relief port

Crimped bezel
Stainless steel 304

Front glass
NG 50 plastic
NG 63 laminated safety glass

Filling liquid
Glycerine (99.5 %)

Options

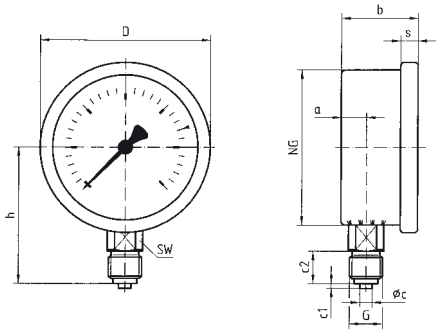
- *Filling liquid silicone oil*
- *Plastic front glass (NG 63)*
- *Brass movement*
- *Back flange (NG 63)*
- *Clamp fixing*
- *3-hole fixing, panel mounting bezel, (NG 63)*
- *Crimped bezel, polished*
- *Special scales*

Refer to page 317 for prices

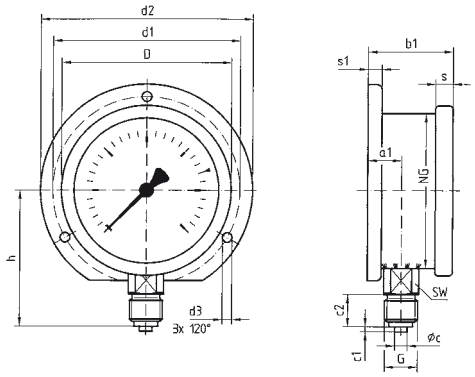
Bourdon tube pressure gauges with glycerine filling, for chemical applications **Type D 7 – NG 50/63**

Housing types and dimensions

Bottom connection NG 50/63

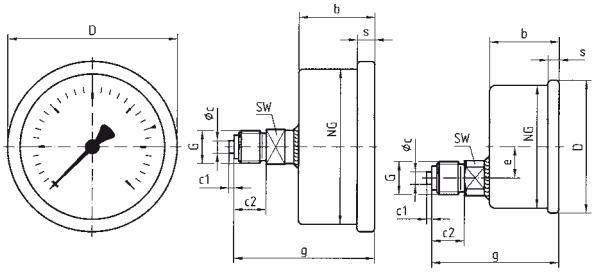


Bottom connection, back flange, NG 63



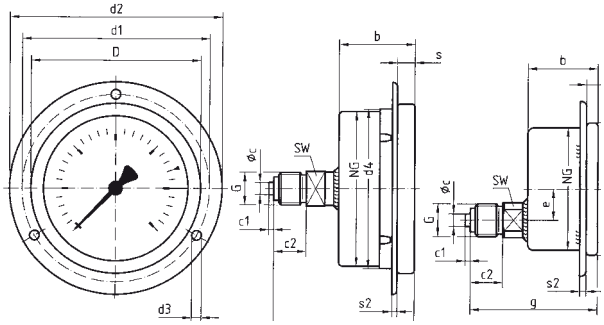
Centre or bottom back connection

NG 63 *NG 50*

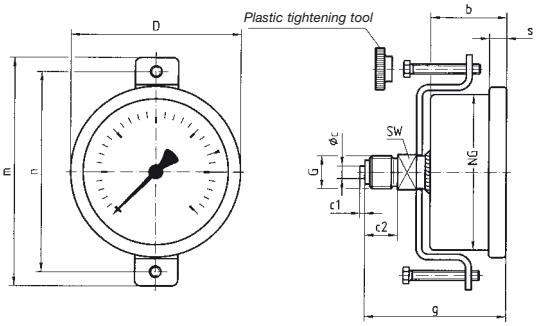


Centre or bottom back connection, 3-hole fixing, panel mounting bezel

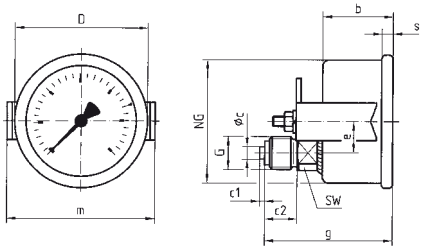
NG 63 *NG 50*



Centre back connection, clamp fixing, NG 63



Bottom back connection, clamp fixing, NG 50



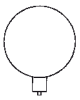
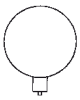
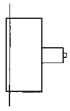
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	d1*	d2*	d3*	d4	D	e	G	g	h	m	n	s	s1	s2
50	10.5	-	28	-	5	2	13	60	70	3.6	-	53	12.5	G1/4B	51	46	59	-	4.5	-	2.5
63	9.5	13	30.5	34	5	2	13	75	85	3.6	64	68	-	G1/4B	56	53	94	82	7	5.5	2
Nominal size (NG)	SW																				
50	14																				
63	14																				

* Dimensions according to DIN 16063

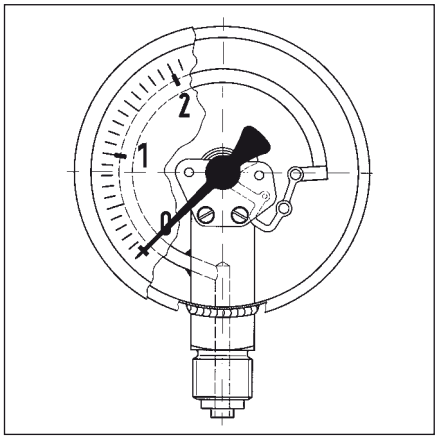
Bourdon tube pressure gauges with glycerine filling, for chemical applications EN 837-1

DG: M

Type	RF50ChGly,D702	RF50ChGly,D712	RF50ChGly,D752		RF63ChGly,D702	RF63ChGly,D712	RF63ChGly,D732	RF63ChGly,D752
Version								
Housing-Ø	50	50	50		63	63	63	63
Housing	Stainless steel 304 with crimped bezel 304							
Meas. elem.	Bourdon tube, stainless steel 316 Ti or 316 L							
Accuracy class	1.6	1.6	1.6		1.6	1.6	1.6	1.6
Connection	G1/4B	G1/4B	G1/4B		G1/4B	G1/4B	G1/4B	G1/4B
			Clamp fixing				3-hole fixing, panel mounting bezel, 304, bare metal surface	Clamp fixing
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85051702	85051712	85051752		85101702	85101712	85101732	85101752
-1/+0,6	85052702	85052712	85052752		85102702	85102712	85102732	85102752
-1/+1,5	85053702	85053712	85053752		85103702	85103712	85103732	85103752
-1/+3	85054702	85054712	85054752		85104702	85104712	85104732	85104752
-1/+5	85055702	85055712	85055752		85105702	85105712	85105732	85105752
-1/+9	85056702	85056712	85056752		85106702	85106712	85106732	85106752
-1/+15	85057702	85057712	85057752		85107702	85107712	85107732	85107752
Price €								
0/0,6	85059702	85059712	85059752		85109702	85109712	85109732	85109752
0/1	85060702	85060712	85060752		85110702	85110712	85110732	85110752
0/1,6	85061702	85061712	85061752		85111702	85111712	85111732	85111752
0/2,5	85062702	85062712	85062752		**85112702**	85112712	85112732	85112752
0/4	85063702	85063712	85063752		**85113702**	**85113712**	**85113732**	**85113752**
0/6	85064702	85064712	85064752		**85114702**	**85114712**	**85114732**	**85114752**
0/10	85065702	85065712	85065752		**85115702**	**85115712**	**85115732**	**85115752**
0/16	85066702	85066712	85066752		**85116702**	**85116712**	**85116732**	**85116752**
0/25	85067702	85067712	85067752		**85117702**	85117712	85117732	85117752
0/40	85068702	85068712	85068752		**85118702**	85118712	85118732	85118752
Price €								
0/60	85069702	85069712	85069752		**85119702**	85119712	85119732	85119752
0/100	85070702	85070712	85070752		**85120702**	85120712	85120732	85120752
0/160	85071702	85071712	85071752		**85121702**	85121712	85121732	85121752
0/250	85072702	85072712	85072752		**85122702**	85122712	85122732	85122752
0/400	85073702	85073712	85073752		**85123702**	85123712	85123732	85123752
Price €								
0/600	85074702	85074712	85074752		85124702	85124712	85124732	85124752
0/1000	---	---	---		85125702	85125712	85125732	85125752

Refer to page 326 for additional costs

Bourdon tube pressure gauges with glycerine filling, for chemical applications EN 837-1



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres.
For measurement in areas with high vibration levels and high, dynamic pressure loads.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 8

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
NG 100 0/0.6 to 0/1,000 bar
NG 160 0/0.6 to 0/1,600 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = 3/4 x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = 2/3 x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529)
with housing vent (≤ 25 bar)
IP 54

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom or bottom back
G1/2B- spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (EN 837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Filling liquid
Glycerine (99.5 %)

Options

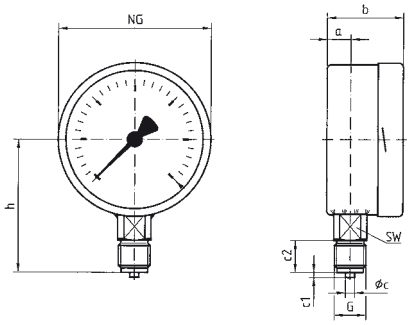
- *Filling liquid silicone oil*
- *Brass movement*
- *Back flange*
- *Panel mounting bezel for clamp fixing*
- *3-hole fixing, panel mounting bezel*
- *Special scales*

Refer to page 320 for prices

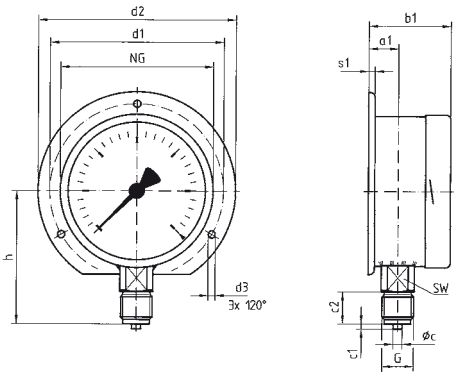
Bourdon tube pressure gauges with glycerine filling, for chemical applications **Type D 8 – NG 100/160**

Housing types and dimensions

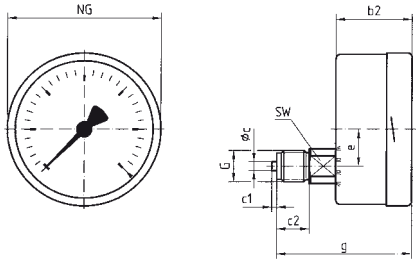
Bottom connection



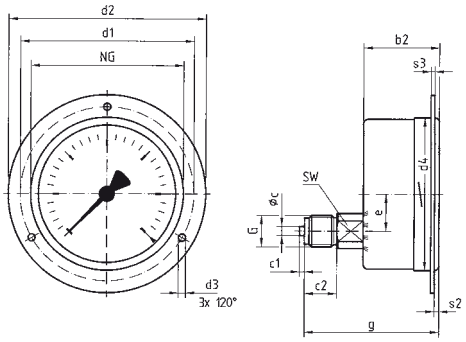
Bottom connection, back flange



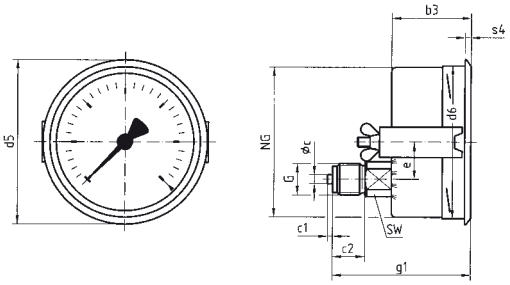
Bottom back connection



Bottom back connection, 3-hole fixing, panel mounting bezel



Bottom back connection, panel mounting bezel for clamp fixing



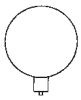
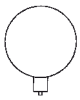
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2*	d3*	d4	d5	d6	e	G	g	g1	h	s1
100	15.6	19.1	49	52.5	49	49	6	3	20	116	132	4.8	104	107	101	34.5	G1/2B	83	83	86	5.5
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	34.5	G1/2B	84	86	116	6
Nominal size (NG)	s2	s3	s4	SW																	
100	4	2	4	22																	
160	4	2	4.5	22																	

* Dimensions according to DIN 16064

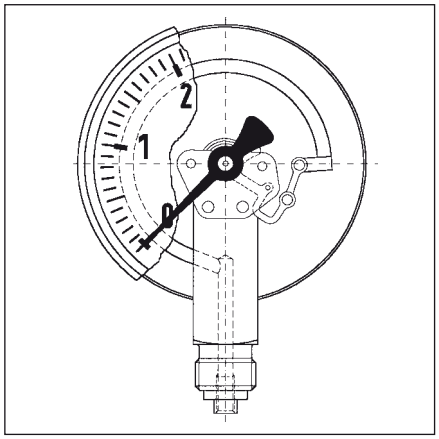
Bourdon tube pressure gauges with glycerine filling, for chemical applications EN 837-1

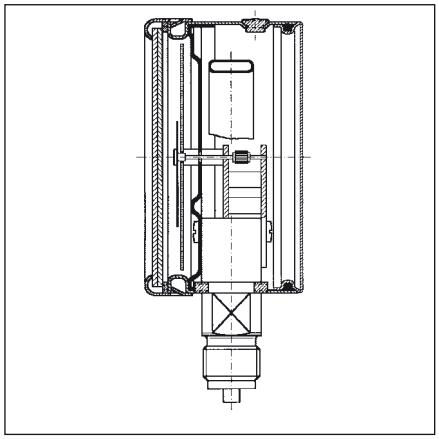
DG: M

Type	RF100ChGly, D802	RF100ChGly, D812	RF100ChGly, D832	RF100ChGly, D852	RF160ChGly, D802	RF160ChGly, D812	RF160ChGly, D832	RF160ChGly, D852
Version								
Housing-Ø	100	100	100	100	160	160	160	160
Housing	Stainless steel 304 with bayonet type bezel, laminated safety front glass							
Meas. elem.	Bourdon tube, stainless steel 316 Ti or 316 L							
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B
			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304 polished clamp fixing			3-hole fixing, panel mounting bezel, 304 polished	Panel mounting bezel, 304 polished clamp fixing
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	**85201802**	85201812	85201832	85201852	85251802	85251812	85251832	85251852
-1/+0,6	85202802	85202812	85202832	85202852	85252802	85252812	85252832	85252852
-1/+1,5	85203802	85203812	85203832	85203852	85253802	85253812	85253832	85253852
-1/+3	85204802	85204812	85204832	85204852	85254802	85254812	85254832	85254852
-1/+5	85205802	85205812	85205832	85205852	85255802	85255812	85255832	85255852
-1/+9	85206802	85206812	85206832	85206852	85256802	85256812	85256832	85256852
-1/+15	85207802	85207812	85207832	85207852	85257802	85257812	85257832	85257852
Price €								
0/0,6	85209802	85209812	85209832	85209852	85259802	85259812	85259832	85259852
0/1	**85210802**	85210812	85210832	85210852	85260802	85260812	85260832	85260852
0/1,6	**85211802**	85211812	85211832	85211852	85261802	85261812	85261832	85261852
0/2,5	**85212802**	85212812	85212832	85212852	85262802	85262812	85262832	85262852
0/4	**85213802**	85213812	85213832	85213852	85263802	85263812	85263832	85263852
0/6	**85214802**	85214812	85214832	85214852	85264802	85264812	85264832	85264852
0/10	**85215802**	85215812	85215832	85215852	85265802	85265812	85265832	85265852
0/16	**85216802**	85216812	85216832	85216852	85266802	85266812	85266832	85266852
0/25	**85217802**	85217812	85217832	85217852	85267802	85267812	85267832	85267852
0/40	**85218802**	85218812	85218832	85218852	85268802	85268812	85268832	85268852
Price €								
0/60	**85219802**	85219812	85219832	85219852	85269802	85269812	85269832	85269852
0/100	**85220802**	85220812	85220832	85220852	85270802	85270812	85270832	85270852
0/160	**85221802**	85221812	85221832	85221852	85271802	85271812	85271832	85271852
0/250	**85222802**	85222812	85222832	85222852	85272802	85272812	85272832	85272852
0/400	**85223802**	85223812	85223832	85223852	85273802	85273812	85273832	85273852
Price €								
0/600	**85224802**	85224812	85224832	85224852	85274802	85274812	85274832	85274852
0/1000	85225802	85225812	85225832	85225852	85275802	85275812	85275832	85275852
0/1600	---	---	---	---	85276802	85276812	85276832	85276852

Refer to page 326 for additional costs

Bourdon tube safety pressure gauges EN 837-1





Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres. This gauge is designed for applications according to EN 837-1/9.7.2.

Type
D 4

Nominal size
63

Accuracy class (EN 837-1/6)
1.6
(> 0/600 bar 2.5)

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom or bottom back
G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (EN 837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with solid baffle wall and blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

- *Glycerine filling (type D 8)*
- *3-hole fixing, panel mounting bezel*

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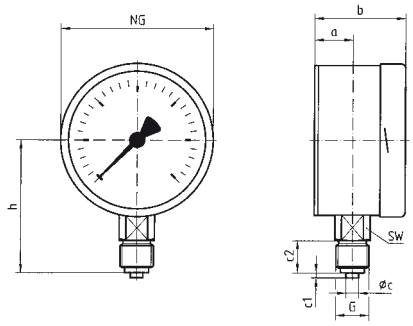
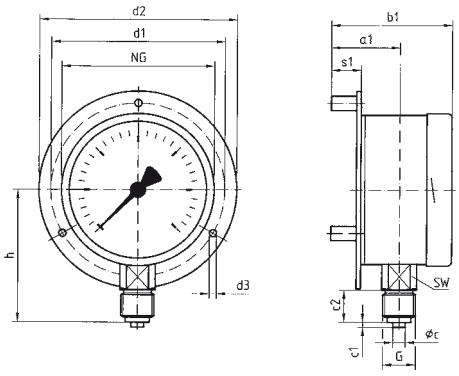
Refer to page 325 for prices

Bourdon tube safety pressure gauges **Type D 4 – NG 63**

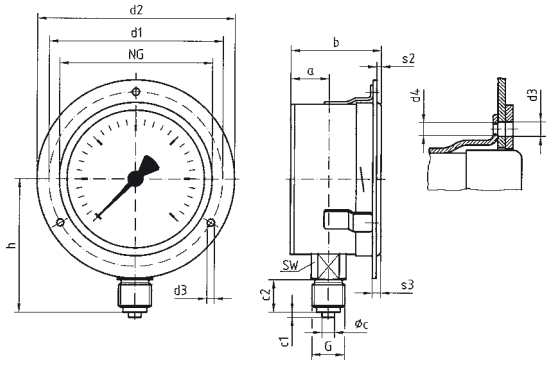
Housing types and dimensions



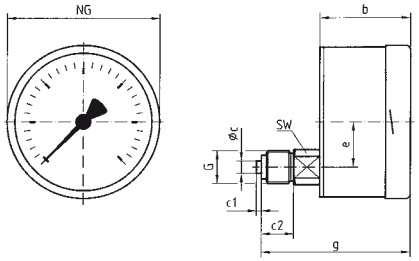
Bottom connection, back flange



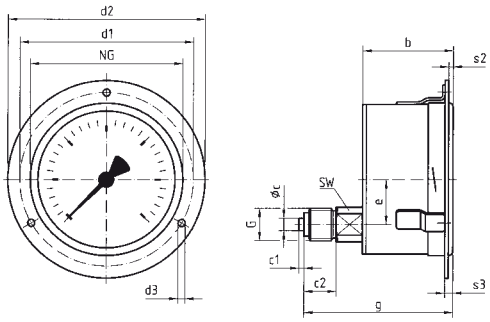
Bottom connection, 3-hole fixing, panel mounting bezel



Bottom back connection



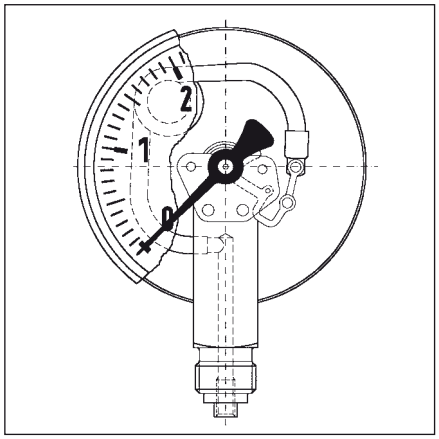
Bottom back connection, 3-hole fixing, panel mounting bezel

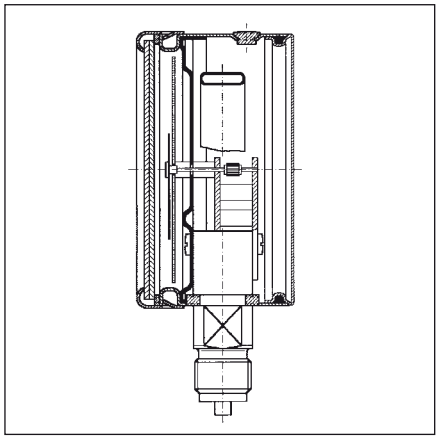


Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	d1	d2	d3	d4	e	g	G	h	s1	s2	s3	SW
63	18	38	41	61	5	2	13	75	85	3.6	M3	18	60	G1/4B	54	21	3	5	14

Bourdon tube safety pressure gauges EN 837-1





Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres. This gauge is designed for applications according to EN 837-1/9.7.2.

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = ¾ x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = ⅔ x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ± 0.4 %/10 K
falling temp. approx. ± 0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom
G½B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube,
> 60 bar helical tube
leak tested (EN837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with solid baffle wall and blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

- *Glycerine filling (type D 8)*
- *3-hole fixing, panel mounting bezel*

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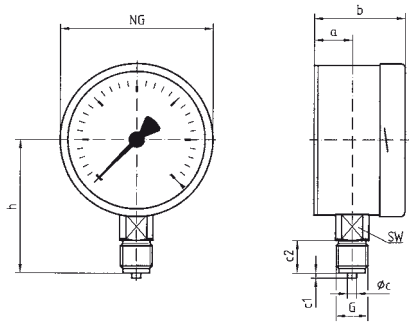
Refer to page 325 for prices

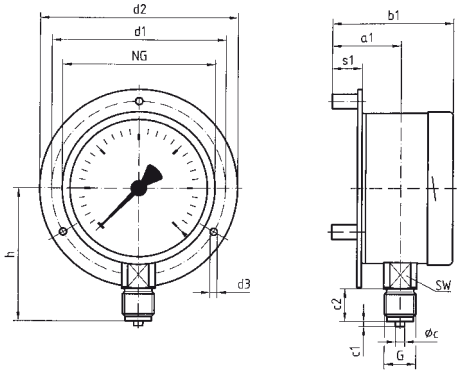
Bourdon tube safety pressure gauges *Type D 4 – NG 100/160*

Housing types and dimensions

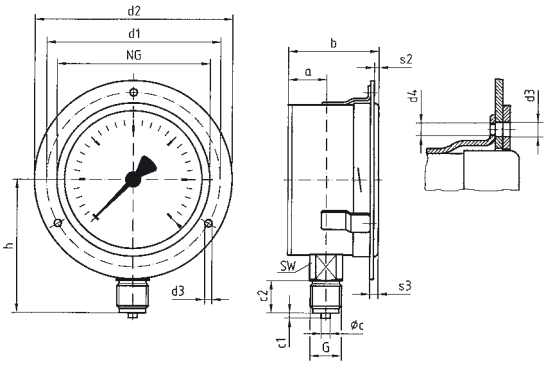
Bottom connection



Bottom connection, back flange



Bottom connection, 3-hole fixing, panel mounting bezel



Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*Øc*	*c1*	*c2*	*d1**	*d2**	*d3**	*d4*	*G*	*h*	*s1*	*s2*	*s3*	*SW*
100	*27*	*57*	*60*	*90*	*6*	*3*	*20*	*116*	*132*	*4.8*	*M4*	*G½B*	*87*	*32*	*3*	*5*	*22*
160	*40*	*70*	*78*	*108*	*6*	*3*	*20*	*178*	*196*	*5.8*	*M5*	*G½B*	*118*	*32*	*3*	*5*	*22*

** Dimensions according to DIN EN 16064*

Bourdon tube safety pressure gauges EN 837-1

DG: H

with glycerine filling

Type	RF63Si. D402	RF63Si, D412	RF100Si, D402	RF160Si, D402	RF63SiGly, D802	RF63SiGly, D812	RF100SiGly, D802	RF160SiGly, D802
Version								
Housing-Ø	63	63	100	160	63	63	100	160
Housing	Stainless steel 304 with bayonet type bezel, laminated safety front glass, blow-out							
Meas. elem.	Bourdon tube, stainless steel 316 Ti or 316 L							
Accuracy class	1.6*	1.6*	1.0	1.0	1.6*	1.6*	1.0	1.0
Connection	G1/4B	G1/4B	G1/2B	G1/2B	G1/4B	G1/4B	G1/2B	G1/2B
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85401402	85401412	85451402	85501402	85401802	85401812	85451802	85501802
-1/+0,6	85402402	85402412	85452402	85502402	85402802	85402812	85452802	85502802
-1/+1,5	85403402	85403412	85453402	85503402	85403802	85403812	85453802	85503802
-1/+3	85404402	85404412	85454402	85504402	85404802	85404812	85454802	85504802
-1/+5	85405402	85405412	85455402	85505402	85405802	85405812	85455802	85505802
-1/+9	85406402	85406412	85456402	85506402	85406802	85406812	85456802	85506802
-1/+15	85407402	85407412	85457402	85507402	85407802	85407812	85457802	85507802
Price €								
0/0.6	85409402	85409412	85459402	85509402	85409802	85409812	85459802	85509802
0/1	85410402	85410412	85460402	85510402	85410802	85410812	85460802	85510802
0/1,6	85411402	85411412	85461402	85511402	85411802	85411812	85461802	85511802
0/2,5	85412402	85412412	85462402	85512402	85412802	85412812	85462802	85512802
0/4	85413402	85413412	85463402	85513402	85413802	85413812	85463802	85513802
0/6	85414402	85414412	85464402	85514402	85414802	85414812	85464802	85514802
0/10	85415402	85415412	85465402	85515402	85415802	85415812	85465802	85515802
0/16	85416402	85416412	85466402	85516402	85416802	85416812	85466802	85516802
0/25	85417402	85417412	85467402	85517402	85417802	85417812	85467802	85517802
0/40	85418402	85418412	85468402	85518402	85418802	85418812	85468802	85518802
Price €								
0/60	85419402	85419412	85469402	85519402	85419802	85419812	85469802	85519802
0/100	85420402	85420412	85470402	85520402	85420802	85420812	85470802	85520802
Price €								
0/160	85421402	85421412	85471402	85521402	85421802	85421812	85471802	85521802
0/250	85422402	85422412	85472402	85522402	85422802	85422812	85472802	85522802
0/400	85423402	85423412	85473402	85523402	85423802	85423812	85473802	85523802
0/600	85424402	85424412	85474402	85524402	85424802	85424812	85474802	85524802
Price €								
0/1000	85425402	85425412	85475402	85525402	85425802	85425812	85475802	85525802

* > 0/600 bar class 2.5

Refer to pages 326 and 372 for additional costs and for electrical contacts respectively.

Additional costs for Bourdon tube pressure gauges

(industrial, glycerine, chemical, safety versions)

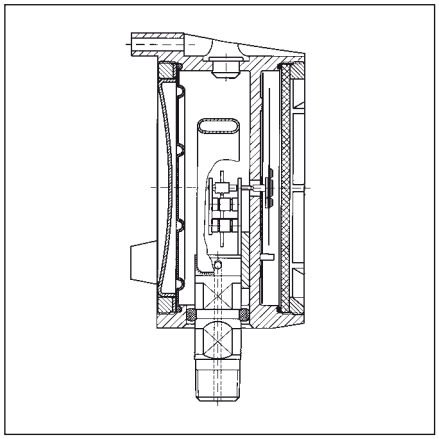
DG: M

Housing diameter (mm)	***50***	***63***	***100***	***160***
Description	***Price €*** *Part no.*	***Price €*** *Part no.*	***Price €*** *Part no.*	***Price €*** *Part no.*
Housing 304 polished	*38281*	*38282*	*38283*	*38284*
Bayonet type bezel 304 polished	*---*	*38286*	*38287*	*38288*
Crimped bezel 304 polished	*38289*	*38290*	*38291*	*---*
Laminated safety front glass	*---*	*38072*	*38074*	*38075*
Connection socket nickel/chrome plated	*38083*	*38084*	*38086*	*38087*
Connection socket with special thread	*on request*	*on request*	*on request*	*on request*
Damping screw brass - hole 0.3 - 0.5 - 0.7 mm (please specify)	*38096*	*38097*	*38099*	*38100*
Damping screw stainless steel - hole 0.3 - 0.5 - 0.7 mm (please specify)	*38102*	*38103*	*38105*	*38106*
Red mark on dial	*38183*	*38184*	*38186*	*38187*
1 reference pointer red - external knob adjustment for gauges without filling (plastic front glass)	*---*	*38188*	*38190*	*38191*
1 reference pointer red - external knob adjustment for filled gauges (plastic front glass)	*---*	*38301*	*38302*	*38303*
Max. pointer for gauges without filling (only for gauges with bayonet type bezel, plastic front glass)	*---*	*---*	*38129*	*38130*
Max. pointer for filled gauges (only for gauges with bayonet type bezel, plastic front glass)	*---*	*---*	*38306*	*38307*
Knife edge pointer	*---*	*38133*	*38135*	*38136*
MICRO-adjustable pointer for zero correction	*---*	*38335*	*38308*	*38309*
Damped movement	*on request*	*on request*	*38293*	*38294*
Measuring system hard-soldered, suitable for T_{max} Medium temperature of +180 °C (Note: gauges with filling = Tmax Medium temperature of +130 °C)	*---*	*38295*	*38296*	*38297*
Version suitable for high accuracy calibration approval, housing can be sealed, serial number on dial (only for housing with bayonet type bezel)	*---*	*---*	*38298*	*38299*
Special mounting position	*38146*	*38147*	*38149*	*38150*
Wetted parts cleaned for oxygen[1)] – label „Oxygen“, „Free from oil and grease“ (only gauges without filling)	*38138*	*38139*	*38141*	*38142*
Higher protection IP 54 (only gauges with bayonet type bezel)	*38310*	*38311*	*38312*	*38313*
Printing block costs per scale and colour (scale design as per EN 837-1, others on request)	*38152*	*38153*	*38155*	*38156*
Printing costs per additional colour	*38164*	*38165*	*38167*	*38168*

[1)] Observe table „Selection criteria according to EN 837-2“ (refer to appendix).

Refer to „Accessories for panel mounting and wall mounting“ on page 403.

Bourdon tube pressure gauges type Process Gauge



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. Specially suitable for the oil and chemical industries.

Type
D 1

Nominal size
4 1/2”

Accuracy class
Grade 2A according to ANSI B 40.1 (corresponds to class 0.5)

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/1,000 bar

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value
Short term:
1.3 x full scale value

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -40 °C
T_{max} = +65 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.3 %/10 K
falling temp. approx. ±0.3 %/10 K
percentage of full scale value

Protection
IP 45 (EN 60529)

Standard version

Connection
Stainless steel AISI 316 Ti or 316 L, bottom or bottom back
1/2-14 NPT – spanner size 22

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (EN 837-1/9.5.6)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Micro-adjustable pointer
Brass, black
Gear brass, nickel plated

Housing
PP-GF20, black
with solid baffle wall
and blow-out
Integrated back flange

Screw type bezel
PP-GF20, black
internal

Front glass
Plastic (PMMA)

Options

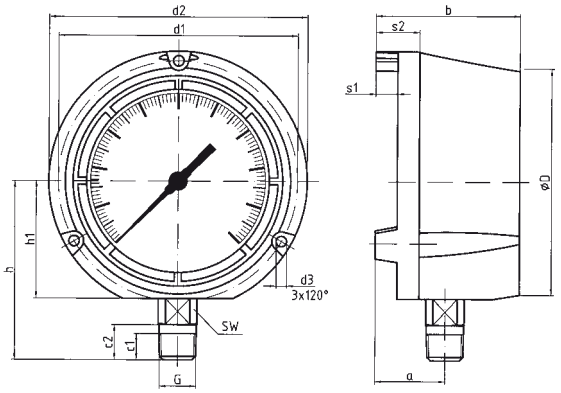
- *Glycerine filling (type D6)*
- *Silicone oil filling (type D6)*
- *Special scales*
- *Copper alloy measuring system*
- *Monel measuring system*
- *Laminated safety front glass*
- *Damping screw*
- *Reference pointer*
- *Max. pointer*
- *Electrical contacts*

Refer to page 329 for prices

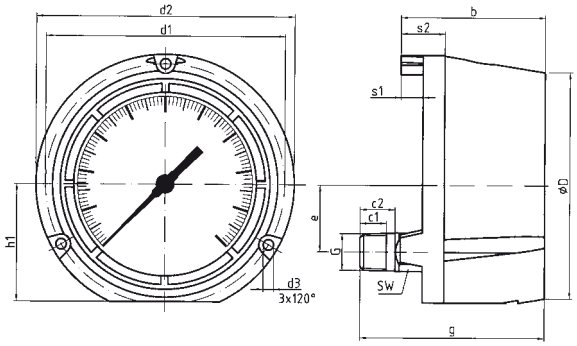
Bourdon tube pressure gauges type Process Gauge Class 0.5 **Type D 1/D 6 – NG 4 1/2“**

Housing types and dimensions

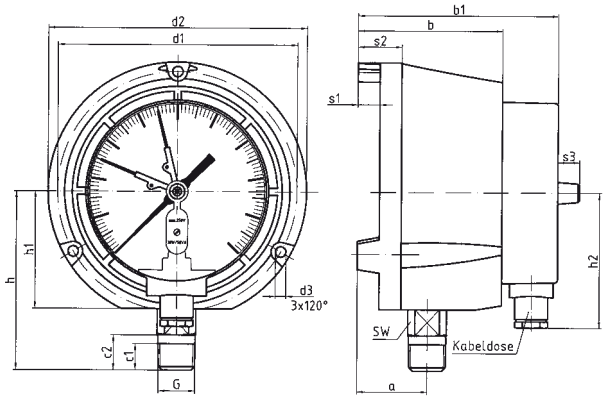
Bottom connection



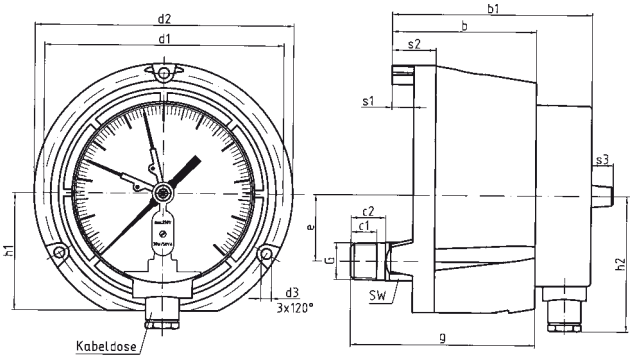
Bottom back connection



Bottom connection, with electrical contacts



Bottom back connection, with electrical contacts

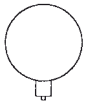
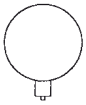
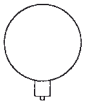
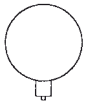


Dimensions (mm)

Nominal size (NG)	a	b	b1	c1	c2	d1	d2	d3	ØD	e	G	g	h	h1	h2	s1	s2	s3	SW
4 1/2“ (D 1/D 6)	40	82.5	114.5	15	20	137	148	6	129	38	1/2-14 NPT	105.5	102	67	78	12.5	25	12.5	22

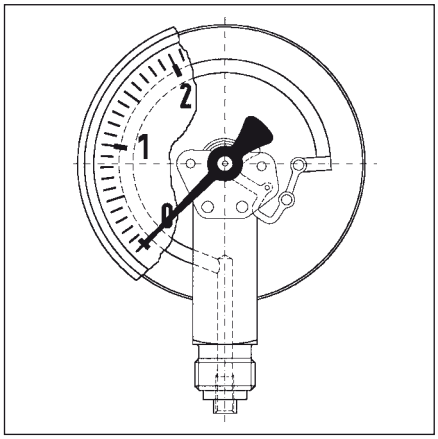
Bourdon tube pressure gauges type Process Gauge with glycerine filling

DG: M

Type	RF130PG, D101	RF130PG, D111	RF130PG, D102	RF130PG, D112	RF130PG, D601	RF130PG, D611	RF130PG, D602	RF130PG, D612
Version								
Housing Ø	4 1/2“	4 1/2“	4 1/2“	4 1/2“	4 1/2“	4 1/2“	4 1/2“	4 1/2“
Housing	PP-GF 20, black, with internal screw type bezel							
Meas. elem.	Copper alloy		Stainless steel 316 Ti or 316 L		Copper alloy		Stainless steel 316 Ti or 316 L	
Accuracy class	Grade 2A according to ANSI B 40.1 (corresponds to class 0.5)							
Connection	1/2-14 NPT	1/2-14 NPT	1/2-14 NPT	1/2-14 NPT	1/2-14 NPT	1/2-14 NPT	1/2-14 NPT	1/2-14 NPT
Range (bar)*	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	87901101	87901111	87901102	87901112	87901601	87901611	87901602	87901612
-1/+0,6	87902101	87902111	87902102	87902112	87902601	87902611	87902602	87902612
-1/+1,5	87903101	87903111	87903102	87903112	87903601	87903611	87903602	87903612
-1/+3	87904101	87904111	87904102	87904112	87904601	87904611	87904602	87904612
-1/+5	87905101	87905111	87905102	87905112	87905601	87905611	87905602	87905612
-1/+9	87906101	87906111	87906102	87906112	87906601	87906611	87906602	87906612
-1/+15	87907101	87907111	87907102	87907112	87907601	87907611	87907602	87907612
Price €								
0/0,6	87909101	87909111	87909102	87909112	87909601	87909611	87909602	87909612
0/1	87910101	87910111	87910102	87910112	87910601	87910611	87910602	87910612
0/1,6	87911101	87911111	87911102	87911112	87911601	87911611	87911602	87911612
0/2,5	87912101	87912111	87912102	87912112	87912601	87912611	87912602	87912612
0/4	87913101	87913111	87913102	87913112	87913601	87913611	87913602	87913612
0/6	87914101	87914111	87914102	87914112	87914601	87914611	87914602	87914612
0/10	87915101	87915111	87915102	87915112	87915601	87915611	87915602	87915612
0/16	87916101	87916111	87916102	87916112	87916601	87916611	87916602	87916612
0/25	87917101	87917111	87917102	87917112	87917601	87917611	87917602	87917612
0/40	87918101	87918111	87918102	87918112	87918601	87918611	87918602	87918612
Price €								
0/60	87919101	87919111	87919102	87919112	87919601	87919611	87919602	87919612
0/100	87920101	87920111	87920102	87920112	87920601	87920611	87920602	87920612
0/160	87921101	87921111	87921102	87921112	87921601	87921611	87921602	87921612
0/250	87922101	87922111	87922102	87922112	87922601	87922611	87922602	87922612
0/400	87923101	87923111	87923102	87923112	87923601	87923611	87923602	87923612
Price €								
0/600	87924101	87924111	87924102	87924112	87924601	87924611	87924602	87924612
0/1000	87925101	87925111	87925102	87925112	87925601	87925611	87925602	87925612

* psi graduation available at no additional cost.

Precision Bourdon tube pressure gauges Class 0.6



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and are not aggressive. For high measuring accuracy.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
160 - 250

Accuracy class (EN 837-1/6)
0.6

Ranges (EN 837-1/5)
-1/0 bar to -1/+15 bar
0/0.6 to 0/600 bar

Calibration medium
≤ 40 bar: air
> 40 bar: water

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, bottom or bottom back (only NG 160)
G1/2B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element,
≤ 100 bar „C“ type bourdon tube, copper alloy
> 100 bar helical tube, stainless steel 316 Ti or 316 L

Movement
Brass/nickel silver
jewel bearing

Dial
Aluminium, white
Dial marking black

Pointer
Knife edge pointer
Aluminium, black

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Plastic (PMMA)

Options

- *Glycerine filling (NG 160/type D 8)*
- *Wetted parts stainless steel (type D 4 x 2)*
- *Laminated safety front glass (NG 160)*
- *Back flange (NG 160)*
- *3-hole fixing, panel mounting bezel (NG 160)*
- *Damping screw*

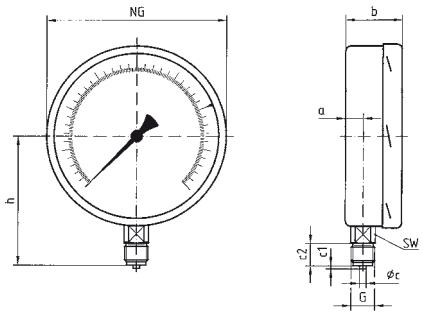
Refer to page 334 for prices

Precision Bourdon tube pressure gauges Class 0.6

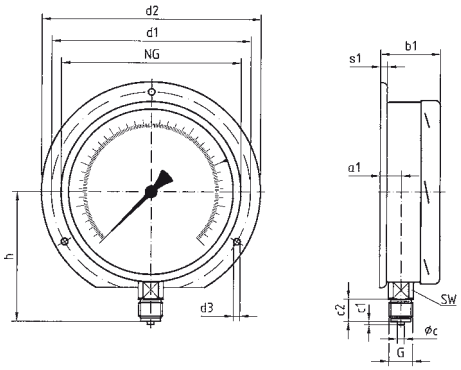
Type D 4 – NG 160/250

Housing types and dimensions

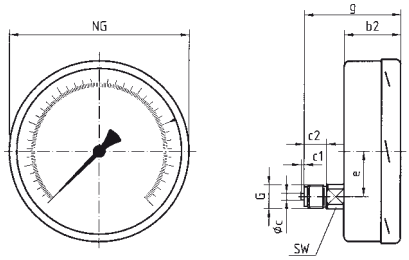
Bottom connection



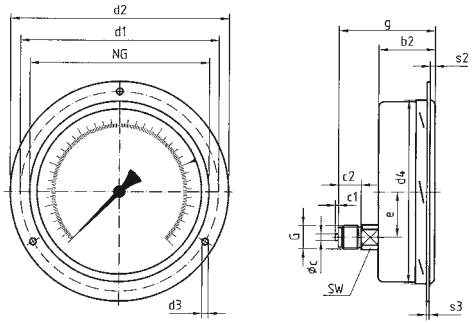
Bottom connection, back flange, (NG 160 only)



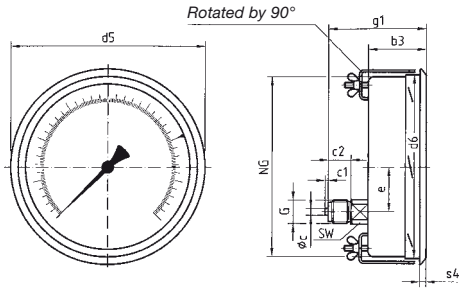
Bottom back connection (NG 160 only)



Bottom back connection, 3-hole fixing, panel mounting bezel (NG 160 only)



Bottom back connection, panel mounting bezel, clamp fixing (NG 160 only)

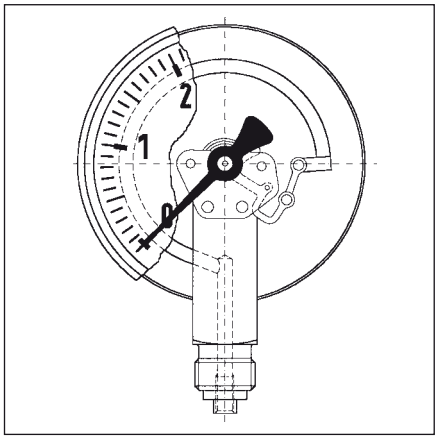


Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2	d3*	d4	d5	d6	e	G	g	g1	h	s1
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	44.5	G1/2B	82	84	116	6
250	16	-	57	-	-	-	6	3	20	-	-	-	-	-	-	-	G1/2B	-	-	165	-
Nominal size (NG)	s2	s3	s4	SW																	
160	4	2	4.5	22																	
250	-	-	-	22																	

* Dimensions according to DIN 16070

Precision Bourdon tube pressure gauges Class 0.25



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and are not aggressive. For very high measuring accuracy.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
160 – 250

Accuracy class (EN 837-1/6)
0.25

Ranges (EN 837-1/5)
-1/0 bar to -1/+15 bar
0/0.6 to 0/400 bar

Calibration medium
≤ 40 bar: air
> 40 bar: water

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, bottom or bottom back (only NG 160)
G1/2B - spanner size 22 (EN 837-1/7.3)

Measuring element
Bourdon tube element,
≤ 100 bar „C“ type bourdon tube, copper alloy
> 100 bar helical tube, copper alloy

Movement
Brass/nickel silver ball bearing

Dial
Aluminium, white
Dial marking black
NG 160 mirror scale 270°
NG 250 mirror scale 330°
with zero correction

Pointer
Knife edge pointer
Aluminium

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Plastic (PMMA)

Options

- *Back flange (NG 160)*
- *3-hole fixing, panel mounting bezel (NG 160)*
- *Factory test certificate*

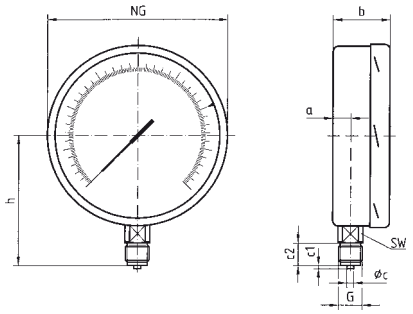
Refer to page 335 for prices

Precision Bourdon tube pressure gauges Class 0.25

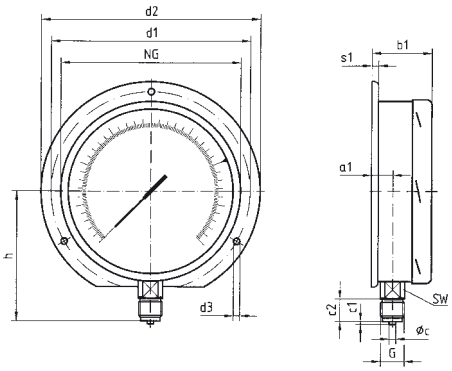
Type D 4 – NG 160/250

Housing types and dimensions

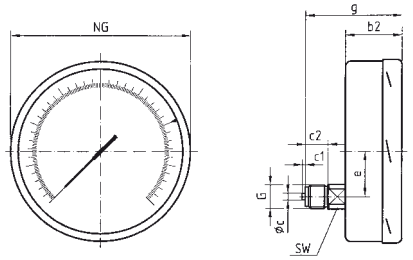
Bottom connection – NG 160



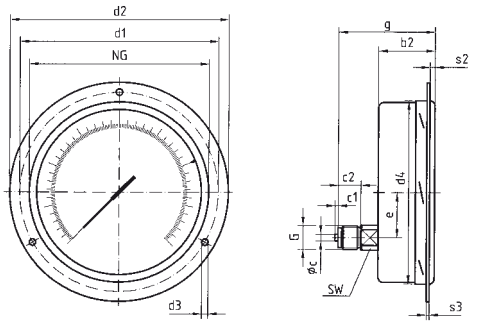
Bottom connection, back flange – NG 160



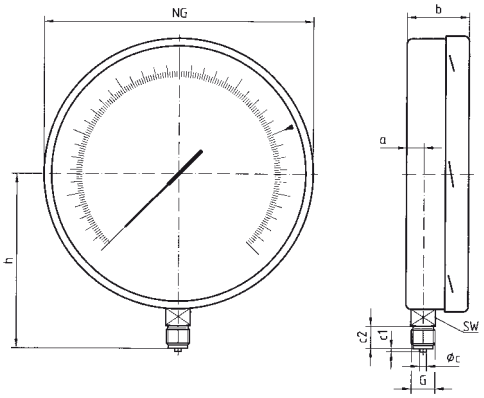
Bottom back connection – NG 160



Bottom back connection, 3-hole fixing, panel mounting bezel – NG 160



Bottom connection – NG 250



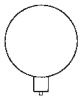
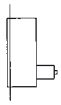
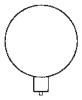
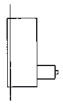
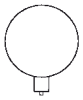
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	b2	b3	Øc	c1	c2	d1*	d2	d3*	d4	d5	d6	e	G	g	g1	h	s1
160	17.5	20.5	50	53	50	52	6	3	20	178	196	5.8	164	167	161	44.5	G1½B	82	84	116	6
250	16	-	57	-	-	-	6	3	20	-	-	-	-	-	-	-	G1½B	-	-	165	-
Nominal size (NG)	s2	s3	s4	SW																	
160	4	2	4.5	22																	
250	-	-	-	22																	

* Dimensions according to DIN 16070

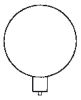
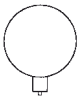
Precision Bourdon tube pressure gauges Class 0.6

DG: M

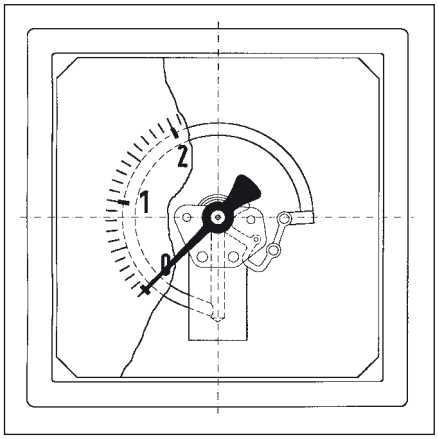
Type	RF160F,D401	RF160F,D411	RF160F,D431		RF160ChF,D402	RF160ChF,D412	RF160ChF,D432	RF250F,D401
Version								
Housing Ø	160	160	160		160	160	160	250
Housing	Stainless steel 304 with bayonet type bezel							
Meas. elem.	Bourdon tube element, copper alloy				Bourdon tube, stainless steel 316 Ti or 316 L			Cu alloy
Accuracy class	0.6	0.6	0.6		0.6	0.6	0.6	0.6
Connection	G1/2B	G1/2B	G1/2B		G1/2B	G1/2B	G1/2B	G1/2B
			3-hole fixing, panel mounting bezel, 304				3-hole fixing, panel mounting bezel, 304	
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	85701401	85701411	85701431		85701402	85701412	85701432	85751401
-1/+0,6	85702401	85702411	85702431		85702402	85702412	85702432	85752401
-1/+1,5	85703401	85703411	85703431		85703402	85703412	85703432	85753401
Price €								
-1/+3	85704401	85704411	85704431		85704402	85704412	85704432	85754401
-1/+5	85705401	85705411	85705431		85705402	85705412	85705432	85755401
-1/+9	85706401	85706411	85706431		85706402	85706412	85706432	85756401
-1/+15	85707401	85707411	85707431		85707402	85707412	85707432	85757401
Price €								
0/0,6	85709401	85709411	85709431		85709402	85709412	85709432	85759401
0/1	85710401	85710411	85710431		85710402	85710412	85710432	85760401
0/1,6	85711401	85711411	85711431		85711402	85711412	85711432	85761401
Price €								
0/2,5	85712401	85712411	85712431		85712402	85712412	85712432	85762401
0/4	**85713401**	85713411	85713431		85713402	85713412	85713432	85763401
0/6	**85714401**	85714411	85714431		85714402	85714412	85714432	85764401
0/10	**85715401**	85715411	85715431		85715402	85715412	85715432	85765401
0/16	**85716401**	85716411	85716431		85716402	85716412	85716432	85766401
0/25	**85717401**	85717411	85717431		85717402	85717412	85717432	85767401
0/40	85718401	85718411	85718431		85718402	85718412	85718432	85768401
Price €								
0/60	85719401	85719411	85719431		85719402	85719412	85719432	85769401
0/100	85720401	85720411	85720431		85720402	85720412	85720432	85770401
0/160	85721401	85721411	85721431		85721402	85721412	85721432	85771401
0/250	85722401	85722411	85722431		85722402	85722412	85722432	85772401
0/400	85723401	85723411	85723431		85723402	85723412	85723432	85773401
0/600	85724401	85724411	85724431		85724402	85724412	85724432	85774401
Additional cost for glycerine filling (> 2.5 bar) **€**								

Precision Bourdon tube pressure gauges Class 0.25

DG: M

Type	RF160F,D401	RF160F,D411	RF160F,D431		RF250F,D401			
Version								
Housing Ø	160	160	160		250			
Housing	Stainless steel 304 with bayonet type bezel							
Meas. elem.	Copper alloy							
Dial	mirror scale 270°				330°			
Accuracy class	0.25	0.25	0.25		0.25			
Connection	G1/2B	G1/2B	G1/2B		G1/2B			
			3-hole fixing, panel mounting bezel, 304					
Range (bar)	Part no.	Part no.	Part no		Part no.			
Price €								
-1/0	88201401	88201411	88201431		88231401			
-1/+0.6	88202401	88202411	88202431		88232401			
-1/+1.5	88203401	88203411	88203431		88233401			
-1/+3	88204401	88204411	88204431		88234401			
-1/+5	88205401	88205411	88205431		88235401			
-1/+9	88206401	88206411	88206431		88236401			
-1/+15	88207401	88207411	88207431		88237401			
0/0.6	88209401	88209411	88209431		88239401			
0/1	88210401	88210411	88210431		88240401			
0/1.6	88211401	88211411	88211431		88241401			
0/2.5	88212401	88212411	88212431		88242401			
Price €								
0/4	88213401	88213411	88213431		88243401			
0/6	88214401	88214411	88214431		88244401			
0/10	88215401	88215411	88215431		88245401			
0/16	88216401	88216411	88216431		88246401			
0/25	88217401	88217411	88217431		88247401			
0/40	88218401	88218411	88218431		88248401			
Price €								
0/60	88219401	88219411	88219431		88249401			
0/100	88220401	88220411	88220431		88250401			
0/160	88221401	88221411	88221431		88251401			
0/250	88222401	88222411	88222431		88252401			
0/400	88223401	88223411	88223431		88253401			
0/600	---	---	---		---			
Price €								
0/1000	---	---	---		---			

Bourdon tube pressure gauges for panel mounting



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys. For panel mounting.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 2/D 3

Nominal size
72 x 72, 96 x 96, 144 x 144

Accuracy class (EN 837-1/6)
72 x 72 - 96 x 96: 1.6
144 x 144: 1.0

Ranges (EN 837-1/5)
-1/0 bar to -1/+15 bar
0/0.6 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, centre back
72 x 72 – 96 x 96:
G1/4B – spanner size 14
144 x 144:
G1/2B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
NG 72/NG 96 D3 – stainless steel 304
NG 144 D2 – sheet steel, black

Bezel
NG 72/NG 96 aluminium, black
NG 144 sheet steel, black

Front glass
Plastic

Options

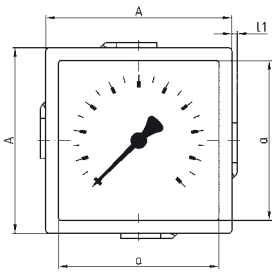
- *Zero correction (NG 96)*
- *Wetted parts stainless steel (NG 72/NG 96)*
- *Damping screw*
- *Reference pointer*

Refer to pages 340 for prices

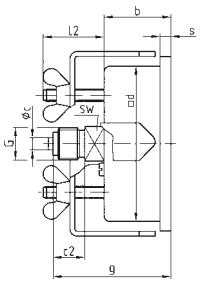
Bourdon tube pressure gauges for panel mounting **NG 72 x 72/96 x 96/144 x 144**

Housing types and dimensions

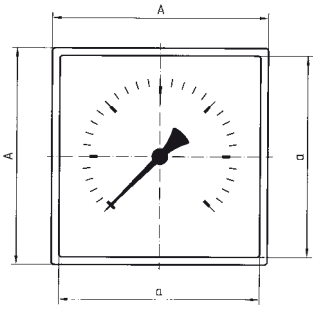
NG 72 x 72 – Type D 3



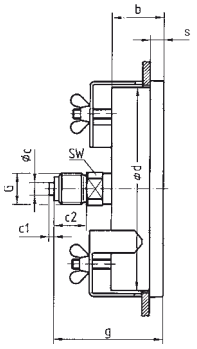
NG 72 x 72 – Type D 3



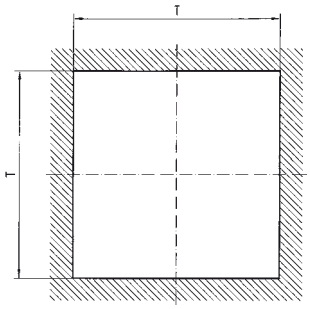
NG 96 x 96 – Type D 3/NG 144 x 144 – Type D 2



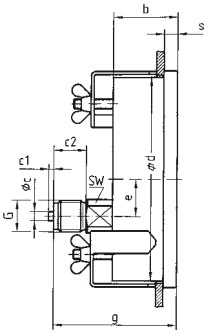
NG 96 x 96 – Type D 3



Panel cut-out



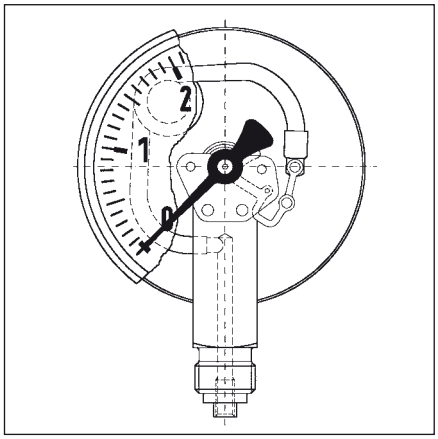
NG 144 x 144 – Type D 2

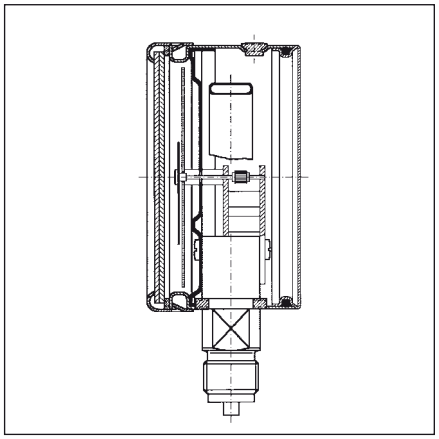


Dimensions (mm)

Nominal size (NG)	A	a	b	Øc	c_1	c_2	d	e	G	g	l_1	l_2	s	SW	T
72 x 72	72	62	27.5	5	2	13	64	-	G1/4B	44.5	2	25	4.5	14	66
96 x 96	96	88	32	5	2	13	88	-	G1/4B	55	-	-	6.5	14	90
144 x 144	144	134	49	6	3	20	136	26.5	G1/2B	81	-	-	9	22	138

Bourdon tube pressure gauges for high pressures *EN 837-1*





Application
For measurement of extremely high pressures in corrosive, gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres.

Type
D 4

Nominal size
160

Accuracy class (EN 837-1/6)
1.0

Ranges
0/2,500 bar
0/4,000 bar

Application area
Static load:
full scale value
Dynamic load:
3/4 x full scale value

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom
HP connection for 1/4" pipe
Female thread M 16 x 1.5
or 9/16-18 UNF
each with sealing cone 60°

Measuring element
Bourdon tube element, NiFe alloy helical tube

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with solid baffle wall and blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Mounting
Wall mounting instrument bracket with 60 mm protrusion (included in scope of delivery) or panel mounting using 3-hole fixing, panel mounting bezel (option).
Direct mounting onto rigid measuring pipe possible.

Options

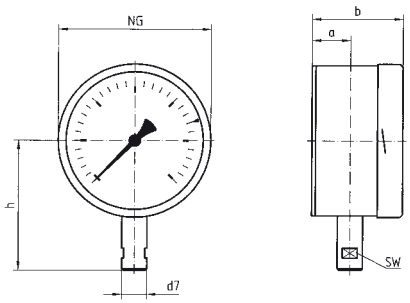
- *Nominal size 100*
- *Glycerine filling (type D802)*
- *3-hole fixing, panel mounting bezel*
- *Other connections*
- *Electrical contacts*

Refer to page 340 for prices

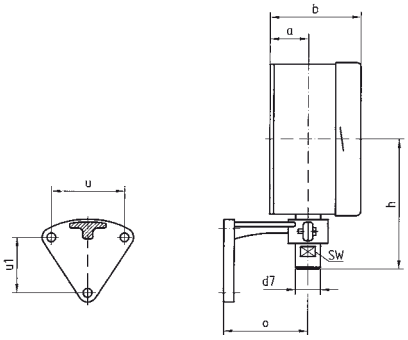
Bourdon tube pressure gauges for high pressures *Type D 4 – NG 160*

Housing types and dimensions

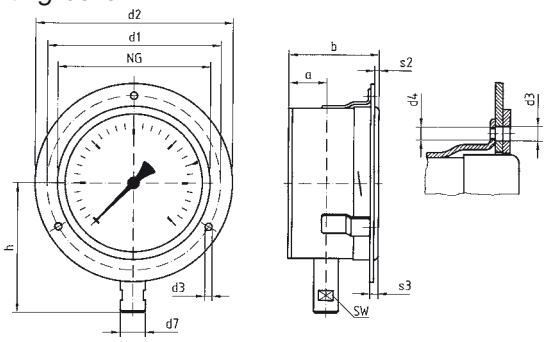
Bottom connection



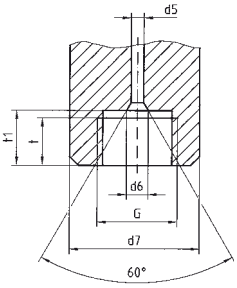
Bottom connection, with instrument holder



Bottom connection, 3-hole fixing, panel mounting bezel



HP connection, female thread M 16 x 1.5



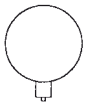
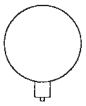
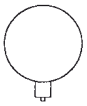
Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*d1**	*d2*	*d3**	*d4*	*d5*	*d6*	*d7*	*G*	*h*	*o*	*s*	*s1*	*s2*	*s3*	*t*	*t1*	*u*
160	*34*	*64*	*78*	*108*	*178*	*196*	*5.8*	*M 5*	*2.5*	*4.3*	*26*	*M 16x1.5 HP*	*139*	*63*	*22*	*32*	*7*	*9*	*9.5*	*11*	*65*
Nominal size (NG)	*u1*	*SW*																			
160	*56*	*22*																			

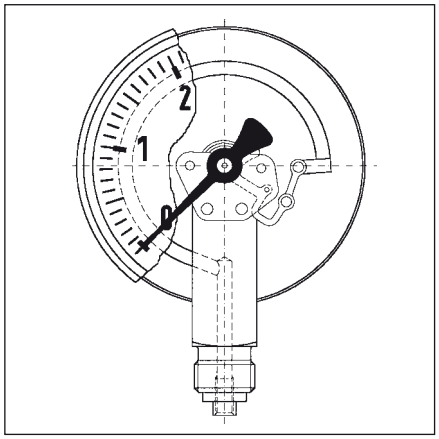
** Dimensions according to DIN 16064*

Bourdon tube pressure gauges for panel mounting
Bourdon tube pressure gauges for high pressures

DG: M

					Glycerine filling		Glycerine filling
Type	RF72, D311	RF96, D311	RF144, D211	RF96, D312	RF100HDGly, D802	RF160HD, D402	RF160HDGly, D802
Version							
Housing Ø	72 x 72	96 x 96	144 x 144	96 x 96	100	160	160
Housing	Stainless steel	Stainless steel	Sheet steel	Stainless steel	Stainless steel 304		
Meas. elem.	Bourdon tube element, copper alloy			Stainless steel	Stainless steel 316 Ti or 316 L/NiFe		
Accuracy class	1.6	1.6	1.0	1.6	1.0	1.0	1.0
Connection	G 1/4 B	G 1/4 B	G 1/2 B	G 1/4 B	G 1/2 B	HP connection 1/4" with female thread M16 x 1.5 or 9/16-18 UNF with sealing cone 60°	
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	85828311	85801311	85851211	85801312	---	---	---
-1/+0,6	85844311	85802311	85852211	85802312	---	---	---
-1/+1,5	85845311	85803311	85853211	85803312	---	---	---
-1/+3	85846311	85804311	85854211	85804312	---	---	---
-1/+5	85847311	85805311	85855211	85805312	---	---	---
-1/+9	85848311	85806311	85856211	85806312	---	---	---
-1/+15	85849311	85807311	85857211	85807312	---	---	---
Price €							
0/0,6	85829311	85809311	85859211	85809312	---	---	---
0/1	85830311	85810311	85860211	85810312	---	---	---
0/1,6	85831311	85811311	85861211	85811312	---	---	---
0/2,5	85832311	85812311	85862211	85812312	---	---	---
0/4	85833311	85813311	85863211	85813312	---	---	---
0/6	85834311	85814311	85864211	85814312	---	---	---
0/10	85835311	85815311	85865211	85815312	---	---	---
0/16	85836311	85816311	85866211	85816312	---	---	---
0/25	85837311	85817311	85867211	85817312	---	---	---
0/40	85838311	85818311	85868211	85818312	---	---	---
Price €							
0/60	85839311	85819311	85869211	85819312	---	---	---
0/100	85840311	85820311	85870211	85820312	---	---	---
0/160	85841311	85821311	85871211	85821312	---	---	---
0/250	85842311	85822311	85872211	85822312	---	---	---
0/400	85843311	85823311	85873211	85823312	---	---	---
Price €							
0/2500	---	---	---	---	86031802	85277402	85277802
Price €							
0/4000	---	---	---	---	---	85278402	85278802

Bourdon tube pressure gauges with glycerine filling for refrigeration applications



Application
For simultaneous measurement of vapour pressures and temperatures in refrigeration applications.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 7/D 8

Nominal size
63 – 80 – 100 (D 7)
100 (D 8)

Accuracy class (EN 837-1/6)
NG 63: 1.6
NG 80/NG 100: 1.0

Ranges
-1/+ 9 bar
-1/+12.5 bar
-1/+15 bar
-1/+24 bar
-1/+30 bar
each with temperature scale

Temperature scales for cooling agent:
R 134a
R 134a/R 22
R 22/R 12/R 502
R 12
R 404A
R 407A
R 410A
R 717 (NH3) – wetted parts stainless steel 316 Ti or 316 L

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: according to cooling agent
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 65 (EN 60529),
with housing vent (< 25 bar)
IP 54

Standard version

Connection
Brass, bottom or back
NG 63 – 100 D 7 centre back
NG 100 D 8 bottom back
7/16-20 UNF, G1/4B, G1/2B
(stainless steel 316 Ti or 316 L for R 717)

Measuring element
Bourdon tube element, copper alloy „C“ type bourdon tube
(stainless steel 316 Ti or 316 L for R 717)

Movement
Brass

Dial
Aluminium, white
Pressure dial marking black
Temperature dial marking coloured
(refer to appendix for examples)

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bezel
D 7 – NG 63 – 80 – 100:
Crimped bezel stainless steel 304
D 8 – NG 100:
Bayonet type bezel stainless steel 304

Front glass
Plastic

Filling liquid
Glycerine (99.5 %)

Options

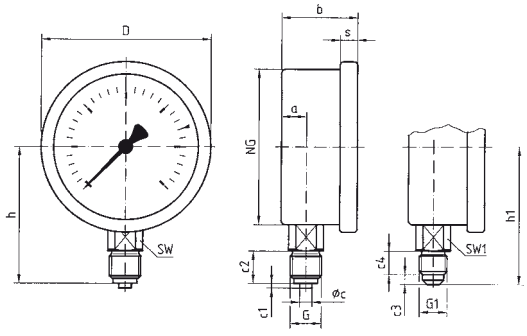
- *Temperature scales for other cooling agents*
- *Back flange*
- *Clamp fixing*
- *3-hole fixing, panel mounting bezel (NG 63/100)*
- *Damping screw*

Refer to page 343 for prices

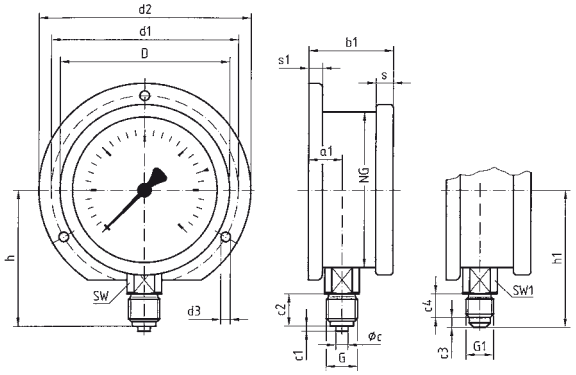
Bourdon tube pressure gauges for refrigeration applications **Type D 7/D 8 – NG 63/80/100**

Housing types and dimensions

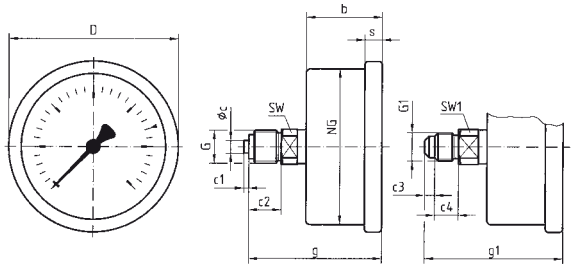
Type D 7 – bottom connection



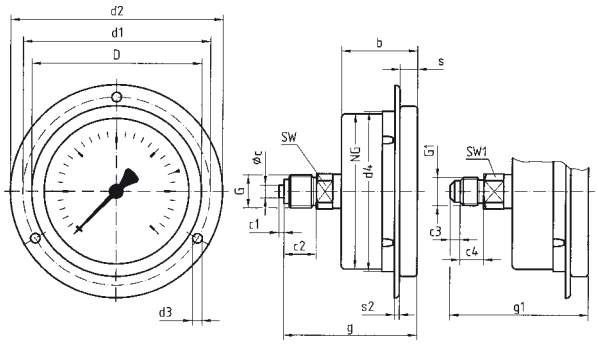
Type D 7 - bottom connection, back flange



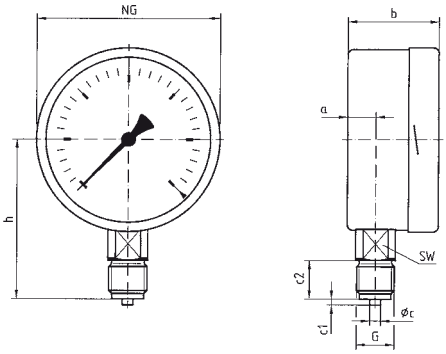
Type D 7 – centre/bottom back connection



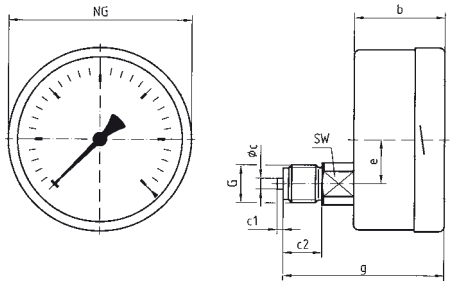
Type D 7 – centre/bottom back connection, 3-hole fixing, panel mounting bezel (NG 63/100)



Type D 8 – bottom connection



Type D 8 – bottom back connection



Dimensions (mm)

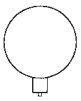
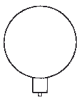
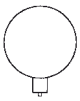
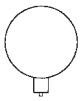
Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	c3	c4	d1*	d2*	d3*	d4	D	e	g	g1	G	G1	h	h1
63 (D 7)	9.5	13	30.5	34	5	2	13	4	9.5	75	85	3.6	64	68	-	53.5	55.5	G¼B	7/16-20 UNF	53	55
80 (D 7)	12.2	15.2	33.5	36.5	6	3	20	4	9.5	95	110	5	-	85	-	65.5	58.5	G½B	7/16-20 UNF	71	62.5
100 (D 7)	12.2	15.7	33.5	37	6	3	20	4	9.5	116	132	4.8	101	106	-	65.5	58.5	G½B	7/16-20 UNF	81	72.5
100 (D 8)	15.6	19.1	49	52.5	6	3	20	-	-	-	-	-	-	-	26.5	81	-	G½B	-	86	-

Nominal size (NG)	s	s1	s2	SW	SW1
63 (D 7)	7	5.5	2	14	14
80 (D 7)	7	5.5	-	22	14
100 (D 7)	7	5.5	3.8	22	14
100 (D 8)	-	5.5	2	22	-

* Dimensions according DIN 16063 (NG 63) and 16064 (NG 80/100)

Bourdon tube pressure gauges with glycerine filling for refrigeration applications

DG: M

Type	RF63KTGly, D701	RF63KTGly, D711	RF80KTGly, D701	RF80KTGly, D711	RF100KTGly, D701	RF100KTGly, D711	RF100KTGly, D802	RF100KTGly, D812
Version								
Housing Ø	63	63	80	80	100	100	100	100
Housing	Stainless steel 304 with crimped bezel						Stainless steel 304 with bayonet type bezel	
Meas. elem.	Bourdon tube element, copper alloy						Stainless steel 316 Ti or 316 L	
Scale	according to selection table						Temperature scale R 717	
Accuracy class	1.6	1.6	1.0	1.0	1.0	1.0	1.0	1.0
Connection*	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	7/16-20 UNF	G1/2B	G1/2B
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/+9	85130701	85130711	85180701	85180711	85230701	85230711	---	---
-1/+12,5	85131701	85131711	85181701	85181711	85231701	85231711	85231802	85231812
-1/+15	85132701	85132711	85182701	85182711	85232701	85232711	85232802	85232812
-1/+24	85133701	85133711	85183701	85183711	85233701	85233711	85233802	85233812
-1/+30	85134701	85134711	85184701	85184711	85234701	85234711	---	---
Add. costs	**Price €**							
Wetted parts 316 Ti or 316 L*							---	

Refer to pages 326 and 403 for additional costs.

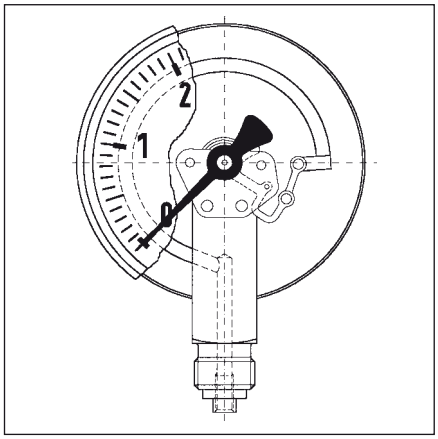
Selection table – temperature scales for cooling agents (refer to appendix for examples)

Please specify the code of the required temperature scale along with the part number of the basic gauge.
Temperature scales for other cooling agents on request.

Temperature scale for cooling agent	**Code**
R 134a	A
R 134a/R 22	B
R 22/R 12/R 502	C
R 12	D
R 404A	E
R 717 (NH3) – stainless steel 316 Ti or 316 L with wetted parts only	F
R 407A	G

* Connection NG 63/80 centre back G¼B – NG 80 bottom/100 G½B for stainless steel wetted parts.

Bourdon tube pressure gauges for welding applications EN 562



Application
For welding systems and cutting machines or similar processes.

Type
D 2/D 3

Nominal size
50 – 63

Version
EN 562

Accuracy class (EN 562)
2.5

Ranges (EN 562)
0/1 to 0/400 bar
-1/0 to -1/+15 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range

Medium:	T_{max} =	*+60 °C*
Ambient:	T_{min} =	*-20 °C*
	T_{max} =	*+60 °C*

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or centre back, with damping in the pressure inlet
G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 40 bar „C“ type bourdon tube
> 40 bar helical tube
(copper portion in case of acetylene < 70 %)

Degree of cleanliness
Wetted parts are oil and grease free.

Movement
Brass

Dial
Aluminium, white
Dial marking black

Marking
„Oxygen“ for oxygen and symbol for „free from oil and grease“
„Acetylene“ for acetylene

Pointer
Aluminium, black

Housing
D 2 – sheet steel (gold or black)
D 3 – stainless steel 304 with rear blow-out

Front glass
Plastic, snap-in

Options

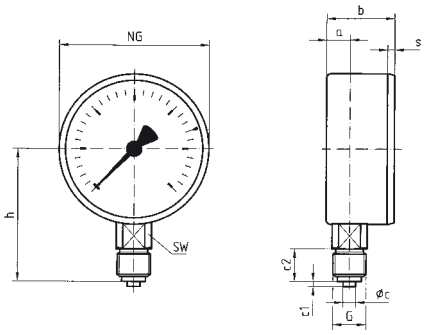
- *Litre scale for argon/CO_2*
- *Other connection threads*

Refer to page 348 for prices

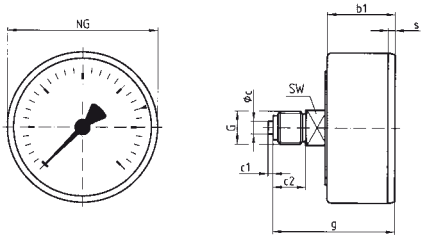
Bourdon tube pressure gauges for welding applications *Type D 3 – NG 50/63*

Housing types and dimensions

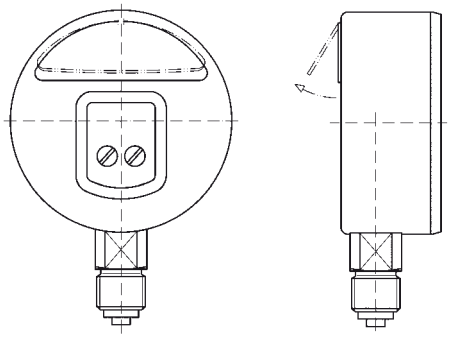
Bottom connection



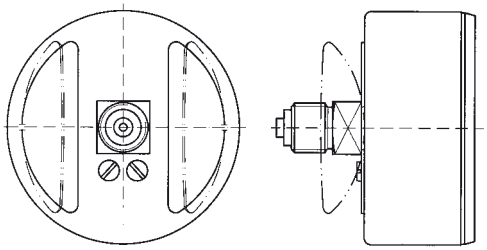
Centre back connection



Blow-out - bottom connection



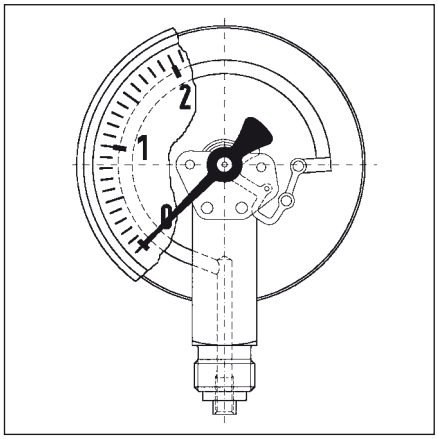
Blow-out - centre back connection



Dimensions (mm)

Nominal size (NG)	*a*	*b*	*b1*	*Øc*	*c1*	*c2*	*G*	*g*	*h*	*s*	*SW*				
50	*10.5*	*29*	*26*	*5*	*2*	*13*	*G¼B*	*47*	*46*	*3.8*	*14*				
63	*11*	*29.5*	*29.5*	*5*	*2*	*13*	*G¼B*	*50.5*	*53*	*3.7*	*14*				

Bourdon tube pressure gauges for gas applications *EN 837-1 (S2)*



Application
For gaseous and liquid media which are not highly viscous and do not crystallize. Especially designed for gas technology fittings and installations.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 3

Nominal size
50 – 63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/1 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or centre back
G1/4B – spanner size 14
(EN 837-1/7.3)

Measuring element
Bourdon tube element, copper alloy
≤ 40 bar „C“ type bourdon tube
> 40 bar helical tube

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304 with rear blow-out according to EN 562

Front glass
Plastic, snap-in

Options

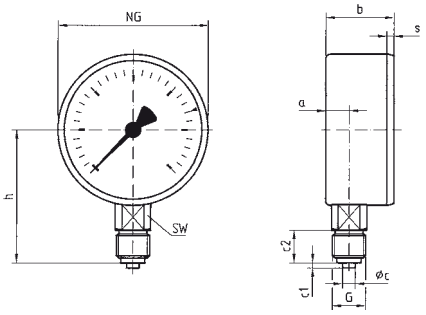
- *Wetted parts stainless steel*
- *Wetted parts oil and grease free*
- *Helium leak test*
- *Other connection threads*
- *Damping screw*

Refer to page 348 for prices

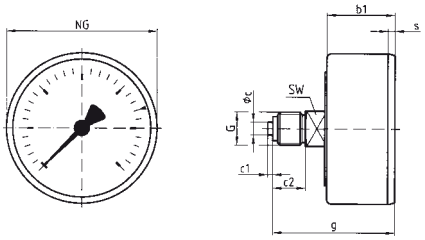
Bourdon tube pressure gauges for gas applications *Type D 3 – NG 50/63*

Housing types and dimensions

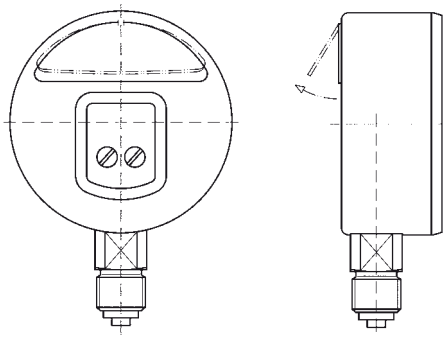
Bottom connection



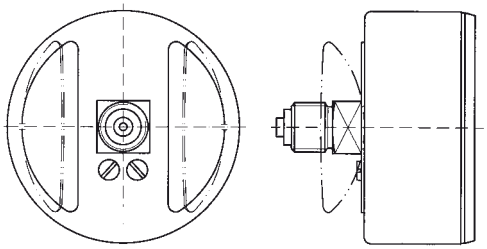
Centre back connection



Blow-out – bottom connection



Blow-out – centre back connection



Dimensions (mm)

Nominal size (NG)	a	b	b1	Øc	c1	c2	G	g	h	s	SW				
50	10.5	29	26	5	2	13	G¼B	47	46	3.8	14				
63	11	29.5	29.5	5	2	13	G¼B	50.5	53	3.7	14				

Bourdon tube pressure gauges for welding/ gas applications

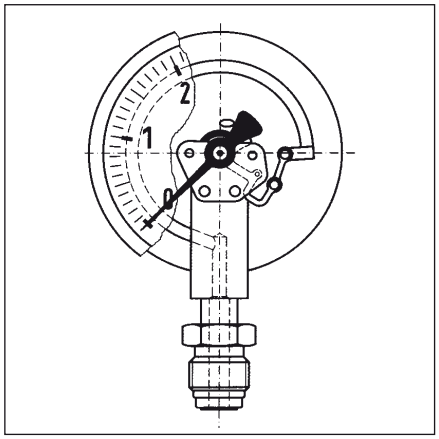
DG: M

Version for welding applications EN 562

Type	RF63ST, D301	RF50GT, D301	RF50GT, D311	RF63GT, D301	RF63GT, D311	RF50GT, D302 4)	RF63GT, D302 4)
Version							
Housing Ø	63	50	50	63	63	50	63
Housing	Stainless steel 304 with blow-out						
Meas. elem.	CU alloy, oil and grease free	Copper alloy				Stainless steel 316 Ti or 316 L	
Accuracy class	2.5	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G1/4B	G1/4B	G1/4B	G1/4B	G1/4B	G1/4B	G1/4B
Range bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
-1/0	---	85051301GT	85051311GT	85101301GT	85101311GT	85051302GT	85101302GT
-1/+0,6	---	85052301GT	85052311GT	85102301GT	85102311GT	85052302GT	85102302GT
-1/+1,5	---	85053301GT	85053311GT	85103301GT	85103311GT	85053302GT	85103302GT
-1/+3	---	85054301GT	85054311GT	85104301GT	85104311GT	85054302GT	85104302GT
-1/+5	---	85055301GT	85055311GT	85105301GT	85105311GT	85055302GT	85105302GT
-1/+9	---	85056301GT	85056311GT	85106301GT	85106311GT	85056302GT	85106302GT
-1/+15	---	85057301GT	85057311GT	85107301GT	85107311GT	85057302GT	85107302GT
Price €							
0/0,6	---	85059301GT	85059311GT	85109301GT	85109311GT	85059302GT	85109302GT
0/1	88300301 1)	85060301GT	85060311GT	85110301GT	85110311GT	85060302GT	85110302GT
0/1,6	88301301 1)	85061301GT	85061311GT	85111301GT	85111311GT	85061302GT	85111302GT
0/2,5	88302301 1)	85062301GT	85062311GT	85112301GT	85112311GT	85062302GT	85112302GT
0/4	88303301	85063301GT	85063311GT	85113301GT	85113311GT	85063302GT	85113302GT
0/6	88304301 2)	85064301GT	85064311GT	85114301GT	85114311GT	85064302GT	85114302GT
0/10	88305301	85065301GT	85065311GT	85115301GT	85115311GT	85065302GT	85115302GT
0/10	88306301 3)	---	---	---	---	---	---
0/16	88307301 2)	85066301GT	85066311GT	85116301GT	85116311GT	85066302GT	85116302GT
0/25	88308301	85067301GT	85067311GT	85117301GT	85117311GT	85067302GT	85117302GT
0/40	88309301 1)	85068301GT	85068311GT	85118301GT	85118311GT	85068302GT	85118302GT
0/40	88310301 2)	---	---	---	---	---	---
Price €							
0/60	---	85069301GT	85069311GT	85119301GT	85119311GT	85069302GT	85119302GT
0/100	---	85070301GT	85070311GT	85120301GT	85120311GT	85070302GT	85120302GT
0/160	---	85071301GT	85071311GT	85121301GT	85121311GT	85071302GT	85121302GT
0/250	88314301	85072301GT	85072311GT	85122301GT	85122311GT	85072302GT	85122302GT
0/315	88315301 2)	85079301GT	85079311GT	85129301GT	85129311GT	85079302GT	85129302GT
0/315	88316301	---	---	---	---	---	---
0/400	88317301	85073301GT	85073311GT	85123301GT	85123311GT	85073302GT	85123302GT

1) with inscription „Acetylene“ 2) with inscription „Oxygen“ 3) Scale 0/30 l/min „Argon“ red, 0/28 l/min „CO_2“ black
4) additional costs for back connection € – refer to page 326 for other additional costs

Bourdon tube pressure gauges for ultra-pure gas applications



Application
Designed for highly demanding applications where product surface quality and absolute purity of wetted parts are of utmost importance, particularly for measuring ultra-pure gases.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 3

Nominal size
63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/0.6 to 0/400 bar

Calibration medium
Nitrogen

Application area
Static load:
3/4 x full scale value
Dynamic load:
3/4 x full scale value
Short term:
full scale value

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10 K
falling temp. approx. ±0.4 %/10 K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Bottom, either:
1/4-18 NPT
9/16-18 UNF, with pressure screw
9/16-18 UNF, with union nut

Measuring element
Bourdon tube element
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube
leak tested (helium), leak rate < 10-9 mbar x l/s

Wetted parts
Connection stainless steel 316 Ti or 316 L
Measuring element stainless steel 316 Ti or 316 L
ultrasonically cleaned, flushed with nitrogen, electrolytically polished, surface roughness ≤ Ra 0.6 µm

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black
Label „Ultra-pure gas“

Pointer
Aluminium, black

Housing
Stainless steel 304 with rear blow-out

Push on bezel
Stainless steel 304, bare metal surface

Front glass
Plastic

Options

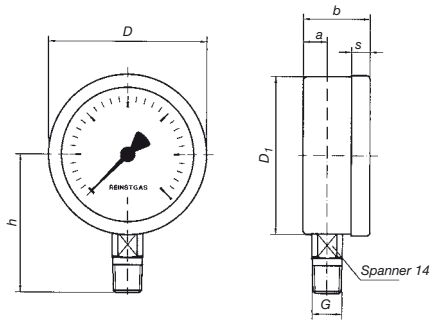
- *Surface roughness Ra 0.4/0.25 µm*
- *Housing polished*
- *Push-on bezel polished*
- *Electrical contacts*

Refer to page 351 for prices

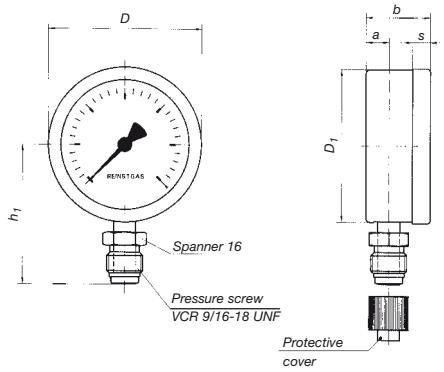
Bourdon tube pressure gauges for ultra-pure gas applications **Type D 3 – NG 63**

Housing types and dimensions

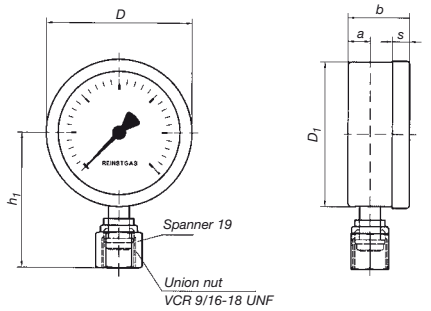
Bottom connection, 1/4-18 NPT



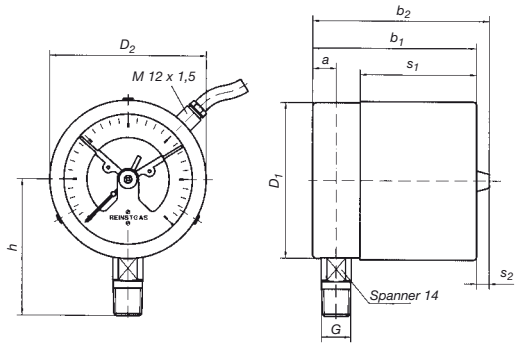
Bottom connection, 9/16-18 UNF, with pressure screw



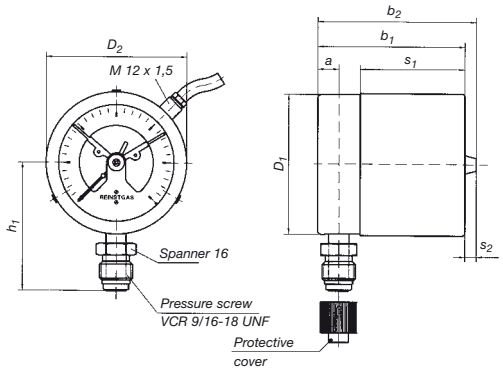
Bottom connection, 9/16-18 UNF, with union nut



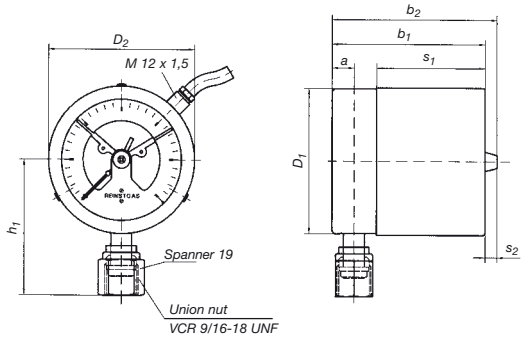
Version with contacts - bottom connection, 1/4-18 NPT



Version with contacts – bottom connection, 9/16-18 UNF, with pressure screw



Version with contacts – bottom connection, 9/16-18 UNF, with union nut

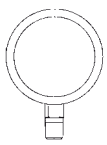
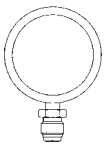
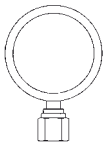
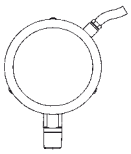
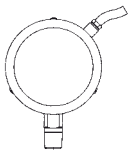
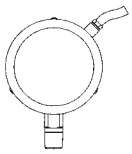
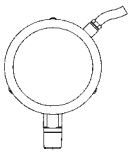


Dimensions (mm)

Nominal size (NG)	a	b	b1	b2	D	D1	D2	G	h	h1	S	S1	S2		
63	9	28	66	74	63	62	64	1/4-18 NPT	54	57	8	48	8		

Bourdon tube pressure gauges for ultra-pure gas applications

DG: M

					with electrical contact			
Type	RF63RG, D302	RF63RG, D302	RF63RG, D302		RF63RG,MK1,D302	RF63RG,MK2,D302	RF63RG,IK1,D302	RF63RG,IK2,D302
Version								
Housing Ø	63	63	63		63	63	63	63
Housing	Stainless steel 304 with push on bezel, plastic front glass							
Meas. element	Bourdon tube stainless steel 316 Ti or 316 L							
Accuracy class	1.6	1.6	1.6		1.6	1.6	1.6	1.6
Connection	1/4-18 NPT	9/16-18 UNF, with pressure screw	9/16-18 UNF, with union nut		1/4-18 NPT	1/4-18 NPT	1/4-18 NPT	1/4-18 NPT
Range (bar)	Part no.	Part no.	Part no.		Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	87001302	87051302	87101302		---	---	---	---
-1/+0,6	87002302	87052302	87102302		87352302	87202302	87252302	87302302
-1/+1,5	87003302	87053302	87103302		87353302	87203302	87253302	87303302
-1/+3	87004302	87054302	87104302		87354302	87204302	87254302	87304302
-1/+5	87005302	87055302	87105302		87355302	87205302	87255302	87305302
-1/+9	87006302	87056302	87106302		87356302	87206302	87256302	87306302
-1/+15	87007302	87057302	87107302		87357302	87207302	87257302	87307302
Price €								
0/0,6	87009302	87059302	87109302		---	---	---	---
0/1	87010302	87060302	87110302		---	---	---	---
0/1,6	87011302	87061302	87111302		87361302	87211302	87261302	87311302
0/2,5	87012302	87062302	87112302		87362302	87212302	87262302	87312302
0/4	87013302	87063302	87113302		87363302	87213302	87263302	87313302
0/6	87014302	87064302	87114302		87364302	87214302	87264302	87314302
0/10	87015302	87065302	87115302		87365302	87215302	87265302	87315302
0/16	87016302	87066302	87116302		87366302	87216302	87266302	87316302
0/25	87017302	87067302	87117302		87367302	87217302	87267302	87317302
0/40	87018302	87068302	87118302		87368302	87218302	87268302	87318302
Price €								
0/60	87019302	87069302	87119302		87369302	87219302	87269302	87319302
0/100	87020302	87070302	87120302		87370302	87220302	87270302	87320302
0/160	87021302	87071302	87121302		87371302	87221302	87271302	87321302
0/250	87022302	87072302	87122302		87372302	87222302	87272302	87322302
0/400	87023302	87073302	87123302		87373302	87223302	87273302	8732330
					Additional cost for 9/16-18 UNF pressure screw or union nut €			

SF6 Gas density controller

Features

- Robust design with high operational reliability
- Reliable switching
- Welded and crimped design ensures absolute tightness
- Suitable for outdoor installation
- Bimetal compensated
- Choice of integrated level switch
- Customer specific versions

Version NG 63 with special connection (option)

Application

SF6 gas density controllers were specifically designed for the control of voltage switchgear systems, converters and transformers.They provide highest levels of operational safety and reliability. The integrated bimetal compensation guarantees a maximum of operational safety in SF6 gas insulated switchgear systems.

Type
D 7

Nominal size
100

Accuracy
± 1 % of full scale value at 20 °C
± 2,5 % of full scale value
at -20/60 °C (compensated range)

Measuring ranges
-1/+5 bar
-1/+9 bar
(others on request)

Usable range
Full scale value

Contact versions
Magnetic spring contact (MK)
Electronic contact (EK)
Inductive contact (IK)

Temperature operating range

Ambient:	T_{min} =	-40 °C
	T_{max} =	+65 °C
Medium:	T_{max} =	+100 °C
Compensated:		-20/+60 °C

Protection
IP 65 (EN 60529)
version with housing vent: IP 54

Standard version

Connection
Stainless steel 316 Ti or 316 L
bottom or bottom back excentric
G½B – SW22 (EN 837-1/7.3)

Electrical connection
Junction box

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L

Mechanism
Stainless steel

Dial
Aluminium, white

Housing
Stainless steel 304

Bezel
Stainless steel 304

Front glass
Laminated safety glass

Filling liquid
Silicone oil

Options

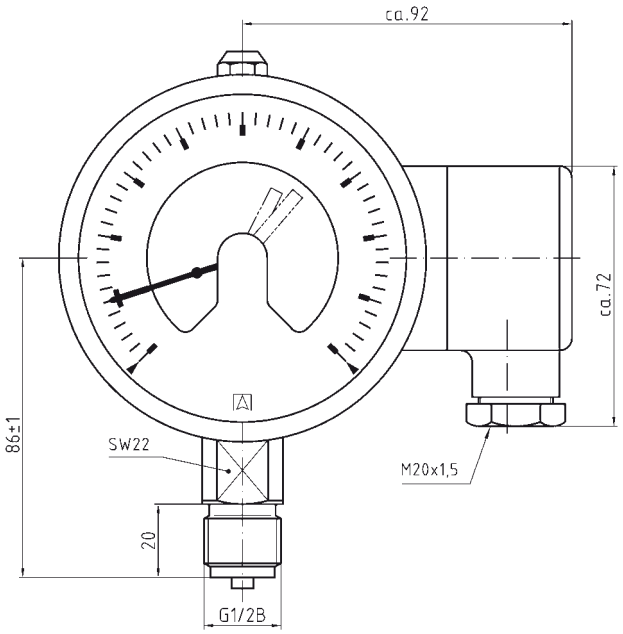
- Without filling liquid (Type D 9)
- Without electrical contact
- Special scales
- Other connections
- Nominal size 63
- Housing filled with nitrogen

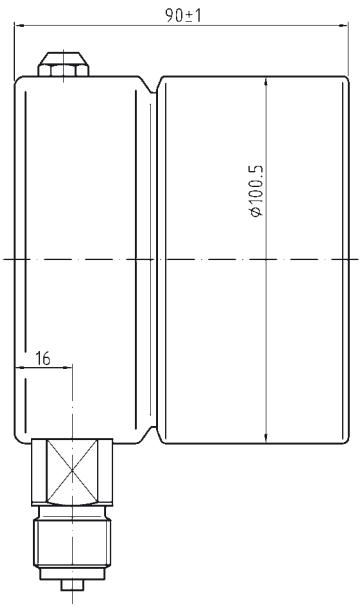
Prices on request.

SF6 gas density controller *Type D 7 – NG 100*

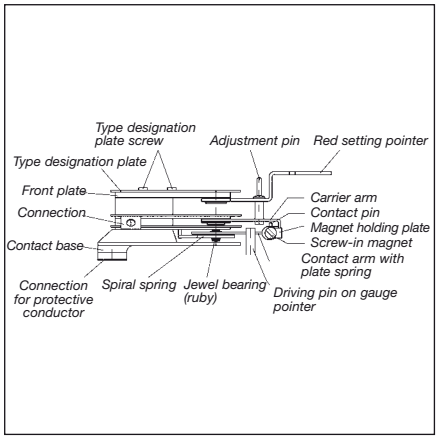
Housing types and dimensions (in mm)

Bottom connection, GB½B – SW 22





Electrical contacts – electromechanical



Electrical contacts – electromechanical

General

Electrical contacts in measuring devices with pointers are auxiliary electrical switches which open or close electrical circuits at set limit values by means of a contact arm which is moved in accordance with the indicated value.

They consist of:

- *an adjustable red setting pointer*
- *a carrier arm which is connected to the setting pointer and which carries the contact pin*
- *a contact arm which is moved by the gauge pointer and which carries the second contact pin*

A contact adjustment lock allows the user to adjust the setting pointer to the value at which the device is to switch.

The gauge pointer can move beyond the adjusted setting pointer after the contact has been made. However, the contact remains active.

Two types of contacts are available: magnetic spring contacts and sliding contacts.

Magnetic spring contact

Principle of operation

Magnetic spring contacts have a permanent magnet screwed to the setting pointer at the contact carrier arm.

To close the circuit, the contact pin of the moving contact arm is attracted by the magnet and the contact closes.

When the circuit opens, the magnet attracts the contact arm until the resetting force of the measuring element overcomes the effective force of the magnet and the contact opens again.

The snap action reduces arcing between the contacts, thus allowing for greater switch ratings. Due to the increased contact force, this type of contact is also less sensitive to vibrations. Furthermore, the stability of contact is increased by greater contact pressure.

Application

Magnetic spring contacts can be used under almost any type of operating condition.
They can also be integrated into gauges with filling.

In order to prevent switching errors (particularly in the case of greater inductive switch ratings or considerable system vibration or in gauges with filling) we recommend installing our pulse-controlled series MSR contact protection relays.

Technical specifications

Nominal supply voltage
250 V max.

Making and breaking current
1.0 A max.

Permanent current
0.6 A max.

Switch rating
30 W 50 VA max.

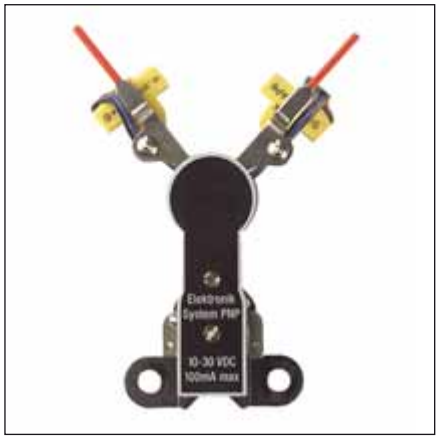
Contact material
Ag80 Ni20 Au 10 µ (additional cost for special materials)

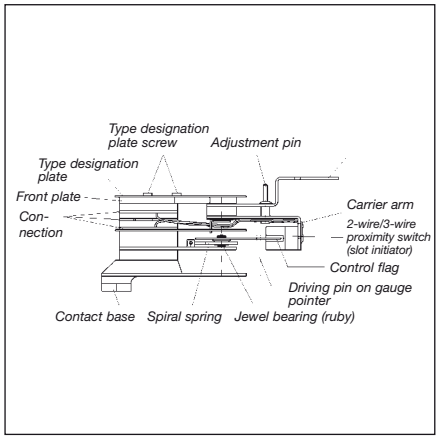
Switching accuracy
Approx. 2–5 % of full scale value

Operating temperature range
-20 °C/+70 °C, depending on type of gauge

Adjustment range
5–95 % of the gauge measuring range

Electrical contacts – electronic





Electronic contact

General

Electronic contacts have non-contacting electrical displacement pick-ups (proximity switches).
They consist of:

- *An adjustable red setting pointer*
- *A carrier arm which is connected to the setting pointer and which carries the control head with the complete, encapsulated electronics*
- *A control flag which is moved by the gauge pointer*

A contact adjustment lock allows the user to adjust the setting pointer to the value at which the unit has to switch.

The gauge pointer can move beyond the adjusted setting pointer after the contact has been made. However, the contact remains active.

Principle of operation

The slot type proximity switches used in the electronic contacts are simple 2-wire or 3-wire DC voltage switches.

Due to the slot design, the proximity switches are also referred to as slot initiators.

The electromagnetic field is concentrated between two opposing coils. The switch is activated when the aluminium control flag moved by the gauge pointer reaches the gap between the two coils (slot). The signal is generated without a delay, according to the movement of the gauge pointer.

The switching behaviour of the PNP switches used in these contacts is usually defined as a normally open contact, i.e.:

Control flag in the slot initiator
- *Contact closed*
- *Output active*

Control flag not in the slot initiator
- *Contact open*
- *Output not active*

Application

Due to the non-contacting switching procedure, the high switching accuracy and the long service life, electronic contacts with PNP output are ideal for any type of industrial application.

The use of these contacts is particularly advantageous in applications with liquid filled measuring instruments, at low voltages (DC 10–30 V) and low DC loads (≤ 100 mA), e.g.

- ***for PLC signal input***
- ***to control opto-isolators***
- ***for other electronic evaluation units***

Version

Standard electronic contacts are shipped with a 3-wire initiator type Si2-K08-AP6. The contacts are also available with the Si2-K08-AG6 2-wire initiator.

Technical specifications

Supply voltage
DC 10–30 V

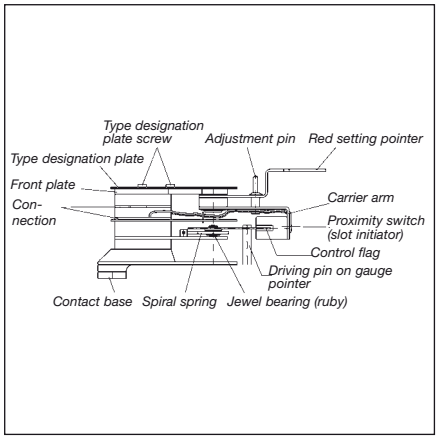
Switch rating
≤ 100 mA

Switching accuracy
Approx. 0.5 % of full scale value

Operating temperature range
-25 °C/+70 °C, depending on type of gauge

Adjustment range
5–95 % of the gauge measuring range

Electrical contacts – inductive



Inductive contact

General

Inductive contacts have non-contact electric displacement pick-ups according to EN 60947-5-6 or NAMUR.
They consist of:

- *an adjustable red setting pointer*
- *a carrier arm which is connected to the setting pointer and which carries the control head with the complete, encapsulated electronics*
- *a control flag which is moved by the gauge pointer*

A contact adjustment lock allows the user to adjust the setting pointer to the value at which the unit has to switch.

The gauge pointer can move beyond the adjusted setting pointer after the contact has been made. However, the contact remains active.

Principle of operation

Inductive contacts are used in connection with a switching amplifier. The amplifier supplies the control head with direct voltage. As soon as the control flag reaches the control head, the internal resistance in the control head increases (high ohmic initiator). This causes the current to change and is used to control the switching amplifier.

The amplifier converts the input signal into a binary output signal.

Therefore, the switching function of inductive contacts is not only determined by the slot initiator, but also by the switching amplifier.

Application

Due to the non-contacting switching, the high switching accuracy and the long service life, inductive contacts are ideal for industrial applications and should be used in liquid filled gauges.
Inductive contacts are particularly recommended when the switching frequency is very high and when highest demands are made on reliability.

The electronics are fully encapsulated, therefore this type of contact is also suitable for use in areas with corrosive atmospheres.

If suitable isolating switching amplifiers are used (such as KFA6-SR2-Ex), the system will conform to the hazardous area classification „intrinsic safety i“. It will be classified as
II 2G EEx ia IIC T6 or
II 1G EEx ia IIC T6 and may be used in hazardous areas zones 1 and 2. The isolating switching amplifier, however, must always be installed in the safe area, e.g. outside the hazardous area.

For standard industrial applications not requiring Ex protection, we recommend our cost-efficient multifunctional series MSR-I relays

Technical specifications

Nominal voltage
8 V = (Ri 1 kOhm)

Supply voltage
5–25 V

Current input
3 mA (active area free)
1 mA (active area covered)

Switching accuracy
Approx. 0.5 % of full scale value

Operating temperature range
-20 °C/+70 °C, depending on type of gauge

Adjustment range
5–95 % of the gauge measuring range

Switching functions and definitions

Figure 1

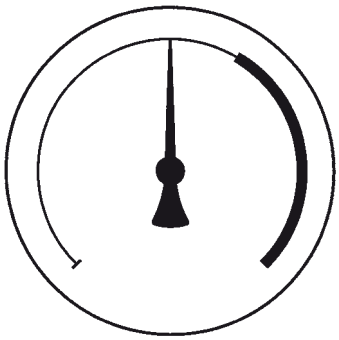


Figure 2

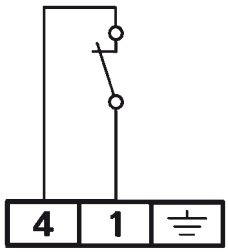
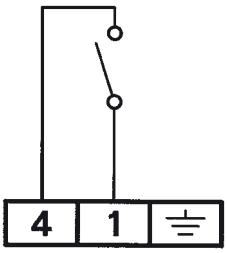


Figure 3



Definition of switching function

1 = Contact closes clockwise when the set point is reached.
2 = Contact opens clockwise when the set point is reached.
W = 1 contact opens and 1 contact closes at the same time (changeover).

The switching function of a contact is always specified in terms of a clockwise movement of the pointer.

If the actual gauge pointer moves counter-clockwise, the switching function is inverted!

Where several contacts are fitted to a gauge, the contact closest to the left end of the scale is defined as the „first“ contact.
This also applies to vacuum ranges!

Optimisation of the switching performance

Application related information, such as the directional movement of the contact pointer (e.g. contact switches with increasing or decreasing pressure), the switch point setting or the speed of pressure changes, help to optimise contact adjustment to achieve a more accurate switching performance.

Selection table for switching functions

The selection tables for switching functions on pages 358 and 359 list the switching functions of single, double and the most common triple contacts (with switching/wiring diagram).

This chart facilitates the quick and easy finding of the correct contact designation for the required switching function.

Description of the switching scheme

Figure 1:
- thin line = contact open, circuit open
- thick line = contact closed, circuit closed

Description of the wiring diagram

Figure 2:
- contact closed
- circuit closed

Figure 3:
- contact open
- circuit open

Definition of the contact type

MK = **m**agnetic spring **c**ontact
SK = **s**liding **c**ontact
EK = **e**lectronic **c**ontact
IK = **i**nductive **c**ontact

Depending on the type of the pressure gauge, up to four contacts can be fitted to one gauge.
The number of switching contacts is indicated by a figure (1–4) after the contact type designation.

Example:
MK 2.12

- Magnetic spring contact
- 2 contacts
- 1st contact closes
- 2nd contact opens

Definition of complete gauge

The code for the contact is added to the type designation of the gauge.

Example:
RF100Ch IK1.2

- Bourdon tube pressure gauge
- NG 100
- Gauge for chemical applications
- Inductive contact
- One contact
- Contact opens

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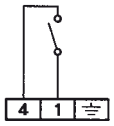
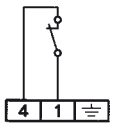
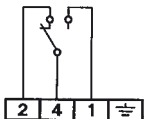
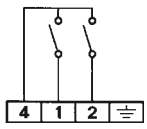
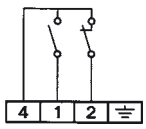
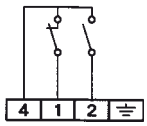
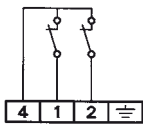
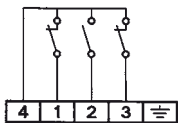
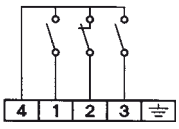
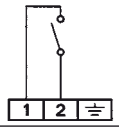
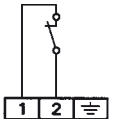
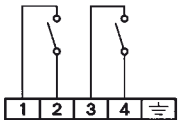
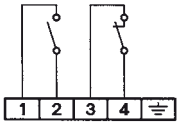
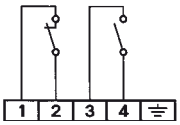
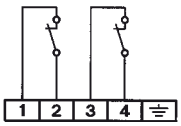
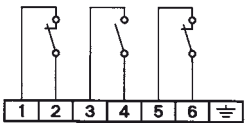
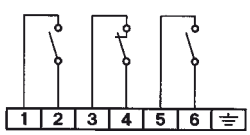
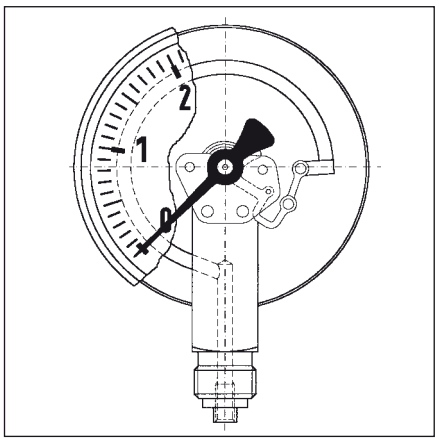
Switching functions of electrical contacts (electromechanical)

Switching scheme	Wiring diagram	Switching function (pointer moves in clockwise direction)	Contact type	
			Magnetic spring contact	Sliding contact
Single contact				
		Contact closes	MK1.1	SK1.1
		Contact opens	MK1.2	SK1.2
		Contact switches over, i.e 1 contact opens 1 contact closes	MK1.W	SK1.W
Double contact				
		1st contact closes 2nd contact closes	MK2.11	SK2.11
		1st contact closes 2nd contact opens	MK2.12	SK2.12
		1st contact opens 2nd contact closes	MK2.21	SK2.21
		1st contact opens 2nd contact opens	MK2.22	SK2.22
Triple contact				
		1st contact opens 2nd contact closes 3rd contact opens	MK3.212	SK3.212
		1st contact closes 2nd contact opens 3rd contact closes	MK3.121	SK3.121

Switching functions of electrical contacts (inductive)

Switching scheme	Wiring diagram	Switching function	The clockwise rotation of the pointer of the gauge moves the control flag...	Contact type
		Pointer moves clockwise		**Inductive contact**
		Single contact		
		Contact closes	outside the switch contact head area	IK1.1
		Contact opens	inside the switch contact head area	IK1.2
		Double contact		
		1st contact closes 2nd contact closes	the 1st and 2nd contact outside the switch contact head	IK2.11
		1st contact closes 2nd contact opens	the 1st contact outside the switch contact head the 2nd contact inside the switch contact head	IK2.12
		1st contact opens 2nd contact closes	the 1st contact inside the switch contact head the 2nd contact outside the switch contact head	IK2.21
		1st contact opens 2nd contact opens	the 1st and 2nd contact inside the switch contact head	IK2.22
		Triple contact		
		1st contact opens 2nd contact closes 3rd contact opens	the 1st and 3rd contact inside the switch contact head the 2nd contact outside the switch contact head	IK3.212
		1st contact closes 2nd contact opens 3rd contact closes	the 1st and 3rd contact outside the switch contact head the 2nd contact inside the switch contact head	IK3.121

Bourdon tube pressure gauges with electrical contacts, nominal size 50



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. For measurement in areas with limited space. Especially suitable for monitoring minimum pressure in gas cylinders together with AFRISO alarm unit for low gas level (refer to page 373).

Type
D 9

Nominal size
50

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/+1.5 to -1/+15 bar
0/2.5 to 0/400 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Contact types
Sliding contact (SK)

Minimum measuring ranges
Contact
SK single 2.5 bar
SK change-over contact 16 bar
(up to 60 bar max.)

Switching point
Exact details of the switching point are required to ensure optimum operation.

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 42 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom
G1/4B – spanner size 14
(EN 837-1/7.3)

Electrical connection
Cable gland, 2 m cable

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304 with rear blow-out according to EN 562

Crimped bezel
Stainless steel 304

Contact cover
Makrolon, with contact adjustment lock

Options

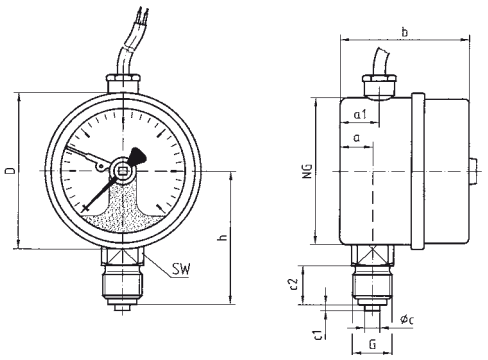
- *Wetted parts oil and grease free*
- *Damping screw*

Refer to page 370 for prices

Bourdon tube pressure gauges with electrical contacts, nominal size 50 *Type D 9*

Housing types and dimensions

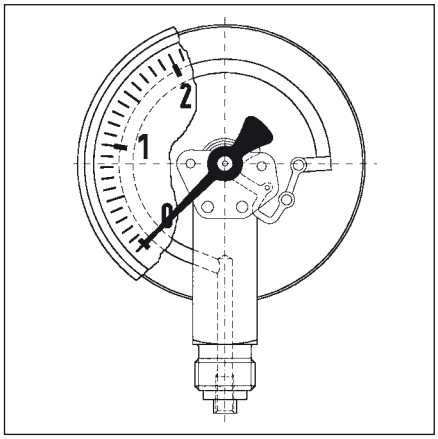
Bottom connection



Dimensions (mm)

Nominal size (NG)	a	a1	b	Øc	c1	c2	D	G	h	SW					
50	10.5	13	43	5	2	13	53	G1/4B	46	14					

Bourdon tube pressure gauges with electrical contacts, nominal size 63



Application
For aggressive gaseous and liquid media which are not highly viscous and do not crystallize. For measurement in areas with limited space. Especially suitable for monitoring minimum pressure in gas cylinders together with AFRISO alarm unit for low gas level (refer to page 373).

Type
D 3

Nominal size
63

Accuracy class (EN 837-1/6)
1.6

Ranges (EN 837-1/5)
-1/+0.6 to -1/+15 bar
1/1.6 to 0/600 bar

Application area
Static load:
3/4 x full scale value
Dynamic load:
2/3 x full scale value
Short term:
full scale value

Contact types
Magnetic spring contact (MK)
Electronic contact (EK)
Inductive contact (IK)
Refer to pages 354–356 for technical specifications

Minimum measuring ranges
Contact
MK single 1.6 bar
MK double 1.6 bar
EK/IK single 1.6 bar
EK/IK double 1.6 bar

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 42 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom or bottom back
G1/4B – spanner size 14
(EN 837-1/7.3)

Electrical connection
Cable gland M 12 x 1.5
1 m cable

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304 with rear blow-out

Push on bezel
Stainless steel 304

Front glass
Makrolon, with contact adjustment lock

Options

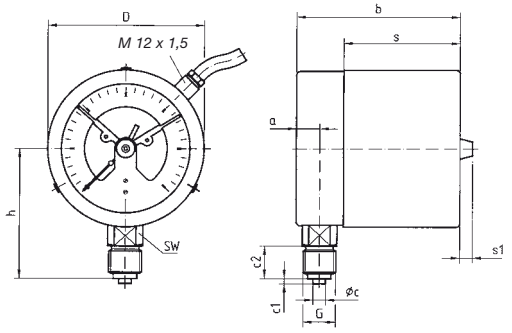
- *Wetted parts oil and grease free (≤ 0/400 bar)*
- *Ultra-pure gas version*
- *Back flange*
- *Damping screw*

Refer to page 370 for prices

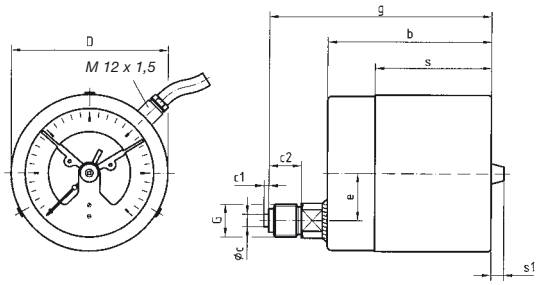
Bourdon tube pressure gauges with electrical contacts, nominal size 63 *Type D 3*

Housing types and dimensions

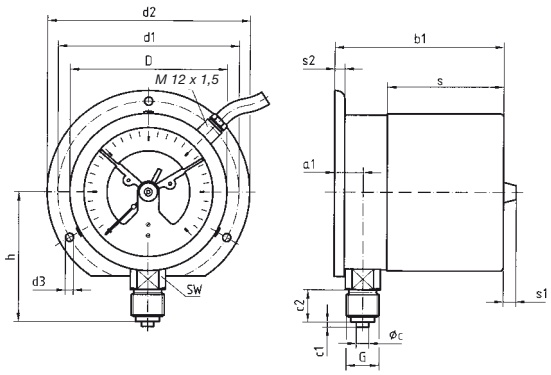
Bottom connection



Bottom back connection



Bottom connection, back flange



Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*Øc*	*c1*	*c2*	*D*	*g*	*G*	*h*	*s*	*s1*	*s2*	*SW*
63	*9.5*	*13*	*66*	*69.5*	*5*	*2*	*13*	*64*	*89*	*G1/4B*	*46*	*47.5*	*8*	*5.5*	*14*

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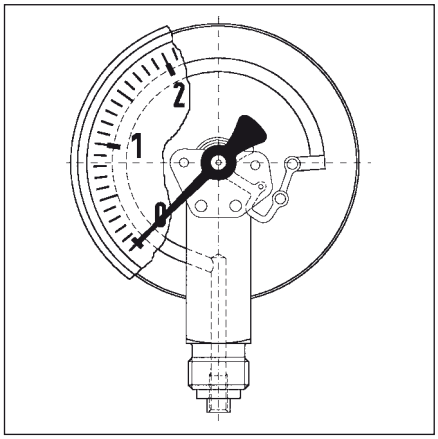
Bourdon tube pressure gauges with electrical contacts for industrial applications



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys. For high accuracy measurement.

Type
D 2

Nominal size
100

Accuracy class (EN 837-1/6)
Class 1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/1 to 0/1,000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = 3/4 x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = 2/3 x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Contact types
Magnetic spring contact (MK)
Electronic contact (EK)
Inductive contact (IK)
Refer to pages 354–356 for technical specifications

Minimum measuring ranges
Contact
MK single 1.6 bar
MK double 1.6 bar
EK/IK single 1 bar
EK/IK double 1 bar

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom or bottom back
G1/2B – spanner size 22
(EN 837-1/7.3)

Electrical connection
Cable gland M 12 x 1.5
1 m cable

Measuring element
Bourdon tube element,
≤ 60 bar „C“ type bourdon tube, copper alloy
> 60 bar helical tube, 316 Ti or 316 L

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Sheet steel, black

Push-on bezel
Sheet steel, black

Front glass
Makrolon, with contact adjustment lock

Options

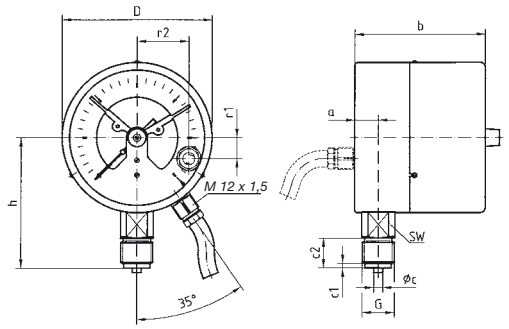
- *Back flange*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*
- *Junction box*
- *Plug-in connectors*

Refer to page 370 for prices

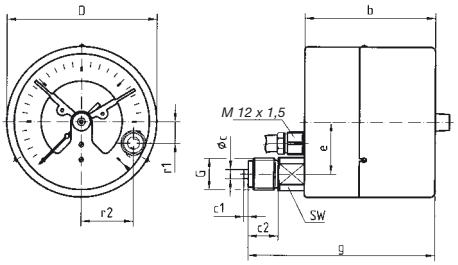
Bourdon tube pressure gauges with electrical contacts for industrial applications **Type D 2 – NG 100**

Housing types and dimensions

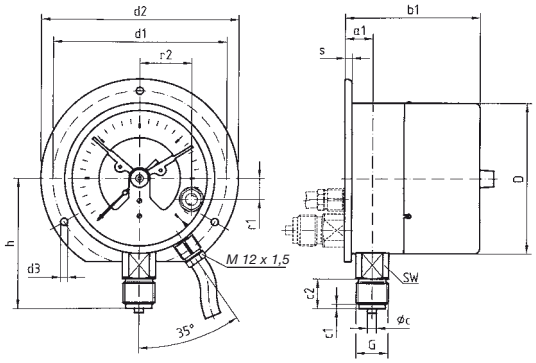
Bottom connection



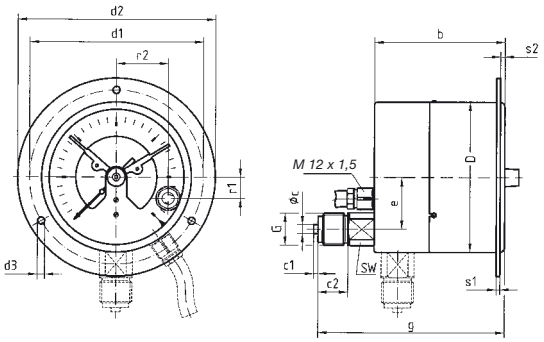
Bottom back connection



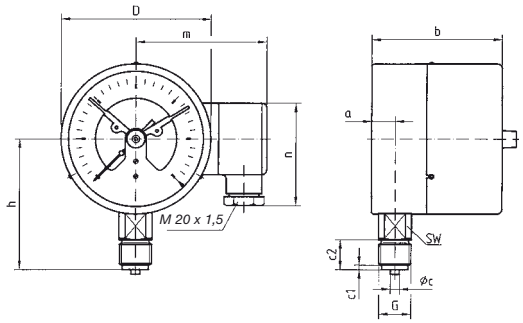
Bottom connection (back), back flange



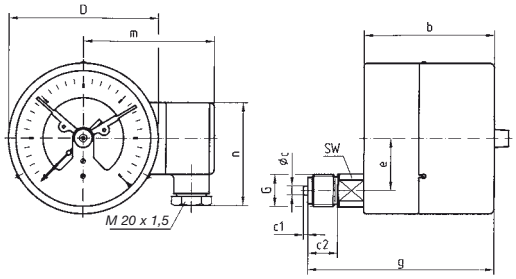
Bottom back connection (or bottom), 3-hole fixing, panel mounting bezel



Bottom connection, with junction box (option)



Bottom back connection, with junction box (option)

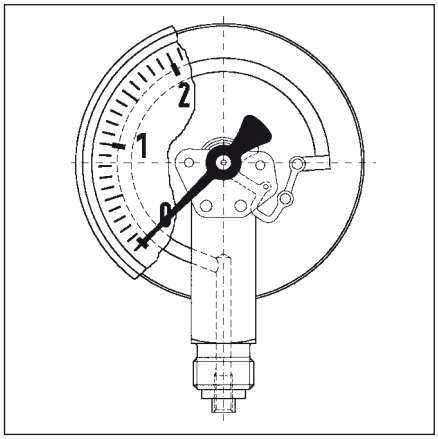


Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	d1*	d2*	d3*	D	e	g	G	h	m	n	r1	r2	s	s1
100	15.6	19.1	87	90.5	6	3	20	116	132	4.8	100.5	26.5	119	G1½B	86	92	72	14	34.5	5.5	3
Nominal size (NG)	s2	SW																			
100	2.5	22																			

* Dimensions according to DIN 16064

Bourdon tube pressure gauges with electrical contacts for industrial applications



Application
For gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys. For high accuracy measurement.

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/1 to 0/1,000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = 3/4 x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = 2/3 x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Contact types
Magnetic spring contact (MK)
Electronic contact (EK)
Inductive contact (IK)
Refer to pages 354–356 for technical specifications

Minimum measuring ranges
Contact
MK single 1.6 bar
MK double 1.6 bar
EK/IK single 1 bar
EK/IK double 1 bar

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, bottom or bottom back
G1/2B – spanner size 22
(EN 837-1/7.3)

Electrical connection
Cable gland M 12 x 1.5
1 m cable

Measuring element
Bourdon tube element,
≤ 60 bar „C“ type bourdon tube, copper alloy
> 60 bar helical tube, 316 Ti or 316 L

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304 with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Makrolon, with contact adjustment lock

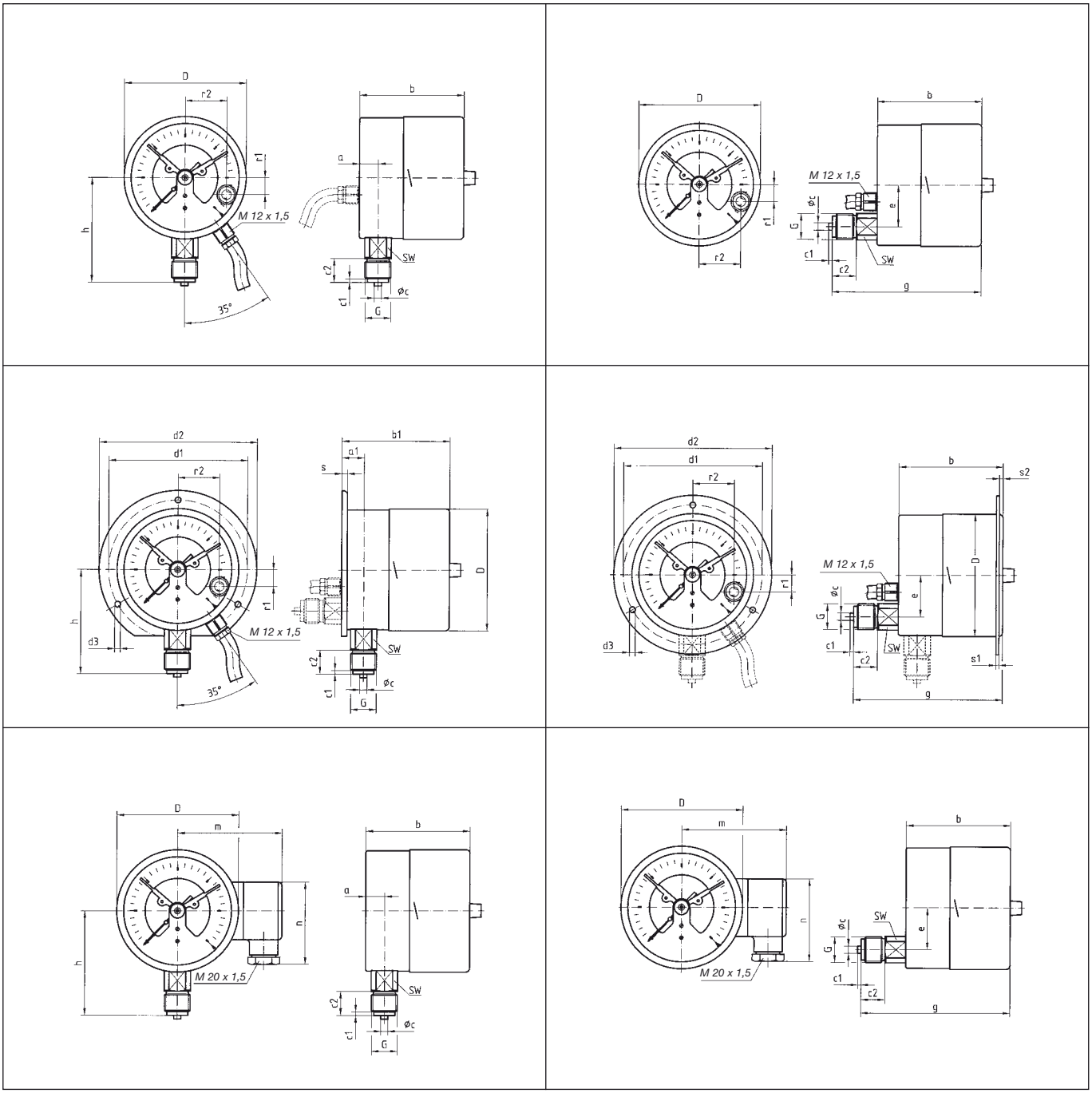
Options

- *Back flange*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*
- *Junction box*
- *Plug-in connectors*

Refer to page 371 for prices

Bourdon tube pressure gauges with electrical contacts for industrial applications **Type D 4 – NG 100/160**

Housing types and dimensions

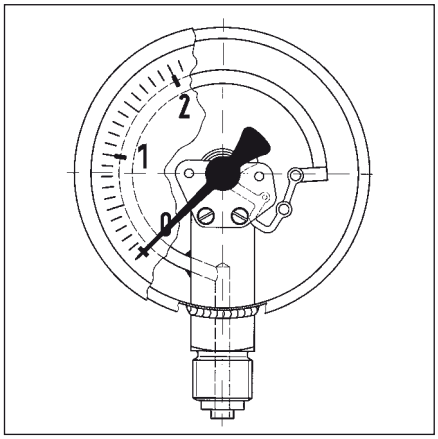


Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	d1*	d2*	d3*	D	e	g	G	h	m	n	r1	r2	s	s1
100	15.6	19.1	87	90.5	6	3	20	116	132	4.8	101.5	26.5	119	G1½B	86	92	72	14	34.5	5.5	2
160	17.5	20.5	97	100	6	3	20	178	196	5.8	161.5	26.5	129	G1½B	116	122	72	14	34.5	6	2
Nominal size (NG)	s2	SW																			
100	4	22																			
160	4	22																			

* Dimensions according to DIN 16064

Bourdon tube pressure gauges with electrical contacts for chemical applications



Application
For corrosive, gaseous and liquid media which are not highly viscous and do not crystallize. Suitable for use in corrosive atmospheres. For high accuracy measurement.

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-1/6)
1.0

Ranges (EN 837-1/5)
-1/0 to -1/+15 bar
0/1 to 0/1,000 bar

Application area
Static load:
≤ 600 bar = full scale value
> 600 bar = 3/4 x full scale value
Dynamic load:
≤ 600 bar = 0.9 x full scale value
> 600 bar = 2/3 x full scale value
Short term:
≤ 600 bar = 1.3 x full scale value
> 600 bar = full scale value

Contact types
Magnetic spring contact (MK)
Electronic contact (EK)
Inductive contact (IK)
Refer to pages 354–356 for technical specifications

Minimum measuring ranges
Contact
MK single 1.6 bar
MK double 1.6 bar
EK/IK single 1 bar
EK/IK double 1 bar

Operating temperature range
Medium: T_{max} = +150 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom or bottom back
G1/2B – spanner size 22
(EN 837-1/7.3)

Electrical connection
Junction box

Measuring element
Bourdon tube, stainless steel 316 Ti or 316 L
≤ 60 bar „C“ type bourdon tube
> 60 bar helical tube

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304 with pressure relief port

Bayonet type bezel
Stainless steel 304

Front glass
Makrolon, with contact adjustment lock

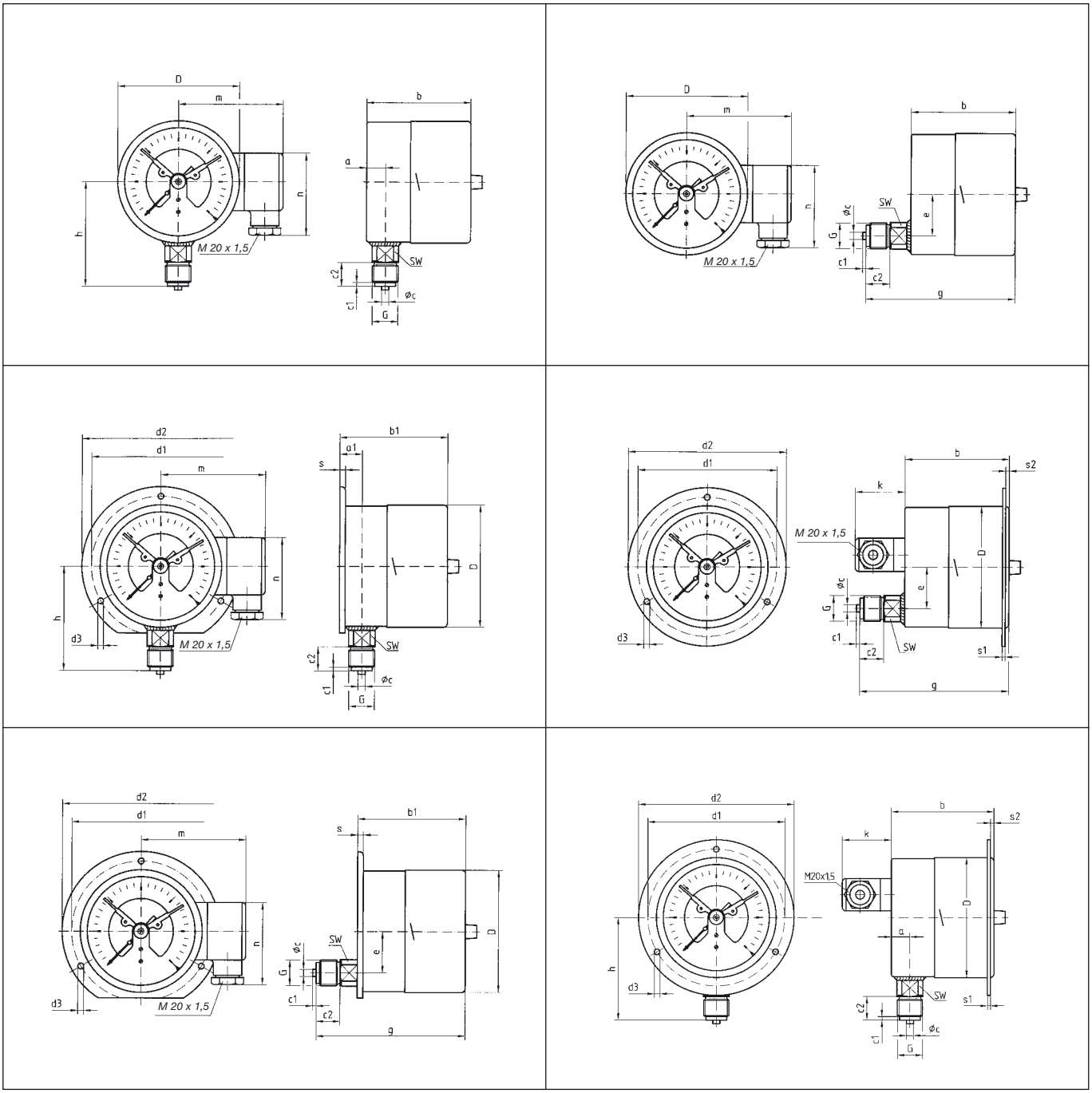
Options

- *Liquid filling (silicone oil)*
- *Back flange*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*
- *Plug-in connectors*

Refer to page 371 for prices

Bourdon tube pressure gauges with electrical contacts for chemical applications *Type D 4 - NG 100/160*

Housing types and dimensions



Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*Øc*	*c1*	*c2*	*d1**	*d2**	*d3**	*D*	*e*	*g*	*G*	*h*	*k*	*m*	*n*	*s*	*s1*	*s2*
100	*15.6*	*19.1*	*87*	*90.5*	*6*	*3*	*20*	*116*	*132*	*4.8*	*101.5*	*34.5*	*121*	*G1½B*	*86*	*40*	*92*	*72*	*5.5*	*2*	*4*
160	*17.5*	*20.5*	*97*	*100*	*6*	*3*	*20*	*178*	*196*	*5.8*	*161.5*	*34.5*	*131*	*G1½B*	*116*	*40*	*122*	*72*	*6*	*2*	*4*
Nominal size (NG)	*SW*																				
100	*22*																				
160	*22*																				

** Dimensions according to DIN 16064*

Bourdon tube pressure gauges with electrical contacts

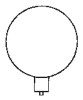
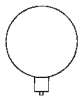
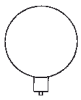
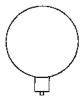
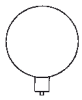
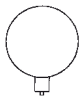
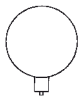
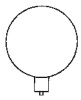
DG: M

Type	RF50SK1, D902	RF50SKW, D902	RF63MK1, D302	RF63MK2, D302	RF63IK1, D302	RF63IK2, D302	RF100IMK1, D201	RF100IMK2, D201
Version								
Housing Ø	50	50	63	63	63	63	100	100
Housing	Stainless steel 304 with crimped bezel		Stainless steel 304 with push-on bezel				Sheet steel, black, with push-on bezel	
Meas. elem.	Bourdon tube, stainless steel 316 Ti or 316 L						Copper alloy	
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.0	1.0
Connection	G 1/4 B	G 1/4 B	G 1/4 B	G 1/4 B	G 1/4 B	G 1/4 B	G 1/2 B	G 1/2 B
Contact type	Sliding single	Sliding change-over	Magnetic spring single	Magnetic spring double	Inductive single	Inductive double	Magnetic spring single	Magnetic spring double
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	---	---	---	---	---	---	---	---
-1/+0.6	---	---	87402302	87502302	87452302	87552302	87602201	87652201
-1/+1.5	87430902	---	87403302	87503302	87453302	87553302	87603201	87653201
-1/+3	87431902	---	87404302	87504302	87454302	87554302	87604201	87654201
-1/+5	87432902	---	87405302	87505302	87455302	87555302	87605201	87655201
-1/+9	87433902	---	87406302	87506302	87456302	87556302	87606201	87656201
-1/+15	87434902	87480902	87407302	87507302	87457302	87557302	87607201	87657201
Price €								
0/0.6	---	---	---	---	---	---	---	---
0/1	---	---	---	---	---	---	---	---
0/1.6	---	---	87411302	87511302	87461302	87561302	87611201	87661201
0/2.5	87435902	---	87412302	87512302	87462302	87562302	87612201	87662201
0/4	87436902	---	87413302	87513302	87463302	87563302	87613201	87663201
0/6	87437902	---	87414302	87514302	87464302	87564302	87614201	87664201
0/10	87438902	---	87415302	87515302	87465302	87565302	87615201	87665201
0/16	87439902	87481902	87416302	87516302	87466302	87566302	87616201	87666201
0/25	87440902	87482902	87417302	87517302	87467302	87567302	87617201	87667201
0/40	87441902	87483902	87418302	87518302	87468302	87568302	87618201	87668201
Price €								
0/60	87442902	87484902	87419302	87519302	87469302	87569302	87619201	87669201
0/100	87443902	---	87420302	87520302	87470302	87570302	87620201	87670201
0/160	87444902	---	87421302	87521302	87471302	87571302	87621201	87671201
0/250	87445902	---	87422302	87522302	87472302	87572302	87622201	87672201
0/400	87446902	---	87423302	87523302	87473302	87573302	87623201	87673201
Price €								
0/600	---	---	87424302	87524302	87474302	87574302	87624201	87674201
0/1000	---	---	---	---	---	---	87625201	87675201

Please specify required switching function (normally closed/normally open). Refer to page 371/372 for other versions.

Bourdon tube pressure gauges with electrical contacts

DG: M

Type	RF100I MK1, D401	RF100I MK2, D401	RF100I IK1, D401	RF100I IK2, D401	RF100Ch MK1, D402	RF100Ch MK2, D402	RF100Ch IK1, D402	RF100Ch IK2, D402
Version								
Housing Ø	100	100	100	100	100	100	100	100
Housing	Stainless steel 304 with bayonet type bezel							
Meas. elem.	Bourdon tube, copper alloy				Bourdon tube, stainless steel 316 Ti or 316 L			
Accuracy class	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Connection	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B	G1/2B
Contact type	Magnetic spring single	Magnetic spring double	Inductive single	Inductive double	Magnetic spring single	Magnetic spring double	Inductive single	Inductive double
Range (bar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
-1/0	---	---	87701401	87751401	---	---	87701402	87751402
-1/+0.6	87602401	87652401	87702401	87752401	87602402	87652402	87702402	87752402
-1/+1.5	87603401	87653401	87703401	87753401	87603402	87653402	87703402	87753402
-1/+3	87604401	87654401	87704401	87754401	87604402	87654402	87704402	87754402
-1/+5	87605401	87655401	87705401	87755401	87605402	87655402	87705402	87755402
-1/+9	87606401	87656401	87706401	87756401	87606402	87656402	87706402	87756402
-1/+15	87607401	87657401	87707401	87757401	87607402	87657402	87707402	87757402
Price €								
0/0.6	---	---	87709401	87759401	---	---	87709402	87759402
0/1	---	---	87710401	87760401	---	---	87710402	87760402
0/1.6	87611401	87661401	87711401	87761401	87611402	87661402	87711402	87761402
0/2.5	87612401	87662401	87712401	87762401	87612402	87662402	87712402	87762402
0/4	87613401	87663401	87713401	87763401	87613402	87663402	87713402	87763402
0/6	87614401	87664401	87714401	87764401	87614402	87664402	87714402	87764402
0/10	87615401	87665401	87715401	87765401	87615402	87665402	87715402	87765402
0/16	87616401	87666401	87716401	87766401	87616402	87666402	87716402	87766402
0/25	87617401	87667401	87717401	87767401	87617402	87667402	87717402	87767402
0/40	87618401	87668401	87718401	87768401	87618402	87668402	87718402	87768402
Price €								
0/60	87619401	87669401	87719401	87769401	87619402	87669402	87719402	87769402
0/100	87620401	87670401	87720401	87770401	87620402	87670402	87720402	87770402
0/160	87621401	87671401	87721401	87771401	87621402	87671402	87721402	87771402
0/250	87622401	87672401	87722401	87772401	87622402	87672402	87722402	87772402
0/400	87623401	87673401	87723401	87773401	87623402	87673402	87723402	87773402
Price €								
0/600	87624401	87674401	87724401	87774401	87624402	87674402	87724402	87774402
0/1000	87625401	87675401	87725401	87775401	87625402	87675402	87725402	87775402

Please specify required switching function (normally closed/normally open). Refer to page 370/372 for other versions.

Additional costs for electrical contacts

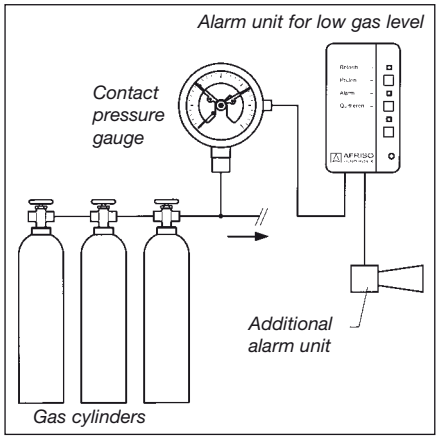
DG: M

Design			Magnetic spring contact			Inductive contact		
Code			MK 1	MK 2	MK 3	IK 1	IK 2	IK 3
Number of contacts			1	2	3	1	2	3
Switching function: 1 = closes, 2 = opens (pointer moves clockwise)			1 2	11 , 12 21 , 22	as specified	1 2	11 , 12 21 , 22	as specified
The additional costs include fitting of contacts; gauge not included								
Version	Nominal size	Housing	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**
Bourdon tube pressure gauges for industrial applications type D2	100	without filling						
Bourdon tube pressure gauges for industrial applications type D4	100	without filling						
Pressure gauges for chemical applications type D4/D8	160	without filling						
Safety pressure gauges type D4/D8	100	with filling						
Stainless steel diaphragm pressure gauges type D4/D8	160	with filling						
Standard diaphragm pressure gauges type D4/D8	100	without filling						
	160	without filling						
Bourdon tube pressure gauges for high pressures type D4/D8	100	with filling						
	160	with filling						
Diaphragm pressure gauges for chemical applications type D4/D8	100	without filling						
	160	without filling						
Diaphragm pressure gauges for differential pressure type D4/D8	100	with filling						
	160	with filling						

Additional costs for special versions		**NG 100**	**NG 160**
Electronic contact with 3-wire slot initiator (additional cost over and above magnetic spring contact)	1 contact (EK 1) 2 contacts (EK 2) 3 contacts (EK 3)		
Separate circuits for double magnetic spring contacts			
Separate circuits for triple magnetic spring contacts			
Cable NYLHY (in excess of 1 metre) per metre	up to 4 wires 5 wires/7 wires		
Junction box	for instruments without filling		
Additional cable for junction box, 1 m long			
Single changeover (additional cost to single magnetic spring contact)			
Double changeover (additional cost to double magnetic spring contact)			
Contact pins from special materials (per contact)	gold/silver platinum/iridium		
Inductive contact, safety version (per contact) (can only be used in conjunction with KHA6-SH-Ex1!)	Type IK SN Type IK S1N (NG 100 only 1 contact possible)		

Versions with four electrical contacts on request.

Alarm unit for low gas level



Application
For monitoring the pressure in gas filled containers (e.g. gas installations, gas cylinder batteries or bundle stations).

Function
The alarm signal is generated by a pressure gauge fitted with an electrical contact. The alarm level can be set to any value from 5 to 95 % via the contact arm of the pressure gauge.

A green LED indicates normal operation.

In case of a power failure, the unit does not generate an alarm signal. When power is restored, the instrument immediately resumes operation. If, in the meantime, the gas pressure has fallen below the set limit, an alarm signal is generated.

When an alarm occurs, the red LED lights up. In addition, the system generates an audible alarm. The audible alarm can be re-set. The red LED remains lit for as long as the alarm condition prevails.

The proper functioning of the system can be checked at all times by pressing the test button. When the button is pressed, the system must generate an alarm, i.e. the red LED must light up and the audible alarm must sound.

Description
The system consists of one or several contact pressure gauges (connected in series), a control unit (alarm unit for low gas level) and, if required, an additional alarm unit.

The contact pressure gauge is equipped with a magnetic spring contact which is actuated by the pointer of the pressure gauge. The ranges of the pressure gauges can be selected as required.
If several gas containers are to be monitored, several contact pressure gauges can be connected in series and monitored by a single alarm unit for low gas level. It is also possible to connect a separate alarm unit for each measuring point.

An additional alarm unit can be connected to the relay output of the alarm unit as an auxiliary remote alarm.

Technical specifications

Operating temperature range
Ambient: -5 °C/+40 °C

Supply voltage
AC 230 V ±10 %

Power consumption
5 VA

Circuit to pressure gauge
Intrinsically safe, U < 16.8 V, I < 57 mA

Relay output
Relay contact: 1 voltage-free contact, normally open
Contact rating: Max. 250 V, 2 A, (resistive load)

Response delay
none

Intrinsic safety
[EEx ia] IIC

Housing
Wall mounting housing made from impact resistant plastic (ABS)
W x H x D: 100 x 188 x 65 mm

Protection
IP 30 (EN 60529)

Protection class
II (EN 60730)

Interference
According to EN 61000-6-3

Noise immunity
According to EN 61000-6-2

	DG	Part no.	Price €
Alarm unit for low gas level	M	67006	
Mounting frame	G	**43521**	
Sealing set (IP 54)	G	**43416**	

Contact protection relay/isolating switching amplifier for electrical contacts

Application and principle of operation of the contact protection relays MSR/MSR-I

The application of a pulsed voltage to the contacts (e.g. of a contact pressure gauge) ensures load free switching of the contacts (99 % voltage-free). This protects the contacts and prolongs their service life. When used for measuring instruments with liquid filling it prevents turbidity of the liquid and protects the contact surfaces.

Supply voltage
AC 230 V, 50–60 Hz
Power consumption approx. 6 VA

Control voltage
MSR DC 35–40 V Pulse
MSR-I DC 10 V

Relay output
Voltage-free changeover contact
Switch rating 250 V/8 A max.

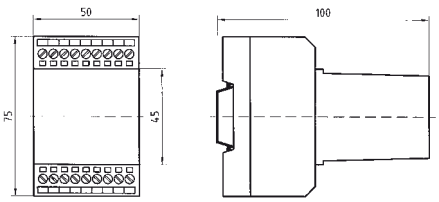
Voltage output
DC 24 V, 20 mA max.

Housing
Polyamide, 6.6
DIN rail mounting, 35 x 7.5 according to DIN 50022

Protection
IP 20 according to IEC 529

Operating temperature range
0/70 °C

Dimensions



Application and principle of operation of the KFA isolating switching amplifier

Isolating switching amplifiers are used to isolate an intrinsically safe control circuit from a non-intrinsically safe operating current circuit. They are required to operate measuring instruments with electrical contacts in hazardous areas (zones 0, 1 and 2). The isolating switching amplifier must always be installed outside of the hazardous area!

Supply voltage
AC 230 V, 50–60 Hz

Open circuit voltage/short circuit current
Standard version
approx. DC 8 V/8 mA
Safety version
approx. DC 8.4 V/11.7 mA

Relay output (not intrinsically safe)
Voltage-free changeover contact
Standard version
AC 250 V/2 A (40 V)/2 A
Safety version
AC 50 V (DC 24 V)/1 A

Hazardous area classification
[EEx ib] IIC + [EEx ia] IIC

Housing
Makrolon
DIN rail mounting 35 x 7.5 according to DIN 50022

Protection
IP 20 according to IEC 529

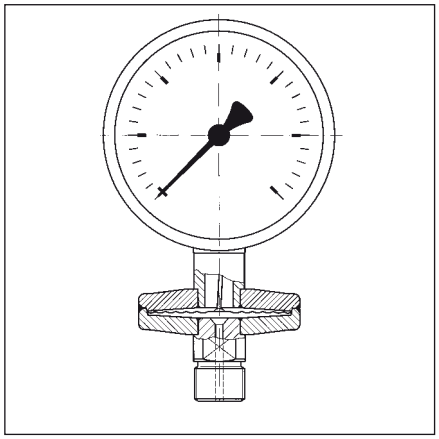
Operating temperature range
-20/+60 °C

DG: H

Version	Part no.	Price €
MSR 010 1 contact	38201	
MSR 020 2 contacts	38202	
MSR 011 Interval	38203	
MSR 010-I 1 contact	38204	
MSR 020-I 2 contacts	38205	
MSR 011-I Interval	38206	
KFA6-SR2-Ex1.W	38215	
KFA6-SR2-Ex2.W	38216	
KHA6-SH-Ex1 1 contact, for fail-safe mode	38217	

Please enquire for complete data sheets on the individual units.

Stainless steel diaphragm pressure gauges EN 837-3



Clamp-Anschluss

Application
For corrosive, gaseous and liquid media, also suitable for use in corrosive atmospheres. Also suitable for viscous and polluted media in conjunction with open connection flange. With clamp connection especially suitable for hygienic processes.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
0/40 mbar to 0/25 bar

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value

Overpressure safety
1.3 x full scale value

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.8 %/10K
falling temp. approx. ±0.8 %/10K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom
G½B – spanner size 22
(EN 837-3/7.3)

Lower flange
Stainless steel 316 Ti or 316 L

Upper flange
Stainless steel 316 Ti or 316 L

Measuring element
Diaphragm:
40 mbar to 2.5 bar
stainless steel 316 Ti or 316 L
4 bar to 25 bar Duratherm

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

- *Glycerine filling*
- *Wetted parts with special coating*
- *Clamp connection*
- *Flush mounting connection flanges according to EN*
- *Open connection flanges according to EN/ANSI*
- *Other connection threads*
- *Electrical contacts (≥ 0/0.6 bar)*

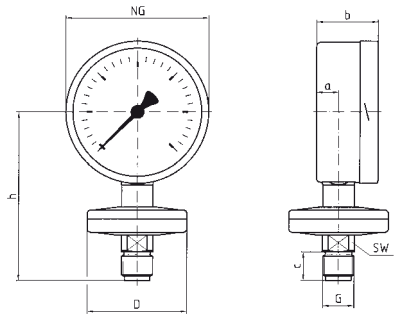
Refer to page 377 for prices

Stainless steel diaphragm pressure gauges

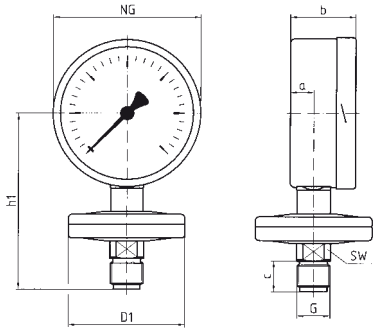
Type D 4 – NG 100/160

Housing types and dimensions (in mm)

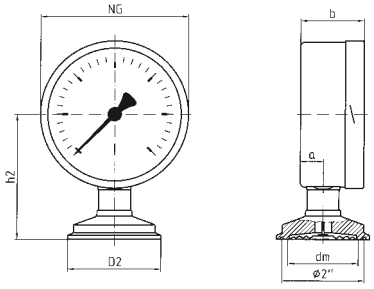
Bottom connection, 0/40 mbar to 0/2.5 bar



Bottom connection, 0/4 bar to 0/25 bar



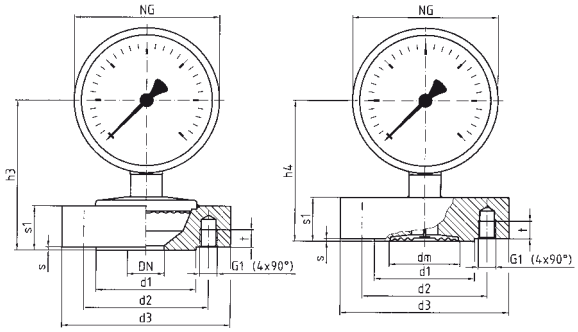
Clamp connection 2“ according to ISO 2852, 0/1 bar to 0/6 bar



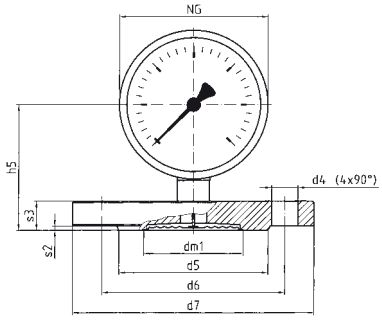
Connection flange according to EN 1092-1/B 1/DN 25/PN 40

Open, 0/40 mbar to 0/25 bar

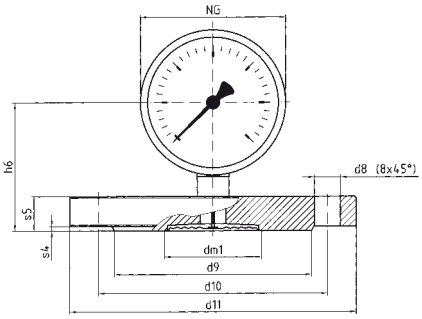
Flush mounting, 0/1 bar to 0/6 bar



Flush mounting connection flange according to EN 1092-1/B 1/DN 50/PN 40, 0/40 mbar to 0/25 bar



Flush mounting connection flange according to EN 1092-1/B 1/DN 80/PN 40, 0/40 mbar to 0/25 bar

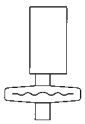
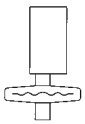
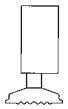
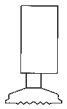
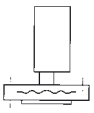
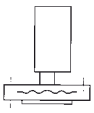
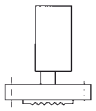
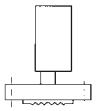


Dimensions (mm)

Nominal size (NG)	*a*	*b*	*c*	*d1*	*d2*	*d3*	*d4*	*d5*	*d6*	*d7*	*d8*	*d9*	*d10*	*d11*	*dm*	*dm1*	*D*	*D1*	*D2*	*DN*	
100	*15.6*	*49*	*20*	*68*	*85*	*115*	*4xØ18*	*102*	*125*	*165*	*8xØ18*	*138*	*160*	*200*	*48*	*68*	*69*	*78*	*64*	*25*	
160	*17.5*	*50*	*20*	*68*	*85*	*115*	*4xØ18*	*102*	*125*	*165*	*8xØ18*	*138*	*160*	*200*	*48*	*68*	*69*	*78*	*64*	*25*	
Nominal size (NG)	*G*	*G1*	*h*	*h1*	*h2*	*h3*	*h4*	*h5*	*h6*	*s*	*s1*	*s2*	*s3*	*s4*	*s5*	*SW*					
100	*G½B*	*4xM12*	*117*	*117*	*86*	*102*	*96*	*86*	*90*	*2*	*30*	*3*	*20*	*3*	*24*	*22*					
160	*G½B*	*4xM12*	*148*	*148*	*117*	*133*	*127*	*117*	*121*	*2*	*30*	*3*	*20*	*3*	*24*	*22*					

Stainless steel diaphragm pressure gauges EN 837-3

DG: H

Type	PF100E, D402	PF160E, D402	PF100CP, D402	PF160CP, D402	PF100E, D402	PF160E, D402	PF100E, D402	PF160E, D402
Version								
Housing Ø	100	160	100	160	100	160	100	160
Housing	Stainless steel 304 with bayonet type bezel							
Meas. elem.	316 Ti or 316 L, ≥ 4 bar Duratherm		Stainless steel 316 Ti or 316 L		Stainless steel 316 Ti or 316 L, ≥ 4 bar Duratherm			
Flanges	Stainless steel 316 Ti or 316 L							
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G 1/2 B	G 1/2 B	Clamp 2" ISO 2852	Clamp 2" ISO 2852	Open connection flange according to EN 1092-1/ B 1/DN 25/PN 40		Flush mounting connection flange according to EN 1092-1/ B 1/DN 50/PN 40	
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/10	---	---	---	---	---	---	---	---
0/16	---	---	---	---	---	---	---	---
0/25	---	---	---	---	---	---	---	---
0/40	85884402	85924402	---	---	88904402	88924402	88944402	88964402
0/60	85885402	85925402	---	---	88905402	88925402	88945402	88965402
0/100	85886402	85926402	---	---	88906402	88926402	88946402	88966402
0/160	85887402	85927402	---	---	88907402	88927402	88947402	88967402
0/250	85888402	85928402	---	---	88908402	88928402	88948402	88968402
0/400	85889402	85929402	---	---	88909402	88929402	88949402	88969402
Range (bar)								
Price €								
0/0,6	85890402	85930402	---	---	88910402	88930402	88950402	88970402
0/1	85891402	85931402	88980402	88990402	88911402	88931402	88951402	88971402
0/1,6	85892402	85932402	88981402	88991402	88912402	88932402	88952402	88972402
0/2,5	85893402	85933402	88982402	88992402	88913402	88933402	88953402	88973402
Price €								
0/4	85894402	85934402	88983402	88993402	88914402	88934402	88954402	88974402
0/6	85895402	85935402	88984402	88994402	88915402	88935402	88955402	88975402
0/10	85896402	85936402	---	---	88916402	88936402	88956402	88976402
0/16	85897402	85937402	---	---	88917402	88937402	88957402	88977402
0/25	85898402	85938402	---	---	88918402	88938402	88958402	88978402

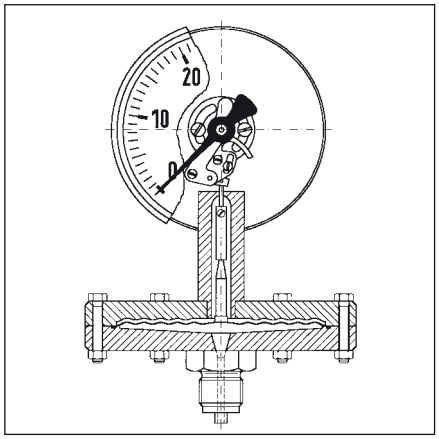
Refer to page 378 for additional costs.

Additional costs for stainless steel diaphragm pressure gauges

DG: H

Process connection			**Price €**
Groove/tongue according to EN 1092-1			
Connection G1/4B			
Connection 1/4 NPT			
Connection 1/2 NPT			
Connection M 20 x 1.5			
Other connection threads			**on request**
Channel bore Ø 10 mm in connection G1/2B			**Standard**
Flush mounting connection flange according to DIN EN 1092-1/B1 (Additional cost over standard connection G1/2B)	Nominal width	Nominal pressure	**Price €**
	DN 25 (0/1 bar to 0/6 bar)	PN 40	
	DN 50	PN 40	
	DN 80	PN 40	
other connection flanges			**on request**
Special coating for diaphragm and lower flange (only for flush mounting flange)	Nominal width		**Price €**
PTFE coating	DN 25	PN 40	
PTFE coating	DN 50	PN 40	
PTFE coating	DN 80	PN 40	
PFA coating	DN 25	PN 40	
PFA coating	DN 50	PN 40	
PFA coating	DN 80	PN 40	
Other materials			**on request**
Glycerine filling			**Price €**
Nominal size 100			
Nominal size 160			
Miscellaneous			**Price €**
Overpressure safety 5 x FSD			**on request**
Vacuum proof (≥ 0/4 bar)			**Standard**
Electrical contacts (≥ 0/0.6 bar)			**See page 372**

Standard diaphragm pressure gauges EN 837-3



Application
For non-corrosive gaseous and liquid media. With open connecting flange also suitable for viscous and polluted media.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
0/10 to 0/250 mbar (flange Ø 160)
0/0.4 to 0/25 bar (flange Ø 100)

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value

Overpressure safety
1.3 x full scale value
≥ 0.6 bar overpressure safety
5 x FSD, however, 40 bar max.

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.8 %/10 K
falling temp. approx. ±0.8 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Steel, bottom
G1/2B – spanner size 22
(EN 837-3/7.3)

Lower flange
Steel

Upper flange
Stainless steel

Measuring element
Diaphragm,
Measuring flange Ø 100:
up to 1.6 bar Duratherm,
≥ 2.5 steel
Measuring flange Ø 160:
Stainless steel 316 Ti or 316 L

Sealing gasket to pressurised area
„Perbunan“ nitrile rubber

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Instrument glass

Options

- *Safety housing*
- *Overpressure safety 10 x FSD flange Ø 100 up to 40 bar max., flange Ø 160 up to 2.5 bar max.)*
- *Glycerine filling (≥ 40 mbar, < 250 mbar accuracy class 2.5)*
- *Wetted parts with special coating*
- *Open connection flanges according to EN/ANSI*

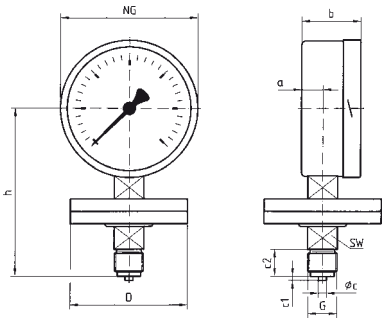
Refer to page 383 for prices

Standard diaphragm pressure gauges

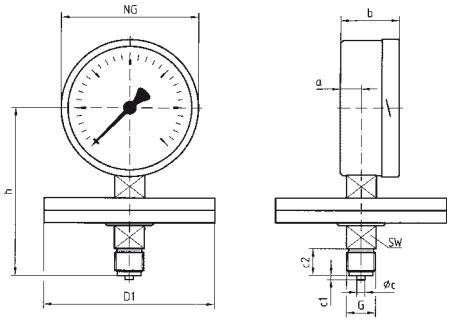
Type D 4 – NG 100/160

Housing types and dimensions

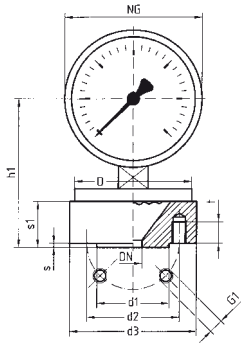
Bottom connection, measuring flange Ø 100



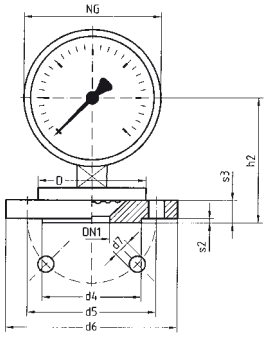
Bottom connection, measuring flange Ø 160



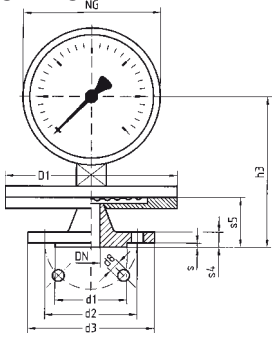
Connection flange according to EN 1092-1, DN 25 Measuring flange Ø 100



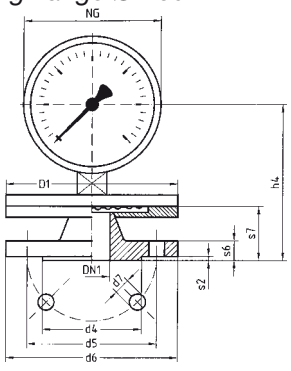
Connection flange according to EN 1092-1, DN 50 Measuring flange Ø 100



Connection flange according to EN 1092-1, DN 25 Measuring flange Ø 160



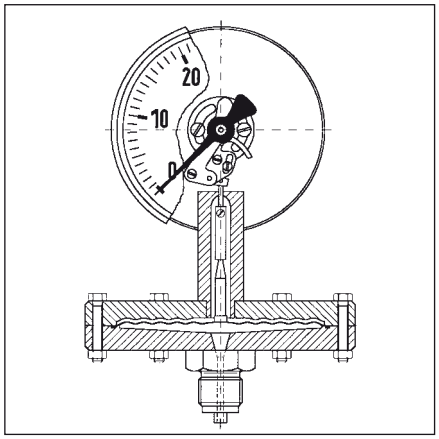
Connection flange according to EN 1092-1, DN 50 Measuring flange Ø 160



Dimensions (mm)

Nominal size (NG)	*a*	*b*	*Øc*	*c1*	*c2*	*d1*	*d2*	*d3*	*d4*	*d5*	*d6*	*d7*	*d8*	*D*	*D1*	*DN*	*DN1*	*G*	*G1*	*h*	*h1*
100	*20*	*55*	*6*	*3*	*20*	*68*	*85*	*115*	*102*	*125*	*165*	*4x18*	*4x14*	*100*	*160*	*25*	*50*	*G½B*	*4xM12*	*127*	*111*
160	*20*	*55*	*6*	*3*	*20*	*68*	*85*	*115*	*102*	*125*	*165*	*4x18*	*4x14*	*100*	*160*	*25*	*50*	*G½B*	*4xM12*	*156*	*141*
Nominal size (NG)	*h2*	*h3*	*h4*	*s*	*s1*	*s2*	*s3*	*s4*	*s5*	*s6*	*s7*	*t*	*SW*								
100	*101*	*129*	*137*	*2*	*30*	*3*	*20*	*18*	*48*	*20*	*56*	*12*	*22*								
160	*131*	*159*	*167*	*2*	*30*	*3*	*20*	*18*	*48*	*20*	*56*	*12*	*22*								

Diaphragm pressure gauges for chemical applications *EN 837-3*



Application
For corrosive, gaseous and liquid media and suitable for use in corrosive atmospheres. With open connecting flange also suitable for viscous and polluted media.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 4

Nominal size
100 – 160

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
0/10 to 0/250 mbar (flange Ø 160)
0/0.4 to 0/25 bar (flange Ø 100)

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value

Overpressure safety
1.3 x full scale value
≥ 0.6 bar overpressure safety
5 x FSD, however 40 bar max.

Operating temperature range
Medium: T_{max} = +100 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.8 %/10 K
falling temp. approx. ±0.8 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom
G½B – spanner size 22
(EN 837-3/7.3)

Lower flange
Stainless steel 316 Ti or 316 L

Upper flange
Stainless steel 316 Ti or 316 L

Measuring element
Diaphragm,
Measuring flange Ø 100:
Duratherm
Measuring flange Ø 160:
Stainless steel 316 Ti or 316 L

Sealing gasket to pressurised area
FPM (Viton)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304
with blow-out

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

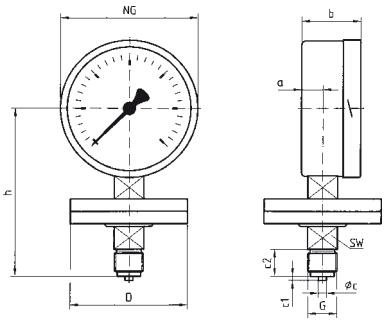
- *Safety housing*
- *Overpressure safety 10 x FSD (flange Ø 100 up to 40 bar max., flange Ø 160 up to 2.5 bar max.)*
- *Glycerine filling (≥ 40 mbar, ≤ 250 mbar accuracy class 2.5)*
- *Wetted parts with special coating*
- *Open connection flanges according to EN/ANSI*

Refer to page 383 for prices

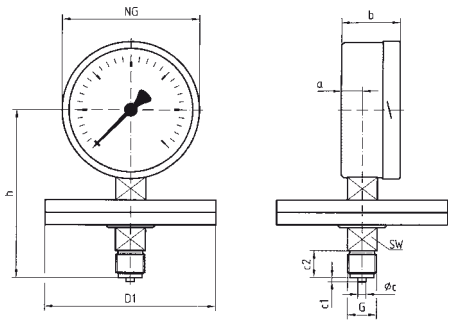
Diaphragm pressure gauges for chemical applications **Type D 4 – NG 100/160**

Housing types and dimensions

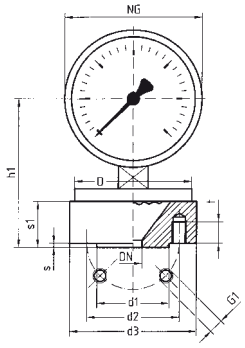
Bottom connection, measuring flange Ø 100



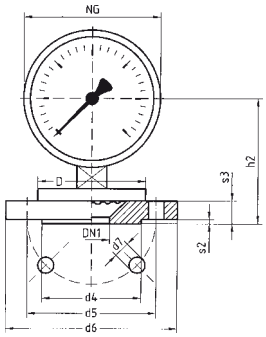
Bottom connection, measuring flange Ø 160



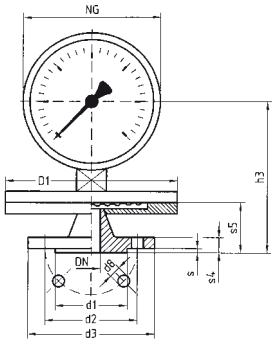
Connection flange according to EN 1092-1, DN 25 Measuring flange Ø 100



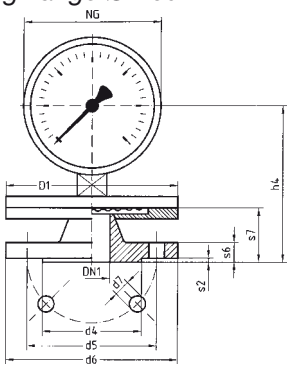
Connection flange according to EN 1092-1, DN 50 Measuring flange Ø 100



Connection flange according to EN 1092-1, DN 25 Measuring flange Ø 160



Connection flange according to EN 1092-1, DN 50 Measuring flange Ø 160



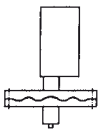
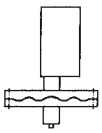
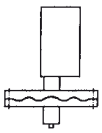
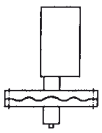
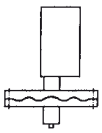
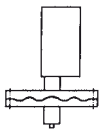
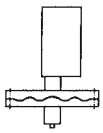
Dimensions (mm)

Nominal size (NG)	a	b	Øc	c1	c2	d1	d2	d3	d4	d5	d6	d7	d8	D	D1	DN	DN1	G	G1	h	h1
100	20	55	6	3	20	68	85	115	102	125	165	4x18	4x14	100	160	25	50	G½B	4xM12	127	111
160	20	55	6	3	20	68	85	115	102	125	165	4x18	4x14	100	160	25	50	G½B	4xM12	156	141
Nominal size (NG)	h2	h3	h4	s	s1	s2	s3	s4	s5	s6	s7	t	SW								
100	101	129	137	2	30	3	20	18	48	20	56	12	22								
160	131	159	167	2	30	3	20	18	48	20	56	12	22								

Standard diaphragm pressure gauges

Diaphragm pressure gauges for chemical applications

DG: H

			with glycerine filling				with glycerine filling	
Type	PF100, D401	PF160, D401	PF100Gly, D801	PF160Gly, D801	PF100Ch, D402	PF160Ch, D402	PF100CHGly, 802	PF160CHGly, 802
Version								
Housing Ø	100	160	100	160	100	160	100	160
Housing	Stainless steel 304 with bayonet type bezel							
Meas. elem.	Diaphragm, refer to data sheet							
Lower flange	Steel				Stainless steel 316 Ti or 316 L			
Accuracy class	1.6	1.6	1.6*	1.6*	1.6	1.6	1.6*	1.6*
Connection	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B	G 1/2 B
Range (mbar)	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/10	85901401	85951401	---	---	85901402	85951402	---	---
0/16	85902401	85952401	---	---	85902402	85952402	---	---
0/25	85903401	85953401	---	---	85903402	85953402	---	---
0/40	85904401	85954401	85904801	85954801	85904402	85954402	85904802	85954802
Price €								
0/60	85905401	85955401	85905801	85955801	85905402	85955402	85905802	85955802
0/100	85906401	85956401	85906801	85956801	85906402	85956402	85906802	85956802
0/160	85907401	85957401	85907801	85957801	85907402	85957402	85907802	85957802
0/250	85908401	85958401	85908801	85958801	85908402	85958402	85908802	85958802
Range (bar)								
Price €								
0/0.4	85909401	85959401	85909801	85959801	85909402	85959402	85909802	85959802
0/0.6	85910401	85960401	85910801	85960801	85910402	85960402	85910802	85960802
0/1	85911401	85961401	85911801	85961801	85911402	85961402	85911802	85961802
0/1.6	85912401	85962401	85912801	85962801	85912402	85962402	85912802	85962802
0/2.5	85913401	85963401	85913801	85963801	85913402	85963402	85913802	85963802
0/4	85914401	85964401	85914801	85964801	85914402	85964402	85914802	85964802
0/6	85915401	85965401	85915801	85965801	85915402	85965402	85915802	85965802
0/10	85916401	85966401	85916801	85966801	85916402	85966402	85916802	85966802
0/16	85917401	85967401	85917801	85967801	85917402	85967402	85917802	85967802
0/25	85918401	85968401	85918801	85968801	85918402	85968402	85918802	85968802

* ≤ 250 mbar class 2.5 – Refer to page 384 for additional costs.

Add. costs for standard diaphragm pressure gauges/ diaphragm pressure gauges for chemical applications

DG: H

Open connection flanges		Ranges 10 to 250 mbar Measuring flange Ø 160		Ranges 0.4 to 25 bar Measuring flange Ø 100	
	Material	Steel	Stainless steel	Steel	Stainless steel
Version	Nominal width	**Price €**	**Price €**	**Price €**	**Price €**
EN 1092-1, PN 40	DN 15				
	DN 20				
	DN 25				
	DN 50				
ASME B 16.5 150 lbs	DN ½“				
	DN 1“				
	DN 2“				

Special connection	Material steel	Material stainless steel 316 Ti or 316 L
	Price €	**Price €**
Channel hole Ø 10 mm		
Groove/spring accor. to EN 1092-1		
RJT groove ANSI B16.5		

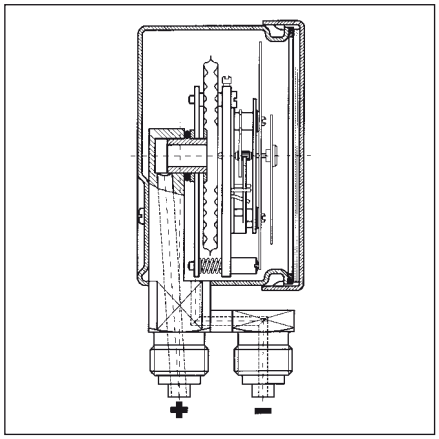
Special materials for diaphragms	Ranges 10 to 250 mbar Measuring flange Ø 160	Ranges 0.4 to 25 bar Measuring flange Ø 100
Material	**Price €**	**Price €**
PTFE foil (≥ 40 mbar)		
Silver foil (≥ 160 mbar	on request	
Tantalum foil (≥ 160 mbar)		
Other materials	on request	

Special materials for lower measuring flange (wetted part) for types D402 and D802	Ranges 10 to 250 mbar Measuring flange Ø 160			Ranges 0.4 to 25 bar Measuring flange Ø 100		
Connection	G½B	Flange, EN 1092-1, DN 15-25 Flange ANSI ½“, 1“	Flange, EN 1092-1, DN 50 Flange ANSI 2“	G½B	Flange, EN 1092-1 ,DN 15-25 Flange ANSI ½“, 1“	Flange, EN 1092-1, DN 50 Flange ANSI 2“
Material	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**
PTFE lining						
Other materials	on request					

Overpressure safety 10 x FSD (Measuring flange Ø 100 up to 40 bar max., Ø 160 up to 2.5 bar max.)	Ranges 10 to 250 mbar Measuring flange Ø 160	Ranges 0.4 to 25 bar Measuring flange Ø 100
	Price €	**Price €**

Refer to page 372 for additional costs for electrical contacts

Standard capsule type pressure gauges for differential pressure



Application
For differential pressure measurement of gaseous, dry media which are non-corrosive. Especially suitable for filter loss measurement in air conditioning and ventilation applications.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 9/D 4

Nominal size
63 – 100 – 160

Function
The „plus“ pressure (= high pressure) is applied to the inside of the diaphragm. The „minus“ pressure (= low pressure) is applied to the inside of the pressure tight housing. The pressure difference causes the diaphragm to change its shape, thus generating the movement required to measure the pressure. This displacement is picked up by the movement. The differential pressure is directly indicated by the pointer of the gauge.

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
NG 63 0/16 to 0/400 mbar
NG 100 0/ 6 to 0/400 mbar
NG 160 0/ 4 to 0/400 mbar

Application area
Static load:
full scale value
Dynamic load:
0.9 x full scale value

Overpressure safety
full scale value

Maximum static pressure
400 mbar

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.6 %/10K
falling temp. approx. ±0.6 %/10K
percentage of full scale value

Protection
IP 66 (EN 60529)

Standard version

Connection (wetted parts)
NG 63: 2 x G¼B – spanner size 14 centre back (brass)
NG 100: 2 x G½B – spanner size 22 bottom (stainless steel)
2 x G½B – spanner size 22 centre back (brass)
(EN 837-3/7.3)

Measuring element (wetted part)
Capsule element, CuBe alloy

Movement (wetted part)
Brass

Seal (wetted part)
„Perbunan“ nitrile rubber

Dial (wetted part)
Aluminium, white
Dial marking black

Pointer (wetted part)
Aluminium, black

Housing (wetted part)
Stainless steel 304

Bayonet type bezel/crimped bezel
Stainless steel 304

Front glass (wetted part)
Plastic (PMMA)

Mounting
Wall mounting via back flange or 3-hole fixing, panel mounting bezel (each as option). Direct mounting to rigid measuring pipe possible.

Options

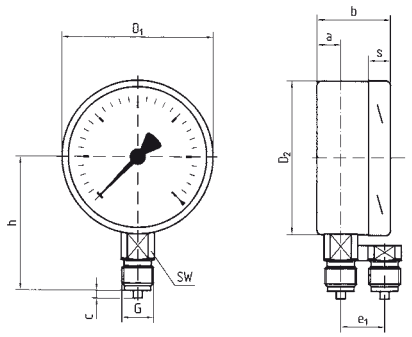
- *Back flange*
- *3-hole fixing, panel mounting bezel*
- *Hose connections*

Refer to page 389 for prices

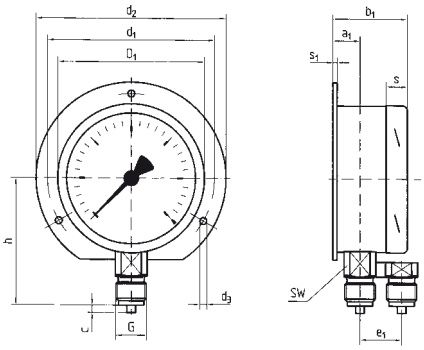
Standard capsule type pressure gauges for differential pressure **Type D 9 – NG 63/Type D 4 – NG 100/160**

Housing types and dimensions

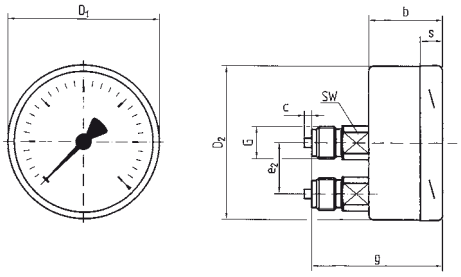
Bottom connection (NG 100/160)



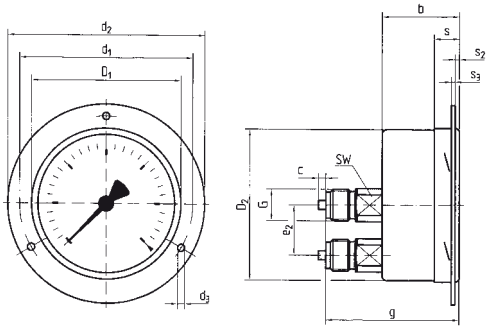
Bottom connection, back flange (NG 100/160)



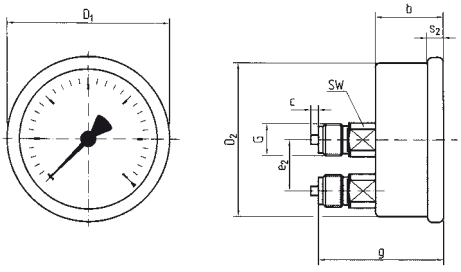
Back connection (NG 100/160)



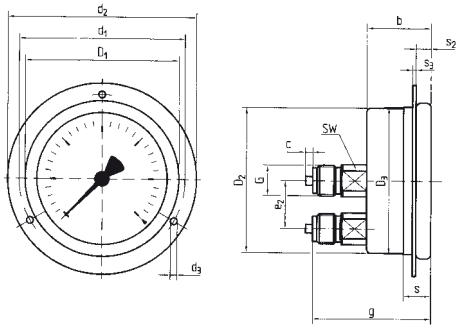
Back connection, 3-hole fixing, panel mounting bezel (NG 100)



Back connection (NG 63)



Back connection, 3-hole fixing, panel mounting bezel (NG 63)

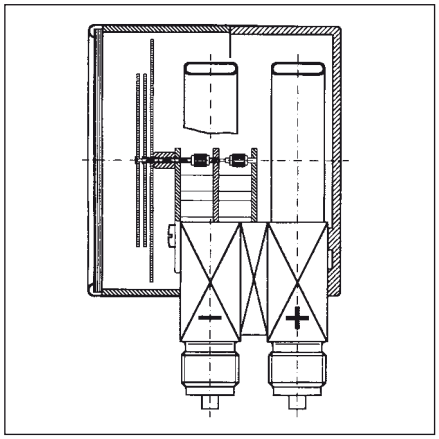


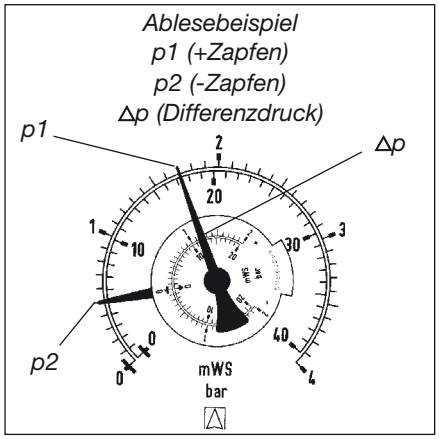
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	c	d1*	d2	d3*	D1	D2	D3	e1	e2	g	G	h	S	S1	S2	S3	SW
63	-	-	30.5	-	2	75	85	3.6	68	62	64.3	-	20	53	G¼B	-	14	-	6	2	14
100	16	18	49	51	3	116	133	4.5	101	99	-	32	34.5	79	G½B	86	20	5	2.5	3	22
160	16	19	49	52	3	178	196	4.5	161	159	-	32	34.5	79	G½B	118	20	6	4.5	2	22

* Dimensions according to DIN 16063/16064

Standard Bourdon tube pressure gauges for differential pressure





Application
For differential pressure measurement of gaseous and liquid media which are not highly viscous, do not crystallize and do not attack copper alloys. Specially suitable for heating systems (supply and return pipes).
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
D 2

Nominal size
100

Function
The pressures are measured in two independent Bourdon tube systems („plus“ pressure = high pressure, „minus“ pressure = low pressure). The pressure is indicated on a dial by a pointer. The differential pressure scale covers 50 % of the range of the „plus“ pressure and 50 % of the range of the „minus“ pressure. The black pointer („plus“ connection) and the red pointer („minus“ connection) at the differential pressure gauge scale allow you to read the pressures in either system on the fixed scale.

Accuracy class (EN 837-1 /6)
1.6

Ranges (EN 837-1/5)
0/0.6 to 0/60 bar

Application area
The maximum pressure in the system must not exceed the full scale value. To ensure good readability, the differential pressure to be measured should not be less than approx. 20 % of the full scale value.

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.4 %/10K
falling temp. approx. ±0.4 %/10K
percentage of full scale value

Protection
IP 32 (EN 60529)

Standard version

Connection
Brass, bottom, parallel in line
2 x G½B – spanner size 22
(EN 837-1/7.3)

Measuring element
Bourdon tube element,
≤ 60 bar „C“ type bourdon tube, copper alloy
> 60 bar helical tube, 316 Ti or 316 L

Movement
Brass

Dial
Aluminium, white
Dial marking black (bar/mWC)

Pointer/dial
Aluminium

Housing
Sheet steel, black

Push-on bezel
Sheet steel, black

Front glass
Instrument glass

Options

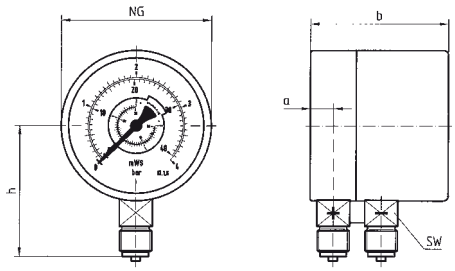
- *Wetted parts stainless steel*
- *Stainless steel housing and push-on bezel*
- *Nominal size 160 (D 1)*
- *Back flange*
- *3-hole fixing, panel mounting bezel*
- *Damping screw*

Refer to page 389 for prices

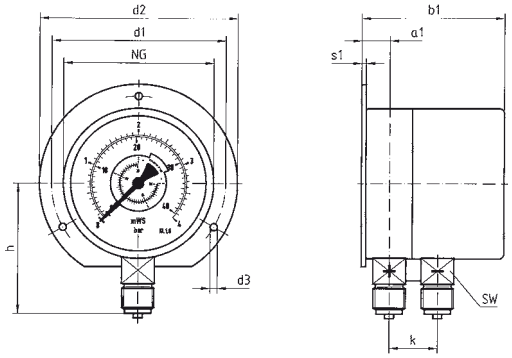
Standard Bourdon tube pressure gauges for differential pressure **Type D 2 – NG 100**

Housing types and dimensions

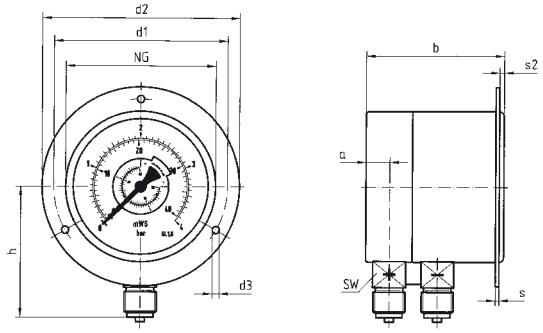
Bottom connection



Bottom connection, back flange



Bottom connection, 3-hole fixing, panel mounting bezel



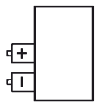
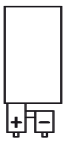
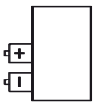
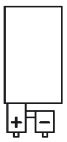
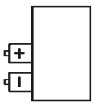
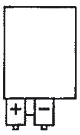
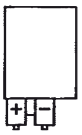
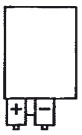
Dimensions (mm)

Nominal size (NG)	a	a1	b	b1	Øc	c1	c2	d1*	d2*	d3*	G	h	k	s	s1	s2	SW		
100	15.6	19.1	84	87.5	6	3	20	116	132	4.8	G1½B	86	32	2	5.5	3	22		

* Dimensions according to DIN 16064

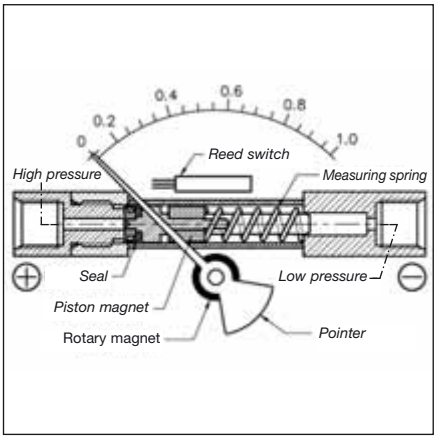
Standard capsule type/Bourdon tube pressure gauges for differential pressure

DG: M

Type	KP63Dif, D911	KP100Dif, D401	KP100Dif, D411	KP160Dif, D401	KP160Dif, D411	RF100Dif, D201	RF100Dif, D301	RF160Dif, D101
Version								
Housing Ø	63	100	100	160	160	100	100	160
Housing	Stainless steel 304, plastic front glass					Sheet steel	Stainless steel	Polyamide
Meas. elem.	Capsule element, CuBe alloy					Bourdon tube element, copper alloy		
Accuracy class	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Connection	G¼B	G½B	G½B	G½B	G½B	G½B	G½B	G½B
						Dual scale bar/mWC, black		
Range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €								
0/4 mbar	---	---	---	35612401	35612411	---	---	---
0/6 mbar	---	35563401	35563411	35613401	35613411	---	---	---
0/10 mbar	---	35564401	35564411	35614401	35614411	---	---	---
0/16 mbar	35515911	35565401	35565411	35615401	35615411	---	---	---
0/25 mbar	35516911	35566401	35566411	35616401	35616411	---	---	---
0/40 mbar	35517911	35567401	35567411	35617401	35617411	---	---	---
0/60 mbar	35518911	35568401	35568411	35618401	35618411	---	---	---
0/100 mbar	35519911	35569401	35569411	35619401	35619411	---	---	---
0/160 mbar	35520911	35570401	35570411	35620401	35620411	---	---	---
0/250 mbar	35521911	35571401	35571411	35621401	35621411	---	---	---
0/400 mbar	35522911	35572401	35572411	35622401	35622411	---	---	---
Price €								
0/0.6 bar	---	---	---	---	---	85609201	85609301	---
0/1 bar	---	---	---	---	---	**85610201**	85610301	85660101
0/1,6 bar	---	---	---	---	---	**85611201**	85611301	85661101
0/2,5 bar	---	---	---	---	---	**85612201**	85612301	85662101
0/4 bar	---	---	---	---	---	**85613201**	85613301	85663101
0/6 bar	---	---	---	---	---	**85614201**	85614301	85664101
0/10 bar	---	---	---	---	---	**85615201**	85615301	85665101
0/16 bar	---	---	---	---	---	**85616201**	85616301	85666101
0/25 bar	---	---	---	---	---	85617201	85617301	85667101
0/40 bar	---	---	---	---	---	85618201	85618301	85668101
Price €								
0/60 bar	---	---	---	---	---	85619201	85619301	85669101
0/100 bar	---	---	---	---	---	---	---	85670101
0/160 bar	---	---	---	---	---	---	---	85671101
0/250 bar	---	---	---	---	---	---	---	85672101
0/400 bar	---	---	---	---	---	---	---	85673101
Add. costs						**Price €**	**Price €**	**Price €**
Wetted parts 316 Ti or 316 L	---	---	---	---	---		**on request**	

Refer to page 403 for additional costs for mounting accessories

Magnetic piston type pressure gauges for differential pressure – high overload protection



- *Extremely compact and robust stainless steel measuring system*
- *Selectable maximum static pressure PN 100/250/400*
- *Switching contacts can be retrofitted*
- *IP 65 protection for pressure gauge and switching contact*
- *Leak-proof due to mechanical separation of pressure chamber and display*
- *Various types of connections*
- *Housing diameters 80 and100 mm*
- *Optional glycerine filling*

Application
For differential pressure measurements with very high static pressures. For gaseous and liquid, non-adhesive media which are not highly viscous. Particularly suitable for monitoring filters, pumps, pipe systems and cooling circuits.

Type
MAG 80/100 Dif D312

Nominal size
80–100 mm

Function
The pressures act on two pressure chambers separated by a piston magnet. If there are different pressures in the chambers, the piston magnet is axially displaced against a pressure spring. This displacement is transmitted from the piston magnet to the pointer via a rotary magnet mounted to the pointer hub. The differential pressure is directly displayed.
The complete mechanical separation of pressure chamber and display excludes the possibility of leaks.

Accuracy of measurement
±3 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5)
0/0.25 bar to 0/10 bar

Maximum static pressure
100 bar

Overpressure safety
Up to the maximum static pressure on both sides

Operating temperature range
Medium: T_{max} = 100 °C
Ambient: T_{min} = 0 °C
T_{max} = 80 °C

Protection
IP 65 (EN 60529)

Standard version

Connection (wetted parts)
Stainless steel 316, on left and right hand side /directly opposite each other)
2 x G1/4 female thread – spanner size 17 (EN 837-3/7.3)

Connection cover
Plastic, glass-fibre reinforced, black

Measuring element (wetted part)
Pressure spring
Stainless steel 1.4310

Magnetic piston (wetted part)
Stainless steel 1.4401/Strontium ferrite

Seal (wetted part)
NBR

Dial
Aluminium, white
Dial marking black/red (bar/psi)
Scale angle 90°

Pointer
Aluminium, black

Housing
Stainless steel 304 with rubber sealing ring at the front

Front glass
Instrument glass

Mounting
Wall mounting via a back mounting plate (optional) or pipe mounting by a combination of back plate and fixing clamp for 2“ pipe (optional).

Options

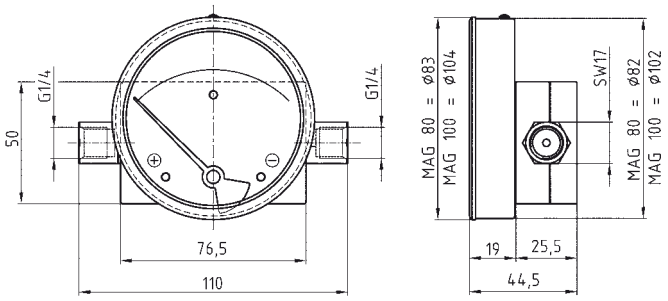
- *Back mounting plate with fixing clamp*
- *3-hole fixing, panel mounting bezel*
- *Max. static pressure PN 250/400*
- *Other connection threads*
- *Other connection designs*
- *Acrylic front glass*
- *Electrical contacts (Reed contacts)*
- *Filter in the „plus“ connection*
- *Glycerine filling*
- *Ref. pointer*
- *Special scales*

Refer to page 394 for prices

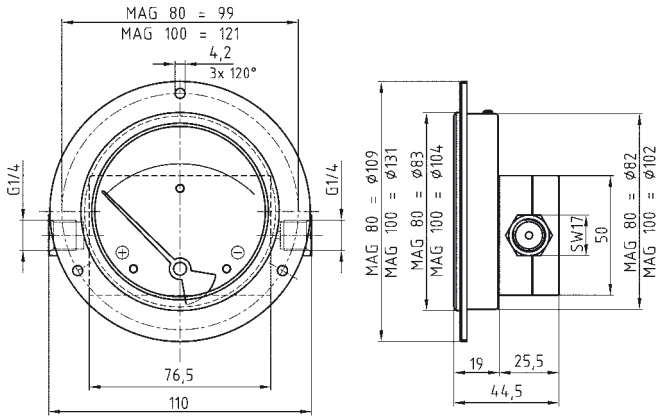
Magnetic piston type pressure gauges for differential pressure – high overload protection ***Type D 3 NG 80/100***

Types and dimensions (mm)

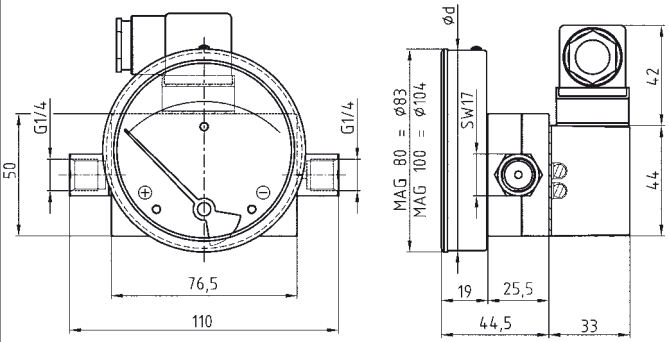
Connection on left and right hand side



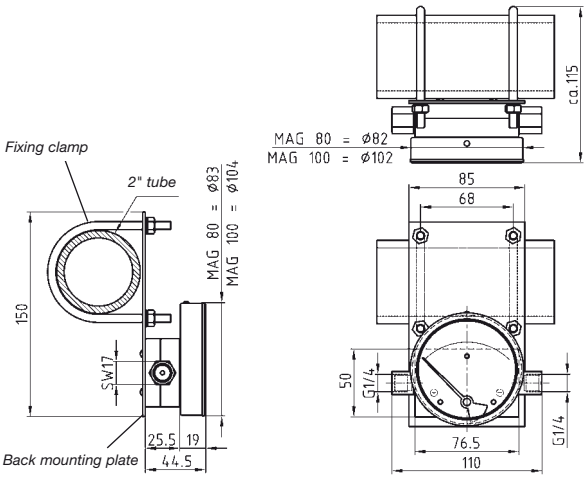
Connection on left and right hand side
3-hole fixing, panel mounting bezel



Connection on left and right hand side
with electrical contact



Back mounting plate and fixing clamp

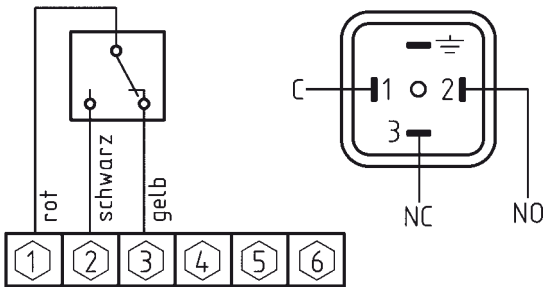


Technical specifications electrical contact

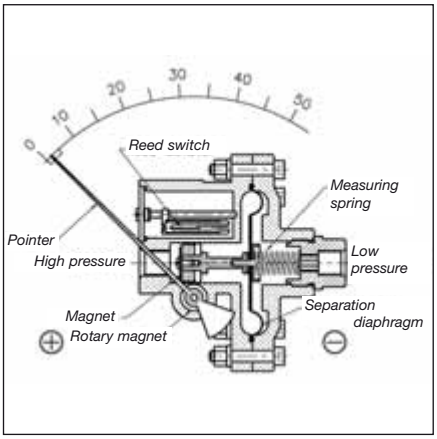
Version: Reed contact, single pole changeover (SPDT)

Max. switching voltage:	*AC/DC 175 V*
Max. switch rating:	*AC 5 VA – DC 5 W*
Max. current:	*AC/DC 250 mA*
Switching hysteresis:	*approx. 5 %*
Adjustment range:	*35–100 % of full scale value*
Electrical connection:	*plug DIN 43650-A*

Wiring diagram



Magnetic diaphragm pressure gauges for very low differential pressure



- *Differential pressure ranges starting at 0/2.5 mbar*
- *Switching contacts can be retrofitted*
- *IP 65 protection for pressure gauge and switching contact*
- *Side or back connection*
- *Delivery includes adapter for hose connection and bracket for control panel mounting*

Application
For differential pressure measurements with very low differential pressure. Especially suitable for gaseous media but in particular for monitoring filters and fans in air supply, air conditioning and ultra-clean room applications.

Type
MAG 115 Dif D311

Nominal size
115 mm

Function
The pressures act on two pressure chambers separated by a diaphragm. If there are different pressures in the chambers, a magnet is axially displaced against a pressure spring. This displacement is transmitted to the pointer via a rotary magnet fitted to the pointer hub. The differential pressure is directly displayed.

Accuracy of measurement
±3 % of full scale value (at increasing differential pressure)

Ranges (EN 837-3/5)
0/2.5 mbar to 0/100 mbar

Maximum static pressure
2.4 bar

Overpressure safety
up to 2.4 bar on both sides

Operating temperature range
Medium: T_{max} = 60 °C
Ambient: T_{min} = 0 °C
T_{max} = 60 °C

Protection
IP 65 (EN 60529)

Standard version

Connection (wetted parts)
Nylon 66, glass-fibre reinforced, choice of left and right hand side, or back (use enclosed blind plugs)
2 x 1/8 NPT female thread or
2 x hose connection 5 mm (use enclosed adaptors)

Measuring element (wetted part)
Diaphragm: NBR
Pressure spring: stainless steel 301
Transmission unit: Stainless steel 301

Magnet (wetted part)
Strontium-ferrite

Seal (wetted part)
NBR

Dial
Aluminium, white
Dial marking black
Scale angle 90° (first graduation after zero at 15% of full scale value)

Pointer
Aluminium, black

Housing
Stainless steel 304 with rubber sealing ring at the front

Front glass
Instrument glass

Mounting
Panel mounting via mounting clips (standard), or wall mounting via back mounting plate (optional) or pipe mounting via a combination of back mounting plate and fixing clamp (optional) for 2“ pipe

Options

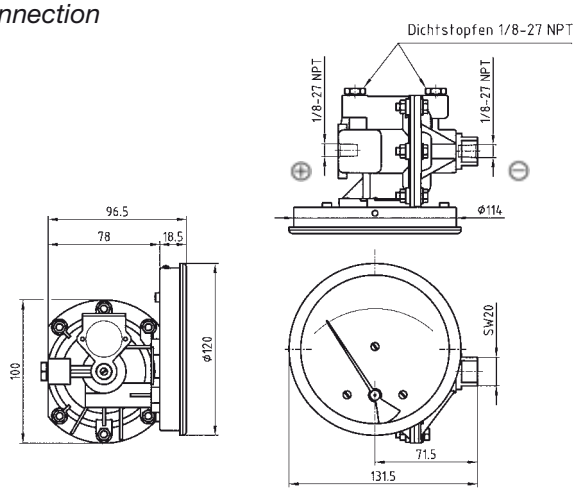
- *Back mounting plate with fixing clamp*
- *Acrylic front glass*
- *Electrical contacts (Reed contacts)*
- *Special scales*

Refer to page 394 for prices

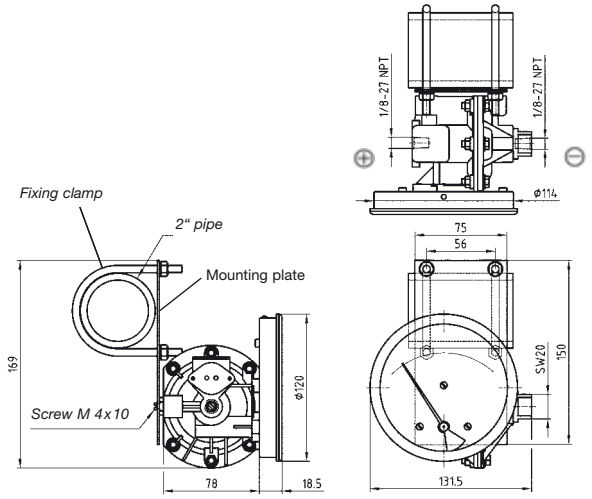
Magnetic diaphragm pressure gauges for very low differential pressure **Type D 3 NG 115**

Types and dimensions (mm)

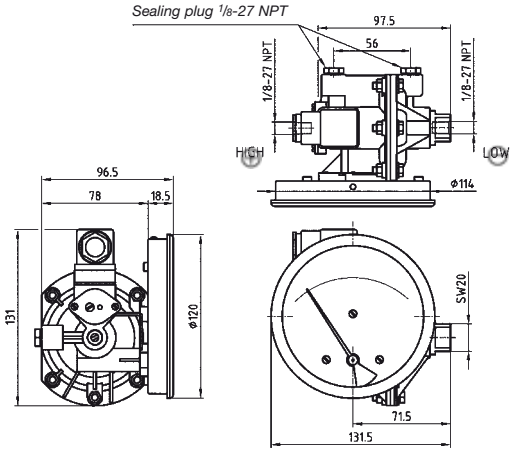
Connection on left and right hand side or back connection



Back mounting plate and fixing clamp



Connection on left and right hand side or back connection with electrical contact

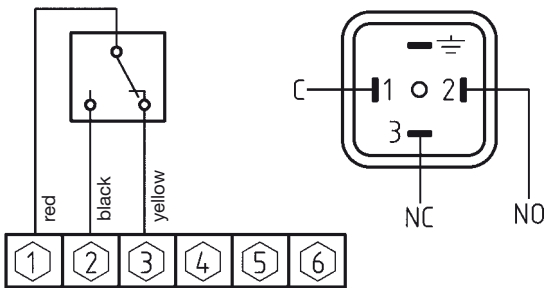


Technical specifications electrical contact

Version: Reed contact, single pole changeover (SPDT)

Max. switching voltage:	*AC/DC 175 V*
Max. switch rating:	*AC 5 VA – DC 5 W*
Max. current:	*AC/DC 250 mA*
Switching hysteresis:	*approx. 5 %*
Adjustment range:	*40-80 % of full scale value*
Electrical connection:	*plug DIN 43650-A*

Wiring diagram



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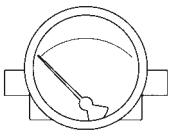
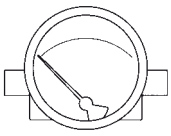
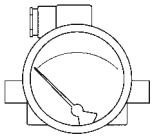
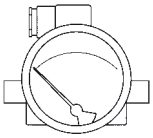
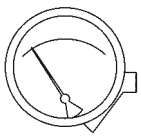
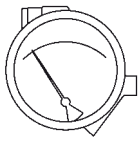
Refer to page 394 for prices

Magnetic piston type pressure gauges/magnetic diaphragm pressure gauges for differential pressure

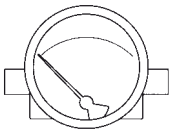
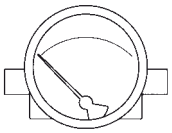
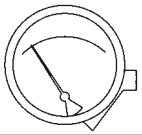
DG: M

Type	MAG 80 Dif, D312	MAG 100 Dif, D312	MAG 80 Dif, RK1.W, D312	MAG 100 Dif, RK1.W, D312	MAG 115 Dif, D311	MAG 115 Dif, RK1.W, D311
Version						
Housing Ø	80	100	80	100	115	115
Housing	Stainless steel 304 with rubber seal at the front					
Meas. elem	refer to data sheet					
Accuracy	±3 % of full scale value (at increasing differential pressure)					
Connection	2 x G1/4 female thread				2 x 1/8 NPT female thread	
Max. static pressure	PN 100				PN 2,4	
Contact type	---	---	Reed, single, changeover*	Reed, single, changeover*	---	Reed, single, changeover*
Electrical connection	---	---	Plug DIN 43650-A	Plug DIN 43650-A	---	Plug DIN 43650-A
Range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
0/2,5 mbar	---	---	---	---	88002311	88013311
0/4 mbar	---	---	---	---	88003311	88014311
0/6 mbar	---	---	---	---	88004311	88015311
0/10 mbar	---	---	---	---	88005311	88016311
0/16 mbar	---	---	---	---	88006311	88017311
0/25 mbar	---	---	---	---	88007311	88018311
0/40 mbar	---	---	---	---	88008311	88019311
0/60 mbar	---	---	---	---	88009311	88020311
0/100 mbar	---	---	---	---	88010311	88021311
0/160 mbar	---	---	---	---	---	---
Price €						
0/0,25 bar	88002312	88013312	88022312	88033312	---	---
0/0,4 bar	88003312	88014312	88023312	88034312	---	---
0/0,6 bar	88004312	88015312	88024312	88035312	---	---
0/1 bar	88005312	88016312	88025312	88036312	---	---
0/1,6 bar	88006312	88017312	88026312	88037312	---	---
0/2,5 bar	88007312	88018312	88027312	88038312	---	---
0/4 bar	88008312	88019312	88028312	88039312	---	---
0/6 bar	88009312	88020312	88029312	88040312	---	---
0/10 bar	88010312	88021312	88030312	88041312	---	---

* Please specify required switching point!

Add. costs for magnetic piston type pressure gauges/magnetic diaphragm pressure gauges

DG: M

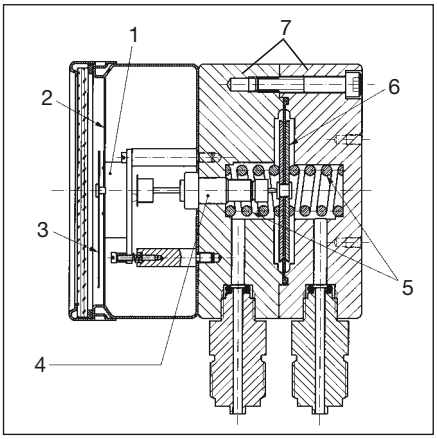
Type	MAG 80 Dif, D312	MAG 100 Dif, D312	MAG 115 Dif, D311
Version			
	Price €	**Price €**	**Price €**
Maximum static pressure PN 250			---
Maximum static pressure PN 400			---
Centre back connection (electrical contacts not possible)			---
Bottom connection			---
Connection 1/4 NPT female thread			---
Connection G1/4B male thread (adaptor)			---
Connection G1/2B male thread (adaptor)			---
Connection 1/2 NPT male thread (adaptor)			---
Piston seal Viton			---
3-hole fixing, panel mounting bezel (can only be factory fitted)			---
Acrylic front glass			
Instrument grade front glass, hardened			
Glycerine filling			---
„Plus“ connection right (pointer moves from right to left)	**no add. cost**	**no add. cost**	---
Ref. pointer			---
Adjustable red reference pointer			
Filter in „plus“ connection			---
Reed contact, double pole changeover (SPDT) RK2.W (additional cost relative to basic unit with single pole change-over Reed contact RK1.W !)			---

Accessories

DG: M

Type	MAG 80 Dif, D312	MAG 100 Dif, D312	MAG 115 Dif, D311
	Price € Part no.	**Price €** Part no.	**Price €** Part no.
Aluminum back mounting plate and fixing clamp for wall mounting or 2“ pipe mounting	38001	38001	38304
Plastic mounting plate for wall mounting	38305	38305	---

Spring-diaphragm pressure gauges for differential pressure – overload protected



Function overview

1. *Movement*
2. *Dial*
3. *Pointer*
4. *Transmission unit*
5. *Measuring spring*
6. *Diaphragm*
7. *Measuring flange*

Application
For differential pressure measurement with low differential pressure and high static pressure. For gaseous and liquid media with low viscosity and non-corrosive. Particularly suitable for monitoring filters, pumps and pipe systems.

Type
MF 100 Dif D401

Nominal size
100

Function
The pressures act on two pressure chambers separated by an elastic diaphragm. Different pressures in the chambers cause an axial deflection of the diaphragm against a pressure spring which is proportional to the pressure. This is transmitted to the movement via a rod. The differential pressure is directly indicated by a pointer. The diaphragm is held by metallic supports at both sides providing an overpressure safety of up to 25 bar.

Accuracy class (EN 837-3/6)
2.5

Ranges (EN 837-3/5)
0/250 mbar to 0/6 bar

Maximum static pressure
25 bar

Overpressure safety
Up to 25 bar on both sides

Operating temperature range

Medium:	T_{max} =	*+60 °C*
Ambient:	T_{min} =	*-20 °C*
	T_{max} =	*+60 °C*

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.5 %/10 K
falling temp. approx. ±0.5 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Brass, nickel plated, bottom, parallel in line
2 x G½B – spanner size 22 (EN 837-3/7.3)
with locked damping screw
inner diameter 0.5 mm

Measuring element
Pressure spring
stainless steel 301

Diaphragm
Viton

Measuring flange
Aluminium eloxed

Movement
Brass

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

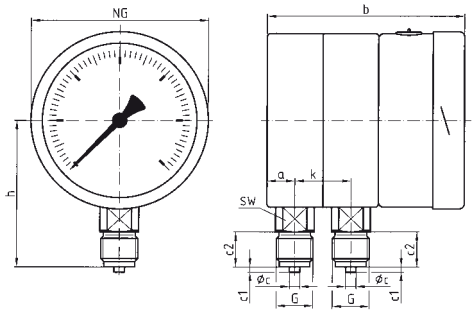
- *Glycerine filling (type D8)*
- *Back flange*
- *Other connections*

Refer to page 402 for prices

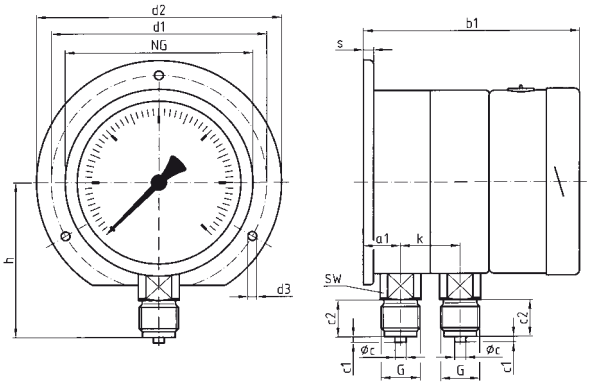
Spring-diaphragm pressure gauges for differential pressure *Type D 4 – NG 100*

Housing types and dimensions

Bottom connection



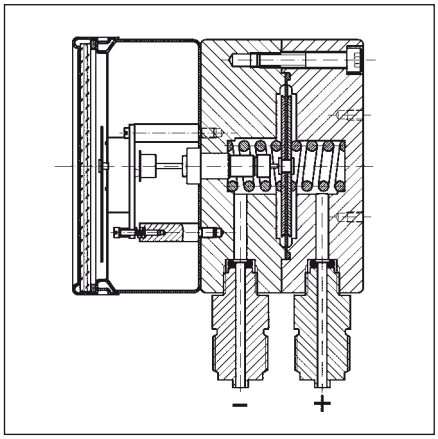
Bottom connection, back flange



Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*Øc*	*c1*	*c2*	*d1*	*d2*	*d3*	*G*	*h*	*k*	*s*	*SW*
100	*16*	*19.5*	*112.5*	*116*	*6*	*3*	*20*	*116*	*132*	*4.8*	*G½B*	*84*	*32*	*5.5*	*22*

Spring-diaphragm pressure gauges for differential pressure and chemical applications – overload protected



Application
For differential pressure measurement with low differential pressure and high static pressure. For corrosive, gaseous and liquid media which are not highly viscous, also for use in corrosive atmospheres. Particularly suitable for monitoring filters, pumps and pipe systems.

Types
MF 100 Ch Dif D402
MFW 100 Ch Dif D402

Nominal size
100

Function
The pressures act on two pressure chambers separated by an elastic diaphragm. Different pressures in the chambers cause an axial deflection of the diaphragm against a pressure spring which is proportional to the pressure. This is transmitted to the movement via a rod. The differential pressure is directly indicated by a pointer. The diaphragm is held by metallic supports at both sides which provides for an overpressure safety of up to 25 bar.

Accuracy class (EN 837-3/6)
2.5

Ranges (EN 837-3/5)
MF 100: 0/250 mbar to 0/6 bar
MFW 100: 0/250 mbar to 0/25 bar

Maximum static pressure
25 bar

Overpressure safety
up to 25 bar on both sides

Operating temperature range
Medium: T_{max} = +60 °C
Ambient: T_{min} = -20 °C
T_{max} = +60 °C

Temperature performance
Indication error when the temperature of the measuring element deviates from 20 °C:
rising temp. approx. ±0.5 %/10 K
falling temp. approx. ±0.5 %/10 K
percentage of full scale value

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel 316 Ti or 316 L, bottom, parallel in line
2 x G½B – spanner size 22 (EN 837-3/7.3)
with locked damping screw
inner diameter 0.5 mm

Measuring element
Pressure spring
stainless steel 1.4310

Diaphragm
Viton

Measuring flange
Stainless steel 316 Ti or 316 L

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Options

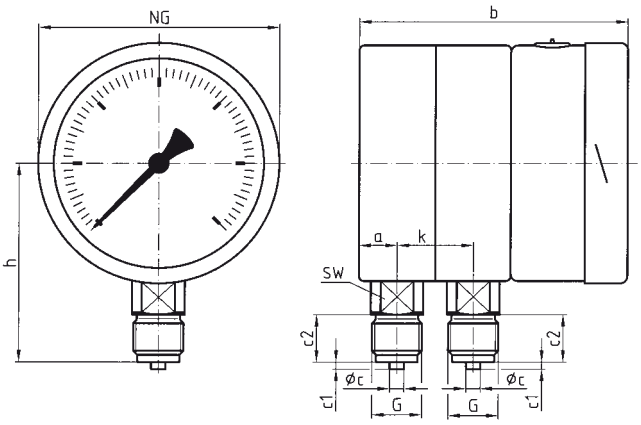
- *Back flange (MF 100)*
- *Other connections*
- *Electrical contacts (MFW 100)*

Refer to page 402 for prices

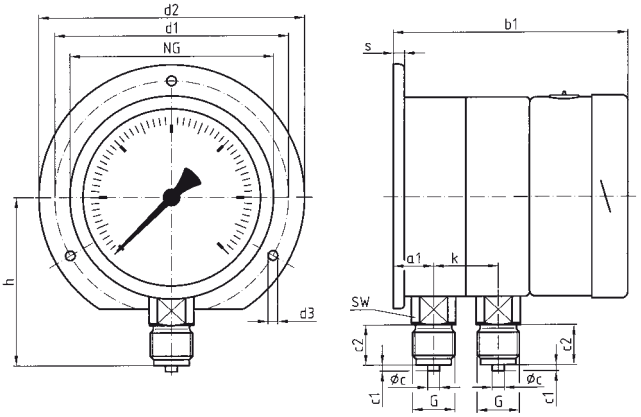
Spring-diaphragm pressure gauges for differential pressure and chemical applications

type D 4 – NG 100 Housing types and dimensions

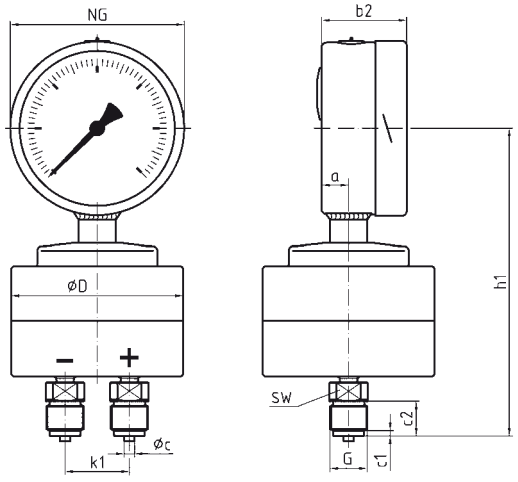
MF 100 Ch Dif D402
Bottom connection



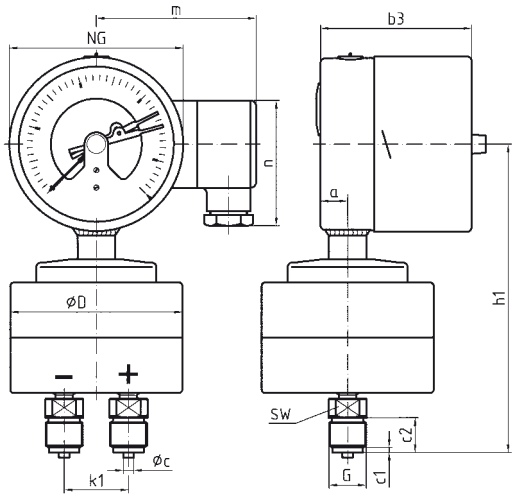
MF 100 Ch Dif D472
Bottom connection, back flange



MFW 100 Ch Dif D402
Bottom connection



MFW 100 Ch Dif D402
Bottom connection with electrical contacts

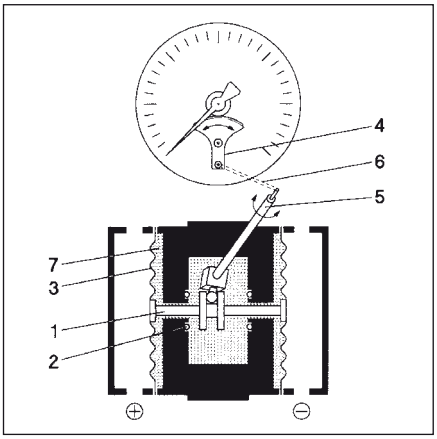


Dimensions (mm)

Nominal size (NG)	*a*	*a1*	*b*	*b1*	*b2*	*b3*	*Øc*	*c1*	*c2*	*d1*	*d2*	*d3*	*ØD*	*G*	*h*	*h1*	*k*	*k1*	*m*
100	*16*	*19*	*84*	*87.5*	*49*	*87*	*6*	*3*	*20*	*116*	*132*	*4.8*	*99*	*G½B*	*86*	*177*	*32*	*37*	*92*

Nominal size (NG)	*n*	*s*	*s1*	*s2*	*SW*
100	*72*	*2*	*5.5*	*3*	*22*

Diaphragm pressure gauges for differential pressure for chemical applications – high overload protection



Function overview

1. *Connection rod*
2. *O ring, overpressure-proof*
3. *Diaphragm*
4. *Movement*
5. *Measuring shaft*
6. *Transmission lever*
7. *Pressure transmission liquid*

Application
For differential pressure measurement with low differential pressure and very high static pressure.
For corrosive, gaseous and liquid media, also for use in corrosive atmospheres. Since the pressure chambers can be flushed, the units are also suitable for polluted media.
! *When measuring gas or vapour, the instruments must be used in accordance with the safety recommendations of EN 837-2 (see appendix).*

Type
PF 100/160 Dif H D402

Nominal size
100 – 160

Function
Each of the pressures acts on a diaphragm. The diaphragms are connected via a rod. To compensate for the static pressure, the chamber between the diaphragms is filled with pressure transmission liquid. At identical pressures, both diaphragms are in „rest“ position. If the pressures are different, the diaphragms change their shape in the direction of the lower pressure. This displacement is picked up by the movement. The differential pressure is directly indicated by a pointer.

Accuracy class (EN 837-3/6)
1.6

Ranges (EN 837-3/5)
NG 100 0/0.6 to 0/25 bar
NG 160 0/40 mbar to 0/25 bar

Maximum static pressure
40 bar/100 bar

Overpressure safety
Up to the maximum static pressure on one side

Operating temperature range
Medium: T_{max} *= +100 °C*
Ambient: T_{min} *= -20 °C*
T_{max} *= +80 °C*

Protection
IP 54 (EN 60529)

Standard version

Connection
Stainless steel, bottom
Flange connection based on DIN 19213
2 x G½ female thread

Measuring element
Diaphragm,
≤ 400 mbar stainless steel 316 Ti or 316 L
> 400 mbar Duratherm

Intermediate block
AlMgSiPb – hard coated

Pressure transmission liquid
Acid free oil

Zero correction
through top housing opening
±25 % of full scale value

Seals
FPM (Viton)

Movement
Stainless steel

Dial
Aluminium, white
Dial marking black

Pointer
Aluminium, black

Housing
Stainless steel 304

Bayonet type bezel
Stainless steel 304

Front glass
Laminated safety glass

Mounting
Wall mounting via a back mounting plate (optional) or pipe mounting by a combination of a back mounting plate and fixing clamp (optional) for 2“ pipe

Options

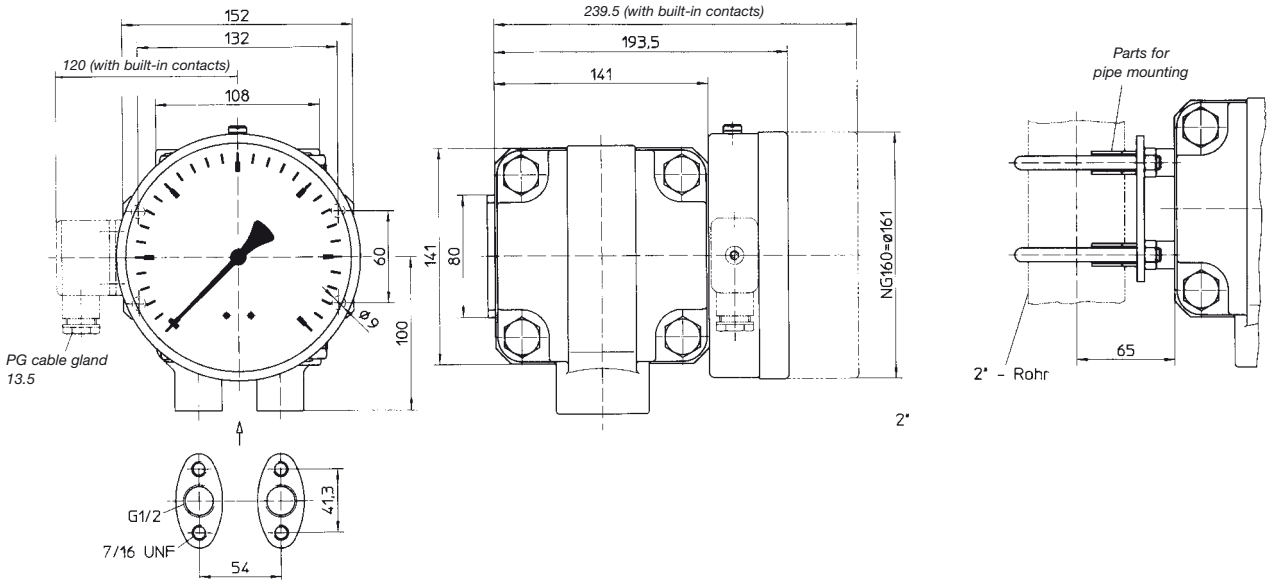
- *Fixing clamp for 2“ pipe*
- *Glycerine filling (type D 802)*
- *Electrical contacts (> 100 mbar)*

Refer to page 402 for prices

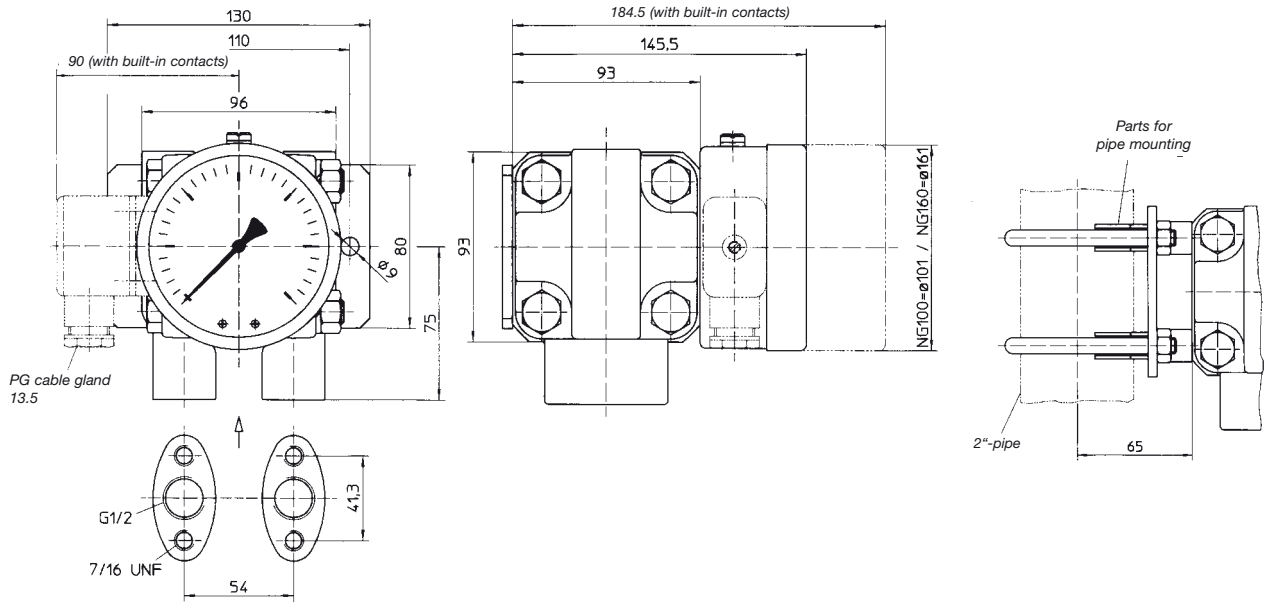
Diaphragm pressure gauges for differential pressure for chemical applications – high overload protection

Type D 4 – NG 100/160 Housing types and dimensions (in mm)

Ranges 0/40 to 0/400 mbar NG 160

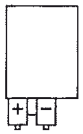
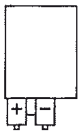
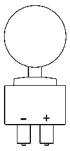
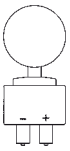


Ranges 0/0.6 to 0/25 bar NG 100/160



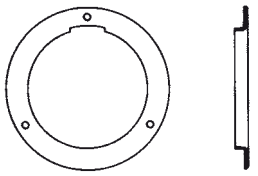
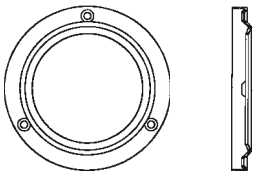
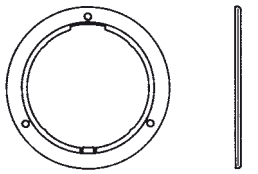
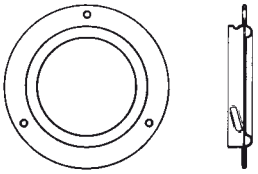
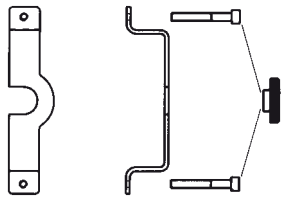
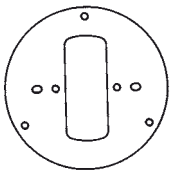
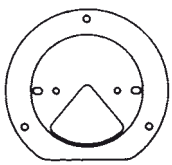
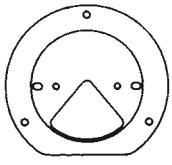
Spring-diaphragm pressure gauges/diaphragm pressure gauges for differential pressure

DG: H

Type	MF 100 Dif, D401	MF 100 Ch Dif, D402	MFW 100 Ch Dif, D402	MFW 100 Ch Dif, MK1 D402	MFW 100 Ch Dif, IK1 D402	PF 100 Ch Dif H, D402	PF 160 Ch Dif H, D402
Version							
Housing-Ø	100	100	100	100	100	100	160
Housing	Stainless steel 304, bayonet type bezel stainless steel 304						
Meas. elem.	refer to data sheet					Stainless steel/Duratherm	
Accuracy class	2.5	2.5	2.5	2.5	2.5	1.6	1.6
Connection	2 x G1/2B	2 x G1/2B	2 x G1/2B	2 x G1/2B	2 x G1/2B	Flange connection based on DIN 19213, 2 x G1/2 female thread	
Max. static pressure	25 bar	25 bar	25 bar	25 bar	25 bar	40 bar	
Range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €							
0/40 mbar	---	---	---	---	---	---	88022402
0/60 mbar	---	---	---	---	---	---	88023402
0/100 mbar	---	---	---	---	---	---	88024402
0/160 mbar	---	---	---	---	---	---	88025402
0/250 mbar	88086401	88086402	88106402	88126402	88146402	---	88026402
0/400 mbar	88087401	88087402	88107402	88127402	88147402	---	88027402
0/600 mbar	88088401	88088402	88108402	88128402	88148402	88008402	88028402
Price €							
0/1 bar	88089401	88089402	88109402	88129402	88149402	88009402	88029402
0/1.6 bar	88090401	88090402	88110402	88130402	88150402	88010402	88030402
0/2.5 bar	88091401	88091402	88111402	88131402	88151402	88011402	88031402
0/4 bar	88092401	88092402	88112402	88132402	88152402	88012402	88032402
0/6 bar	88093401	88093402	88113402	88133402	88153402	88013402	88033402
0/10 bar	---	---	88114402	88134402	88154402	88014402	88034402
0/16 bar	---	---	88115402	88135402	88155402	88015402	88035402
0/25 bar	---	---	88116402	88136402	88156402	88016402	88036402
Add. costs	**Price €**						
Max. static pressure PN 100	---	---	---	---	---		
Glycerine filling							
Wall mounting	Back flange		Connection piece for instrument bracket is standard. Refer to page 409 for instrument brackets.			Standard	
Pipe mounting (2“)	---	---	---	---	---		

Accessories for panel mounting and wall mounting

DG: M

Type	Housing diameter (mm)	50	63	100	160
	Description	**Price €** Part-no.	**Price €** Part-no.	**Price €** Part-no.	**Price €** Part-no.
	3-hole fixing, panel mounting bezel Stainless steel 304, bare metal surface, for retrofitting (with mounting aid) to RF 63, 100 centre back D7/D9 (stainless steel housing with crimped bezel)	---	38015	--- 38017	
	3-hole fixing, panel mounting bezel Stainless steel 304, bare metal surface, for retrofitting (front) to RF 63 centre back or bottom D6/D7/D9 (plastic or stainless steel housing with crimped bezel)	---	38019	---	---
	3-hole fixing, panel mounting bezel Plastic, black, for retrofitting to RF 63 back D611 (plastic housing with crimped bezel)	---	38003	---	---
	3-hole fixing, panel mounting bezel (bayonet type) Stainless steel 304, polished, for factory-mounting to RF 100, 160 D4/D8 KP 63, 100, 160 D4 (stainless steel housing with bayonet type bezel)	---	38054	38056	38057
	Clamp fixing Stainless steel 304, bare metal surface, with 2 hex socket screws M4 and knurled knob as mounting aid for retrofitting to RF 50, 63 D611 (plastic housing) RF 50, 63 D711 (stainless steel housing)	38033	38034	---	---
	Back flange Plastic, black, for retrofitting to RF 63 bottom D601 (plastic housing with crimped bezel)	---	38018	---	---
	Back flange Stainless steel 304, bare metal surface, for factory-fitting to RF 63, 100, 160 D3/D4/D7/D8/D9 KP 63, 100, 160 D3/D4 (stainless steel housing)	---	38048	38050	38051
	Back flange Steel sheet, black, for factory-fitting to RF 100, 160 D2 KP 63,100, D2 (steel sheet housing)	---	**5** 38042	38044	38045

Pressure gauge stop cocks and valves

Pressure gauge stop cocks

Application
Shut-off element between pipe and pressure gauge. Stop cocks with test port allow you to connect both pressure gauges and testing devices to the pipe. Suitable for liquids, gases and steam.

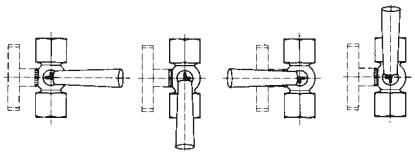
Version
DIN 16261 to 16263 (or based on DIN)

Operating temperature range
Medium: -10/+50 °C

Connection and nominal pressure
refer to price list on page 406

Housing and tap
Brass bare metal surface or stainless steel bare metal surface. The tap contains two holes which are arranged in the shape of a T. The function depends on the tap position:

1. *Vent pressure gauge*
2. *Apply pressure to pressure gauge*
3. *Blow out measuring pipe*
4. *Apply pressure to testing device*



Vent *Operation* *Blow out* *Test*

Pressure gauge stop valves

Application
Shut-off or reducing element between pipe and pressure gauge. Stop valves with test port allow you to connect both, pressure gauges and testing devices, to the pipe. Suitable for liquids, gases and steam.

Version
DIN 16270 without test port
DIN 16271 with test port
DIN 16272 with test port which can be closed separately
Design A female/female x male connector
Design B loose female coupling x male connector and shaft for instrument holder

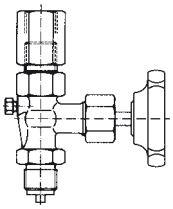
Materials

Parts	Brass	Steel	Stainl. steel
Housing	Brass	1.0460	1.4571
Valve spindle	1.4104	1.4104	1.4571
Valve cone	1.4104	1.4104	1.4571
Packing	PTFE	PTFE	PTFE
Cap	Steel	Steel	Stainl. steel
Union nut	Steel	Steel	Stainl. steel
Fem./fem. connector	Steel	Steel	Stainl. steel
Loose fem. coupling	Brass	Steel	Stainl. steel
Vent screw	1.4571	1.4571	1.4571
Wheel	plastic	plastic	plastic

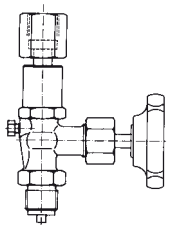
Operating temperature range
Brass -10/+120 °C
Steel 1.0460 -10/+120 °C
Stainl.steel 1.4571 -20/+200 °C

Connection and nominal pressure
refer to price list on page 406

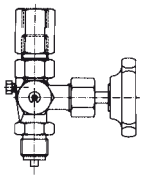
DIN 16270
Design A



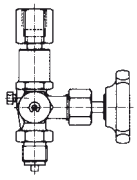
Design B



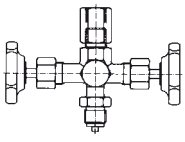
DIN 16271
Design A



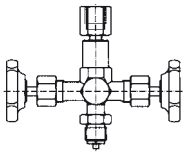
Design B



DIN 16272
Design A



Design B



Refer to page 406/407 for prices

Push-button stop cock/overpressure device

Push-button stop cock

Application
Shut-off element between pipe and pressure gauge. Normally, the push-button stop cock is closed. In this state no pressure is applied to the pressure gauge. Push button to apply pressure to the pressure gauge and to display the operating pressure. Suitable for gases.

Version
DVGW- and SVGW-tested, with EC type approval, product ID number CE-0085AQ0985

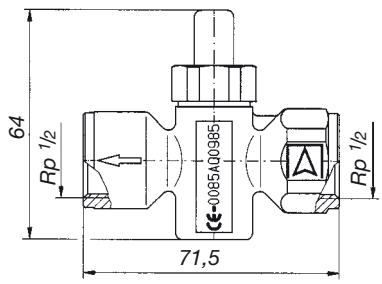
Operating temperature range
Medium: 0/+70 °C
Ambient: -20/+60 °C

Connection
2 x female thread Rp1/2, DIN 2999

Nominal pressure
5 bar (MOP 5)

Housing
Brass, nickel-plated

Dimensions (in mm)



Overpressure safety device

Application
Adjustable overpressure device used to protect the system against peak pressures exceeding the maximum rating of the pressure gauge. For use at measuring points which are subject to great pressure variations; it enables the use of different pressure gauges with different ranges to be used and measure even the lower pressures accurately. The overpressure safety devices are adjusted according to the maximum pressure ratings of the various pressure gauges installed.

Operation
When the set pressure is reached, a piston valve shuts off the port to the pressure gauge. After the pressure has dropped down again to a value of approx. 25 % below the closing pressure, the valve opens again.

Operating temperature range
Max. +80 °C

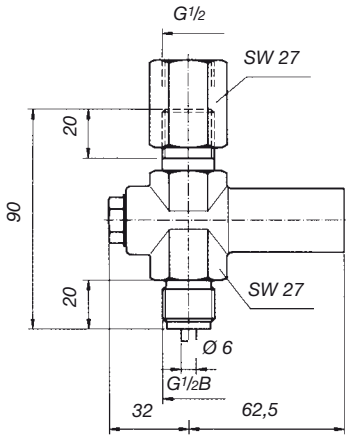
Overpressure safety
Brass 600 bar
Stainless steel 1,000 bar
Max. vacuum range up to -1 bar, no adjustment function

Materials

Parts	Brass	Stainl. steel
Housing	Brass	1.4571
Piston	1.4571	1.4571
Female/fem. connector	Steel	1.4305
Diaphragm	FPM	FPM
O ring	FPM	FPM
Closing plug	Brass	A4

Connection
G1/2 female x male connector

Dimensions (in mm)



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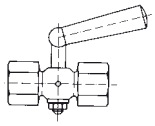
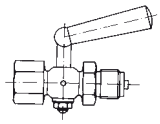
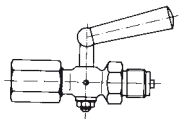
Refer to page 407 for prices

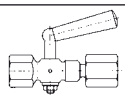
Accessories for pressure gauges

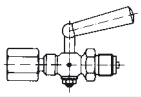
DG: E

Pressure gauge stop cock female x female					
	Connection	Nominal pressure	Material	Part no.	**Price €**
	G1/4	PN 6	Brass	**63001**	
	G3/8	PN 16	Brass	**63002**	
	G1/2	PN 16	Brass	**63003**	
with round test flange 40 x 5	G1/2	PN 16	Brass	63004	
with test flange 60 x 25 x 10	G1/2	PN 16	Brass	**63005**	
with sealing gland	G1/2	PN 16	Brass	**63006**	

Pressure gauge stop cock female x male					
	Connection	Nominal pressure	Material	Part no.	**Price €**
	G1/4	PN 6	Brass	**63011**	
	G3/8	PN 16	Brass	**63012**	
	G1/2	PN 16	Brass	**63013**	
with round test flange 40 x 5	G1/2	PN 16	Brass	63009	
with test flange 60 x 25 x 10	G1/2	PN 16	Brass	63010	

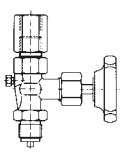
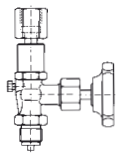
Pressure gauge stop cock female/female connector x male					
	Connection	Nominal pressure	Material	Part no.	**Price €**
	G1/4	PN 6	Brass	63014	
	G1/2	PN 16	Brass	**63027**	
	G1/2	PN 16	316 Ti or 316 L	63090	
with test flange 60 x 25 x 10	G1/2	PN 16	Brass	**63028**	
with test flange 60 x 25 x 10	G1/2	PN 16	316 Ti or 316 L	63091	
with test socket M20 x 1.5	G1/2	PN 16	Brass	63015	
with test socket M20 x 1.5	G1/2	PN 16	316 Ti or 316 L	63016	

Pressure gauge stop cock with loose rotatable female coupling x female					
	Connection	Nominal pressure	Material	Part no.	**Price €**
	G1/2	PN 16	Brass	63017	
with test flange 60 x 25 x 10	G1/2	PN 16	Brass	63018	

Pressure gauge stop cock with loose rotatable female coupling x male					
	Connection	Nominal pressure	Material	Part no.	**Price €**
	G1/2	PN 16	Brass	63107	
with test flange 60 x 25 x 10	G1/2	PN 16	Brass	63024	

Pressure gauge stop valve DIN 16270

Design A-female/female x male connector
Design B-rotatable loose female coupling x male connector and shaft for instrument holder

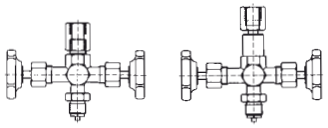
Design A	Design B	Connection	Nom. pressure	Material	Design A	**Price €**	Design B	**Price €**
					Part no.		Part no.	
		G1/4	PN 125	Brass	**63094**		---	**---**
		G1/2	PN 250	Brass	**63092**		63046	
		G1/2	PN 400	Steel	63040		63047	
		G1/2	PN 400	1.4571	**63093**		63048	
Test socket M20 x 1.5 **DIN 16271**		G1/2	PN 250	Brass	**63041**		63049	
		G1/2	PN 400	Steel	63042		63108	
		G1/2	PN 400	1.4571	63044		63109	
Add. cost for „oil and grease free*“					63045		63110	
Add. cost for DVGW-tested						**on request**	---	**---**

* Only for brass and stainless steel.

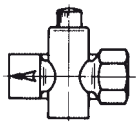
Accessories for pressure gauges

DG: E

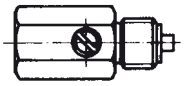
Pressure gauge dual stop valve DIN 16272 with test socket M 20 x 1.5
Design A-female/female x male connector
Design B-rotatable loose female coupling x male connector and shaft for instrument holder

Design A	Design B	Connection	Nom. pressure	Material	Design A	Price €	Design B	Price €
					Part no.		Part no.	
		G1/2	PN 250	Brass	63111		63115	
		G1/2	PN 400	Steel	63112		63116	
		G1/2	PN 400	316 Ti or 316 L	63113		63117	
Add. cost for „oil and grease free“ (only for brass and stainless steel)					63114		63118	

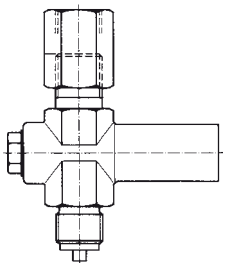
Push-button stop cock female x female - DVGW- and SVGW-tested/CE-0085AQ0985

	Connection	Nominal pressure	Material	Part no.	Price €
	Rp 1/2 DIN 2999	MOP 5	Brass, nickel-plated	**63031**	

Damping device female x male - adjustable

	Connection	Nominal pressure	Material	Part no.	Price €
	G1/2	PN 250	Brass	**63074**	
	G1/2	PN 400	Steel	63075	
	G1/2	PN 400	316 Ti or 316 L	**63076**	

Overpressure device G1/2 female/female connector x male - adjustable

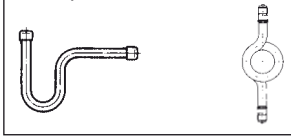
	Adjustment range in bar	Material	Part no.	Price €	Material	Part no.	Price €
	0.4 - 2.5	Brass	63131		1.4571	63139	
	2 - 6	Brass	63132		1.4571	63140	
	5 - 25	Brass	63133		1.4571	63141	
	20 - 60	Brass	63134		1.4571	63142	
	50 - 250	Brass	63135		1.4571	63143	
	240 - 400	Brass	63136		1.4571	63144	
Add. cost for „oil and grease free“			63137			63145	
Add. cost for DVGW-tested			63138			63146	

Siphon DIN 16282 – outlet female/female connector G1/2

		Shape	Inlet	Material	Nom. pressure	Part no.	Price €
U-shape		A*	G1/2B	Steel	PN 100	63147	
		B	without thread	Steel	PN 100	**63148**	
		A*	G1/2B	1.4571	PN 100	63149	
Circular shape		C*	G1/2B	Steel	PN 100	63150	
		D	without thread	Steel	PN 100	**63151**	
		C*	G1/2B	1.4571	PN 100	63152	

* Designs A and C are no longer provided for in the new DIN edition

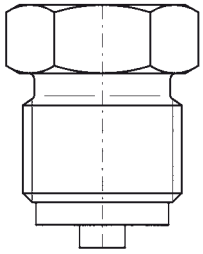
Siphon – standard – inlet G1/2

U-shape	Circular shape	Shape	Outlet	Material	Nom. pressure	Part no.	Price €
		U-	G1/2B	Steel	PN 25	**63085**	
		U-	Female connector G1/2B	Steel	PN 25	63153	
		Circular	G1/2B	Steel	PN 25	**63081**	
		Circular	Female connector G1/2B	Steel	PN 25	63154	

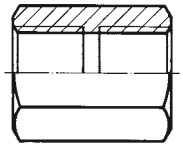
Accessories for pressure gauges

DG: E

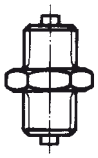
Reducers and adapters



Female connector	Male connector	Material	Part no.	Price €
G 1/8	G 1/4	Brass	**63050**	
G 1/4	G 1/8	Brass	**63052**	
G 1/4	G 3/8	Brass	**63053**	
G 1/4	G 1/2	Brass	**63054**	
G 1/4	G 1/2	316 Ti or 316 L	63051	
G 3/8	G 1/4	Brass	**63056**	
G 3/8	G 1/2	Brass	**63057**	
G 1/2	G 1/4	Brass	**63058**	
G 1/2	G 3/8	Brass	**63059**	
G 1/2	M 20 x 1.5	Brass	63155	
M 20 x 1.5	G 1/2	Brass	63156	

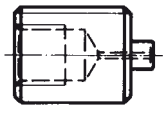


Female connector	Female connector	Material	Part no.	Price €
G 1/4	G 1/8	Brass	63158	
G 1/4	G 1/4	Brass	63159	
G 1/2	G 1/4	Brass	63160	
G 1/2	G 1/2	Brass	63161	



Male connector	Male connector	Material	Part no.	Price €
G 1/2	G 1/2	Brass	63164	
G 1/2	G 1/2	316 Ti or 316 L	63165	

Connection nipple – self-sealing



Female connector	Male connector	Material	Part no.	Price €
G 1/8	G 1/4	Brass	**63067**	
G 1/4	G 3/8	Brass	**63068**	
G 1/4	G 1/2	Brass	**63069**	
G 3/8	G 1/2	Brass	**63065**	

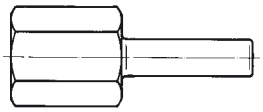
Mounting valve with self-sealing coating – closes automatically when the pressure gauge is replaced

Female connector	Male connector	Material	Part no.	Price €
G 1/4	G 1/4	Brass	**77907**	
G 1/4	G 3/8	Brass	**77908**	
G 3/8	G 3/8	Brass	**77917**	
G 1/4	G 1/2	Brass	**77914**	
G 3/8	G 1/2	Brass	77918	

Accessories for pressure gauges

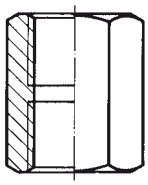
DG: E

Union nut + nipple DIN 16284



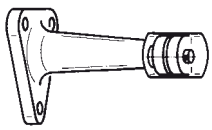
Female connector	Nipple	Material	Part no.	Price €
G1/4	6 mm	Brass	**63072**	
G1/2	12 mm	Brass	**63084**	
G1/2	12 mm	316 Ti or 316 L	63070	

Female/female connector DIN 16283



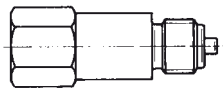
Female connector	Nipple	Material	Part no.	Price €
G1/4 links	G1/4	Brass	63101	
G1/4 links	G1/4	Stahl	63102	
G1/4 links	G1/4	316 Ti or 316 L	63103	
G1/2 links	G1/2	Brass	63104	
G1/2 links	G1/2	Stahl	63105	
G1/2 links	G1/2	316 Ti or 316 L	63106	

Gauge bracket DIN 16281 – design H



Female connector	Nipple	Material	Part no.	Price €
26 mm	60 mm	Aluminium	**63077**	
26 mm	100 mm	Aluminium	**63078**	
26 mm	160 mm	Aluminium	63079	
26 mm	100 mm	316 Ti or 316 L	63080	

Adapter DIN 16281

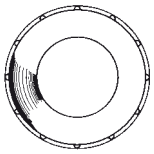


Female connector	Nipple	Material	Part no.	Price €
G1/2	G1/2	Brass	**63095**	
G1/2	G1/2	Steel	63097	
G1/2	G1/2	316 Ti or 316 L	63096	

Seals

Female connector	Nipple	Material	Part no.	Price €
Profile seal for internal centering	G1/4 M 12 x 1.5	Copper	**39205**	
Profile seal for internal centering	G1/2 M 20 x 1.5	Copper	**39206**	
Flat gasket DIN 16258	G1/4 M 12 x 1.5	Copper	**39209**	
Flat gasket DIN 16258	G1/2 M 20 x 1.5	Copper	**39210**	
Flat gasket DIN 16258	G1/2 M 20 x 1.5	316 Ti or 316 L	39211	
Flat gasket DIN 16258	G1/2 M 20 x 1.5	PTFE	**39212**	

Protective covers



Female connector	Nipple	Material	Part no.	Price €
63	blau	Gummi	**63029**	
63	rot	Gummi	**63100**	
63	schwarz	Gummi	63019	
80	schwarz	Gummi	63071	
100	schwarz	Gummi	**63030**	

* Other nominal sizes and colours on request

Diaphragm seals

Application

Diaphragm seals are devices with a separating diaphragm which are used to separate the measuring unit from the medium to be measured. They extend the application ranges of pressure gauges, pressure switches and pressure transducers.

Diaphragm seals are used for the following:

- *Where the medium to be measured must not come into contact with the measuring element, for example: the medium is polluted or highly viscous, crystallizes or hardens.*
- *The medium is corrosive and special corrosion resistant materials would have to be used for Bourdon tubes, which is not always possible.*
- *The ambient temperatures at the measuring point or the temperature of the medium are extremely high.*
- *For hygienic reasons, there must be no „dead“ space.*
- *The site conditions do not allow for direct installation of a pressure gauge.*

Principle of operation

Diaphragm seals are used in conjunction with Bourdon tube pressure gauges, pressure transducers or pressure switches.
They are either mounted directly on to the measuring instrument or connected via a cooling element or a capillary tube.

The separating element is the main component of a diaphragm seal. It consists of either a diaphragm, a pipe or an immersion shaft. The diaphragm type is the most commonly used diaphragm seals.

It is always a sealed system in which the volume between the separating element and the measuring gauge (end of Burdon tube) is first evacuated and then filled with a pressure transmission liquid.

The medium to be measured is in contact with the separating element and causes it to bend which in turn causes a displacement of the volume within the system.

The element must have a displacement capacity which is sufficient to move the measuring element of the associated gauge.
The deflection must always take place in the elastic area of the separating diaphragm.
This is determined by the diameter, the material and the shape.

Temperature performance

The system is filled at ambient room temperature. Different temperatures will change the volume of the filling liquid causing differences in pressure readings. By specifying the exact operating temperatures at the time of order, we can counteract this effect by selecting the most suitable filling liquid. If the temperatures are higher than +100 °C, the gauge and the diaphragm seal at the measuring point should be separated by a capillary tube or the system should be equipped with a cooling element.

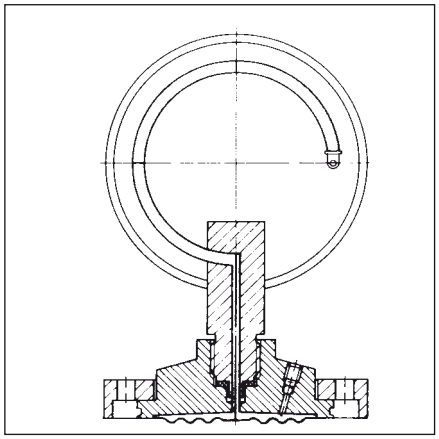
Response time

Using a diaphragm seal will generally result in a slightly delayed response of the pressure gauge. This effect can be useful for system damping purposes.

Filling liquid

The filling liquid for the diaphragm seal must be selected according to the minimum and maximum operating temperatures.
Furthermore, the filling liquid must be compatible with the medium to be measured as it cannot be ruled out that they may come into contact with each other, when a diaphragm seal is damaged.

Diaphragm seals plastic version – type MD 10



Type MD 10

Application
For use with Bourdon tube pressure gauges or pressure switches. Especially designed for polluted waste water, fertilizers, corrosive media.

Technical specifications

Process connection
PVC, PP, PVDF
Female thread G1/2 or G1/4

Diaphragm
EPDM, PTFE-coated internal

Instrument connection
Female thread G1/2 or G1/4

Screws and nuts
Stainless steel

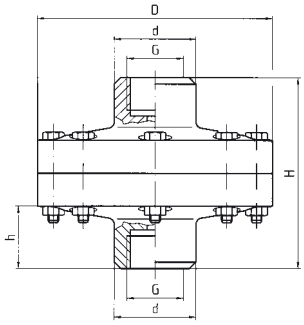
Pressure ranges
Refer to price list section

Operating temperature range
PVC, PP -10 °C/+40 °C
PVDF -10 °C/+50 °C

Options

- *Other process connections*
- *Other materials*

Dimensions (in mm)



G	d	D	h	H
G1/4	25	72	15	71
G1/2	32	100	22	90

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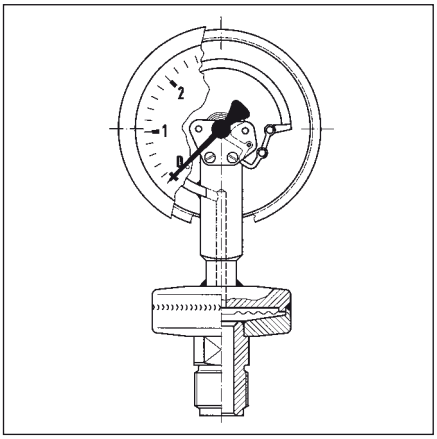
Refer to page 424 for prices

Diaphragm seals, compact version



Compact version type MD 21

Compact version type MD 22

Type MD 21

Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches.
For corrosive, hot and polluted media at high pressures. Especially for use in the machinery and chemical industries.

Technical specifications

Process connection
Stainless steel 1.4571 (316 Ti)
G1/2B to G2B, fixed thread

Diaphragm
Stainless steel 1.4571 (316 Ti)
flush mounting, welded flush to upper body

Instrument connection
Welded connection

Filling liquid
Silicone oil (FM 01)

Pressure ranges
Refer to price list section

Nominal pressure
PN 600 to 1000

Options

- *Adapter for instrument connection G1/4/G1/2*
- *Cooling element (> 100 °C)*
- *Capillary tube*
- *Other threads*
- *Other materials*

Type MD 22

Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches.
For corrosive, hot and polluted media at high pressures. Especially for use in the machinery and chemical industries.

Technical specifications

Process connection
Stainless steel 1.4571 (316 Ti)
G1/2B, fixed thread

Upper and lower part
Stainless steel 1.4571 (316 Ti)
welded

Diaphragm
Stainless steel 1.4571 (316 Ti)
internal, welded

Instrument connection
Welded connection

Filling liquid
Silicone oil (FM 01)

Pressure ranges
Refer to price list section

Nominal pressure
PN 40 to 250

Options

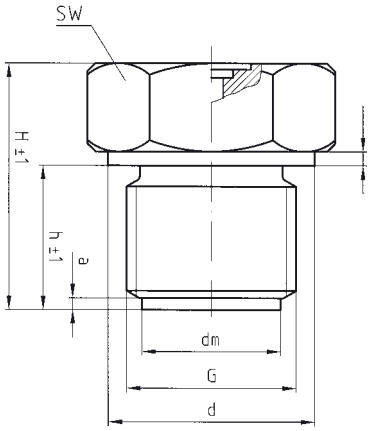
- *Adapter for instrument connection G1/4/G1/2*
- *Cooling element (> 100 °C)*
- *Capillary tube*
- *Other threads*
- *Other materials*
- *Other filling liquids*

Refer to page 424 for prices

Diaphragm seals, compact version

Types and dimensions (mm)

Type MD 21



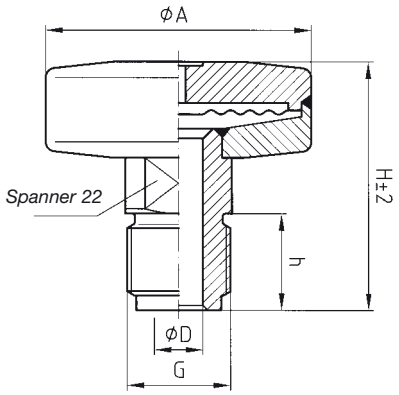
Pipe thread according to ISO 228-1

G	d	dm	h	H	a	b	SW
G1/2B	26	17.2	17	33.5	3	3	27
G3/4B	32	23.5	19	34	3	3	32
G1B	39	28	21	36	3	3	41
G1 1/2B	55	40	25	48	3	3	55
G2B	68	50	27	56	3	3.5	70

Pipe thread according to ANSI/ASME B1.20.1

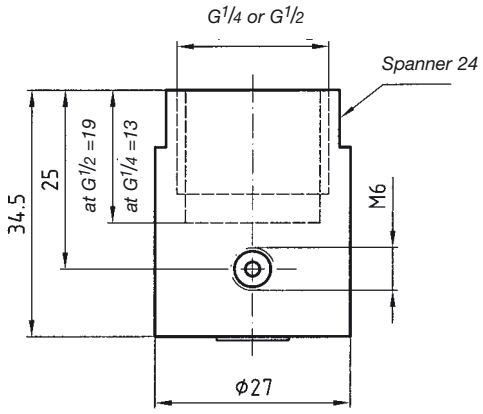
G	d	dm	h	H	a	b	SW
1"NPT	-	23.5	24	36	-	-	41
1 1/2"NPT	-	35	25	45	-	-	55
2"NPT	-	48	26	50	-	-	70

Type MD 22

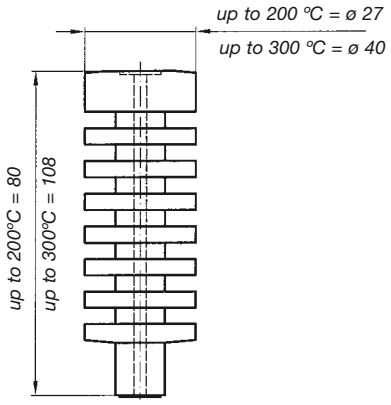


PN	G	ØA	ØD	h	H
40	G1/4B	55	6	13	44,5
40	G3/8B	55	6	16	47,5
40	G1/2B	55	10	20	51,5
40	1/4"NPT	55	6	15	46,5
40	1/2"NPT	55	10	20	51,5
250	G1/4B	40	6	13	44,5
250	G3/8B	40	6	16	47,5
250	G1/2B	40	10	20	51,5
250	1/4"NPT	40	6	15	46,5
250	1/2"NPT	40	10	20	51,5

Adapter for instrument connection G1/4/G1/2 with filling port



Cooling element, can be welded at both ends



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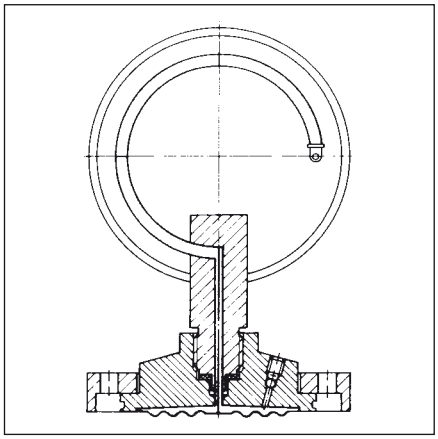
Diaphragm seals, standard version
Thread connection – type MD 30



Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches.
For corrosive, viscous, polluted or hot media.

Technical specifications

Process connection/lower part
Stainless steel 316 Ti or 316 L (316 Ti)
G½B or ½ NPT
Female or male thread

Diaphragm
Stainless steel 1.4435 (316 L)

Seal
Viton (FPM)

Instrument connection/upper part
Stainless steel 1.4435 (316 L)
Welded connection

Retaining flanges
Stainless steel 316 Ti or 316 L (316 Ti)

Spacer ring
Stainless steel 316 Ti or 316 L (316 Ti)

Screws and nuts
Stainless steel A2

Filling liquid
Silicone oil (FM 01)

Pressure ranges
Refer to price list section

Nominal pressure
PN 25 to 250

Options

Process connection/lower part
- *Special materials/coatings*
- *Other connection threads*

Diaphragm
- *Special materials/coatings*

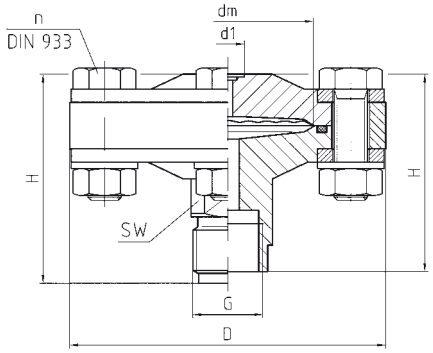
Seal
- *Other materials*

Instrument connection/upper part
- *Adapter for instrument connection G¼/G½*
- *Cooling element (> 100 °C)*
- *Capillary tube*

Screws/nuts/spacer ring
- *Other materials*

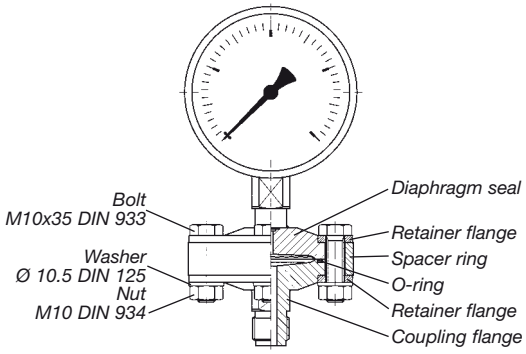
Miscellaneous
- *Other filling liquids*

Dimensions (in mm)



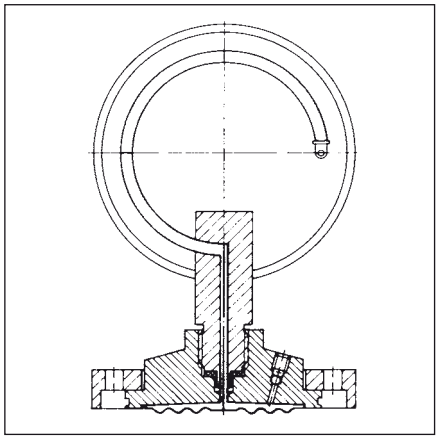
G	d1	PN	dm	D	H	n	SW
G½	10	25	36	95	60	4xM10	22
G½B	10	25	36	95	63	4xM10	22
½-14NPT	10	25	36	95	63	4xM10	22
G½	10	100	36	95	60	4xM10	22
G½B	10	100	36	95	63	4xM10	22
½-14NPT	10	100	36	95	63	4xM10	22
G½	10	250	56	95	56	8xM10	22
G½B	10	250	56	95	79	8xM10	22
½-14NPT	10	250	56	95	76	8xM10	22

Mounting example



Refer to page 425 for prices

Diaphragm seal for the paper and pulp industries – type MD 40



Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches.
For corrosive, highly viscous, polluted or media which tend to harden. Especially designed for use in the paper, pulp and lacquer industries.

Technical specifications

Process connection/tubus
Stainless steel 1.4571(316 Ti), DN 48 loose retaining flange, stainless steel 304 (304)

Diaphragm
Stainless steel 1.4571 (316 Ti)

Seal
„Perbunan“ nitrile rubber

Instrument connection
Stainless steel 1.4571 (316 Ti)
Welded connection

Filling liquid
Glycerine

Pressure ranges
Refer to price list section

Nominal pressure
PN 40

Accessories

Screws M 6 x 20, galvanized steel
Seal („Perbunan“ nitrile rubber) 59 x 48 x 2 mm (included in scope of delivery)

Options

Process connection/tubus
- *Extended tubus 18 mm (also suitable for O-ring seal)*
- *Special materials*
- *Silicone-free*

Diaphragm
- *Special materials*

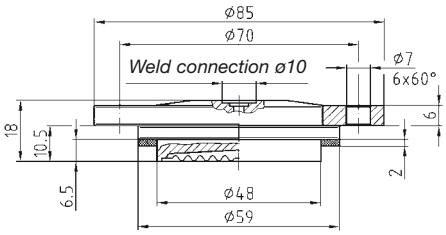
Instrument connection
- *Adapter for instrument connection G¼/G½*
- *Cooling element (> 100 °C)*
- *Capillary tube*

Miscellaneous
- *Other filling liquids*

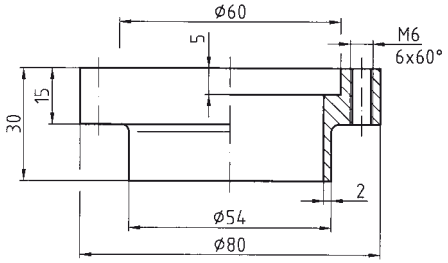
Mounting accessories
- *Welding flange stainless steel 1.4301 (304)*

Dimensions (in mm)

MD 40



Welding flange (optional)



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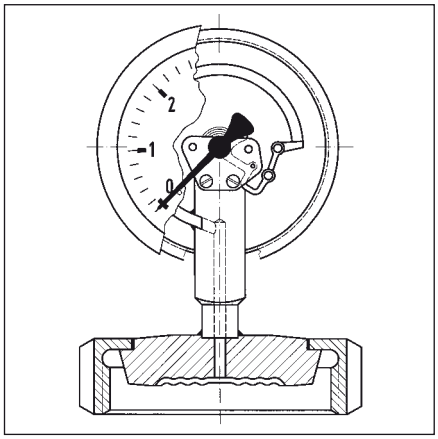
Refer to page 425 for prices

Diaphragm seals for hygienic applications



Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches. For viscous, perishable or hot media. Especially designed for applications in the food, beverage, pharmaceutical, chemical and biotech industries.

Type summary/ process connections

Type MD 50: DIN 11851/11887

Type MD 51: SMS 1147

Type MD 52: Hygienic DIN 11864

Type MD 53: APV-RJT

Type MD 54: IDF

Type MD 55: APV-ISS

Type MD 60: Clamp ISO 2852

Type MD 61: Clamp DIN 32676

Type MD 62: Tri-Clamp

Refer to table on page 417 for nominal diameters.

Technical specifications MD 50 – MD 55

Process connection
Stainless steel 1.4435 (316 L)
Male or female thread
(grooved union nut stainless steel 304/304)

Diaphragm
Stainless steel 1.4435 (316 L), welded flush to upper body

Instrument connection
Welded connection

Filling liquid
Vegetable oil, food quality (FM 05)

Pressure ranges
Refer to price list section

Nominal pressure
PN 25 to 40

Options

- *Adapter for instrument connection G1/4/G1/2*
- *Special materials/coatings*
- *Electrolytically polished*
- *Cooling element (> 100 °C)*
- *Capillary tube*
- *Other filling liquids*

Technical specifications MD 60 – MD 62

Process connection
Stainless steel 1.4435 (316 L)
Clamp 3/4“ to 3“

Diaphragm
Stainless steel 1.4435 (316 L), welded flush to upper body

Instrument connection
Welded connection

Filling liquid
Vegetable oil, food quality

Pressure ranges
Refer to price list section

Nominal pressure
PN 25 to 40

Options

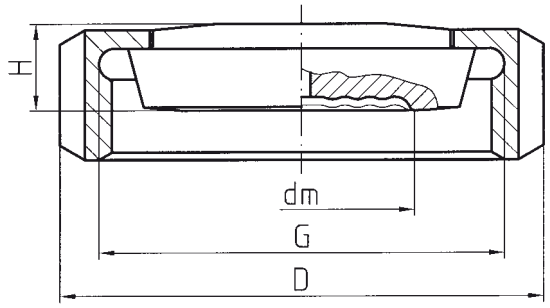
- *Adapter for instrument connection G1/4/G1/2*
- *Special materials/coatings*
- *Electrolytically polished*
- *Cooling element (> 100 °C)*
- *Capillary tube*
- *Other filling liquids (FDA-approved)*
- *Accessories (retainer ring, seal, socket)*

Refer to page 426 for prices

Diaphragm seals for hygienic applications

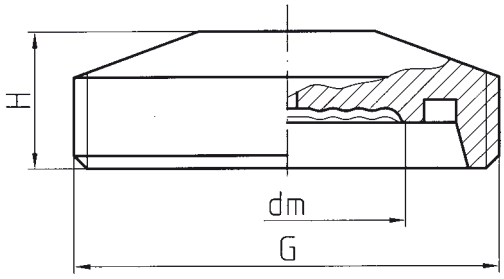
Types and dimensions (mm)

*Grooved union nut**



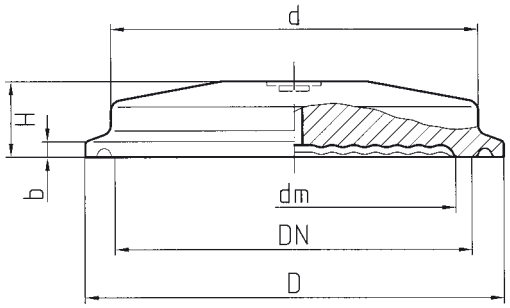
Version	DN	PN	dm	G	D	H
DIN 11851	25	40	23.5	Rd52 x 1/6	63	14
	32	40	28	Rd58 x 1/6	70	14
	40	40	36	Rd65 x 1/6	78	14
	50	25	48	Rd78 x 1/6	92	15
	65	25	-	Rd95 x 1/6	112	-
SMS norm	1 1/2"	40	36	Rd60 x 1/6	74	14
	2"	40	48	Rd70 x 1/6	84	14
	2 1/2"	25	-	Rd85 x 1/6	100	-

*Threaded socket**



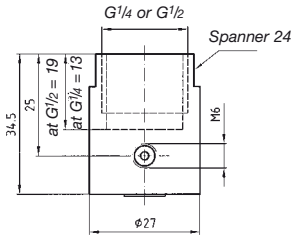
Version	DN	PN	dm	G	H	
DIN 11851	25	40	23.5	Rd52 x 1/6	21	
	32	40	28	Rd58 x 1/6	21	
	40	40	36	Rd65 x 1/6	21	
	50	25	48	Rd78 x 1/6	21	
	65	25	-	Rd95 x 1/6	-	
SMS norm	1 1/2"	40	36	Rd60 x 1/6	17	
	2"	40	48	Rd70 x 1/6	17	
	2 1/2"	25	-	Rd85 x 1/6	-	

Clamp connection ISO 2852

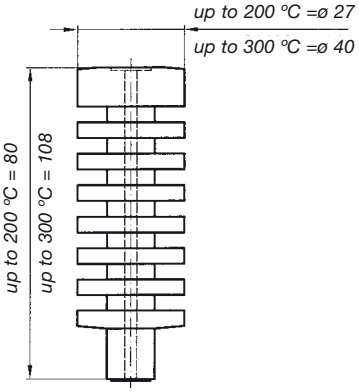


DN	PN	D	dm	d	H	b
3/4"	40	25	17.2	19	20	3.6
1"	40	50.5	26	42	28	2.85
1 1/2"	40	50.5	36	42	28	2.85
2"	40	64	48	55	28	2.85
2 1/2"	25	77.5	59	68	28	2.85
3"	25	91	72	81	28	2.85

Adapter for instrument connection G1/4/G1/2 with filling hole



Cooling element, can be welded at both ends



* Fig. shows connection DIN 11851

11

Diaphragm seals for homogenising machines/ tongue type diaphragm seals

Homogenising machine version type MD 70

Tongue type diaphragm seal type MD 71 with fixed thread

Tongue type diaphragm seal type MD 71 with union nut (optional)

Type MD 70

Application
For use with Bourdon tube pressure gauges. For highly viscous media at high pressures. Especially for homogenising machines.

Technical specifications

Process connection
Stainless steel 1.4404 (316 L) loose retaining flange, stainless steel

Diaphragm
Stainless steel 1.4404 (316 L), welded flush to upper body

Instrument connection
Stainless steel 1.4404 (316 L) Welded connection

Filling liquid
Glycerine (FM 03)

Pressure ranges
Refer to price list section

Nominal pressure
PN 600

Options

- *Nominal pressure PN 1600*
- *Other filling liquids*

Type MD 71

Application
For use with Bourdon tube pressure gauges. For flowing and heterogeneous media at high pressure.

Technical specifications

Process connection
Stainless steel 1.4571 (316 Ti) G1/2B or G3/4B

Diaphragm/pressure sensor
Corrugated diaphragm pipe with star-shaped cross section Stainless steel 1.4571 (316 Ti), welded to upper body

Instrument connection
Stainless steel 1.4571 (316 Ti) Female thread G1/2

Filling liquid
Silicone oil (FM 01)

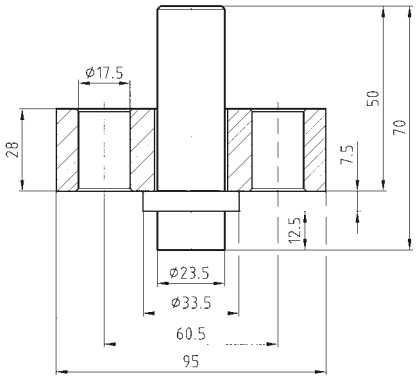
Pressure ranges
Refer to price list section

Nominal pressure
PN 1000

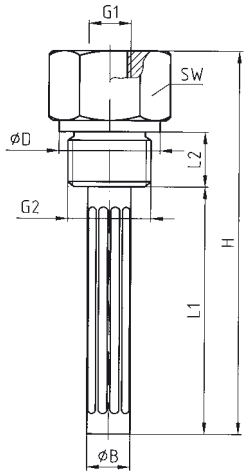
Options

- *Other process connections*
- *Connection with union nut*
- *Other filling liquids*

Dimensions (in mm) type MD 70



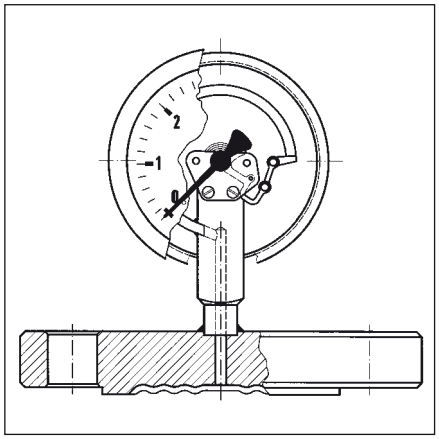
Dimensions (in mm) type MD 71



G1	G2	SW	Ø D	L1	L2	B	H
G1/2	G1/2B	27	26	82	14	15	118
G1/2	G3/4B	32	32	82	16	15	118
G1/2	1/2-14 NPT	27	26	82	18	15	120

Refer to page 427 for prices

Diaphragm seals, flange version – type MD 80



Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches.
For corrosive, highly viscous, polluted, perishable, crystallising and hot media.

Pressure ranges
Refer to price list section

Nominal pressure
PN 16 to 40
Class 150 to 300

Miscellaneous
- *Adapter for instrument connection G¼/G½*
- *Cooling element (> 100 °C)*
- *Capillary tube (back or bottom)*
- *Other filling liquids*
- *Customer-specific flanges*
- *Other nominal diameters*

Technical specifications

Process connection
Stainless steel 316 L,
flange connection according to EN 1092-1 design B 1
DN 25 to 120 or ASME B 16.5
DN 1“ up to 4“

Diaphragm
Stainless steel 316 L

Instrument connection
Welded connection

Filling liquid
Silicone oil (FM 01)

Options

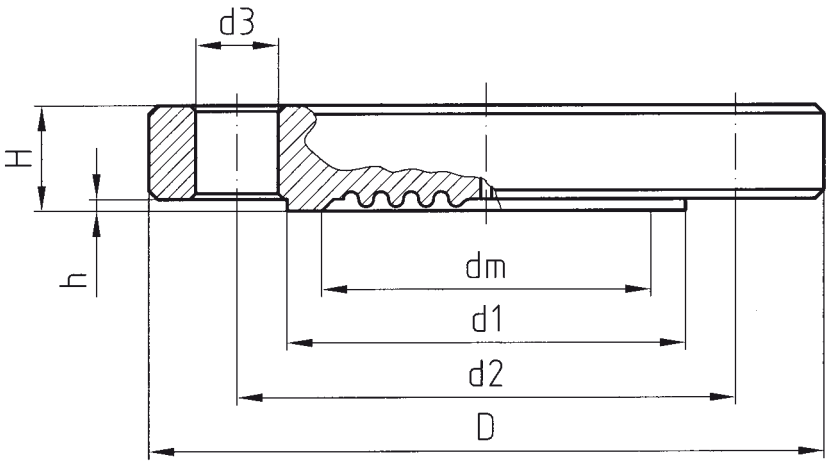
Process connection
- *Special materials/coatings*
- *Other sealing surfaces*

Diaphragm
- *Special materials: Hastelloy, Monel, Nickel, Inconel, Incoloy, Platinum, Titanium, Tantalum, Zirconium*
- *Coatings/linings: PFA (up to 200 °C), ECTFE (up to 150 °C), PTFE (up to 150 °C, up to 100 bar), silver (up to 150 °C), gold (up to 200 °C)*

Refer to page 427 for prices

Diaphragm seals, flange version – type MD 80

Types and dimensions (mm)



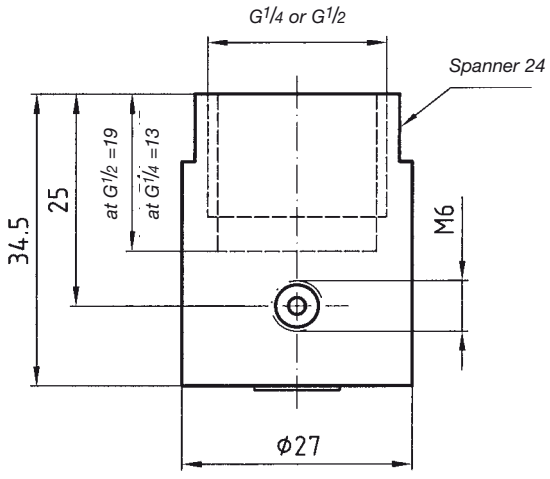
Flange connection according to EN 1092-1 design B 1

DN	PN	D	d_1	d_2	d_3	H	h	dm
25	40	115	68	85	4x14	18	-	28
40	40	150	88	110	4x18	18	3	48
50	40	165	102	125	4x18	18	3	48
80	40	200	138	160	8x18	24	3	48
100	40	235	162	190	8x22	24	3	48

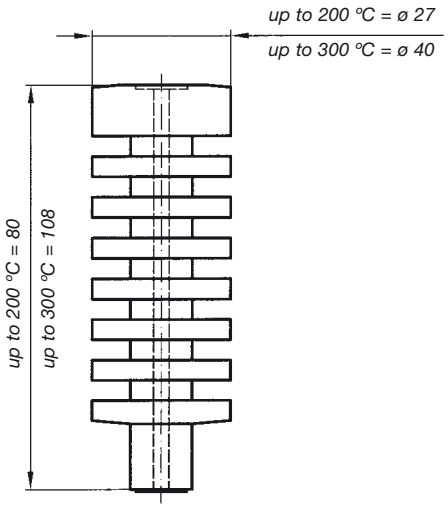
Flange connection according to ASME B 16.5

DN	CL	D	d_1	d_2	d_3	H	h	dm
1”	150	108	50,8	79,4	4x15,9	14,3	1,6	28
	300	123,9	50,8	88,9	4x19,1	17,5	1,6	28
1½”	150	127	73,2	98,6	4x15,9	17,5	1,6	36
	300	155,6	73,2	114,3	4x22,4	22,4	1,6	36
2”	150	152,4	92,1	120,7	4x19,1	19,1	1,6	48
	300	165,1	92,1	127	8x19,1	25,4	1,6	48
3”	150	190,5	127	152,4	4x19,1	23,9	1,6	48
	300	209,6	127	168,3	8x22,4	31,8	1,6	48
4”	150	228,6	157,2	190,5	8x19,1	23,9	1,6	48
	300	254	157,2	200,1	8x22,3	31,7	1,6	48

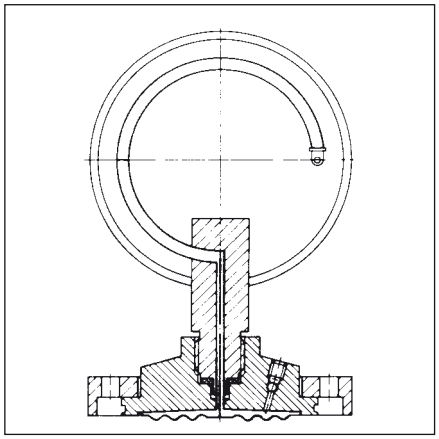
Adapter for instrument connection G1/4/G1/2 with filling hole



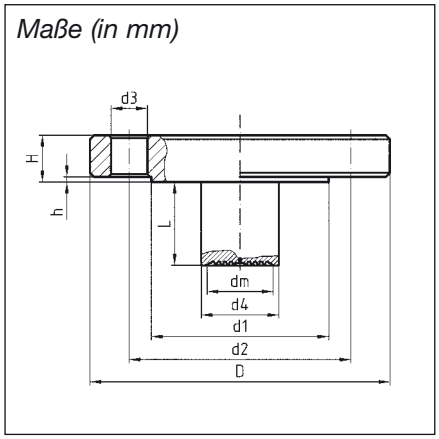
Cooling element, can be welded at both ends



Diaphragm seals „tubus“-flange version – type MD 81



Maße (in mm)



Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches. For corrosive, highly viscous, polluted, perishable, crystallising and hot media. Especially designed for use on insulated vessels or tanks with thick walls.

Technical specifications

Process connection
Stainless steel 316 L,
flange connection according to
EN 1092-1 design B 1
DN 50 to 100 or ASME B 16.5
DN 1“ up to 4“
„tubus“ lengths 50, 100, 150 mm

Diaphragm/sealing surface
Stainless steel 316 L, welded

Instrument connection
Stainless steel 316 L,
welded connection

Filling liquid
Silicone oil (FM 01)

Pressure ranges
Refer to price list section

Nominal pressure
PN 16 to 40
Class 150 to 300

Options

Process connection

- *Other „tubus“ lengths*
- *Special materials/coatings*
- *Other sealing surfaces*

Diaphragm

- *Special materials:*
  Hastelloy, Monel, Nickel, Inconel, Incoloy, Platinum, Titanium, Tantalum, Zirconium
- *Coatings/linings:*
  PFA (up to 200 °C),
  ECTFE (up to 150 °C),
  PTFE (up to 150 °C, up to 100 bar),
  silver (up to 150 °C),
  gold (up to 200 °C)

Miscellaneous

- *Adapter for instrument connection G¼/G½*
- *Capillary tube (back or bottom)*
- *Cooling element (> 100 °C)*
- *Other filling liquids*
- *Customer-specific flanges*
- *Other nominal diameters*

11

Flange connection according to EN 1092-1 design B 1

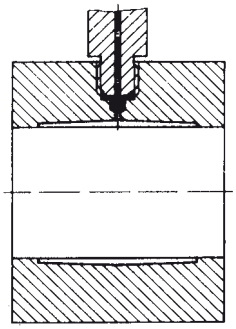
DN	PN	D	d1	d2	d3	d4	H	h	dm	L
50	40	165	102	125	4x18	48	20	3	48	50, 100, 150
80	40	200	138	160	8x18	76	24	3	75	
100	40	235	162	190	8x22	94	24	3	93	

Flange connection according to ASME B 16.5

DN	CL	D	d1	d2	d3	d4	H	h	dm	L
1”	150	108	51	79,5	4x16	25	14,5	1,5	27	50, 100, 150
2”	150	152	92	121	4x19	48	19	1,5	48	
3”	150	190	127	152	4x19	76	24	1,5	75	

Refer to page 428 for prices

In-line chemical seals for hygienic processes
In-line chemical seals with clamp connection



Threaded socket type RD 50

Clamp connection type RD 60

Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches. For flowing, corrosive and highly viscous media; designed for direct installation in pipes. Especially designed and suitable for applications in the biochemical, food, beverage and pharmaceutical industries.

Technical specifications

Process connection
Type RD 50 DIN 11851, 1.4404 (316 L), male thread DN 15 to DN 100, type RD 51 SMS, 1.4404 (316 L), 1“ to 3“, type RD 60 Clamp ISO 2852, 1.4404 (316 L) 1/2“ to 3“

Diaphragm
Stainless steel 316 L, welded flush to body

Instrument connection
Stainless steel 1.4404 (316 L)
Welded connection

Filling liquid
Vegetable oil, food quality (FM 05)

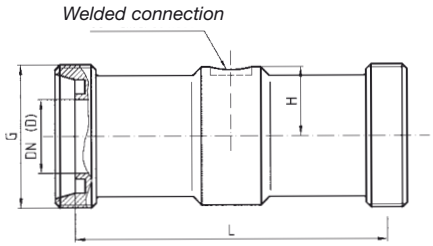
Pressure ranges
Refer to price list section

Nominal pressure
PN 40

Options

- *Coatings*
- *Cooling element (> 100 °C)*
- *Capillary tube*
- *Other filling liquids*

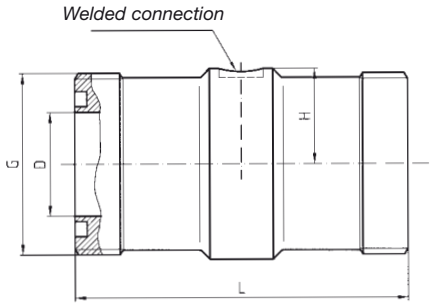
Dimensions (in mm)
Type RD 50 DIN 11851/DIN 11887



DIN 11851/DIN 11887

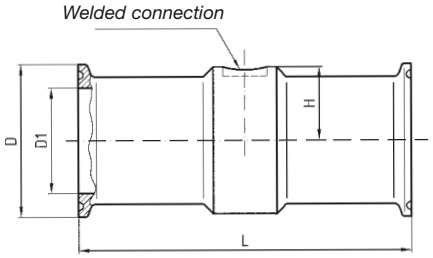
DN	PN	G	L	D	H
15	40	Rd34x1/8	240	16	20
25	40	Rd52x1/6	110	26	24
32	40	Rd58x1/6	110	32	29
40	40	Rd65x1/6	110	38	31,5
50	25	Rd78x1/6	110	50	37
65	25	Rd95x1/6	110	66	45
80	25	Rd110x1/4	60	81	51,5
100	25	Rd130x1/4	60	100	64

Type RD 51 SMS norm



DN	PN	G	L	D	H
1” (DN25)	40	Rd40x1/6	110	22,2	24
1 1/2” (DN38)	40	Rd60x1/6	110	34,8	31,5
2” (DN51)	25	Rd70x1/6	110	47,8	37
2 1/2” (DN63,5)	25	Rd85x1/6	110	60,3	45
3” (DN76)	25	Rd98x1/6	60	72,9	51,5

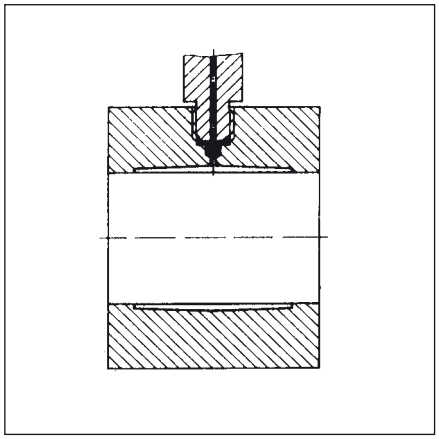
Type RD 60 Clamp ISO 2852



DN	PN	D	D1	L	H
1”	40	50,5	22,2	110	24
1 1/2”	40	50,5	34,8	110	31,5
2”	25	64	47,8	110	37
2 1/2”	25	77,5	60,3	110	45
3”	25	91	72,9	60	51,5

Refer to page 430 for prices

In-line chemical seal, intermediate flange version – type RD 80



Application
For use with Bourdon tube pressure gauges, pressure transducers or pressure switches.
For flowing, corrosive and highly viscous media; designed for direct installation in pipes.

Technical specifications

Process connection
Stainless steel 1.4404 (316 L), for flanges according to EN 1092-1 design B 2, DN 25 to DN 100 or ASME B 16.5, 1“ to 4“

Diaphragm
Stainless steel 1.4404 (316 L), welded flush to body

Instrument connection
Stainless steel 1.4404 (316 L)
Female thread G1/2

Filling liquid
Silicone oil (FM 01)

Pressure ranges
Refer to price list section

Nominal pressure
PN 4 to 400
Class 150 to 6,000

Options

- *Coatings*
- *Cooling element (> 80 °C)*
- *Capillary tube*
- *Other filling liquids*

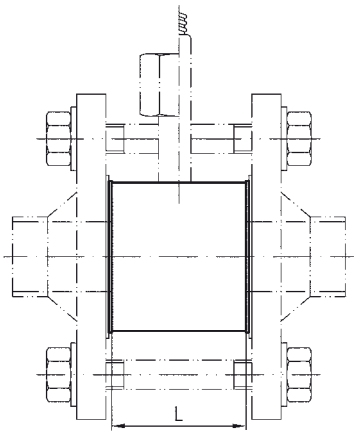
Dimensions (in mm)

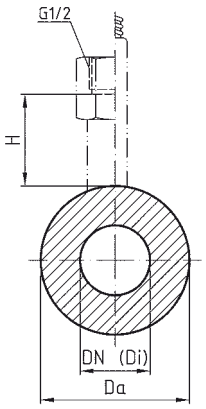
Flange connection according to EN 1092-1 design B 2

DN	Di	PN	Da	L	H
25	28,5	4-400	68	100	29
40	43,1	4-400	88	100	29
50	54,5	4-400	100	100	29
65	70,3	4-400	120	100	29
80	82,5	4-400	138	60	29
100	107,1	4-400	160	60	29

Flange connection according to ASME B 16.5

DN	Di	PN	Da	L	H
1”	28,5	150-6.000	50	100	29
1½”	43,1	150-6.000	73,2	100	29
2”	54,5	150-6.000	91,9	100	29
3”	82,5	150-6.000	127	60	29
4”	107,1	150-6.000	157,2	60	29

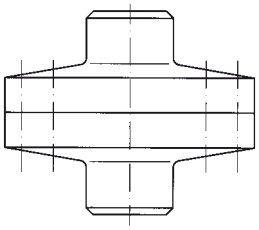




Refer to page 430 for prices

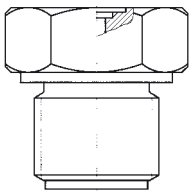
Diaphragm seals, types MD 10/21/22

RK: M



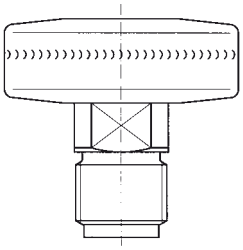
MD 10 plastic version
Diaphragm PTFE-coated, PN 10 (PVDF PN 16)

Diaphragm seal body	Process connection	Instrument connection	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
			63	100	160	DMU		
PVC	G1/4	G1/4	1.6	1.6	1.6	---	31411	
PVC	G1/2	G1/2	1.6	1.6	1.6	---	31412	
PP	G1/4	G1/4	1.6	1.6	1.6	---	31900	
PP	G1/2	G1/2	1.6	1.6	1.6	---	31901	
PVDF	G1/4	G1/4	4	4	4	---	31902	
PVDF	G1/2	G1/2	4	4	4	---	31903	



MD 21 compact version
Diaphragm stainless steel 316 Ti or 316 L, welded

Nominal pressure	Process connection	Instrument connection	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
			63	100	160	DMU		
PN 600	G1/2B	welded	10	100	100	1	31415W	
PN 1,000	G3/4B	welded	4	100	100	1	31416W	
PN 1,000	G1B	welded	4	4	4	1	31328W	
PN 600	G1 1/2B	welded	0.6	1.6	1.6	0.6	31329W	
PN 600	G2B	welded	0.6	0.6	0.6	0.6	31330W	**on request**



MD 22 compact version
Diaphragm stainless steel 316 Ti or 316 L, internal, welded

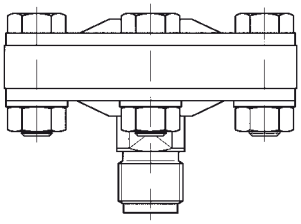
Nominal pressure	Process connection	Instrument connection	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
			63	100	160	DMU		
PN 40	G1/4B	welded	0.6	0.6	0.6	0.6	31997W	
PN 40	G1/2B	welded	0.6	0.6	0.6	0.6	31998W	
PN 40	1/2-14 NPT	welded	0.6	0.6	0.6	0.6	31999W	
PN 250	G1/4B	welded	4	4	4	4	32000W	
PN 250	G1/2B	welded	4	4	4	4	32001W	
PN 250	1/2-14 NPT	welded	4	4	4	4	32002W	

* Valid for standard filling liquid, direct mounting (without capillary tube) and at a room and medium temperature of 20 °C.

Additional costs for options, fixtures and accessories see page 431

Diaphragm seals, types MD 30/40

DG: M



MD 30 standard version

Nominal pressure	Process connection	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
PN 25	Stainless steel 1.4571, G1/2B	0.6	0.6	0.6	0.6	31417W	
PN 100	Stainless steel 1.4571, G1/2B	0.6	0.6	0.6	0.6	31331W	
PN 250	Stainless steel 1.4571, G1/2B	0.6	0.6	0.6	0.6	31332W	
Additional costs							
Process connection G1/2B, PFA-coated							**on request**
Process connection 1/2-14 NPT							
Process connection 1/2-14 NPT, PFA-coated							**on request**
Process connection G1/2 female thread							**no add. costs**
Process connection G1/2 female thread, PFA-coated							**on request**

MD 40 version for the paper and pulp industries

Instrument connection stainless steel 1.4571, welded connection
Process connection stainless steel 1.4571, DN 48, PN 40 (with seal and screws)
Retaining flange 1.4301, ranges 0/1.6 to 0/40 bar*

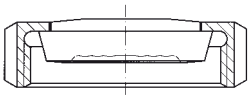
	Part no.	Price €
Direct mounting connection	31347W	
Spare parts/accessories		
6 screws M6 x 20	31418	
Spare seal, „Perbunan“ nitrile rubber 59 x 48 x 2	31419	
Welding flange 1.4301	31351	

* Valid for standard filling liquid, direct mounting (without capillary tube) and at a room and medium temperature of 20 °C.

Additional costs for options, fixtures and accessories see page 431

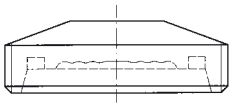
Diaphragm seals, types MD 50/51/60

RK: M



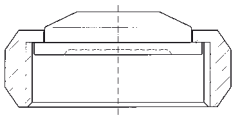
MD 50 for hygienic processes, grooved union nut DIN 11851

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
25	40	4	4	4	1	31300W	
32	40	0.6	1.6	1.6	0.6	31301W	
40	40	0.6	0.6	0.6	0.6	31302W	
50	25	0.6	0.6	0.6	0.6	31303W	
65	25	0.6	0.6	0.6	0.6	31304W	**on request**



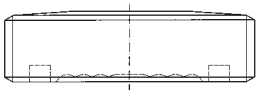
MD 50 for hygienic processes, threaded socket DIN 11851

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
25	40	4	4	4	1	31306W	
32	40	0.6	1.6	1.6	0.6	31307W	
40	40	0.6	0.6	0.6	0.6	31308W	**on request**
50	25	0.6	0.6	0.6	0.6	31309W	**on request**
65	25	0.6	0.6	0.6	0.6	31310W	**on request**



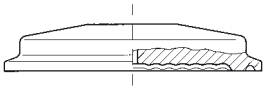
MD 51 for hygienic processes, grooved union nut SMS 1147

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
1 1/2"	40	0.6	0.6	0.6	0.6	31314W	
2"	40	0.6	0.6	0.6	0.6	31315W	
2 1/2"	25	0.6	0.6	0.6	0.6	31316W	**on request**



MD 51 for hygienic processes, threaded socket SMS 1147

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
1 1/2"	40	0.6	0.6	0.6	0.6	31320W	
2"	40	0.6	0.6	0.6	0.6	31321W	



MD 60 clamp connection ISO 2852

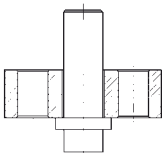
Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
3/4"	40	6	---	---	1.6	31913W	
1"	40	4	4	---	1	31914W	
1 1/2"	40	0.6	0.6	1.6	0.6	31324W	
2"	40	0.6	0.6	0.6	0.6	31325W	
2 1/2"	25	0.6	0.6	0.6	0.6	31326W	

* Valid for standard filling liquid, direct mounting (without capillary tube) and at a room and medium temperature of 20 °C.

Additional costs for options, fixtures and accessories see page 431

Diaphragm seals, types MD 70/71/80

DG: M

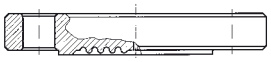


MD 70 version for homogenisation machines

Instrument connection stainless steel 1.4404 Process connection stainless steel 1.4404, DN 23,9, PN 600 Ranges 0/100 to 0/600 bar*	Part no. 31352W	**Price €**
Price reduction without retaining flange	**netto**	

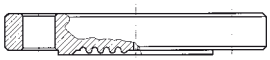
MD 71 tongue type diaphragm seal

Instrument connection stainless steel 1.4571, G1/2 Process connection stainless steel 1.4571, PN 1000 Ranges 0/60 to 0/1000 bar*	Part no.	**Price €**
Process connection G1/2B	31353	
Process connection G3/4B	31354	



MD 80 flange version, flange connection according to EN 1092-1 design B 1

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	**Price €**
		63	100	160	DMU		
25	40	4	4	4	0.6	31333W	
40	40	4	4	4	0.6	31336W	
50	40	0.6	0.6	0.6	0.6	31339W	
80	40	4	4	4	0.6	31385W	
100	40	0.6	0.6	0.6	0.6	31388W	



MD 80 flange version, flange connection according to ASME B 16.5

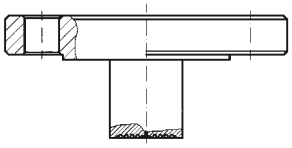
Nominal width DN	Nominal pressure Class	Minimum meas. range* (in bar) at nominal size				Part no.	**Price €**
		63	100	160	DMU		
1”	150	4	4	4	0.6	31393W	
	300	4	4	4	0.6	31394W	
1 1/2”	150	4	4	4	0.6	31396W	
	300	4	4	4	0.6	31397W	
2”	150	4	4	4	0.6	31399W	
	300	4	4	4	0.6	31400W	
3”	150	4	4	4	0.6	31402W	
	300	4	4	4	0.6	31403W	
4”	150	4	4	4	0.6	31405W	
	300	4	4	4	0.6	31406W	

* Valid for standard filling liquid, direct mounting (without capillary tube) and at a room and medium temperature of 20 °C.

Diaphragm seals, types MD 81

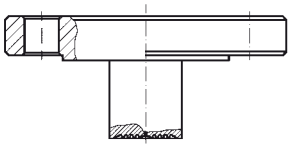
DG: M

MD 81 „tubus“ flange version, „tubus“ length 50 mm,
flange connection according to EN 1092-1 design B 1



Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
50	40	1	2.5	---	4	31917W	
80	40	0.6	0.6	1	4	31921W	
100	40	0.6	0.6	1	4	31924W	

MD 81 „tubus“ flange version, „tubus“ length 50 mm,
flange connection according to ASME B 16.5



Nominal width DN	Nominal pressure Class	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
1”	150	4	4	---	4	31938W	
2”	150	1	2.5	---	4	31929W	
3”	150	0.6	0.6	1	4	31931W	

Additional costs €

	Nominal width DN		
„Tubus“ length	50/2“	80/3“	100
100 mm			
150 mm			

* Valid for standard filling liquid, direct mounting (without capillary tube)
and at a room and medium temperature of 20 °C.

Additional costs for options, fixtures and accessories see pages 429/431

Additional costs for diaphragm seals, types MD 80/81

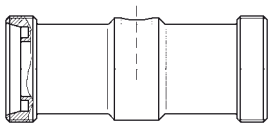
DG: M

Type of sealing surface		*MD 80* ***Additional costs €***	*MD 81* ***Additional costs €***
Groove, design D EN 1092-1 (for stainless steel)			***on request***
Tongue, design C EN 1092-1 (for stainless steel)			***on request***
Groove, design RJF ASME B 16.5			***on request***
Capillary connection			
Capillary connection, centre back		***no additional cost***	***no additional cost***
Capillary connection, bottom back		***no additional cost***	***no additional cost***
Special materials for wetted parts*	*Nominal width*		
Hastelloy C276	*DN 25*		***on request***
	DN 40		***on request***
	DN 50		***on request***
	DN 80		***on request***
	DN 100		***on request***
Tantalum	*DN 25*		***on request***
	DN 40		***on request***
	DN 50		***on request***
	DN 80		***on request***
	DN 100		***on request***
Monel 400, Nickel, Inconel, Platinum, Titanium		***on request***	***on request***
Coatings*			
PFA (up to 200 °C)	*DN 25*		***on request***
	DN 40		***on request***
	DN 50		***on request***
	DN 80		***on request***
	DN 100		***on request***
ECTFE (up to 150 °C)	*DN 25*		***on request***
	DN 40		***on request***
	DN 50		***on request***
	DN 80		***on request***
	DN 100		***on request***
PTFE, silver, gold		***on request***	***on request***

** Please enquire for special materials for groove or tongue version.*

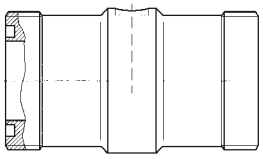
In-line chemical seals, types RD 50/51/60/80

DG: M



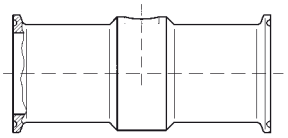
RD 50 for hygienic processes, male thread DIN 11851

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
15	40	1.6	---	---	4	31952W	
25	40	1.6	2.5	---	0.6	31365W	
32	40	1	2.5	---	0.6	31953W	
40	40	1	2.5	4	0.6	31366W	
50	40	1	2.5	4	0.6	31367W	
80	40	1	2.5	4	0.6	31369W	



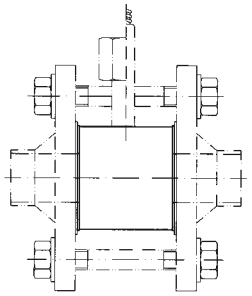
RD 51 for hygienic processes, threaded socket SMS 1147

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
1“	40	1.6	2.5	---	1.6	31371W	
1½“	40	1.6	2.5	4	1.6	31372W	
2“	40	1	1.6	2.5	1.6	31373W	
2½“	40	1	1.6	2.5	1.6	31374W	**on request**
3“	40	1	1.6	1.6	1.6	31375W	**on request**



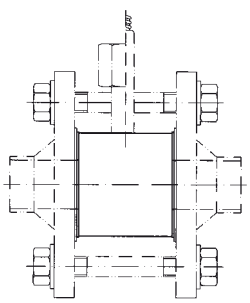
RD 60 clamp connection ISO 2852

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
1“	40	1.6	2.5	---	1.6	31377W	
1½“	40	1.6	2.5	4	1.6	31378W	
2“	40	1.6	2.5	2.5	1	31379W	
2½“	40	1.6	2.5	2.5	1	31380W	
3“	40	1.6	2.5	2.5	1	31381W	



RD 80 intermediate flange version for flanges according to EN 1092-1 design B 2

Nominal width DN	Nominal pressure PN	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
25	4-400	1.6	2.5	---	1.6	31355	
40	4-400	1.6	2.5	4	1.6	31356	
50	4-400	1.6	2.5	2.5	1	31357	
65	4-400	1.6	2.5	2.5	1	31956	
80	4-400	1.6	2.5	2.5	1	31358	



RD 80 intermediate flange version for flanges according to ASME B 16.5

Nominal width DN	Nominal pressure Class	Minimum meas. range* (in bar) at nominal size				Part no.	Price €
		63	100	160	DMU		
1“	150-6,000	1.6	2.5	---	1.6	31360	
1½“	150-6,000	1.6	2.5	4	1.6	31361	
2“	150-6,000	1.6	2.5	2.5	1	31362	
3“	150-6,000	1.6	2.5	2.5	1	31363	
4“	150-6,000	1.6	2.5	2.5	1	31364	

* Valid for standard filling liquid, direct mounting (without capillary tube) and at a room and medium temperature of 20 °C.

Additional costs for options, fixtures and accessories see page 431

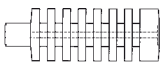
Diaphragm seals – fitting costs and accessories

DG : M

The fitting costs include the mounting of the pressure gauge or pressure transducer to the diaphragm seal, filling of the system with transmission fluid, securing the screw connections and calibration of the system at a room temperature of +20 °C. The final price is made up of the price for the pressure gauge, the price for the diaphragm seal and the fitting cost as well as the price for options and/or accessories, where applicable.

Fitting costs € [1]	Length of capillary tube	Fitting to AFRISO Bourdon tube pressure gauges [2]		Fitting to AFRISO pressure transducers [2]	
		Part no.	**Price €**	Part no.	**Price €**
Direct mounting (at >100 °C it is advisable to use a cooling element or a capillary tube)	---	32007		32016	
Fitting with capillary tube Capillary tube stainless steel 316 Ti or 316 L, screwed or welded to diaphragm seal, with kink protection and connection piece for instrument bracket	1 metre	32008		32017	
	2 metres	32009		32018	
	3 metres	32010		32019	
	4 metres	32011		32020	
	5 metres	32012		32021	
	6 metres	32013		32022	
	8 metres	32014		32023	
	10 metres	32015		32052	
	other		**on request**	**on request**	

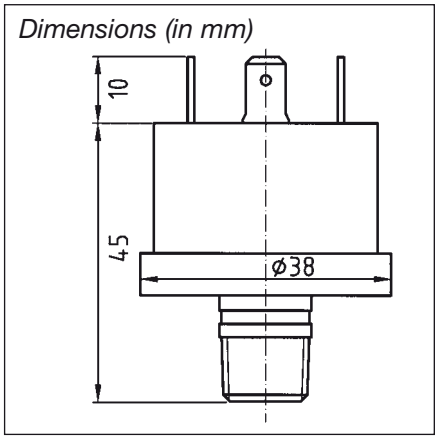
Additional costs			**Price €**
Spiral protection hose		per metre	
Calibration of filled system at operating temperatures other than +20 °C (between +20 and +100 °C), with dial marking t_A = x °C dial			
Calibration of filled system at operating temperatures other than +20 °C (between 100 and +180 °C), with dial marking t_A = x °C dial			
Other filling liquids		Operating temperature range [3]	
FM 01	Silicone oil	-20/+200 °C	Standard/no additional cost
FM 02	Silicone oil	-90/+100 °C	
FM 03	Glycerine	0/+230 °C	Standard/no additional cost
FM 04	Glycerine/water	-10/+120 °C	no additional cost
FM 05	Vegetable oil	-10/+250 °C	Standard/no additional cost
FM 06	High temperature oil	-10/+300 °C	
FM 07	High temperature oil	-10/+400 °C	
FM 08	Halocarbon [4] (for oxygen or chlorine)	-40/+175 °C	
FM 09	Paraffin oil (FDA-compliant)	-10/+220 °C	

Accessories		Version	Part no.	**Price €**	Version	Part no.	**Price €**
Adapter for instrument connection with thread and filling port, for welding to diaphragm seal		Instrument connection G1/4 female	32003		Instrument connection G1/2 female	32004	
Cooling element, can be welded at both ends (only factory-fitted)		Up to T_{max} medium 200 °C (Ø 27)	32005		Up to T_{max} medium 300 °C (Ø 40)	32006	
Cooling element, screw connection at both ends G1/2 female x male		Up to T_{max} medium 200 °C (Ø 27)	31420		Up to T_{max} medium 300 °C (Ø 40)	31421	

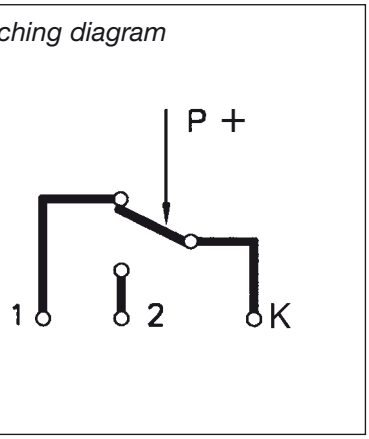
[1] For differential pressure measuring devices = twice the additional cost
[2] Please enquire for other makes or measuring instruments.
[3] Only at positive overpressure
[4] Up to a maximum of 160 bar

Pressure switches DS 600/250

Dimensions (in mm)



Switching diagram



Switching point
Factory pre-set to required value between 0.5 und 6 bar

Overpressure safety
2 bar greater than switching point

Switching differential
0.3 bar

Pressure connection
Brass, R1/4 DIN 2999, fixed thread

Type of connection
Direct mounting

Housing
Plastic/stainless steel
34 x 26 mm (Ø x H)

Protection
IP 00 (EN 60529)

Contact rating
K1 16 (4) A AC 250 V
K1-2 6 (1) A AC 400 V

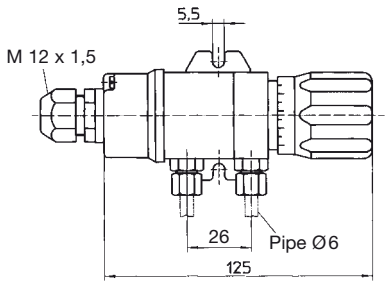
Options

- *Fixed cable connection with 1 metre cable*
- *Other switching points*

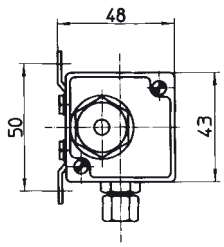
DG: H	PU	Part no.	Price €
DS 600/250	200	**88140**	

Differential pressure switches DS 01

Dimensions (in mm)



Dimensions (in mm)



Application
Suitable for all practically neutral media such as process water, heating water, neutral gases, oils. Suitable for two-point control by means of a continuously adjustable switching point (between 10 and 100 % of pressure range).

Function
A robust diaphragm type movement serves as the basis for this unit. It is suitable for pressure, vacuum and differential pressure measurements. The unit uses the same principle of operation for all three measuring applications. The pressure or the differential pressure applies a force to one side of the diaphragm. This force displaces the diaphragm system and moves the measurement range spring. A switching plunger fixed to the diaphragm actuates an electrical switching element. The switching point is adjusted via a knurled knob according to the scale.

Pressure ranges
0/0.6 to 0/4 bar

Maximum static pressure
16 bar, device is overpressure-proof up to 16 bar and vacuum-proof

Operating temperature range
Medium: T_{max} = +80 °C
Ambient: T_{max} = +80 °C

Connection
2 x G1/8 female thread

Pressure chamber
Brass

Diaphragm
NBR

Mounting
Bracket for wall mounting

Electrical connection
Cable gland M 12 x 1.5

Switching point
10–100 % of pressure range, continuously adjustable

Contact
Microswitch, normally closed or normally open

Hysteresis
Approx. 2 %

Max. rating
U ... AC/DC 250 V, I ... 3 A
P ... 500 VA/250 W

DG: H

Pressure range	Part no.	Price €
0/0.6 bar	88103	
0/1 bar	88104	
0/1,6 bar	88105	
0/2,5 bar	88107	
0/4 bar	88106	

Additional costs – options

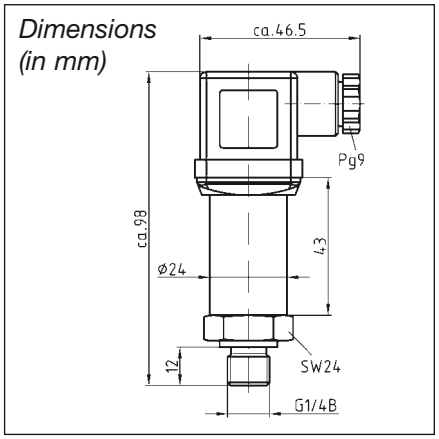
DG: H

Option	Part no.	Price €
Diaphragm FKM	88125	
Fixed cable 2.5 m*	88126	
Compression fitting for 6 mm pipe, steel	88120	
Compression fitting for 6 mm pipe, brass	88108	
Compression fitting for 8 mm pipe, brass	88114	

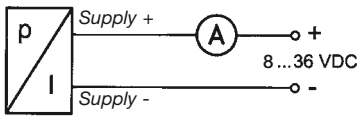
** Please specify required switching function (normally closed/normally open)*

Pressure transducer DMU 01K
Compact version

Dimensions (in mm)



Wiring diagram



Application
Special OEM unit. For electronic pressure measurement in industrial or HVAC applications (such as hydraulic, pneumatic, automation, heating or air conditioning).

Description
The DMU 01K pressure transducers use proven ceramic measuring cell technology and feature calibrated, amplified sensor signals which are available as standardised current outputs.

DMU 01K features:
- *Compact design*
- *Superior price/performance ratio due to automated mass production*
- *High temperature resistance*
- *No mechanical ageing*

Accuracy of measurement
Deviation characteristics according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < ± 1 % FSO (meas. ranges ≥ 0/100 bar < ± 2 % FSO)

Measuring ranges
Relative pressure: 0/1.6 to 0/250 bar

Overpressure safety
At least 2 x FS
(burst pressure at least 3 x FS)

Operating temperature range

Medium:	*-25 °C/+125 °C*
Ambient:	*-25 °C/ +85 °C*
Storage:	*-40 °C/ +85 °C*

Temperature error band
In compensated range
-25/+85 °C ≤ 0.5 % FSO/10 K

Dynamic characteristics
Response time < 10 ms

Process connection
G 1/4 B, DIN 3852

Materials

Housing:	*stainless steel 1.4301*
Pressure-connection:	*stainless steel 1.4301*
Diaphragm:	*ceramic $Al_2 0_3$ 96 %*
Seal:	*FKM (Viton)*

Supply voltage
DC 8–36 V

Output signal
4–20 mA, 2-wire

Load
4–20 mA $\leq \frac{U_B - U_{B\,min}}{0{,}02\ A}$

Current input
4–20 mA < 25 mA

Protective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box
DIN 43650-A (IP 65)

CE conformity (EMC)
EMC directive 2004 / 108 / EG

Options

- *Fixed cable connection*
- *Other output signals*
- *Other connection threads*

Refer to page 439 for prices

Pressure transducers DMU 01
Standard version

Flush mounted diaphragm

DMU 01 with DA 06 plug-in local display

Application
For electronic pressure measurement in industrial applications (such as hydraulic and pneumatic applications as well as machine and plant construction).

Description
The DMU 01 pressure transducers use proven ceramic measurement cell technology and feature calibrated, amplified sensor signals which are available as standardised voltage or current outputs.

DMU 01 features:

- *High temperature resistance*
- *No mechanical ageing*
- *No transmission liquid*

Accuracy of measurement
Deviation characteristics according to IEC 60770 – limit point setting (non-linearity, hysteresis, repeatability): < ±0,5 % FSO
(meas. ranges -1/0 bar < ± 1 % FSO)

Measuring ranges
Relative pressure: -1/0 to 0/400 bar
Absolute pressure: 0/1 to 0/400 bar

Overpressure safety
≤ 250 bar min. 2 x FS
> 250 bar min. 1.5 x FS
(burst pressure min. 3 x FS)

Operating temperature range

Medium:	*-25 °C/+125 °C*
Ambient:	*-25 °C/ +85 °C*
Storage:	*-40 °C/ +85 °C*

Temperature error band
In compensated range
-25/+85 °C ≤ ±0.3 % FSO/10 K

Dynamic characteristics
Response time

2-wire	*< 10 ms*
3-wire	*< 3 ms*

Process connection
G½B (EN 837-1/7.3) or
G½B DIN 3852 with flush mounted diaphragm (up to 0/25 bar max.)

Materials

Housing:	*stainless steel 1.4301*
Pressure-connection:	*stainless steel 1.4571*
Diaphragm:	*ceramic $Al_2 0_3$ 96 %*
Seal:	*FKM (Viton)*

Output signal/supply voltage

4–20 mA 2-wire	*DC 8–36 V*
0–10 V 3-wire	*DC 14–30 V*

Load
4–20 mA $\leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$
0–10 V > 10 kOhm

Current input

4–20 mA	*< 25 mA*
0–10 V	*< 20 mA*

Protective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box
DIN 43650-A (IP 65)

CE conformity (EMC)
EMC directive 2004 / 108 / EG

Options

- *Other connection threads*
- *Fixed cable connection*
- *Other plug-in connectors*
- *Fitting of diaphragm seals (measuring range ≥ 0/10 bar)*

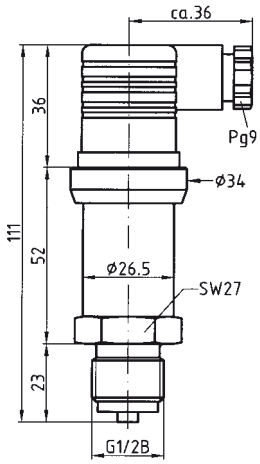
11

Refer to page 439 for prices

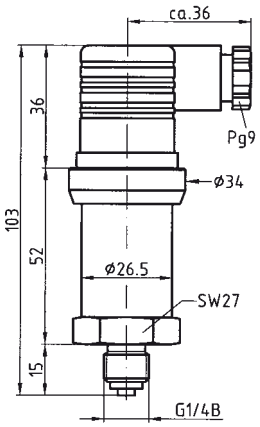
Pressure transducers DMU 01

Dimensions (in mm) and electrical connections

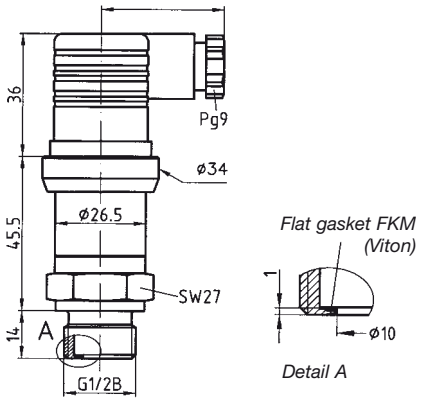
Connection G1/2B EN 837



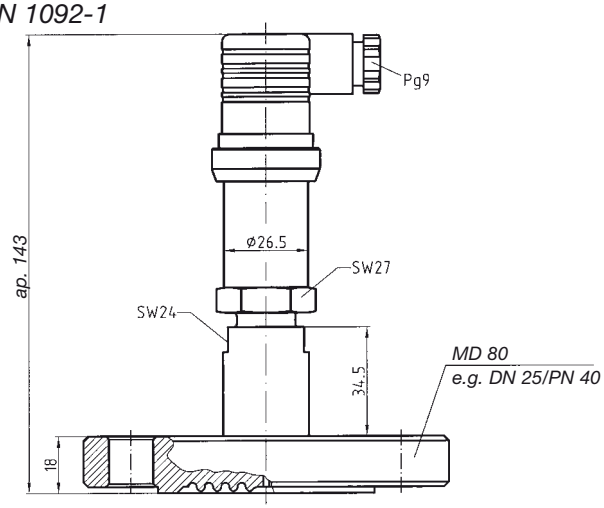
Connection G1/4B EN 837



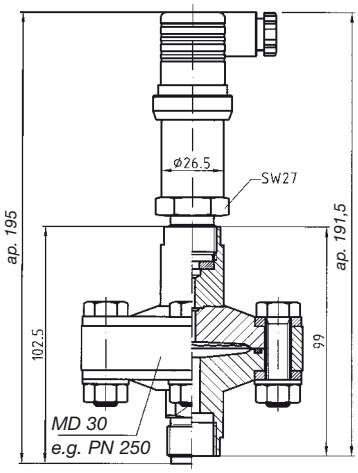
Connection G1/2B DIN 3852 with flush mounted diaphragm



With diaphragm seal MD 80 – flange connection EN 1092-1



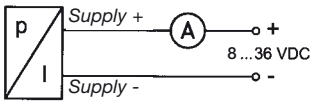
With diaphragm seal MD 30 – connection G1/2B



Wiring diagrams

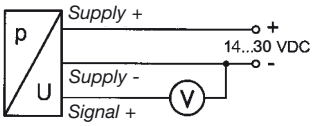
4–20 mA

2-wire



0–10 V

3-wire



Pin assignment table

			Plug DIN 43650	Cable colours (DIN 47100)
2-wire system: (4–20 mA)	Supply	+	1	white
	Supply	–	2	brown
	Earth		Earth pin	Screen
3-wire system: (0–10 V)	Supply	+	1	white
	Supply	–	2	brown
	Signal	+	3	green
	Earth		Earth pin	Screen

The units are shipped with a detailed wiring diagram.

Pressure transducers DMU 03 Industrial version

Flush mounted diaphragm

Weatherproof housing version (optional)

with display

Application
For electronic pressure measurement in machine and plant construction applications as well as in chemical and process technology applications. With flush mounted diaphragm, the units are suitable for use with sticky, highly viscous or crystallising media.

Description
The DMU 03 pressure transducers use piezo-resistive stainless steel measuring cells and feature calibrated, amplified sensor signals which are available as standardised voltage or current outputs.

DMU 03 is available in the following versions:

- *Threaded connection*
- *Flush mounted diaphragm*
- *Ex version (DMU 03Ex)*
- *Weatherproof housing version*
- *Weatherproof housing version with display*

Accuracy of measurement
Deviation characteristic according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < ±0.35 % FSO
(measuring ranges 0/40 mbar to 0/400 mbar < ±0.5 % FSO)

Long-term stability
≤ ±0.1 % FSO/year

Measuring ranges
Relative: 0/40 mbar to 0/600 bar
Absolute: 0/100 mbar to 0/600 bar

Overpressure safety
≤ 250 bar min. 2 x FS
> 250 bar min. 1.5 x FS
(burst pressure min. 3 x FS)

Operating temperature range

Medium:	*-25 °C/+125 °C*
Ambient:	*-25 °C/ +85 °C*
Storage:	*-40 °C/+100 °C*

Temperature error band
In compensated range
0–70 °C ≤ 1 % FSO
(≤ 0.25 bar ≤ 2 % FSO)

Dynamic characteristics
Response time < 10 ms

Process connection
G½B (EN 837-1/7.3) or
G½B DIN 3852 with flush mounted diaphragm (0/100 mbar to 0/40 bar)

Materials

Housing:	*stainless steel 1.4301*
Pressure-connection:	*stainless steel 1.4571*
Diaphragm:	*stainless steel 1.4435*
Seal:	*FKM (Viton), NBR for 60 bar and above*

Pressure transmission liquid
Silicone oil

Output signal/supply voltage

4–20 mA 2-wire	*DC 12–36 V*
Ex version	*DC 14–28 V*
0–20 mA 3-wire	*DC 14–36 V*
0–10 V 3-wirer	*DC 14–36 V*

Load

4–20 mA	$\leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$
0–20 mA	*≤ 500 Ohm*
0–10 V	*> 10 kOhm*

Current input

4–20 mA	*< 25 mA*
0–20 mA	*< 25 mA*
0–10 V	*< 7 mA*

Protective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box DIN 43650-A (IP 65)

CE conformity (EMC)
EN 61326

Options

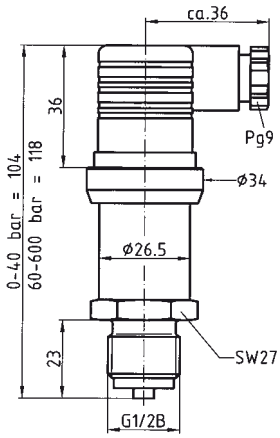
- *Ex version (II 1 G EEx ia IIC T4)*
- *Other process connections*
- *Other electrical connections*
- *Weatherproof housing (stainless steel 1.4305)*
- *Weatherproof housing with display*
- *Other seal materials*
- *Higher accuracy*
- *Greater overpressure safety*
- *Diaphragm seal mounting*

Refer to page 439/440 for prices

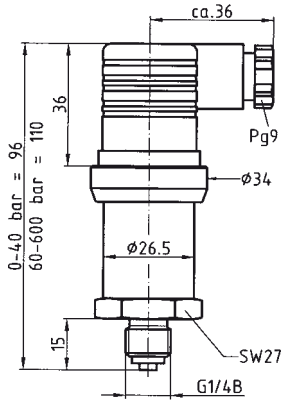
Pressure transducers DMU 03

Dimensions (in mm) and electrical connections

Connection G1/2B EN 837

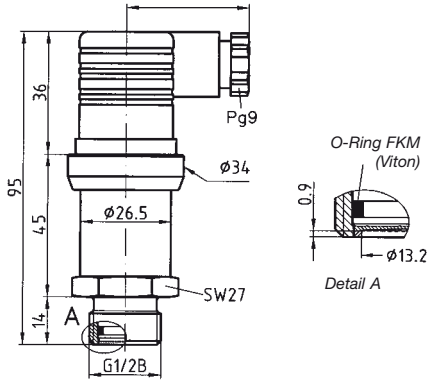


Connection G1/4B EN 837



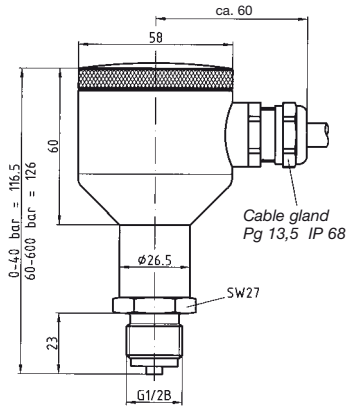
The Ex version is 20 mm longer.

Connection G1/2B DIN 3852 with flush mounted diaphragm



The Ex version is 20 mm longer.

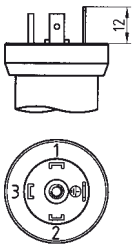
Weatherproof housing



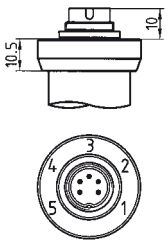
The Ex version is 26.5 mm longer.

Electrical connections

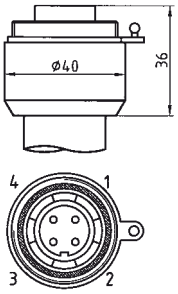
DIN 43650



„Binder“ plug 723

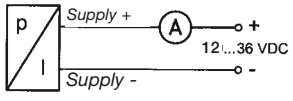


„Buccaneer“ plug

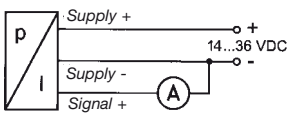


Wiring diagram

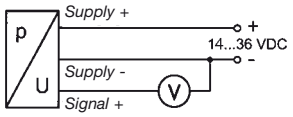
2-wire *4–20 mA*



3-wire *0–20 mA*



0–10 V



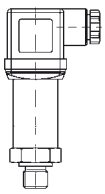
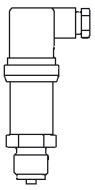
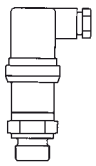
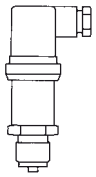
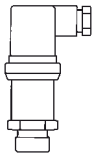
Pin assignment table

			Plug DIN 43650	Cable colours (DIN 47100)
2-wire system:	*Supply*	+	*1*	*white*
(4-20 mA)	*Supply*	−	*2*	*brown*
	Earth		*Earth pin*	*Screen*
3-wire system:	*Supply*	+	*1*	*white*
(0-10 V,	*Supply*	−	*2*	*brown*
0-20 mA)	*Signal*	+	*3*	*green*
	Earth		*Earth pin*	*Screen*

The units are supplied with a detailed wiring diagram.

Pressure transducers

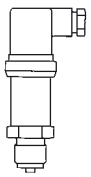
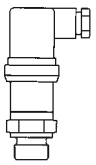
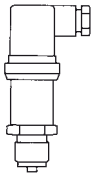
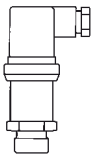
DG: H

Type	DMU 01 K*	DMU 01	DMU 01 VM	DMU 03	DMU 03 VM
Version					
Measuring principle	Piezo-resistive ceramic measuring cell			Piezo-resistive stainless steel meas. cell	
Accuracy (IEC 60770)	1 % FSO (≥ 100 bar 2 % FSO)	0.5 % FSO (-1/0 bar 1 % FSO)	0.5 % FSO	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)
Wetted parts	Ceramic/stainless steel 1.4571			Stainless steel 1.4571/1.4435	
Connection	G¼B DIN 3852	G½B EN 837	G½B DIN 3852 with flush mounted diaphragm	G½B EN 837	G½B with flush mounted diaphragm
Supply voltage	DC 8–36 V	DC 8–36 V	DC 8–36 V	DC 12–36 V	DC 12–36 V
Outout	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA
System	2-wire	2-wire	2-wire	2-wire	2-wire
Electrical Connection	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.
Price €					
-1/0 bar	---	**31114**	31619	31634	---
-1/+1,5 bar	31608	31616	31620	31635	---
-1/+3 bar	31609	31617	31621	31636	---
-1/+5 bar	31610	31618	31622	31637	---
Price €					
0/40 mbar	---	---	---	32024	---
0/60 mbar	---	---	---	32025	---
0/100 mbar	---	---	---	31638	31643
0/160 mbar	---	---	---	31639	31644
0/250 mbar	---	---	---	31145	31165
0/400 mbar	---	---	---	31146	31166
0/600 mbar	---	---	---	31147	31167
Price €					
0/1 bar	---	**31115**	31623	31148	31168
0/1.6 bar	31511	31116	31624	31149	31169
0/2.5 bar	31512	**31117**	31625	31150	31170
0/4 bar	31513	**31118**	31626	31151	31171
0/6 bar	31514	**31119**	31627	31152	31172
0/10 bar	31515	**31120**	31628	31153	31173
0/16 bar	31516	**31121**	31629	31154	31174
0/25 bar	31517	**31122**	31630	31155	31175
0/40 bar	31518	31123	---	31156	32026
0/60 bar	31611	31124	---	31157	---
0/100 bar	31612	31125	---	31158	---
Price €					
0/160 bar	---	**31126**	---	31159	---
0/250 bar	---	**31127**	---	31160	---
0/400 bar	---	**31128**	---	31161	---
0/600 bar	---	---	---	31162	---

* Delivery only in packing units of 10 pieces per measuring range

Additional costs for pressure transducers

RK: H

Type	*DMU 01*	*DMU 01 VM*	*DMU 03*	*DMU 03 VM*	
Version					
	Price €	***Price €***	***Price €***	***Price €***	
Ex protection II 1 G EEx ia IIC T4	**---**	**---**			
Connection G1/4 DIN 3852	**---**	**---**		**---**	
Connection G1/2 DIN 3852	**---**	***standard***	***no add. cost***	***standard***	
Connection G1/4B EN 837		**---**		**---**	
Connection 1/4 NPT		**---**		**---**	
Connection 1/2 NPT		**---**		**---**	
Other connections	***on request***	***on request***	***on request***	***on request***	
Suitable for oxygen			**---**	**---**	
Weatherpr. housing (stainl. steel 1.4305)	**---**	**---**			
Weatherproof housing with display (as DA 06)	**---**	**---**			
„Binder“ plug 723	**---**	**---**			
Fixed cable connection 2 metres					
Cable extension per metre					
Output 0–20 mA, 3 wires	**---**	**---**			
Output 0–10 V, 3 wires					
Other output signals	***on request***	***on request***	***on request***	***on request***	
Absolute pressure (measuring ranges according to data sheet)					
Accuracy of measurement 0.25 % FSO	**---**	**---**			
Calibration certificate (for accuracy of measurement 0.25 % FSO)	**---**	**---**			
Fitting of diaphragm seal	*for measuring range 0/10 bar*		*All measuring ranges, minimum range depends on design of diaphragm seal*		

Refer to chapter 14 for digital display units and signal processing

Pressure transducers DMU 04 for hygienic processes

Clamp connection

High temperature version (optional)

Application
For applications requiring hygienic process connections, materials or processing, especially in food technology, pharmaceutical and biotech applications.

Description
The DMU 04 pressure transducers use piezo-resistive measuring cells and feature calibrated, amplified sensor signals which are available as standardised voltage or current outputs.

DMU 04 is available in the following versions:

- *Flush diaphragm*
- *Various process connections*
- *Ex version (DMU 04Ex)*
- *High temperature version up to 300 °C (DMU 04HT)*
- *Weatherproof housing version*
- *Weatherproof housing version with display*

Accuracy of measurement
Deviation characteristics according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < ±0.35 % FSO (ranges ≤ 0/400 mbar < ±0.5 % FSO)

Measuring ranges
Relative: 0/100 mbar to 0/400 bar
Absolute: 0/600 mbar to 0/400 bar

Overpressure safety
≤ 250 bar min. 2 x FS
> 250 bar min. 1.5 x FS
(burst pressure min. 3 x FS)

Operating temperature range

Medium:	*-25 °C/+125 °C*
Ambient:	*-25 °C/ +85 °C*
Storage:	*-40 °C/+100 °C*

Temperature error band
In compensated range
0-70 °C ≤ 1 % FSO
(≤ 0.25 bar ≤ 2 % FSO)

Dynamic characteristics
Response time < 10 ms

Process connections
G½B DIN 3852 with flush diaphragm (≥ 0/2.5 bar), G1B DIN 3852 with flush mounting diaphragm, clamp 1"/1½"/2" ISO 2852, conical dairy fitting DIN 11851 DN 25/40/50 (without union nut)

Materials

Housing:	*stainless steel 304*
Pressure-connection:	*stainless steel 1.4435*
Diaphragm:	*stainless steel 1.4435*

Pressure transmission liquid
Food quality oil

Output signal/supply voltage

4–20 mA 2-wire	*DC 12–36 V*
Ex version	*DC 14–28 V*
0–20 mA 3-wire	*DC 14–36 V*
0–10 V 3-wire	*DC 14–36 V*

Load
4–20 mA $\leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$
0–20 mA ≤ 500 Ohm
0–10 V > 10 kOhm

Current input

4–20 mA	*< 25 mA*
0–20 mA	*< 25 mA*
0–10 V	*< 7 mA*

Erotective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box
DIN 43650-A (IP 65)

CE conformity (EMC)
EN 61326

Options

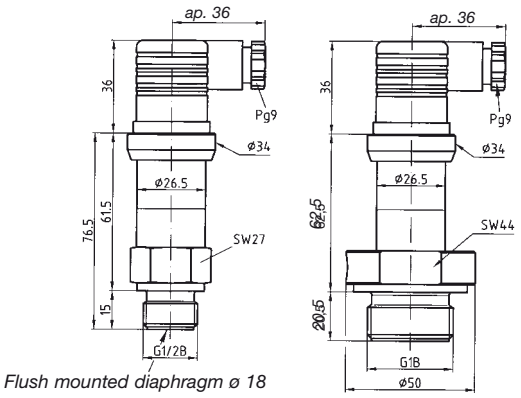
- *Ex version (II 1 G EEx ia IIC T4)*
- *Other process connections*
- *Other electrical connections*
- *Weatherproof housing*
- *Weatherproof housing with display*
- *High temperature version*
- *Higher accuracy*
- *Union nut DN 25/40/50*

Refer to pages 445/446 for prices

Pressure transducers DMU 04

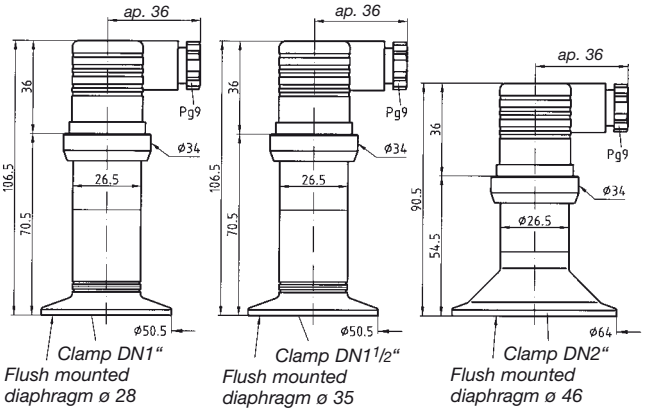
Dimensions (in mm) and electrical connections

Threaded connections with flush diaphragm

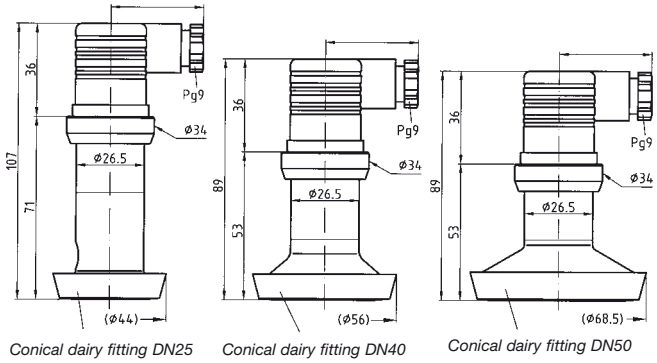


The Ex version is 26.5 mm longer.

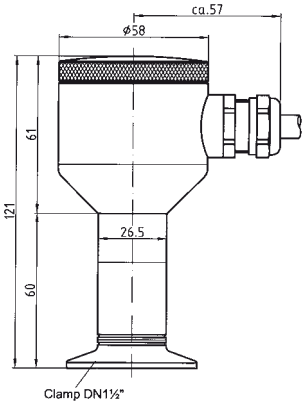
Clamp connections ISO 2852



Conical dairy fitting DIN 11851

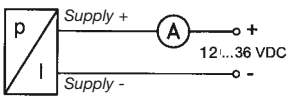


Weatherproof housing

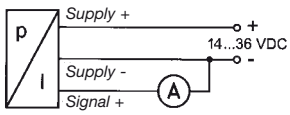


Wiring diagram

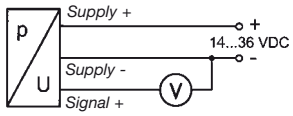
2-wire *4–20 mA*



3-wire *0–20 mA*



0–10 V



Pin assignment table

			Plug DIN 43650	Cable colours (DIN 47100)
2-wire system:	*Supply*	+	*1*	*white*
(4–20 mA)	*Supply*	−	*2*	*brown*
	Earth		*Earth pin*	*Screen*
3-wire system:	*Supply*	+	*1*	*white*
(0–10 V,	*Supply*	−	*2*	*brown*
0–20 mA)	*Signal*	+	*3*	*green*
	Earth		*Earth pin*	*Screen*

The units are supplied with a detailed wiring diagram

Pressure transducers DMU 05 P
Precision version

Vorgezogene Membrane

Application
For electronic pressure measurement in applications requiring high accuracy of measurement and long-term stability. Application areas include: process technology, electroplating, water treatment, laboratory applications as well as measurements of gas consumption and heat energy.

Description
The intelligent DMU 05 pressure transducers are equipped with digital amplifier electronics (microprocessor and 16 bit A/D converter). DMU 05 actively compensates for sensor-specific deviations (non-linearity and temperature error), allowing for superior measuring characteristics. DMU 05 can also be supplied with an optional digital RS 232 interface for setting offset, range and damping.

Accuracy of measurement
Deviation characteristics according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < ±0.1 % FSO

Long-term stability
≤ ±0.1 % FSO/year

Measuring ranges
Relative: 0/160 mbar to 0/600 bar
Absolute: 0/400 mbar to 0/600 bar

Overpressure safety
≤ 250 bar min. 2 x FS
> 250 bar min. 1.5 x FS
(burst pressure min. 3 x FS)

Operating temperature range

Medium:	*-25 °C/+125 °C*
Ambient:	*-25 °C/ +85 °C*
Storage:	*-40 °C/+100 °C*

Temperature error band
In compensated range
-20/+80 °C ≤ 0.2 % FSO

Dynamic characteristics
Response time < 40 ms

Process connection
G½B (EN 837-1/7.3) or
G½B DIN 3852 with flush mounted diaphragm (up to 0/25 bar)

Materials

Housing:	*stainless steel 304*
Pressure-connection:	*stainless steel 316 Ti or 316 L*
Diaphragm:	*stainless steel 1.4435*
Seal:	*FKM (Viton), NBR for 40 bar and above*

Pressure transmission liquid
Silicone oil

Output signal/supply voltage

4–20 mA	*DC 12–36 V*
2-wire	
Bei Ex-Ausführung	*DC 14–28 V*

Load
$4–20\ mA \leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$

Current input

4–20 mA	*< 25 mA*

Protective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box
DIN 43650-A (IP 65)

CE conformity (EMC)
EN 61326

Options

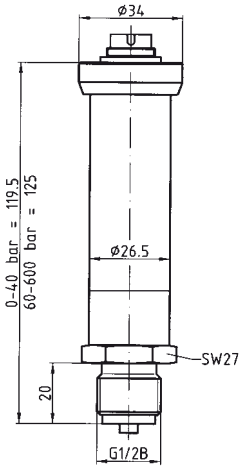
- *RS 232 (interface and software required)*
- *Ex version (II 1 G EEx ia IIC T4)*
- *Other process connections*
- *Other electrical connections*
- *Other seal materials*

Refer to page 445/446 for prices

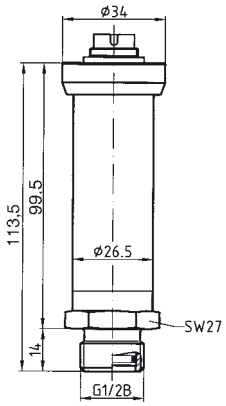
Pressure transducers DMU 05

Dimensions (in mm) and electrical connections

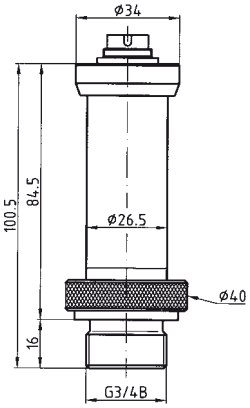
Connection G1/2B EN 837



Connection G1/2B DIN 3852 with flush mounted diaphragm

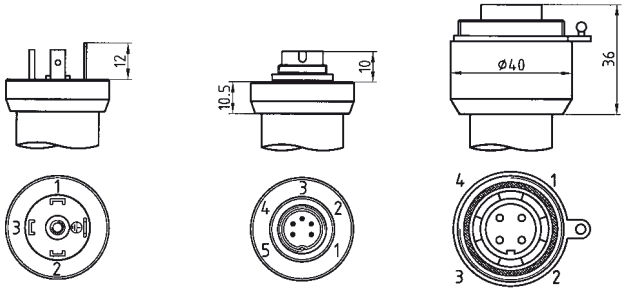


Screw-in version for level measurement



Electrical connections

DIN 43650 *„Binder“ plug 723* *„Buccaneer“ plug*



Pin assignment table

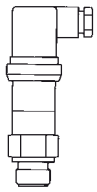
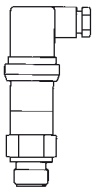
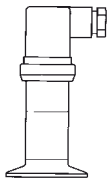
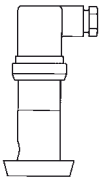
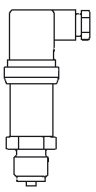
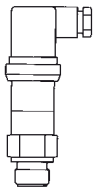
Electrical connections				
		DIN 43650	*„Binder“ plug 723 (5 poles)*	*„Binder“ plug 723 (7 poles)*
2-wire system:	*Supply +* *Supply –* *Earth*	*1* *2* *Earth contact*	*3* *4* *5*	*3* *1* *2*
RS 232 [1]	*RxD* *TxD* *CTS* *GND*	–	–	*4* *5* *6* *7*

[1] *Software, interface and cable must be ordered separately.*

The units are supplied with a detailed wiring diagram.

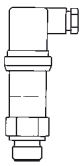
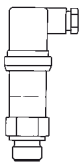
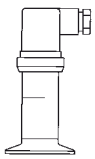
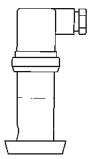
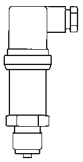
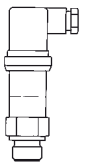
Pressure transducers

DG: H

Type	DMU 04	DMU 04	DMU 04 CP	DMU 04 MR	DMU 05 P	DMU 05 P VM
Version						
Meas. principle	Piezo-resistive					
Accuracy (IEC 60770)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.35 % FSO (≤ 0.4 bar 0.5 % FSO)	0.1 % FSO	0.1 % FSO
Wetted parts	Stainless steel 1.4435				Stainless steel 1.4435	
Connection	G1/2B DIN 3852 with flush mounted diaphragm	G1B DIN 3852 with flush mounted diaphragm	Clamp 1“ ISO 2852	Conical dairy fitting DIN 11851 DN 25 (without union nut)	G1/2B EN 837	G1/2B DIN 3852 with flush mounted diaphragm
Supply voltage	DC 12-36 V	DC 12-36 V	DC 12-36 V	DC 12-36 V	DC 12-36 V	DC 12-36 V
Output	4-20 mA	4-20 mA	4-20 mA	4-20 mA	4-20 mA	4-20 mA
System	2-wire	2-wire	2-wire	2-wire	2-wire	2-wire
Electrical connection	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A	Plug DIN 43650-A
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
-1/0 bar	---	31663	31686	31719	31742	---
-1/+1.5 bar	31647	31664	31687	31720	31743	---
-1/+3 bar	31648	31665	31688	31721	31744	---
-1/+5 bar	31649	31666	31689	31722	31745	---
Price €						
0/100 mbar	---	---	---	---	---	---
0/160 mbar	---	---	---	---	31747	31771
0/250 mbar	---	31669	---	---	31748	31772
0/400 mbar	---	31670	---	31726	31749	31773
0/600 mbar	---	31671	31694	31727	31750	31774
Price €						
0/1 bar	---	31672	31695	31728	31751	31775
0/1.6 bar	---	31673	31696	31729	31752	31776
0/2.5 bar	31651	31674	31697	31730	31753	31777
0/4 bar	31652	31675	31698	31731	31754	31778
0/6 bar	31653	31676	31699	31732	31755	31779
0/10 bar	31654	31677	31710	31733	31756	31780
0/16 bar	31655	31678	31711	31734	31757	31781
0/25 bar	31656	31679	31712	31735	31758	31782
Price €						
0/40 bar	31657	31680	31713	31736	31759	---
0/60 bar	31658	31681	---	---	31760	---
0/100 bar	31659	31682	---	---	31761	---
0/160 bar	31660	31683	---	---	31762	---
0/250 bar	31661	31684	---	---	31763	---
0/400 bar	31662	31685	---	---	31764	---
0/600 bar	---	---	---	---	31765	---

Additional costs for pressure transducers

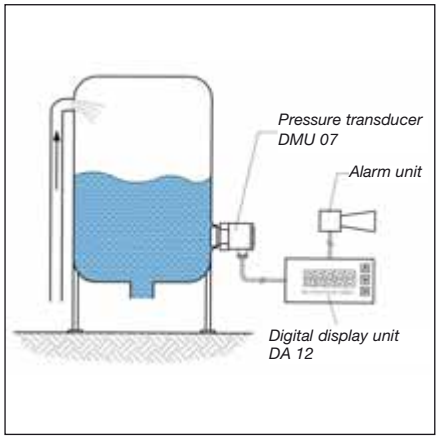
DG: H

Type	DMU 04	DMU 04	DMU 04 CP	DMU 04 MR	DMU 05 P	DMU 05P VM
Version						
	Price €	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**
Ex protection II 1 G EEx ia IIC T4						
Clamp 1½“ ISO 2852 (≥ 0/400 mbar)	---	---	**no add.costs**	---	---	---
Clamp 2“ ISO 2852 (≥ 0/250 mbar)	---	---		---	---	---
Conical dairy fitting DIN 11851 DN 40 (≥ 0/400 mbar)	---	---	---		---	---
Conical dairy fitting DIN 11851 DN 50 (≥ 0/250 mbar)	---	---	---		---	---
Sep. union nut DIN 11851 DN 25	---	---	---		---	---
Sep. union nut DIN 11851 DN 40	---	---	---		---	---
Sep. union nut DIN 11851 DN 50	---	---	---		---	---
G1B with conical seal	---		---	---	---	---
Other process connections	**on request**	**on request**	**on request**	**on request**	**on request**	**on request**
High temperature version up to +300 °C					---	---
Food quality pressure transmission liquid					---	---
Weatherpr. housing (stainl. steel 1.4305)					---	---
Weatherproof housing with display (as DA 06)					---	---
„Binder“ plug 723						
Fixed cable connection 2 metres						
Cable extension per metre					---	---
Output 0-20 mA, 3 wires					---	---
Output 0-10 V, 3 wires					---	---
Other output signals	**on request**	**on request**	**on request**	**on request**	**on request**	**on request**
Absolute pressure (measuring ranges according to data sheet)						
Accuracy of measurement 0.25 % FSO					---	---
Calibration certificate (for accuracy of measurement 0.25 % FSO)					---	---
RS 232 interface	---	---	---	---		
Interface and software	---	---	---	---		

Refer to chapter 14 for digital display units and signal processing

Pressure transducer DMU 07 for level measurement

Weatherproof housing version (option)



Application
For continuous electronic level measurement of liquids and pressure measurement of liquids and gases in plant construction.

Description
The DMU 07 pressure transducers are equipped with a ceramic sensor element for capacitive measurement. They feature a calibrated, amplified sensor signal which is available as a standardised current output.

DMU 07 features:

- *Flush mounted diaphragm*
- *Measuring cell without oil filling*
- *High resistance to chemicals*
- *Mechanically insensitive ceramic sensor*
- *Robust and reliable design; also suitable for arduous industrial applications (shock, vibration)*
- *Excellent long-term stability*
- *Good temperature characteristics*

Accuracy of measurement
Deviation characteristics according to IEC 60770 – limit point setting (non-linearity, hysteresis, repeatability): < ±0.35 % FSO

Measuring ranges
Relative pressure:
0/40 mbar to 0/10 bar

Overpressure safety
≤ 400 mbar min. 8 x FS
> 400 mbar min. 4 x FS

Operating temperature range
Medium: -25 °C/+125 °C
Ambient: -25 °C/ +85 °C
Storage: -40 °C/+100 °C

Temperature error band
In compensated range
0/+85 °C ≤ 0.1 % FSO/10 K

Dynamic characteristics
Response time < 200 ms

Process connection
G1½B flush mounted diaphragm

Materials
Housing: stainless steel 1.4305
Pressure-connection: stainless steel 1.4571
Diaphragm: ceramic Al_2O_3 96 %
Seal: FKM (Viton)

Output signal/supply voltage
4–20 mA DC 9-36 V
2-wire

Load
4–20 mA ≤ $\frac{U_B - U_{Bmin}}{0{,}02\ A}$
0–10 V > 10 kOhm

Current input
4–20 mA < 21 mA

EProtective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box
DIN 43650-A (IP 65)

CE conformity (EMC)
EN 61326

Options

- *PVDF pressure connection*
- *Other seal materials*
- *Weatherproof housing (stainless steel 1.4305)*
- *Weatherproof housing with display*
- *Higher accuracy*
- *Other output signals*

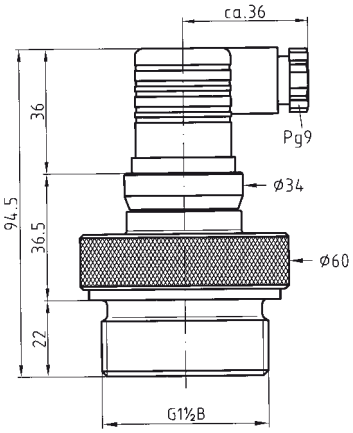
Please refer to chapter 1 for the complete „Level Measurement“ range.

Refer to page 457/458 for prices

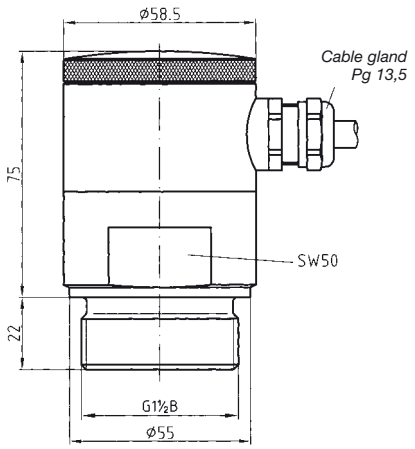
Pressure transducers DMU 07

Dimensions (in mm) and electrical connections

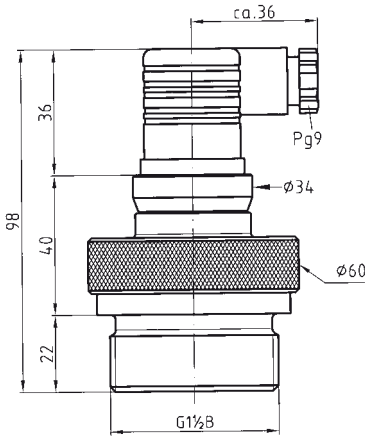
Connection G1½B – plug and junction box DIN 43650-A



Connection G1½B – weatherproof housing

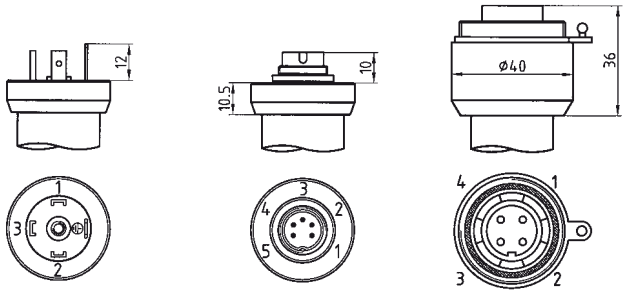


Connection G1½B – PVDF pressure connection



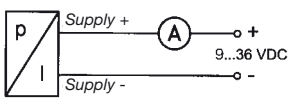
Electrical connections

DIN 43650 *„Binder“ plug 723* *„Buccaneer“ plug*



Wiring diagram

2-wire *4–20 mA*



Pin assignment table

			Electrical connections	
			DIN 43650	*Cable colours (DIN 47100)*
2-wire system:	*Supply*	+	*1*	*white*
(4-20 mA)	*Supply*	–	*2*	*brown*
	Earth		*Earth contact*	*Screen*

The units are supplied with a detailed wiring diagram.

Pressure transducers DMU 08
Level probe – stainless steel version

DMU 08

Digital display unit (option)

Application
For electronic, continuous level measurement in wells, drilling holes, water reservoirs, containers or in waste water systems.

Description
The DMU 08 pressure transducers use silicon technology and feature calibrated, amplified sensor signals which are available as standardised voltage or current outputs.

Features
- *Compact and robust stainless steel design*
- *Version with PUR or FEP cable*
- *Special calibration for all standard pressure units*
- *Integrated overload protection according to EN 61000-4-5*

Accuracy of measurement
Deviation characteristics according to IEC 60770 – limit point setting (non-linearity, hysteresis, repeatability): < ±0.35 % FSO (ranges 0/100 mbar to 0/400 mbar < ±0.5 % FSO)

Measuring ranges
0/100 mbar to 0/40 bar relative pressure

Overpressure safety
Min. 2 x FS
(burst pressure min. 3 x FS)

Operating temperature range
Medium: -10 °C/+70 °C
Ambient: -10 °C/+70 °C
Storage: -25 °C/+70 °C
Ex-approved: max. +60 °C

Temperature error band
In compensated range
0-70 °C ≤ 1 % FSO
(≤ 0.25 bar ≤ 2 % FSO)

Dynamic characteristics
Response time < 10 ms

Materials
Housing: stainless steel 1.4571
(Ex-approved version: stainless steel 1.4435)
Diaphragm: stainless steel 1.4404
Seals: FKM (Viton)

Pressure transmission liquid
Silicone oil

Supply voltage
DC 12–36 V
Ex version DC 14–28 V

Output signal
4–20 mA, 2-wire

Bürde
$$4\text{–}20\ mA \leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$$

Current input
4–20 mA < 25 mA

rotective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
PUR cable (IP 68)

CE conformity (EMC)
EN 61326

Accessories (options)
- *Screw connector set*
- *Junction box*
- *Lightning protection*
- *Clamp*
- *Extension for weight*

Options

- *Ex version (II 1 G EEx ia IIC T4)*
- *FEP cable*
- *Higher operating temperature ranges*

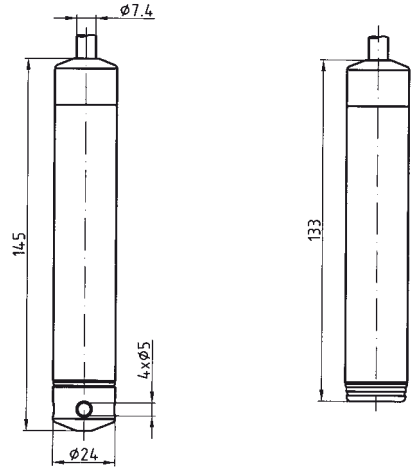
Please refer to chapter 1 for the complete „Level Measurement“ range.

Refer to page 457/458 for prices

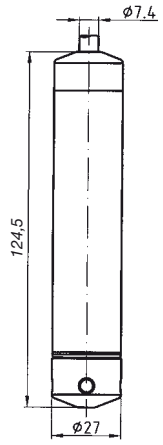
Pressure transducers DMU 08

Dimensions (in mm) and electrical connections

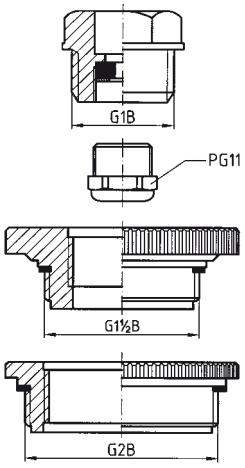
Standard version



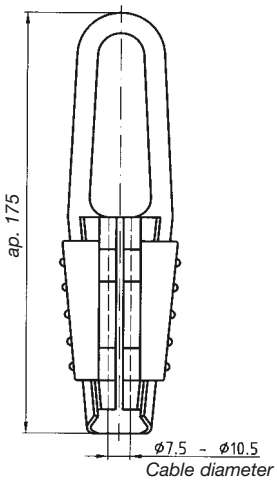
Ex version



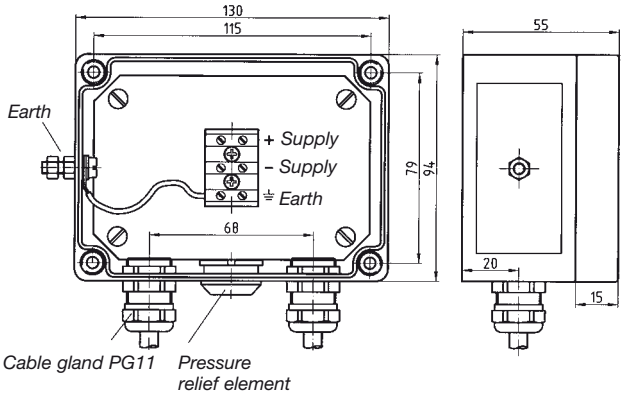
Screw connector set



Clamp

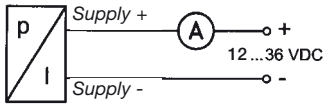


Junction box with pressure relief port



Wiring diagram

2-wire *4–20 mA*



Pin assignment table

			Cable colours (DIN 47100)
2-wire system:	*Supply*	+	*white*
(4-20 mA)	*Supply*	–	*brown*
	Earth		*Screen*

The units are supplied with a detailed wiring diagram.

Pressure transducers DMU 09
Level probe – plastic version

DMU 09

Digital display unit (option)

Application
For electronic, continuous level measurement in extremely aggressive liquids such as chemicals or waste water from waste collection plants.

Description
The DMU 09 pressure transducers use capacitance ceramic sensors and feature calibrated, amplified sensor signals which are available as standardised current outputs.

DMU 09 features:

- *Chemical resistant plastic version made of PVC*
- *Highly resistant FEP cable*
- *Robust, insensitive ceramic diaphragm*
- *Special calibration for all standard pressure units (option)*

Accuracy of measurement
Deviation characteristics according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < ±0,35 % FSO

Measuring ranges
0/40 mbar to 0/10 bar relative pressure

Overpressure safety
≤ 400 mbar min. 8 x FS
> 400 mbar min. 4 x FS

Operating temperature range
Medium: 0 °C/+50 °C
Ambient: 0 °C/+50 °C
Storage: -10 °C/+50 °C

Temperature error band
In compensated range
0–80 °C ≤ 0.1 % FSO/10 K

Dynamic characteristics
Response time < 200 ms

Materials
Housing: PVC
Diaphragm: ceramic Al_2O_3 96 %
Seals: FKM (Viton)

Output signal/supply voltage
4–20 mA DC 12–36 V
2-wire

Load
$$4\text{–}20\ mA \leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$$

Current input
4–20 mA < 25 mA

Protective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
FEP cable (IP 68)

CE conformity (EMC)
EN 61326

Accessories (optional)

- *Screw connector set*
- *Junction box*
- *Lightning protection*
- *Clamp*

Options

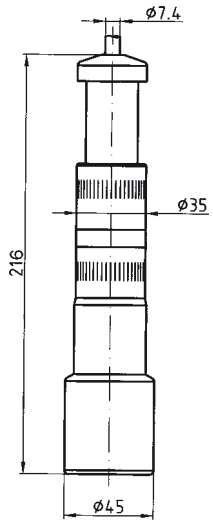
- *Other materials*
- *Flexible conduit cable protection*

Please refer to chapter 1 for the complete „Level Measurement“ range.

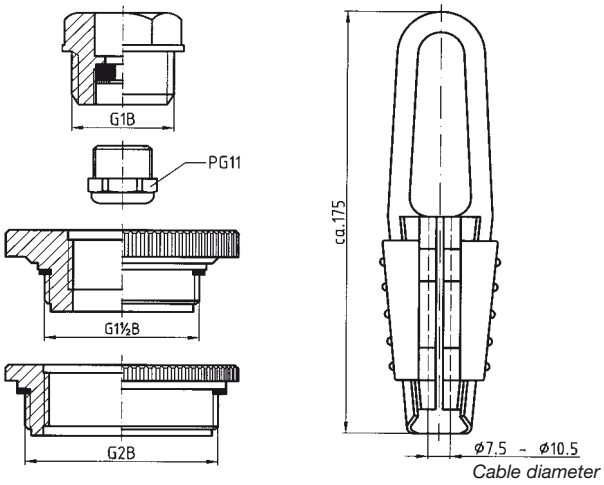
Refer to page 457/458 for prices

Pressure transducers DMU 09

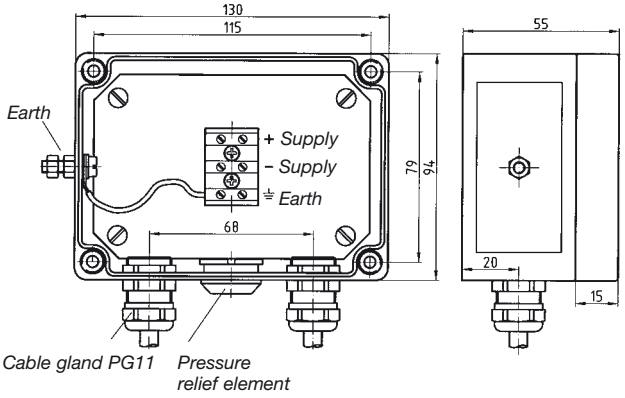
Dimensions (in mm) and electrical connections



Screw connector set *Clamp*

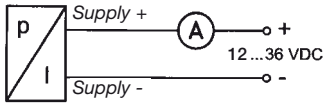


Junction box with pressure relief port



Wiring diagram

2-wire *4–20 mA*



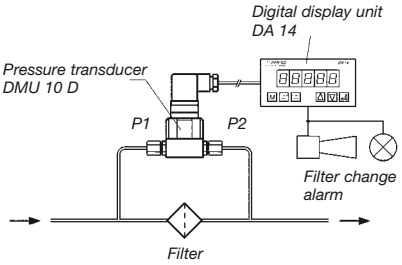
Pin assignment table

			Cable colours (DIN 47100)
2-wire system:	*Supply*	+	*white*
(4–20 mA)	*Supply*	–	*brown*
	Earth		*Screen*

The units are supplied with a detailed wiring diagram.

Pressure transducers DMU 10 D
Differential pressure version

DMU 10 D



DMU 10 D with plug-in display
DA 06

Application
For electronic differential pressure measurements at very low differential pressure. For non-corrosive gaseous media. Particularly suitable for monitoring filters and fans in air moving and air conditioning equipment.

Description
The DMU 10 D pressure transducers feature piezo-resistive silicon measuring cells. When pressure is applied, the pressure difference between the positive side and the negative side is converted into a current or voltage signal which is proportional to the differential pressure.

DMU 10 features:

- Robust aluminium housing
- Compact design
- Long service life
- Excellent long-term stability
- High overpressure safety
- Plug-in display DA 06 for local indication on site and switching output (optional)

Accuracy of measurement
Deviation characteristics according to IEC 60770 – limit point setting (non-linearity, hysteresis, repeatability):

> 0/160 mbar:	≤ ±0.35 % FSO
0/40–0/160 mbar:	≤ ±1 % FSO
< 0/40 mbar:	≤ ±2 % FSO

Long-term stability
≤ ±0.2 % FSO/year

Measuring ranges/overpressure safety

Differential pressure range	Max. static pressure
0/6 mbar bis 0/10 mbar	100 mbar
0/25 mbar	200 mbar
0/40 mbar bis 0/60 mbar	350 mbar
0/100 mbar bis 0/400 mbar	1000 mbar
0/600 mbar bis 0/1000 mbar	3000 mbar

Operating temperature range

Medium:	-25 °C/+125 °C
Ambient:	-25 °C/ +85 °C
Storage:	-40 °C/+100 °C

Temperature error band

Differential pressure range	In compensated range 0/60 °C
≤ 0/10 mbar	≤ ±2 % FSO
≤ 0/25 mbar	≤ ±1,5 % FSO
≤0/250 mbar	≤ ±1 % FSO
>0/250 mbar	≤ ±0,5 % FSO

Dynamic characteristics
Response time < 5 ms

Process connection
2 x G1/8 female thread

Materials

Housing:	aluminium
Process-connection:	aluminium
Sensor:	silicon, glass, RTV, ceramic, Al_2O_3, nickel
Seal:	PUR glued

Output signal/supply voltage

4–20 mA 2-wire	DC 12–36 V
0–20 mA 3-wire	DC 14–36 V
0–10 V 3-wire	DC 14–36 V

Load
4–20 mA ≤ $\frac{U_B - U_{Bmin}}{0{,}02\ A}$
0–20 mA = 500 Ohm
0–10 V = 10 kOhm

Current input

0/4–20 mA	max. 25 mA
0–10 V	max. 7 mA

EProtective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Plug and junction box
DIN 43650-A (IP 65)

CE conformity (EMC)
EN 61326

Options

- Other process connections
- Other electrical connections
- Digital plug-in display DA 06

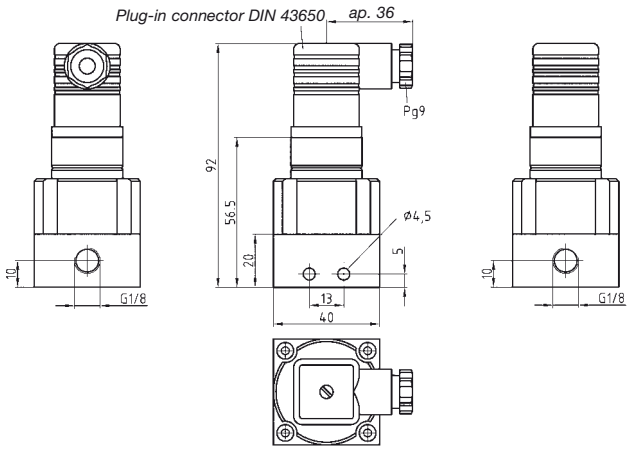
11

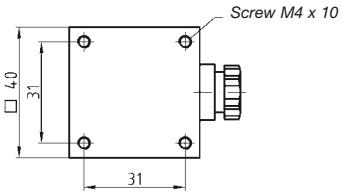
Refer to page 457/458 for prices

Pressure transducers DMU 10 D

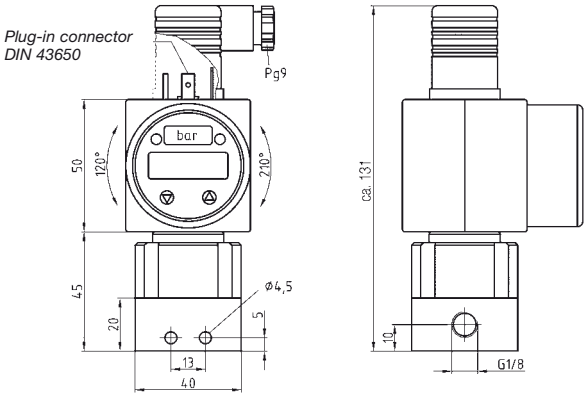
Dimensions (in mm) and electrical connections

Connection 2 x G1/8 female thread

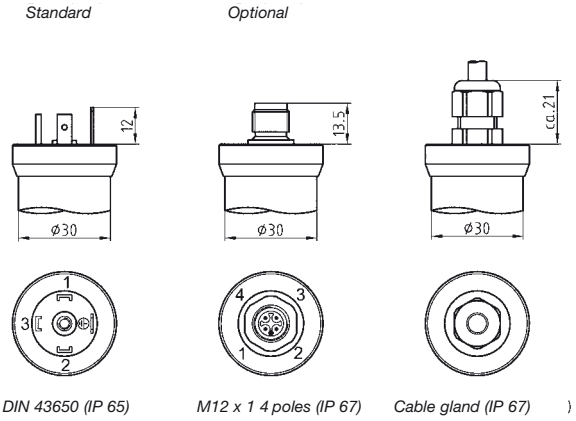




DMU 10 D with plug-in display DA 06

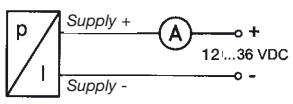


Electrical connections

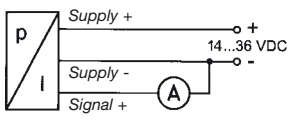


Wiring diagram

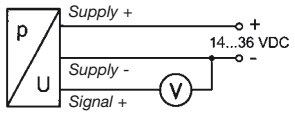
2-wire *4–20 mA*



3-wire *0–20 mA*



0–10 V

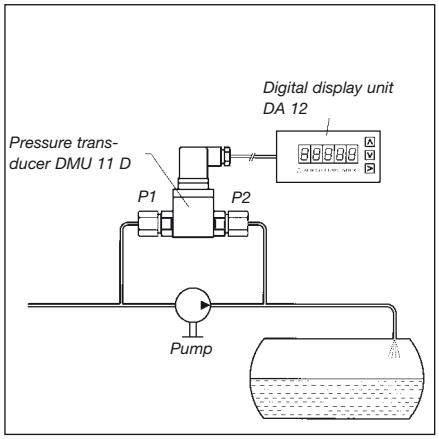


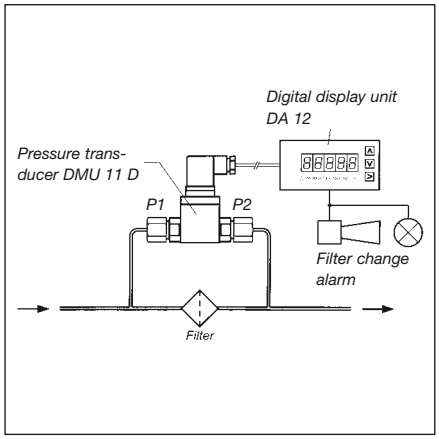
Pin assignment table

Assignment			*DIN 43650*
2-wire system:	*Supply*	+	*1*
(4–20 mA)	*Supply*	−	*2*
	Earth		*Earth contact*

The units are supplied with a detailed wiring diagram.

Pressure transducers DMU 11 D
Differential pressure version





Application
For electronic differential pressure measurement in industrial applications. For aggressive gaseous and liquid media, which are not highly viscous and do not crystallize.

Description
The DMU 11 D pressure transducers feature two piezo-resistive stainless steel measuring cells. When pressure is applied, the pressure difference between the positive side and the negative side is converted into a current signal, which is proportional to the differential pressure.

Features:
- *High overload safety*
- *Compact design*
- *Overvoltage protection*
- *Mechanically robust and reliable, suitable for use in applications where vibration or shocks occur*

Accuracy of measurement
Deviation characteristics according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < +0.5 % FSO

Measuring ranges/overload safety

Nominal pressure (bar)	Diff. pressure range (bar)	Max. static pressure on one side (bar)
0.4	0/0.04 up to 0/0.4	1
1.0	0/0.1 up to 0/1.0	3
2.5	0/0.25 up to 0/2.5	6
6.0	0/0.6 up to 0/6.0	20
16	0/1.6 up to 0/16	60

Operating temperature range
Medium: -25 °C/+125 °C
Ambient: -25 °C/ +85 °C
Storage: -40 °C/+100 °C

Temperature error band
In compensated range
0–70 °C ≤ 1.5 % FSO
Nominal pressure 0.4 bar ≤ 2 % FSO

Dynamic characteristics
Response time < 5 ms

Process connection
2 x G1/2B (EN 837-1/7.3)

Materials
Housing: aluminium
Pressure-connection: stainless steel 1.4571
Diaphragm: stainless steel 1.4435
Seal: FKM (Viton)

Output signal/supply voltage
4–20 mA DC 12–36 V
2-wire

Load
$4–20\ mA \leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$

Current unput
4–20 mA < 25 mA

Protective electrical measures
Short circuit proof and polarity protected

Electrical connections (protection)
Plug and DIN 43650-A (IP 65)

CE conformity (EMC)
EN 61326

Accessories
- *Fixing bracket (included)*

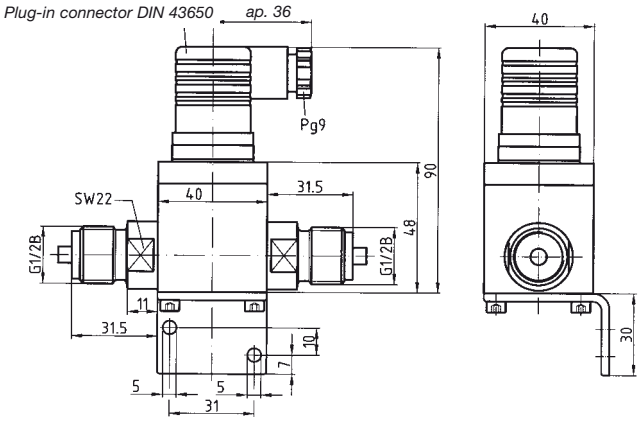
Options
- *Other process connections*
- *Other electrical connections*
- *Other seal materials*
- *Fitting of diaphragm seal*

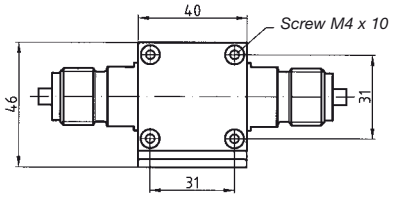
Refer to page 457/458 for prices

Pressure transducers DMU 11 D

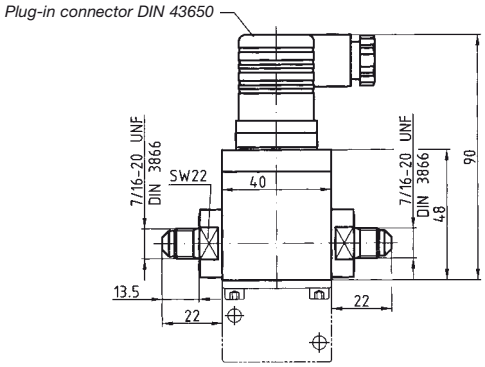
Dimensions (in mm) and electrical connections

Connection 2 x G1/2B EN 837

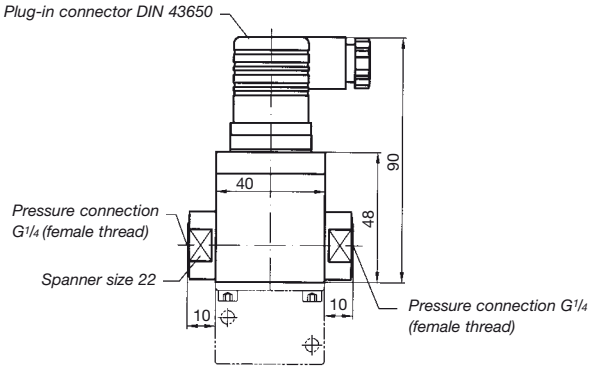




Connection 2 x 7/16 UNF

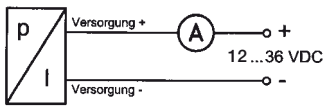


Connection 2 x G1/4 female thread



Wiring diagram

2-wire *4–20 mA*

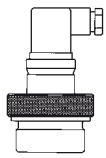
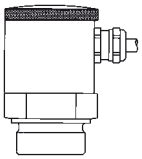
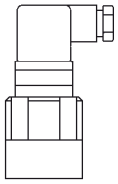
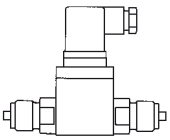


Pin assignment table

Assignment			*DIN 43650*
2-wire system:	*Supply*	+	*1*
(4-20 mA)	*Supply*	−	*2*
	Earth		*Earth contact*

Pressure transducers

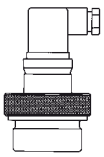
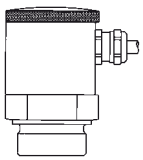
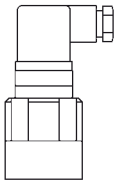
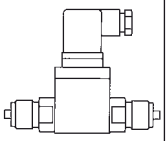
DG: H

Type	DMU 07	DMU 07 FG	DMU 08	DMU 09	DMU 10 D	DMU 11 D*
Version						
Measuring principle	Capacitance ceramic measuring cell		Piezo-resistive stainl. steel measuring cell	Capacitance ceramic measuring cell	Piezo-resistive silicon measuring cell	Piezo-resistive stainl. steel measuring cell
Accuracy (IEC 60770)	0.35 % FSO	0.35 % FSO	0.35 % FSO (≤0.4 bar 0.5 % FSO)	0.35 % FSO	>160 mbar = 0.35 % FSO 40-160 mbar = 1 % FSO <40 mbar = 2 % FSO	0.5 % FSO (with ref. to nom. pressure)
Wetted parts	Ceramic/stainless steel 1.4571	Ceramic/stainless steel 1.4571	Stainless steel 1.4571/1.4404	PVC/ceramic	Alu/silicon/glass RTV/ceramic, nickel/PUR (glued)	Stainless steel 1.4571/1.4435
Connection	G1 1/2B with flush mounted diaphragm	G1 1/2B with flush mounted diaphragm			2 x G1/8 female thread	2 x G1 1/2B EN 837
Supply voltage	DC 9–36 V	DC 9–36 V	DC 12–36 V	DC 9–36 V	DC 12–36 V	DC 12–36 V
Output	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA
System	2-wire	2-wire	2-wire	2-wire	2-wire	2-wire
Electrical connection	plug DIN 43650-A	Weatherpr. housing PG 13.5	5 m PUR cable	5 m FEP cable	plug DIN 43650-A	plug DIN 43650-A
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
0/6 mbar	---	---	---	---	31861	---
0/10 mbar	---	---	---	---	31862	---
0/25 mbar	---	---	---	---	31863	---
0/40 mbar	31789	31821	---	31767	31864	31830
0/60 mbar	31790	31805	---	31768	31865	31831
0/100 mbar	31791	31547	**31555**	31571	31866	31813
0/160 mbar	31792	31806	**31556**	31572	31867	31814
0/200 mbar	31793	31548	**31557**	31573	---	---
0/250 mbar	31794	31807	**31558**	31574	31868	31815
0/300 mbar	---	---	**31519**	31812	---	---
0/400 mbar	31795	31549	31559	31575	31869	31832
0/600 mbar	31796	31808	31560	31576	31870	31833
0/1 bar	31797	31550	31561	31577	31871	31816
0/1.6 bar	31798	31809	31562	31578	---	31834
0/2 bar	31799	31551	31563	31579	---	---
0/2.5 bar	---	---	31564	31580	---	31817
0/4 bar	31800	31552	31565	31581	---	31835
0/6 bar	31801	31810	31566	31582	---	31818
0/10 bar	31802	31553	31567	31583	---	31836
0/16 bar	---	---	31568	---	---	31837
0/20 bar	---	---	31569	---	---	---
0/25 bar	---	---	31570	---	---	---
0/40 bar	---	---	31766	---	---	---

* Please specify required nominal pressure/maximum static pressure when ordering.

Additional costs for pressure transducers accessories

DG: H

Type	DMU 07	DMU 07 FG	DMU 08	DMU 09	DMU 10 D	DMU 11 D
Version						
	Price €	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**
Ex protection II 1 G EEx ia IIC T4	---	---		---	---	---
2 x G1/4 female thread	---	---	---	---	---	**on request**
2 x capillary connection 6 mm	---	---	---	---		**on request**
2 x 7/16 UNF	---	---	---	---	---	
Other connections	**on request**	**on request**	---	---	**on request**	**on request**
Cable connection per metre PUR cable	---	---		---	---	---
Cable connection per metre FEP cable	---	---			---	---
Extension for weight	---	---	**on request**	---	---	---
Weatherproof housing with display (DA 06)	---		---	---	---	---
„Binder“ plug		---	---	---	---	---
Fixed cable connection 2 metres		---	---	---		---
Cable extension per metre		---	---	---		---
Output 0–20 mA, 3 wires	---	---		---		---
Output 0–10 V, 3 wires	**on request**	**on request**		---		
Other output signals	**on request**	**on request**	**on request**	**on request**	**on request**	**on request**
Absolute pressure	---	---	---	---	---	---
Accuracy of measurement 0.25 % FSO			---	---	---	---
Calibration certificate (for accuracy of measurement 0.25 % FSO)			---	---	---	---

Accessories for DMU 08/09

DG: H

	Part no.	**Price €**
Screw connector set plastic G2“ – 1 1/2“ – 1“	**52125**	
Screw connector set stainless steel G1“	**31822**	
Adapter stainless steel G1“ to G1 1/2“	**31823**	
Junction box with pressure relief port (IP 65)	**31824**	
Tensioning clamp	**31825**	

Intelligent pressure transducers with microprocessor DMU 12

Application
For high accuracy electronic measurement of pressure or differential pressure, with integrated digital display. The robust design renders this unit suitable for use under arduous operating conditions in the chemical industry, process technology as well as the food and feedstuffs industry.

Description
The DMU 12 pressure transducer features a calibrated, amplified sensor signal which is available as a standardised current output.

DMU 12 is available in the following versions:

- *Relative, absolute or differential pressure versions*
- *With threaded connection, flange connection EN 61518, relief/stop valve, fitted diaphragm seals*
- *Level measurement version with parameter tables*

Menu types
Refer to table on page 460.

Graphic display
Text orientated menu guide
Display modes (standard):
Measured value and pressure unit plus choice of the following:
1. *Bar chart*
2. *Sensor temperature*
3. *Measured value expressed as a percentage*
4. *Output current in mA*

Mounting position
Any position; housing can be rotated by 170° to the left or to the right, allowing the display and control panel to be factory pre-set at angles of 90°, 180° or 270°, as required.

Accuracy of measurement
< 0/200 bar ≤ ±0.2 % FSO
≥ 0/200 bar ≤ ±0.5 % FSO

Measuring ranges
Refer to table on page 460.

Range selection/range spread
User adjustable without test bed
Maximum 1:20
(differential pressure, max. 1:10)

Operating temperature range
Medium: -10 °C/+90 °C
Ambient: -10 °C/+55 °C
Storage: -20 °C/+60 °C
TC zero point:< ±0.1 %/10 K

Dynamic characteristics
Suitable for static and dynamic measurements
Measuring cycle max. 0.5 s
(0.8 s with HART protocol)

Process connection
Stainless steel 1.4404
G½B (EN 837-1/7.3)

Wetted parts
Stainless steel 1.4404

Pressure transmission liquid
Silicone oil

Output signal/supply voltage
4–20 mA DC 12–50 V
2-wire
optional with HART protocol)
Short circuit proof and polarity protected
max. ± supply voltage

Load
$$4\text{–}20\ mA \leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$$

Current input
4–20 mA max. 20 mA

Housing (protection)
Stainless steel 1.4305 (IP 65), safety front glass (display)

Electrical connections
Cable gland

CE conformity (EMC)
EN 50081-1 and EN 50082-2

Options

- *HART protocol*
- *Differential pressure version*
- *Level version*
- *Fitting of diaphragm seal*
- *Bracket for wall mounting*
- *Ex version (II 2 G EEx ia II C T4/T5/T6)*

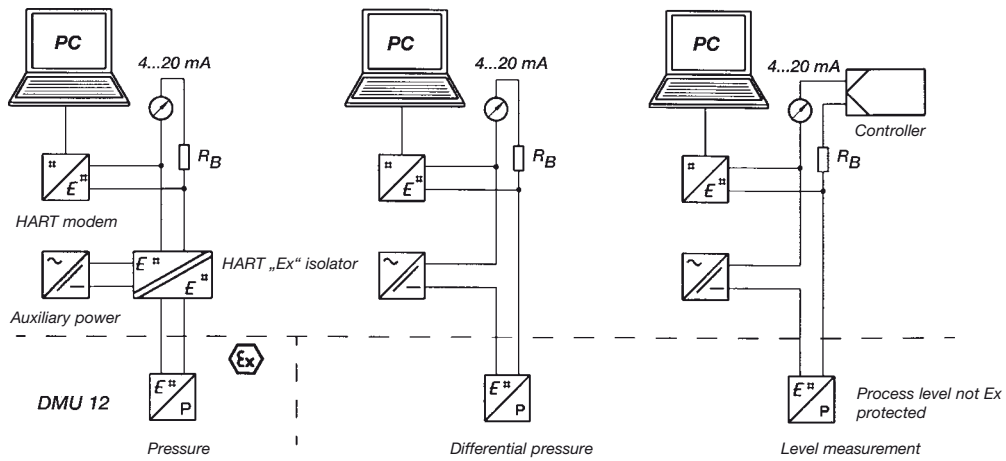
Refer to page 467 for prices

Intelligent pressure transducers with microprocessor DMU 12

Menu types *The following menus are available for displaying information and selecting parameters:*			
Menu type	***Meaning***	***Menu type***	***Meaning***
Measuring range selection	*Specify min. and max. pressure range, without actual pressure*	*Alarm condition*	*Specify output current for fault or malfunction*
Damping	*Select signal damping*	*Calibrate*	*Specify min. and max. pressure range, with pressure*
Min./max. values	*Display of min./max. values for pressure, level measurement and temperature*	*Current balancing*	*Adapt output signal to connected instruments*
Signal evaluation	*Select transmission mode*	*Factory defaults*	*Re-set to factory defaults*
Pressure units	*Selection of physical unit with conversion*	*Security lock*	*Protection against unauthorised use*
Measurement cycle test	*Create a defined output signal*		

Measuring ranges	***Overpressure safety***	***Measuring ranges***	***Overpressure safety (on one side)***	***Max. static pressure***
Relative pressure:		*Differential pressure:*		
-1/ +1 bar	*-1/ +6 bar*	*0/ 1 bar*	*6 bar*	*75 bar*
-1/ +4 bar	*-1/ +10 bar*	*0/ 4 bar*	*10 bar*	*75 bar*
-1/ +16 bar	*-1/ +30 bar*	*0/16 bar*	*30 bar*	*75 bar*
-1/ +40 bar	*-1/ +75 bar*			
-1/+100 bar	*-1/+200 bar*			
-1/+400 bar	*-1/+500 bar*			
Absolute pressure:				
0/ 1 bar	*6 bar*			
0/ 4 bar	*10 bar*			
0/16 bar	*30 bar*			

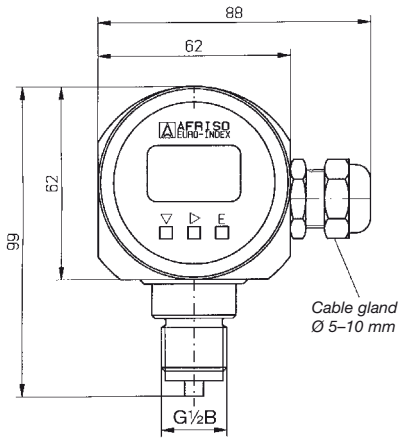
Function diagram with HART protocol

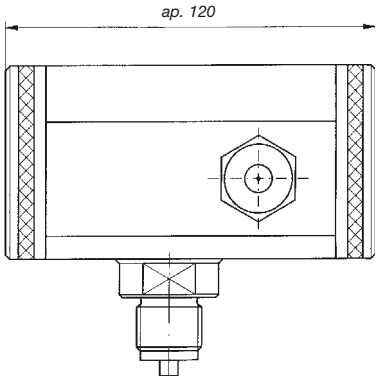


Pressure transducers DMU 12

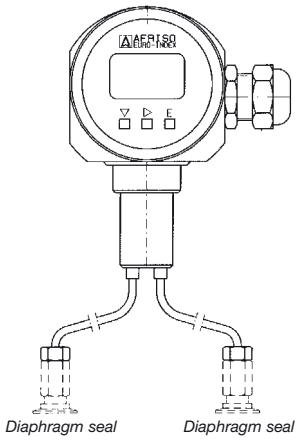
Types and dimensions (in mm)

Standard version – connection G½B

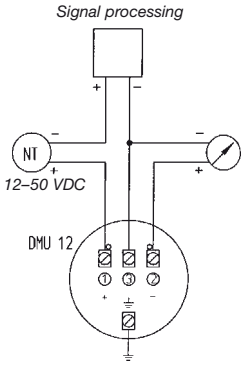




Differential pressure version – diaphragm seal fitted

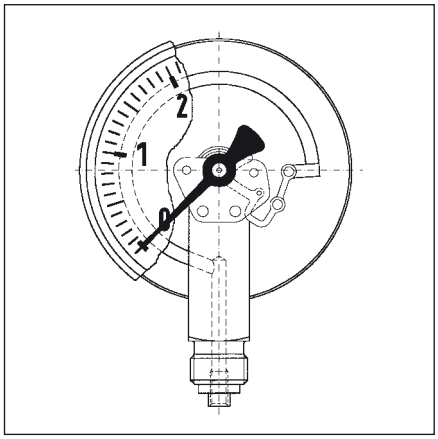


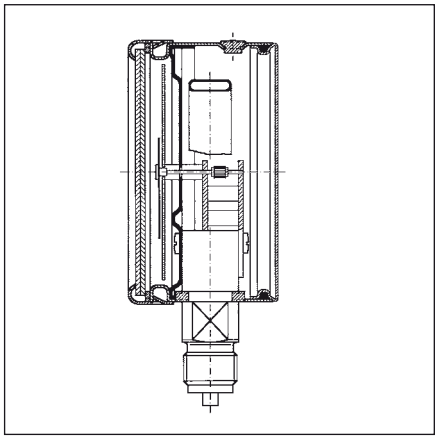
Wiring diagram



11

Pressure transducers with local display DMU 13





Application
For pressure measurements with a power-independent local display in combination with an electrical output signal.

Description
The DMU 13 pressure transducers consist of a mechanical Bourdon tube measuring element and a piezo-resistive stainless steel measuring cell. The Bourdon tube measuring element is used to provide an easy-to-read local display.
The display is power-independent. Due to the integrated pressure transducer, a high accuracy measurement in parallel is possible. A standardised current output is available for signal transmission and recording of measured data. The robust stainless steel housing has a solid baffle wall and blow-out (safety housing).

Technical specifications

Nominal size
100

Accuracy of measurement
Pressure gauge:
Class 1.0 (EN 837-1/6)
Pressure transducer:
Deviation characteristics according to IEC 60770 - limit point setting (non-linearity, hysteresis, repeatability): < ±0.35 % FSO

Measuring ranges
0/0.6 to 0/40 bar

Application area
Static load:
Full scale value
Dynamic load:
0.9 x full scale value
Short term:
1.3 x full scale value

Operating temperature range
Medium: -20 °C/+100 °C
Ambient: -20 °C/ +60 °C
Storage: -40 °C/ +70 °C

Housing
with solid baffle wall and blow-out

Front glass
Laminated safety glass

Protection
IP 54 (EN 60529)

Process connection
G½B – spanner size 22, bottom back (EN 837-1/7.3)

Materials
Housing: stainless steel 304
Pressure-connection: stainless steel 1.4571 or 1.4404/1.4435
Diaphragm: stainless steel 1.4404
Seal: FKM (Viton)

Electrical connection
Junction box

Additional data transducer

Output signal/supply voltage
4–20 mA DC 12–36 V
2-wire

Load
$4–20\ mA \leq \frac{U_B - U_{Bmin}}{0{,}02\ A}$

Current input
4–20 mA < 25 mA

Long-term stability
≤ ±0,2 % FSO/Jahr

Long-term stability
≤ ±0.2 % FSO/year

Temperature error band
in compensated range
0–70 °C ≤ 1 % FSO

Pressure transmission liquid
Silicone oil

Options

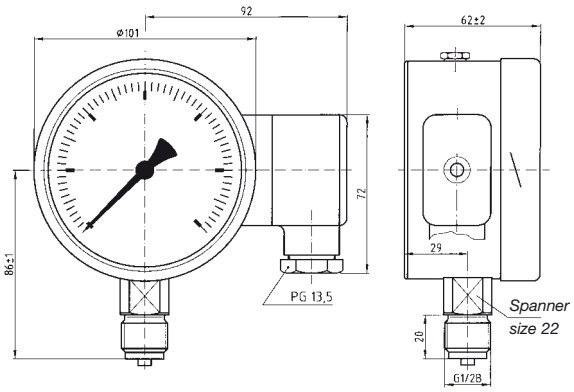
- *Liquid filling (silicone oil)*
- *Electrical contacts*
- *Other process connections*
- *Diaphragm seal fitting*

Refer to page 467 for prices

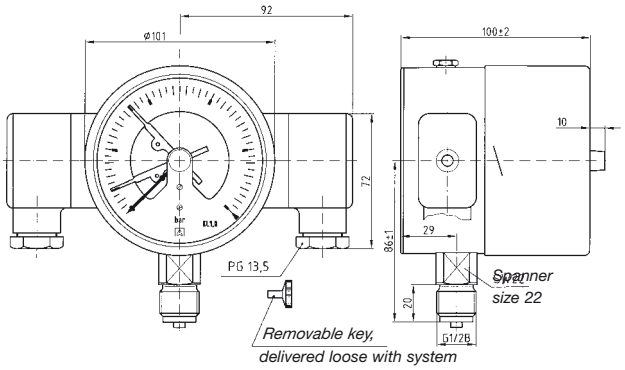
Pressure transducers with local display DMU 13

Types and dimensions (in mm)

Bottom connection



Bottom connection, with electrical contact

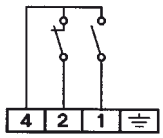


Pin assignment table for pressure measuring cell (right hand junction box)

Supply +	*1*
Supply -	*2*
Earth	*Earth pin*

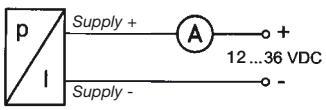
Pin assignment table for electrical contact (left hand junction box)
Example: Magnetic spring contact MK2.12

Normally open contact	*1*
Normally closed contact	*2*
Common (+ve)	*4*



Wiring diagram

2-wire



11

Intelligent pressure transducers DMU 14

Application
For electronic pressure measurement in applications requiring high accuracy of measurement and long-term stability, especially under arduous operating conditions. With aluminium die cast housing, the units are particularly suitable for process technology applications. With stainless steel weatherproof housing and hygienic process connection, the units are ideally suited for applications in the food and beverage industries.

Description
The DMU 14 pressure transducers use piezo-resistive stainless steel measuring cells and feature calibrated, amplified sensor signals which are available as standardised current outputs.

11

DMU 14 features:

- *Robust housing versions*
- *High accuracy*
- *Long service life*
- *High long-term stability*
- *High overpressure safety*
- *Turn Down 1:5*
- *Display (optional)*
- *HART communication (optional)*
- *Ex version (optional)*

Accuracy of measurement
Deviation characteristics according to IEC 60770 – limit point setting (non-linearity, hysteresis, repeatability)
250 mbar: ≤ ± 0.2 % FSO
> 0/1 bar: < ± 0.1 % FSO

Long-term stability
± 0,1 % x Turn Down FSO/year

Meas. ranges/overpressure safety

Measuring range	Max. overpressure
0/ 250 mbar	1000 mbar
0/1 bar	3 bar
0/1,6 bar	6 bar
0/6 bar	20 bar
0/16 bar	60 bar
0/25 bar	100 bar
0/60 bar	140 bar
0/160 bar	340 bar
0/250 bar	600 bar
0/600 bar	1000 bar

Operating temperature range
Without display
Medium: -40 °C/+125 °C
Ambient: -40 °C/ +80 °C
Storage: -40 °C/ +80 °C
With display
Medium: -40 °C/+125 °C
Ambient: -20 °C/ +70 °C
Storage: -30 °C/ +80 °C

Temperature error
-20/+80 °C ≤ 0,1 % FSO/10 K

Dynamic characteristics
Response time < 200 ms

Process connection
G½B (EN 837-1/7.3)

Materials
Housing: Stainless steel 1.4435
Process-connection: stainless steel 1.4571
Diaphragm: stainless steel 1.4435
Seal: FKM, NBR for ≥ 35 bar

Adjustable parameters
Electronic damping: 0/100 s
Offset: 0/90 %
Turn down (of span): 1:5

Output signal/supply voltage
4–20 mA, 2-wire DC 10–30 V
4–20 mA, 2-wire DC 10–28 V
ith Ex version/
HART communication

Load
$R_{max} = [(U_B - U_{Bmin})/0.02]\ \Omega$
HART-Kommunikation $R_{min} = 250\ \Omega$

Current input
4–20 mA max. 25 mA

Protective electrical measures
Short circuit proof and polarity protected

Electrical connection (protection)
Connection terminals in terminal chamber (IP 67)

CE conformity (EMC)
EN 61326

Options

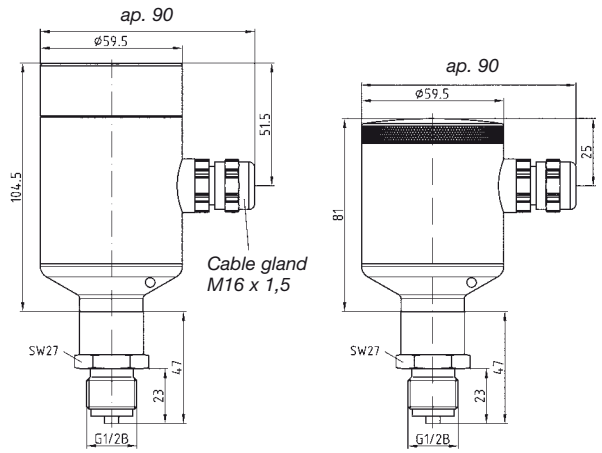
- *Other process connections*
- *Ex version with HART communication*
- *High temperature version*
- *Integrated local display*

Refer to page 467 for prices

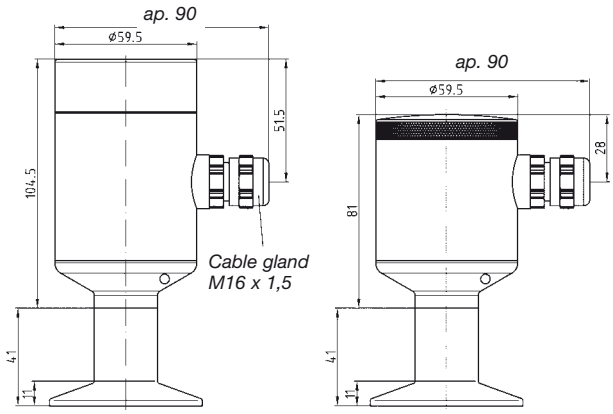
Intelligent pressure transducers DMU 14

Dimensions (in mm) and electrical connections

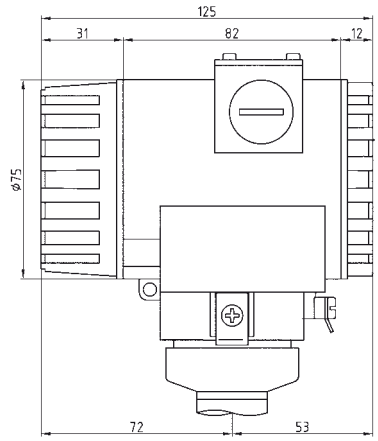
DMU 14 FG ½“ with and without local display



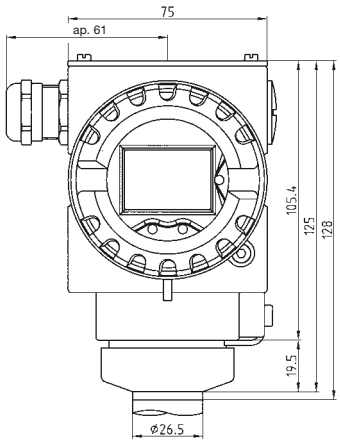
DMU 14 FG clamp 1½“ with and without local display



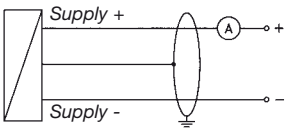
DMU 14 DG



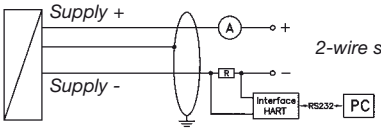
DMU 14 DG



Wiring diagrams



2-wire system (current)



2-wire system (current) HART

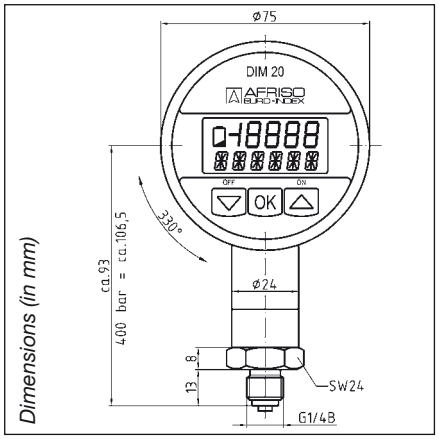
Pin assignment table

		Stainless steel weatherproof housing Connection terminals	Aluminium die cast housing Connection terminals
Supply	+	1	2
Supply	-	2	4
Test		-	3
Earth		6	1

By connecting an ammeter between supply + and test terminals, the output signal can be checked without disconnecting the supply voltage.

Universal digital pressure gauge DIM 20

- *Selection of measurement units*
- *Min.-Max value memory*
- *Menu-guided operation*
- *Indicator rotatable by 330 degrees*
- *Zero point and full scale calibration possible*
- *Adjustable switch-off automatic*
- *Decimal point adjustment*
- *Every instrument supplied with a calibration protocol*



Application
For high accuracy electronic pressure measurement with local digital display, for use in hydraulics, pneumatics, machinery and plant construction.

Description
Compact microprocessor controlled pressure gauge with thick-film ceramic measuring cell. The microprocessor processes the signal received from the pressure sensor, converts it into the desired unit and displays it.
Every instrument is supplied with a calibration protocol.

Functions features
Selection of measurement units, min. and max. value memory, zero point and full scale calibration, adjustable switch-off automatic, adjustable decimal point, battery status indication.

Displayed values
Selectable pressure units: bar/mbar/psi/InHg/mmHg/hPa/kPa/MPa/mWS

Display
Multi-line liquid crystal display, line 1: 4.5-digit, numeric, for display of measured value (digit height 9.5 mm)
Line 2: 6-digit, alphanumeric, for display of additional information (digit height 6.8 mm) as well as additional symbols. Indicator rotatable by 330 degrees.

Accuracy of measurement
±0.5 % FSD acc.to IEC 60770

Measuring ranges
-1/0 bar,
0/2.5 bar to 0/400 bar

Overpressure safety
Minimum 1.5 x FS

Burst pressure
≤ 160 bar minimum 2.5 x FSD
> 160 bar minimum 1.5 x FSD

Operating temperature range

Medium:	*-20 °C/+125 °C*
Ambient:	*-20 °C/+45 °C*
Storage:	*-30 °C/+80 °C*

Temperature error
In compensated range
0–70 °C ≤ 0,5 % FSD

Dynamic characteristics
Measurement scanning rate 5/s

Process connection
G¼B (EN 837-1/7.3)
bottom

Materials

Housing	*PA6, glass reinforced*
Pressure connection	*Stainless steel 304*
Diaphragm	*Ceramic Al_2O_3 96 %*
Seal	*<100 bar: FKM*
	>100 bar: NBR

Protection
IP 51 (EN 60529)

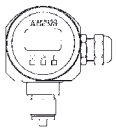
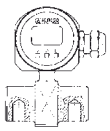
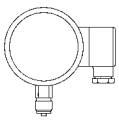
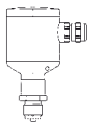
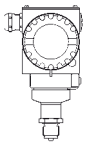
Supply voltage
1x Lithium battery 3.6 V (included), battery life depends on usage, max 5 years

DG: H	Part no.	**Price €**
Spare battery	68309	

Refer to page 467 for prices

Pressure transducer / Digital pressure gauge

RK: H

Type	DMU 12	DMU 12 Dif	DMU 13	DMU 14 FG	DMU 14 DG	DIM 20
Housing diam						
Housing -Ø	62	62	100	60	75	75
Housing	stainless	stainless	stainless	stainless	aluminium	plastic
Accuracy	0,2 % FSD	0,2 % FSD	0,35 % FSD	see data sheet	see data sheet	0,5 % FSD
Wetted parts	stainless 1.4404	stainless 1.4404	stainless 1.4571/1.4404	stainless 1.4571/1.4435	stainless 1.4571/1.4435	stainless 1.4305 ceramic
Connection	G1/2B	EN 61518	G1/2B	G1/2B	G1/2B	G1/4B
Supply voltage	DC 12–50 V	DC 12–50 V	DC 12–36 V	DC 10–30 V	DC 10–30 V	DC 3,6 V
Output	4–20 mA	4–20 mA	4–20 mA	4–20 mA	4–20 mA	---
Measuring range	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.
Price €						
0/250 mbar	---	---	---	31977	31987	---
Price €						
-1/0 bar	---	---	---	---	---	**32500**
0/0,6 bar	---	---	31076	---	---	---
0/1 bar	31040*	31049	31077	31978	31988	---
Price €						
0/1,6 bar	---	---	31078	31979	31989	---
0/2,5 bar	---	---	31079	---	---	**32503**
0/4 bar	31041*	31050	31080	---	---	---
0/6 bar	---	---	31081	31980	31990	**32505**
0/10 bar	---	---	31082	---	---	**32506**
0/16 bar	31042*	31051	31083	31981	31991	---
0/25 bar	---	---	31084	31982	31992	**32508**
0/40 bar	31043*	---	31085	---	---	**32509**
Price €						
0/60 bar	---	---	---	31983	31993	---
0/100 bar	31044*	---	---	---	---	**32511**
0/160 bar	---	---	---	31984	31994	**32512**
0/250 bar	---	---	---	31985	31995	**32513**
0/400 bar	31045*	---	---	---	---	**32514**
0/600 bar	---	---	---	31986	31996	---
Additonal costs**	**Price €**	**Price €**	**Price €**	**Price €**	**Price €**	**Spare battery** **Part no.** 68309 **Price €**
Ex-version with HART protocol	on request	on request	---			
Liquid filling	---	---		---	---	
Display	standard	standard	---			
Clamp connection 1" or 1½"	---	---	---			
Clamp connection 2"	---	---	---			
Dairy fitting DIN 11851 DN 25	---	---	---			
Dairy fitting DIN 11851 DN 40	---	---	---			
Dairy fitting DIN 11851 DN 50	---	---	---			
High temperature version +300 °C	---	---	---			

* Measuring range -1/+x bar

** Wetted parts of clamp and dairy fittings = stainless steel 1.4435