Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

All Stainless Steel Bourdon Tube "Solid-front" Pressure Gauges

S3 acc. to EN 837-1 for exceptional safety

measuring • monitoring • analysing

MAN-N ... S

- Housing: 63 mm, 100 mm, 150 mm
- Connection: G¼, G½, ¼" NPT, ½" NPT
- Material: Stainless steel
- Measuring range: -1 ... 0 bar to 0 ... 1600 bar
- Accuracy class: 1.0 (1.6 with 63 mm)
- Options: Damping liquids, oxygen service and many others

P1

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KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com

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Description

These Solid-front instruments are built in accordance with safety specifications of EN 837.1 and ASME B40.1.

The safety construction consists of a solid separating wall in stainless steel, placed between the scale and the elastic element and a blow out back which is released from the case whenever an internal pressure, due to leaks, is created or the elastic element is broken. A leak tight fit is ensured if the instrument is filled with a dampening fluid to prevent damage due to vibration. These instruments are designed for use in food, beverage, pharmaceutical, cryogenic, chemical and petrochemical processing industries, and in conventional and nuclear power plants. They are built to resist the most severe operating conditions created by the ambient environment and the process medium.

Technical Data

Dial Size: 63 mm

Standard Model

Design:	EN 837-1
Safety designation:	S3 as per EN 837-2
Ranges:	From 0 ... 15 to 0 ... 15000 psi; from 0 ... 1 to 0 ... 1000 bar (or other equivalent units)
Accuracy class:	1.6 as per EN 837-1
Ambient temperature:	-25 ... + 65 °C(-13 ... +149 °F)
Process fluid temperature:	Max. +100 °C (+212 °F)
Thermal drift:	± 0.4%/10 K of range (starting from 68 °F / 20 °C)
Working pressure:	75% of FSV for static pressure 66% of FSV for pulsating pressure
Over pressure limit (15 min. max.):	25% of FSV for pressure ranges ≤ 1500 psi (100 bar) 15% of FSV for pressure ranges over 1500 psi (100 bar)
Protection degree:	IP 55 as per IEC 529
Socket material:	AISI 316 stainless steel
Bourdon tube:	AISI 316L stainless steel
Case:	Stainless steel
Ring:	Stainless steel, bayonet lock
Blow out disk:	Plastic
Window:	Safety glass
Movement:	Stainless steel
Dial:	Plastic
Pointer:	Adjustable, aluminium, black

Fillable Model

Protection degree:	IP 67 as per IEC 529
Pointer:	Not adjustable, aluminium, black
Other features:	As Standard Model

Filled Model

Damping liquid:	Glycerine 98%, silicon oil or fluorinated fluid
Ambient temperature:	0 ... +65 °C (+59 ... +149 °F) with glycerine filling; -40 ... +65 °C (-40 ... +149 °F) with silicon oil or fluorinated fluid filling
Process fluid temperature:	Max. +65 °C (+149 °F)
Protection degree:	IP 67 as per IEC 529
Pointer:	Not adjustable, aluminium, black
Other features:	As Standard Model

Instruments for Oxygen

Glycerine or silicone should not be used with highly oxidising agents such as oxygen, chlorine, nitric acid or hydrogen peroxide, because of danger of spontaneous chemical reaction, inflammability or explosion. The use of fluorinates fluid is recommended in these cases.

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Dial Size: 100 mm / 150 mm

Standard Model

Design:	EN 837-1
Safety designation:	S3 as per EN 837-2
Ranges:	From 0...0.6 to 0...1600 bar; from 0...15 to 0...30000 psi (or equivalent units)
Accuracy class:	1 as per EN 837-1
Ambient temperature:	-40...+65 °C (-40...+149 °F), IP 55 housing (IEC 529); -50...+65 °C (-58...+149 °F), vented IP 67 housing (IEC 529)
Process fluid temperature:	-40...+150 °C
Working pressure (referred to the full scale value):	Max. 90% for pulsating pressure; 100% for static pressure
Over pressure limit:	30% of full scale value
Special over pressure limit:	50% of full scale value, for pressure ranges ≤ 400 bar (max. 1 hour)
Protection:	IP 55 as per IEC 529
Socket material:	AISI 316L stainless steel
Bourdon tube:	AISI 316L stainless steel seamless tube for pressure ranges up to 20000 psi (0...1000 bar); Duplex stainless steel for range ≥20000 psi (0...1400 bar)
Case:	AISI 304 stainless steel
Ring:	AISI 304 stainless steel, bayonet lock
Blow out disk:	AISI 304 stainless steel
Window:	Safety glass
Movement:	Stainless steel with internal limit stops for minimum and maximum pressure
Dial:	Aluminium, white with black markings and "▼" symbol at the edges of the scale value
Special dial:	Ranges different from standard, custom artworks available on request
Pointer:	Aluminium, micrometric adjustable

Fillable Model - Vertical type only

Protection:	IP 67 as per IEC 529
Note:	Suitable for glycerine filling; other filling fluids available on request (see Options Table)
Pointer:	Not adjustable, aluminium, black
Other features:	As standard model

Liquid filled Model - Vertical type only

Ambient temperature:	Max. +65 °C, (see Damping Liquids Table for further information)
Process fluid temperature:	+65 °C
Protection:	IP 67 as per IEC 529
Damping liquids:	Glycerine 98%, (see Damping Liquids Table for others filling fluid)
Pointer:	Not adjustable, aluminium, black
Other features:	As Standard Model

Damping Liquids

Damping liquids	Ambient temperatur
Glycerine 98%	0...+65 °C (+59...+150 °F)
Silicone oil / "Fluorolube"	-40...+65 °C (-40...+150 °F)

Instruments for Oxygen

Glycerine or silicone should not be used with highly oxidising agents such as oxygen, chlorine, nitric acid or hydrogen peroxide, because of danger of spontaneous chemical reaction, flammability or exposition. The use of fluorinates fluid is recommended in these cases.

Accessories

Diaphragm seal: A complete range of diaphragm seals are available with a choice of materials of construction. Specifically for corrosive and difficult process fluids plus hygienic applications.

Adjustable over-load protector: This is useful for installations which may generate high overpressures; the pressure gauges is automatically excluded at the pre-set pressure and cut in again automatically when the operating pressure returns to normal.

Valves: For construction details and for use limits refer to our data-sheet for accesories.

Pigtail and siphons: Recommended with temperatures of 65° C (150° F) or over.

Pressure snubbers: For further details refer to our data sheet for accesories.

Ranges: D = DS 63, F = DS 100, H = DS 150

Pressure

Table 1

Range	bar	kPa	MPa	bar ext.	bar ext.	bar ext.
				psi int.	kPa int.	MPa int.
0...0.6[1)]	FH			FH	FH	
0...1	DFH		DFH	FH	FH	
0...1.6	DFH		DFH	FH	FH	
0...2.5	DFH		DFH	FH	FH	
0...4	DFH		DFH	FH	FH	
0...6	DFH		DFH	FH	FH	
0...10	DFH		DFH	FH		FH
0...16	DFH		DFH	FH		FH
0...25	DFH		DFH	FH		FH
0...40	DFH		DFH	FH		FH
0...60[1)]	DFH	FH	DFH	FH		FH
0...100	DFH	DFH	DFH	FH		FH
0...160	DFH	DFH	DFH	FH		FH
0...250	DFH	DFH		FH		FH
0...400	DFH	DFH		FH		FH
0...600	DFH	DFH		FH		FH
0...1000	DFH	DFH		FH		FH
0...1600	FH	DFH		FH		FH
0...2500		DFH				

[1)] not available for filled version

Table 2

Range	psi	psi int.	psi ext.	psi ext.
		kPa ext.	bar int.	kg/cm² int.
0...15	DFH	FH	FH	FH
0...30	DFH	FH	FH	FH
0...60	DFH	FH	FH	FH
0...100	DFH	FH	FH	FH
0...160	DFH	FH	FH	FH
0...200	DFH	FH	FH	FH
0...300	DFH	FH	FH	FH
0...400	DFH	FH	FH	FH
0...600	DFH	FH	FH	FH
0...1000	DFH	FH	FH	FH
0...1500	DFH	FH	FH	FH
0...2000	DFH	FH	FH	FH
0...3000	DFH	FH	FH	FH
0...4000	DFH	FH	FH	FH
0...5000	DFH	FH	FH	FH
0...6000	DFH	FH	FH	FH
0...10000	DFH	FH	FH	FH
0...15000	DFH	FH	FH	FH
0...20000	FH	FH	FH	FH
0...30000[1)]	FH	FH	FH	FH

[1)] working pressure: Max. 75% of the full scale value
over pressure limit: 10% of the full scale value

Receiver

Table 3

External	Internal	Internal
	0÷100 linear	0÷10 quadratic
0.2...1 bar	FH	FH
0.2...1 kg/cm²	FH	FH
3...15 psi	FH	FH
20...100 kPa	FH	FH

Vacuum and Compound

Table 4

Range	bar	kPa	bar ext.	bar ext.
			psi int.[1)]	kPa int.
-1...0	DFH		FH	FH
-1...0.6	DFH		FH	FH
-1...1.5	DFH		FH	FH
-1...3	DFH		FH	FH
-1...5	DFH		FH	FH
-1...9	DFH		FH	FH
-1...15	DFH		FH	FH
-1...24	DFH		FH	FH
-100...0		DFH		
-100...150		DFH		
-100...300		DFH		
-100...500		DFH		
-100...900		DFH		
-100...1500		DFH		
-100...2400		F		

[1)] vacuum unit of measurement: "inHg"

Table 5

Range	psi[1)]	psi int.[1)]	psi ext.[1)]	psi ext.[1)]
		kPa ext.	bar int.	kg/cm² int.
-30...0	DFH	FH	FH	FH
-30...15	DFH	FH	FH	FH
-30...30	DFH	FH	FH	FH
-30...150	DFH	/	FH	/

[1)] vacuum unit of measurement: "inHg"

NH3

Table 6

bar external	NH3 internal	Dial size
-1...5	-70...+9 °C	F
-1...9	-70...+25 °C	F
-1...15	-70...+40 °C	F
-1...24	-70...+56 °C	F

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Order Details (Example **MAN-N F 2 6 S B7 000**)

Model	Dial size (DS)	Version	Process connection	Version	Range (bar)	Options
MAN-N ...	**... D ...** = 63 mm	**... 2 ...** = standard version **... B ...** = fillable version **... 7 ...** = filled version	**5** = G¼ bottom **7** = G¼ back **R** = ¼" NPT bottom **T** = ¼" NPT back **X** = special connection (specify in clear text)	**S** = solid front acc. to EN 837-1 "S3"	**AD** = -1...0 **A0** = -1...0.6 **A1** = -1...1.5 **A2** = -1...3 **A3** = -1...5 **A4** = -1...9 **A5** = -1...15 **A6** = -1...24 **B1** = 0...0.6[1] **B2** = 0...1 **B3** = 0...1.6 **B4** = 0...2.5 **B5** = 0...4 **B6** = 0...6 **B7** = 0...10 **B8** = 0...16 **B9** = 0...25 **B0** = 0...40 **C1** = 0...60 **C2** = 0...100 **C3** = 0...160 **C4** = 0...250 **C5** = 0...400 **C6** = 0...600 **D7** = 0...1000 **D8** = 0...1600 **XX** = special e.g. dual scale, other units of measurement (see range tables and specify in clear text)	**000** = no option **other options:** see options table **YYY** = special option (specify in clear text)
	... F ... = 100 mm **... H ...** = 150 mm		**6** = G½ bottom **8**[2] = G½ back **S** = ½" NPT bottom **U**[2] = ½" NPT back **X** = special connection (specify in clear text)			

[1] not available for dial size 63 mm and for filled version

[2] only available with standard version code "2"

Note: *Minimum order quantity: 6 pieces per order*

Options: D = DS 63, F = DS 100, H = DS 150

Description	Code	Standard	Fillable	Filled
AISI 316 stainless steel case and ring	C40	FH	FH	FH
"Fluorolube" filling[3]	F30			DFH
Accuracy class: 0.6 as per EN 837-1 (only for ranges ≤ 400 bar (6000 psi))	K06[4]	FH	FH	
Suitable for filling with silicon[3], IP 67	P01		DFH	
Oxygen service (only for ranges ≤ 1000 bar (15 000 psi))	P02	DFH	DFH[2]	DFH[1]
Compensating device, for lower mounting	P03	F	F	F
Silicon filling[3]	S10			DFH
Overpressure 50% of the scale value (max. range 0 ... 400 bar)	SVP	FH	FH	FH
Tropicalisation	T01	FH	FH	FH
AISI 316 stainless steel label	T25	FH	FH	FH
Front flange, for back connection pressure gauges	E00	DFH	D	D
Back flange, for lower connection pressure gauges	C00	FH	FH	FH
Dial tagging	SQ1	FH	FH	FH
Serial number on dial	SQ2	DFH	DFH	DFH

[1] to be ordered only with fluid "Fluorolube" filling (option F30)
[2] to be ordered with option P01
[3] window gasket: Silicone rubber; filling plug and blowout vent: VITON
[4] not available for receivers

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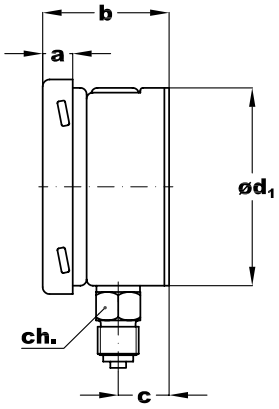
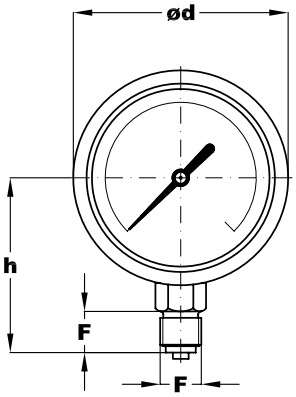
Dimensions (mm) **and Weights** (kg)

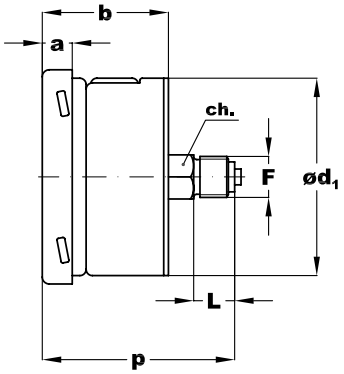
DS 63

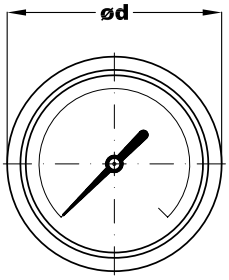
Lower connection





Back connection



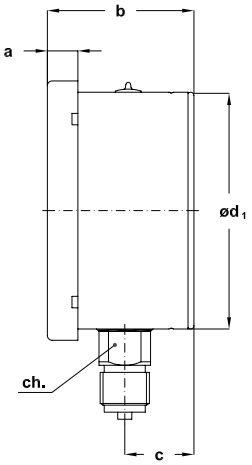


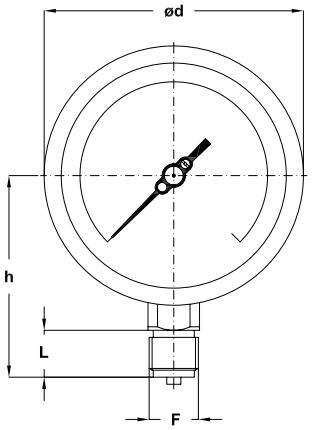
Mounting	F	a	b	c	d	d_1	h	p	L	ch	Weight[1)]
Lower	G2 - G¼A N2 - ¼-18 NPT	10	40	16.7	68	62.6	54.3 - 55.3		13	14 x 8 - 14 x 9	0.2 kg
Back	G2 - G¼A N2 - ¼-18 NPT	10	40		68	62.6		59.1 - 60.1	13	14 x 8 - 14 x 9	0.23 kg

[1)] add 0.1 kg when filled

DS 100, DS 150

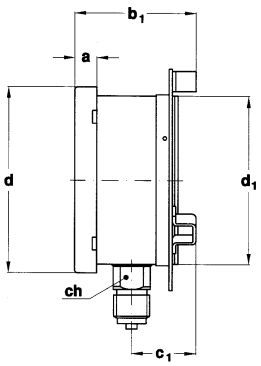
Stem mounting; lower connection

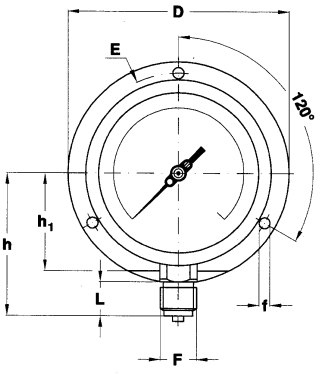




Option C00

Surface mounting, back flange; lower connection



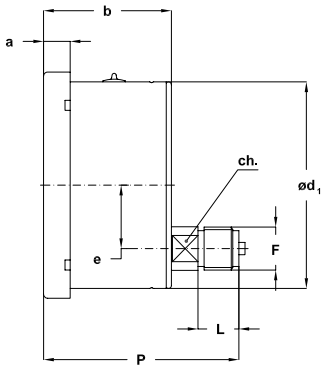


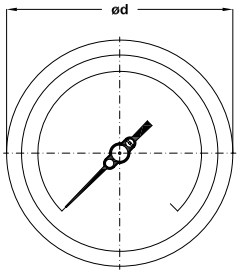
DS	a	b	b_1	c	c_1	d	d_1	h_1	f	D	E	ch	Weight without filling	Weight with filling
100	13	62.5	74	29.5	41	110.6	101	-	6	132	118	22	0.65 kg	0.98 kg
150	15	64	75.5	30	41.5	161	149.6	85	6	190	175	22	1.2 kg	2 kg

DS 100, DS 150

Applicable on standard version only

Stem mounting; back connection

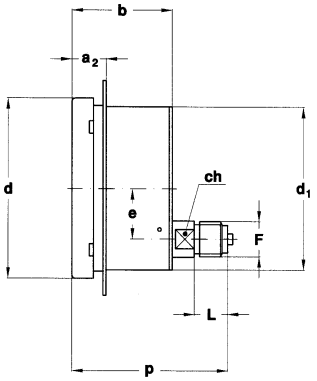


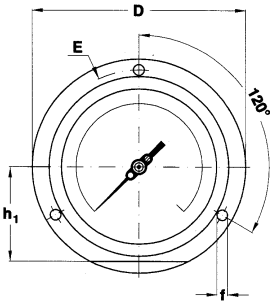


DS 100, DS 150

Option E00 applicable on standard version only

Flush mounting, front flange; back connection





DS	a	a_2	b	d	d_1	e	f	h_1	D	E	ch	Weight without filling
100	13	20	61	110.6	101	31	6	-	132	118	17	0.7 kg
150	15	25.5	64	161	149.6	47.8	6	85	190	175	17	1.15 kg

Process connection

F	Code	DS 100			DS 150		
		L	h	p	L	h	p
¼" BSP M	5	13	79	93.5	13	110	94
¼" NPT	R	15	81	95.5	15	112	96
⅜" BSP M		16	86	95.5	16	117	96
G½ A	6	20	86	95.5	20	117	96
½ - 14 NPT	5	20	86	95.5	20	117	96
M20 x 1.5		20	86	95.5	20	117	96

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