

DSB, DSF: Pressure monitors and pressure switches

How energy efficiency is improved

Demand-led controlling and monitoring, without auxiliary energy.

Areas of application

For controlling and monitoring pressures in liquids, gases and vapours according to VdTÜV100/1 and DIN 3398/4. Especially suitable for applications in compact installations, for fitting onto pipes or walls.

Features

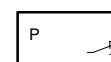
- Pressure range: -1 to +40 bar
- Contact rating: 4 mA, 5 V to 10 A, 250 V
- Up to 110 °C media temperature
- Gold-plated silver contacts
- Switching point can be adjusted
- Adjustable switching difference
- Sealable
- Complies with DGRL 97/23/EC, Cat. IV.

Technical description

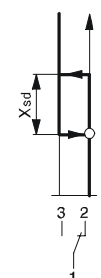
- Ambient temperature: -20 to +70 °C
- IP 65
- Brass sensor or stainless steel for aggressive media
- Standard housing-mounted plug with cable connector for cables of 6 to 10 mm in diameter
- Plastic housing with transparent cover made of impact-resistant thermoplastic
- Pressure connection G $\frac{1}{2}$ "A



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Type	Setting range bar	Variable switching difference ⁴⁾ (averages) bar	Max. pressure bar	Max. sensor temp. °C	Weight kg
Pressure sensor of brass for non-aggressive media; X _S = lower switching point					
DSB 138 F001	0...1,6	0,25...0,65	12	70	0,5
DSB 140 F001	0...2,5	0,25...0,75	12	70	0,5
DSB 143 F001	0...6	0,3...1,6	16	70	0,5
DSB 146 F001	0...10	0,8...3,7	30	70	0,4
DSB 152 F001	6...16	1...4	30	70	0,4
DSB 158 F001	0...25	1...7,5	60	70	0,4
DSB 170 F001	5...40	1,4...7,5	60	70	0,4
Pressure sensor of stainless steel for aggressive media; X _S = lower switching point					
DSF 125 F001	-1...1,5	0,25...0,75	12	110	0,5
DSF 127 F001	-1...5	0,3...1,5	16	110	0,5
DSF 135 F001	0...0,6	0,12...0,60	12	110	0,5
DSF 138 F001	0...1,6	0,25...0,7	12	110	0,5
DSF 140 F001	0...2,5	0,25...0,75	12	110	0,5
DSF 143 F001	0...6	0,3...1,5	16	110	0,5
DSF 146 F001	0...10	0,8...3,0	18	110	0,5
DSF 152 F001	0...16	1,2...3,8	60	110	0,3
DSF 158 F001	0...25	1,5...8,0	60	110	0,3
DSF 170 F001	15...40	1,7...8,2	60	110	0,3

Contact rating as silver contacts ¹⁾	10(4) A, 250 V~ 50 W, 250 V=	Degree of protection	IP 65 (EN 60529)
minimum	100 mA, 24 V	Protection class	I (IEC 60730)
as gold contacts ²⁾	400 mA, 24V; 10 VA	Test marks ⁵⁾	DWFS (SDBFS) ³⁾ ID: 0000006024
minimum	4 mA, 5 V	DIN CERTO: DIN 3398-4	3C03705
Permissible vacuum loading DSB 138; 140; 143	-1,0 bar -0,7 bar	PED	Cat. IV
Ambient temperature	-20...70 °C	Wiring diagram	A01499
		Dimension drawing	M07815
		Fitting instructions	MV 505560
		Declaration on materials	MD 23.760

1) See technical notes: *RC circuit under inductive load*

2) If the contacts are ever loaded at more than the value stated above, the gold plating will be destroyed. They then lose the properties of gold contacts and can thereafter be used only as silver contacts

3) As a safety pressure limiter when an external electric locking facility is connected

4) See technical notes: 'Influence of switching difference'

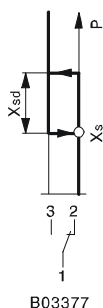
5) Certificates can be downloaded from www.tuv.com



Accessories

- 0035465 000** Brass throttling screw for damping pressure surges.
0114467 000* Steel capillary tube (1 m) for arresting pressure surges.
0192222 000* Cap nut with solder connector.
0192700 000* Copper capillary tube (1 m) for arresting pressure surges.
0214120 000 Stainless-steel throttling screw for damping pressure surges.
0259239 000* Brass adaptor (G $\frac{1}{2}$ to $\frac{7}{16}$ " 20-UNF-2A) for copper pipes of \varnothing 6 mm.
0292001 000 Setpoint as per customer's specifications (\pm 3% of setting range, but at least \pm 0,2 bar).
0292002 000 Switching difference set to customer's specifications (\pm 5% of setting range, but at least \pm 0,5 bar, with accessory 0292001 only).
0292004 000 Sealed setpoint screw (with accessory 0292001 only).
0292018 001* Throttling screw for damping pressure surges in low-viscosity media.
0292150 001* Fixing bracket for wall mounting.
0296936 000* Fixing bracket for rails (top-hat rail EN 60715, 35 \times 7,5 or 35 \times 15); with accessory 0292150 only).
0311572 000* Brass screw fitting for copper pipes of \varnothing 6 mm.
0381141 001* Copper gasket for G $\frac{1}{2}$ ".

*) Dimension drawing or wiring diagram are available under the same number

**Operation**

Whenever the pressure falls below the lower switching point (variable setpoint X_S), the contacts switch over from 1-3 to 1-2. When the pressure exceeds the lower switching point by the amount of the switching difference X_{Sd} , the contacts switch over from 1-2 to 1-3.

The switching difference can be set externally via a set screw: one turn of the screw alters the switching difference by about 20% of the whole range.

Engineering and fitting notes

The pressure limiters conform to European regulation 97/23/EEC on pressure equipment and, as safety components, belong to equipment category IV. They are approved for liquids and gases that are covered by the areas of usage stated in DIN 3398, Part 4. The devices also comply with low-voltage regulation 2006/95/EC and EMC regulation 2004/108/EC. They can be used as assemblies in accordance with machine regulation 89/37/EEC Appendix II.B.

These devices can be employed as safety pressure limiters (SDBFS) for falling or rising pressure if an electric interlock circuit (see examples of use) is used and the requirements in DIN 57116/VDE 0116 have been fulfilled. The electrical equipment must comply with VDE 0660 or VDE 0435.

Additional details on materials

Materials which come into contact with the medium:-

Pressure sensor of brass (DSB): brass, stainless steel and nitrile rubber.

Pressure sensor of stainless steel (DSF): stainless steel, material nos. 1.4104 and 1.4541.

Additional technical data

Switching system causes minimal radio interference	as per EN 55014	Electrical life when:- cos φ = 1:- 10 A, 250,000 switching operations 5 A, 400,000 switching operations 2 A, approx. 10^6 switching operations cos φ = 0.6:- 3 A, 400,000 switching operations cos φ = 0.3 ¹⁾ :- 3 A, 250,000 switching operations 2 A, 400,000 switching operations 1 A, 700,000 switching operations Mechanical life expectancy: DSF: as per 'Pressure' 100/1 > 2×10^6 strokes
Complies with:-		
Directive 2006/95/EC	EN 60730-1/ EN 60730-2-6	
EMC directive 2004/108/EC	EN 61000-6-1/ EN 61000-6-2 EN 61000-6-3/ EN 61000-6-4	
PED 97/23/EEC, Cat. IV	Pressure 100/1 DIN 3398 T4	

1) cos φ < 0,3: substantial reduction in life expectancy; with RC circuitry, life expectancy is as for cos φ > 0,3 (see also technical notes).

Technical notes

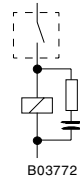
RC circuit under inductive load

For the optimum RC circuitry, refer to the specifications supplied by the manufacturers of the relays, contactors etc. If these are not available, the inductive load can be reduced by applying the following rule of thumb (not binding):-

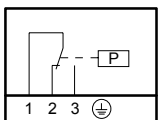
- Capacity of the RC circuitry (μF) \geq operating current (A)
- Resistance of the RC circuitry (Ω) \approx coil resistance (Ω)

Influence coefficient on switching difference

The switching difference is slightly dependent on the setpoint. The switching differences stated in the PDS sheet are typical values at the start of the range. The setpoint's influence on the switching difference increases the switching difference by: $\Delta X_{\text{sd}} = (\text{setpoint } X_S - \text{start of range}) \times 0,04$.

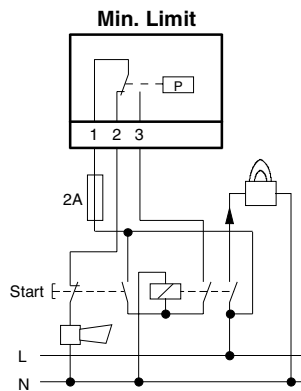


Wiring diagram

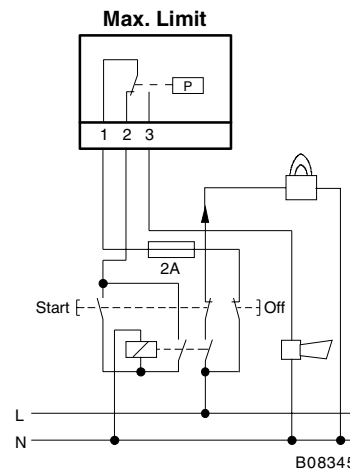


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Connections for use as safety pressure limiter

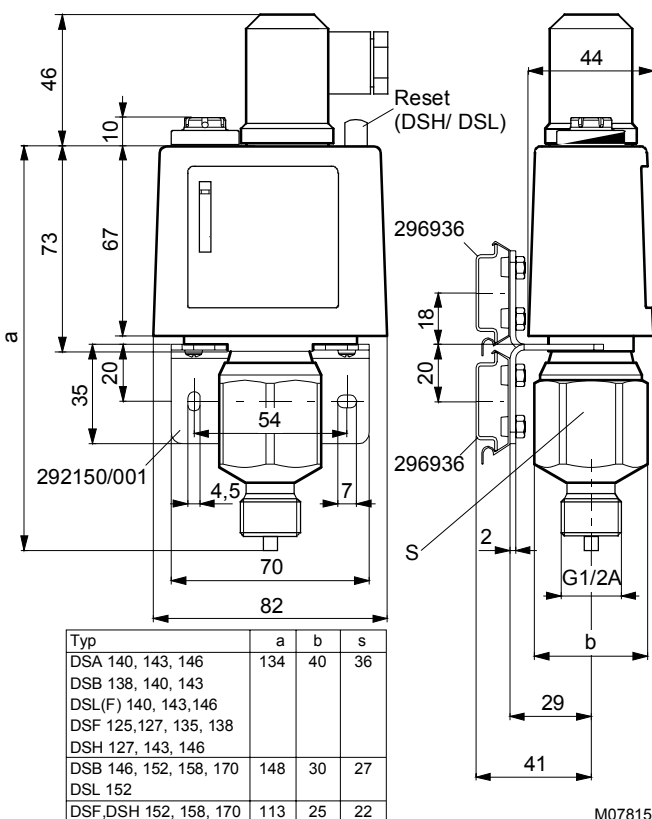


Pressure monitor as safety pressure limiter for falling pressure



Pressure monitor as safety pressure limiter for rising pressure

Dimension drawing

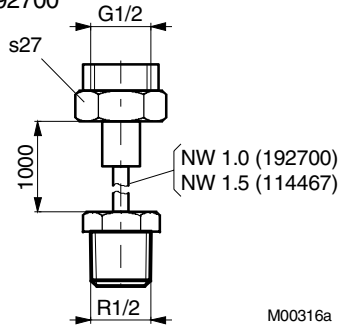


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Typ	a	b	s
DSA 140, 143, 146	134	40	36
DSB 138, 140, 143			
DSL(F) 140, 143, 146			
DSF 125, 127, 135, 138			
DSH 127, 143, 146			
DSB 146, 152, 158, 170	148	30	27
DSL 152			
DSF, DSH 152, 158, 170	113	25	22

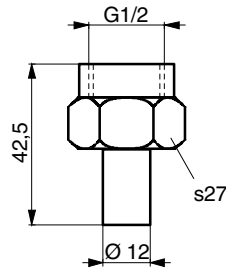
Accessories

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192700



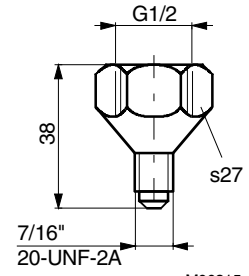
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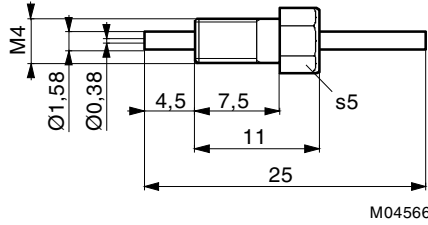
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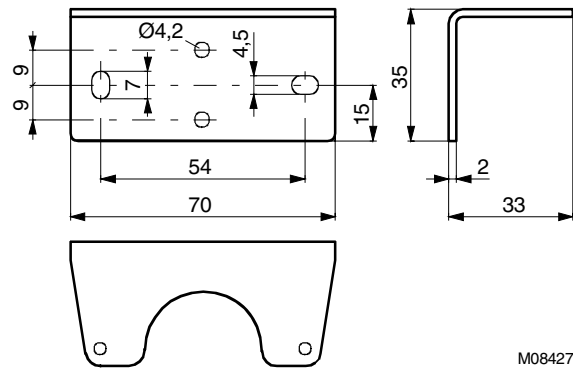
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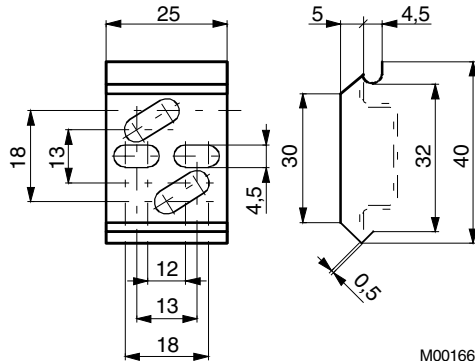
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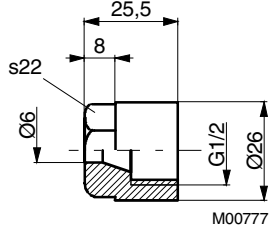
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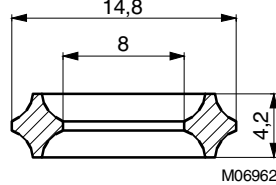
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