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

Mechanical Pressure Switches

for overpressure, vacuum pressure
and differential pressure

measuring
•
monitoring
•
analysing

SCH

- Switching range:
  -1 ... +0.1 bar
  -250 ... +100 mbar,
  1 ... 16 mbar a 16 ... 63 bar
- Temperature:
  max. 70 °C
- Material:
  copper, brass,
  stainless steel, NBR
- Connection: G ½, G ¼

P3

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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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General Description

Mode of operation

The pressure applied in the sensor housing (1) acts on the measuring bellows (2).

Pressure changes lead to movements of the measuring bellows (2) which are transferred through a pressure pin (4) to the switching rocker (5). The switching rocker is supported on hardened pivot points (6).

As the pressure increases the switching rocker (5) moves upwards and operates the micro-switch (7). The spring (8), the initial stress of which can be changed by the setting screw (9) (switching point setting), acts as opposing force. The travelling nut (10) is moved by turning the setpoint spindle, and the initial stress of the spring (8) is changed. The screw (11) serves for the internal adjustment of the micro switch. The counterpressure spring (12) ensures stable switching behaviour, even for low setting values.

Pressure sensors

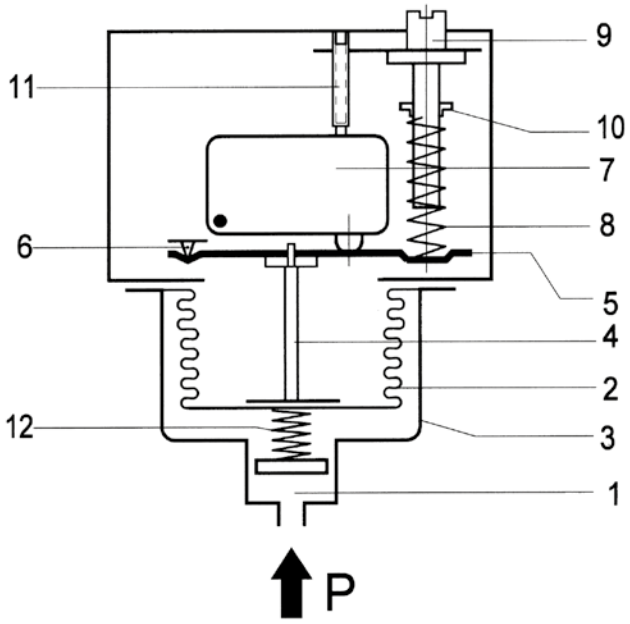
With few exceptions in the low pressure range, all pressure sensors are equipped with measuring bellows, partly made of a copper alloy but mostly in high stainless steel quality (1.4571). In comparison with the permissible values, the measuring bellows are subject to low loads and move only slightly. This results in long service life with low switching point drift and high overpressure safety. The movement of the measuring bellows is also restricted by an international stop so that the forces resulting from the overpressure cannot be transmitted to the switching mechanism.

The parts of the sensor in contact with the medium are welded together without additional materials and the sensors contain no seals. Cu bellows which are used for low pressure ranges are soldered to the sensor housing. The sensor housing and all parts in the unit in contact with the medium can also be manufactured completely in stainless steel 1.4571 (series DNS). The individual data sheets contain exact data on materials.

Pressure connection

The pressure connection is designed in accordance with DIN 16288 for all pressure switches (pressure gauge connection G½ A). They can also be connected optionally to the interna thread G ¼ in accordance with ISO 228 Part 1. Max. screw-down depth on the internal thread G¼ = 9 mm. Differential pressure switches have two pressure connections (max. and min.) and must be connected to one internal thread G¼ each.

Design



1 = pressure connection
2 = measuring bellows
3 = sensor housing
4 = pressure pin
5 = switching rocker
6 = pivot points
7 = microswitch or other switching elements
8 = setpoint spring
9 = setting spindle (switching point setting)
10 = travelling nut (switching point indicator)
11 = adjusting screw for microswitch
12 = counterpressure spring

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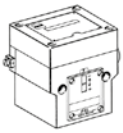
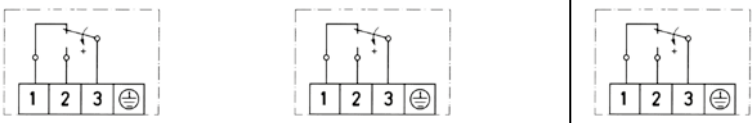
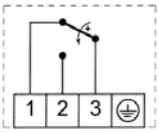
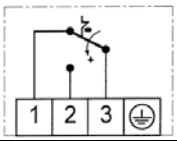
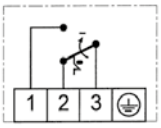
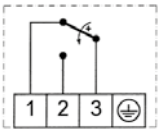
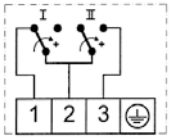
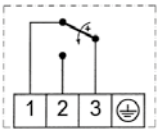
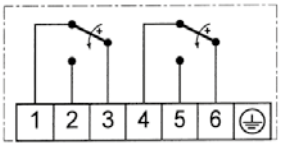
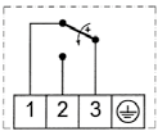
Technical Details	Valid for all pressure switches with microswitches of the DCM, VCM, DNM, DNS, DDC series. The technical data of the component tested units deviate partly slightly. (Please refer to model sheet)		
Version	**Normal version** Plug connection Terminal connection 		Ⓔx **-version** 
Switch housing	Aluminium die-cast GD Al Si 12		Aluminium die-cast GD Al Si 12
Pressure connection	G ½ external thread (pressure gauge connection) and G ¼ internal thread. Internal thread G ¼ at differential pressure switches DDCM.		
Switching function and connection drawing	(only for version with microswitch). Floating change-over contact. With rising pressure switching over single-pole from 3-1 to 3 - 2. 		
Switch capacity (applies only for version with microswitch)	8 A at 250 V_{AC} 5 A at 250 V_{AC} inductive 8 A at 24 V_{DC} 0.3 A at 250 V_{DC}	8 A at 250 V_{AC} 5 A at 250 V_{AC} inductive 8 A at 24 V_{DC} 0.3 A at 250 V_{DC}	3 A at 250 V_{AC} 2 A at 250 V_{AC} inductive 3 A at 24 V_{DC} 0.1 A at 250 V_{DC}
Installation position	Arbitrary preferably vertical. See data sheet		Vertical
Protection (in vertical position)	IP 54	IP 65	IP 65
Ex degree of protection			Ⓔx II 2G Ex d e IIC T6 Gb Ⓔx II 1/2D Ex ta/tb IIIC T80 °C Da/Db -20 °C ≤ T_a ≤ +60 °C
EC-Type Examination Certificate Number			IBExU13ATEX1125
Electrical connection	Plug connection or terminal connection		Terminal plug
Cable entry	Pg 11	M16 x 1.5	M16 x 1.5
Ambient temperature	See data sheets		-15 ... +60 °C
Switch point	Adjustable on the spindle. In switching mechanism 300 the terminal box lid must be removed.		Adjustable on the spindle after the terminal box is removed.
Switching difference	Adjustable or not adjustable (see model overview)		Not adjustable
Medium temperature	Max. 70 °C, temporary 85 °C		Max. 60 °C
	Higher medium temperatures are possible if the limit values mentioned above at the switching mechanism are ensured by suitable measures (e. g. siphon).		
Vacuum	All pressure switches can operate under vacuum, the device is not damaged by this. Exception: SCH-DCM 1000		
Repeat accuracy of the switching points	< 1% of the working range (for pressure ranges > 1 bar)		
Vibration strength	Up to 4 g no noteworthy deviations.		
Mechanical life	With sinusoidal pressure application and room temperature, 10 x 106 switching cycles. The expected life depends strongly upon the type of pressure application, therefore this figure can serve only as rough estimate. With pulsating pressure or pressure impacts in hydraulic systems, pressure surge reduction is recommanded.		
Isolation values	Overvoltage category III, contamination class 3, reference surge voltage 4000 V. The confirmity to DIN VDE 0110 is approved.		
Oil and grease-free	The parts of all pressure switches in contact with the medium are also available in oil and grease-free version. The sensors are hermetically encapsulated, they contain no seals.		

Option	Description	Connection diagram	Explanation
	Normal version microswitch, single pole switching over, switching differential not adjustable		all pressure switches
205	**Maximum limiter** with manual reset device. Interlocking with increasing pressure		DCM025…DCM63, DNM, VCM301…VCM095, DDCM, VNS, DNS, DGM
206	**Minimum limiter** with manual reset device. Interlocking with falling pressure		DCM06…DCM63, DNM, VCM301…VCM095, DDCM, VNS, DNS, DGM
213	**Gilded contacts** hysteresis not adjustable **Switching capacity** max. 24 V_{DC}, 100 mA min. 5 V_{DC}, 2 mA		DCM, DNM, VCM, VNM, DDCM, VNS, DNS, DWAM, DGM
217	**Two microswitches** switching in succession, 1 plug, adjustable switching interval. Specify switch diagram (not possible with SCH-DDCM-252, 652, 1602, 6002)		DCM025…DCM63, DNM, VCM301…VCM095, VNM, (DDCM), VNS, DNS
301	**Terminal connection instead of plug connection** protection IP 65		DCM, DNM, VCM, DDCM,VNS, DNS, DGM
307	**Two microswitches** switching in parallel or in succession. Terminal connection case, fixed switching interval (not possible with SCH-DDCM-252, 652, 1602, 6002)		DCM025…DCM63, DNM, VCM301…VCM095, VNM, (DDCM), VNS, DNS
970	**1 switch point fixed**		DCM, DNM, VCM, VNM, DDCM, VNS, DNS
971	**1 switch point fixed and sealed**		DCM, DNM, VCM, VNM, DDCM, VNS, DNS
972	**Switch point and hysteresis fixed**		DCMV, VCMV
973	**Switch point and hysteresis fixed and sealed**		DCMV, VCMV

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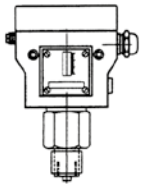
Switch diagram
Option 217

		Microswitch I (lower switch point)			
		A descending, closing	B rising, closing	C descending opening	D rising, opening
Microswitch II (upper switch point)	1 descending, closing	A1	B1	C1	D1
	2 rising, closing	A2	B2	C2	D2
	3 descending opening	A3	B3	C3	D3
	4 rising, opening	A4	B4	C4	D4

Pressure switches with special equipment can also be used in the **Ex area Zone 1**.



The following alternatives are possible:

Pressure switch with pressure-proof encapsulated switching device, degree of protection Ⓔx II 2G Ex d e IIC T6 Gb and **Ⓔx II 1/2D Ex ta/tb IIIC T80 °C Da/Db** -20 °C ≤ T_a ≤ +60 °C.

The pressure switch in pressure-proof encapsulation can be used directly in the Ex area (≥ Zone 1). Maximum switching voltage, switching capacity and ambient temperature must be taken into account and the rules for the installation in the Ex area must be observed.

All pressure switches can be equipped with Ex switching mechanisms.

Special circuits as well as versions with adjustable switching differences are not possible.

Order Example:

SCH-DCM 6 - 205

- Code of Switching unit (e. g. maximum limiter)
- Code of switching range
- Sensor system

Order specification:

Pressure switch
SCH-DCM 6-205

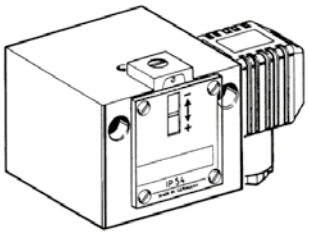
ATEX approvals

Model SCH-Ex... **II 2G Ex d e IIC T6 Gb**
II 1/2D Ex ta/tb IIIC T80 °C Da/Db
-20 °C ≤ T_a ≤ +60 °C

Switch housing with switching mechanisms

The switch housings consist of high quality and seawater-resistant aluminium diecastings.
Three versions are available:

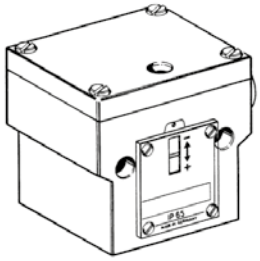
IP 54



Housing (normal version)

Plug connections to EN 175301;
Degree of protection IP 54;
Setpoint setting accessible from the outside.

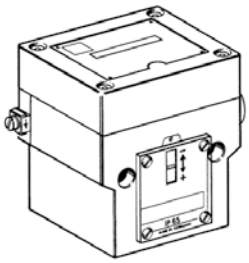
IP 65



Terminal connection (option: 301)

With terminal connection box;
Degree of protection IP 65;
Setpoint setting and terminal connections accessible only after removal of the terminal box lid.

IP 65



-Housing (Ex-de-version)

All pressure and differential pressure switches can be equipped with these switch housings and are thus approved for EX ≥ 1.
Degree of protection IP 65;
Ex degree of protection Ex-de IIC T6.

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In limiter functions it is frequently necessary to retain and lock the shutdown status and to release the lock and switch on the system again only after the causes that led to the safety shutdown have been eliminated.

There are two possibilities for this:

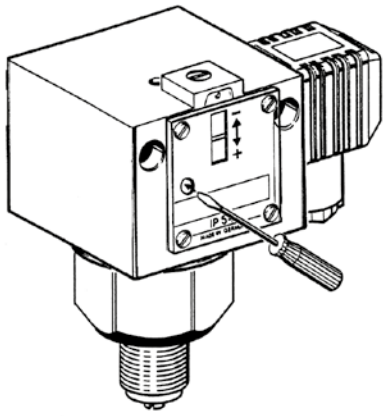
1. Mechanical lock inside the pressure switch

A "bistable" microswitch is built into the limiters instead of the microswitch with automatic reset.

When the value set on the scale is reached, the microswitch switches over and remains in this position. The lock must be released by pressing the unlocking button (marked by a red dot on the scale side of the switching device). According to version, the lock can be effective with rising or falling value. Unlocking can take place only if the pressure has dropped by a certain amount or, in the case of locking, has risen back to the lower switching point.

When the pressure limiter is selected, a distinction must be made between maximum pressure and minimum pressure monitoring.

Ex-versions cannot be delivered with internal locking.

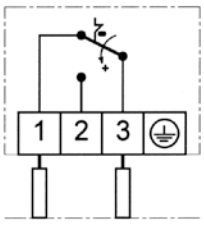


1.1 Maximum pressure limitation

Switching over and locking with rising pressure.

Option: 205

Connection to terminal 1 and 3.

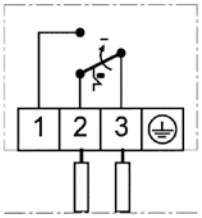


1.2 Minimum pressure limitation

Switching over and locking with falling pressure.

Option: 206

Connection to terminal 2 and 3.

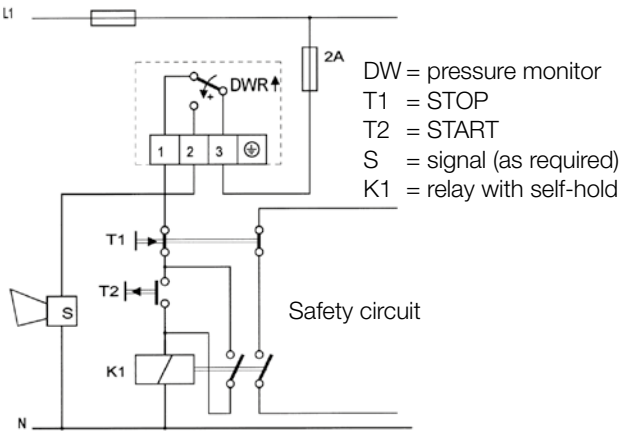


2. External electrical interlock in the switchgear cabinet (switching examples)

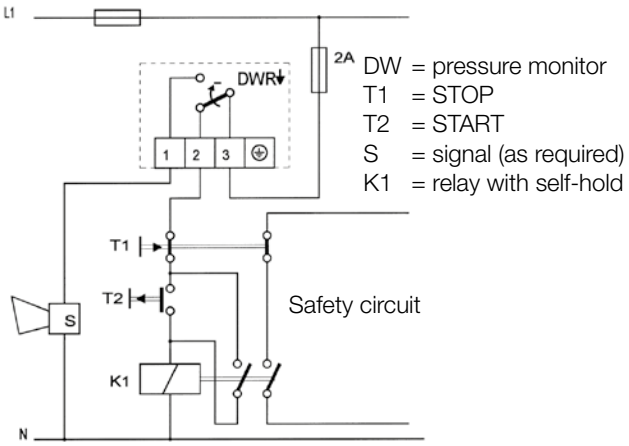
A pressure monitor (microswitch with automatic reset) can also be used as limiter if an electrical interlock is connected in series.

In pressure limitation in steam and hot water boilers, the external interlock is only permissible if it is ensured that the pressure monitor is of "special construction".

2.1 Maximum pressure limitation with external interlock



2.2 Minimum pressure limitation with external interlock



When the interlock circuit shown above is used, the requirements in accordance with DIN 57 116/VDE 0116 are fulfilled if the electrical equipment such as contactors or relays of the external interlock circuit correspond to VDE 0660 or VDE 0435 respectively.

Technical Details

Pressure connection: external thread G ½ A (pressure gauge connection) acc. to DIN 16 288 and internal thread G ¼ to ISO 228 part 1

Switching device: rugged housing of seawater resistant aluminium die-casting GD Al Si 12

Protection: IP 54, with vertical fitting position

Pressure sensing element:

DCM 3 … DCM 63
metal bellows: 1.4571
sensor casing: 1.4104

DCM 025-DCM 1
diaphragm: Cu
sensor casing: Cu + Ms

DCM 4016/DCM 4025
diaphragm: NBR
sensor casing: 1.4301

DCM 1000
membrane: NBR
sensor casing: Ms

Fitting position: vertically upwards and horizontal. DCM 4016 and 4025 vertically upwards

Max. ambient temperature at the switch unit: -25 … +70 °C
exception: DCM 4016, DCM 4025, DCM 1000: -15 … +60 °C

Max. temperature of the medium: The maximum temperature of the medium at the pressure sensor must not exceed the allowable temperature at the switching device. Temperatures up to 85 °C are allowable for short periods. Higher temperatures of the medium are possible, provided that the upper limit at the switching device is safeguarded by suitable measures (e. g. water tube trap).

Fitting: directly in the pressure line (pressure gauge connection) or on a flat surface with 2 - off 4 mm screws

Switching pressure: adjustable externally by means of screw-driver

Switching differential: Not adjustable in the case of DCM. Externally adjustable in the case of DCMV.
For values see summary of models.

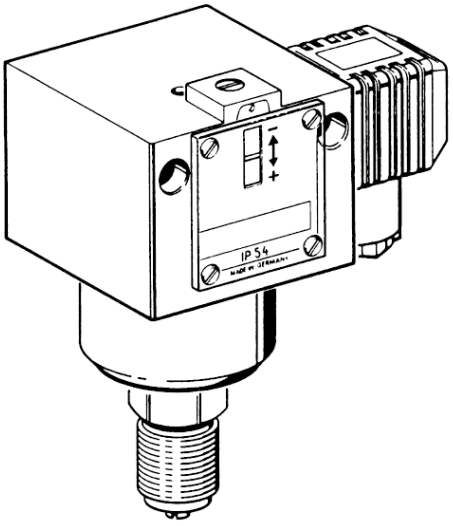
Methods of sealing: as required (may also be carried out after mounting)

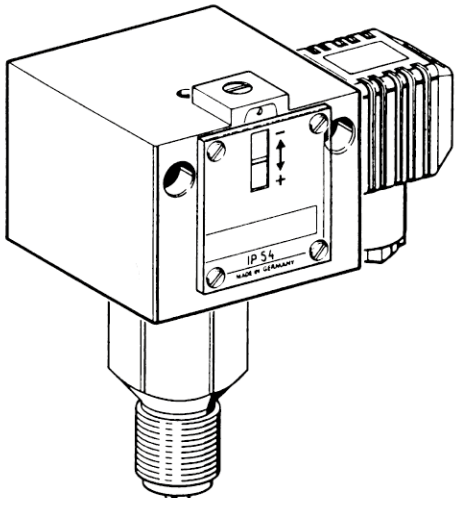
Adjustment: Scale value corresponds to the lower switching point, the upper switching point is higher by the switching differential

Contact agreement: single-pole change-over switch

Switching capacity:

	250 V_{AC}		250 V_{DC}	24 V_{DC}
	Ω	(ind)	Ω	Ω
Normal	8A	5A	0.3A	8A





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Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Material	Dimensional drawing
Switching difference not adjustable					
SCH-DCM 4016	1 ... 16 mbar	2 mbar	1 bar	NBR + 1.4301	1 + 11
SCH-DCM 4025	4 ... 25 mbar	2 mbar	1 bar	NBR	1 + 11
SCH-DCM 1000	10 ... 100 mbar	12 mbar	10 bar	NBR + MS	1 + 10
SCH-DCM 025	0.04 ... 0.25 bar	0.03 bar	6 bar	Cu + Ms	1 + 14
SCH-DCM 06	0.1 ... 0.6 bar	0.04 bar	6 bar	Cu + Ms	1 + 14
SCH-DCM 1	0.2 ... 1.6 bar	0.04 bar	6 bar	Cu + Ms	1 + 14
SCH-DCM 3	0.2 ... 2.5 bar	0.1 bar	16 bar	1.4104 + 1.4571	1 + 18
SCH-DCM 6	0.5 ... 6 bar	0.15 bar	16 bar	1.4104 + 1.4571	1 + 18
SCH-DCM 625	0.5 ... 6 bar	0.25 bar	25 bar	1.4104 + 1.4571	1 + 17
SCH-DCM 10	1 ... 10 bar	0.3 bar	25 bar	1.4104 + 1.4571	1 + 17
SCH-DCM 16	3 ... 16 bar	0.5 bar	25 bar	1.4104 + 1.4571	1 + 17
SCH-DCM 25	4 ... 25 bar	1 bar	60 bar	1.4104 + 1.4571	1 + 16
SCH-DCM 40	8 ... 40 bar	1.3 bar	60 bar	1.4104 + 1.4571	1 + 16
SCH-DCM 63	16 ... 63 bar	2 bar	130 bar	1.4104 + 1.4571	1 + 16
SCH-DCMV 025	0.04 ... 0.25 bar	0.03 ... 0.04 bar	6 bar	Cu + Ms	1 + 14
SCH-DCMV 1	0.2 ... 1.6 bar	0.07 ... 0.55 bar	6 bar	Cu + Ms	1 + 14
SCH-DCMV 625	0.5 ... 6 bar	0.25 ... 2 bar	25 bar	1.4104 + 1.4571	1 + 17
SCH-DCMV 63	16 ... 63 bar	3.0 ... 10 bar	130 bar	1.4104 + 1.4571	1 + 16
Switching difference adjustable					
SCH-DCMV 06	0.1 ... 0.6 bar	0.04 ... 0.5 bar	6 bar	Cu + Ms	1 + 14
SCH-DCMV 3	0.2 ... 2.5 bar	0.15 ... 1.5 bar	16 bar	1.4104 + 1.4571	1 + 18
SCH-DCMV 6	0.5 ... 6 bar	0.25 ... 2.0 bar	16 bar	1.4104 + 1.4571	1 + 18
SCH-DCMV 10	1 ... 10 bar	0.5 ... 2.8 bar	25 bar	1.4104 + 1.4571	1 + 17
SCH-DCMV 16	3 ... 16 bar	0.7 ... 3.5 bar	25 bar	1.4104 + 1.4571	1 + 17
SCH-DCMV 25	4 ... 25 bar	1.3 ... 6.0 bar	60 bar	1.4104 + 1.4571	1 + 16
SCH-DCMV 40	8 ... 40 bar	2.6 ... 6.6 bar	60 bar	1.4104 + 1.4571	1 + 16
For smaller pressure ranges see also VCM, DGM, HCD and PSB data sheets. Options see data sheet switch units / optional function /connection diagrams.					

Order specification

Pressure switch with plug connection, housing of aluminium die-casting
adjustment range from … to … bar / mbar
Switching differential adjustable / none adjustable
Model…

Technical Details

Pressure connection: external thread G ½ A (pressure gauge connection) acc. to DIN 16 288 and internal thread G ¼ to ISO 228 part 1

Switching device: rugged housing of seawater resistant aluminium die-casting GD Al Si 12

Protection: IP 54, with vertical fitting position
IP 65, with Ex-de-version

Pressure sensing element: sensor casing: 1.4104
pressure bellows: 1.4571

Fitting position: vertically upwards and horizontal

Max. ambient temperature at the switch unit: -25 … +70 °C
Ex-de-versions: -15 ... 60 °C

Max. temperature of the medium: The maximum temperature of the medium at the pressure sensor must not exceed the allowable temperature at the switching device. Temperatures up to 85 °C are allowable for short periods (not Ex-de). Higher temperatures of the medium are possible, provided that the upper limit at the switching device is safeguarded by suitable measures (e. g. water tube trap).

Fitting: directly in the pressure line (pressure gauge connection) or on a flat surface with 2 - off 4 mm screws

Switching pressure: adjustable externally by means of screw-driver

Switching differential: not adjustable in the case of DNM and Model Ex-DNM

Methods of sealing: as required (may also be carried out after mounting)

Adjustment: Scale value corresponds to the lower switching point, the upper switching point is higher by the switching differential.

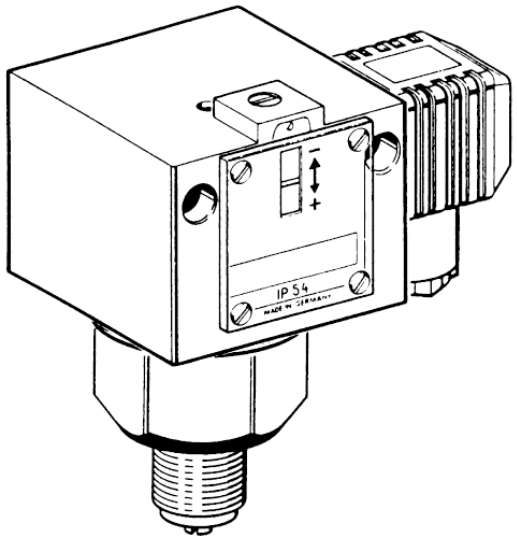
Contact agreement: single-pole change-over switch

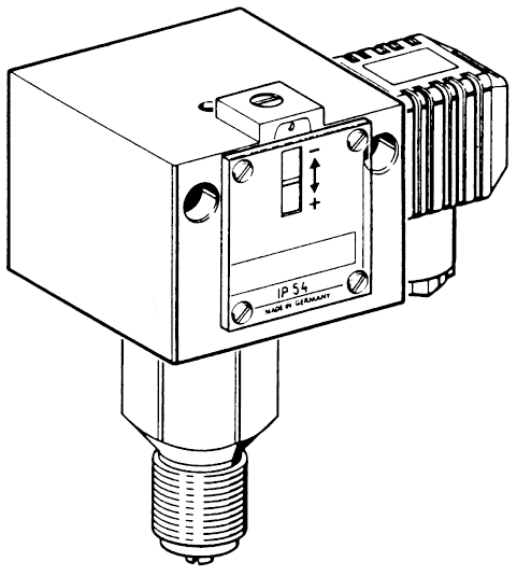
Switching capacity:

	250 V_{AC}		250 V_{DC}	24 V_{DC}
	Ω	(ind)	Ω	Ω
Normal	8A	5A	0.3A	8A
Ex-de	3A	2A	0.03A	3A

All parts of the SCH-DNM series of pressure switches which come into contact with the medium are made of stainless steel. The pressure sensor is welded by the most up-to-date method without added material.

The aluminium switch housing has a high resistance to the corrosive effects of the ambient atmosphere.





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Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
Switching difference not adjustable				
SCH-DNM 025	0.04 ... 0.25 bar	0.03 bar	6 bar	1 + 15
Switching difference not adjustable **II 2G Ex d e IIC T6 Gb** and **II 1/2D Ex ta/tb IIIC T80 °C Da/Db** -20 °C ≤ T_a ≤ +60 °C				
SCH-Ex-DNM 025	0.04 ... 0.25 bar	30 mbar	6 bar	4 + 15
SCH-Ex-DNM 1	0.2 ... 1.6 bar	60 mbar	6 bar	4 + 15
SCH-Ex-DNM 3	0.2 ... 2.5 bar	100 mbar	16 bar	4 + 18
SCH-Ex-DNM 6	0.5 ... 6.0 bar	0.20 bar	16 bar	4 + 18
SCH-Ex-DNM 625	0.5 ... 6.0 bar	0.25 bar	25 bar	4 + 17
SCH-Ex-DNM 10	1 ... 10 bar	0.3 bar	25 bar	4 + 17
SCH-Ex-DNM 16	3 ... 16 bar	0.5 bar	25 bar	4 + 17
SCH-Ex-DNM 25	4 ... 25 bar	1.0 bar	63 bar	4 + 16
SCH-Ex-DNM 40	10 ... 40 bar	1.3 bar	63 bar	4 + 16
SCH-Ex-DNM 63	16 ... 63 bar	1.0 bar	130 bar	4 + 16

Options see data sheet switch units / optional function /connection diagrams.

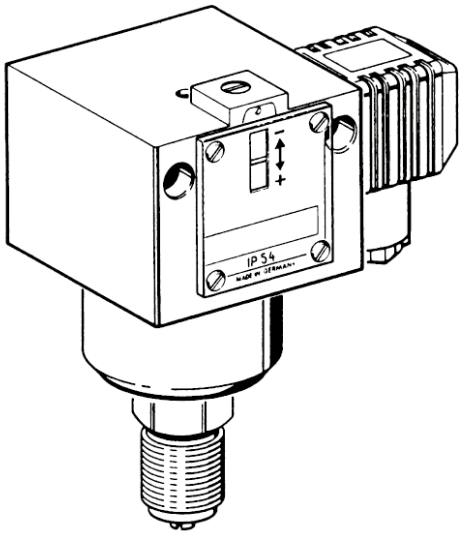
Technical Details

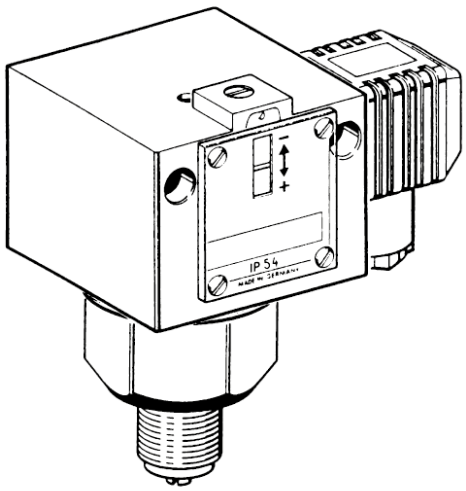
Pressure connection:	external thread G ½ A (pressure gauge connection) acc. to DIN 16 288 and internal thread G ¼ to ISO 228 part 1
Switching device:	rugged housing of seawater resistant aluminium die-casting GD Al Si 12
Protection:	IP 54, with vertical fitting position
Pressure sensing element:	VNM111 and VNM301 metal bellows: 1.4571 sensor casing: 1.4104 VCM095, 101 and 301: metal bellows: Cu Zn sensor casing: CuZn VCM4156 diaphragm: NBR sensor casing: 1.4301
Fitting position:	vertically upwards and horizontal VCM 4156 vertically upwards
Max. ambient temp. at the switch unit:	-25 … +70 °C
Max. temperature of the medium:	The maximum temperature of the medium at the pressure sensor must not exceed the allowable temperature at the switching device. Temperatures up to 85 °C are allowable for short periods (not Ex-de). Higher temperatures of the medium are possible, provided that the upper limit at the switching device is safeguarded by suitable measures (e. g. water tube trap).
Fitting:	Directly in the pressure line (pressure gauge connection) or on a flat surface with 2 - off 4 mm screws.
Switching pressure:	adjustable externally by means of screw-driver
Switching differential:	not adjustable in the case of models VCM, VNM and model VNV externally adjustable in the case of model VCMV for values see summary of models
Methods of sealing:	as required (may also be carried out after mounting)
Adjustment:	Scale value corresponds to the lower switching point, the upper switching point is higher by the switching differential.
Contact agreement:	single-pole change-over switch

Switching capacity:

	250 V_{AC}		250 V_{DC}	24 V_{DC}
	Ω	(ind)	Ω	Ω
Normal	8A	5A	0.3A	8A

The Negative Pressure Switches detect the pressure differencerelative to the atmospheric pressure. All data on switchingpressure ranges and therefore also the scala divisionson the switch units are to be understood at the difference inpressure between the atmospheric pressure at any one timeand the set switching pressure. The "zero" reference point on the scale of the unit correspondsto the atmospheric pressure at the time. The minussign »–« by the indicated pressure stand for under-pressurebelow the respective atmospheric pressure.





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Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
Switching difference not adjustable				
SCH-VCM 4156	-15 ... +6 mbar	2 mbar	1 bar	1 + 11
SCH-VCM 301	-250 ... +100 mbar	25 mbar	1.5 bar	1 + 13
SCH-VNM 301	-250 ... +100 mbar	45 mbar	3 bar	1 + 15
SCH-VCM 101	-1* ... +0.1 bar	45 mbar	3 bar	1 + 14
SCH-VCM 095	-0.9 ... +0.5 bar	50 mbar	3 bar	1 + 14
SCH-VNM 111	-1* ... +0.1 bar	50 mbar	6 bar	1 + 15
SCH-VNMV 301	-250 ... +100 mbar	70 ... 500 mbar	3 bar	1 + 15
SCH-VCMV 101	-1* ... +0.1 bar	80 ... 350 mbar	3 bar	1 + 14
SCH-VCMV 095	-0.9 ... +0.5 bar	90 ... 400 mbar	3 bar	1 + 14
SCH-VNMV 111	-1* ... +0.1 bar	90 ... 650 mbar	6 bar	1 + 15
Switching difference adjustable				
SCH-VCMV 301	-250 ... +100 mbar	30 ... 200 mbar	1.5 bar	1 + 13
Switching difference not adjustable **II 2G Ex d e IIC T6 Gb** and **II 1/2D Ex ta/tb IIIC T80 °C Da/Db** -20 °C ≤ T_a ≤ +60 °C				
SCH-Ex-VCM 301	-250 ... +100 mbar	25 mbar	1.5 bar	4 + 13
SCH-Ex-VCM 101	-1* ... + 0.1 bar	45 mbar	3 bar	4 + 14

* In the case of very high vacuum, close to the negative pressure of -1 bar which is only theoretically possible, the switch can be adjusted only with reservations on account of the special conditions of vacuum technology. The pressure switch itself however, will not be damaged at maximum negative pressure.

Options see data sheet switch units / optional function /connection diagrams.
For small pressure ranges see HCD data sheet.

Technical Details

Pressure connection: internal thread G¼

Switching device: rugged housing of seawater resistant aluminium die-casting GD Al Si 12

Protection: IP 54, with vertical fitting position

Pressure sensing element: DDCM 014-16:
pressure bellows: 1.4571
sensor casing: 1.4305
DDCM 252-6002:
diaphragm: NBR.
sensor casing: aluminium

Fitting position: optional, preferably vertically upwards

Max. ambient temperature at the switch unit: -25…+70 °C

Max. temperature of the medium: The maximum temperature of the medium at the pressure sensor must not exceed the allowable temperature at the switching device. Temperatures up to 85 °C are allowable for short periods. Higher temperatures of the medium are possible, provided that the upper limit at the switching device is safeguarded by suitable measures (e. g. water tube trap).

Fitting: directly in the pressure line (pressure gauge connection) or on a flat surface with 2 - off 4 mm screws
S (-) = lower pressure
P (+) = higher pressure

Switching pressure: adjustable externally by means of screw-driver

Switching differential: not adjustable,
for values see summary of model

Methods of sealing: as required (may also be carried out after mounting)

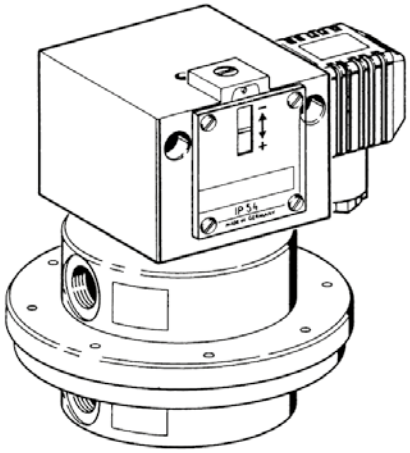
Adjustment: Scale value corresponds to the lower switching point, the upper switching point is higher by the switching differential.

Scale: models 252-6002 without graduation, adjustment with a pressure gauge

Switching capacity:

	250 V_{AC}		250 V_{DC}	24 V_{DC}
	Ω	(ind)	Ω	Ω
Normal	8A	5A	0.3A	8A

The SCH-DDCM differential pressure monitors are suitable for monitoring and controlling differential pressures, flow monitoring and automatic checking of filter plants. A double chamber system with stainless steel bellows resp. NBR diaphragm accurately detects the difference between the two applied pressures. The differential pressure to be monitored is infinetely adjustable within the ranges mentioned in the summary of models. The settings relate to the lower switching point (in the case of falling differential pressure); the upper switching point (in the case of rising differential pressure) is the value of the switching differential higher. All differential pressure control switches can also be used in the negative pressure area. Every pressure switch has two pressure connections.



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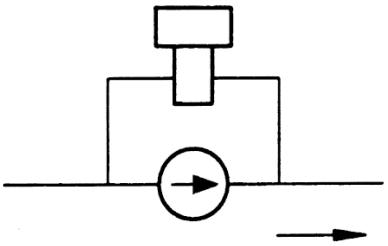
Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
Switching difference not adjustable				
SCH-DDCM 252*	4 ... 25 mbar	2 mbar	0.5 bar	1 + 20
SCH-DDCM 662*	10 ... 60 mbar	15 mbar	1.5 bar	1 + 20
SCH-DDCM 1602*	20 ... 160 mbar	20 mbar	3 bar	1 + 20
SCH-DDCM 6002*	100 ... 600 mbar	35 mbar	3 bar	1 + 20
SCH-DDCM 014*	-0.1 ... 0.4 bar	0.15 bar	15 bar	1 + 21
SCH-DDCM 1	0.2 ... 1.6 bar	0.13 bar	15 bar	1 + 21
SCH-DDCM 4*	1 ... 4 bar	0.2 bar	25 bar	1 + 21
SCH-DDCM 6	0.5 ... 6 bar	0.2 bar	15 bar	1 + 21
SCH-DDCM 16	3 ... 16 bar	0.6 bar	25 bar	1 + 21

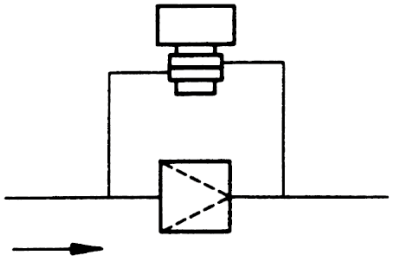
* Without graduation, only +/- scale

Options see data sheet switch units / optional function /connection diagrams.
For small pressure ranges see HCD data sheet.

Example for application



Pump monitoring



Filter monitoring

Order specification

Differential pressure monitor with plug connection, casing of die-cast aluminium
Sensor casing of stainless steel / aluminium
Range of adjustment …to … bar / mbar
Model …

Technical Details

Pressure connection: external thread G ½ A (pressure gauge connection) acc. to DIN 16288 and internal thread G ¼ to ISO 228 part 1

Switching device: rugged housing of seawater resistant aluminium die-casting GD Al Si 12

Protection: IP 54, with vertical fitting position
IP 65, with Ex-de-version

Pressure sensing element: pressure bellow, and all parts connected to media:
X 6 Cr Ni Mo Ti 17 122
material No. 1.4571

Fitting position: vertically upwards and horizontal

Max. ambient temperature at the switch unit: -25 … +70 °C
Ex-de-version: -15 … +60 °C

Max. temperature of the medium: The maximum temperature of the medium at the pressure sensor must not exceed the allowable temperature at the switching device. Temperatures up to 85 °C are allowable for short periods (not Ex-de). Higher temperatures of the medium are possible, provided that the upper limit at the switching device is safeguarded by suitable measures (e. g. water tube trap).

Fitting: directly in the pressure line (pressure gauge connection) or on a flat surface with 2 - off 4 mm screws

Switching differential: for values see summary of models

Methods of sealing: as required (may also be carried out after mounting)

Adjustment: Scale value corresponds to the lower switching point, the upper switching point is higher by the switching differential

Contact agreement: single-pole change-over switch

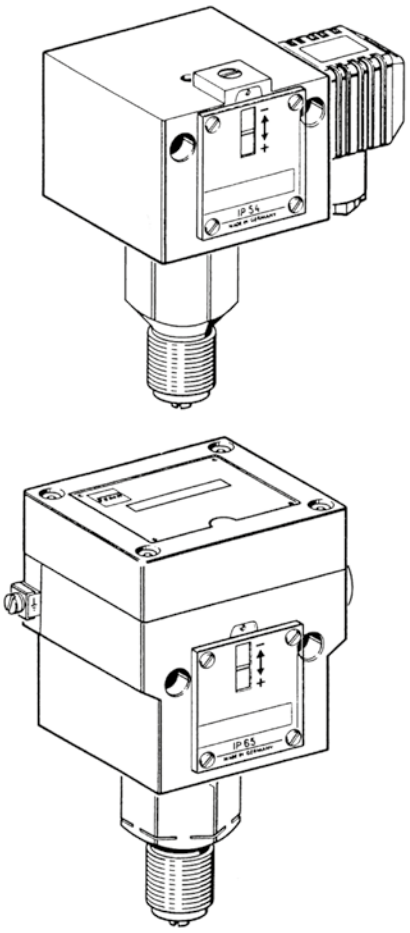
Switching capacity:

	250 V_{AC}		250 V_{DC}	24 V_{DC}
	Ω	(ind)	Ω	Ω
Normal	8A	5A	0.3A	8A
Ex-de	3A	2A	0.03A	3A

Plastic coating: The die-cast aluminum housing is chromed and coated with chemical resistant plastic. This coating wad tested for 20 days with a 3% NaCl solution. During this test, the temperature was changed 30 times between +10 … 80 °C. The quality of the coating was not changed during this test.

The pressure switches of series DNS are suitable for monitoring and controlling pressures in devices of the chemical industry and in the process engineering as well as wherever the pressure of aggressive liquids and gases has to be monitored.

All component parts of the sensor system are made of stainless steel (1.4571) and are welded by using the latest techniques without additional materials. The pressure sensor is hermetically encapsulated and does not contain any seal material.



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Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
Switching difference not adjustable				
SCH-VNS 301–201	-250 ... +100 mbar	45 mbar	3 bar	1 + 15
SCH-VNS 111–201	-1* ... + 0.1 bar	50 mbar	6 bar	1 + 15
SCH-DNS 025–201	0.04 ... 0.25 bar	30 mbar	6 bar	1 + 15
SCH-DNS 06–201	0.1 ... 0.6 bar	40 mbar	6 bar	1 + 15
SCH-DNS 1–201	0.2 ... 1.6 bar	60 mbar	6 bar	1 + 15
SCH-DNS 3–201	0.2 ... 2.5 bar	0,1 bar	16 bar	1 + 18
SCH-DNS 6–201	0.5 ... 6 bar	0.15 bar	16 bar	1 + 18
SCH-DNS 10–201	1 ... 10 bar	0.3 bar	16 bar	1 + 16
SCH-DNS 16–201	3 ... 16 bar	0.5 bar	25 bar	1 + 16
Housing with surface protection				
SCH-VNS 301–351	-250 ... +100 mbar	45 mbar	3 bar	2 + 15
SCH-VNS 111-351	-1* ... + 0.1 bar	50 mbar	6 bar	2 + 15
SCH-DNS 025–351	0.04 ... 0.25 bar	30 mbar	6 bar	2 + 15
SCH-DNS 06–351	0.1 ... 0.6 bar	40 mbar	6 bar	2 + 15
SCH-DNS 1–351	0.2 ... 1.6 bar	60 mbar	6 bar	2 + 15
SCH-DNS 3–351	0.2 ... 2.5 bar	0.1 bar	16 bar	2 + 18
SCH-DNS 6–351	0.5 ... 6 bar	0.15 bar	16 bar	2 + 18
SCH-DNS 10–351	1 ... 10 bar	0.3 bar	16 bar	2 + 16
SCH-DNS 16–351	3 ... 16 bar	0.5 bar	25 bar	2 + 16
II 2G Ex d e IIC T6 Gb and **II 1/2D Ex ta/tb IIIC T80 °C Da/Db** -20 °C ≤ T_a ≤ +60 °C				
SCH-Ex-VNS 111	-1* ... + 0.1 bar	50 mbar	6 bar	4 + 15
SCH-Ex-DNS 3	0.2 ... 2.5 bar	0,1 bar	16 bar	4 + 18
SCH-Ex-DNS 10	1 ... 10 bar	0.3 bar	16 bar	4 + 16

* In the case of very high vacuum, close to the negative pressure of -1 bar which is only theoretically possible, the switch can be adjusted only with reservations on account of the special conditions of vacuum technology. The pressure switch itself however, will not be damaged at maximum negative pressure.

Options see data sheet switch units / optional function /connection diagrams

Technical Details

Pressure connection: external thread G ½ A acc. to DIN ISO 228 Part 1 (permissible only with flat gasket) and internal thread G ¼ acc. to ISO 228 Part 1 (permissible up to 4 bar)

Switching device: sea water resistant aluminium die casting GD Al Si 12

Protection: IP 54, for vertical installation position

Materials of the pressure probe: see summary of models

Ambient temperature: - 25 ... + 60 °C
At ambient temperatures below 0 °C, ensure that no condensation water can rise on the inside of the sensor and in the switching device.

Max. permissible operating pressure: see summary of models

Fitting: either directly on the pipeline or with 2 screws 4 mm Ø on the wall surface

Fitting position: vertical upwards or horizontal

Adjustment: Continuously adjustable by means of screw-driver on the adjusting spindle.
The set switching difference is visible in the scale window.

Possibility of lead sealing: on request (can also be fitted subsequently)

Switching differences: Largely independent of the set switching pressure. Not adjustable. For values see summary of models.

Adjustment: Scale value corresponds to the upper switching point, the lower switching point is lower by the switching difference.

Switching capacity:

	250 V_{AC}		250 V_{DC}	24 V_{DC}
	Ω	(ind)	Ω	Ω
Normal	8A	5A	0.3A	8A

Pressure measuring connection: It must be ensured that a pressure measuring connection is available at a suitable place on the gas appliance.

Model	Range of adjustment	Hysteresis (Mean value)	Max. operating pressure	Materials in contact with medium	Dimensional drawing
Switching difference not adjustable					
SCH-DGM 306	15 ... 60 mbar	6 mbar	0.8 bar	Cu + Ms	1 + 13
SCH-DGM 310	20 ... 100 mbar	7 mbar	0.8 bar	Cu + Ms	1 + 13
SCH-DGM 325	40 ... 250 mbar	10 mbar	0.8 bar	Cu + Ms	1 + 13
SCH-DGM 06	100 ... 600 mbar	25 mbar	2 bar	Cu + Ms	1 + 14
SCH-DGM 1	0.2 ... 1.6 bar	40 mbar	3 bar	Cu + Ms	1 + 14
SCH-DGM 506	15 ... 60 mbar	8 mbar	5 bar	1.4104	1 + 12
SCH-DGM 516	40 ... 160 mbar	12 mbar	5 bar	1.4104	1 + 12
SCH-DGM 525	100 ... 250 mbar	20 mbar	5 bar	1.4104	1 + 12

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Applications

Adjustable differential pressure switch for monitoring over-pressure, vacuum and differential pressure of air or other non-combustible, non-aggressive gases. Possible fields of application include:

- Monitoring air filters and ventilators
- Monitoring industrial cooling-air circuits
- Overheating protection for fan heaters
- Monitoring flows in ventilation ducts
- Controlling air and fire-protection flaps
- Frost protection for heat exchangers

Versions

With this pressure switch the switching pressure can be adjusted without a pressure gauge using a scaled adjustment knob. The switching differential can also be adjusted with a screwdriver.

Type	Adjustment range for upper switching pressure [Pascal]	Switching differential set to [Pascal]	Tolerance for upper and lower switching pressure
SCH-PSB-0300	20 ... 300	10	±15%
SCH-PSB-0500	50 ... 500	20	±15%
SCH-PSB-1000	200 ... 1000	100	±15%

Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards. If the switches are installed horizontally with AMP connection terminals uppermost, the switching values are approximately 20 Pa higher.

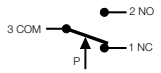
Technical Details

Maximum operating pressure:	10 kPa for all pressure ranges
Medium:	air, non-combustible and non-aggressive gases

Temperature range

Medium and ambient temperature:	-20 °C ... +70 °C (limited from +85 °C to +70 °C due to PVC-hose)
Storage temperature:	-40 °C ... +70 °C (limited from +85 °C to +70 °C due to PVC-hose)
Diaphragm material:	silicone, tempered at 200 °C getempert, free of gas emissions
Pressure connections:	2 plastic pipe connection pieces (P1 and P2), external diameter 6.0 mm: P1 for connection to higher pressure (marked +); P2 for connection to lower pressure (marked –)

Housing materials

Switch body:	PA 6.6
Cover:	PS
Weight:	150 g
Mechanical working life:	over 10^6 switching operations.
Electrical rating:	max. 1.0 A (0.4 A) / 250 V_{AC}
Electrical connections:	AMP flat plug 6.3 x 0.8 mm acc. to DIN 46244 or push-on screw terminals. Cable conduit with cable strain relief.
Cable entry:	cap nut conduit AF20
Mounting:	with fastening lugs
Arrangement of contacts:	 1 Break contact 2 Operating contact 3 Power supply line
Protection:	IP 54

Order Details (Example: **SCH-PSB-0300**)

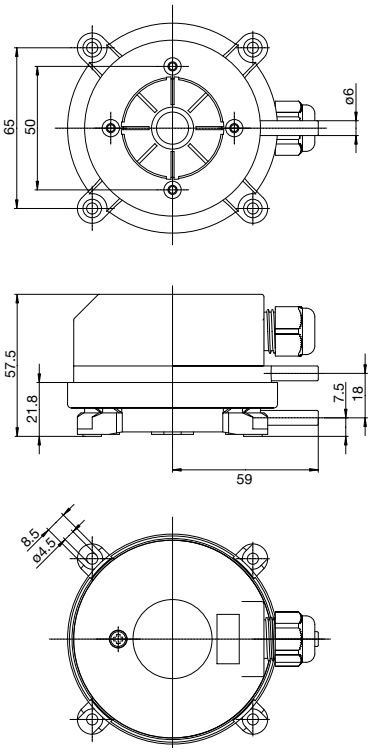
Model	Pressure ranges [Pascal]
SCH-PSB-	**...0300** = 20 ... 300 **...0500** = 50 ... 500 **...1000** = 200 ... 1000

Accessories included in scope of delivery

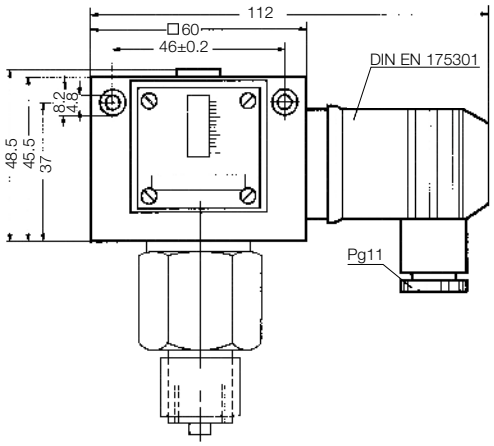
2 m PVC hose and 2 plastic tubes made of ABS

Set consisting of three push-on screw terminals

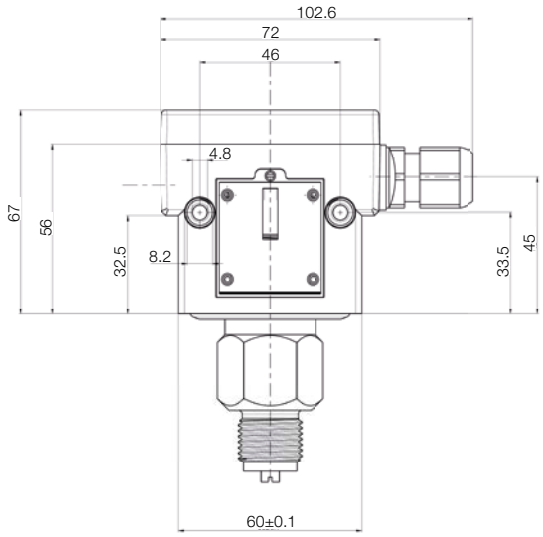
Dimensions [mm]



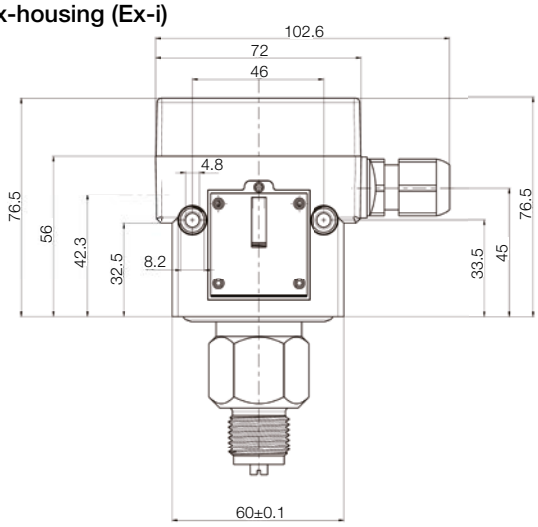
1 Standard housing



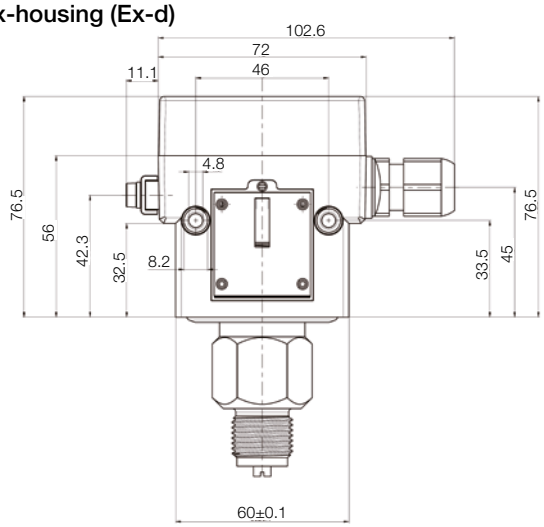
2 Terminal connection housing



3 Ex-housing (Ex-i)



4 Ex-housing (Ex-d)



Dimensional Drawings of Pressure Sensors

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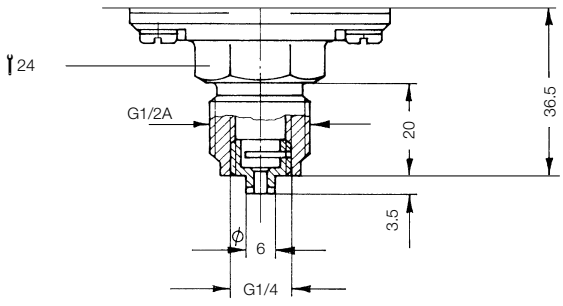

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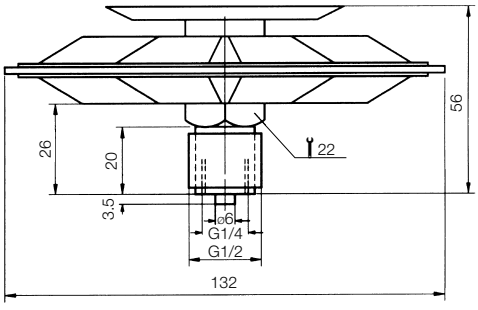

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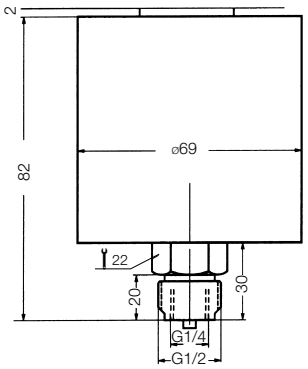

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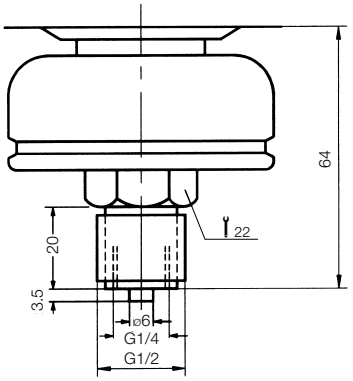

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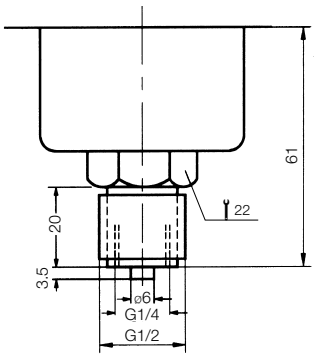

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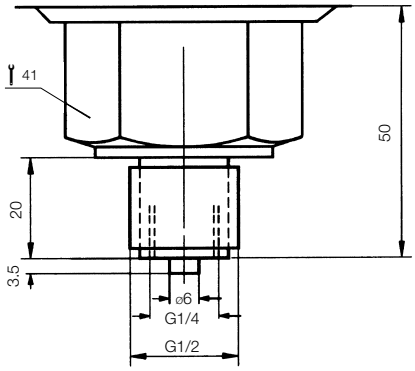
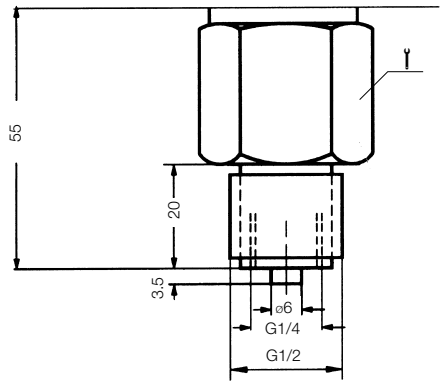
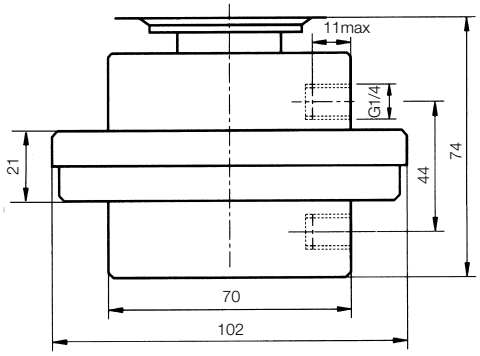


16-19



Dimensional drawing	
16	22
17	24
18	30
19	32

20



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