



## 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 1/2, G 1/4



P3

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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

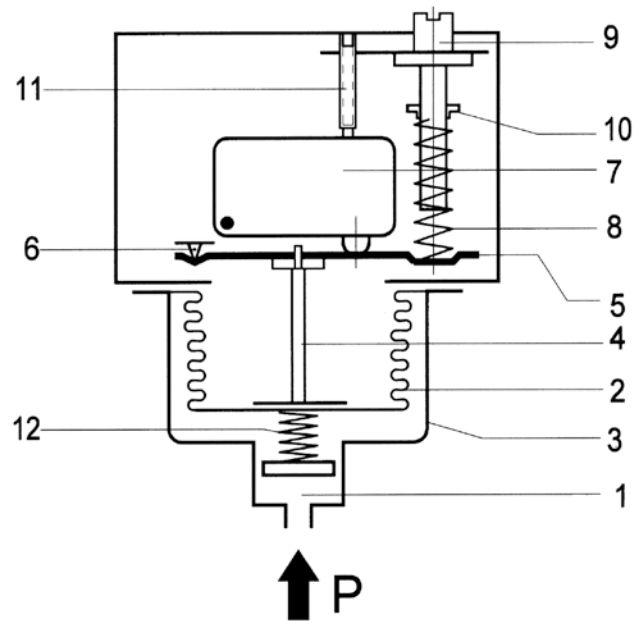
With few exceptions in the low pressure range, all pressure sensors are equipped with measuring bellows, partly made of a copper alloy but mostly in high stainless steel quality (1.4571). In comparison with the permissible values, the measuring bellows are subject to low loads and move only slightly. 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.

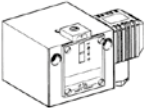

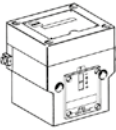
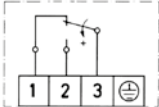
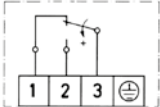
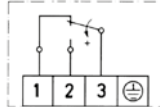
### Pressure connection

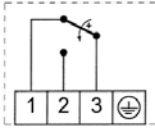
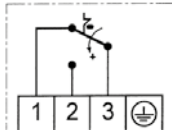
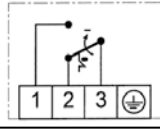
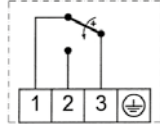
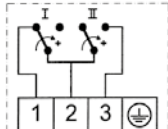
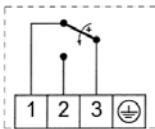

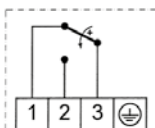
The pressure connection is designed in accordance with DIN 16288 for all pressure switches (pressure gauge connection G ½ A). They can also be connected optionally to the internal thread G ¼ in accordance with ISO 228 Part 1. Max. screw-down depth on the internal thread G ¼ = 9 mm. Differential pressure switches have two pressure connections (max. and min.) and must be connected to one internal thread G ¼ 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

<b>Technical Details</b>	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)		
<b>Version</b>	<b>Normal version</b> Plug connection 	Terminal connection 	<b>Ex -version</b> 
<b>Switch housing</b>	Aluminium die-cast GD Al Si 12		Aluminium die-cast GD Al Si 12
<b>Pressure connection</b>	G 1/2 external thread (pressure gauge connection) and G 1/4 internal thread. Internal thread G 1/4 at differential pressure switches DDCM.		
<b>Switching function and connection drawing</b>	(only for version with microswitch). Floating change-over contact. With rising pressure switching over single-pole from 3-1 to 3 - 2.   		
<b>Switch capacity</b> (applies only for version with microswitch)	8 A at 250 V <sub>AC</sub> 5 A at 250 V <sub>AC</sub> inductive 8 A at 24 V <sub>DC</sub> 0.3 A at 250 V <sub>DC</sub>	8 A at 250 V <sub>AC</sub> 5 A at 250 V <sub>AC</sub> inductive 8 A at 24 V <sub>DC</sub> 0.3 A at 250 V <sub>DC</sub>	3 A at 250 V <sub>AC</sub> 2 A at 250 V <sub>AC</sub> inductive 3 A at 24 V <sub>DC</sub> 0.1 A at 250 V <sub>DC</sub>
<b>Installation position</b>	Arbitrary preferably vertical. See data sheet		Vertical
<b>Protection</b> (in vertical position)	IP 54	IP 65	IP 65
<b>Ex degree of protection</b>	Ex II 2G Ex d e IIC T6 Gb Ex II 1/2D Ex ta/tb IIIC T80°C Da/Db -20°C ≤ T <sub>a</sub> ≤ +60°C		
<b>EC-Type Examination Certificate Number</b>			IBExU13ATEX1125
<b>Electrical connection</b>	Plug connection or terminal connection		Terminal plug
<b>Cable entry</b>	Pg 11	M16 x 1.5	M16 x 1.5
<b>Ambient temperature</b>	See data sheets		-15 ... +60 °C
<b>Switch point</b>	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.
<b>Switching difference</b>	Adjustable or not adjustable (see model overview)		Not adjustable
<b>Medium temperature</b>	Max. 70 °C, temporary 85 °C		Max. 60 °C
<b>Vacuum</b>	Higher medium temperatures are possible if the limit values mentioned above at the switching mechanism are ensured by suitable measures (e. g. siphon).		
<b>Repeat accuracy of the switching points</b>	All pressure switches can operate under vacuum, the device is not damaged by this. Exception: SCH-DCM 1000		
<b>Repeat accuracy of the switching points</b>	< 1% of the working range (for pressure ranges > 1 bar)		
<b>Vibration strength</b>	Up to 4 g no noteworthy deviations.		
<b>Mechanical life</b>	With sinusoidal pressure application and room temperature, 10 x 10 <sup>6</sup> 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 recommended.		
<b>Isolation values</b>	Overvoltage category III, contamination class 3, reference surge voltage 4000 V. The conformity to DIN VDE 0110 is approved.		
<b>Oil and grease-free</b>	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
	<b>Normal version</b> microswitch, single pole switching over, switching differential not adjustable		all pressure switches
205	<b>Maximum limiter</b> with manual reset device. Interlocking with increasing pressure		DCM025...DCM63, DNM, VCM301...VCM095, VNM, DDCM, VNS, DNS, DGM
206	<b>Minimum limiter</b> with manual reset device. Interlocking with falling pressure		DCM025...DCM63, DNM, VCM301...VCM095, VNM, DDCM, VNS, DNS, DGM
213	<b>Gilded contacts</b> Hysteresis not adjustable  <b>Switching capacity</b> max. 24 V <sub>DC</sub> , 100 mA min. 5 V <sub>DC</sub> , 2 mA		DCM, DNM, VCM, VNM, DDCM, VNS, DNS, DWAM, DGM
217	<b>Two microswitches</b> 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	<b>Terminal connection instead of plug connection</b> Protection IP 65		DCM, DNM, VCM, VNM, DDCM, VNS, DNS, DGM
307	<b>Two microswitches</b> 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	<b>1 switch point fixed</b>		DCM, EX-DCM, DNM, EX-DNM, VCM, VNM, DDCM, EX-DDCM, VNS, EXVNS, DNS, EX-DNS, DGM, EX-VCM
972	<b>Switch point and Hysteresis fixed</b>		DCMV, VCMV, VNMV

Switch diagram  
Option 217

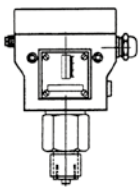
		Microswitch I (lower switch point)			
		A descending, closing	B rising, closing	C descending opening	D rising, opening
Microswitch II (upper switch point)	1 descending, closing	A1	B1	C1	D1
	2 rising, closing	A2	B2	C2	D2
	3 descending opening	A3	B3	C3	D3
	4 rising, opening	A4	B4	C4	D4



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  $\text{Ex}$  II 2G Ex d e IIC T6 Gb and  $\text{Ex}$  II 1/2D Ex ta/tb IIC T80°C Da/Db -20°C ≤ T<sub>a</sub> ≤ +60°C.**



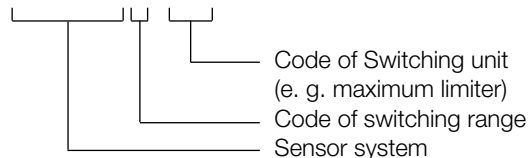
The pressure switch in pressure-proof encapsulation can be used directly in the Ex area (≥ Zone 1). Maximum switching voltage, switching capacity and ambient temperature must be taken into account and the rules for the installation in the Ex area must be observed.

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



**Order specification:**

Pressure switch  
**SCH-DCM 6-205**

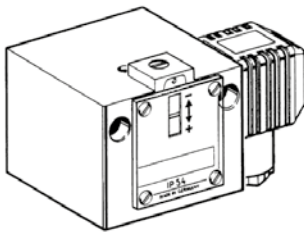
II 2G Ex d e IIC T6 Gb  
 II 1/2D Ex ta/tb IIIC T80°C Da/Db  
 -20°C ≤ T<sub>a</sub> ≤ +60°C  
 (pressure proof encapsulated)

-Versions  
 For Ex areas ≥ Zone 1, all pressure switches can be delivered in pressure-proof encapsulated design (Ex degree of protection de).  
 EC-Type Examination Certificate Number IBExU13ATEX1125

**Switch housing with switching mechanisms**

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

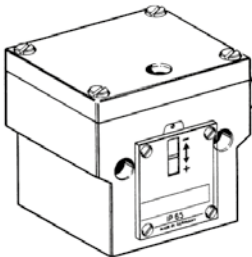
IP 54



**Housing (normal version)**

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

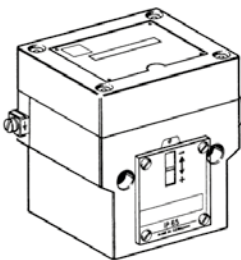
IP 65



**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.

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:

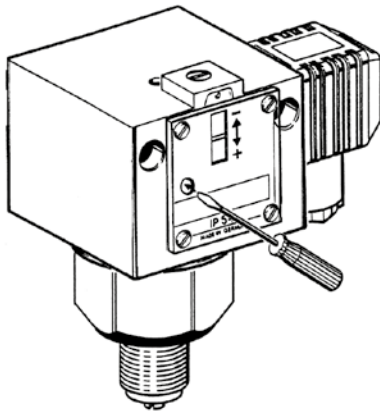
**1. Mechanical lock inside the pressure switch**

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.

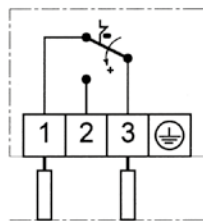


**1.1 Maximum pressure limitation**

Switching over and locking with rising pressure.

Option: 205

Connection to terminal 1 and 3.

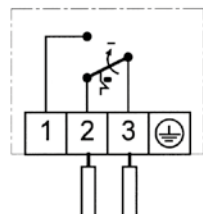


**1.2 Minimum pressure limitation**

Switching over and locking with falling pressure.

Option: 206

Connection to terminal 2 and 3.

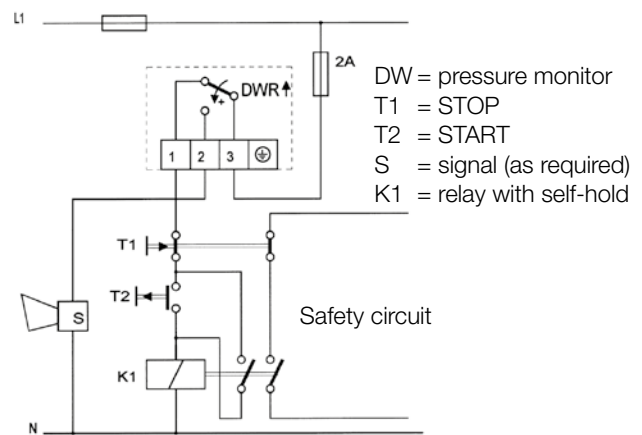


**2. External electrical interlock in the switchgear cabinet (switching examples)**

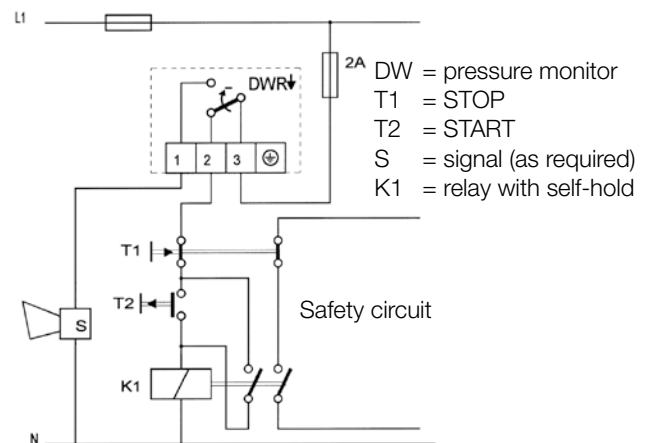
A pressure monitor (microswitch with automatic reset) can also be used as limiter if an electrical interlock is connected in series.

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, DCM4025, DCM 1000: -15...+60 °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 DCM and Ex-DCM  
externally adjustable in the case of DCMV  
for values see summary of models

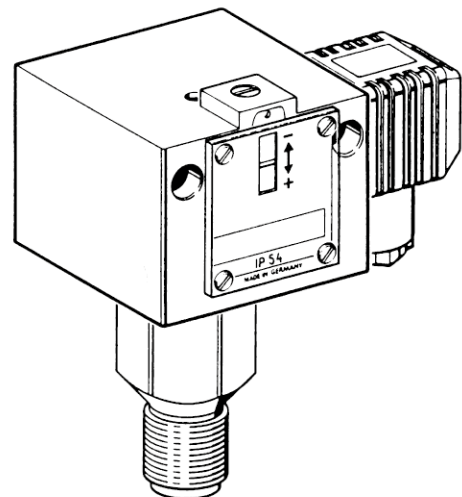
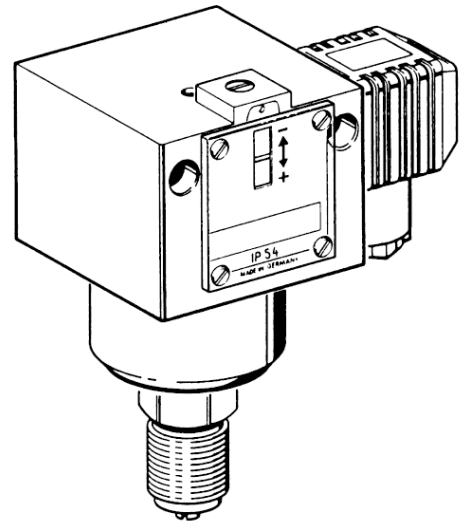
Methods of sealing: as required (may also be carried out after mounting)

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 <sub>AC</sub>	250 V <sub>DC</sub>	24 V <sub>DC</sub>
	Ω	(ind)	Ω
Normal	8A	5A	0.3A
Ex-de	3A	2A	0.03A





Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Material	Dimensional drawing
<b>Switching difference not adjustable</b>					
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
<b>Switching difference adjustable</b>					
SCH-DCMV 025	0.04 ... 0.25 bar	0.03 ... 0.04 bar	6 bar	Cu + Ms	1 + 14
SCH-DCMV 06	0.1 ... 0.6 bar	0.04 ... 0.5 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 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 625	0.5 ... 6 bar	0.25 ... 2 bar	25 bar	1.4104 + 1.4571	1 + 17
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
SCH-DCMV 63	16 ... 63 bar	3.0 ... 10 bar	130 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.					
 II 2G Ex d e IIC T6 Gb und  II 1/2D Ex ta/tb IIIC T80°C Da/Db -20°C ≤ T <sub>a</sub> ≤ +60°C (Switching difference not adjustable)					
SCH-Ex-DCM 4016	1 ... 16 mbar	2 mbar	1 bar	NBR	4 + 11

### 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 1/2 A (pressure gauge connection) acc. to DIN 16 288 and internal thread G 1/4 to ISO 228 part 1

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

Protection: IP54, with vertical fitting position  
IP65, 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.

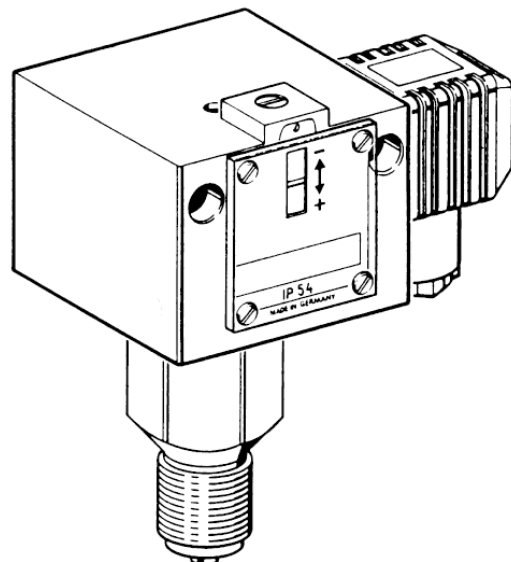
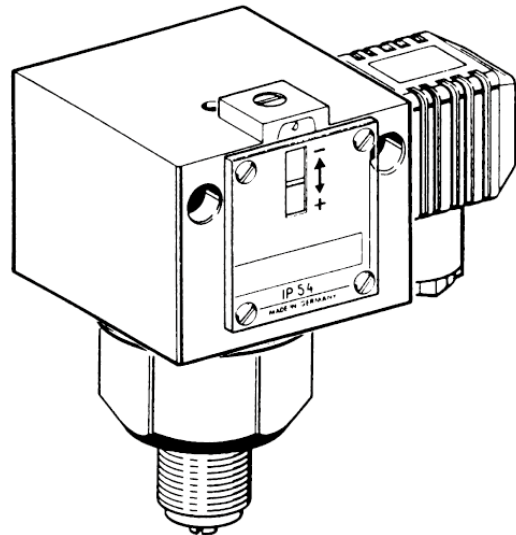
Contact agreement: single-pole change-over switch

Switching capacity:

	250 V <sub>AC</sub>		250 V <sub>DC</sub>	24 V <sub>DC</sub>
	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.





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 <sub>a</sub> ≤ +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 1/2 A (pressure gauge connection) acc. to DIN 16 288 and internal thread G 1/4 to ISO 228 part 1

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

Protection: IP54, 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: Cu Zn  
 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 model VCM and model VNM externally adjustable in the case of model VCMV for values see summary of model

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

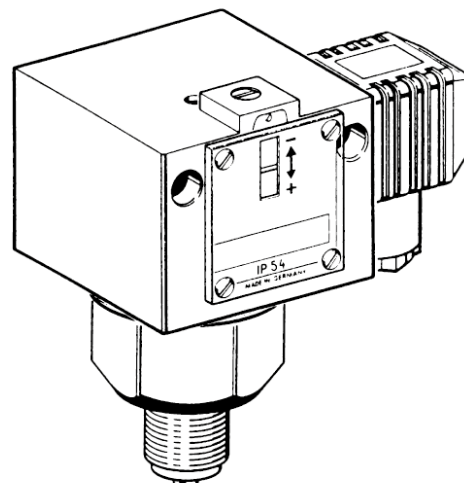
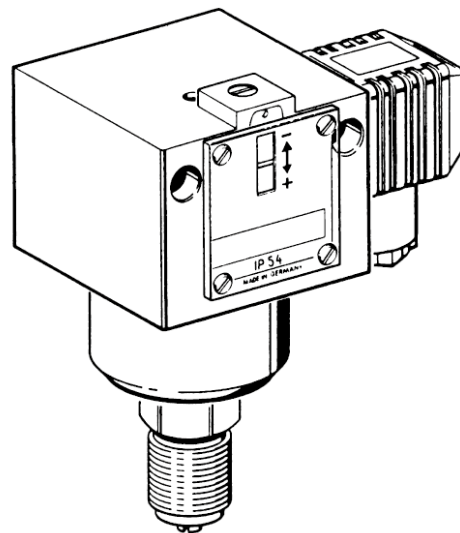
Adjustment: Scale value corresponds to the lower switching point, the upper switching point is higher by the switching differential.

Contact agreement: single-pole change-over switch

Switching capacity:

	250 V <sub>AC</sub>	250 V <sub>DC</sub>	24 V <sub>DC</sub>
	Ω	(ind)	Ω
Normal	8A	5A	0.3A 8A

The Negative Pressure Switches detect the pressure difference relative to the atmospheric pressure. All data on switching pressure ranges and therefore also the scale divisions on the switch units are to be understood at the difference in pressure between the atmospheric pressure at any one time and the set switching pressure. The "zero" reference point on the scale of the unit corresponds to the atmospheric pressure at the time. The minus sign «-» by the indicated pressure stand for under-pressure below the respective atmospheric pressure.





Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
<b>Switching difference not adjustable</b>				
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
<b>Switching difference adjustable</b>				
SCH-VCMV 301	-250...+100 mbar	30...200 mbar	1.5 bar	1 + 13
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
<b>Switching difference not adjustable</b> Ⓔ II 2G Ex d e IIC T6 Gb and Ⓔ II 1/2D Ex ta/tb IIIC T80 °C Da/Db -20 °C ≤ T <sub>a</sub> ≤ +60 °C				
SCH-Ex-VCM 4156	-15...+6 mbar	2 mbar	1 bar	4 + 11
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.

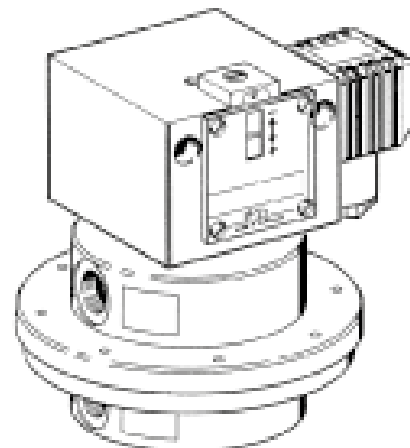
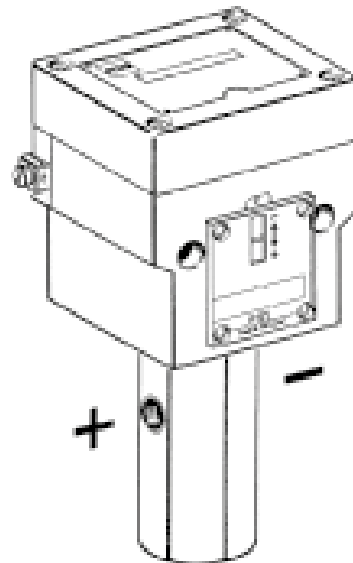
Options see data sheet switch units / optional function /connection diagrams.  
 For small pressure ranges see HCD data sheet.

**Technical Details**

- Pressure connection: internal thread G 1/4
- 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 (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  
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 <sub>AC</sub>		250 V <sub>DC</sub>	24 V <sub>DC</sub>
	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 infinitely 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.

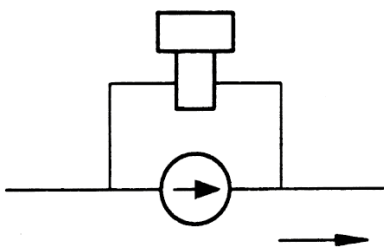


Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
<b>Switching difference not adjustable</b>				
SCH-DDCM 252*	4 ... 25 mbar	2 mbar	0.5 bar	1 + 20
SCH-DDCM 662*	10 ... 60 mbar	15 mbar	1.5 bar	1 + 20
SCH-DDCM 1602*	20 ... 160 mbar	20 mbar	3 bar	1 + 20
SCH-DDCM 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
<b>Switching difference not adjustable</b> Ⓔ II 2G Ex d e IIC T6 Gb and Ⓔ II 1/2D Ex ta/tb IIIC T80 °C Da/Db -20 °C ≤ T <sub>a</sub> ≤ +60 °C				
SCH-Ex-DDCM 1	0.2 ... 1.6 bar	0.13 bar	15 bar	4 + 21
SCH-Ex-DDCM 16	3 ... 16 bar	0.6 bar	25 bar	4 + 21

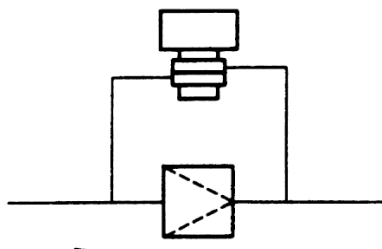
\* Without graduation, only +/- scale

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 1/2 A (pressure gauge connection) acc. to DIN 16288 and internal thread G 1/4 to ISO 228 part 1

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

Protection: IP54, with vertical fitting position  
IP65, 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

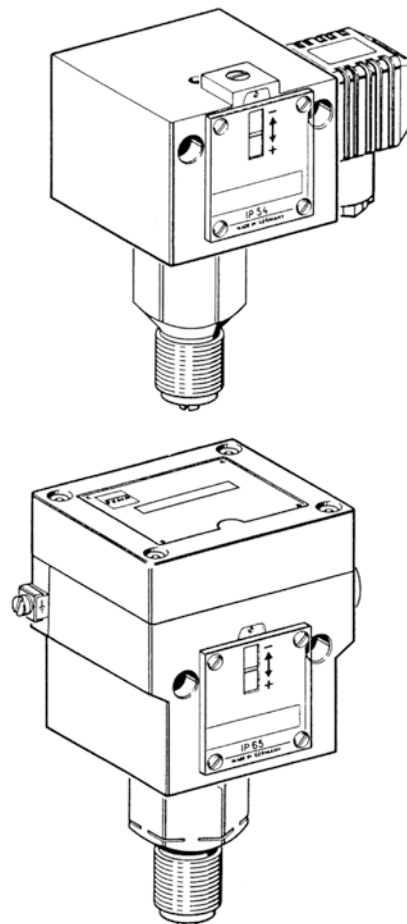
Switching capacity:

	250 V <sub>AC</sub>		250 V <sub>DC</sub>	24 V <sub>DC</sub>
	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 was 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.





**Mechanical Pressure Switches · Summary of Models**  
SCH-DNS, SCH-VNS, SCH-Ex-DNS, SCH-Ex VNS



Model	Range of adjustment	Hysteresis (Mean value)	Max. allowable pressure	Dimensional drawing
<b>Switching difference not adjustable</b>				
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
<b>Housing with surface protection</b>				
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
<b>Ex II 2G Ex d e IIC T6 Gb and Ex II 1/2D Ex ta/tb IIIC T80 °C Da/Db -20 °C ≤ T<sub>a</sub> ≤ +60 °C</b>				
SCH-Ex-VNS 301	-250...+100 mbar	45 mbar	3 bar	4 + 15
SCH-Ex-VNS 111	-1*...+ 0.1 bar	50 mbar	6 bar	4 + 15
SCH-Ex-DNS 025	0.04...0.25 bar	30 mbar	6 bar	4 + 15
SCH-Ex-DNS 3	0.2...2.5 bar	0,1 bar	16 bar	4 + 18
SCH-Ex-DNS 6	0.5...6 bar	0.15 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: IP54, 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 <sub>AC</sub>		250 V <sub>DC</sub>	24 V <sub>DC</sub>
	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
<b>Switching difference not adjustable</b>					
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



**Technical Details**

Pressure connection: pressure connection for overpressure: G 1/4 internal thread for vacuum and differential pressure: G 1/8 internal thread

Switching capacity: 10 A/220 V (resistive load)  
2.5 A/220 V (inductive load)

Cable entry: Pg 13.5

thread

Switch case: aluminium die-cast

Temperature of medium: -15 ... +60 °C

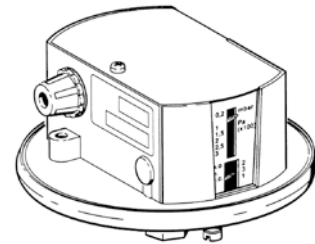
Max. admissible working pressure: see summary of models

Fitting position: horizontal with connecting piece pointing downwards

Protection: IP 44 according to DIN 40050

Mounting: Either direct on pipe or with mounting bracket (is supplied as standard) onto a vertical surface

Adjustment of the switching point: Remove cover and turn the setpoint spindle marked with ± into the relevant position. The scale indicates only standard values, for exact adjustment of the required value a manometer is necessary which can be connected at the measuring connection (pressure tapping piece 9 mm Ø).

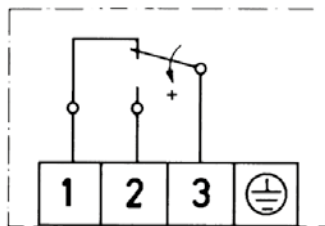


The pressure switches of series HCD are suitable for neutral and non-aggressive gases. They can be used for monitoring overpressure, vacuum as well as differential pressure. For detecting overpressure, connection is made on the pressure side at the lower connecting piece G 1/4 for detecting the vacuum pressure at the upper connecting piece G 1/8 (remove locking clamp). For detecting the differential pressure, the high pressure is applied at the lower connecting piece (G 1/4) and the low pressure at the upper connecting piece (G 1/8). For exact adjustment of the required value a pressure tapping (9 mm Ø) is available.

**Electrical Data**

Switching function: single pole switching over

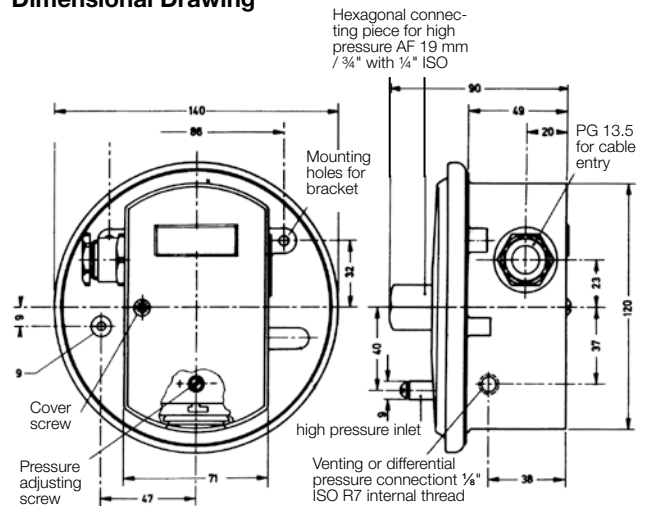
Electr. connection:



3= com = common connection  
2= no = normally open  
1= nc = normally closed

Connection directly at the inner micro switch. The grounding terminal is accessible after removal of the case over.

**Dimensional Drawing**



**Summary of Models**

Model	Range of adjustment	Hysteresis at lower range	Hysteresis at upper range	Max. operating pressure mbar	Dimensional drawing
SCH-HCD 6003	0.2 ... 3 mbar	0.3 mbar	0.5 mbar	100	see above
SCH-HCD 6010	1 ... 10 mbar	0.3 mbar	1 mbar	100	see above
SCH-HCD 6050	5 ... 50 mbar	1.5 mbar	3 mbar	200	see above
SCH-HCD 6150	15 ... 150 mbar	4 mbar	10 mbar	300	see above

The switching differential is not adjustable. The low switching differentials are valid for the lower range of adjustment, the higher values for the upper ranges.

### 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 ge-temperat, 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<sup>6</sup> switching operations.  
 Electrical rating: max. 1.0 A (0.4 A) / 250 V<sub>AC</sub>  
 Electrical connections: AMP flat plug 6.3x0.8 mm acc. to DIN 46244 or push-on screw terminals. Cable conduit with cable strain relief.  
 Cable entry: M16x1.5  
 Mounting: with fastening lugs  
 Arrangement of contacts:   
 Protection: IP 54

1 Break contact  
 2 Operating contact  
 3 Power supply line

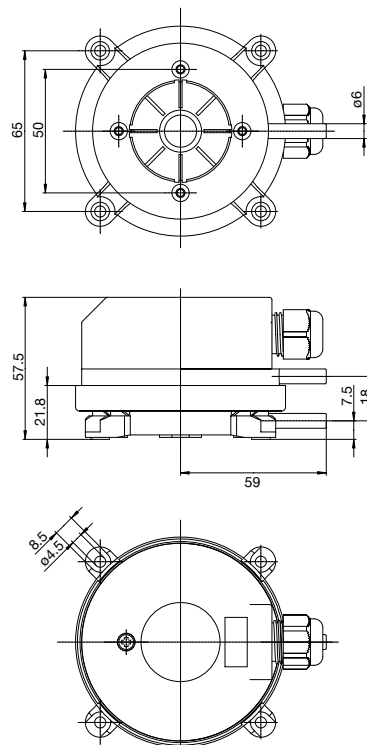
### Order Details (Example: SCH-PSB-0300)

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

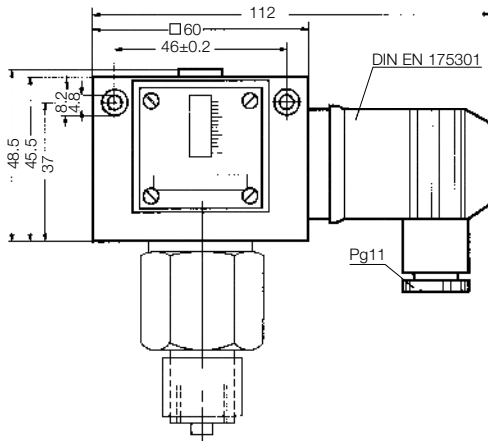
### Accessories included in scope of delivery

2 m PVC hose and 2 plastic tubes made of ABS  
 Set consisting of three push-on screw terminals

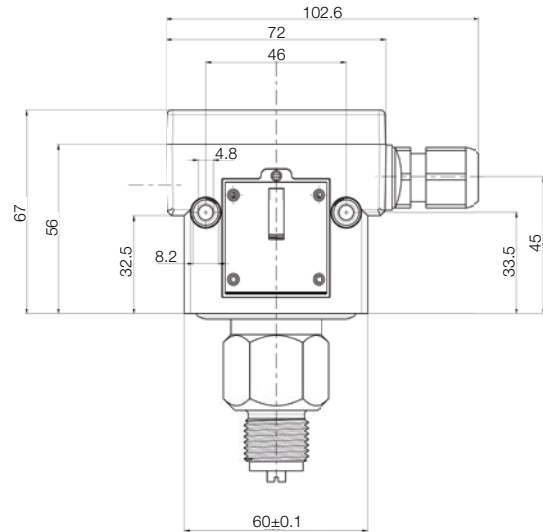
### Dimensions [mm]



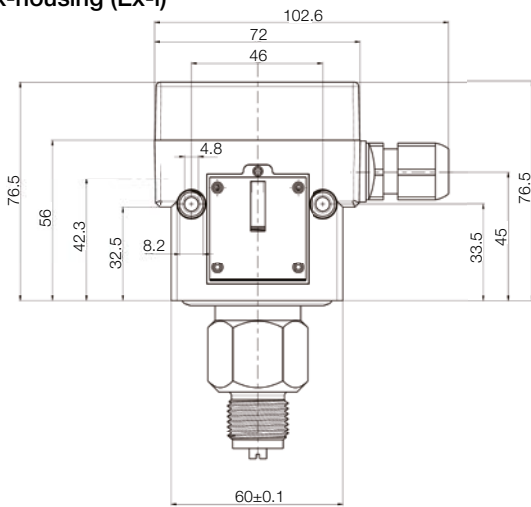
1 Standard housing



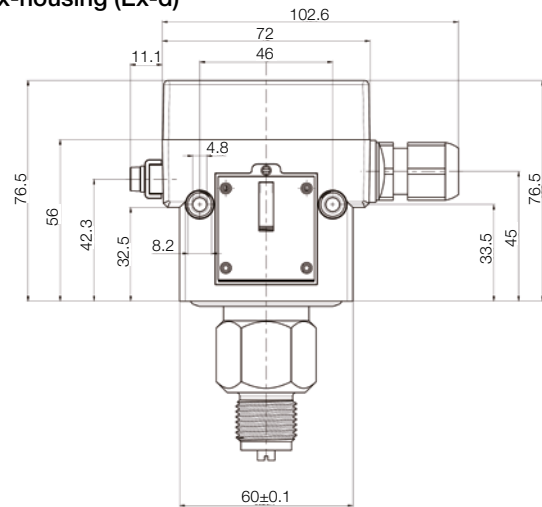
2 Terminal connection housing



3 Ex-housing (Ex-i)

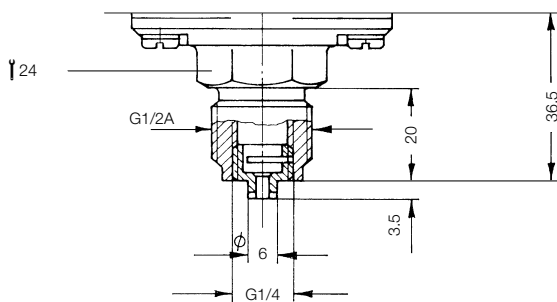


4 Ex-housing (Ex-d)

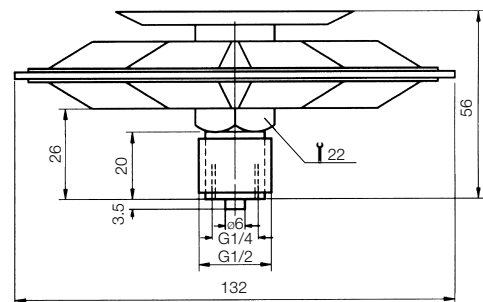


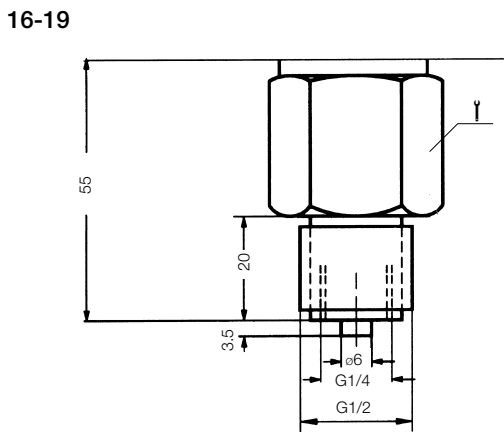
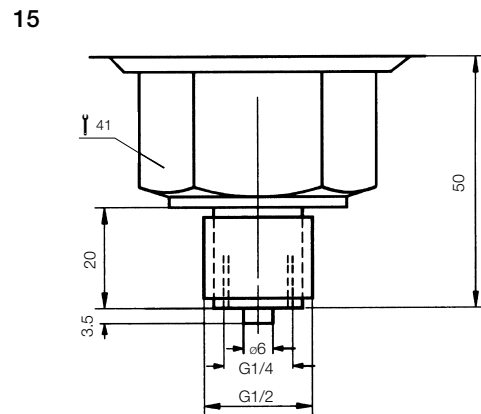
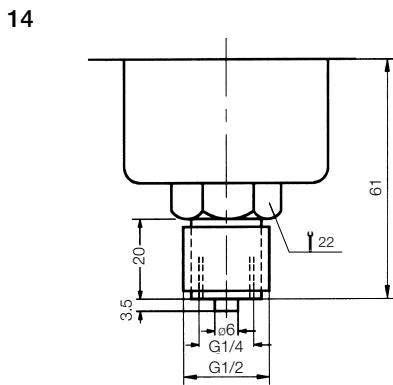
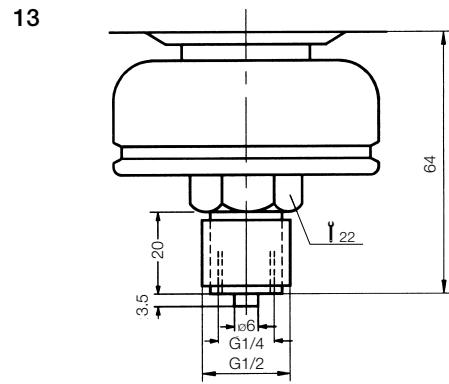
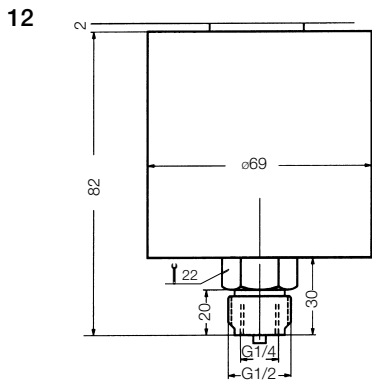
Dimensional Drawings of Pressure Sensors

10



11





Dimensional drawing	Y
16	22
17	24
18	30
19	32

