Pressure switches
- Types DNS, DCM, SDBAM -

Pressure sensors

All pressure sensors have measuring bellows, some made of copper alloy, but the majority of high-quality stainless steel. The measuring bellows are exposed to a minimal load and perform only a small lifting movement. This results in a long service lifetime with only little drift switching point and high overload safety. Furthermore, the elongation of the bellows is limited by an internal stop so that the forces resulting from the overpressure cannot have impact on the switching device. The parts of the sensor in contact with the medium are welded together without filler metals. The sensors contain no seals. Copper bellows, which are used only for low pressure ranges, are soldered to the sensor housing. The sensor housing and all parts of the sensor in contact with the medium can also be made entirely from stainless steel 1.4571 (DNS series). Precise material data can be found in the individual data sheets.

Pressure connection

The pressure connection on all pressure switches is designed in accordance with DIN 16288 (pressure gauge connection G 1/2A). If wanted, the connection can also be made with a G 1/4 internal thread according to ISO 228 Part 1. Maximum screw-in depth on the G 1/4 internal thread is 9 mm.

- optionally with diaphragm seal for flush mounting to different applications (see data sheet)

Example: 7375 and 7310 diaphragm seal

Pressure switches
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- Type DNS -
Pressure switch with stainless steel sensor system, optional with plastic-coated housing

Pressure switches of the DNS series are suitable for monitoring and controlling pressures in chemical plants, process engineering and any situation where the pressure of aggressive liquids and gases must be monitored. All components of the sensor system are made from high-quality stainless steel (1.4571) and welded using the latest methods without filler metals. The pressure sensor is hermetically encapsulated and contains no sealing materials.

Technical data

Pressure connection
External thread G 1/2 (pressure gauge connection) according to DIN 16 288 or internal thread G 1/4 according to ISO 228 Part 1.

Switching device
Robust housing (200) made of seawater-resistant diecast aluminium GD Al Si 12.

Degree of protection
IP 54, in vertical position.
IP 65, for EEx-d version.

Pressure sensor materials
Pressure bellows and all parts in contact with medium. X 6 Cr Ni Mo Ti 17122 Material no. 1.4571

Mounting position
Vertically upright or horizontal.

Max. ambient temperature at switching device
–25…+70 °C.
For EExd versions: –15…+60 °C.

Max. medium temperature
The maximum medium temperature at the pressure sensor should not exceed the ambient temperature permitted at the switching device. Temperatures may reach 85°C for short periods (not EEx-d). Higher medium temperatures are possible provided the above limit values for the switching device are ensured by suitable measures (e.g. siphon).

Mounting
Directly on the pressure line (pressure gauge connection)
or on a flat surface with two 4 mm Ø screws.

Switching pressure
Adjustable from outside with screwdriver.

Switching differential
For values see product type overview.

Contact arrangement
Single-pole changeover switch.

Switching capacity

	250VAC		250VDC	24VDC
	(ohm)	(ind)	(ohm)	(ohm)
Normal	8A	5A	0,3A	8A
EEx-d	3A	2A	0,03A	3A

Plastic coating
The diecast aluminium housing in GD Al Si is chromated or stove-enamelled with resistant plastic. Corrosion tests with 3% saline solution and 30 temperature changes from +10 to +80°C showed no surface changes after 20 days.

Product type overview

Type	Setting range	Switching differential (mean values)	Max. permissible pressure
Switching differential not adjustable			
VNS 301-201	-250…+100 mbar	45 mbar	3 bar
VNS 111-201	-1*…+0,1 bar	50 mbar	6 bar
DNS 025-201	0,04…0,25 bar	30 mbar	6 bar
DNS 06-201	0,1…0,6 bar	40 mbar	6 bar
DNS 1-201	0,2…1,6 bar	60 mbar	6 bar
DNS 3-201	0,2…2,5 bar	0,1 bar	16 bar
DNS 6-201	0,5…6 bar	0,15 bar	16 bar
DNS 10-201	1…10 bar	0,3 bar	16 bar
DNS 16-201	3…16 bar	0,5 bar	25 bar
… -203 types Adjustable switching differential Plastic-coated housing			
VNS 301–351	–250…+100 mbar	45 mbar	3 bar
VNS 111–351	–1*…+0,1 bar	50 mbar	6 bar
DNS 025–351	0,04…0,25 bar	30 mbar	6 bar
DNS 06–351	0,1…0,6 bar	40 mbar	6 bar
DNS 1–351	0,2…1,6 bar	60 mbar	6 bar
DNS 3–351	0,2…2,5 bar	0,1 bar	16 bar
DNS 6–351	0,5…6 bar	0,15 bar	16 bar
DNS 10–351	1…10 bar	0,3 bar	16 bar
DNS 16–351	3…16 bar	0,5 bar	25 bar
Ⓔx version, (housing 700), explosion potection EEx-d			
Ex-VNS 301	–250…+100 mbar	45 mbar	3 bar
Ex-VNS 111	–1*…+0,1 bar	50 mbar	6 bar
Ex-DNS 025	0,04…0,25 bar	30 mbar	6 bar
Ex-DNS 06	0,1…0,6 bar	40 mbar	6 bar
Ex-DNS 1	0,2…1,6 bar	60 mbar	6 bar
Ex-DNS 3	0,2…2,5 bar	0,1 bar	16 bar
Ex-DNS 6	0,5…6 bar	0,15 bar	16 bar
Ex-DNS 10	1…10 bar	0,3 bar	16 bar
Ex-DNS 16	3…16 bar	0,5 bar	25 bar

Explosion protection EEx-i with ZF 513
Example for ordering: DNS…-513

* At very high vacuums, close to the theoretical maximum of –1 bar, the switch may not be usable in view of the special conditions of vacuum engineering. However, the pressure switch itself will not be damaged at maximum vacuum.

Pressure switches
- Types DNS, DCM, SDBAM -

Hengesbach Prozessmesstechnik

- Type DCM -
for non-aggressive liquid and gaseous media

Technical data

Pressure connection
External thread G 1/2 (pressure gauge connection) according to DIN 16 288 or internal thread G 1/4 according to ISO 228 Part 1.

Switching device
Robust housing (200) made of seawater-resistant diecast aluminium GD Al Si 12.

Degree of protection
IP 54, in vertical position.

Pressure sensor materials
DCM 3…DCM 63 Metal bellows: 1.4571
Sensor housing: 1.4104 DCM 025 – DCM 1
Metal bellows: Cu Sensor housing: Cu + Ms
DCM 4016/ Diaphragm: Perbunan
DCM 4025 Sensor housing: 1.4301
DCM 1000 Diaphragm: Perbunan
Sensor housing: Brass

Mounting position
Vertically upright or horizontal. DCM 4016 and 4025 vertically upright.

Ambient temp. at switching device
–25…+70 °C, except: DCM 4016, 4025, 1000: –15…+60 °C
For EEx-d versions: –15…+60 °C

Max. medium temperature
The maximum medium temperature at the pressure sensor should not exceed the ambient temperature permitted at the switching device. Temperatures may reach 85°C for short periods (not EEx-d). Higher medium temperatures are possible provided the above limit values for the switching device are ensured by suitable measures (e.g. siphon).

Mounting
Directly on the pressure line (pressure gaugeconnection) or on a flat surface with two 4 mm Ø screws.

Switching pressure
Adjustable from outside with screwdriver.

Switching differential
Not adjustable with DCM and Ex-DCM types. Adjustable from outside with DCM-203 types.
For values see product type overview.

Contact arrangement
Single-pole changeover switch.

Switching capacity

	250VAC		250VDC	24VDC
	(ohm)	(ind)	(ohm)	(ohm)
Normal	8A	5A	0,3A	8A
EEx-d	3A	2A	0,03A	3A

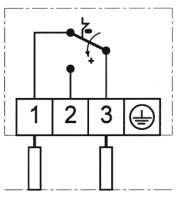
Product type overview

Type	Setting range	Switching differential (mean values)	Max. permissible	Materials in contact with medium
Switching differential not adjustable				
DCM 4016	1…16 mbar	2 mbar	1 bar	Perbunan
DCM 4025	4…25 mbar	2 mbar	1 bar	+ 1.4301
DCM 1000	10…100 mbar	12 mbar	10 bar	Perbunan + MS
DCM 025	0,04…0,25 bar	0,03 bar	6 bar	
DCM 06	0,1…0,6 bar	0,04 bar	6 bar	Cu + Ms
DCM 1	0,2…1,6 bar	0,04 bar	6 bar	
DCM 506	15…60 mbar	10 mbar	12 bar	
DCM 3	0,2…2,5 bar	0,1 bar	16 bar	
DCM 6	0,5…6 bar	0,15 bar	16 bar	
DCM 625	0,5…6 bar	0,25 bar	25 bar	
DCM 10	1…10 bar	0,3 bar	25 bar	1.4104
DCM 16	3…16 bar	0,5 bar	25 bar	+
DCM 25	4…25 bar	1,0 bar	60 bar	1.4571
DCM 40	8…40 bar	1,3 bar	60 bar	
DCM 63	16…63 bar	2,0 bar	130 bar	
Switching differential adjustustable				
DCM 025-203	0,04…0,25 bar	0,03…0,4 bar	6 bar	
DCM 06-203	0,1…0,6 bar	0,04…0,5 bar	6 bar	Cu + Ms
DCM 1-203	0,2…1,6 bar	0,07…0,55 bar	6 bar	
DCM 3-203	0,2…2,5 bar	0,15…1,5 bar	16 bar	
DCM 6-203	0,5…6 bar	0,25…2,0 bar	16 bar	
DCM 10-203	1…10 bar	0,5…2,8 bar	25 bar	1.4104
DCM 16-203	3…16 bar	0,7…3,5 bar	25 bar	+
DCM 25-203	4…25 bar	1,3…6,0 bar	60 bar	1.4571
DCM 40-203	8…40 bar	2,6…6,6 bar	60 bar	
DCM 63-203	16…63 bar	3,0…10 bar	130 bar	

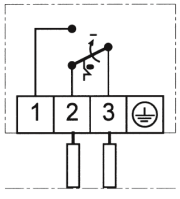
Calibration

The **DCM** series is calibrated for falling pressure. This means that the adjustable switching pressure on the scale corresponds to the switching point at falling pressure. The reset point is higher by the amount of the switching differential.

Wiring diagram
all types



Switch over and locking on rising pressure.
Connection control circuit at terminal 1 and 3.



only type SDBAM
additional leakage function

Pressure switches
- Types DNS, DCM, SDBAM -

- Type SDBAM –
Maximum pressure monitors and limiters
Optionally with diaphragm-seals

Technical data

Pressure connection
External thread G 1/2 (pressure gauge connection) to DIN 16 288 or internal thread G 1/4 to ISO 228 Part 1.

Switching device
Robust housing (200) made of seawaterresistant diecast aluminium.

Materials
Pressure bellows: Material no. 1.4571
Sensor housing: Material no. 1.4104
Switch housing: GD Al Si 12
according to DIN 1725

Mounting position
Vertically upright or horizontal.

Ambient temperature at switching device
–20 to +70°C.

Medium temperature –20 to +70°C.
The maximum medium temperature at the pressure sensor must not exceed the ambient temperature permitted at the switching device.
Temperatures may reach 85°C for short periods. Higher medium temperatures are possible provided the upper limit at the switching device is ensured by suitable measures (e.g. siphon).

Mounting
Directly on the pressure line (pressure gauge connection) or on a flat surface with two 4 mm Ø screws.

Calibration for maximum pressure switch
The pressure monitors and safety pressure limiting devices are calibrated so that, with **rising pressure**, switching takes place at the defined switching pressure. The reset point under falling pressure is lower by the amount of the switching differential, or, in the case of pressure limitingdevices, by the fall in pressure specified
in the table. The scale value corresponds to the upper switching point.

Switching differential
See product type overview.

Contact arrangement
Single-pole changeover switch.

Switching capacity

	250VAC (ohm)	250VAC ind)	250VDC (ohm)	24VDC (ohm)
Normal	**8A**	**5A**	**0,3A**	**8A**

Sealing P2 of setting spindle

Generally available for SDBAM limiters.

Bursting pressure
For all types ≥ 100 bar.
Verified by TÜV test.

Component testet for	Steam	Systems according to TRD 604
	Hot water	Systems according to DIN 4751, T. 2
Testing basis	VdTÜV-rule „Pressure 100/1“	
TÜV-type test approval mark	TÜV · DW 04 -132 for series DWAM …	
	TÜV · DW 04 -133 for series DWAMV …	
	TÜV · SDB 04 -134 for series SDBAM …	
Function	Pressure monitor / Pressure limiter	
Direction of action	**For maximum pressure monitoring only**	
Sensor	**„Of spezial constuction“** (self-monitoring sensor with safety diaphragm)	

Product type overview Maximum pressure monitoring (↑)

Type	Setting range	Switching differential (mean values)	Max. permissible pressure
Pressure monitors without differential adjustment for max. pressu			TÜV TESTED
DWAM 06	0,1…0,6 bar	0,04 bar	
DWAM 1	0,2…1,6 bar	0,05 bar	5 bar
DWAM 6	1,2…6 bar	0,2 bar	10 bar
DWAM625	1,2…6 bar	0,25 bar	20 bar
DWAM 16	3…16 bar	0,4 bar	20 bar
DWAM 32	6…32 bar	1,2 bar	45 bar
Pressure monitors with differential adjustment for max. pressure monitoring			
DWAMV 1	0,2…1,6 bar	0,12…0,6 bar	5 bar
DWAMV 6	1,2…6 bar	0,4…1,5 bar	10 bar
DWAMV 16	3…16 bar	0,8…2,5 bar	20 bar
DWAMV 32	6…32 bar	2,5…6,0 bar	45 bar

Pressure limiters for maximum pressure monitoring (with internal interclock)

		Pressure change for unlocking	
SDBAM 1	0,2…1,6 bar	0,12 bar	5 bar
SDBAM 2	0,4…2,5 bar	0,15 bar	5 bar
SDBAM 6	1,2…6 bar	0,4 bar	10 bar
SDBAM 625	1,2…6 bar	0,6 bar	20 bar
SDBAM 16	3…16 bar	0,8 bar	20 bar
SDBAM 32	6…32 bar	3,0 bar	45 bar

The maximum permissible working pressure is defined as the upper limit at which the operation, switching reliability and water tightness of the pressure switch are in no way impaired. Pressure monitors DWAM… can also be used for maximum pressure limitation if an external interlock is used.

Our equipment is currently being developed, therefore we reserve the right to make amendments