DWAM6-576

DBS

Pressure monitors / pressure limiters

In many aspects, safety engineered pressure limiters offer a higher degree of safety compared with normal pressure switches and are therefore especially suitable for chemical process engineering and thermal installations in which safety is an especially critical factor in pressure monitoring. Pressure switches can also be used in Ex- zones (zone 0, 1, 2 and 20, 21, 22) and, in all cases, require an isolating amplifier.
The isolating amplifier is also responsible for monitoring lines for short circuit and line break and therefore offers an additional safety advantage – even in non Ex-zones. For Ex-applications, the isolating amplifier must be installed outside the Ex-zone. The lines between the isolating amplifier and the pressure switch are monitored for short circuit and line break.

SIL 2 according IEC 61508-2

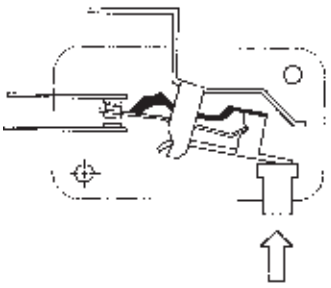
Technical data

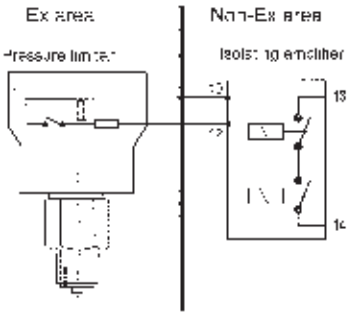
Greater safety
· in process engineering and chemical installations,
· in gas and liquid gas installations

Basic features:
– "Of special construction" according to VdTÜV Memorandum "Pressure 100"
– Line break and short circuit monitoring-between pressure switch and isolating amplifier
– Suitable for Ex-areas (zone 0, 1 & 2 or 20, 21 & 22) (explosion protection Ex-i)
– Protection class IP 65
– Plastic-coated housing (chemical version)

Options:
– Limiter with internal interlock

Type specific features:
– Self-monitoring sensors
– Positive opening microswitches
– Gold plated contacts
– TÜV, DVGW component tests





Safety requirements for pressure limiters

Pressure limiters "of special construction" (DBS) must fulfil additional safety requirements, i.e. breakage or leakage in the mechanical part of the sensor must lead to shutdown to the safe side. The pressure limiter must respond as if the system pressure had already exceeded the maximum limit. The control circuit for the pressure limiter must also be considered from the point of view of safety, as short circuits in the supply lines or other faults in the control current circuit can lead to dangerous conditions.

Switching element with positive opening operation and gold plated contacts

The microswitch is equipped with positive opening operation. Rather than transmitting the plunger force via a spring, which is the usual method with most microswitches, this newly developed microswitch has an additional lever which transmits the movements of the pressure bellows positively to the contact lever. If the spring breaks, the contact lever is moved directly.

Line break and short circuit monitoring in the control circuit

The resistor connected in series with the switching contact limits the current to a defined value with the switch closed. In the event of short circuit in the area between the isolating amplifier and the series resistor, the current rises above the predetermined limit value, the relay of the isolating amplifier drops out, the output current circuit is interrupted and thus the safe condition is achieved. In the event of a line break, the current flow is interrupted, the relay drops to the safe side and interrupts the output current circuit (safety sequence). Furthermore, the isolating amplifier is designed so that, if faults occur in the electronics (conductor interruption, component defect etc.) and in the resulting situations, the safe shutdown condition is assured. These characteristics of the safety engineered isolating amplifier, including line break and short circuit monitoring, satisfy the requirements of DIN/VDE 0660, Part 209.

Connection diagram

For pressure monitoring in Ex-areas, the isolating amplifier must be installed outside the Ex-zone. The pressure limiter has an intrinsically safe control current circuit (Ex-i). This arrangement is suitable for zones 0, 1 and 2, 20, 21 and 22.

Safety engineered maximum pressure monitors

Technical data

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

Switch housing 500
Die cast aluminium GD Al Si 12. Aluminium housing coated with resistant plastic.

Mounting position
Vertically upright.

Protection class IP 65.

Ex protective category
Ex-i (only when used in conjunction with suitable isolating amplifier).

Component testing See table on page 52.

Pressure sensor materials
Housing: 1.4104
Pressure bellows: 1.4571
All parts fully welded.

Ambient temperature
DWAM: –20°C to +60°C, DWR: –25°C to +60°C. At ambient temperatures at or below 0°C, ensure that condensation cannot occur in the sensor or in the switching device.

Max. temperature of medium at sensor
+ 60°C.

Outdoor installations
Protect the device against direct atmospheric influences. Provide a protective cover.

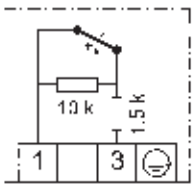
Max. working pressure
See Product Summary

Switching pressure setting
Adjustable with the setting spindle after removing the terminal box.

Mounting
With suitable weld on connections and union nuts or with pressure gauge screw union G 1/2.

Power supply circuit
U_i 14 V DC
R_i 1500 Ohm
C_i 1 nF
L_i 100 µH

Connection scheme



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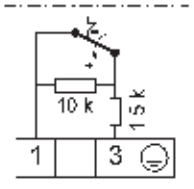

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Maximum pressure monitors

Sensor "of special construction", self monitoring via safety diaphragm, type tested according to VdTÜV Memorandum "Pressure 100". **SIL2 according IEC 61508-2**

Type	Setting range	Switching differential (mean values)	Max. permissible pressure	Dimensioned drawing
				page 21 + 22
DWAM06-576	0.1…0.6 bar	0.04 bar	5 bar	
DWAM1-576	0.2…1.6 bar	0.05 bar	5 bar	
DWAM2,5-576	0.4…2.5 bar	0.07 bar	5 bar	3 +
DWAM6-576	1.2…6 bar	0.2 bar	10 bar	15
DWAM625-576	1.2…6 bar	0.25 bar	20 bar	
DWAM16-576	3…16 bar	0.4 bar	20 bar	3 +
DWAM32-576	6…32 bar	1.2 bar	45 bar	19

Versions:
ZF577: Maximum pressure limiter (with internal interlock)
Microswitch not positive opening, contacts: silver alloy other equipment like DWAM…576.

Maximum pressure monitors

Sensor "of special construction" made from stainless steel. (Component testing with 2 million operating cycles).
Component tests: VdTÜV Memorandum "Pressure 100", DIN EN1854 (fuel gases), DIN EN764-7, systems in accordance to DIN EN12952-11 and DIN EN12953-9.
SIL 2 according ICE 61508-2

Type	Setting range	Switching differential (mean values)	Max. permissible pressure	Dimensioned drawing
				page 21 + 22
DWR06-576	0,1…0,6 bar	0.04 bar	6 bar	3 +
DWR1-576	0.2…1.6 bar	0.06 bar	6 bar	15
DWR3-576	0.2…2.5 bar	0.1 bar	16 bar	3 +
DWR6-576	0.5…6 bar	0.2 bar	16 bar	18
DWR625-576	0.5…6 bar	0.25 bar	25 bar	3 +
DWR16-576	3…16 bar	0.5 bar	25 bar	17
DWR25-576	4…25 bar	1.0 bar	63 bar	3 +
DWR40-576	8…40 bar	1.3 bar	63 bar	16

Versions:
ZF577: Maximum pressure limiter (with internal interlock)
Microswitch not positive opening, contacts: silver alloy other equipment like DWR… 576

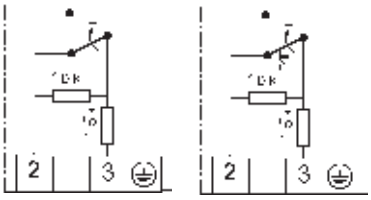
Calibration
Devices of the **DWR-576** and **DWAM-576** series are calibrated for rising pressure. This means that the adjustable switching pressure on the scale corresponds to the switching point at rising pressure. The reset point is lower by the amount of the switching differential. (See also page 23, 2. Calibration at upper switching point).

FEMA by Honeywell

CE TÜV tested DIN DVGW Ex Protection Class: IP 65

Technical data
see page 28

Connection scheme



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Safety engineered minimum pressure monitors
Sensor "of special construction" made of stainless steel. (self-monitoring and component testing with 2 million operating cycles). Component tests: VdTÜV Memorandum "Pressure 100", DIN EN3398 (fuel gases) DIN EN764-7, systems in accordance to DIN EN12952-11 and DIN EN12953-9
SIL2 according IEC 61508-2

Type	Setting range	Switching differential (mean values)	Max. permissible pressure	Dimensioned drawing page 21 + 22
DWR06-574	0.1…0.6 bar	0.04 bar	6 bar	3 +
DWR1-574	0.2…1.6 bar	0.06 bar	6 bar	15
DWR3-574	0.2…2.5 bar	0.1 bar	16 bar	3 +
DWR6-574	0.5…6 bar	0.2 bar	16 bar	18
DWR625-574	0.5…6 bar	0.25 bar	25 bar	3 +
DWR16-574	3…16 bar	0.5 bar	25 bar	17
DWR25-574	4…25 bar	1.0 bar	63 bar	3 + 16

Calibration
The **DWR-574** 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. (See also page 23, 1. Calibration at lower switching point).

Versions:
ZF575: Minimum pressure limiters (with internal interlock)
Switching contacts: silver alloy
other equipment like DWR… 574

Features of safety engineered pressure monitors and pressure limiters

Devices	Component testing	Features					Options	
	1 = VdTÜV Memorandum "Pressure 100" 2 = DIN EN1854 3 = DIN EN764-7 4 = DIN EN12952-11 / DIN EN12953-9 5 = ATEX / IEXEx	Resistor combination for line break and short circuit monitoring	Ex-i version for intrinsically safe control circuits	Self monitoring pressure sensor	Plastic coated housing Chemical version	Positive opening microswitches	Gold plated contacts	Limiter with internal interlock Chemical version
Maximum pressure monitoring								
FD16-326	1 + 3 + 5	■	■	■		■	■	
FD16-327	1 + 3 + 5	■	■	■				■
DWAM…576	1 + 4 + 5	■	■	■	■	■	■	
DWAM…577	1 + 4 + 5	■	■	■	■			■
DWR…576	1 + 2 + 3 + 4 + 5	■	■		■	■	■	
DWR…577	1 + 2 + 3 + 4 + 5	■	■		■			■
Minimum pressure monitoring								
DWR…574	1 + 2 + 3 + 4 + 5	■	■		■		■	
DWR…575	1 + 2 + 3 + 4 + 5	■	■		■			■

CE TÜV tested DIN DVGW Ex Protection Class: IP 65