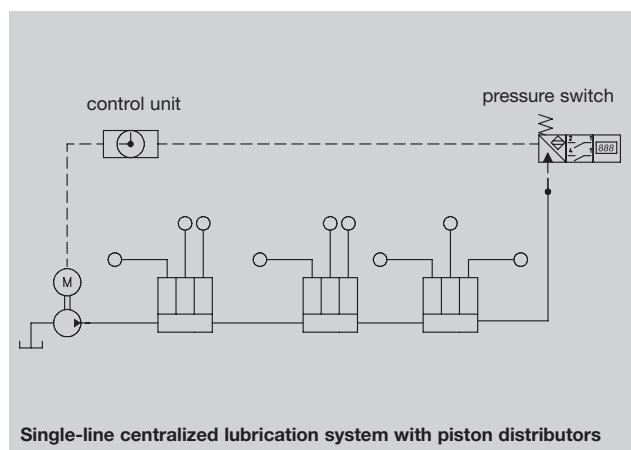


for centralized lubrication, hydraulic and compressed air systems



Pressure switches are responsible for monitoring the pressure a system needs in order to function.

The pressure switch is an important monitoring element in centralized lubrication systems. It is used to keep an eye on the following:

- the functions of the pump unit (pressure build-up and relief)
- the functioning of the directional control valve in the case of zoned centralized lubrication systems
- filter functions (clogging)
- the tubing
- air in the centralized lubrication system (leaks, seals).

The amount of time elapsing between the point at which the pump unit or directional control valve is actuated in order to fill the centralized lubrication system and the point at which the pressure switch responds is an important indicator of whether the centralized lubrication system is working faultlessly.

In the opposite case, the time elapsing between the point at which the unit is switched off and the point at which minimal pressure is reached is an important indicator of the system's pressure relief. So, preferentially, the pressure switch should be located at the end of a total-loss centralized lubrication system.

The electrical signal from the pressure switch is evaluated by the centralized lubrication system's control unit or the machine's control system and can, for example, be used for maintenance-related jobs or to shut down the machine.

A number of pressure switches are available for this task. They are listed in the following overview.

Important criteria for the selection are:

- the hydraulic characteristics of the pressure switch
- the electrical data
- the fluid
- demands made on switching frequency and service life.

Group	Type	Switching pressure range	Switching pressure	Electrical limit values	Type of contact or signal output	Fig.
DS-W	Membrane of FKM (FPM)	1 ... 30	nonadjustable	30 - 250 V AC	microswitch changeover contact	1
DS-EP-40-D-4 with 4-place digital display for pressure and switching point	Membrane of FKM (FPM)	max. 100	adjustable	9 - 35 V DC	PNP transistor stages	2
176-...-...	Membrane of NBR	0.2 ... 45	nonadjustable	max. 42 V 30 VA	mechanical snap-action contact NO or NC type	3, 4
		1 ... 50	adjustable	5 - 24 V DC gold contact 1 W	changeover contact	5

Pressure switch, group DS-W

The pressure switches comprising this Group are designed to be mounted on a wall. The switching element (changeover contact) is built into an air-tight, distortion-resistant plastic housing (conforming to UL specifications). When the switching pressure is reached it is actuated by a pin connected to a spring-loaded membrane. The switching pressure is set at the factory and is nonadjustable.

The pressure switch is available in three different plug versions. When inductive loads are switched off it is possible for protective circuits (RC elements or varistors) to limit voltage spikes and thus increase the life of the contacts (spark quenching).

Please note! An incorrectly dimensioned interference suppression circuit can cause greater wear than none at all. The following guideline value applies to the dimensioning: 1 µF per ampere of switching current for the capacitor C and resistor R, roughly equal to the DC resistance of the switched coil. However, it is always absolutely necessary to test the interference suppression circuit with measurements.

The DIN 43235 standards sheet provides information on the exact calculations to be performed for overvoltage limitation elements in DC networks.

When the pressure-switch signal is evaluated by external control systems (PLC or the like), pay attention to the limit values indicated for the switching contact. If the switch is to be operated out-side its limit values, please indicate the same when ordering.

Technical Data

Rated switching pressure	cf. table
Permissible operating pressure ¹⁾	45 bars
Contact load, max.	125 VA
Switching voltage, max.	250 V AC / 30 V DC
Switching current	2 mA min. / 300 mA max.
Operating temperature, max.	+60 °C
Type of contact	changeover
Switching frequency	30 1/min
Mechanical service life	5x10 ⁶ switching operations
Type of enclosure (with line socket)	IP 65
Housing material	PBT+PC (UL 94-V0)
Contact material/switch module	AuAg25Pt6
Material membrane	FKM (FPM)
Fluid	mineral oils, fluid grease, compressed air
Mounting position	any

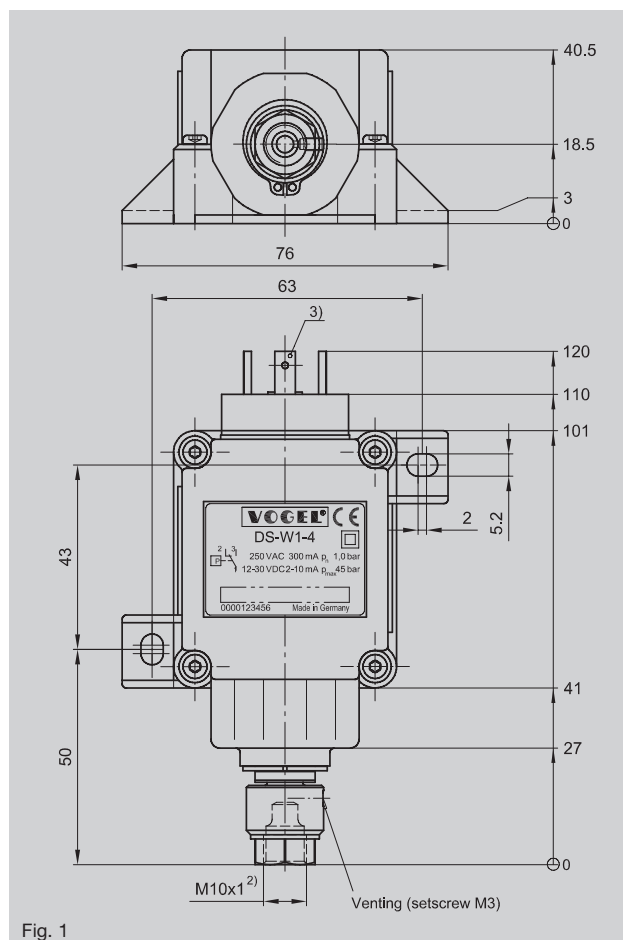


Fig. 1

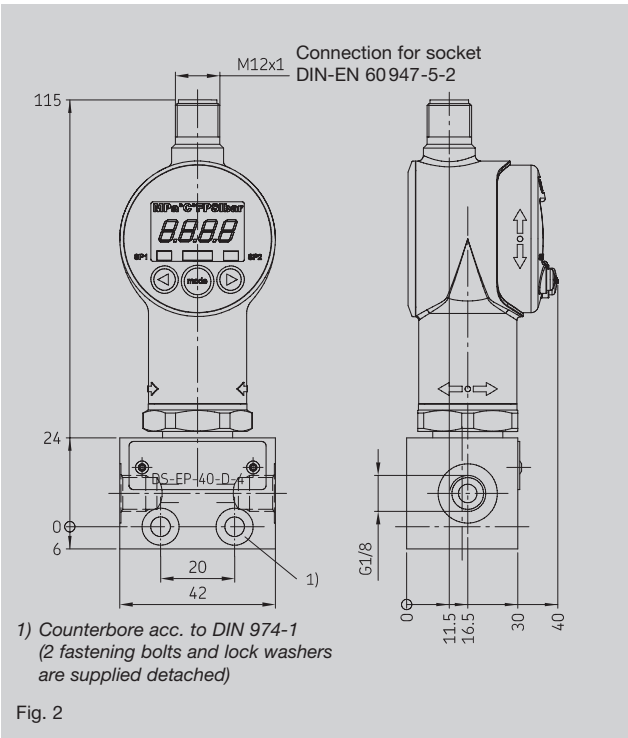
Pressure switch with connector to DIN EN 175301-803
Illustration: (DS-W1-4)

- ¹⁾ A safety valve has to be provided for in the system to keep the maximum permissible pressure from being exceeded.
- ²⁾ Ports tapped for solderless tube connection for tube diam. 6.
- ³⁾ Cable sockets for pressure switches with plugs conforming to DIN EN 175301-803 (DS-W.-4) have to be ordered separately:
Cable socket, order No. 179-990-034
Cable socket with indicator light for 220 V AC, order No. 179-990-110
Cable socket with indicator light for 24 V DC, order No. 179-990-111

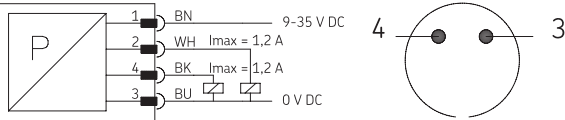
Attention: when installing the pressure switch and connecting the tubing make sure no strain is placed on the assembly.

DIN EN 175301-803 (cube plug) Order No.	Connector plug to DIN EN 175201-804 (6 pole machine plug) Order No.	ISO 60 947-5-2 (4 pole sensor plug) Order No.	Rated switching pressure nonadjustable [bars]
DS-W1-4	DS-W1-4-S9	DS-W1-5	1 +0.3
DS-W2-4	DS-W2-4-S9	DS-W2-5	2 +0.5
DS-W3-4	DS-W3-4-S9	DS-W3-5	3 -0.5
DS-W5-4	DS-W5-4-S9	DS-W5-5	5 ±0.5
DS-W8-4	DS-W8-4-S9	DS-W8-5	8
DS-W12-4	DS-W12-4-S9	DS-W12-5	12
DS-W20-4	DS-W20-4-S9	DS-W20-5	20 +0.5 -1.5
DS-W25-4	DS-W25-4-S9	DS-W25-5	25
DS-W30-4	DS-W30-4-S9	DS-W30-5	30

Electronic pressure switch
Group DS-EP-40-D-4



Electrical connection



Pin	Function	Core color *)
1	(+)	brown (BN)
2	output 2	white(WH)
3	(-)	blue (BU)
4	output 1	black (BK)

*) When a cable harness with cable socket is used (see accessories).

Technical data

General characteristics

Rated pressure	max. 100 bars
Permissible overpressure	200 bars
Rupture pressure	> 500 bars
Display optionally adjustable	bars, psi MPa
Ambient temperature	-25 to +80 °C
Fluid temperature	-25 to +80 °C
Materials in contact with medium	stainless steel, FKM (FPM)
Type of enclosure	IP67
Mounting position	any
Vibration resistance	< 10 g/0 - 500 Hz

Deviation from full-scale value

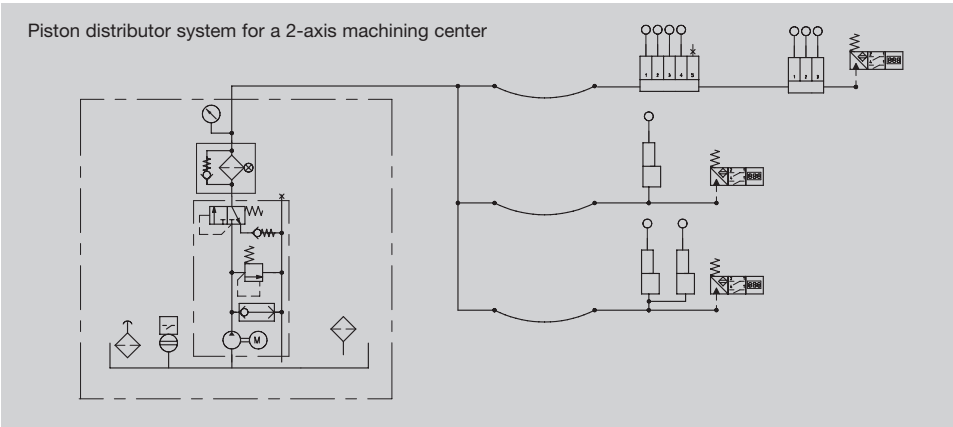
Accuracy (display)	< ± 0.5% type 1) < ± 1% max. 1)
Temperature drift	< ± 0.25% / 10K 1) in relation to full measuring scale

Electrical characteristics

Rated input voltage	9-35 VDC
Rated input voltage	max. 35 mA
Current-carrying capacity of signal outputs	1.2 A
Number of signal outputs	2
Type of signal outputs	PNP-Transistorstufen
Electrical connection	M12x1 plug, 4-pole type

Accessories:

- Cable with socket (straight), length 5 m, **order No. DS-E.U2**
- Cable with socket (angled), length 5 m, **order No. 179 990-382**
- Screw plug 1/8" E02, **order No. 466-419-001**
- Socket, angled, **order No. 179-990-372 8**



Practical example

The piston distributors for the individual axes are connected by hoses (cf. example). It is advisable to install a pressure switch at the end of each branch line in order to have any hose defect signaled at an early point in time.

Pressure switches, Group 176-...-...

Version with screw-type terminal screwed directly into the tubing.

Circuit closer (NO type) Order No.	Circuit opener (NC type) Order No.	Changeover Order No.	Rated switching pressure [bars]	Fig.
			nonadjustable	
176-110-101	—		$0.2^{+0.2}_{-0.1}$	3
176-110-100	176-120-100		$0.5^{+0.3}_{-0.1}$	3
176-110-102	176-120-102		1 ± 0.2	3
176-110-120	—		1.2 ± 0.5	3
176-110-200	176-120-200		2 ± 0.5	3
176-110-250	—		2.5 ± 0.5	3
176-110-300	—		3 ± 0.5	3
176-110-401	176-120-400		4 ± 0.5	3
176-110-450	—		4.5 ± 0.5	3
—	176-120-500		5 ± 0.5	3
176-110-800	176-120-800		8 ± 0.5	3
176-111-201	176-121-202		$12^{+0.5}_{-1.5}$	3
176-112-000	176-122-000		20 ± 1	3
176-112-200	—		22^{+2}_{-1}	3
176-112-800	176-122-800		28^{+2}_{-1}	3
176-114-500	176-124-500		45 ± 2	3

Version with tab connectors

	nonadjustable	
176-120-101	$0.5 \pm_{0.1}^{0.3}$	4
176-120-301	3 ± 0.5	4
176-120-801	8 ± 0.5	4
176-121-001	10 ± 1	4

Version with gold contacts

	adjustable	
176-170-400	1 to 10	5
176-175-000	10 to 50	5

*) 176-170-400 set for 4 ± 5 and 176-175-000 for $12 \pm_{-1.5}^{0.5}$

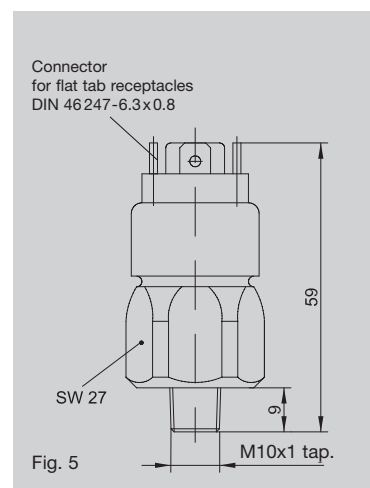
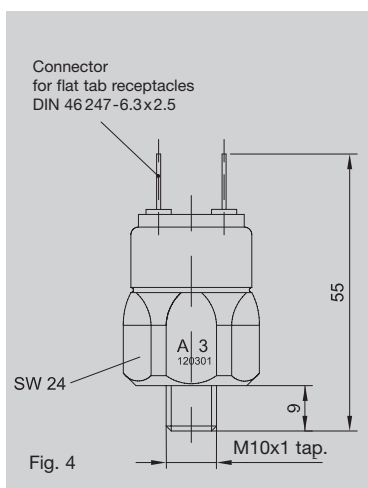
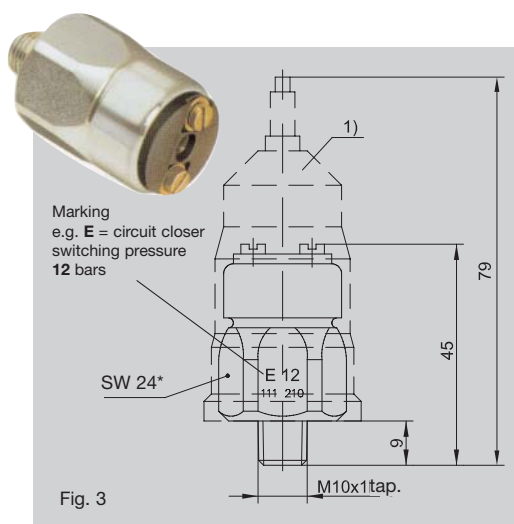
Technical data

Circuit closer / Circuit opener (NO type / NC type)

Contact load	30 VA
Switching voltage, max	42 V
Switching current, max	2.5 A
Min. switching current with 12 V DC	50 mA
Permissible operating pressure	50 bars
with type 176-114-500 and 176-124-500	80 bars
Rated switching pressure	cf. table
Type of contact	NO or NC
Switching frequency	60/min
Mechanical service life	10 ⁶ switching operations
Type of enclosure	IP 65, IP 00 terminals
Operating temperature, max	+80 °C
Fluids	mineral oils and oiled compressed air
Mounting position	any
NB: overpressure safety	
P _{max} static:	300 bars
P _{max} dynamic:	200 bars
maximum pressure-change speed:	1 bar/msec
vibration resistance:	10 g at 5-200 Hz sinusoidal

Changeover

Switching capacity	gold contact 1W
Switching voltage, min. / max	5 V DC / 24 V DC
Switching current, min. / max	5 mA / 50 mA
Rated switching pressure	cf. table
Release difference	20%
Permissible operating pressure	at 176-170-400: 100 bars at 176-175-000: 300 bars
Type of contact	changeover
Switching frequency	200/min
Mechanical service life	10 ⁶ operations
Type of enclosure	IP 65, terminals IP 00
Operating temperature, max	+80 °C
Fluids	mineral oils and oiled compressed air
Mounting position	any



¹⁾ Protective cap, order No. 898-420-001, has to be ordered separately

Please note: See leaflet 1-1730-US for respective sockets.



A brand of the SKF Group

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