

# Pressure switch FF 4

0.11 up to 250 bar, ample wiring room, easy to adjust  
high repeatability of set switchpoints, easily read scale



## Applications

Air compressors, water pumps, booster pumps, firefighting equipment, oil supply equipment.

## Description

TIVAL pressure switches of the FF 4 series are suitable for a wide range of applications. They can be utilized for:

- Monitoring and controlling the pressure of liquid or gaseous media in pipelines, tanks, vats, pressure vessels and apparatus.
- Applications in process control, cooling, pneumatics and hydraulics.
- Pressure monitoring of cooling circuits and lubrication systems on various types of machinery.
- Automatic switching of pump and compressor motors for supplying water to dwellings, booster pumps, firefighting equipment and on compressed air systems.

## Mode of operation

The pressure of the monitored medium operates against a flat diaphragm, bellows or plunger (depending on pressure range). A system of levers and springs work on a snapaction cascade switch of high vibration resistance, ensuring flutterfree switching. With no pressure on the diaphragm contact 1-2 is closed. This can be used as an „ON“ signal for a pump or compressor motor. If pressure exceeds the upper switchingpoint, contact 1-2 opens and contact 1-4 closes. The connected motor will be switched off. Contact 1-4 is often used to indicate the „off“ condition.

Contact 1-2 will close again, when the pressure on the diaphragm has dropped below the set lower switchpoint. Upper and lower switch points can be adjusted independently of each other using a screwdriver. The two switch points are indicated on the scale inside the unit.

### Change-over contact with manual reset min.:

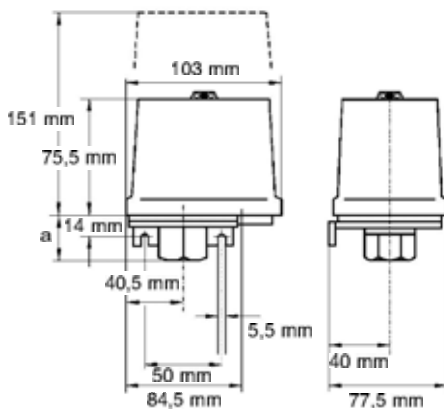
If the pressure drops below the set value, contact 1-4 opens and contact 1-2 closes and locks. When the pressure has risen above the set value, the contact can be unlocked with the manual reset button.

### Change-over contact with manual reset max.:

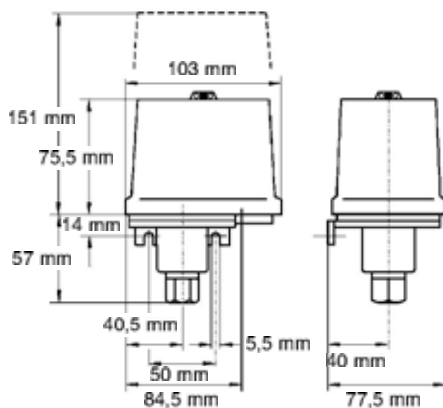
If the pressure rises above the set value, contact 1-2 opens and contact 1-4 closes and locks. When the pressure has dropped below the set value, the contact can be unlocked with the manual reset button.

Pressure connection, pressure sensing element, switch mechanism and electrical terminals are fitted on a die-cast aluminum-alloy base. The scale and switch are protected against environmental effects by an impact-resistant, transparent polycarbonate cover, (CTI 200-225) and can be lead-sealed.

**Included in standard units:** Rubber grommet with orifice for cable entry, pressure connector „Y“, made out of plastic for demineralised water applications.



FF 4-2, FF 4-4, FF 4-8,  
FF 4-16, FF 4-32



FF 4-12, FF 4-30, FF 4-60,  
FF 4-120, FF 4-250

### Options upon request:

- Gold flashed contacts
- Cable gland M 20 for protection IP 65
- Viton diaphragm for aggressive media
- Manual reset

- GL - approved version
- UL/CSA - approved version
- ATEX - approved version
- VdS - approved version

# Pressure switch FF 4

## Types

**Pressure switch with perbunan diaphragm** for mineral oils, water and air. Additional type **G** = **gold flashed contacts**

Pressure connector: H (G 3/8" Female thread, DIN ISO 228/l), silumin. VDE 0660, IEC 337-1, IEC 553-1

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-2 DAH	0,11 ... 2	0,04 ... 1,89	0,07 0,11	20	40	0,5 / 1,5	1010061
FF 4-2 DAH G	0,11 ... 2	0,04 ... 1,89	0,07 0,11	20	40	0,5 / 1,5	1010109
FF 4-4 DAH	0,22 ... 4	0,07 ... 3,75	0,15 0,25	24	40	1 / 3	1010062
FF 4-4 DAH G	0,22 ... 4	0,07 ... 3,75	0,15 0,25	24	40	1 / 3	1010012
FF 4-8 DAH	0,5 ... 8	0,2 ... 7,5	0,3 0,5	30	40	2 / 6	1010078
FF 4-8 DAH G	0,5 ... 8	0,2 ... 7,5	0,3 0,5	30	40	2 / 6	1010096
FF 4-16 DAH	1 ... 16	0,4 ... 15	0,6 1	36	48	4 / 12	1010081
FF 4-16 DAH G	1 ... 16	0,4 ... 15	0,6 1	36	48	4 / 12	1010102
FF 4-32 DAH	2 ... 32	0,8 ... 30	1,2 2	52	64	10 / 20	1010076
FF 4-32 DAH G	2 ... 32	0,8 ... 30	1,2 2	52	64	10 / 20	1010003

\* at lower ... higher end of range

## Types

**Pressure switch with perbunan diaphragm and plastic pressure connector** suitable i.e. for demineralised water.

Pressure connector: Y (G 3/8" Female thread, DIN ISO 228/l), polyamid. VDE 0660, IEC 337-1, IEC 553-1



Control pressure switch FF 4-... DAY

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-2 DAY	0,11 ... 2	0,04 ... 1,89	0,07 0,11	6	12	0,5 / 1,5	1010077
FF 4-4 DAY	0,22 ... 4	0,07 ... 3,75	0,15 0,25	8	12	1 / 3	1010063
FF 4-8 DAY	0,5 ... 8	0,2 ... 7,5	0,3 0,5	12	16	2 / 6	1010084
FF 4-10 DAY	0,7 ... 10	0,3 ... 9,2	0,4 0,8	12	16	4 / 5	1010073
FF 4-16 DAY	1 ... 16	0,4 ... 15	0,6 1	20	24	4 / 12	1010082

\* at lower ... higher end of range

# Pressure switch FF 4

## Types

**Pressure switch with stainless steel bellows Declaration of Conformity in acc. with PED, media temperature up to 200°C, de-ionised water**

Pressure connector: G (G 1/4" Female thread DIN ISO 228/1), stainless steel. VDE 0660, IEC 337-1, IEC 553-1



Control pressure switch FF 4-... AAG/PAH

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-12 AAG	1 ... 12	0,5 ... 11,2	0,5 0,8	12	16	6 / 7	1010074
FF 4-30 AAG	4 ... 30	1 ... 26,4	1,8 3,6	30	42	16 / 20	1010066

\* at lower ... higher end of range

## Types

**High pressure switch with plastic plunger.**

Throttle is fitted as standard on these units. This must be removed for use with viscous media.

Pressure connector: H (G 3/8" Female thread, DIN ISO 228/1), stainless steel. VDE 0660, IEC 337-1, IEC 553-1

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-60 PAH	8 ... 60	4 ... 52	4 8	100	120	20 / 40	1010064
FF 4-120 PAH	16 ... 120	8 ... 104	8 16	200	240	20 / 80	1010079
FF 4-250 PAH	30 ... 250	14 ... 226	12 24	400	500	100 / 200	1010072

\* at lower ... higher end of range

# Pressure switch FF 4

## Types

**Pressure switch with manual reset** DDH = reset min., DRH = reset max.

Pressure connector: H (G 3/8" Female thread, DIN ISO 228/I), silumin. VDE 0660, IEC 337-1, IEC 553-1



Control pressure switch FF 4-... with manual reset

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff. (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-2 DRH	0,11 ... 2		0,2	20	40	0,5 / 1,5	1010106
FF 4-2 DDH		0,04 ... 1,89	0,1	20	40	0,5 / 1,5	1010107
FF 4-4 DRH	0,22 ... 4		0,5	24	40	1 / 3	1010016
FF 4-4 DDH		0,07 ... 3,75	0,2	24	40	1 / 3	1010100
FF 4-8 DRH	0,5 ... 8		1,0	30	40	2 / 6	1010069
FF 4-8 DDH		0,2 ... 7,5	0,4	30	40	2 / 6	1010094
FF 4-16 DRH	1 ... 16		2,0	36	48	4 / 12	1010110
FF 4-16 DDH		0,4 ... 15	0,8	36	48	4 / 12	1010101
FF 4-32 DRH	2 ... 32		4,0	52	64	10 / 20	1010057
FF 4-32 DDH		0,8 ... 30	1,6	52	64	10 / 20	1010087

# Pressure switch FF 4

## Types

Pressure switch with UL / CSA-approval IP 65 for mineral oils, water and air.

Pressure connector: F (1/4"18 NPTF), silumin. Cable gland 1/2" 14 NPTF is fitted as standard on these units.

VDE 0170/0171/0660, IEC 337-1, IEC 553-1



Control pressure switch FF 444-... with UL/CSA-approval

Order reference	Upper switch pt. adjustable (psi)	Lower switch pt. adjustable (psi)	Smallest diff.* (psi)	Max. operating pressure (psi)	Max. test pressure (psi)	Standard setting (psi)	Part No.
FF444-V1 DAF	1,5 ... 29	0,5 ... 27	1 0,5	290	580	7 / 22	1010308
FF444-V2 DAF	3 ... 58	1 ... 54	2 4	348	580	14 / 44	1010309
FF444-V3 DAF	7 ... 116	3 ... 109	4 7	435	580	29 / 87	1010310
FF444-V4 DAF	15 ... 232	6 ... 217	9 14	522	696	58 / 174	1010311
FF444-V5 DAF	29 ... 464	12 ... 435	17 29	769	928	145 / 290	1010312
FF444-V6 PAF	116 ... 870	58 ... 754	58 116	1450	1740	290 / 580	1010299
FF444-V7 PAF	232 ... 1740	116 ... 1508	116 232	2900	3840	290 / 1160	1010300
FF444-V8 PAF	435 ... 3625	203 ... 3277	174 348	5800	7250	1450 / 2900	1010301

\* at lower ... higher end of range

## Technical data

Rated operating current at 230 V AC 1	16 A
Rated operating current at 230 V AC 15	6 A
Rated operating current at 230 V DC 13	0,1 A
Permissible motor power 1 ~ 230 V	0.55 kW
Resistance to vibration 10 up to 1000 Hz	4 g

Protection acc. to DIN 40 050/IEC 529 with rubber grommet	IP 54
Protection acc. to DIN 40 050/IEC 529 with cable glands PG 13.5/M20	IP 65
Ambient temperature range	-20...+70° C
Perm. medium temperature (...DAH, PAH)	+70° C
(...DAY)	+50° C
(...AAG)	+200° C
Repeatability	< 2% FS



# Pressure switch FF 4

## Media compatibility guide

Medium name	Chemical Formula	Stainless steel	Perbunan	Viton	Plastic
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	X			
Acetylene	HC = CH	X	X	X	X
Air	-	X	X	X	X
Benzene	Sulphur-free	X		X	
Butane	C <sub>4</sub> H <sub>10</sub>	X	X	X	X
Butyl acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	X			
Butyl alcohol	CH <sub>3</sub> -CH <sub>2</sub> -CH <sub>2</sub> -CH <sub>2</sub> -OH	X			
Carbon dioxide	CO <sub>2</sub>	X	X	X	X
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	X	X	X	X
Chlorine	Cl <sub>2</sub>			X	
Crude oil	-	X	X	X	X
Diesel oil	See fuels	X	X	X	X
Ethyl acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	X			
Fuels	Diesel oil,	X	X	X	X
	Leaded petrol	X	X	X	X
	Benzene	X		X	
Glycerine	CH <sub>2</sub> OH-CHOH-CH <sub>2</sub> OH	X	X	X	X
Glycol	CH <sub>2</sub> OH-CH <sub>2</sub> OH	X	X	X	X
Heating fuel oil	See also oils	X	X	X	X
Hydrogen	H <sub>2</sub>	X	X		X
Inert gases	-	X			
Methanol	CH <sub>3</sub> OH	X			
Methyl chloride	CH <sub>3</sub> Cl	X			
Natural gas	-	X	X	X	X
Nitrogen	N <sub>2</sub>	X	X	X	X
Oils	Mineral	X	X	X	X
Oils	Vegetable	X	X	X	
Oxygen	O <sub>2</sub>	X		X	
Ozone	-	X		X	
Perchloroethylene	CCl <sub>2</sub> =CCl <sub>2</sub>	X		X	
Petrol	All types	X		X	
Phenolic acid	C <sub>6</sub> H <sub>5</sub> (OH)	X			
Propane	C <sub>3</sub> H <sub>8</sub>	X	X	X	X
Sulphar dioxide	SO <sub>2</sub>	X		d	
Toluene (Metyl benzene)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	X		X	
Trichlorethene	CHCl=CCl <sub>2</sub>	X		X	
Water	Steam/vapor	X	X	X	
Water	Distilled, de-aerated	X	X	X	X
Water	Sea water	X	X		X
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	X		X	

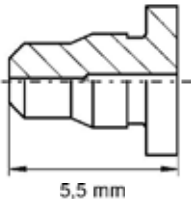
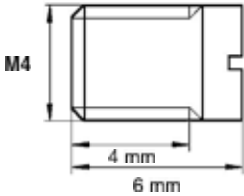
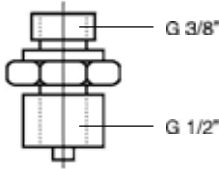
X = recommended, d = dry

## Accessories

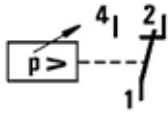
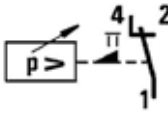
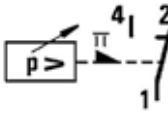
Order reference	Description	Weight (g)	Part No.
	<b>Throttles</b>		
Throttle FF4-2...32	Throttle for series FF4-2 up to 32	3	1011002
Throttle FF4-60...250	Throttle for series FF4-60 up to 250	3	1011003
	<b>Glands</b>		
H 124-114	Steel gauge fitting, G 3/8" - G 1/2"	180	1071004
Gland M 20	Glands FF4	-	1011004
Nut M 20	Nut FF4	-	1011007
	<b>Cover</b>		
H FF4	Cover FF4	-	1011001

# Pressure switch FF 4

## Dimensions

 <p><b>Throttle for FF 4-2 up to 32</b> approx. weight: 0,003 kg Order No.: 1011002</p>	 <p><b>Throttle screw for FF 4-60 up to 250</b> approx. weight: 0,003 kg Order No.: 1011003</p>
 <p><b>Gauge fitting</b> Steel, G 3/8" - G 1/2", Type: H 124-114 approx. weight: 0.18 kg Order No.: 1071004</p>	

## Circuit diagrams

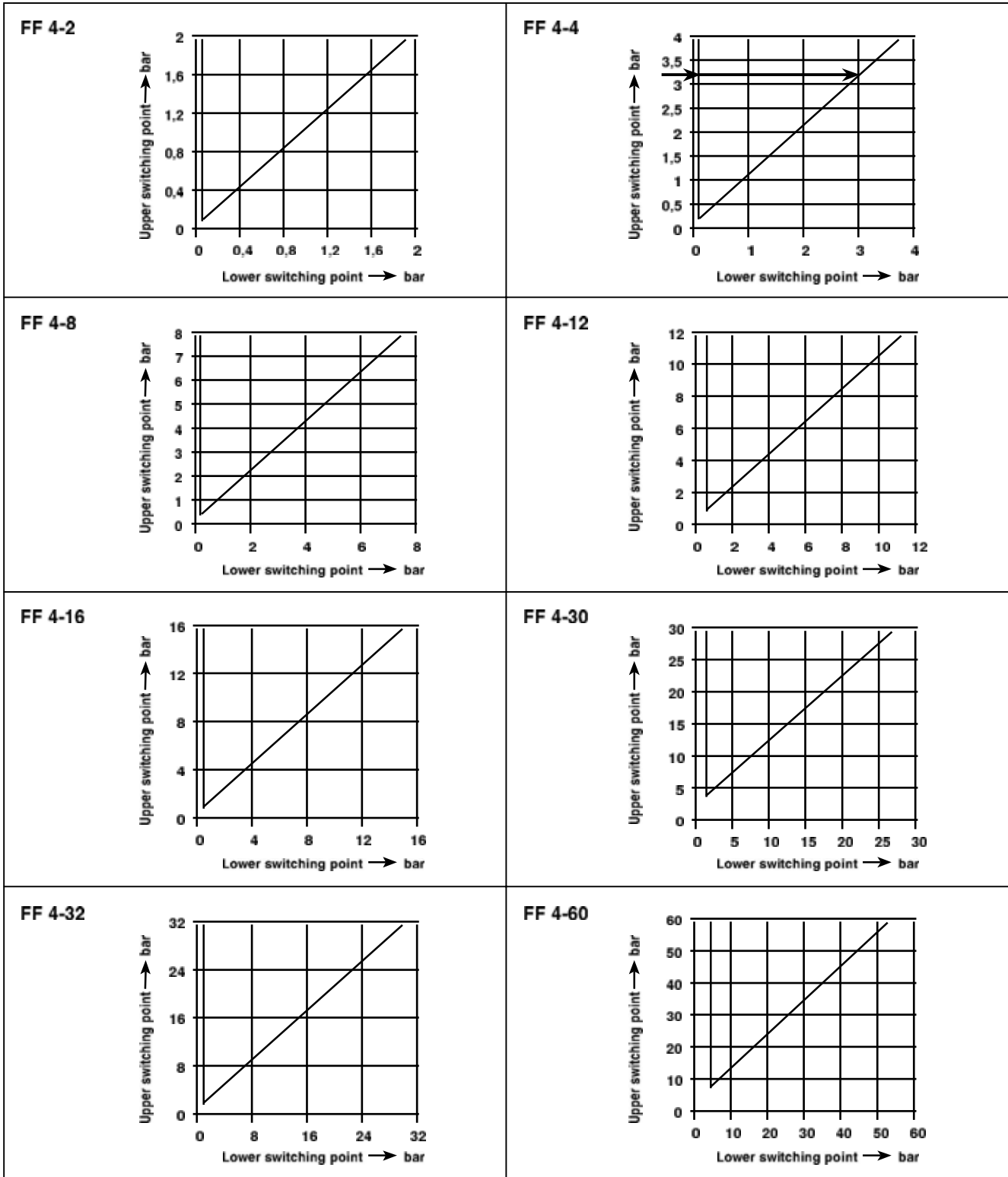
 <p><b>Change-over contact</b></p>	 <p><b>Change-over contact with manual reset min.</b></p>	 <p><b>Change-over contact with manual reset max.</b></p>
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# Pressure switch FF 4

## Pressure diagrams

Above charts show the smallest adjustable differential.

Example per figure FF 4-4: If upper setting is at 3.25 bar, lower setting can be adjusted between 0.07 and 3.0 bar (see arrows in the drawing).

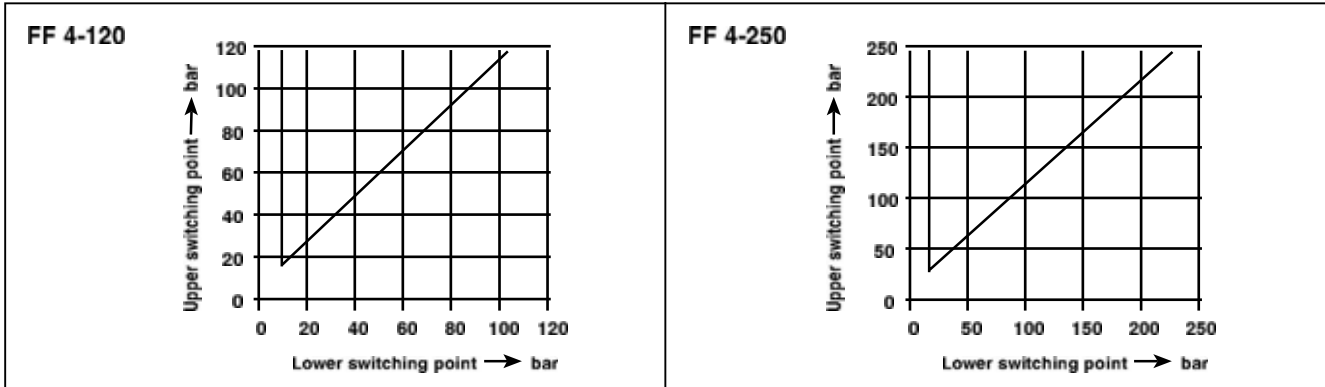




# Pressure switch FF 4



## Pressure diagrams



Pressure switches

# Pressure switch FF 4

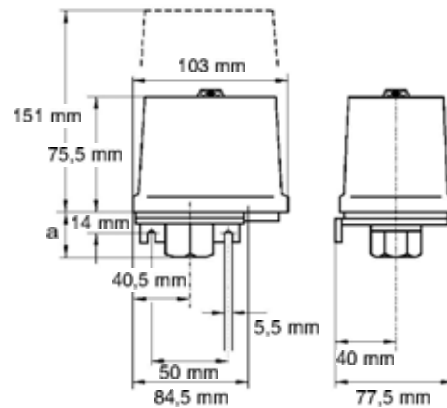
Approval acc. to ATEX

## Description

- Pressure switches 2 to 32 bar with perbunan diaphragm.
- Pressure switches 60 to 250 bar with plastic plunger and throttle.
- Throttle must be removed when using viscous media.



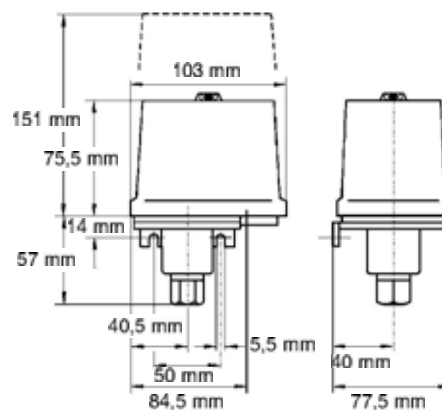
Control pressure switch FF 4-4 AB DAH



FF 4-2, FF 4-4, FF 4-8,  
FF 4-16, FF 4-32



Control pressure switch FF 4-4 AC DAH



FF 4-12, FF 4-30, FF 4-60,  
FF 4-120, FF 4-250

## Types

Protection class: IM2 EEx ia I, Pressure connector: H (G 3/8" Female thread)

Order reference	Upper switch set adjustable (bar)	Lower switch set adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-2 AB DAH	0,11 ... 2	0,04 ... 1,89	0,07 0,11	20	40	0,5 / 1,5	1030133
FF 4-4 AB DAH	0,22 ... 4	0,07 ... 3,75	0,15 0,25	24	40	1 / 3	1030134
FF 4-8 AB DAH	0,5 ... 8	0,2 ... 7,5	0,3 0,5	30	40	2 / 6	1030135
FF 4-16 AB DAH	1 ... 16	0,4 ... 15	0,6 1	36	48	4 / 12	1030136
FF 4-32 AB DAH	2 ... 32	0,8 ... 30	1,1 2	52	64	10 / 20	1030137
FF 4-60 AB PAH	8 ... 60	4 ... 52	4 8	100	120	20 / 40	1030138
FF 4-120 AB PAH	16 ... 120	8 ... 104	8 16	200	240	20 / 80	1030139
FF 4-250 AB PAH	30 ... 250	14 ... 226	12 24	400	500	100 / 200	1030140

\* at lower ... higher end of range

Marketed By: D. K. Instruments Pvt. Ltd. 76/2, Selimpur Road, Kolkata – 700 031

Tel: 91-33-2415 1310, Fax: 91-33-2415 2311, Email: info@dkinstruments.com, Url: www.dkinstruments.com

# Pressure switch FF 4

## Types

Protection class: II 2G EEx ia IIC T6, Pressure connector: H (G 3/8" Female thread)

Order	Upper adjustable (bar)	Lower adjustable (bar)	Smallest (bar)	Max. pressure (bar)	Max. pressure (bar)	Standard (bar)	Part No.
FF 4-2 AC DAH	0,11 ... 2	0,04 ... 1,89	0,07 0,11	20	40	0,5 / 1,5	1030141
FF 4-4 AC DAH	0,22 ... 4	0,07 ... 3,75	0,15 0,25	24	40	1 / 3	1030142
FF 4-8 AC DAH	0,5 ... 8	0,2 ... 7,5	0,3 0,5	30	40	2 / 6	1030144
FF 4-16 AC DAH	1 ... 16	0,4 ... 15	0,6 1	36	48	4 / 12	1030145
FF 4-32 AC DAH	2 ... 32	0,8 ... 30	1,1 2	52	64	10 / 20	1030146
FF 4-60 AC PAH	8 ... 60	4 ... 52	4 8	100	120	20 / 40	1030147
FF 4-120 AC PAH	16 ... 120	8 ... 104	8 16	200	240	20 / 80	1030149
FF 4-250 AC PAH	30 ... 250	14 ... 226	12 24	400	500	100 / 200	1030150

\* at lower ... higher end of range

## Types

Protection class: II 2G EEx ia IIC T6, Pressure connector with stainless steel corrugated bellows, Pressure connector: G (G 1/4" Female thread)

Order	Upper adjustable (bar)	Lower adjustable (bar)	Smallest (bar)	Max. pressure (bar)	Max. pressure (bar)	Standard (bar)	Part No.
FF4-12 AC AAG	1 ... 12	0,5 ... 11,2	0,5 0,8	12	16	6 / 7	1030131
FF4-30 AC AAG	4 ... 30	1 ... 26,4	1,8 3,6	30	42	16 / 20	1030132

\* at lower ... higher end of range

## Technical Data

Resistance to vibration 10 up to 1000 Hz	4 g
Protection acc. to DIN 40 050/IEC 529 with rubber grommet	IP 54
Protection acc. to DIN 40 050/IEC 529 with cable glands PG 13.5/M20	IP 65

Ambient temperature range	-30...+60° C
Perm. medium temperature (...DAH, PAH) (...AAG)	+70° C +200° C
Repeatability	< 2% FS

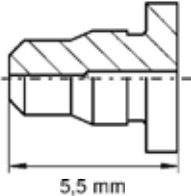
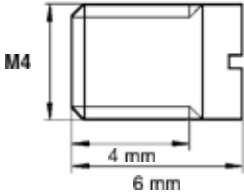
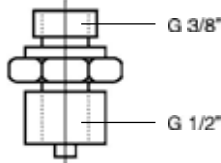
# Pressure switch FF 4



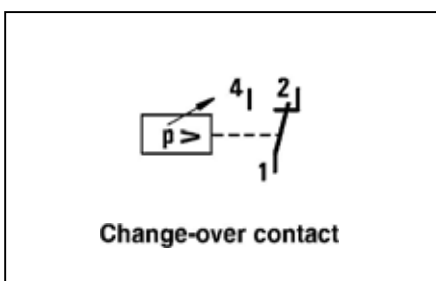
## Accessories

Order reference	Description	Weight (g)	Part No.
<b>Throttle FF4-2...32</b>	<b>Throttles</b> Throttle for series FF4-2 up to 32	3	1090401002
<b>Throttle FF4-60...250</b>	Throttle for series FF4-60 up to 250	3	1090401003
<b>H 124-114</b>	<b>Glands</b> Steel gauge fitting, G 3/4" - G 1/2"	180	1090501004

## Dimensions

 <p><b>Throttle for FF 4-2 up to 32</b> approx. weight: 0,003 kg Order No.: 1011002</p>	 <p><b>Throttle screw for FF 4-60 up to 250</b> approx. weight: 0,003 kg Order No.: 1011003</p>
 <p><b>Gauge fitting</b> Steel, G 3/8" - G 1/2", Type: H 124-114 approx. weight: 0.18 kg Order No.: 1071004</p>	

## Circuit diagram



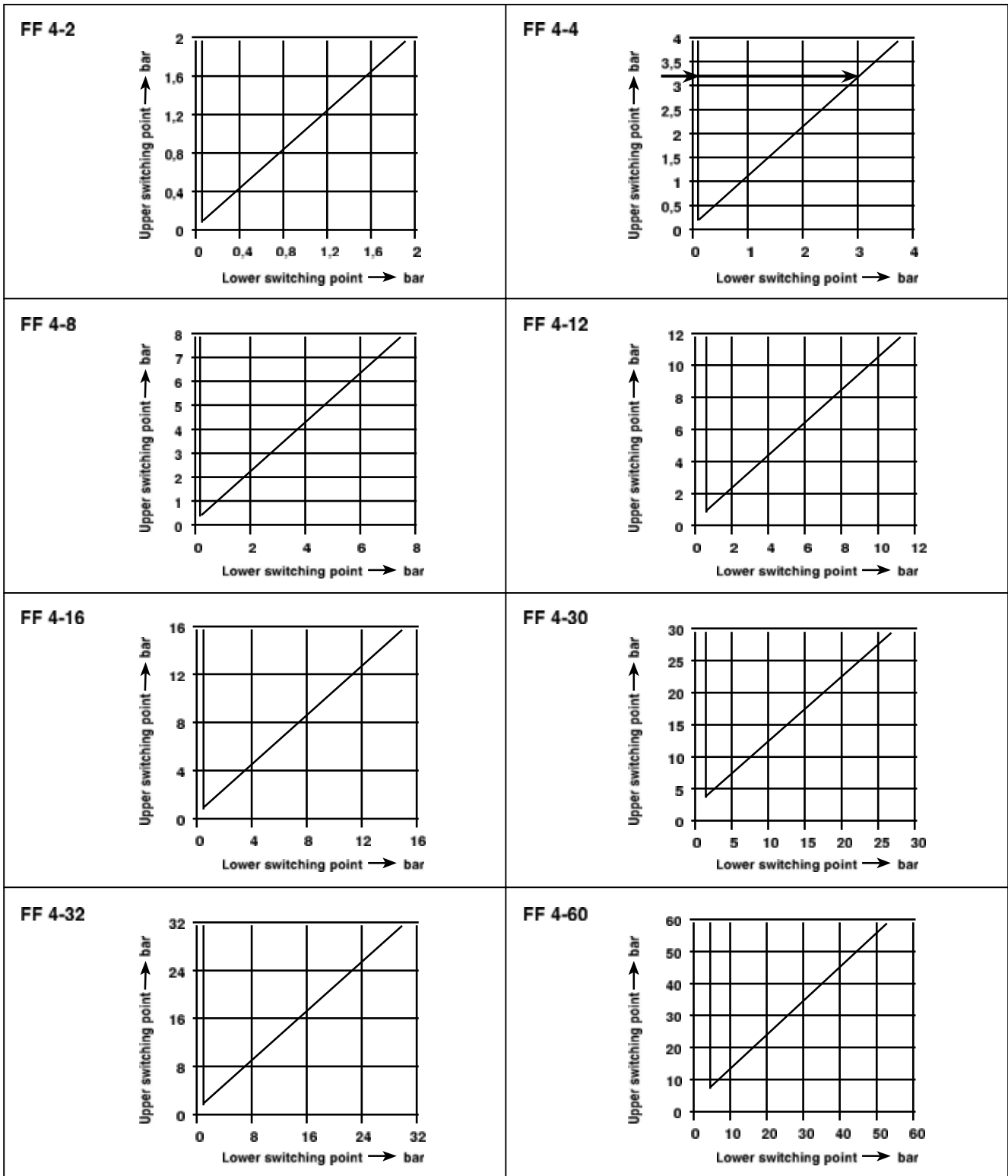
# Pressure switch FF 4



## Pressure diagrams

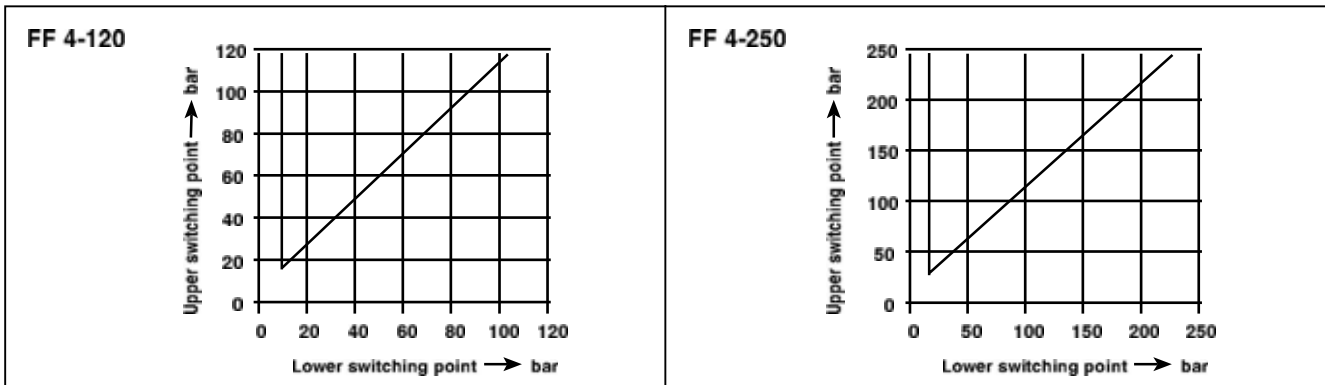
Above charts show the smallest adjustable differential.

Example per figure FF 4-4: If upper setting is at 3.25 bar, lower setting can be adjusted between 0.07 and 3.0 bar (see arrows in the drawing).



# Pressure switch FF 4

## Pressure diagrams



## Media compatibility guide

Medium name	Chemical Formula	Stainless steel	Perbunan	Viton	Plastic
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	X			
Acetylene	HC = CH	X	X	X	X
Air	-	X	X	X	X
Benzene	Sulphur-free	X		X	
Butane	C <sub>4</sub> H <sub>10</sub>	X	X	X	X
Butyl acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	X			
Butyl alcohol	CH <sub>3</sub> -CH <sub>2</sub> -CH <sub>2</sub> -CH <sub>2</sub> -OH	X			
Carbon dioxide	CO <sub>2</sub>	X	X	X	X
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	X	X	X	X
Chlorine	Cl <sub>2</sub>			X	
Crude oil	-	X	X	X	X
Diesel oil	See fuels	X	X	X	X
Ethyl acetate	CH <sub>3</sub> OOOC <sub>2</sub> H <sub>5</sub>	X			
Fuels	Diesel oil,	X	X	X	X
	Leaded petrol	X	X	X	X
	Benzene	X		X	
Glycerine	CH <sub>2</sub> OH-CHOH-CH <sub>2</sub> OH	X	X	X	X
Glycol	CH <sub>2</sub> OH-CH <sub>2</sub> OH	X	X	X	X
Heating fuel oil	See also oils	X	X	X	X
Hydrogen	H <sub>2</sub>	X	X		X
Inert gases	-	X			
Methanol	CH <sub>3</sub> OH	X			
Methyl chloride	CH <sub>3</sub> Cl	X			
Natural gas	-	X	X	X	X
Nitrogen	N <sub>2</sub>	X	X	X	X
Oils	Mineral	X	X	X	X
Oils	Vegetable	X	X	X	
Oxygen	O <sub>2</sub>	X		X	
Ozone	-	X		X	
Perchloroethylene	CCl <sub>2</sub> =CCl <sub>2</sub>	X		X	
Petrol	All types	X		X	
Phenolic acid	C <sub>6</sub> H <sub>5</sub> (OH)	X			
Propane	C <sub>3</sub> H <sub>8</sub>	X	X	X	X
Sulphar dioxide	SO <sub>2</sub>	X		d	
Toluene (Metyl benzene)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	X		X	
Trichlorethene	CHCl=CCl <sub>2</sub>	X		X	
Water	Steam/vapor	X	X	X	
Water	Distilled, de-aerated	X	X	X	X
Water	Sea water	X	X		X
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	X		X	

X = recommended, d = dry

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# Pressure switch FF 4 GL

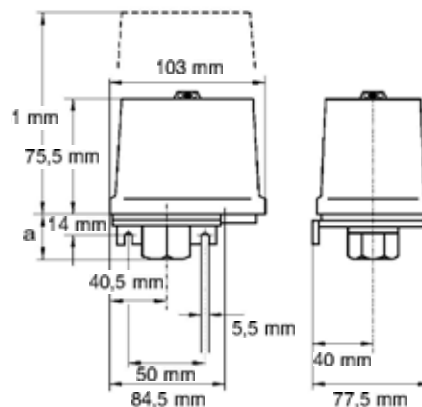
Approved for shipbuilding applications by Germanischer Lloyd  
Certificate No.: 26490-05HH

## Description

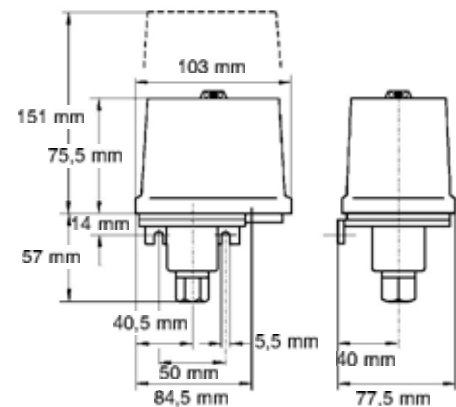
- Pressure switch 2 to 32 bar range equipped with perbunan diaphragm.
- Pressure switch 60 to 250 bar range equipped with a plastic plunger and a throttle is fitted as standard.
- All GL-certified pressure switches are equipped with a marine-type cable gland and additional grounding clamp as standard.



FF 4-... GL-approval



FF 4-2, FF 4-4, FF 4-8,  
FF 4-16, FF 4-32



FF 4-12, FF 4-30, FF 4-60,  
FF 4-120, FF 4-250

## Types

**Pressure switch with perbunan diaphragm** for mineral oils, water and air.

Pressure connector: H (G 3/8" Female thread, DIN ISO 228/1), silumin. VDE 0660, IEC 337-1, IEC 553-1

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-2 GL DAH	0,11 ... 2	0,04 ... 1,89	0,07 0,11	20	40	0,5 / 1,5	1010122
FF 4-4 GL DAH	0,22 ... 4	0,07 ... 3,75	0,15 0,25	24	40	1 / 3	1010020
FF 4-8 GL DAH	0,5 ... 8	0,2 ... 7,5	0,3 0,5	30	40	2 / 6	1010031
FF 4-16 GL DAH	1 ... 16	0,4 ... 15	0,6 1	36	48	4 / 12	1010117
FF 4-32 GL DAH	2 ... 32	0,8 ... 30	1,2 2	52	64	10 / 20	1010026

\* at lower ... higher end of range

## Types

**High pressure switch with plastic plunger.**

Throttle is fitted as standard on these units. This must be removed for use with viscous media.

Pressure connector: H (G 3/8" Female thread, DIN ISO 228/1), stainless steel. VDE 0660, IEC 337-1, IEC 553-1

Order reference	Upper switch pt. adjustable (bar)	Lower switch pt. adjustable (bar)	Smallest diff.* (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-60 GL PAH	8 ... 60	4 ... 52	4 8	100	120	20 / 40	1010088
FF 4-120 GL PAH	16 ... 120	8 ... 104	8 16	200	240	20 / 80	
FF 4-250 GL PAH	30 ... 250	14 ... 226	12 24	400	500	100 / 200	

\* at lower ... higher end of range

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# Pressure switch FF 4 GL



## Technical data

Rated operating current at 230 V AC 1	16 A
Rated operating current at 230 V AC 15	6 A
Rated operating current at 230 V DC 13	0,1 A
Permissible motor power 1 ~ 230 V	0.55 kW
Resistance to vibration 10 up to 1000 Hz	4 g

Protection acc. to DIN 40 050/IEC 529 with rubber grommet	IP 54
Protection acc. to DIN 40 050/IEC 529 with cable glands PG 13.5/M20	IP 65
Ambient temperature range	-20...+70° C
Perm. medium temperature (...DAH, PAH) (...DAY) (...AAG)	+70° C +50° C +200° C
Repeatability	< 2% FS

## Media compatibility guide

Medium name	Chemical Formula	Stainless steel	Perbunan	Viton	Plastic
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	X			
Acetylene	HC = CH	X	X	X	X
Air	-	X	X	X	X
Benzene	Sulphur-free	X		X	
Butane	C <sub>4</sub> H <sub>10</sub>	X	X	X	X
Butyl acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	X			
Butyl alcohol	CH <sub>3</sub> -CH <sub>2</sub> -CH <sub>2</sub> -CH <sub>2</sub> -OH	X			
Carbon dioxide	CO <sub>2</sub>	X	X	X	X
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	X	X	X	X
Chlorine	Cl <sub>2</sub>			X	
Crude oil	-	X	X	X	X
Diesel oil	See fuels	X	X	X	X
Ethyl acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	X			
Fuels	Diesel oil,	X	X	X	X
	Leaded petrol	X	X	X	X
	Benzene	X		X	
Glycerine	CH <sub>2</sub> OH-CHOH-CH <sub>2</sub> OH	X	X	X	X
Glycol	CH <sub>2</sub> OH-CH <sub>2</sub> OH	X	X	X	X
Heating fuel oil	See also oils	X	X	X	X
Hydrogen	H <sub>2</sub>	X	X		X
Inert gases	-	X			
Methanol	CH <sub>3</sub> OH	X			
Methyl chloride	CH <sub>3</sub> Cl	X			
Natural gas	-	X	X	X	X
Nitrogen	N <sub>2</sub>	X	X	X	X
Oils	Mineral	X	X	X	X
Oils	Vegetable	X	X	X	
Oxygen	O <sub>2</sub>	X		X	
Ozone	-	X		X	
Perchloroethylene	CCl <sub>2</sub> =CCl <sub>2</sub>	X		X	
Petrol	All types	X		X	
Phenolic acid	C <sub>6</sub> H <sub>5</sub> (OH)	X			
Propane	C <sub>3</sub> H <sub>8</sub>	X	X	X	X
Sulphur dioxide	SO <sub>2</sub>	X		d	
Toluene (Metyl benzene)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	X		X	
Trichlorethene	CHCl=CCl <sub>2</sub>	X		X	
Water	Steam/vapor	X	X	X	
Water	Distilled, de-aerated	X	X	X	X
Water	Sea water	X	X		X
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	X		X	

X = recommended, d = dry

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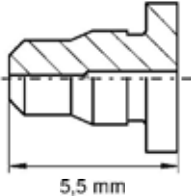
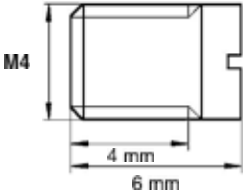
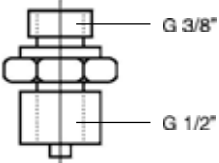
# Pressure switch FF 4 GL



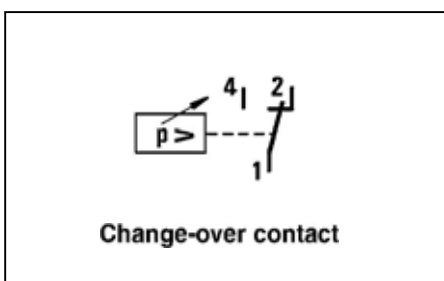
## Accessories

Order reference	Description	Weight (g)	Part No.
<b>Throttles</b>			
<b>Throttle FF4-2...32</b>	Throttle for series FF4-2 up to 32	3	1011002
<b>Throttle FF4-60...250</b>	Throttle for series FF4-60 up to 250	3	1011003
<b>Glands</b>			
<b>H 124-114</b>	Steel gauge fitting, G 3/4" - G 1/2"	180	1071004

## Dimensions

 <p><b>Throttle for FF 4-2 up to 32</b> approx. weight: 0,003 kg Order No.: 1011002</p>	 <p><b>Throttle screw for FF 4-60 up to 250</b> approx. weight: 0,003 kg Order No.: 1011003</p>
 <p><b>Gauge fitting</b> Steel, G 3/8" - G 1/2", Type: H 124-114 approx. weight: 0.18 kg Order No.: 1071004</p>	

## Circuit diagram



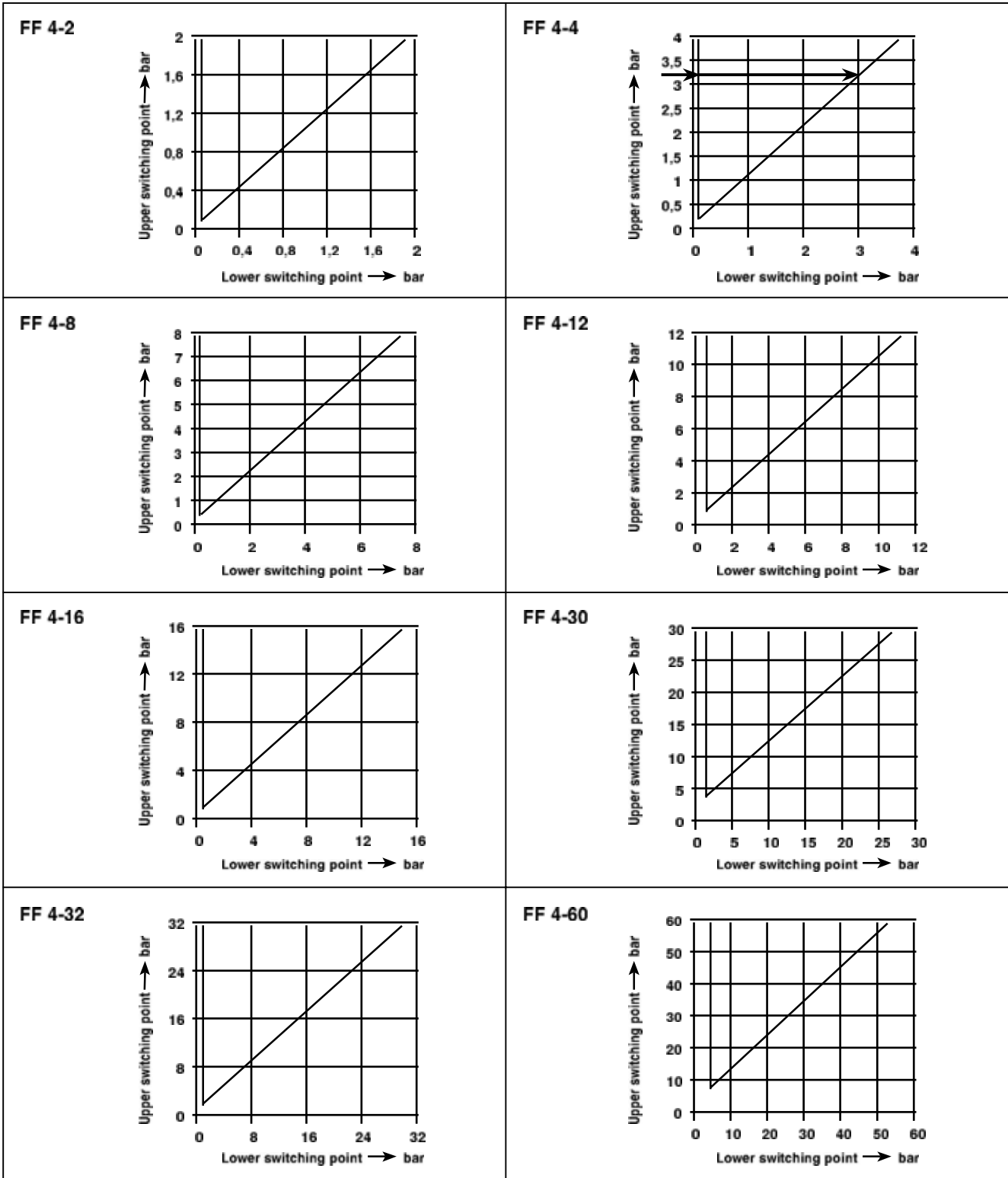
# Pressure switch FF 4 GL



## Pressure diagrams

Above charts show the smallest adjustable differential.

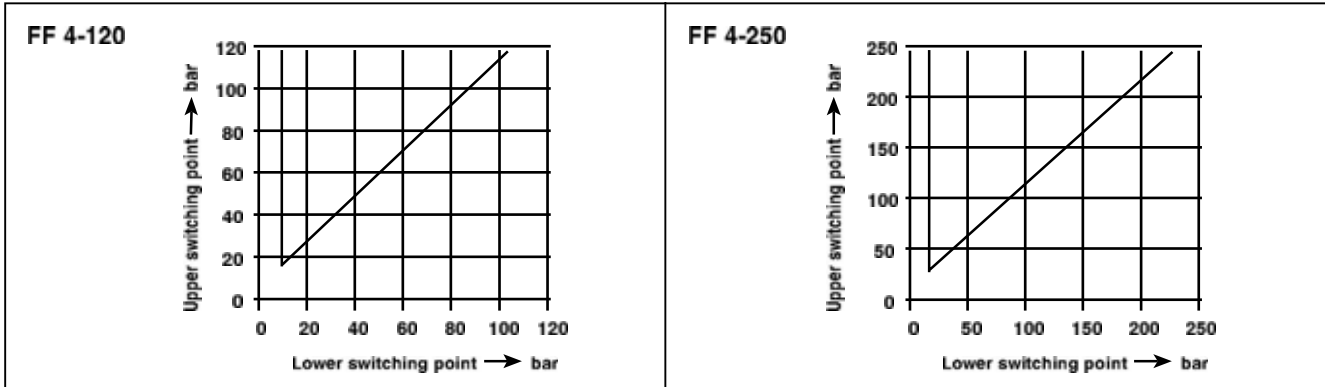
Example per figure FF 4-4: If upper setting is at 3.25 bar, lower setting can be adjusted between 0.07 and 3.0 bar (see arrows in the drawing).



# Pressure switch FF 4 GL



## Pressure diagrams



Pressure switches

# Pressure switch FF 4 VdS

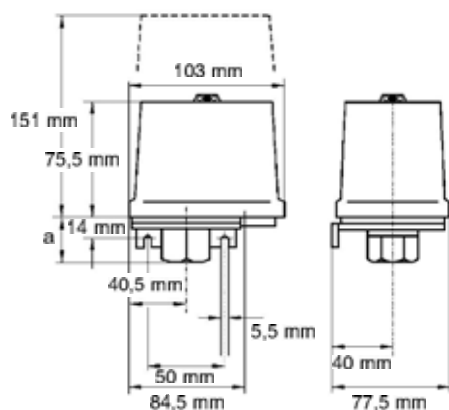
for firefighting equipment;  
VdS-approval



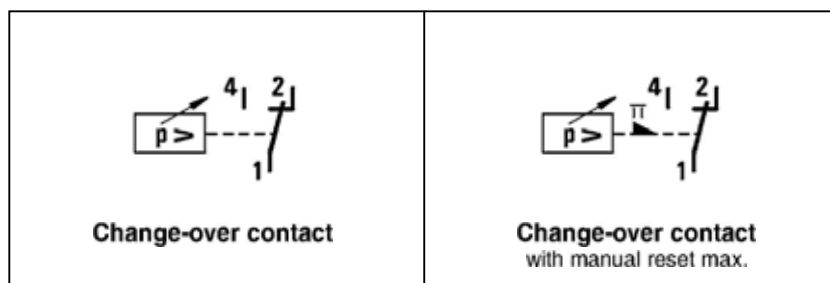
## Description

- FF 4-... VdS are approved for use in fixed watersprinkler installations by the German Association of Insurers
- 4-2 VdS is a typical alarm pressure switch. The setting range is limited to 1 bar. Differential lever and spring are omitted to assure a minimum resetting differential..
- FF 4-10 VdS and FF 4-16 VdS pressure switches limit the differential to 1.5 bar maximum

Control pressure switch FF 4-... VdS



## Circuit diagrams



## Types

**Pressure switch for fire fighting equipment VdS-approved.** Especially demanding requirements regarding quality and functional reliability are placed on pressure switches intended for pressure monitoring on fireprotection equipment. Pressure connector: I (G 1/2" Female thread, DIN ISO 228/1), silumin.

Order reference	Upper adjustable (bar)	Lower adjustable (bar)	Smallest offset (bar)	Max. operating pressure (bar)	Max. test pressure (bar)	Standard setting (bar)	Part No.
FF 4-2 VdS DAI	0,35 ... 1	0,25 ... 0,9	0,1 fixed	20	40	0,6 / 0,7	1020068
FF 4-2 VdS DRI**	0,5 ... 1		0,2 fixed	20	40	... / 0,7	1020070
FF 4-10 VdS DAI	0,7 ... 10	0 ... 8,5	0,5 1,5	32	40	4 / 5	1020080
FF 4-16 VdS DAI	1 ... 16	0,5 ... 15	0,8 1,5	36	48	11 / 12	1020067

\*\* FF 4-2 VdS DRI with manual reset max.

\* at lower ... higher end of range

## Technical data

Rated operating current at 230 V AC 1	16 A
Rated operating current at 230 V AC 15	6 A
Rated operating current at 230 V DC 13	0,1 A
Permissible motor power 1 ~ 230 V	0.55 kW
Resistance to vibration 10 up to 1000 Hz	4 g

Protection acc. to DIN 40 050/IEC 529 with rubber grommet	IP 54
Protection acc. to DIN 40 050/IEC 529 with cable glands PG 13.5/M20	IP 65
Ambient temperature range	20...+70° C
Perm. medium temperature	+70° C
Repeatability	< 2% FS

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# Pressure switch FF 142

2 Change-over contacts, simple installation, easy pressure setting, scale in bar and psi, high repeatability, die cast enclosure



Control pressure switch FF 142-... DAH

## Applications

The FF 142 Series is a pressure switch which has been standardized in a wide variety of industrial, commercial and seagoing applications to monitor or control the pressure of liquid or gaseous media:

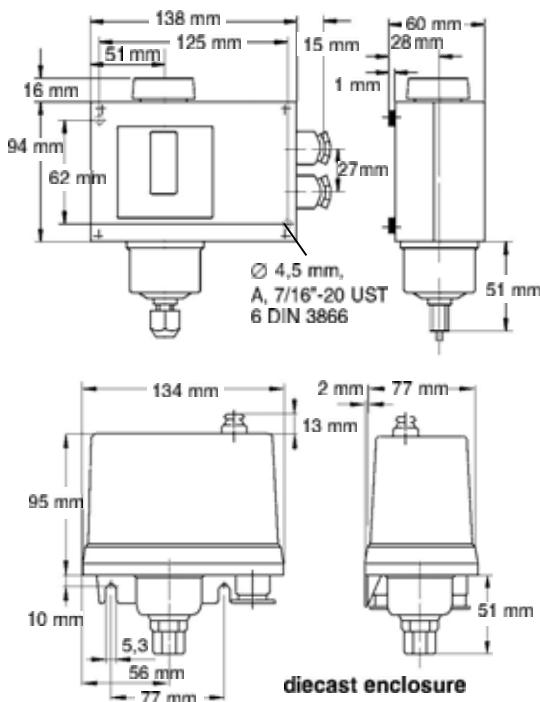
- Pipelines
- Pressure vessels
- Process technology
- Refrigeration and heating plants
- Pump motors for water supply to dwellings
- Containers
- Apparatus
- Pneumatics and hydraulics
- Lubrication systems

## Function description

Turning the setting knob Pmax changes both the upper and the lower switch points. By turning the differential spindle Dp only, the lower switch point is adjusted, while the upper setting remains unchanged.

## Construction

The standard FF 142 series are fitted in insulation enclosures, made of ABS. Large clear scales ease exact adjustment of upper switch point and switching differential. They are marked both in bar and in psi units. Scales are connected to the frame of the device and remain in place, when the cover is removed. Ample wiring room simplifies wiring.



diecast enclosure

## Types

with Perbunan diaphragm, standard enclosure. Pressure connector: G 3/8" female polyamid. Suitable for oil, water, air etc.

Order reference	Upper switch pt. adjustable	Pressure diff. adjustable	Lower switch pt. adjustable	max. pressure (bar)	Standard setting (bar)	Part No.
FF 142-6 DAH	0,2 ... 1,5	0,12 ... 0,5	0,1	5	1 / 0,8	1050004
FF 142-8 DAH	1 ... 8	0,4 ... 2,4	0,1	10,5	5 / 4	1050003
FF 142-9 DAH	2 ... 21	0,8 ... 6	0,1	25	12 / 10	1050002

## Types

Pressure switch with stainless steel bellows, silumin enclosure. Pressure connector: R 1/4" male, stainless-steel. Suitable for ammonia and other aggressive media

Order reference	Upper switch pt. adjustable	Pressure diff. adjustable	Lower switch pt. adjustable	max. pressure (bar)	Standard setting (bar)	Part No.
FF 142-3 AAC	-0,4 ... 8	0,6 ... 3	- 1	25	4 / 2	1050001
FF 142-5 AAC	2 ... 22	2 ... 9	0,1	30	16 / 12	1050005
FF 142-10 AAC	5 ... 40	2 ... 10	0,1	50	25 / 21	1050009

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# Pressure switch FF 142

## Types

### Pressure switch with perbunan diaphragm, silumin enclosure

Suitable for oil, water, air etc.

Order reference	Upper switch pt. adjustable	Pressure diff. adjustable	Lower switch pt. adjustable	max. pressure (bar)	Standard setting (bar)	Part No.
FFg 142-6 DAH	0,2 ... 1,5	0,12 ... 0,5	0,1	5	1 / 0,8	1050025
FFg 142-8 DAH	1 ... 8	0,4 ... 2,4	0,1	10,5	5 / 4	1050026
FFg 142-9 DAH	2 ... 21	0,8 ... 6	0,1	25	12 / 10	1050027

## Types

### Pressure switch with stainless steel bellows, silumin enclosure

Suitable for ammonia and other aggressive media

Order reference	Upper switch pt. adjustable	Pressure diff. adjustable	Lower switch pt. adjustable	max. pressure (bar)	Standard setting (bar)	Part No.
FFg 142-3 AAC	-0,4 ... 8	0,6 ... 3	- 1	25	4 / 2	1050028
FFg 142-5 AAC	2 ... 22	2 ... 9	0,1	30	16 / 12	1050029
FFg 142-10 AAC	5 ... 40	2 ... 10	0,1	50	25 / 21	1050030

## Technical data

Rated operating current at 230 V FF (g) 142... AC 1	16 A
Rated operating current at 230 V FF (g) 142... AC 15	6 A
Rated operating current at 230 V FF (g) 142... DC 13	0.1 A

Rated operating current at 400 V FF (g) 142... AC 1	10 A
Rated operating current at 400 V FF (g) 142... AC 15	4 A

### Enclosure standard

Protection class acc. to DIN 40050/IEC 529	IP 55
Resistance of vibration 10 up to 1000 Hz	4 g
Ambient temperature range	-50° C...+70° C
Ambient temperature range with Perbunan diaphragm	-30° C...+70° C
Contacts	2 Change-over contacts (SPDT)
Weight Approx.	0.8 kg

### Enclosure silumin

Protection acc. to DIN 40050/IEC 529	IP 65
Resistance of vibration 10 up to 1000 Hz	4 g
Ambient temperature range	-50° C...+70° C
Ambient temperature range with Perbunan diaphragm	-30° C...+70° C
Contacts	2 Change-over contacts (SPDT)
Weight Approx.	1.2 kg

# Pressure switch FF 142

## Media compatibility guide

Medium name	Chemical Formula	Stainless steel	Perbunan
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	X	
Acetylene	HC = CH	X	X
Air	-	X	X
Benzene	Sulphur-free	X	
Butane	C <sub>4</sub> H <sub>10</sub>	X	X
Butyl acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	X	
Butyl alcohol	CH <sub>3</sub> -CH <sub>2</sub> -CH <sub>2</sub> -CH <sub>2</sub> -OH	X	
Carbon dioxide	CO <sub>2</sub>	X	X
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	X	X
Chlorine	Cl <sub>2</sub>		
Crude oil	-	X	X
Diesel oil	See fuels	X	X
Ethyl acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	X	
Fuels	Diesel oil,	X	X
	Leaded petrol	X	X
	Benzene	X	
Glycerine	CH <sub>2</sub> OH-CHOH-CH <sub>2</sub> OH	X	X
Glycol	CH <sub>2</sub> OH-CH <sub>2</sub> OH	X	X
Heating fuel oil	See also oils	X	X
Hydrogen	H <sub>2</sub>	X	X
Inert gases	-	X	
Methanol	CH <sub>3</sub> OH	X	
Methyl chloride	CH <sub>3</sub> Cl	X	
Natural gas	-	X	X
Nitrogen	N <sub>2</sub>	X	X
Oils	Mineral	X	X
Oils	Vegetable	X	X
Oxygen	O <sub>2</sub>	X	
Ozone	-	X	
Perchlorethylene	CCl <sub>2</sub> =CCl <sub>2</sub>	X	
Petrol	All types	X	
Phenolic acid	C <sub>6</sub> H <sub>5</sub> (OH)	X	
Propane	C <sub>3</sub> H <sub>8</sub>	X	X
Sulphar dioxide	SO <sub>2</sub>	X	
Toluene (Metyl benzene)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	X	
Trichlorethene	CHCl=CCl <sub>2</sub>	X	
Water	Steam/vapor	X	X
Water	Distilled, de-aerated	X	X
Water	Sea water	X	X
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	X	

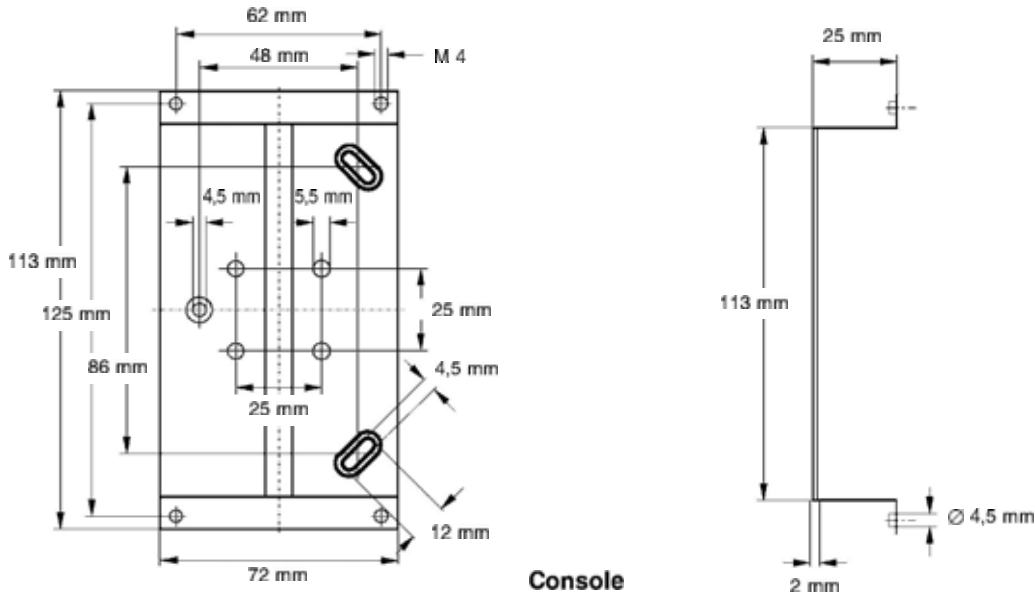
X = recommended

## Accessories

Order reference	Description	Weight (g)	Part No.
	<b>Glands</b>		
H 124-114	Steel gauge fitting, G 3/8" - G 1/2"	180	1051004
H 124g-127	Console	115	1051006

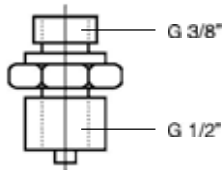
# Pressure switch FF 142

## Dimensions



### Console

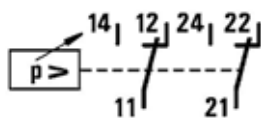
Type: H 124-g127  
 approx. weight: 0.115 kg  
 Order No.: 1051006



### Gauge fitting

Steel, G 3/8" - G 1/2", Type: H 124-114  
 approx. weight: 0.18 kg  
 Order No.: 1071004

## Circuit diagram



2 Change-over contacts

# Pressure switch PS 1

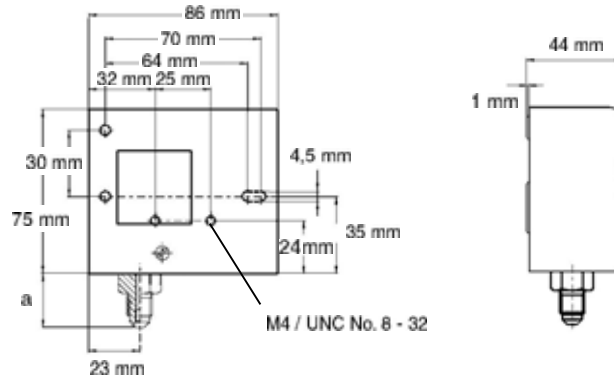
Compact size pressure switch for high and low pressure, such as vacuum applications



Control pressure switch PS 1-...

## Description

- Adjustable pressure range, narrow adjustable differentials,
- pressure and differential range pointer in bar and psi, lockable by lead
- seal, test lever for maintenance work, sturdy terminals.



## Types

### Standard

Pressure switch Type	Setting range		Lowest setpoint (bar)	Factory setting (bar)	Leakage test pressure (bar)	Pressure connection	Part No.
	upper setpoint (bar)	differential (bar)					
PS1-A1R	- 0,75 ... 3	0,25 ... 2	- 0,9	0,5 / 1	13	G 1/4" extern	1040007
PS1-A2R	- 0,8 ... 1,5	0,2 ... 1	- 1,0	0,5 / 1	13	G 1/4" extern	1040002
PS1-A3R	- 0,5 ... 7	0,5 ... 5	- 0,9	3,5 / 4,5	13	G 1/4" extern	1040008
PS1-A4R	1 ... 20	1 ... 10	0,3	8 / 10	23	G 1/4" extern	1040004
PS1-A5R	6 ... 31	2 ... 15	3,0	16 / 20	36	G 1/4" extern	1040009
PS1-A6R	4 ... 12	0,5 ... 7	0,1	6 / 7	16	G 1/4" extern	1040011

## Technical Data

### General

Type of contact: PS1	1xChange-over contact (SPDT)
Contact material: Standard	CuAg3
Special option	gold fl.contacts*
AC 1	24 A / 230 V AC
AC 15	10 A / 230 V AC
DC 13	0.1 A / 230 V AC 3 A / 24 V AC 6 A / 12 V AC
Motor rating (FLA)	24 A / 230 V AC
Locked rotor (LRA) / startup (AC3)	144 A / 230 V AC

### Environmental conditions

Ambient temperature storage, transportation and operation	-50° C ... + 70° C
Temperature at pipe tap	-50° C ... + 70° C
Dust and water protection EN 60529 / IEC 529	IP44 **
Vibration resistance	4g@10...1000 Hz

\*\* Switch mounted flush against wall

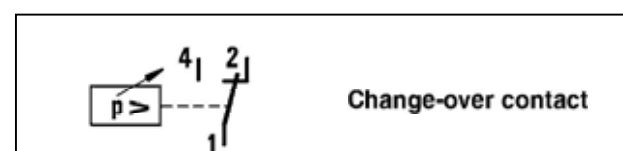
### Materials and compatibility

Housing material: Cover frame	Polycarbonate(PC) Steel
Materials with medium contact: Pressure connection (A/R) / bellows	Brass/Bronze

### Approvals

Low voltage directive (CE-Label) 73/23/EWG 93/68/EWG; EN 60947-1, EN 60947-5-1	Standard models
UL / CSA	Standard models

### Circuit diagram



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# Pressure switch PS 1

## Media compatibility guide

Medium name	Chemical Formula	Bronze
Acetone	$\text{CH}_3\text{COCH}_3$	X
Acetylene	$\text{HC} \equiv \text{CH}$	
Air	-	X
Benzene	Sulphur-free	X
Butane	$\text{C}_4\text{H}_{10}$	X
Butyl acetate	$\text{CH}_3\text{COOC}_4\text{H}_9$	X
Butyl alcohol	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-OH}$	X
Carbon dioxide	$\text{CO}_2$	X
Carbonic acid	$\text{H}_2\text{CO}_3$	X
Chlorine	$\text{Cl}_2$	
Crude oil	-	X
Diesel oil	See fuels	X
Ethyl acetate	$\text{CH}_3\text{COOC}_2\text{H}_5$	X
Fuels	Diesel oil,	X
	Leaded petrol	X
	Benzene	X
Glycerine	$\text{CH}_2\text{OH-CHOH-CH}_2\text{OH}$	X
Glycol	$\text{CH}_2\text{OH-CH}_2\text{OH}$	X
Heating fuel oil	See also oils	X
Hydrogen	$\text{H}_2$	X
Inert gases	-	X
Methanol	$\text{CH}_3\text{OH}$	X
Methyl chloride	$\text{CH}_3\text{Cl}$	X
Natural gas	-	X
Nitrogen	$\text{N}_2$	X
Oils	Mineral	X
Oils	Vegetable	X
Oxygen	$\text{O}_2$	X
Ozone	-	
Perchloroethylene	$\text{CCl}_2=\text{CCl}_2$	d
Petrol	All types	X
Phenolic acid	$\text{C}_6\text{H}_5(\text{OH})$	
Propane	$\text{C}_3\text{H}_8$	X
Sulphur dioxide	$\text{SO}_2$	
Toluene (Metyl benzene)	$\text{C}_6\text{H}_5\text{CH}_3$	X
Trichloroethene	$\text{CHCl}=\text{CCl}_2$	d
Water	Steam/vapor	X
Water	Distilled, de-aerated	X
Water	Sea water	
Xylene	$\text{C}_6\text{H}_4(\text{CH}_3)_2$	X

X = recommended, d = dry



# Pressure switch PS 3

Miniature pressure switch, fixed pressure setting, high repeatability, custommade styles



## Description

PS 3 are equipped with a SPDT snap action contact, switching from 1-2 to 1-4 on rising pressure and from 1-4 to 1-2 on falling pressure (see diagram). The PS 3 is factory preset according to customers specification and it is not adjustable.

### Several models are available:

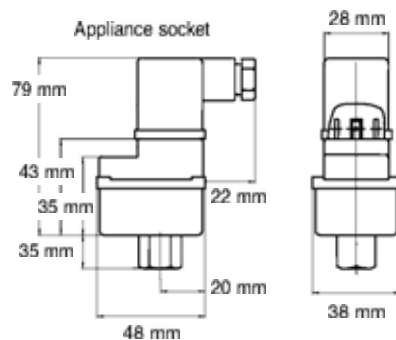
- Low pressure switch, with automatic or manual reset
- High pressure switch, with automatic or manual reset

### Control pressure switch PS 3-...

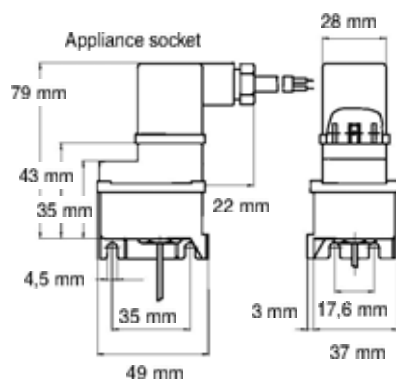
The PS 3 is mainly designed for OEM use and manufactured in minimum batches of 100 pieces.

## Options

- With high temperature diaphragm and snubber for direct mounting on the head of compressor
- Factory wiring
- Available with microswitch for narrow pressure differentials
- Gold flashed contacts for use with electronic circuits
- Other pressure connectors



free standing



Panel mounting

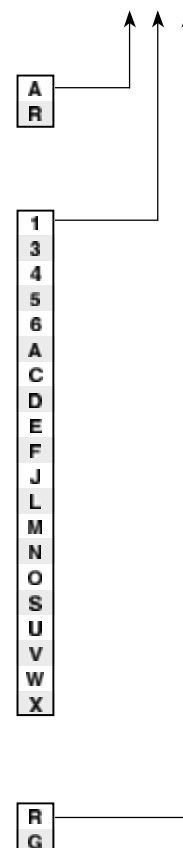
## Typescode

PS 3 -    - XX/XX

Function
Automatic reset
With manual reset

Pressure range / Type of contact
Standard, max. 6 bar
Standard, max. 16 bar
Standard, max. 30 bar
Standard, max. 30 bar
Standard, max. 43 bar
Standard, gold flashed, max. 6 bar
Standard, gold flashed, max. 16 bar
Standard, gold flashed, max. 30 bar
Standard, gold flashed, max. 30 bar
Standard, gold flashed, max. 43 bar
Micro switch, max. 6 bar
Micro switch, max. 16 bar
Micro switch, max. 30 bar
Micro switch, max. 30 bar
Micro switch, max. 43 bar
Micro switch, gold flashed contacts, max. 6 bar
Micro switch, gold flashed contacts, max. 16 bar
Micro switch, gold flashed contacts, max. 30 bar
Micro switch, gold flashed contacts, max. 30 bar
Micro switch, gold flashed contacts, max. 43 bar

Pressure connectors
G 1/4" male brass
G 1/4" female brass



# Pressure switch PS 3

## Pressure range

Range code	Type of contact	Range (bar)	Max. operating pressure PS (bar)	Proof pressure (bar)	Reset difference (bar)	Differential (bar)
<b>1</b>	Standard (change-over)	- 0.6 - 6	27	30	approx. 1,3	See diagrams
<b>3</b>		0.1 - 16	27	30	approx. 1,5	
<b>4 and 5</b>		6 - 30	31	36	approx. 4,0	
<b>6</b>		10 - 43	43	48	approx. 5,0	
<b>1</b>	Micro switch (change-over)	-0,6 - 6	27	30		approx. 0,2-0,3
<b>3</b>		0.1 - 16	27	30		approx. 0,3-0,45
<b>5</b>		6 - 30	31	36		
<b>6</b>		10 - 43	43	48		approx. 0,4-0,6

## Tolerances (bar)

Range code	1	3	4	5	6
Setting	± 0,1	± 0,25	± 0,5	± 0,5	± 0,5
Repeatability	± 0,06	± 0,15	± 0,3	± 0,3	± 0,3

## Electrical rating

Type of contact	Standard (change-over)	Standard gold flashed	Micro switch (change-over)	Micro switch gold flashed
Inductive load (AC15)	3 A / 230 VAC	0,1 A / 230 VAC	1,5 A / 230 VAC	0,1 A / 230 VAC
Inductive load (DC)	0,1 A / 230 VDC	0,1 A / 230 VDC	0,1 A / 230 VDC	0,1 A / 230 VDC
Motor rating amps	6 A / 230 VAC		2,5 A / 230 VAC	
Locked rotor amps	36 A / 230 VAC		15 A / 230 VAC	

## Technical data

Resistance of vibration at 10...1000 Hz	4 g
Medium compatibility depending on material of diaphragm	see table
Storage and transportation temperature	-30 ... +70° C
Weight	approx.0.09 kg
Approvals	UL,CSA

## Standard Diaphragm (Single diaphragm)

Max. media temperature	+ 70° C
Material	Bronze
DIN/TÜV approval	optional
UL Function code	A, R
Pressure range	1, 3, 4, 5, 6

## Protection (IEC 529 / DIN 40050)

without cover	IP 00
with appliance socket acc. to DIN 43650	IP 65

# Pressure switch PS 3

## Media compatibility guide

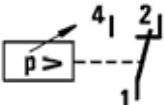
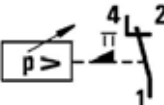
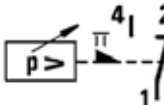
Medium name	Chemical Formula	Bronze
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	X
Acetylene	HC = CH	
Air	-	X
Benzene	Sulphure-free	X
Butane	C <sub>4</sub> H <sub>10</sub>	X
Butyl acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	X
Butyl alcohol	CH <sub>3</sub> -CH <sub>2</sub> -CH <sub>2</sub> -CH <sub>2</sub> -OH	X
Carbon dioxide	CO <sub>2</sub>	X
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	X
Chlorine	Cl <sub>2</sub>	
Crude oil	-	X
Diesel oil	See fuels	X
Ethyl acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	X
Fuels	Diesel oil, Leaded petrol Benzene	X X X
Glycerine	CH <sub>2</sub> OH-CHOH-CH <sub>2</sub> OH	X
Glycol	CH <sub>2</sub> OH-CH <sub>2</sub> OH	X
Heating fuel oil	See also oils	X
Hydrogen	H <sub>2</sub>	X
Inert gases	-	X
Methanol	CH <sub>3</sub> OH	X
Methyl chloride	CH <sub>3</sub> Cl	X
Natural gas	-	X
Nitrogen	N <sub>2</sub>	X
Oils	Mineral	X
Oils	Vegetable	X
Oxygen	O <sub>2</sub>	X
Ozone	-	
Perchlorethylene	CCl <sub>2</sub> =CCl <sub>2</sub>	d
Petrol	All types	X
Phenolic acid	C <sub>6</sub> H <sub>5</sub> (OH)	
Propane	C <sub>3</sub> H <sub>8</sub>	X
Sulphar dioxide	SO <sub>2</sub>	
Toluene (Metyl benzene)	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	X
Trichlorethene	CHCl=CCl <sub>2</sub>	d
Water	Steam/vapor	X
Water	Distilled, de-aerated	X
Water	Sea water	
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	X

X = recommended, d = dry

## Accessories

Order reference	Description	Weight (g)	Part No.
Seal	Appliance socket PG 9 acc. to DIN 43 650	-	1061008
	Seal for plug socket	-	1061009
	Terminal cover, cable entry from top/side	-	

## Circuit diagrams

 <p>Change-over contact</p>	 <p>Change-over contact with manual reset min.</p>	 <p>Change-over contact with manual reset max.</p>
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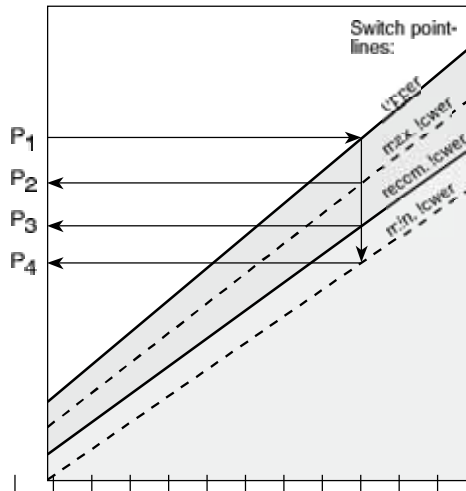
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# Pressure switch PS 3

## Pressure diagrams

### Example



### Selection

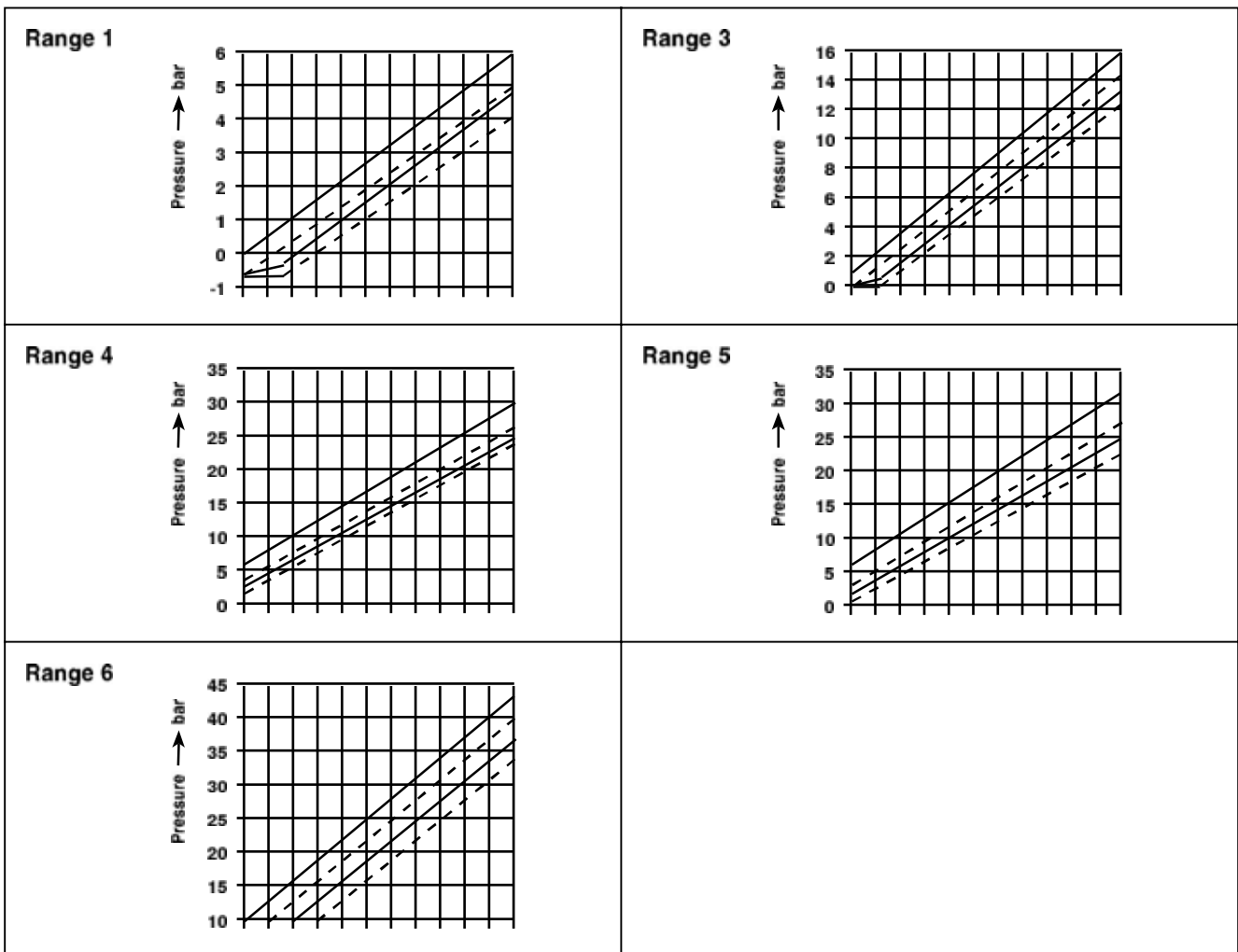
The possibilities of factory switch point settings are shown on charts below. Use the recommended lower switch point in the working window for optimum results.

### Example

- Step 1:**  
Select your desired upper switch point P1.  
Draw a horizontal line to cross the upper switch point line.
- Step 2:**  
Draw a vertical line from above mentioned intersection point.
- Step 3:**  
Select your desired switch point between P2 and P4.

### Notes:

1. Select P1/P3 as switch points for optimum results
2. Specify always upper and lower switch points for pressure switch with automatic reset function.
3. Specify only cutout switch point for pressure switch with manual reset function.



# Pressure Switch PM/PT

2- and 3-pole pressure switch  
1...12 bar perbunan-diaphragm equipped



Pressure switch PM/PT

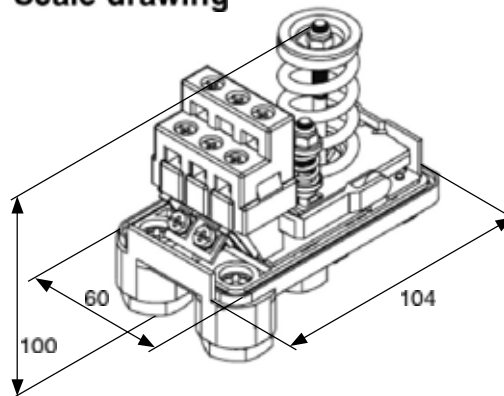
## Description

TIVAL-Pressure switches of the type series PM and PT are designed for a broad field of application in industrial and commercial use. Main application is for pumps, compressors and pressure tanks. Equipped with double or triple openers in their contact blocks these pressure switches are suitable for direct switching action of AC and rotary-current electrical motors.



(ON/OFF switch equipped)

## Scale drawing



## Type

Series PM (2 opening contacts)  
Series PMA (ON/OFF switch equipped)  
Pressure port: 1/4" female  
Perbunan-diaphragm equipped

Order reference	adjustment range		adjustable differential bar	standard setting bar	Part no.
	min. bar	max. bar			
PM/5	1	5	0,6 ... 2,5	1,4/2,8	1080001
PMA/5	1	5	0,6 ... 2,5	1,4/2,8	1080004
PM/6	1,8	6	0,8 ... 2	1,4/2,8	1080005
PM/12	3	12	1,5 ... 4	5/7	1080006
PMA/12	3	12	1,5 ... 4	5/7	1080007

## Type

Series PT (3 opening contacts)  
Series PTA (ON/OFF switch equipped)  
Pressure port: 1/4" female  
Perbunan-diaphragm equipped

Order reference	adjustment range		adjustable differential bar	standard setting bar	Part no.
	min. bar	max. bar			
PT/5	1	5	0,6 ... 2,5	1,4/2,8	1080002
PT/12	3	12	1,5 ... 4	6/8	1080008
PTA/12	3	12	1,5 ... 4	6/8	1080009

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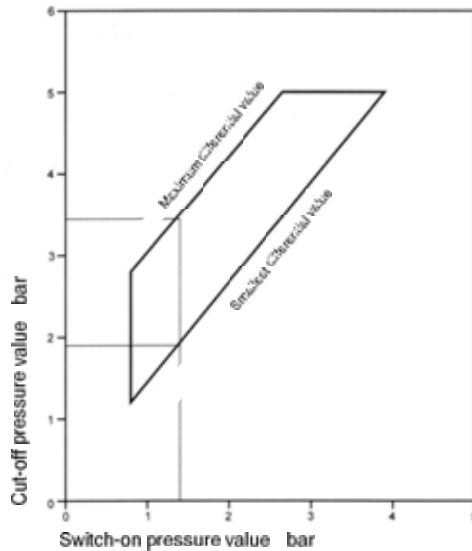
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# Pressure Switch PT/PM

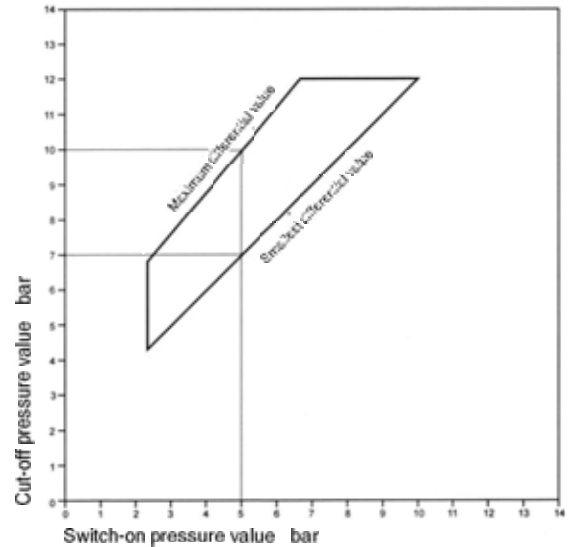
2- and 3-pole pressure switch

1...12 bar perbunan-diaphragm equipped

## Adjustable pressure range: PM/PMA/PT/PTA 5



## Adjustable pressure range: PM/PMA/PT/PTA 12



## Technical data

Type	PTM/PMA	PT/PTA
Rated isolation voltage	500 V	500V
Conventional thermic current I <sub>th</sub>	16 A	16 A
Braking capacity $\frac{U \cdot I}{\sqrt{3}}$	258 V · 16 A = 4,1 kW	400 V · 16 A = 6,4 kW
Contact assembly	2 opening contacts	3 opening contacts
Protection class	IP 44	IP 44
Permitted media temperature	+ 55°C	+ 55°C
Cable gland	2 mounted (Ø 11 mm)	2 mounted (Ø 11 mm)
Weight, approx.	0,4 kg	0,4 kg

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# Pressure Switch FF 501

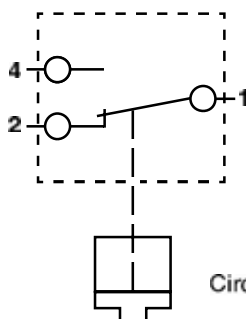
10 to 1000 mbar



## Description

Model range FF 501 pressure switches are change-over contact equipped. The subtle pressure range grading allows a precise switchpoint adjustment within mbar range..

- Subtle pressure range grading, accurate adjustment
- High-rated maximum operating cycles
- Factory pre-calibrated types available



Circuit diagram

## Types

Pressure switch with diaphragm for mbar range usage, pressure connection G 1/4" male

Order reference	Adjustment range	Over-pressure safety	Sealing type
FF 501-50	10-50 mbar	1 bar	NBR- or silicone diaphragm
FF 501-100	10-100 mbar	1 bar	NBR- or silicone diaphragm
FF 501-200	20-200 mbar	2 bar	NBR- or silicone diaphragm
FF 501-500	50-500 mbar	2 bar	NBR- or silicone diaphragm
FF 501-1000	100-1000 mbar	5 bar	NBR- or silicone diaphragm

Technical data	
Reproducibility	~ 3 to 5 %
Switch-back difference	~ 5 to 10 %
Circuit element	change-over contact
Max. operating cycles	200/min.
Max. voltage	250 Volt
Max. current	5 Amp. (FF 501-50: 2 Amp.)
Protection class	IP 55
Operating temperature	-20° to +80° C
Weight	0,185 kos, approx.
Connection thread	G 1/8", G 1/4"

Please state medium and desired mounting position when ordering. Special types (i.e. gold-plated switch contacts) upon request.

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# Pressure Switch FF 603

Flush mounted diaphragm, 1 to 100 bar



stainless steel 1.4305 /1.4571 on request

## Description

Model range FF 603 pressure switches are change-over contact equipped. This type series is purpose-built for high-viscous media pressure monitoring and flush-mount diaphragm equipped. Depending on application, lower or upper switchpoint is tuned, switch-back difference arises from typical switch hysteresis (20% approx.).

- Purpose-built for high-viscous media
- High-rated over-pressure safety
- High-rated maximum operating cycles
- Factory pre-calibrated types available

## Types

Pressure switch with flush mounted diaphragm, pressure connection G 3/4" male

Order reference	Adjustment range	Over-pressure safety	Sealing type
FF 603-10	1-10 bar	100 bar	Diaphragm 60 FKM 590
FF 603-20	2-20 bar	300 bar	Diaphragm 60 FKM 590
FF 603-50	5-50 bar	300 bar	Diaphragm 60 FKM 590
FF 603-100 M	10-100 bar	300 bar	Diaphragm 60 FKM 590
connector plug type 600, please order separately			

Technical data	
Reproducibility	~ 2 to 5 %
Switch-back difference	~ 20%, smaller values upon request
Circuit element	change-over contact
Max. operating cycles	200/min.
Max. voltage	250 Volt
Max. current	6 Amp.
Protection class	IP 65
Operating temperature	-20° to +80° C
Weight	0,120 kos, approx.
Connection thread	G 3/4"

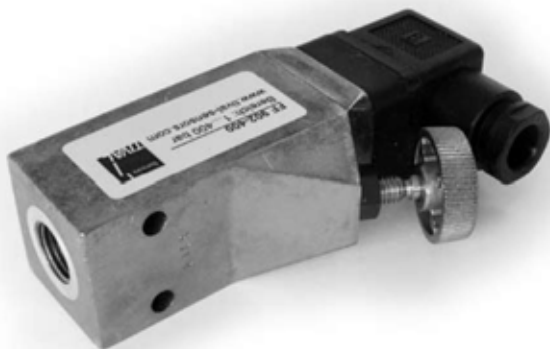
Special types (i.e. gold-plated switch contacts) upon request.

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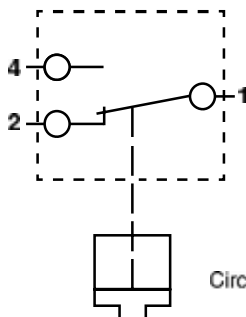
# Pressure Switch FF 902

0,2 to 400 bar, high-rated over-pressure safety



## Description

Model range FF 701 pressure switches are change-over contact equipped. Depending on application, lower or upper switchpoint is tuned, switch-back difference arises from typical switch hysteresis (20 to 30% approx.)



Circuit diagram

- High-rated over-pressure safety
- Special suitability for hydraulic and pneumatic application
- Plate-mounting types upon request
- High-rated maximum operating cycles
- Factory pre-calibrated types available

## Types

Diaphragm- or piston-type pressure switch, pressure connection G 1/4" female

Product code	adjustment range	over-pressure safety	sealing
FF 902-2	0,2-2 bar	100 bar	Perbunan-diaphragm
FF 902-10	1-10 bar	100 bar	Perbunan-diaphragm
FF 902-20	2-20 bar	200 bar	Viton- diaphragm
FF 902-50	5-50 bar	200 bar	Viton- diaphragm
FF 902-100 M	10-100 bar	200 bar	Viton- diaphragm
FF 902-100	10-100 bar	600 bar	Piston-type
FF 902-200	20-200 bar	600 bar	Piston-type
FF 902-400	40-400 bar	600 bar	Piston-type

Technical data			
Reproducibility	~ 2-5 %		
Switch-back difference	~ 20-30 %	smaller values upon request	
Circuit element	change-over contact		
Max. operating cycles	200/min.		
Max. voltage	250 Volt		
Max. current	2 Amp.	optional: 10 Amp.	
Protection class	IP 55		
Operating temperature	-20° to +100° C		
Weight	0,380 kos, approx.		

Special types (i.e. gold-plated switch contacts) upon request.

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# Electronic pressure switch TST-EDA



## Mode of operation

The electronic pressure switches consist of a primary sensor and an integrated electronic interpretation device, which evaluates the signal coming from the primary sensor and controls the display, the analogue output and the switching output. (=adjustable limit values)

## Description

- two switching points
- 4(0)..20mA analogue output
- hysteresis selectable in magnitude and direction
- graphical LCD display
- dialogue messages in the display
- stainless steel housing
- mineral glass (tempered, scratch and breakage proof) for covering the display
- M12x1 connector system; 5-pole
- compact dimensions
- IP 67

### 2x NPN and PNP switches:

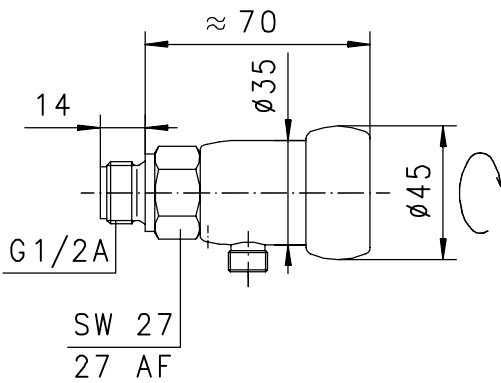
- Push pull driver offers easy set up. You set the interface as a PNP and it is a PNP. You connect it as a NPN and it is a NPN switch. Without any program settings
- Independent hysteresis of switch 1 and 2.
- Two point regulator possible.
- Short circuit and reverse power protected.

### 4(0)...20mA output:

- The 3 wire design offers a 0..10V output, too.
- Select 4 or 0...20mA with the parameter setting at the sensor (program ring).
- Programmable span for best fit to the application.

### flashing LED:

- Additional bright indicator, to read messages on the display.



# Electronic pressure switch TST-EDA

## Description

### Graphic LCD display :

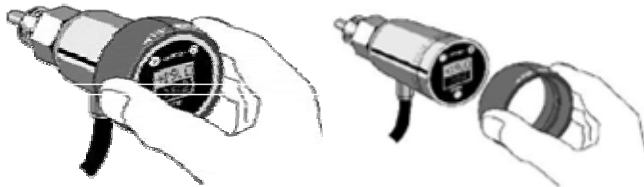
- Guarantee of best human interface and flexibility. Illuminated transparent-reflex design. Even good contrast in bright sun or in darkness. Best temperature range (-20...+70°C).
- Select units for US or European market. (bar, psi)

### Stainless steel housing with toughened glass front :

- Small (diameter 35mm) and rugged design, even for outdoor applications.
- IP 67
- Easy to keep the instrument clean (flush front)
- Head can be turned for alignment after installation. A mechanical block limits the total range turnable of 360°.

### Program ring :

- No weak parts (as touch panels, potentiometers ...) to enter parameters
- Manual lock by turning the ring (easy)



By position the central partition of the ring to pos.1 or 2 a test signal is activated. The neutral position is the centre between pos. 1 +2!



### Principle:

- Pos.1 = look or next step
- Pos.2 = modification

## Handling and operation

The program ring can be geared into pos.1 or pos.2 the following performances can be selected:

### Display of parameters with Pos. 1

- Switching points S 1 and S 2: Switching points in the selected unit.
- Hysteresis direction of S1 and S2:
  - Max = Hysteresis under S1 or S2
  - Min = Hysteresis über S1 oder S2
- Hysteresis Hyst 1 and Hyst 2:
- Hysteresis values of the switching points in the selected unit.
- Code: After entering the code 111 other parameters can be set (should only occur if necessary)
- Filter: Selectable filter constant in s (affects display and output)
- Units: e.g. bar or psi ...
- Output: 0..20mA or 4..20mA
- 4 (0) mA: Value specification for 4 (0) mA
- 20mA: Value specification for 20mA

### Editing with Pos. 2

- Turn the ring gap to Pos. 2 and a flashing „cursor“ appears showing the position to be changed. By repeated turning to Pos. 2 the values are increased and by turning to Pos. 1 you obtain the next position. Each position can be edited in this way. If no action is made within 5 s, the device returns to the normal display section without the change being accepted

### Saving the change with Pos. 1

- Turning 1x to Pos.1 after quitting the last value signifies acceptance of the change

### Programming protection:

- The programming ring can be pulled off, turned through 180° and replaced. Then programming is no longer possible on turning the ring further.
- Please ask for further information.

## Types (ceramic measuring cell, non-flush)

Type	Range bar	Process connection	Part no.
TST- EDA, P1, 1 bar, RK 015, S	0 - 1	G 1/2" SS	1100200
TST- EDA, P1, 2 bar, RK 015, S	0 - 2	G 1/2" SS	1100201
TST- EDA, P1, 5 bar, RK 015, S	0 - 5	G 1/2" SS	1100202
TST- EDA, P1, 10 bar, RK 015, S	0 - 10	G 1/2" SS	1100203
TST- EDA, P1, 20 bar, RK 015, S	0 - 20	G 1/2" SS	1100204
TST- EDA, P1, 50 bar, RK 015, S	0 - 50	G 1/2" SS	1100205
TST- EDA, P1, 100 bar, RK 015, S	0 - 100	G 1/2" SS	1100206
TST- EDA, P1, 200 bar, RK 015, S	0 - 200	G 1/2" SS	1100207
TST- EDA, P1, 400 bar, RK 015, S	0 - 400	G 1/2" SS	1100208

Absolute pressure transmitter available on special request

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# Electronic pressure switch TST-EDA

## System of instruments

Switching points can be set directly on site with these sensors for upward and downward excursions of process values. Using the display this setting can also be carried out without the process. The momentary values at the measuring point are always visible and all the important parameters can be called up at the point of measurement (this saves time during installation and set-up and when trouble-shooting in your process). The analogue current signal can be evaluated over long distances and the momentary value made available remotely. The sensor is configured to your specification. It is therefore immediately ready for use without you having to do any programming. If you need to change parameters, then you can do this directly on the sensor with the programming ring without any additional device or tool.

The signal is displayed with units using a back-lit LCD graphical display and converted to a 4(0)..20mA signal. Two switching points with alternatively a PNP or NPN output can be programmed over the complete range. The switching point hystereses can be set separately in value and direction (min./max. switching value).

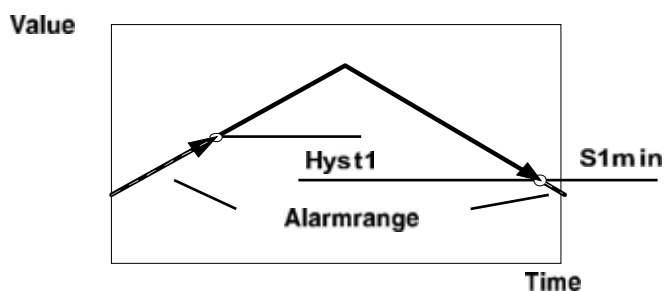
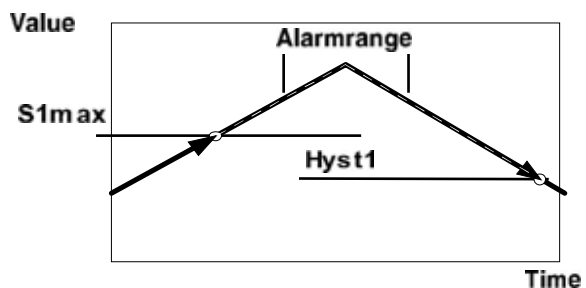
Upward and downward crossings of switching points and **error messages** are shown in the display with a flashing red LED, easily visible at a distance, as well as a message.

Other **parameters can be changed** using a code: Signal filter, selectable unit (bar, psi ...) incl. automatic conversion of the values, selectable 0 or 4..20mA output, value assignment of 4(0) and 20 mA (setting of zero point and span). The complete housing can be rotated about the mechanical connection so that the correct reading position can be set after sealing. During commissioning the sensor supports a simulation mode of the analog signal. It is possible to create a programmable mA value related to the support signal. The range is 0..20 mA. Doing so the user may test the connection between sensors and electronic. Correction by Code 311.

Customer related 0 calibration: Customer programs 0 bar and selects the automatic 0 correction by Code 211. The Sensor shifts the total diagramm related to new 0 position. OVERRATING of output will be detected, indicated on display and the output.

With this sensor particular attention has been paid to ease of use. Operation occurs in a dialogue with the display messages (this small sensor can also be set when wearing protective gloves if necessary).

Reset to factory setting possible by code 989.



Example of hysteresis setting: S1 as max. switching point and as min. switching point

## Types (stainless steel diaphragm, flush)

Type	Range bar	Process connection	Part no.
TST- EDA, P, 1bar, RK 015, S	0 - 1	G 1/2" SS	1100209
TST- EDA, P, 2,5 bar, RK 015, S	0 - 2,5	G 1/2" SS	1100210
TST- EDA, P, 6 bar, RK 015, S	0 - 6	G 1/2" SS	1100211
TST- EDA, P, 10 bar, RK 015, S	0 - 10	G 1/2" SS	1100212
TST- EDA, P, 25 bar, RK 015, S	0 - 25	G 1/2" SS	1100213
TST- EDA, P, 60 bar, RK 015, S	0 - 60	G 1/2" SS	1100214
TST- EDA, P, 100 bar, RK 015, S	0 - 100	G 1/2" SS	1100215
TST- EDA, P, 250 bar, RK 015, S	0 - 250	G 1/2" SS	1100216
TST- EDA, P, 400 bar, RK 015, S	0 - 400	G 1/2" SS	1100217

Absolute pressure transmitter available on special request

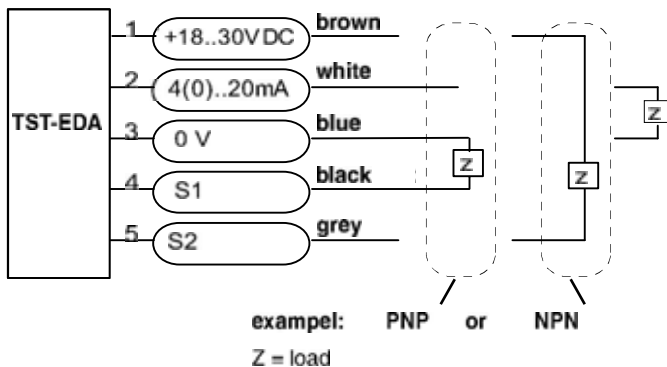
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# Electronic pressure switch TST-EDA

Technical data	Typ: TST-EDA
accuracy	±1% v. F.S., above 60°C 0,02% /°C (Typ P) / ±1% v.F.S; 0,05% /°C below <0° and above >60°C (Typ P1)
reproducibility	±0,5% F.S. (Typ P) / ±0,1% F.S. (Typ P1)
dynamic	measurement and output cycle 32 ms, display cycle 0,5 sec.
operating temperature	-20...70°C (with goose-neck max. 120°C)
storage temperature	-20...80°C
supply voltage	18...30 VDC
power consumption	<1W
analog output	4(0)..20mA, 2(0)..10V via resistor of 500 Ohm to GND (impedance of receiver > 100kOhm)
switching outputs S1 and S2	PNP or NPN (push-pull), programmable as minimum- or maximum-switch max. 300 mA output current (sum of both outputs), short circuit proof, polarity safe
hysteresis	adjustable, direction dependent on setting min or max
display	graphical LCD-Display with extended temperature range -20..70°C, 32x16 pixel, backlit LED-indicator flashing with additional message on display
connection	at locking plugs M 12x1, 5pole
protection class	IP 67
materials	stainless steel 1.4301 (Typ P) / stainless steel 1.4571, ceramic Al <sub>2</sub> O <sub>3</sub> , Viton (Typ P1)
media contact material	
materials electronic housing	„stainless steel 1.4305 (housing), hardened mineral glass, POM (programming ring), cobalt-samarium (magnet)“

## Terminal assignment



The switchpoints are changing to PNP or NPN depending to your interface automaticly. Please use shielded cable, signal lines < 30m and power supply lines < 10m.

## Accessory

### Locking plug M12x1

K5	PU-	02	S	G
K5				
KB05				
	PU-			
		02		
		05		
		10		
			S	
				G
				W

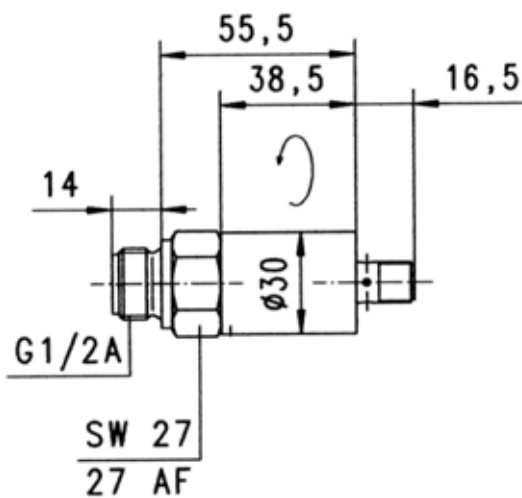
### basic type specification

- ready-made cable 5-pole
- self makable cable 5-pole
- material PUR
- length 2 m
- length 5 m
- length 10 m
- moulded-on plug
- straight plug
- angled plug 90°



# Electronic pressure switch TST-ED

Magnet programming



## Mode of operation

The electronic pressure switches consist of a primary sensor and an integrated electronic interpretation device which evaluates the signal coming from the primary sensor and controls the analog output and the switching output (adjustable limit values).

## Description

- two switching points
- 4(0)..20 mA analog output
- hysteresis selectable in magnitude and direction
- stainless steel housing
- M12 x 1 connector system; 5-pole
- compact dimensions
- IP 67

## NPN or PNP switch:

- Easiest installation is provided by the existence of push-pull outputs. Just connect the output like a NPN switch, and the device performs as a NPN switch, connecting the output like a PNP makes the TST-ED perform as a PNP switch; just without any additional programming or use of wire jumpers.
- Short-circuit- proof and protected against polarity reversal

## 4(0)..20mA analogue output:

- Three-phase-circuit also allows a 0..10V output
- The programmable range allows the best possible adaption for your application.

Technical data	Typ: TST-ED
Precision	±1% F.S.; 0,02% /K from 60°C(Typ P) / ±1% F.S.; 0,05% /K at <0° and >60°C (Typ P1)
Reproducibility	±0,5% F.S.(Typ P) / ±0,1% F.S. (Typ P1)
Dynamics	measuring cycle of 50 ms
Working temperature	-20...70°C
Storage temperature	-20...80°C
Voltage supply	18...30 VDC
Power consumption	<1W
Analog output	4(0)...20mA, 2(0)...10V with use 500 Ohm resistor to 0V (impedance of receiver >100kOhm)
Limit switch S1 and S2	PNP or NPN, selectable, minimum- or maximum switch performance programmable max. total summarized output current 300mA, short circuit proof, reverse polarity protected
Hysteresis	adjustable, hysteresis above limit value for minimum switch, below limit value for maximum switch
Connection	at locking plugs M 12x1, 4pole
Protection class	IP 67
Materials in contact with media	Stainless steel 1.4301 (Typ P) / Stainless steel 1.4571, Ceramic Al <sub>2</sub> O <sub>3</sub> , Viton (Typ P1)
Materials Electronic housing	Stainless steel 1.4305 (housing), cobalt-samarium (magnet)

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# Electronic pressure switch TST-ED

Magnet programming

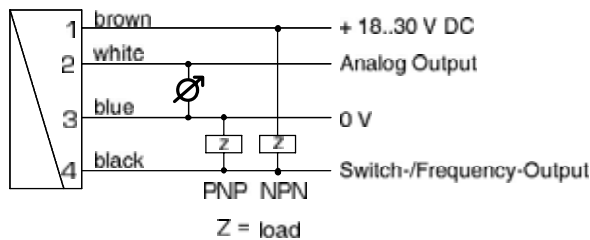
## Mounting

The pressure transducers are screwed into a connection piece or T-piece of the pipeline together with suitable sealing material (Teflon tape, Sikurit seal, etc.). The installation of a pressure gauge should not result in any considerable cross-section changes in the pipe system. To tighten the pressure gauge, please use only the fixed spanner provided for this purpose (width against flats of SW27). Avoid high-concussion installation sites (see overload limits).

## Programming

Designs with a limit switch have a magnetic contact by means of which the current measurement value can be assumed as a limit value. It is programmed by applying a magnet to the marking on the type plate for 0.5 to 2 seconds. If the contact time is too short or too long, no programming will take place (protection against magnetic fields). Immediately after programming, the switching output enters the OK state (LED on, output switched through, e.g. PNP = high or NPN = low).

## Terminal assignment



## Types (ceramic measuring cell)

Absolute pressure transmitter available on request

Product	Pressure range (bar)	Process connection	Art. code
TST-ED, P1, 1 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 1	G 1/2" A Stainless steel	
TST-ED, P1, 2 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 2	G 1/2" A Stainless steel	
TST-ED, P1, 5 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 5	G 1/2" A Stainless steel	
TST-ED, P1, 10 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 10	G 1/2" A Stainless steel	
TST-ED, P1, 20 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 20	G 1/2" A Stainless steel	
TST-ED, P1, 50 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 50	G 1/2" A Stainless steel	
TST-ED, P1, 100 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 100	G 1/2" A Stainless steel	
TST-ED, P1, 200 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 200	G 1/2" A Stainless steel	
TST-ED, P1, 400 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 400	G 1/2" A Stainless steel	

## Types (stainless steel diaphragm, flush)

Absolute pressure transmitter available on request

Product	Pressure range (bar)	Process connection	Art. code
TST-ED, P, 1 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 1	G 1/2" A Stainless steel	
TST-ED, P, 2,5 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 2,5	G 1/2" A Stainless steel	
TST-ED, P, 6 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 6	G 1/2" A Stainless steel	
TST-ED, P, 10 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 10	G 1/2" A Stainless steel	
TST-ED, P, 25 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 25	G 1/2" A Stainless steel	
TST-ED, P, 60 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 60	G 1/2" A Stainless steel	
TST-ED, P, 100 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 100	G 1/2" A Stainless steel	
TST-ED, P, 250 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 250	G 1/2" A Stainless steel	
TST-ED, P, 400 bar, RK 015H, x <sup>1</sup> x <sup>2</sup> x <sup>3</sup> , O	0 - 400	G 1/2" A Stainless steel	

x<sup>1</sup> x<sup>2</sup> x<sup>3</sup>:

x<sup>1</sup> current output 4-20mA, code letter I  
x<sup>1</sup> voltage output 0-10V, code letter U

x<sup>2</sup> switching output NPN, code letter N  
x<sup>2</sup> switching output PNP, code letter P

x<sup>2</sup> w/o switching output, code letter K  
x<sup>3</sup> switch signal as minimum-switch, code letter L

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