

FU 522



Electronic Pressure Switch

with IO-Link interface

Stainless Steel Sensor

accuracy according to IEC 60770:
0.35 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Digital output signal

IO-Link according to specification V 1.1

Smart sensor profile

Data transfer 38.4 kBaud

2 contacts

Analog output (optional)

4 ... 20 mA or 0 ... 10 V

Special characteristics

- ▶ indication of measured values on a 4-digit LED display
- ▶ rotatable and configurable display module
- ▶ parameter settings via IO-Link or menu (VDMA-conform)

Optional versions

- ▶ different mechanical connections
- ▶ customer specific versions

The electronic pressure switch FU 522 is equipped with an IO-Link interface as standard in order to exchange process data, diagnostic reports and status messages with a superordinate control level. The parameters are set either also via the control level or via the VDMA-compliant menu system, which can be carried out at a local level using two keys.

The FU 522 is designed for the mechanical engineering and plant engineering sectors. A large number of inch threads, metric threads or NPT threads are available to users in order to ensure optimum integration in the application. In addition, unusual display positions can be compensated to the multiple rotatability of the display so that the user is able to read the vital information without any problems.

Preferred areas of use are



Plant and machine engineering

- machine tools
- pneumatic plants
- hydraulic plants



Input pressure range												
Nominal pressure gauge	[bar]	-1 ... 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6
Overpressure (static)	[bar]	5	0.5	1	1	2	5	5	10	10	20	40
Burst pressure \geq	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50

Nominal pressure gauge / abs. [bar]	10	16	25	40	60	100	160	250	400	600
Overpressure (static) [bar]	40	80	80	105	210	210	600	1000	1000	1000
Burst pressure \geq [bar]	50	120	120	210	420	420	1000	1250	1250	1800
Vacuum resistance	$P_N \geq 1$ bar: fully vacuum resistant $P_N < 1$ bar: on request									

Contact							
Voltage supply	$V_S = 18 \dots 30 V_{DC}$						
	<table border="0"> <tr> <th>Output signal 1</th> <th>Output signal 2</th> </tr> <tr> <td>Standard</td> <td>IO-Link / SIO (PNP or NPN) + 1 PNP contact</td> </tr> <tr> <td>Optional</td> <td>IO-Link / SIO (PNP or NPN) + 1 NPN contact (on request)</td> </tr> </table>	Output signal 1	Output signal 2	Standard	IO-Link / SIO (PNP or NPN) + 1 PNP contact	Optional	IO-Link / SIO (PNP or NPN) + 1 NPN contact (on request)
Output signal 1	Output signal 2						
Standard	IO-Link / SIO (PNP or NPN) + 1 PNP contact						
Optional	IO-Link / SIO (PNP or NPN) + 1 NPN contact (on request)						
Switching current	200 mA						
Accuracy of switching points ¹	$\leq \pm 0.35$ % FSO						
Repeatability	$\leq \pm 0.1$ % FSO						
Switching frequency	max. 200 Hz						
Switching cycles	$> 100 \times 10^6$						
Delay time	0.0 ... 50.0 sec						

Analog output (optional)							
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Accuracy ¹	nominal pressure ≥ 0.4 bar: $\leq \pm 0.35$ % FSO nominal pressure < 0.4 bar: $\leq \pm 0.5$ % FSO						
Influence effects	supply: 0.05 % FSO load: ≤ 0.1 % FSO						
Long term stability	$\leq \pm 0.3$ % FSO / year at reference conditions						
Response time	< 12 msec						

¹ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Thermal effects (Offset and Span)					
Nominal pressure P_N	[bar]	-1 ... 0	< 0.40	≥ 0.40	> 40
Tolerance band	[% FSO]	$\leq \pm 0.75$	$\leq \pm 1$	$\leq \pm 1$	$\leq \pm 0.75$
in compensated range	[°C]	-20 ... 85	0 ... 70	-20 ... 85	0 ... 70

Permissible temperatures	
Permissible temperatures	medium: -40 ... 125 °C electronics/environment: -40 ... 85 °C storage: -40 ... 100 °C

Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326

IO-Link	
Interface	IO-Link 1.1; Slave
Data transfer	COM2, 38.4 kBaud
Mode	SIO / IO-Link
Standard	IEC 61131-9

Mechanical stability	
Vibration	10 g / 25 Hz ... 2 kHz according to DIN EN 60068-2-6
Shock	500 g / 1 ms ec according to DIN EN 60068-2-27

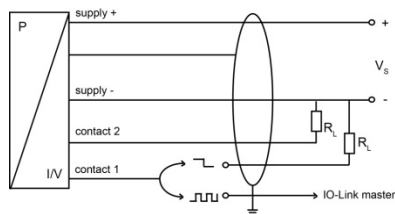
Materials	
Pressure port / Housing	stainless steel 1.4404 (316L)
Display housing	standard: PA 6.6
Seals (media wetted)	standard: FKM option: EPDM others on request
Diaphragm	stainless steel 1.4435 others on request
Media wetted parts	pressure port, seal, diaphragm
Miscellaneous	
Display	4-digit, red LED display, digit height 7 mm, range of indication -1999 ... +9999, visible range 22.5 x 10.5 mm, 4 LED's for unit switching (bar, mbar, PSI, MPa) status display contact: contact 1 : LED, green, contact 2: LED, yellow
Operation	2 buttons / functions according to VDMA 24574-1
Turn-on time	110 msec
Weight	approx. 220 g
Operational life	100 million load cycles
Current consumption	< 40 mA
Protection class	IP 65 / IP 67
Installation position	any ²
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ³

² Pressure transmitters are calibrated vertically with pressure port downwards. Changing the installation position could lead to minor zero offsets for pressure ranges $P_N \leq 1$ bar.

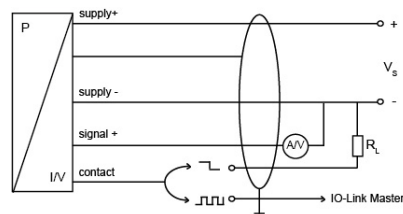
³ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams

3-wire-system (IO-Link / SIO with contact)



3-wire-system (IO-Link / SIO with analogue output)



Pin configuration

Electrical connections	M12x1 (4-pin) metal (without analogue output)	M12x1 (4-pin) metal (with analogue output)
Supply +	1	1
Supply -	3	3
Signal +	-	2
Communication / contact 1	4	4
Contact 2	2	-
Shield	pressure port	pressure port

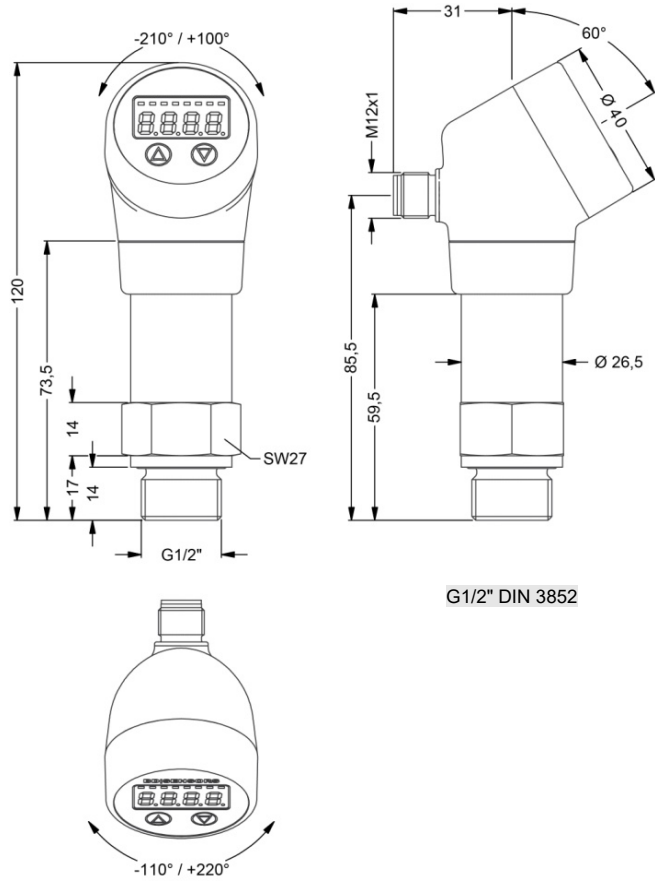
FU 522

Electronic Pressure Switch



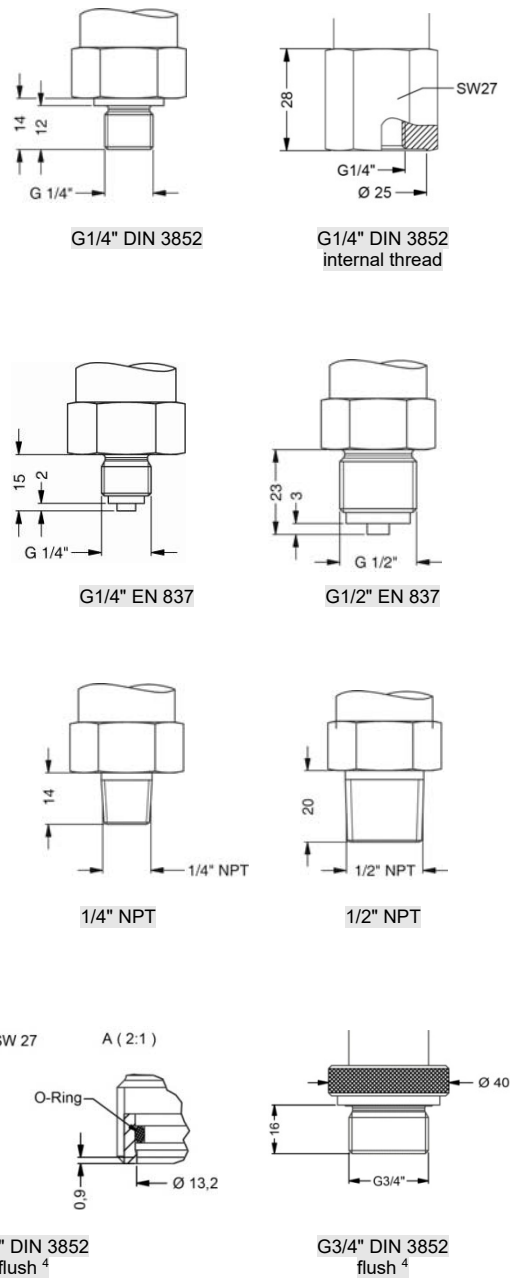
Mechanical connections (dimensions in mm)

standard



G1/2" DIN 3852

option



G1/2" DIN 3852
flush⁴

G3/4" DIN 3852
flush⁴

⁴ not possible for nominal pressure $P_N > 40$ bar and for vacuum ranges; for G3/4" flush absolute pressure on request

Ordering code FU 522

FU 522



Pressure		7	9	2																						
gauge in bar		7	9	2																						
absolute in bar ¹		7	9	4																						
Input																										
	[bar]																									
0.10	¹	1	0	0	0																					
0.16	¹	1	6	0	0																					
0.25	¹	2	5	0	0																					
0.40		4	0	0	0																					
0.60		6	0	0	0																					
1.0		1	0	0	1																					
1.6		1	6	0	1																					
2.5		2	5	0	1																					
4.0		4	0	0	1																					
6.0		6	0	0	1																					
10		1	0	0	2																					
16		1	6	0	2																					
25		2	5	0	2																					
40		4	0	0	2																					
60		6	0	0	2																					
100		1	0	0	3																					
160		1	6	0	3																					
250		2	5	0	3																					
400		4	0	0	3																					
600		6	0	0	3																					
-1 ... 0		X	1	0	2																					
customer		9	9	9	9															consult						
output																										
IO-Link / SIO ²																				I	O					
IO-Link / SIO + 0 ... 10 V / analogue ³																					I	3				
IO-Link / SIO + 4 ... 20 mA / analogue ³																					I	7				
contact																										
1 x PNP																						1				
1 x NPN																						5				
2 x PNP																						2				
2 x NPN																						6				
customer																						9				
																						consult				
																						consult				
Accuracy																										
standard for P _N ≥ 0.4 bar	0.35 %																					3				
standard for P _N < 0.4 bar	0.5 %																					5				
customer																						9				
																						consult				
Electrical connection																										
Male plug M12x1 (4-pin) / metal																						M	2	L		
customer																						9	9	9		
																								consult		
Mechanical connection																										
G1/2" DIN 3852																							1	0	0	
G1/2" EN 837																							2	0	0	
G1/4" DIN 3852																							3	0	0	
G1/4" DIN 3852, internal thread																							J	0	0	
G1/4" EN 837																							4	0	0	
G1/2" DIN 3852 with ⁴																							F	0	0	
flush sensor																										
G3/4" DIN 3852 with ⁴																								K	0	0
flush sensor																										
1/2" NPT																								N	0	0
1/4" NPT																								N	4	0
customer																								9	9	9
																									consult	
Seals																										
FKM																								1		
EPDM																								3		
customer																								9		
																									consult	
Special version																										
standard																								0	0	0
customer																								9	9	9
																									consult	

¹ absolute pressure possible from 0.4 bar

² possible in combination with contact code 2, 6

³ possible in combination with contact code 1, 5

⁴ not possible for nominal pressure P_N > 40 bar; also not possible for vacuum ranges; for G3/4" flush nominal pressure abs. on request