



DS 350P

Electronic Pressure Switch with IO-Link Interface

Pressure Ports and Process
Connections with Flush Welded
Stainless Steel Diaphragm

Stainless Steel Sensor

accuracy according to IEC 61298-2:
standard: 0.5 % FSO / 0.35 % FSO
option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Digital output signal

IO-Link according to specification V 1.1
smart sensor profile
data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 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)
- ▶ additional information via IO-Link accessible

Optional versions

- ▶ different mechanical connections
- ▶ cooling element for medium temperatures up to 300 °C
- ▶ customer specific versions

The DS 350P is an electronic pressure switch which has been designed for food industry and pharmacy. In addition to a large number of flush process connections, a multi-rotatable display module as standard is offered. This makes it easier for the user to read / operate it also in unusual display positions due to installation conditions on-site.

The integrated IO-Link interface provides process data, diagnostics, and status messages as well as other features, which are helpful for service and maintenance.

The switchability of the output signal as switching signal or analogue signal (mA / V) increases flexibility and integration in different applications.

Preferred areas of use are



Food industry



Pharmacy

Material and test certificates

- ▶ Inspection certificate 3.1 according to EN 10204
- ▶ Test report 2.2 according to EN 10204



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Electronic Pressure Switch with IO-Link Interface

Technical Data

Input pressure range ¹																							
Nominal pressure gauge	[bar]	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40								
Nominal pressure absolute	[bar]	-	-	-	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40								
Overpressure (static)	[bar]	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105								
Burst pressure ≥	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210								
Vacuum resistance	[bar]	p _N ≥ 1 bar: unlimited vacuum resistance										p _N < 1 bar: on request											
¹ consider the pressure resistance of fitting and clamps																							
Supply																							
Voltage supply		V _S = 18 ... 30 V _{DC}																					
Output signals																							
Output signal 1		IO-Link / SIO (PNP / NPN) switchable																					
Output signal 2		4 ... 20 mA / 3-wire					or					0 ... 10 V / 3-wire					or		PNP / NPN switchable				
Signal characteristics switching signal																							
Accuracy of switching points ²		≤ ± 0.35 % FSO																					
Repeatability		≤ ± 0.1 % FSO																					
Max. switching current		125 mA																					
Switching frequency		max. 170 Hz																					
Delay time		0.0 ... 50.0 sec																					
Response time		< 12 msec																					
Signal characteristics analogue signal																							
Accuracy ²		standard: nominal pressure < 0.4 bar: ≤ ± 0.50 % FSO nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO option: nominal pressure ≥ 0.4 bar ≤ ± 0.25 % FSO																					
Long term stability		≤ ± 0.3 % FSO / year at reference conditions																					
Load (4 ... 20 mA / 3-wire)		R _{max} = 330 Ω																					
Load (0 ... 10 V / 3-wire)		R _{min} = 10 kΩ																					
Influence effects		supply: 0.05% FSO							load: ≤ 0.1 % FSO														
Adjustability		offset: ± 5 %							span: -10 %														
² accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)																							
Thermal effects (offset and span) ³																							
Nominal pressure p _N	[bar]	< 0.40							≥ 0.40														
Tolerance band	[%FSO]	≤ ± 1.5							≤ ± 0.75														
In compensated range	[°C]	0 ... 50							-20 ... 85														
³ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions																							
Permissible temperatures																							
Filling fluid		silicone oil							food compatible oil														
Medium ⁴		-40 ... 125 °C							-10 ... 125 °C														
Medium with cooling element ⁵		overpressure: -40 ... 300 °C vacuum: -40 ... 150 °C							overpressure: -10 ... 250 °C vacuum: -10 ... 150 °C														
Electronics / environment / storage		-25 ... 70 °C																					
⁴ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C																							
⁵ max. temperature depends on the used sealing material, type of seal and installation																							
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		38.4 kbit/sec (COM 2)																					
Mode		SIO / IO-Link																					
Standard		IEC 61131-2, IEC 61131-9																					
Mechanical stability																							
Vibration		20 g RMS / 10 ... 2000 Hz							according to DIN EN 60068-2-6														
Vibration with cooling element		10 g RMS / 10 ... 2000 Hz							according to DIN EN 60068-2-6														
Shock		500 g / 1 msec half sine							according to DIN EN 60068-2-27														
Filling fluids																							
Standard		silicone oil																					
Optional		food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)										others on request											

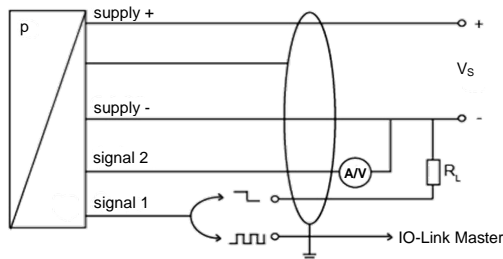
Materials	
Display housing	PA 6.6
Housing	stainless steel 1.4404 (316 L)
Pressure port	stainless steel 1.4404 (316 L) Clamp, Varivent®, G1" cone: stainless steel 1.4435 (316 L)
Diaphragm	stainless steel 1.4435 (316 L)
Seal	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: EPDM (recommended for medium temperatures ≤ 140 °C) others on request G1" cone, Clamp, Varivent®: without
Media wetted parts	pressure port, seal, diaphragm
Miscellaneous	
EHEDG certificate Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C63): T-ring-seal from Combifit International B.V. - Varivent® (P41): EPDM-O-ring which is FDA-listed
Display	4-digit, 7-segment-LED display on black base body, white, blue foil, digit height 7 mm, range of indication -1999 ... +9999, visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mbar, PSI, MPa) LED status display for IO-Link and contacts
Operation	2 buttons
Featured	functions according to VDMA 24574-1
Turn-on time	110 msec
Surface roughness	pressure port $R_a < 0.8 \mu\text{m}$ (media wetted parts) diaphragm $R_a < 0.15 \mu\text{m}$ weld seam $R_a < 0.8 \mu\text{m}$
Weight	approx. 250 g
Operational life	100 million load cycles
Current consumption	< 50 mA (without contacts)
Ingress protection	IP 67
Installation position	any ⁶
CE-conformity	EMC Directive: 2014/30/EU

⁶ The pressure switch is calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $p_N \leq 1 \text{ bar}$.

Wiring diagrams

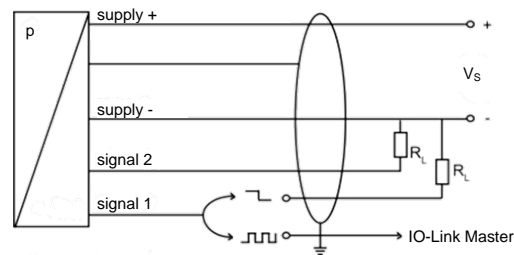
3-wire-system / configuration of analogue output:

signal 1: IO-Link or contact
signal 2: analogue output



3-wire-system / configuration of contact:

signal 1: IO-Link or contact
signal 2: contact



Electrical connection

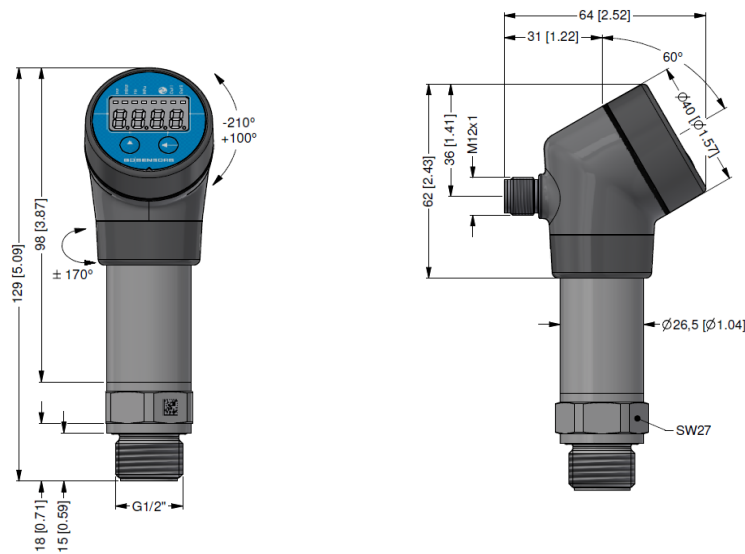
Pin configuration	Description	M12x1 (4-pin), metal	
Supply +	supply	1	
Supply -	supply	3	
Output signal 1	IO-Link / SIO (PNP / NPN)	4	
Output signal 2	4 ... 20 mA – 3-wire / 0 ... 10 V – 3-wire (PNP / NPN)	2	
Shield	shielding	plug housing	

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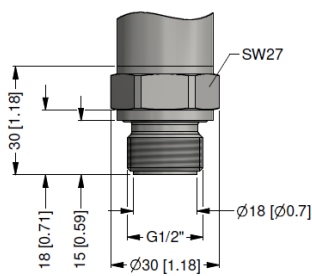
Electronic Pressure Switch with IO-Link Interface

Technical Data

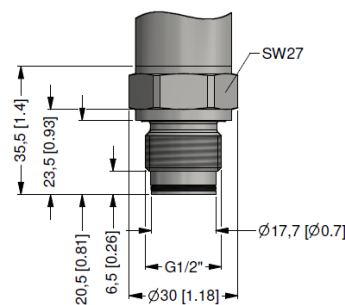
Dimensions (mm / in)



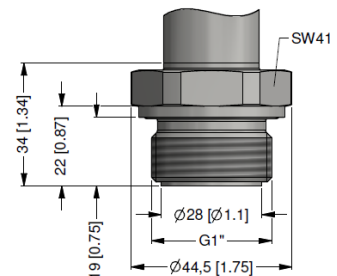
Mechanical connection (dimensions mm / in)



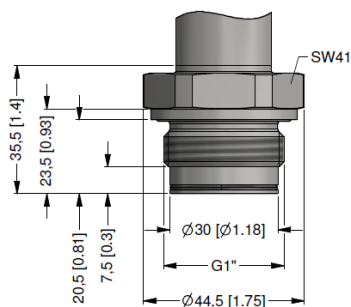
G1/2" DIN 3852 flush
 $p_N \geq 1$ bar



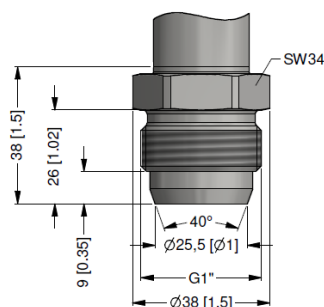
G1/2" DIN 3852 with 2x o-ring
 $p_N \geq 1$ bar



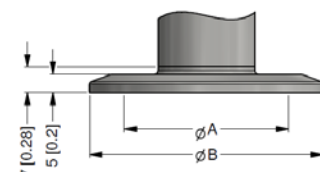
G1" DIN 3852 flush



G1" DIN 3852 with 2x o-ring
 $p_N \leq 2$ bar

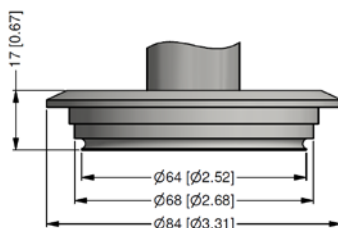


G1" cone

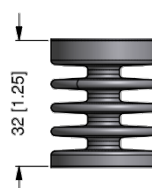


Clamp (DIN 32676)
 $p_N \leq 16$ bar

dimensions in mm / in		
size	DN 25 / 1"	DN 50 / 2"
A	23,0 [0.91]	45 [1.77]
B	50,5 [1.99]	64 [2.52]



Varivent® DN 40/50
 $p_N \leq 25$ bar



cooling element up to 300 °C⁵

⇒ metric threads and other versions on request

⁵ max. temperature depends on the used sealing material, type of seal and installation

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Ordering code DS 350P

DS 350P



Pressure										
gauge	7	E	A							
absolute ¹	7	E	C							
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			
customer				9	9	9	9			consult
Output										
IO-Link + PNP/NPN + analogue output ²						I	X			
Accuracy										
standard for $p_N \leq 0.4$ bar	0.50%	FSO						5		
standard for $p_N > 0.4$ bar	0.35%	FSO						3		
option for $p_N \geq 0.4$ bar	0.25%	FSO						2		
customer								9		consult
Electrical connection										
male plug M12x1 (4-pin) / metal						M	1	B		
customer						9	9	9		consult
Mechanical connection										
G1/2" DIN 3852 flush ($p_N \geq 1$ bar)						Z	0	0		
G1/2" DIN 3852 with 2x o-ring ($p_N \geq 1$ bar)						Z	6	1		
G1" DIN 3852 flush						Z	S	1		
G1" DIN3852 with 2x o-ring ($p_N \leq 2$ bar)						Z	S	7		
G1" cone						K	S	1		
Clamp DN 25 DIN 32676 ($p_N \leq 16$ bar)						C	6	1		
Clamp DN 50 DIN 32676 ($p_N \leq 16$ bar)						C	6	3		
Varivent® DN 40/50 ($p_N \leq 25$ bar)						P	4	1		consult
customer						9	9	9		consult
Diaphragm										
stainless steel 1.4435 (316L)								1		
customer								9		
Seal										
for Clamp, cone, Varivent®:	without							0		
	FKM							1		
	EPDM							3		
customer								9		consult
Filling fluids										
silicone oil								1		
food compatible oil (FDA)								2		
customer								9		
Special version										
standard								0	0	0
cooling element up to 300 °C								2	0	0
customer								9	9	9
										consult

¹ absolute pressure possible from 0.4 bar

² contact PNP/NPN switchable; analogue output 0 ... 10 V / 4 ... 20 mA switchable

Varivent® is a brand name of GEA Tuchenhausen GmbH