



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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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

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Technical Data

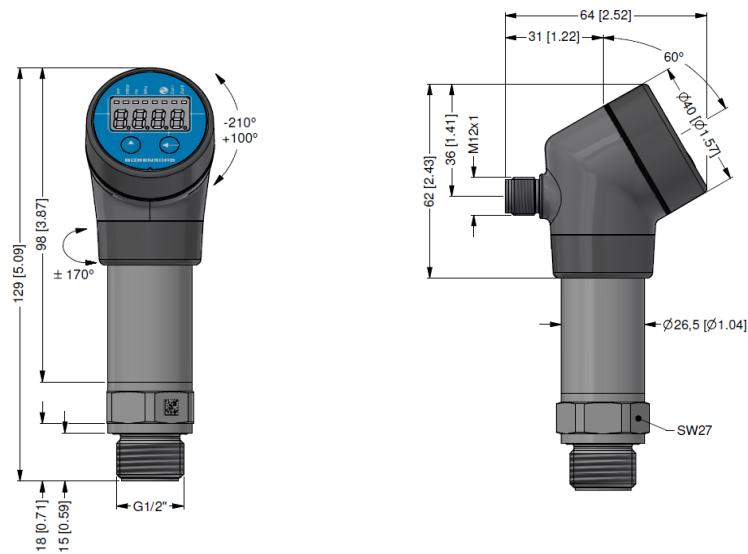
Materials			
Display housing	PA 6.6		
Housing	stainless steel 1.4404 (316 L)		
Pressure port	stainless steel 1.4404 (316 L) Clamp, Varivent®, G1" cone: stainless steel 1.4435 (316 L)		
Diaphragm	stainless steel 1.4435 (316 L)		
Seal	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: 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	

DS 350P

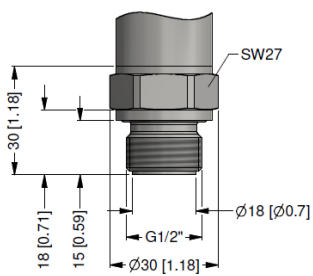
Electronic Pressure Switch with IO-Link Interface

Technical Data

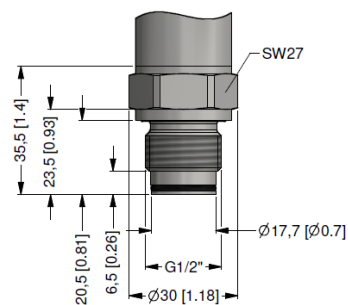
Dimensions (mm / in)



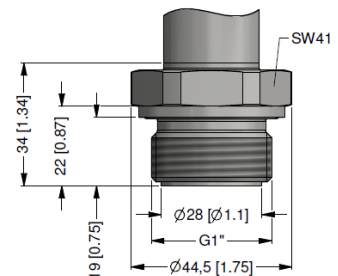
Mechanical connection (dimensions mm / in)



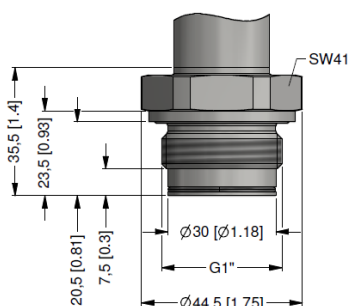
G1/2" DIN 3852 flush
 $p_N \geq 1$ bar



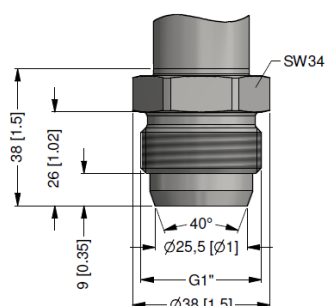
G1/2" DIN 3852 with 2x o-ring
 $p_N \geq 1$ bar



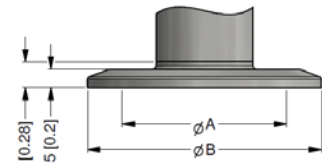
G1" DIN 3852
flush



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

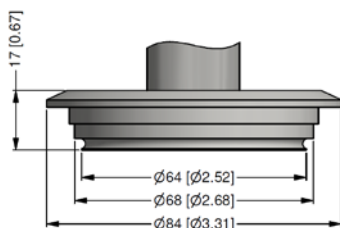


G1" cone

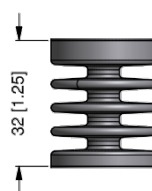


dimensions in mm / in		
size	DN 25 / 1"	DN 50 / 2"
A	23,0 [0.91]	45 [1.77]
B	50,5 [1.99]	64 [2.52]

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



Varivent® DN 40/50
 $p_N \leq 25$ bar



cooling element up to 300 °C ⁵

⇒ metric threads and other versions on request

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

Ordering code DS 350P

DS 350P

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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 ≤ 0.4 bar	0.50% FSO							5				
standard for p _N > 0.4 bar	0.35% FSO							3				
option for p _N ≥ 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 ≥ 1 bar)						Z	0	0				
G1/2" DIN 3852 with 2x o-ring (p _N ≥ 1 bar)						Z	6	1				
G1" DIN 3852 flush						Z	S	1				
G1" DIN 3852 with 2x o-ring (p _N ≤ 2 bar)						Z	S	7				
G1" cone						K	S	1				
Clamp DN 25 DIN 32676 (p _N ≤ 16 bar)						C	6	1				
Clamp DN 50 DIN 32676 (p _N ≤ 16 bar)						C	6	3				
Varivent® DN 40/50 (p _N ≤ 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