



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 60770:
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 200 °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



IO-Link

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		150 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 60770 – 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																	
Permissible temperatures ⁴		medium: -40 ... 125 °C					electronics / environment / storage: -40 ... 85 °C										
Permissible temperature medium for cooling element 200°C		filling fluid silicone oil					overpressure: -40 ... 200 °C vacuum: -40 ... 150 °C										
		filling fluid food compatible oil					overpressure: -10 ... 200 °C vacuum: -10 ... 150 °C										
⁴ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °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		38.4 kbit/sec (COM 2)															
Mode		SIO / IO-Link															
Standard		IEC 61131-2, IEC 61131-9															
Mechanical stability																	
Vibration		10 g RMS (25 ... 2000 Hz)					according to DIN EN 60068-2-6										
Shock		100 g / 1 msec					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					option: EPDM						others on request				
		G1" cone, Clamp, Varivent®:					without										
Media wetted parts		pressure port, seal, diaphragm															

DS 350P

Electronic Pressure Switch with IO-Link Interface

Technical Data

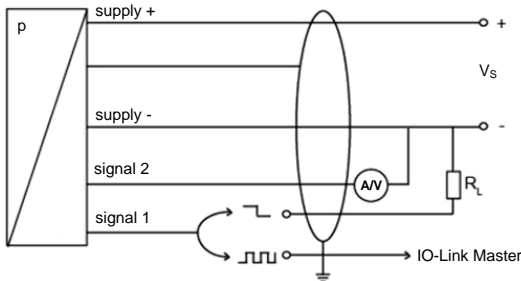
Miscellaneous	
Display	4-digit, 7-segment-LED display on black base body, white, blue foil, digit height 7 mm, range of indication -1999 ... +9999, visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mbar, PSI, MPa) LED status display for IO-Link and contacts
Operation	2 buttons
Featured	functions according to VDMA 24574-1
Turn-on time	110 msec
Weight	approx. 250 g
Operational life	100 million load cycles
Current consumption	< 50 mA (without contacts)
Ingress protection	IP 67
Installation position	any ⁵
CE-conformity	EMC Directive: 2014/30/EU

⁵ 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 $p_N \leq 1$ bar.

Wiring diagrams

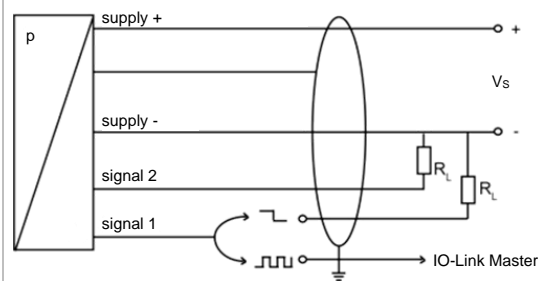
3-wire-system / configuration of analogue output:

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



3-wire-system / configuration of contact:

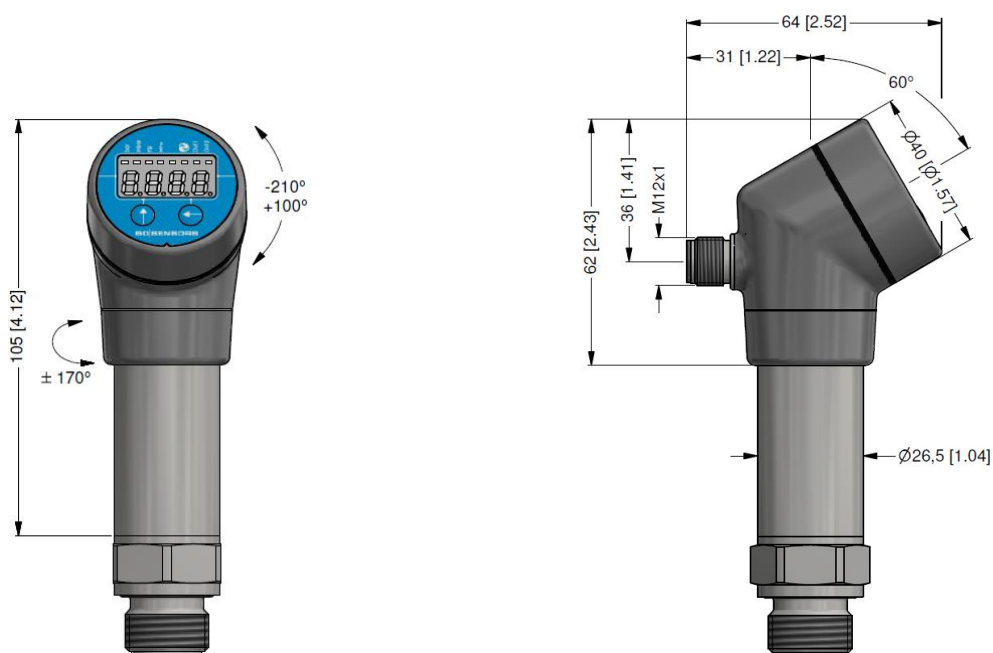
signal 1: IO-Link or contact
signal 2: contact



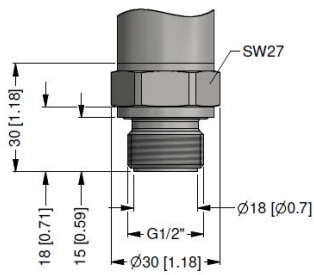
Electrical connection

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	

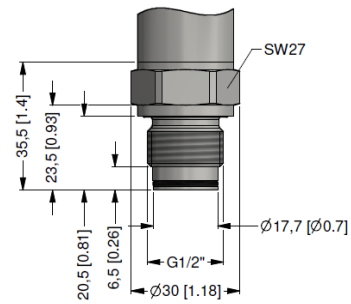
Dimensions (mm / in)



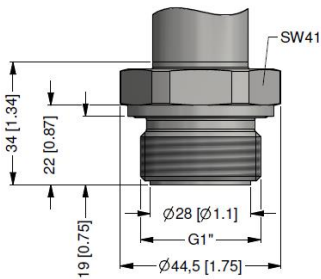
Mechanical connection (dimensions mm / in)



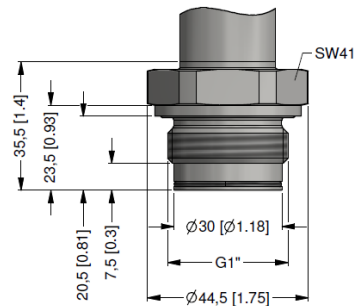
G1/2" DIN 3852 flush
p_N ≥ 1 bar



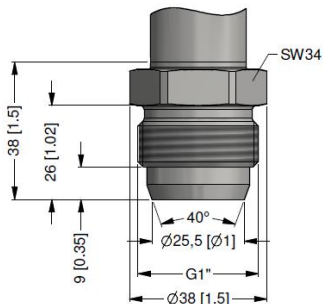
G1/2" DIN 3852 with 2x o-ring
p_N ≥ 1 bar



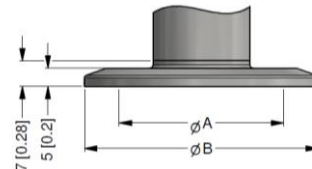
G1" DIN 3852 flush



G1" DIN 3852 with 2x o-ring
p_N ≤ 2 bar

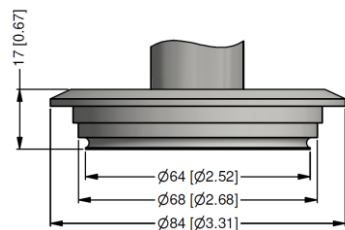


G1" cone

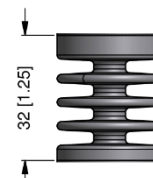


Clamp (DIN 32676)
p_N ≤ 16 bar

Abmessungen in mm / in		
Maß	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



cooling element up to 200 °C

⇒ metric threads and other versions on request

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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
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	4	1		
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
Filling fluids									
silicone oil									1
food compatible oil (FDA)									2
customer									9
Special version									
standard									0 0 0
cooling element up to 200 °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