DS 350

Electronic Pressure Switch with IO-Link Interface

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 ... 600 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
- customer specific versions

The electronic pressure switch DS 350 is interesting for all users in plant and machine engineering, due to the integrated IO-Link interface to exchange process data, diagnostic reports and status messages with a superordinate control level, as standard. In addition, further information can be retrieved that allow conclusions to the application process.

Especially in mechanical engineering, great demand for flexible operating conditions have to be satisfied. Therefor the multi-rotable display module offers best readability for the user by a quick and easy adjustment. Also, 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

Plant and machine engineering

Environmental engineering
(water – sewage – recycling)

CE ROHS REACH IO-Link

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

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

Supply	
Voltage supply	$V_S = 18 \ldots 30\ V_{DC}$
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 [1]	≤ ± 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 [1]	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)	$R_{max} = 330\ \Omega$
Load (0 … 10 V / 3-wire)	$R_{min} = 10\ k\Omega$
Influence effects	supply: 0.05% FSO load: ≤ 0.1 % FSO
Adjustability	offset: ± 5 % span: -10 %
[1] *accuracy according to IEC 61298-2 – limit point adjustment (non-linearity, hysteresis, repeatability)*	
Thermal effects (offset and span)	
Thermal error	≤ ± 0.3 % FSO / 10 K
in compensated range	-25 ... 85 °C
Permissible temperatures	
Permissible temperatures	medium: -40 ... 125 °C electronics / environment / storage: -40 ... 85 °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	20 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
Materials		
Display housing	PA 6.6	
Pressure port / housing	stainless steel 1.4404 (316L)	
Seal	standard: FKM options: EPDM welded version (only for pressure port according to EN 837 and NPT with $p_N \leq 40$ bar) others on request	
Diaphragm	stainless steel 1.4435 (316L)	
Media wetted parts	pressure port, seal, diaphragm	
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. 230 g	
Operational life	100 million load cycles	
Current consumption	< 50 mA (without contacts)	
Ingress protection	IP 67	
Installation position	any [2]	
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) [3]	

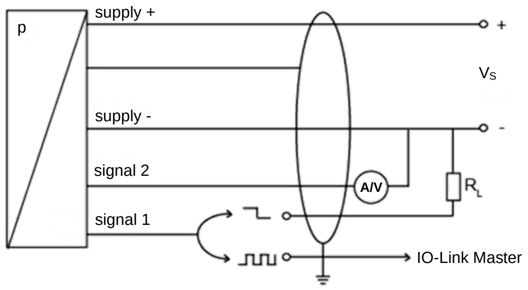
[2] *Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $p_N \leq 1$ bar.*

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

Wiring diagrams

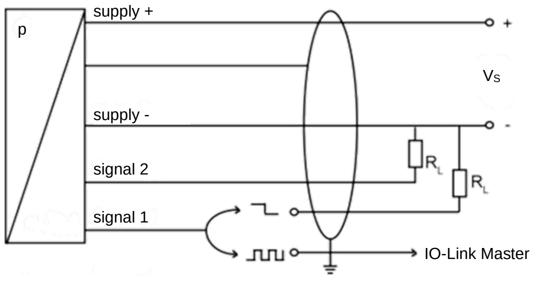
3-wire-system / configuration of analogue output:

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

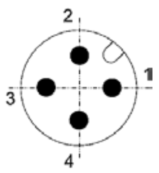


3-wire-system / configuration of contact:

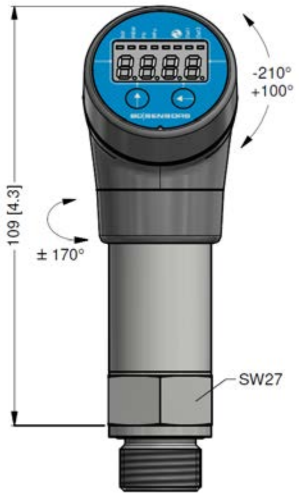
signal 1: IO-Link or contact
signal 2: contact

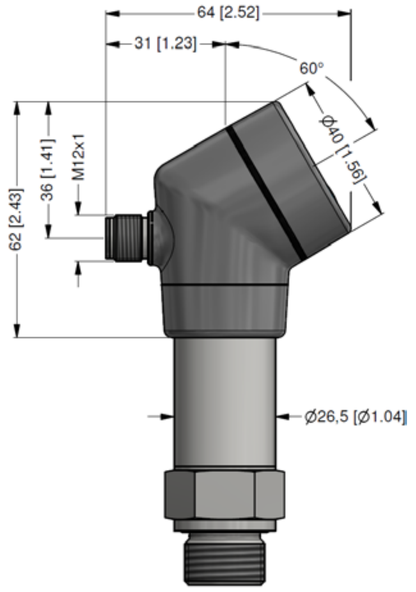


Electrical connection

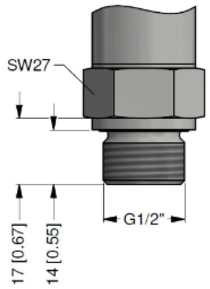
Pin configuration	Description	M12x1 (4-pin), metal	
Supply +	supply	1	
Supply –	supply	3	
Output signal 1	IO-Link / SIO (PNP / NPN)	4	
Output signal 2	4 … 20 mA – 3-wire / 0 …10 V – 3-wire (PNP / NPN)	2	
Shield	shielding	plug housing	

Dimensions (mm / in)

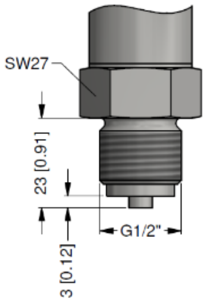




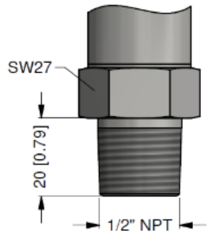
Mechanical connections (dimensions mm / in)



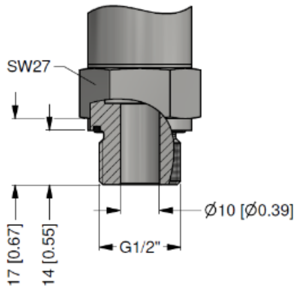
G1/2" DIN 3852



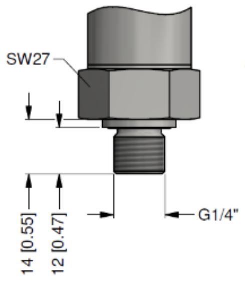
G1/2" EN 837



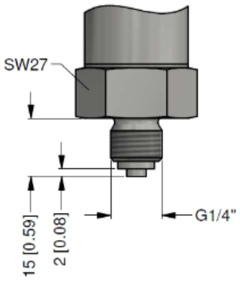
1/2" NPT



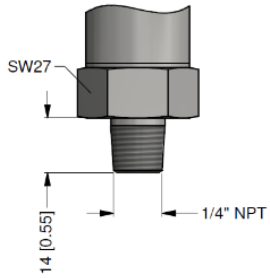
G1/2" open port
DIN 3852 (p_N ≤ 40 bar)



G1/4" DIN 3852



G1/4" EN 837



1/4" NPT

⇨ **metric threads and other versions on request**

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Ordering code DS 350

DS 350 ☐☐☐-☐☐☐☐-☐☐-☐-☐☐☐-☐☐☐-☐-☐☐☐

Pressure			
gauge		7 E 0	
absolute [1]		7 E 1	
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	
	customer	9 9 9 9	consult
Output			
IO-Link + PNP/NPN + analogue output [2]		I X	
Accuracy			
standard for $p_N \le 0.4$ bar	0.50 % FSO	5	
standard for $p_N > 0.4$ bar	0.35 % FSO	3	
option for $p_N \ge 0.4$ 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		1 0 0	
G1/2" EN 837		2 0 0	
G1/4" DIN 3852		3 0 0	
G1/4" EN 837		4 0 0	
G1/2" DIN 3852 open port [3]		H 0 0	
1/2" NPT		N 0 0	
1/4" NPT		N 4 0	
customer		9 9 9	consult
Seal			
FKM		1	
EPDM		3	
without (welded version) [4]		2	
customer		9	consult
Special version			
standard		0 0 0	
customer		9 9 9	consult

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[1] absolute pressure possible from 0.4 bar

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

[3] not possible for nominal pressure $p_N > 40$ bar

[4] welded version only with pressure ports according to EN 837 and NPT, possible for $p_N \le 40$ bar

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