



DS 400

Intelligent Electronic Pressure Switch Stainless Steel

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

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

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA

3-wire: 0 ... 10 V (on request)

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

IS-version

Ex ia = intrinsically safe for gases and dust

- welded pressure sensor
- customer specific versions

The electronic pressure switch DS 400 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 400 offers a PNP contact and a display module, which is mounted rotable in the globe housing. Additional optional versions like e.g. an intrinsically safe version, a second contact and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



Environmental engineering (water – sewage – recycling)



Tel.: +49 (0) 92 35 / 98 11- 0

Fax: +49 (0) 92 35 / 98 11- 11





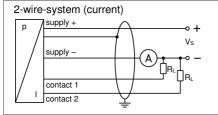


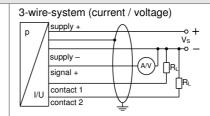
Input pressure range													
Nominal pressure gauge	[bar]	-1 0	0.10	0.16	0.25	0.40	0.60	Τ.	1	1.6	2.5	4	6
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60		1	1.6	2.5	4	6
Overpressure	[bar]	5	0.5	1	1	2	5	į	5	10	10	20	40
Burst pressure	[bar]	7.5	1.5	1.5	1.5	3	7.5	7	.5	15	15	25	50
Nominal pressure									1				
gauge / abs.	[bar]	10	16	25	40	6)	100	1	160	250	400	600
Overpressure	[bar]	40	80	80	105	5 21	0	210	-	600	1000	1000	1000
Burst pressure	[bar]	50	120	120	210			420		000	1250	1250	1250
Vacuum resistance	[Dai]	p _N ≥ 1 ba					.0	420			on reques		1230
Vacuum resistance		p _N ≥ 1 ba	i. uiiiiiiii	eu vacuu	iii iesisia	iice			þη <	ı Dai.	on reques	ot	
Contact 1													
Number, type		standard	: 1 PNP	contact	option	: 2 indep	endent	PNP c	onta	cts			
Max. switching current				nd 3-wire: (on reque							ant; V _{switch} rcuit resist		/
Accuracy of contacts 2		≤ ± 0.25 °	% FSO	•									
Repeatability		≤ ± 0.1 %	6 FSO										
Switching frequency		2-wire: m	nax. 10 H	łz /	3-wire	: 50 Hz							
Switching cycles		> 100 x 1		· · ·	2 30								
Delay time		0 100											
1 with IS-protection max. 1 cont	tact possi												
Analogue output (optional													
2-wire current signal			nA / V _S =	= 13 36	V _{DC}								
3 ··				$R_{max} = [(V_{max}, V_{max}, V_{max}$		n) / 0.02 A	Ω [.			respo	nse time:	< 10 mse	С
2-wire current signal with				= 15 28			_						
IS-protection				$R_{max} = [(\$		a) / 0.02 A	Ω			respo	nse time:	< 10 mse	С
3-wire current signal		4 20 m	nA / Vs =	= 24 V _{DC} ±	: 10 % ac			wn of s	span				
		permissil	ole load:	$R_{max} = 50$	Ω 0	-				respo	nse time:	< 30 mse	С
3-wire voltage signal		0 10 \	$I / V_S = 2$	24 V _{DC} ± 1	10 % adjı	ustable (t	ırn-dow	n of sp	oan 1	:5) ³			
(on request)		permissil	ole load:	$R_{min} = 10$	kΩ					respo	nse time:	< 30 mse	С
Without analogue output		$V_{\rm S} = 15$.											
Accuracy ²		standard		al pressu	re < 0.4 k	oar: ≤±().5 % F	SO					
				al pressu	re ≥ 0.4 k	oar: ≤±0	0.35 %						
		option:	nomin	al pressu al pressu	re ≥ 0.4 k re ≥ 0.4 k	oar: ≤±0 oar: ≤±0).35 %).25 %						
² accuracy according to IEC 602	770 – limi	t point adjus	nomin	al pressul al pressul on-linearity,	re ≥ 0.4 k re ≥ 0.4 k <i>hysteresi</i>	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % oility)						
³ with turn-down of span the ana	alogue si	it point adjus gnal is adjus	nomin	al pressul al pressul on-linearity,	re ≥ 0.4 k re ≥ 0.4 k <i>hysteresi</i>	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % oility)						
³ with turn-down of span the and Thermal effects (Offset an	alogue si nd Span	it point adjus gnal is adjus	nomin stment (no sted auton	al pressur al pressur on-linearity, matically to	re ≥ 0.4 k re ≥ 0.4 k <i>hysteresi</i>	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % oility) ange	SO				0.40	
³ with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N	alogue sig nd Span [bar]	it point adjus gnal is adjus	nomin stment (no sted auton	al pressural pressural pressural pressurantinearity, matically to	re ≥ 0.4 k re ≥ 0.4 k <i>hysteresi</i>	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % oility) ange < 0.40	SO				≥ 0.40	
³ with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N Tolerance band [9	alogue sion di Span [bar] 6 FSO]	it point adjus gnal is adjus	nomin stment (no sted auton -1 ≤ ± 0.	al pressural pressural pressural pressurant	re ≥ 0.4 k re ≥ 0.4 k <i>hysteresi</i>	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % 0.25 % ility) ange < 0.40 ≤ ± 1	SO			<u> </u>	± 0.75	
in compensated range	alogue signd Span [bar] 6 FSO] [°C]	it point adjus gnal is adjus	nomin stment (no sted auton	al pressural pressural pressural pressurant	re ≥ 0.4 k re ≥ 0.4 k <i>hysteresi</i>	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % oility) ange < 0.40	SO			<u> </u>		
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³ with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N Tolerance band [% in compensated range Permissible temperatures Permissible temperatures	alogue signd Span [bar] 6 FSO] [°C]	it point adjus gnal is adjus	nomin stment (no sted auton -1 ≤ ± 0. -20	al pressui al pressui on-linearity, natically to 0 	re ≥ 0.4 k re ≥ 0.4 k hysteresia the new m	oar: ≤±(oar: ≤±(s, repeatal	0.35 % 0.25 % 0.25 % 0.18 0.18 0.18 0.19 0.		8	95 °C	≤ -2	± 0.75	100 °C
3 with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N Tolerance band [9 in compensated range Permissible temperatures Permissible temperatures Electrical protection	alogue signd Span [bar] 6 FSO] [°C]	t point adjus gnal is adjus)	nomin stment (no sted auton -1 ≤ ± 0. -20	al pressui al pressui on-linearity, natically to 0 	re ≥ 0.4 k re ≥ 0.4 k hysteresia the new m	oar: ≤±(oar: ≤±(s, repeatal neasuring r	0.35 % 0.25 % 0.25 % 0.18 0.18 0.18 0.19 0.		8	95 °C	≤ -2	± 0.75	100 °C
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3 with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N Tolerance band [9/ in compensated range Permissible temperatures Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protection	alogue signd Span [bar] [6 FSO] [°C]	t point adjus gnal is adjus) medium: permane no dama	nomin stment (not sted auton -1 ≤ ± 02040 12 nt ge, but a	al pressural pressural pressural pressurantinearity, natically to 0 75 85 25 °C	re ≥ 0.4 t re ≥ 0.4 t hysteresi the new n	par: ≤±(par: ≤±(s, repeatal neasuring r	0.35 % 0.25 % 0.25 % 0.35 % 0.		8	55 °C	≤ -2	± 0.75	100 °C
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3 with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N Tolerance band [9 in compensated range Permissible temperatures Permissible temperatures Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Wibration Shock Materials Pressure port Housing Viewing glass Seals (media wetted) Diaphragm Media wetted parts 4 welded version only for pressure Explosion protection (only Approval AX14-DS 400 Safety techn. maximum value Max. switching current 5 Permissible temperatures for environment	alogue signd Span [bar] [bar] [6 FSO] [°C] [sty	medium: permane no dama emission 10 g RMS 500 g / 1 stainless stainless laminated option: stainless pressure according to zone 20: U _i = 28 V 70 mA in zone 0 in zone 1	nomin stment (no sted auton steel 1.4 ≤ ± 0 20 1.2 1.2 1.3 1	al pressural pressural pressural pressural pressural pressurant pr	re ≥ 0.4 k re ≥ 0.4 k hysteresi the new n electro electro ction ording to 4 on requ L) L) 4 on requ L) Ga (con 135 °C D 160 mW, 60 °C w 70 °C	par: $\leq \pm 0$ par: $\leq \pm 0$ par: $\leq \pm 0$ s, repeatable easuring in the part of	0.35 % 0.25 % 0.	ding to ding to ≤ 40 ba Ex ia III the to 1.1	DIN DIN other	EN 600 EN 600 ers on re	storage	± 0.75	100 °C
3 with turn-down of span the and Thermal effects (Offset an Nominal pressure p _N Tolerance band [9 in compensated range Permissible temperatures Permissible temperatures Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Wibration Shock Materials Pressure port Housing Viewing glass Seals (media wetted) Diaphragm Media wetted parts 4 welded version only for pressure Explosion protection (only Approval AX14-DS 400 Safety techn. maximum value Max. switching current 5 Permissible temperatures for	alogue signd Span [bar] [bar] [6 FSO] [°C] [sty	medium: permane no dama; emission 10 g RMS 500 g / 1 stainless stainless laminated standard option: stainless pressure according to zone 0: zone 20: U _i = 28 V 70 mA in zone 0	nomin stment (no sted auton sted auton -1 ≤ ± 02040 12 nt ge, but a and imm sec steel 1.4 d safety (sec steel 1.4 d safety (sec steel 1.4 port, sea > EN 837; 2-wire) 6 ATEX 1 II 1G Ex III 1D Ex III	al pressural pressural pressural pressural pressural pressurant pr	re ≥ 0.4 k re ≥ 0.4 k re ≥ 0.4 k hysteresi the new n electro electro cording to 4 on requ L) L) L) 4 on requ L) ragm r nominal Ga (con 135 °C D 160 °C w 70 °C I line/shie	par: ≤ ± (0.35 % 0.25 % 0.	ding to ding to size 40 bases ding to ding to ding to ding to ding to	DIN DIN other	EN 600 EN 600 ers on re	storage	± 0.75	100 °C

Miscellaneous						
Display	4-digit, 7-segment-LED display					
	visible range 37.2 x 11 mm					
	digit height 10 mm					
	range of indication -1999 +9999					
	accuracy 0.1 % ± 1 digit					
	digital damping 0.3 30 sec (programmable)					
	measured value update 0.0 10 sec (programmable)					
Current consumption	2-wire signal output current: max. 25 mA					
(without contacts)	3-wire signal output current: approx. 30 mA + signal current					
	3-wire signal output voltage: approx. 30 mA					
Ingress protection	IP 67					
Installation position	any 6					
Weight	approx. 400 g					
Operational life	100 million load cycles					
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) 7					
ATEX Directive	2014/34/EU					

 ⁶ Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges p_N ≤ 1 bar.
 ⁷ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams





Pin configuration	
Electrical connection	M12x1 metal (5-pin)
Supply +	1
Supply –	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	plug housing / pressure port

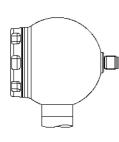
Electrical connection (dimensions in mm)

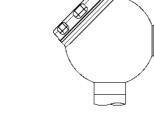




M12x1 (5-pin)

Designs 8





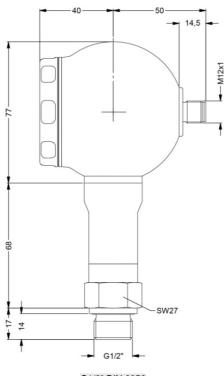
45° display (on request)

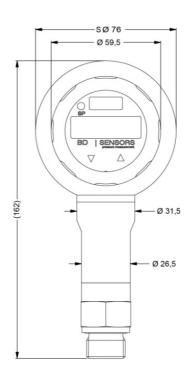
side display ⁸ all designs in horizontal rotatable housing as standard

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Mechanical connections (dimensions in mm)

standard

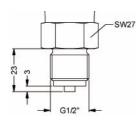




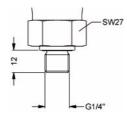
G1/2" DIN 3852

 \Rightarrow for nominal pressure $p_N > 400$ bar increases the length of devices without IS-version by 19 mm and of devices with IS-version by 39 mm

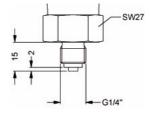
options



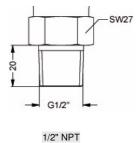
G1/2" EN 837



G1/4" DIN 3852

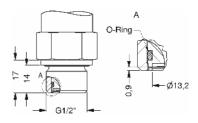


G1/4" EN 837



\$W2

1/4" NPT



G1/2" flush DIN 3852 (p_N from 0.1 up to 40 bar)

⇒ metric threads and other versions on request

BD SENSORS
pressure measurement

Tel.: +49 (0) 92 35 / 98 11- 0 Fax: +49 (0) 92 35 / 98 11- 11



Ordering code DS 400 **DS 400** Pressure A 0 A 1 gauge absolute 2 Input [bar] 0 0 0 0.10 1 0 0 0 0.16 6 5 0 0.25 0 0 4 0.40 0 0 0 0 0 0 0 0 1 6 0 1 5 0 1 0.60 6 1.0 6 5 0 0 6 5 0 1.6 2 25 0 1 0 1 0 2 4 4.0 6 6.0 10 0 2 16 0 2 0 2 0 2 25 4 40 specifications and r 60 6 100 0 0 3 6 0 3 5 0 3 0 0 3 160 250 2 400 4 600 6 0 1 9 0 3 modifications to the 0 2 9 -1 ... 0 2 customer consult stainless steel globe housing КН (side display) stainless steel globe housing K consult right to make (45° display) Analogue output without 0 4 ... 20 mA / 2-wire We reserve the 0 ... 10 V / 3-wire, adjustable 3J consult 4 ... 20 mA / 3-wire, adjustable 7J intrinsic safety 4 ... 20 mA / 2-wire ³ Е customer 9 consult Contact time of publishing. 1 contact 2 contacts 3 standard for p_N ≥ 0.4 bar 0.35 % 3 5 standard for p_N< 0.4 bar 0.5 % the state of engineering at the option for $p_N \ge 0.4$ bar 0.25 % 2 9 customer consult Electrical connection male plug M12x1 (5-pin) / N 1 1 metal version 9 9 9 customer consult Mechanical connection G1/2" DIN 3852 1 0 0 G1/2" EN 837 0 0 2 BD|SENSORS GmbH - The specifications given in this document represent G1/4" DIN 3852 3 0 0 G1/4" EN 837 0 0 4 G1/2" DIN 3852 with F 0 0 flush sensor ⁴ 1/2" NPT N 0 0 N 4 0 9 9 9 1/4" NPT customer consult FKM without (welded version) consult customer 9 consult Special version 0 0 0 9 9 9 standard customer consult

01.04.2020

¹ from 60 bar: measurement starts with ambient pressure

² absolute pressure possible from 0.4 bar

³ with IS version max. 1 contact is possible

 $^{^4\,}$ only possible for nominal pressure ranges $p_N \le 40\,$ bar

 $^{^{5}}$ welded version only with pressure ports according to EN 837; possible for nominal pressure ranges $p_{N} \le 40$ bar