



DS 214

Electronic Pressure Switch for Very High Pressure

Thinfilm Sensor

accuracy according to IEC 60770:
standard: 0.35 % FSO

Nominal pressure

from 0 ... 600 bar up to 0 ... 2 200 bar

Contacts

1, 2 or 4 independent PNP contacts,
freely configurable

Analogue output

2-wire: 4 ... 20 mA
3-wire: 4 ... 20 mA / 0 ... 10 V
others on request

Special characteristics

- ▶ indication of measured values
on a 4-digit LED display
- ▶ pressure sensor welded
- ▶ extremely robust and excellent long-
term stability

Optional versions



- ▶ adjustability of span and offset
(4 ... 20 mA / 3-wire)
- ▶ customer specific versions

The electronic pressure switch DS 214 for very high pressure up to 2 200 bar has been designed especially for use in plant and machine engineering as well as in mobile hydraulics.

The DS 214 has one 1 contact with standard version, this can optionally be upgraded up to four independent contacts.

Via the rotatable module with an integrated 4-digit display the DS 214 can be programmed easily and comfortably.

Preferred areas of use are

-  Plant and machine engineering
-  Commercial vehicles and
mobile hydraulics



Input pressure range						
Nominal pressure gauge	[bar]	600	1000	1600	2000	2200
Overpressure	[bar]	2000	2000	2800	2800	2800

Contact ¹	
Standard	1 PNP contact
Options	2 independent PNP contacts 4 independent PNP contacts (possible with M12x1, 8-pin for 4 ... 20 mA/3-wire)
Max. switching current	4 ... 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; $V_{\text{switch}} = V_S - 2 \text{ V}$ 0 ... 10 V / 3-wire: contact rating 125 mA, short-circuit resistant
Accuracy of contacts ²	$\leq \pm 0.35 \% \text{ FSO}$
Repeatability	$\leq \pm 0.1 \% \text{ FSO}$
Switching frequency	max. 10 Hz
Switching cycles	$> 100 \times 10^6$
Delay time	0 ... 100 sec

¹ max. 1 contact for 2-wire current signal with plug ISO 4400
no contact possible with 3-wire in combination with plug ISO 4400

Analogue output (optionally) / Supply

2-wire current signal	4 ... 20 mA / $V_S = 13 \dots 36 \text{ V}_{\text{DC}}$ permissible load: $R_{\text{max}} = [(V_S - V_{S_{\text{min}}}) / 0.02 \text{ A}] \Omega$	response time: < 10 msec
3-wire current signal	4 ... 20 mA / $V_S = 19 \dots 30 \text{ V}_{\text{DC}}$ adjustable (turn-down of span 1:5) ³ permissible load: $R_{\text{max}} = 500 \Omega$	response time: < 3 sec
3-wire voltage signal	0 ... 10 V / $V_S = 15 \dots 36 \text{ V}_{\text{DC}}$ permissible load: $R_{\text{min}} = 10 \text{ k}\Omega$	response time: < 3 msec
Without analogue output	$V_S = 15 \dots 36 \text{ V}_{\text{DC}}$	
Accuracy ²	$\leq \pm 0.35 \% \text{ FSO IEC 60770}$	

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

³ with turn-down of span the analogue signal is adjusted automatically to the new measuring range

Thermal effects (offset and span)

Thermal error	$\leq \pm 0.25 \% \text{ FSO} / 10 \text{ K}$
In compensated range	-20 ... 85 °C

Permissible temperatures

Medium	-40 ... 140 °C
Electronics / environment	-25 ... 85 °C
Storage	-40 ... 100 °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

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

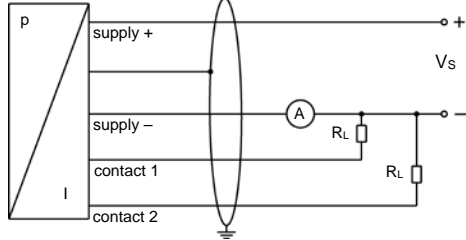
Pressure port	stainless steel 1.4542 (17-4 PH)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	none (welded version)
Diaphragm	stainless steel 1.4542 (17-4 PH)
Media wetted parts	pressure port, diaphragm

Miscellaneous

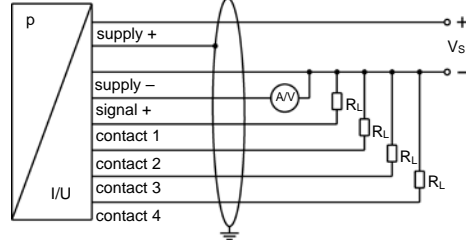
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % \pm 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 45 mA 3-wire signal output voltage: approx. 7 mA + signal current
Ingress protection	IP 65
Installation position	any
Weight	min. 200 g (depending on mechanical connection)
Operational life	$p_N = 600 \text{ bar}$: 100 million load cycles $p_N > 600 \text{ bar}$: 10 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A)

Wiring diagrams

2-wire-system (current)



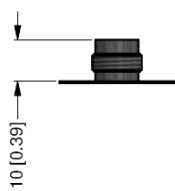
3-wire-system (current / voltage)



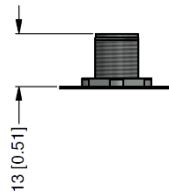
Pin configuration

Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)
Supply +	1	1	1	1	1
Supply -	3	3	3	2	3
Signal + (only 3-wire)	2	2	2	3	2
Contact 1	4	4	4	3	4
Contact 2	5	5	5	-	5
Contact 3	-	-	6	-	-
Contact 4	-	-	7	-	-
Shield	via pressure port	plug housing/ pressure port	via pressure port	ground contact	plug housing/ pressure port

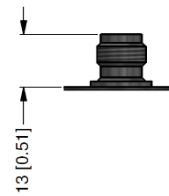
Electrical connections (dimensions mm / in)



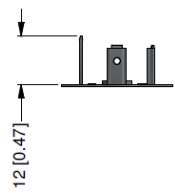
M12x1 plastic (5-pin)



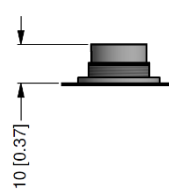
M12x1 metal (5-pin)



M12x1 plastic (8-pin)

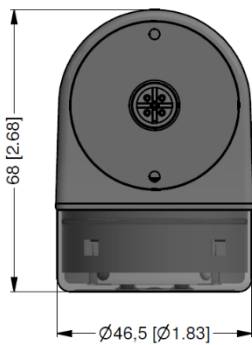
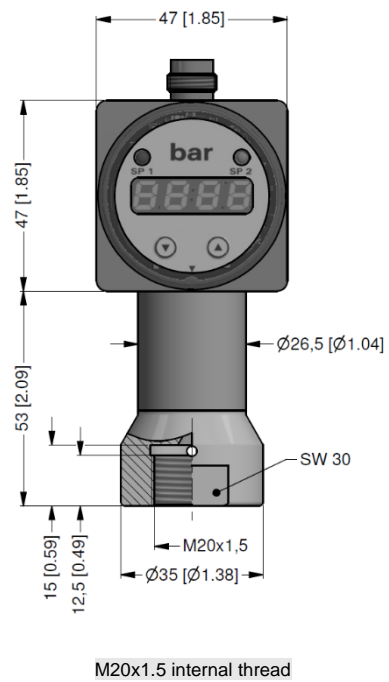
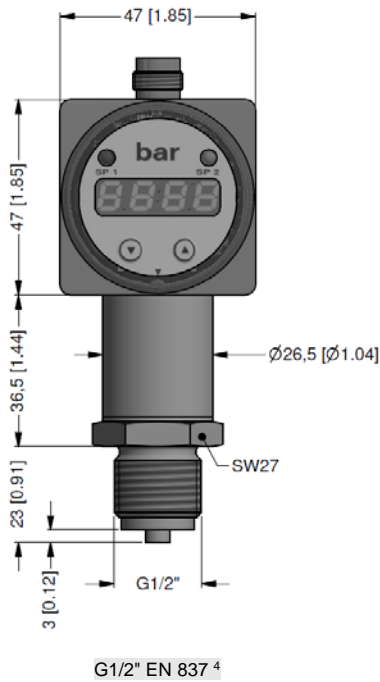


ISO 4400



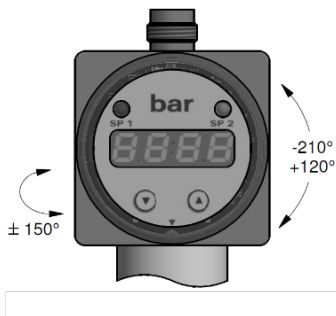
Binder series 723 (5-pin)

Dimensions (mm / in)



⁴ According to EN 837, the pressure port and the complement, at pressure over 1000 bar must be preferably made of stainless steel with a tensile strength of $R_p > 260 \text{ N/mm}^2$ in accordance with DIN 17440. The maximum allowed pressure is 1600 bar!

Rotatability of display module



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Ordering code DS 214

DS 214

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Pressure					
gauge	7	8	B		
Input					
[bar]					
600	6	0	0	3	
1000	1	0	0	4	
1600	1	6	0	4	
2000	2	0	0	4	
2200	2	2	0	4	
customer	9	9	9	9	consult
Analogue output					
without				0	
4 ... 20 mA / 2-wire				1	
0 ... 10 V / 3-wire				3	
4 ... 20 mA / 3-wire, adjustable				7	
customer				9	consult
Contact					
1 contact ¹				1	
2 contacts ¹				2	
4 contacts ²				4	consult
Accuracy					
0.35 % FSO				3	
customer				9	consult
Electrical connection					
male plug M12x1 (5-pin) / plastic version				N 0 1	
male plug M12x1 (8-pin) / plastic version ²				M 5 0	
male plug M12x1 (5-pin) / metal version				N 1 1	
male and female plug ISO 4400 ¹				1 0 0	
male plug Binder series 723 (5-pin)				2 0 4	
customer				9 9 9	consult
Mechanical connection					
G1/2" EN 837 ³				2 0 0	
M20x1.5 internal thread				D 2 8	
customer				9 9 9	consult
Seal					
without (welded version)				2	
customer				9	consult
Special version					
standard				0 0 0	
customer				9 9 9	consult

¹ with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
² 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request
³ According to EN 837, the pressure port and the complement, at pressure over 1000 bar must be preferably made of stainless steel with a tensile strength of R_p > 260 N/mm² in accordance with DIN 17440. The maximum allowed pressure is 1600 bar!

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