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

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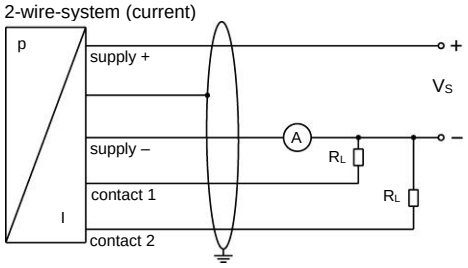
Input pressure range						
Nominal pressure gauge	[bar]	600 [1]	1000	1600	2000	2200
Overpressure	[bar]	800	1400	2200	2800	2800
[1] only available with pressure port G1/2" EN 837						

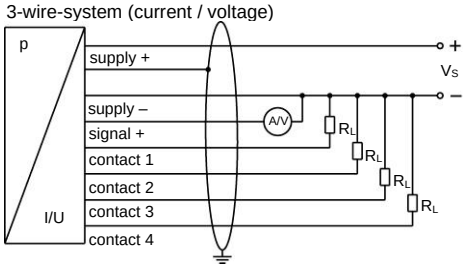
Contact [2]	
Standard	1 PNP contact
Options	2 independent PNP contacts 4 independent PNP contacts (possible with M12x1, 8-pin for 4 ... 20 mA/3-wire)
Max. switching current	4 ... 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; $V_{switch} = V_S - 2$ V 0 ... 10 V / 3-wire: contact rating 125 mA, short-circuit resistant
Accuracy of contacts [3]	≤ ± 0.35 % FSO
Repeatability	≤ ± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10^6
Delay time	0 ... 100 sec
[2] 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 ... 36 V_{DC} permissible load: $R_{max} = [(V_S - V_{S\,min}) / 0.02\ A]\ \Omega$ response time: < 10 msec
3-wire current signal	4 ... 20 mA / V_S = 19 ... 30 V_{DC} adjustable (turn-down of span 1:5) [4] permissible load: R_{max} = 500 Ω response time: < 3 sec
3-wire voltage signal	0 … 10 V / V_S = 15 ... 36 V_{DC} permissible load: R_{min} = 10 kΩ response time: < 3 msec
Without analogue output	V_S = 15 ... 36 V_{DC}
Accuracy [3]	≤ ± 0.35 %FSO IEC 60770
[3] accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability) *[4] with turn-down of span the analogue signal is adjusted automatically to the new measuring range*	
Thermal effects (offset and span)	
Thermal error	≤ ± 0.25 % FSO / 10 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	10 g RMS (25 ... 2000 Hz)
Shock	100 g / 11 msec
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 % ± 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 bar: 100 million load cycles p_N > 600 bar: 10 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A)

Wiring diagrams

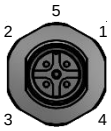
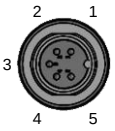
2-wire-system (current)



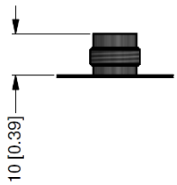
3-wire-system (current / voltage)



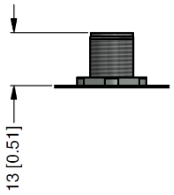
Pin configuration

Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)	cable colours (IEC 60757)
						
Supply +	1	1	1	1	1	WH (white)
Supply –	3	3	3	2	3	BN (brown)
Signal + (only 3-wire)	2	2	2	3	2	GN (green)
Contact 1	4	4	4	3	4	GY (grey)
Contact 2	5	5	5	-	5	PK (pink)
Contact 3	-	-	6	-	-	-
Contact 4	-	-	7	-	-	-
Shield	via pressure port	plug housing/ pressure port	via pressure port	ground contact ⏚	plug housing/ pressure port	GNYE (green-yellow)

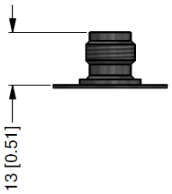
Electrical connections (dimensions mm / in)



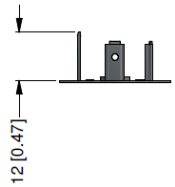
M12x1 plastic (5-pin)



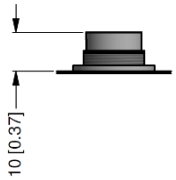
M12x1 metal (5-pin)



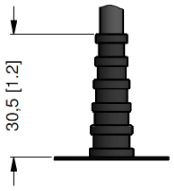
M12x1 plastic (8-pin)



ISO 4400



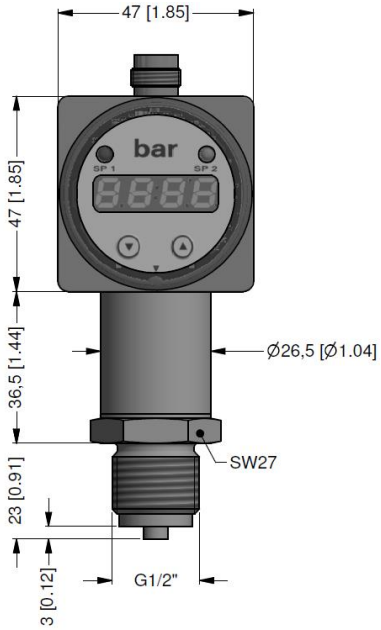
Binder series 723 (5-pin)



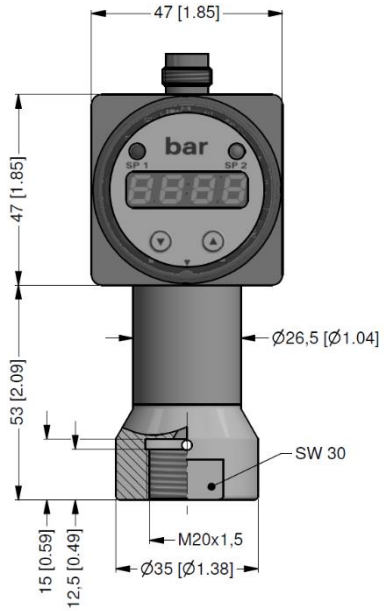
cable outlet [5]

[5] *different cable types and lengths available; permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)*

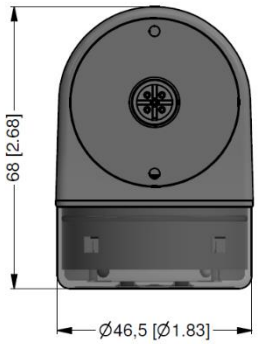
Dimensions (mm / in)



G1/2" EN 837 [6]

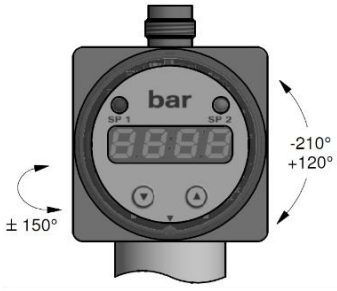


M20x1.5 internal thread



[6] *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!*

Rotatability of display module



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BD|SENSORS pressure measurement

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Ordering code DS 214

DS 214 □□□-□□□□-□-□-□-□-□□□-□□□-□-□-□□□

Pressure																										
gauge		7	8	B																						
Input	**[bar]**																									
600	[1]				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	[2]									1																
2 contacts	[2]									2																
4 contacts	[3]									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	[3]											M	5	0												
male plug M12x1 (5-pin) / metal version												N	1	1												
male and female plug ISO 4400	[2]											1	0	0												
male plug Binder series 723 (5-pin)												2	0	4												
cable outlet with PVC cable	[4]											T	A	0												
customer												9	9	9												consult
Mechanical connection																										
G1/2" EN 837	[5]														2	0	0									
M20x1.5 internal thread															D	2	8									
customer															9	9	9									consult
Seals																										
without (welded version)																		2								
customer																		9								consult
Special version																										
standard																			0	0	0					
customer																			9	9	9					consult

[1] only available with pressure port G1/2" EN 837

[2] with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

[3] 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

[4] standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request

[5] 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!

01.04.2022

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