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# POSIWIRE®

Cable Extension Position Sensors

**WS10EX**  
**Position Sensor**

Datasheet



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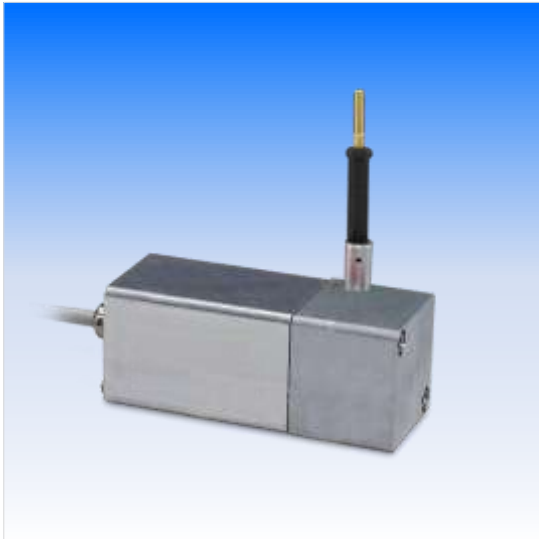
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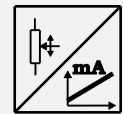
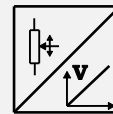
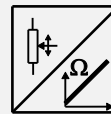
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## Analog output, Dust Explosion-Proof



### Sensor features

- Measurement range up to 1250 mm
- Analog output
- DIN EN 60079-0 (June 2014)  
DIN EN 60079-31 (December 2014)
-  II 3D Ex tc IIIC T80°C Dc X  
(X = examined with low impact energy of 4J)



### Specifications

<b>Output</b>	<b>R1K</b> = Potentiometer 1 kΩ <b>10V</b> = Voltage 0 ... 10 V <b>420A</b> = Current 4 ... 20 mA, 2 wire <b>420T</b> = Current 4 ... 20 mA, 3 wire Excitation voltage WS-EX sensors: 24 V DC typical
<b>Resolution</b>	Quasi infinite
<b>Linearity</b>	±0.10% f.s. (standard) ±0.05% f.s. (optional)
<b>Sensing device</b>	Precision potentiometer
<b>Housing material</b>	Aluminium measuring cable: stainless steel
<b>Protection class of the housing</b>	IP65
<b>Connection</b>	Cable output, standard length 2 m
<b>Weight</b>	approx. 600 g
<b>Temperature range</b>	-20°C ... +40°C
<b>Standards</b>	
<b>Dust-Ex Proof</b>	DIN EN 60079-0 (June 2014) DIN EN 60079-31 (December 2014)
<b>EMC</b>	DIN EN 61326-1:2013
<b>Shock</b>	DIN EN 60068-2-27:2010, 50 g 11 ms, 100 shocks
<b>Vibration</b>	DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles

<b>Cable forces</b> typical at = 20 °C	<b>Measurement range</b>	<b>Maximum pull-out force</b>	<b>Minimum pull-in force</b>
	[mm]	[N]	[N]
	100	4.7	3.0
	125	4.6	2.4
	375	7.4	3.9
	500	5.5	2.8
	750	7.6	3.8
	1000	5.3	2.9
	1250	4.6	2.4

**Order code**WS10EX – 1 – 2 – 3 – 4 – 5**1 Measurement range (in mm)**

100 / 125 / 375 / 500 / 750 / 1000 / 1250

**2 Output**

**R1K** = Potentiometer 1 kΩ  
**10V** = Voltage 0 ... 10 V  
**420A** = Current 4 ... 20 mA, 2 wire  
**420T** = Current 4 ... 20 mA, 3 wire  
Excitation voltage WS-EX sensors: 24 V DC typical

**3 Linearity**

**L10** = ±0.10% f.s. (standard)  
**L05** = ±0.05% f.s. (optional)

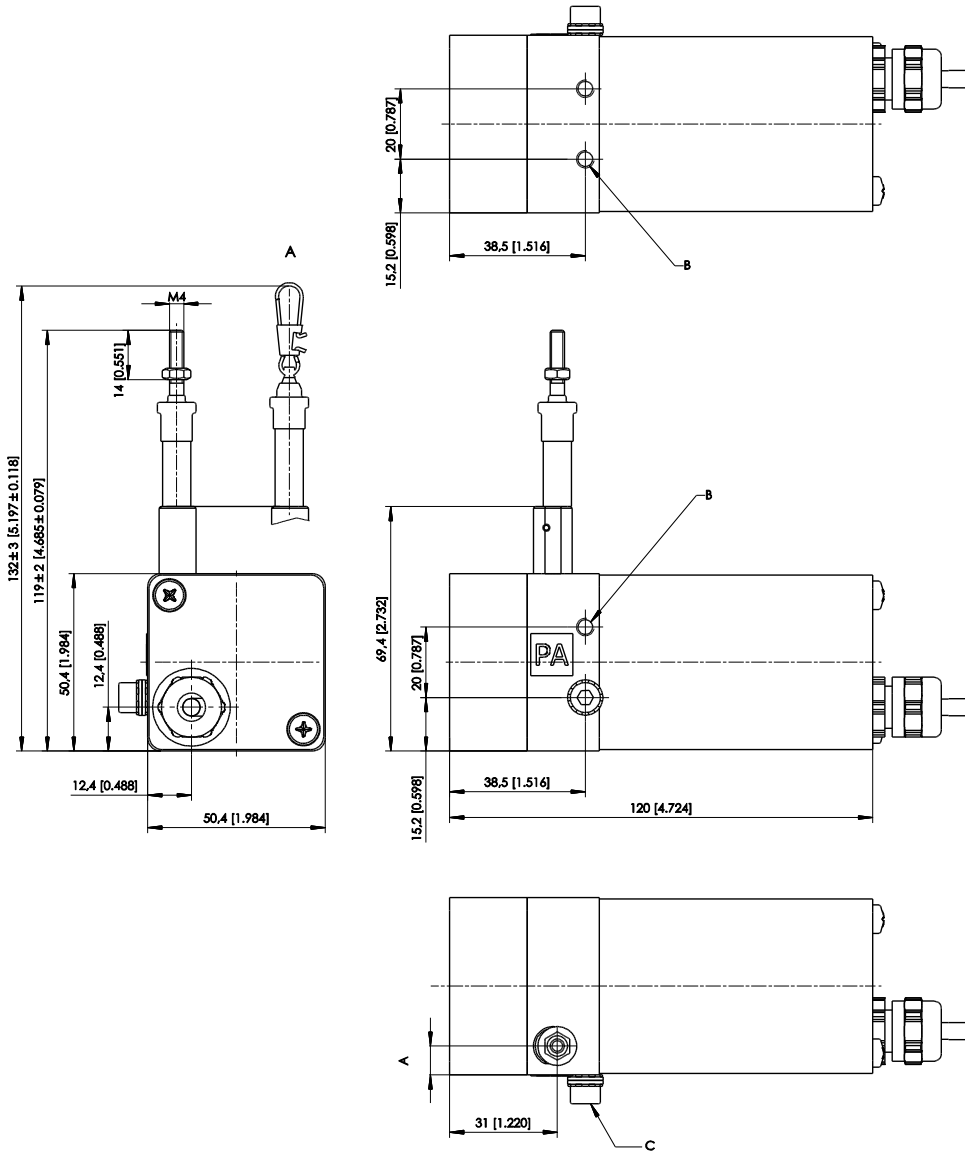
**4 Cable fixing**

**M4** = M4 cable fixing  
**SB0** = cable clip

**5 Connection****KAB2M** = Cable output, standard length 2 m**Order example****WS10EX – 1250 – 10V – L10 – M4 – KAB2M**

## Dimensions

Measurement range 100 ... 1250 mm, analog output, Dust-Explosion-Proof



Dimensions in mm	Measurement range	A
	375; 750	12.7
100; 125; 500; 1000; 1250	8.2	

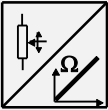
A – Option SB0  
B – M5 - 8 [.315] deep  
C – Connection for potential equalization

Dimensions in mm [inch]  
Dimensions informative only.  
For guaranteed dimensions consult factory.

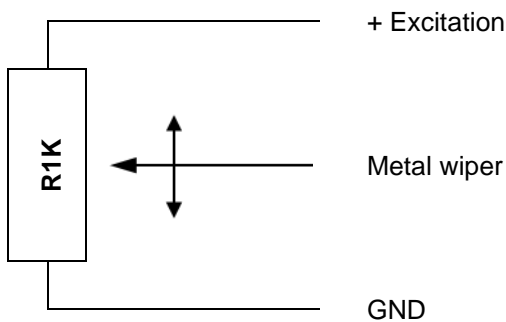
## Output specifications

### Analog outputs

#### Voltage divider R1K

Potentiometer 	Excitation voltage	24 V DC (32 V DC max. at 1 kΩ, max. power 1 W)
	Potentiometer impedance	1 kΩ ±10 %
	Thermal coefficient	±25 x 10 <sup>-6</sup> / °C f.s.
	Sensitivity	Depends on the measuring range, individual sensitivity of the sensor is specified on the label
	Voltage divider utilization range	approx. 3 % ... 97 %
	Operating temperature	Refer to output specification
	EMC	DIN EN 61326-1:2013

### Output signals



**Note:**

**The metal wiper of the potentiometer must be protected against current load!**

Electrical current flow impact on the wiper causes linearity errors and shortens the lifetime of the potentiometer.

Additional information:

[http://www.asm-sensor.com/asm/pdf/pro/ws\\_poti\\_technote\\_en.pdf](http://www.asm-sensor.com/asm/pdf/pro/ws_poti_technote_en.pdf)

### Signal wiring

Signal	Connector pin no.	Cable color	Cable color
Poti +	1	white	brown
Poti GND	2	brown	white
Poti slider	3	green	blue
-	4	yellow	black
-	5	grey	-
-	6	pink	-
-	7	blue	-
-	8	red	-

View to sensor connector



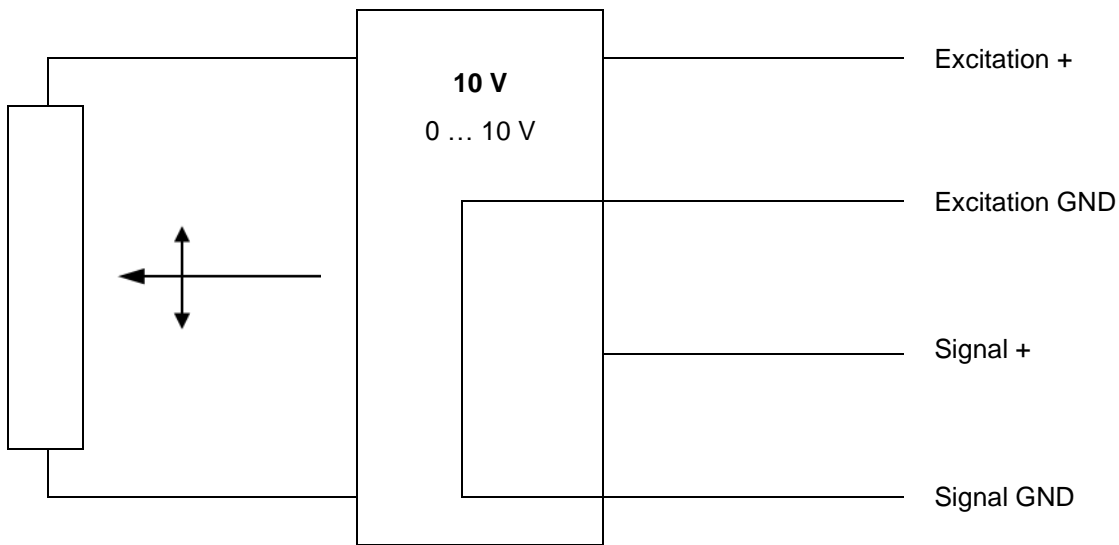
CONN-M12-8F



**Signal conditioner 10V**

Voltage output  	Excitation voltage	24 V DC non stabilized (18 ... 27 V DC )
	Excitation current	20 mA max.
	Output voltage	0 ... 10 V DC
	Output current	2 mA max.
	Output load	> 5 kΩ
	Stability (temperature)	±50 x 10 <sup>-6</sup> / °C f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV <sub>RMS</sub>
	Operating temperature	Refer to output specification
	EMC	DIN EN 61326-1:2013

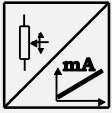
**Output signals**



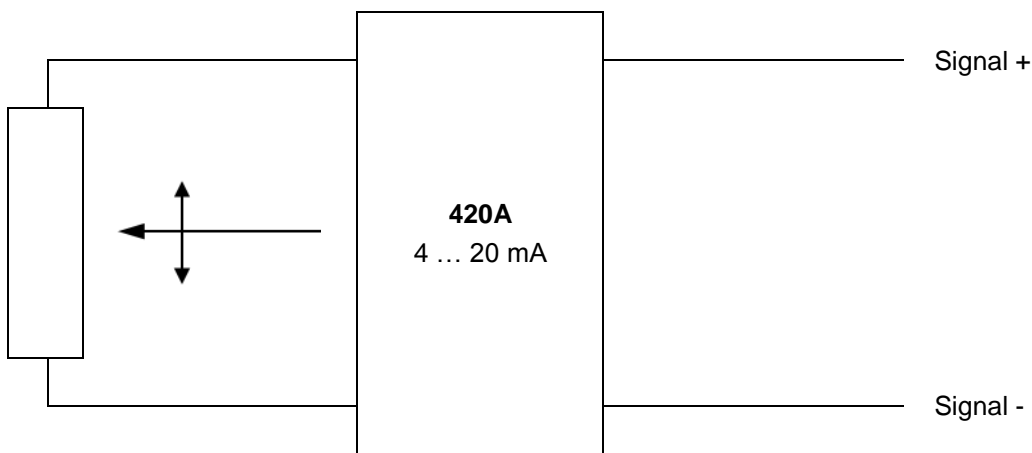
**Signal wiring**

Signal	Connector pin no.	Cable color	View to sensor connector
Excitation +	1	white	 CONN-M12-8F
Excitation GND	2	brown	
Signal +	3	green	
Signal GND	4	yellow	
Not connected	5	grey	
Not connected	6	pink	
Not connected	7	blue	
Not connected	8	red	


**Signal conditioner 420A**

Current output (2 wire) 	Excitation voltage	24 V DC non stabilized (12 ... 27 V DC), measured at the sensor terminals
	Excitation current	35 mA max.
	Output current	4 ... 20 mA equivalent for 0 ... 100 % range
	Stability (temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ f.s.
	Protection	Reversed polarity, short circuit
	Output noise	0.5 mV <sub>eff</sub>
	Operating temperature	Refer to output specification
	EMC	DIN EN 61326-1:2013

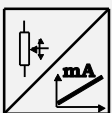
**Output signals**



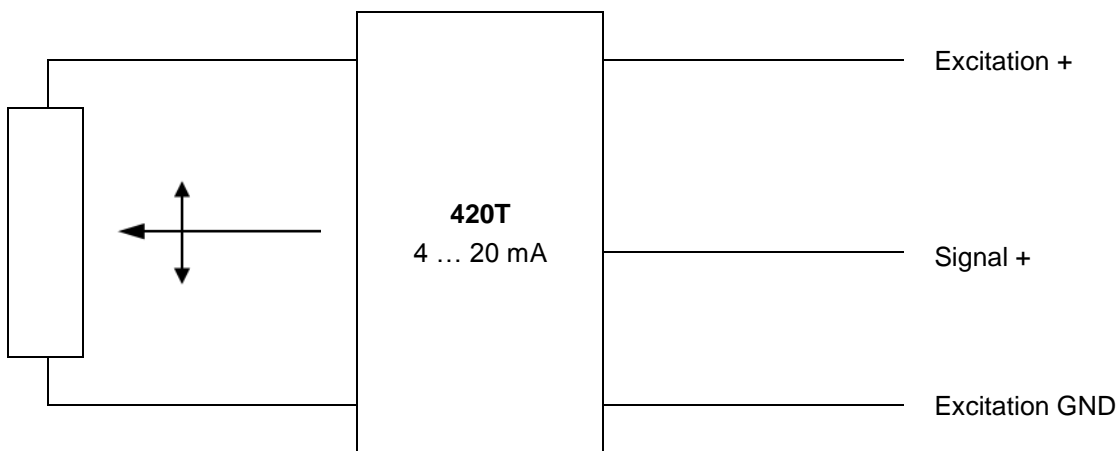
**Signal wiring**

Signal	Connector pin no.	Cable color	View to sensor connector
Signal +	1	white	 CONN-M12-8F
Signal -	2	brown	
Not connected	3	green	
Not connected	4	yellow	
Not connected	5	grey	
Not connected	6	pink	
Not connected	7	blue	
Not connected	8	red	

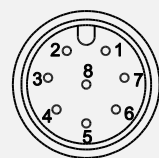
**Signal conditioner 420T**

Current output (3 wire)	Excitation voltage	24 V DC non stabilized (18 ... 27 V DC)
	Excitation curren	40 mA max.
	Load resistor	350 Ω max.
	Output current	4 ... 20 mA equivalent for 0 ... 100 % range
	Stability (temperature)	±50 x 10 <sup>-6</sup> / °C f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV <sub>RMS</sub>
	Operating temperature	Refer to output specification
	EMC	DIN EN 61326-1:2013

**Output signals**



**Signal wiring**

Signal	Connector pin no.	Cable color	View to sensor connector
Excitation +	1	white	 <p>CONN-M12-8F</p>
Excitation GND	2	brown	
Signal +	3	green	
Not connected	4	yellow	
Not connected	5	grey	
Not connected	6	pink	
Not connected	7	blue	
Not connected	8	red	