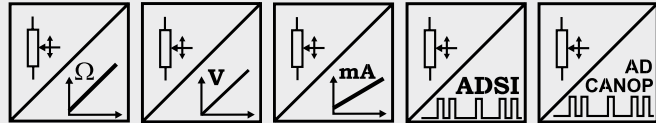


# POSIWIRE® WS10ZG with Analog, SSI or CANopen Output



## New: WS10 in a zinc diecast housing

- Protection class IP65
- Measurement range 0 ... 100 mm to 0 ... 1250 mm
- Analog output or  
A/D converted synchronous serial output (SSI) or  
A/D converted CANopen output



Specifications	Outputs	Potentiometer 1 kΩ Voltage 0 ... 10 V Current 4 ... 20 mA, 2 or 3 wire A/D converted synchronous serial interface (SSI) A/D converted CANopen bus
Resolution		Analog: essentially infinite; ADSI16: max. 16 bit f.s.; ADCANOP: 16 bit f.s.
Linearity		Up to ±0.05% f. s.
Sensing device		Precision potentiometer
Material		Zinc diecast, aluminum und stainless steel; measuring cable: stainless steel
Protection class		IP65
Connection		Male socket M12, 8 pin (ADCANOP: 5 pin)
Weight		800 g approx.
EMC, temperature		Refer to output specification

## Order code WS10ZG

WS10ZG - [ ] - [ ] - [ ] - [ ] - [ ]

### Model name

### Measurement range (in mm)

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

### Output

R1K = Potentiometer 1 kΩ  
 10V = 0 ... 10 V signal conditioner  
 420A = 4 ... 20 mA signal conditioner (2 wire)  
 420T = 4 ... 20 mA signal conditioner (3 wire)  
 PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner  
 ADSI16 = A/D converted synchronous serial interface (SSI)  
 ADCANOP = A/D converted CANopen bus

### Linearity

L10 = ±0.1 % option: L05 = ±0.05 % L25 = ±0.25 %

### Cable fixing

M4 = M4 thread  
 SB0 = Cable clip

### Connection

M12 = 8 pin socket M12 (ADCANOP: 5 pin)

Order code connector cable

**KAB-...M-M12/8F/G-LITZE**

ADCANOP:

**KAB-...M-M12/5F/G-M12/5M/G**

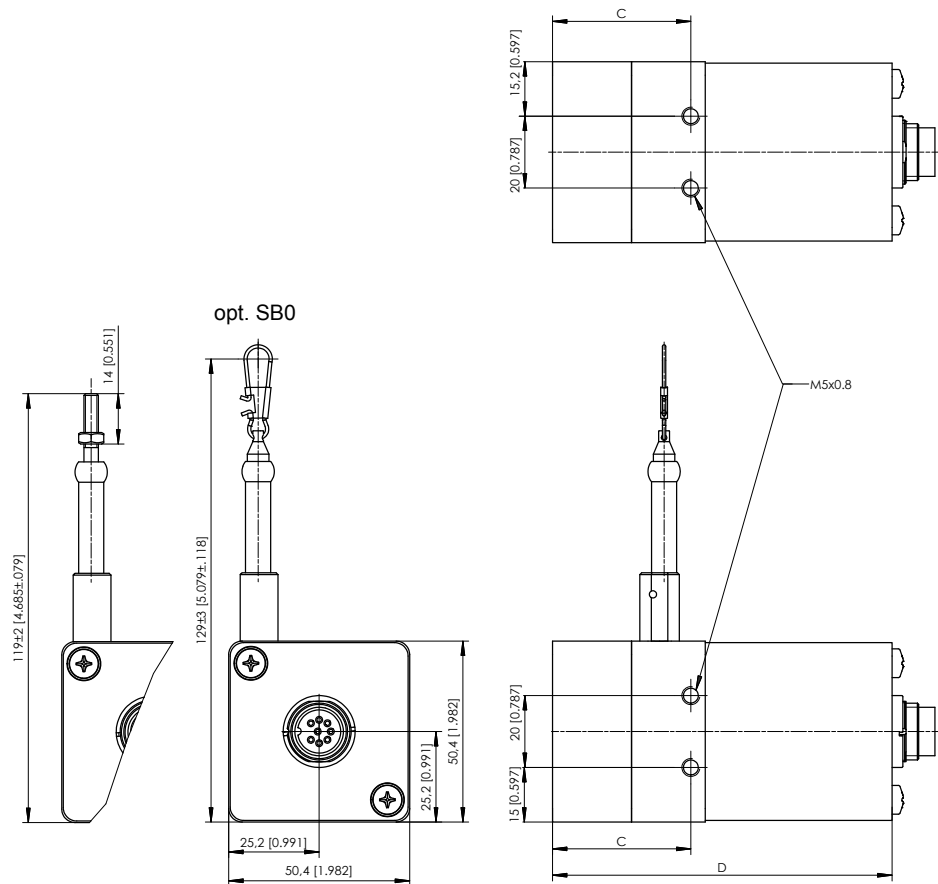
**Order example: WS10ZG - 1250 - 10V - L10 - M4 - M12**

# POSIWIRE® WS10ZG with Analog, SSI or CANopen Output



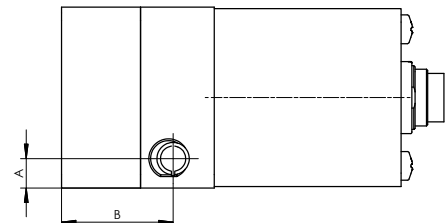
Cable forces, typical at 20 °C	Measurement range	Max. pull-out force	Min. pull-in force
	[mm]	[N]	[N]
	100	4.7	3.0
	125	4.6	2.4
	375	7.4	3.9
	500	5.5	2.8
	750	7.6	3.8
	1000	5.3	2.9
	1250	4.6	2.4

## Outline drawing



Dimensions in mm [inch]

Dimensions informative only.  
For guaranteed dimensions consult factory.

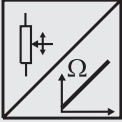


Dimensions [mm]	Measurement range	A	B, C	D
	375; 750	12.5	B=31.0; C=38.5	94.5
	100; 125; 500	8.0		
1000; 1250	8.0			

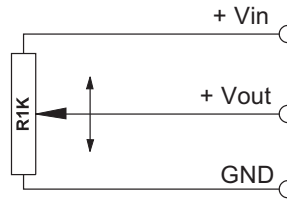
# Output Specifications

## R1K and 10V for WS position sensors

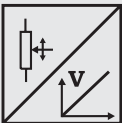


<b>Voltage divider R1K</b> Potentiometer 	Excitation Voltage	32 VDC max. at 1 k $\Omega$ (input power 1 W max.)
	Potentiometer Impedance	1 k $\Omega$ $\pm$ 10%
	Thermal coefficient	$\pm$ 25 x 10 <sup>-6</sup> / °C full scale
	Sensitivity	Depends on measurement range, individual sensitivity of sensor specified on label
	Voltage Divider Utilization Range	Approx. 3% ... 97% of full range
	Operating Temperature	-20 ... +85 °C

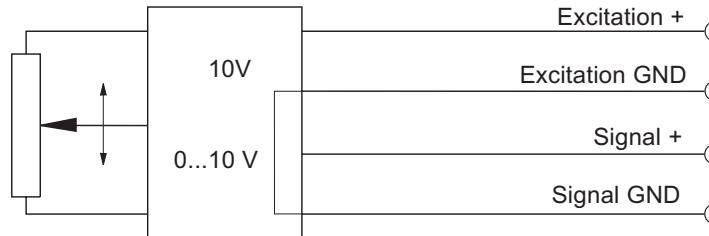
### Signal diagram



Note: The potentiometer must be connected as a voltage divider. The input impedance of the following processing circuit should be 10 M $\Omega$  min.

<b>Signal conditioner 10V</b> Voltage output 	Excitation Voltage	+18 ... +27 V DC non stabilized
	Excitation Current	20 mA max.
	Output Voltage	0 ... +10 V DC
	Output Current	2 mA max.
	Output Load	> 5 k $\Omega$
	Stability (Temperature)	$\pm$ 50 x 10 <sup>-6</sup> / °C full scale
	Protection	Reverse polarity, short circuit
	Output Noise	0,5 mV <sub>RMS</sub>
	Operating Temperature	-20 ... +85 °C
	EMC	According to EN 61326:2004

### Signal diagram

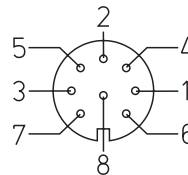


Signal Wiring	Output signals		Cable color	Connector pin no.
	R1K	10V		
	+ Vin	Excitation +	White	1
	GND	Excitation GND	Brown	2
	+ Vout	Signal +	Green	3
		Signal GND	Yellow	4

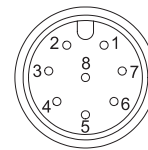
### Connection

#### Mating Connector

View to solder terminals



CONN-DIN-8F-W

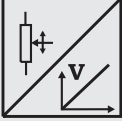


CONN-M12-8F-G

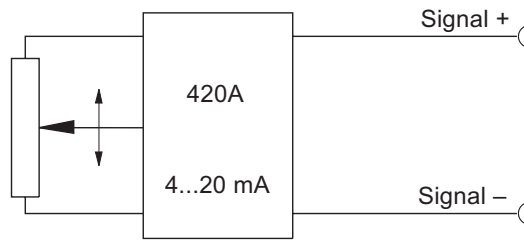
# Output Specifications

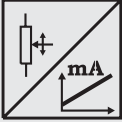
## 420A and 420T for WS position sensors



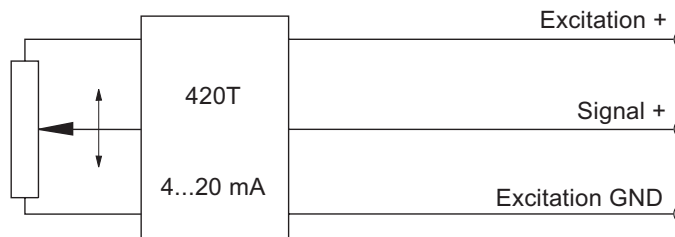
<b>Signal conditioner</b> <b>420A</b> Current output (2 wire) 	Excitation Voltage	+12 ... 27 VDC non stabilized, measured at the sensor terminals
	Excitation Current	35 mA max.
	Output Current	4 ... 20 mA equivalent to 0 ... 100% range
	Stability (Temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ full scale
	Protection	Reverse polarity, short circuit
	Output Noise	0.5 mV <sub>RMS</sub>
	Operating Temperature	-20 ... +85 °C
	EMC	According to EN 61326:2004

### Signal Diagram



<b>Signal Conditioner</b> <b>420T</b> Current output (3 wire) 	Excitation Voltage	+18...+27 V DC non stabilized
	Excitation Current	40 mA max.
	Load Resistor	350 Ω max.
	Output Current	4 ... 20 mA equivalent to 0 ... 100% range
	Stability (Temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ full scale
	Protection	Reverse polarity, short circuit
	Output Noise	0.5 mV <sub>RMS</sub>
	Operating Temperature	-20 ... +85 °C
	EMC	According to EN 61326:2004

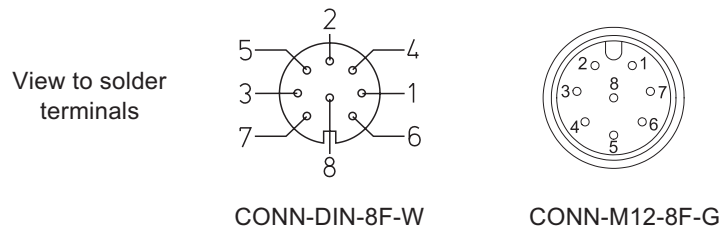
### Signal diagram



Signal Wiring	Output signals		Cable color	Connector pin no.
	420A	420T		
Signal +		Excitation +	White	1
Signal -		Excitation GND	Brown	2
		Signal +	Green	3

### Connection

Mating Connector

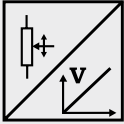
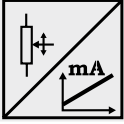


# POSIWIRE®

## PMUV / PMUI

### Analog Outputs for WS Position Sensors



<b>Signal conditioner PMUV / PMUI</b> Voltage or current output  	Excitation voltage	18 ... 27 V DC
	Excitation current	50 mA max.
	Voltage output <b>PMUV</b>	0 ... 10 V
	Output current	10 mA max.
	Output load	1 kΩ min.
	Current output <b>PMUI</b>	4 ... 20 mA
	Load resistor	500 Ω max.
	Adjustment	
	Activation of offset und gain	Connect with excitation GND
	Scalable range	90% max f. s.
	Stability (temperature)	±50 x 10 <sup>-6</sup> / °C f. s.
Operation temperature	-20 ... +85 °C	
Protection	Reverse polarity, short circuit	
EMC	According to EN61326:2004	

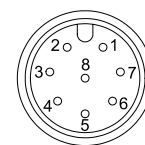
#### Signal diagram



Signal wiring	Output signal name	Connector pin no.
	Excitation +	1
	Excitation GND	2
	Signal +	3
	Signal GND	4
	Offset	7
	Gain	8

#### Connection

View to sensor  
connector

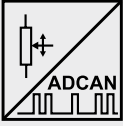


CONN-M12-8F

Signal wiring PMUI2	Output signal name	Connector pin no.
	Excitation +	1
	Excitation GND	2
	Signal +	5
	Signal GND	6
	Offset	7
	Gain	8

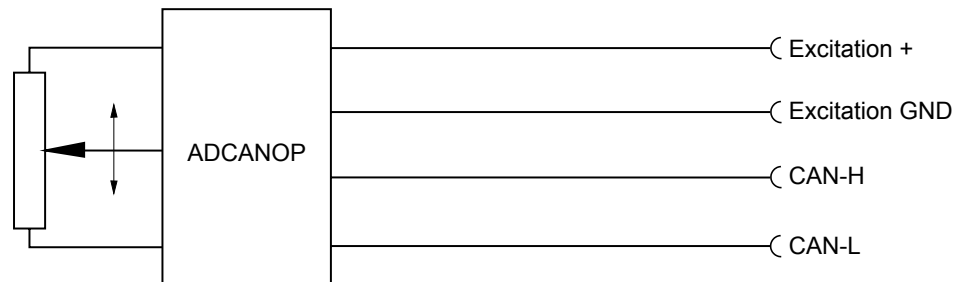
# POSIWIRE® ADCANOP CANopen output for WS Position Sensors



Interface ADCANOP 	Communication profile	CANopen CiA 301 V 4.02, Slave
	Encoder profile	Encoder CiA 406 V 3.2
	Error Control	Node Guarding, Heartbeat, Emergency Message
	Node ID	Adjustable via LSS
	PDO	3 TxPDO, 0 RxPDO, no linking, static mapping
	PDO Modes	Event-/Time triggered, Remote-request, Sync cyclic/acyclic
	SDO	1 server, 0 client
	CAM	2 cams
	Certified	Yes
	Transmission rates	50 kBaud to 1 MBaud, adjustable via LSS
	Nodes	127 max.
	Bus connection	M12 connector, 5 pins
	Integrated bus terminating resistor	No
Bus, galvanic isolated	No	

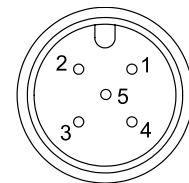
Specifications	Excitation voltage	18 ... 36 V DC
	Excitation current	Max. 100 mA
	Resolution	16 bit f. s.
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-40 ... +85 °C
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
	Environment - EMC Automation	EN 61326:2004

## Signal diagram

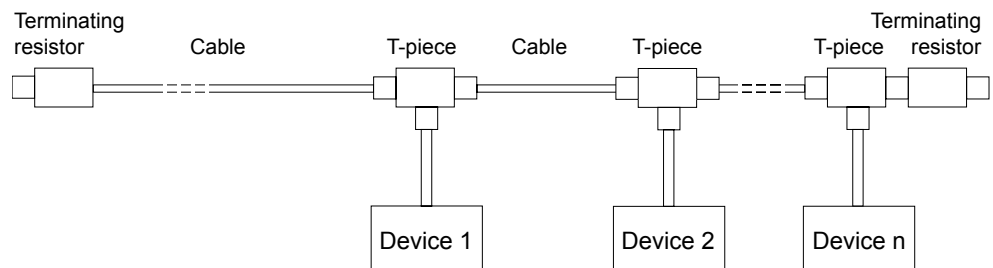


Signal wiring / connection	Signal name	Connector pin
	Shield	1
	Excitation +	2
	GND	3
	CAN-H	4
	CAN-L	5

View to sensor connector



## CAN bus wiring



# Output Specification

## ADSI16 for WS position sensors



- Resolution 16 bit, data transmission synchronous serial/SSI
- Optional available with 12 bit (ADSI) or 14 bit (ADSI14) resolution
- No loss of data at power-down
- Easy to connect to PLC's with SSI input circuit

### Description

The sensing device of the ADSI is a precision potentiometer. The position information is given by an analog/digital converter output serialized as a data word. Data transmission takes place by means of the signals CLOCK and DATA. The processing unit (PLC, Micro-computer) sends pulse sequences which clock the data transmission with the required transfer rate. With the first falling edge of a pulse sequence the position of the sensor is recorded and stored. The following rising edges control the bit-by-bit A/D conversion, encoding and output of the data word. After a delay time the next new position information will be transmitted.

### Data Format

(Train of 26 Pulses)



### Signal Conditioner

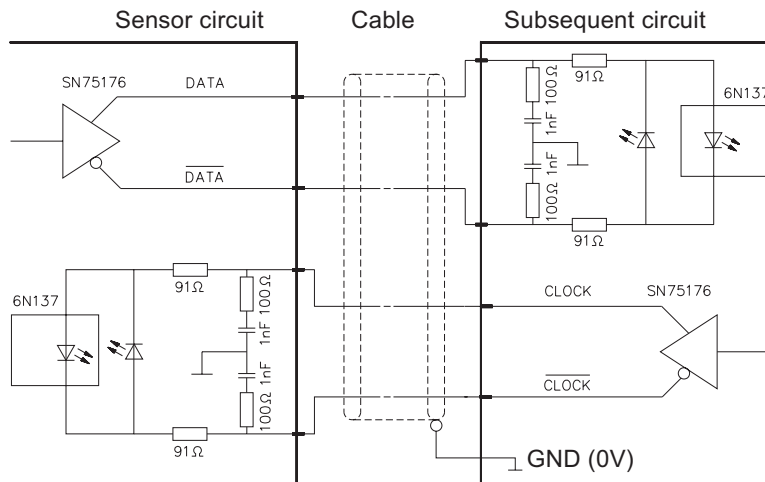
#### ADSI

A/D converted synchronous serial



Output	EIA RS-422, RS-485, short-circuit proof
Excitation voltage	11 ... 27 VDC
Excitation current	200 mA max.
Clock frequency	70 ... 500 kHz
Code	Gray code, continuous progression
Delay between pulse trains	T=30 μs min.
Resolution	16 bit (65536 counts) full scale; optional 12 bit or 14 bit
Stability (temperature)	±50 x 10 <sup>-6</sup> / °C full scale
Operation temperature	-20 ... +85 °C
EMC	According to EN 61326:2004

### Recommended Processing Input Circuit



### Transmission rate

Cable length	Baud rate
< 50 m	< 300 kHz
< 100 m	< 100 kHz

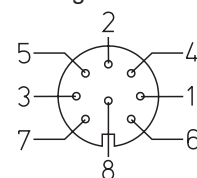
### Note:

Extension of the cable length will reduce the maximum transmission rate. The signals CLOCK/CLOCK and DATA/DATA must be connected in a twisted pair cable, shielded per pair and common.

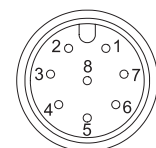
### Signal Wiring

Signal names	Connector pin no.
Excitation +	1
Excitation GND (0V)	2
CLOCK	3
CLOCK	4
DATA	5
DATA	6
Screen	not connected

Mating connector: view to solder terminals



CONN-DIN-8F-W



CONN-M12-8F-G