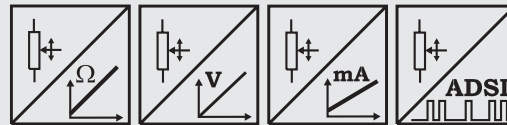


# Model WS17KT with analog or SSI output



## Compact sensor for medium ranges

- Protection class IP64
- Measurement ranges:  
0 ... 1500 mm to 0 ... 15000 mm
- Analog output 0 ... 10 V, 4 ... 20 mA, potentiometer or A/D converted synchronous serial output (SSI)



<b>Specifications</b>	Outputs	Potentiometer: 1 kΩ Voltage: 0...10 V Current: 4...20 mA, 2 or 3 wire Voltage and current output, adjustable A/D converted synchronous serial max. 16 bit (SSI)
	Resolution	Essentially infinite / ADSI16: max. 16 bit full scale
	Material	Aluminium and stainless steel Cable: stainless steel
	Sensing Device	Precision potentiometer
	Connector	Male socket 8 pin (M12 or DIN 45326)
	Linearity	Up to ±0.05 % full scale
	Protection class	IP64
	Weight	See table next page
	Environmental	
	EMC	Refer to output specification
Temperature	Refer to output specification	

**Order Code WS17KT**  
**Analog or SSI**

**Model Name** WS17KT - [ ] - [ ] - [ ] - [ ] - [ ]

**Measurement Range (in mm)**  
1500 / 2000 / 2500 / 3000 / 4000 / 5000 / 6250 / 10000 / 12500 / 15000

**Outputs** (see pages 57 ff.)

R1K = Potentiometer 1 kΩ (other values on request)  
10V = with 0 ... 10 V signal conditioner  
420A = with 4 ... 20 mA signal conditioner (2 wire)  
420T = with 4 ... 20 mA signal conditioner (3 wire)  
PMU = with 0...10 V/4 ... 20 mA signal conditioner, adjustable  
ADSI = with A/D converted synchronous serial output 16 bit (option: 12, 14 bit)

**Linearity**  
L10 = ±0.10 %    option:    L05 = ±0,05 %    L25 = ±0.25 %

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

**Connection**  
M12 = 8 pin socket M12  
D8 = 8 pin socket DIN 45326

**Order Code Mating Connector** (see accessories p. 82) D8: **CONN-DIN-8F-W** M12: **CONN-M12-8F-G**

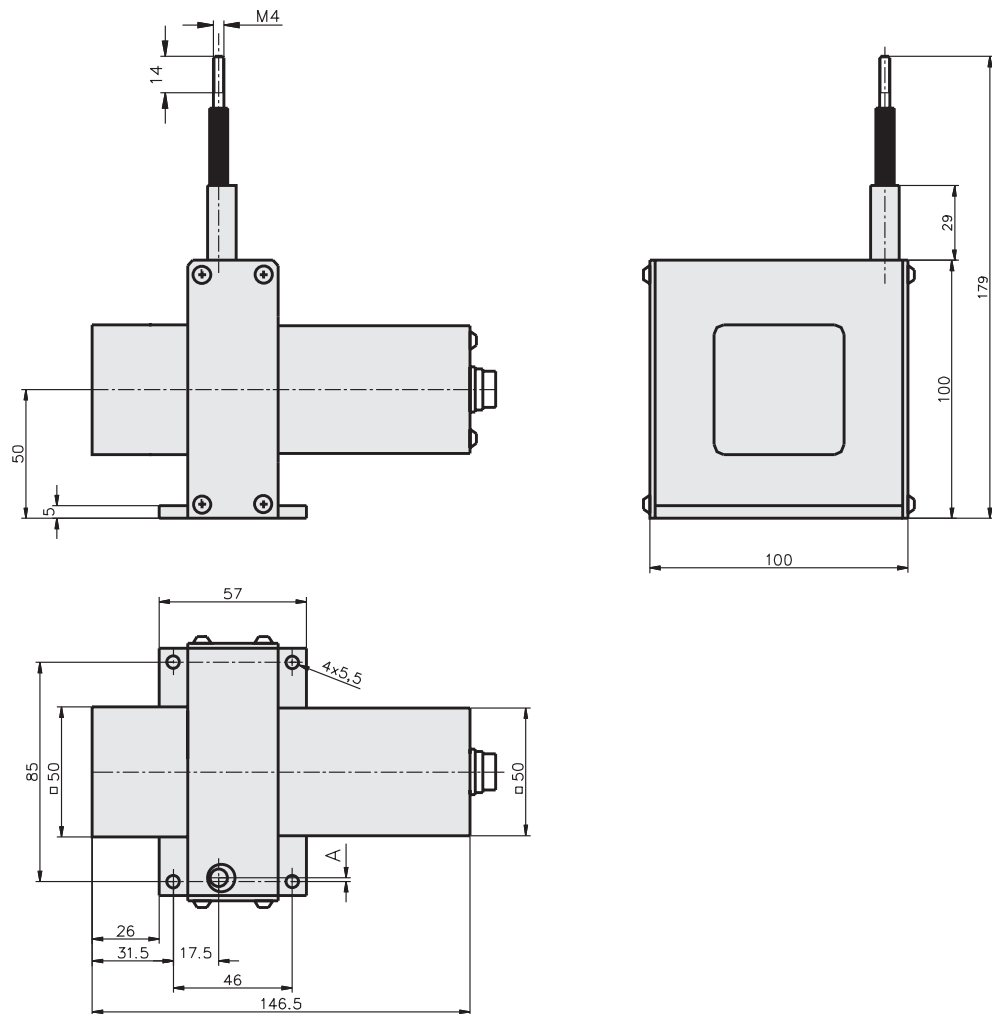
**Order Example: WS17KT - 2500 - 10V - L10 - M4 - M12**

# Model WS17KT with analog or SSI output



Cable Forces and Weights typical at 20 °C	Range [mm]	Weight (approx.) [kg]	Maximum pull-out force [N]	Minimum pull-in force [N]
	1500	1.4	11.0	6.2
	2000	1.4	8.5	4.8
	2500	1.5	5.5	3.5
	3000	2.9	14.5	10.3
	4000	2.9	12.7	9.1
	5000	5.3	13.0	9.3
	6250	5.5	10.2	7.3
	10000	6.0	16.5	9.1
	12500	6.0	16.5	9.1
	15000	6.0	16.5	9.1

## Outline drawing WS17KT-1500 / 2000 / 2500



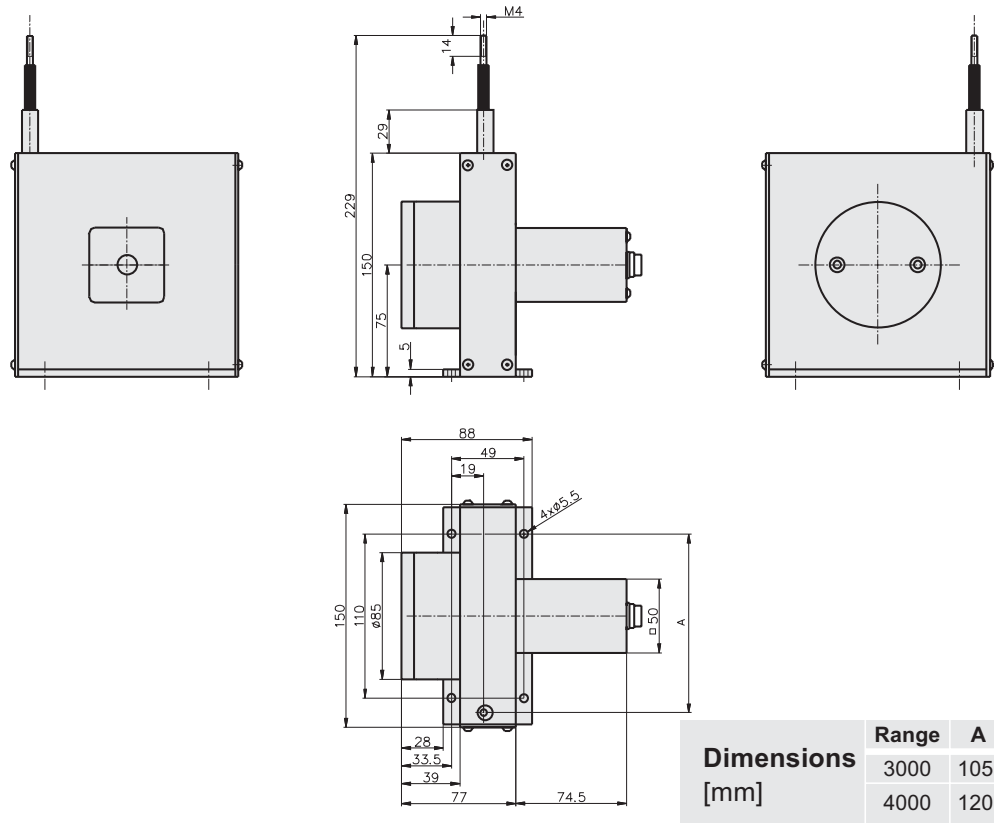
Dimensions informative only.  
For guaranteed dimensions consult factory

Dimensions (mm)	Range	A
	1500	17.5
	2000	9.5
	2500	2.5

# Model WS17KT with analog or SSI output

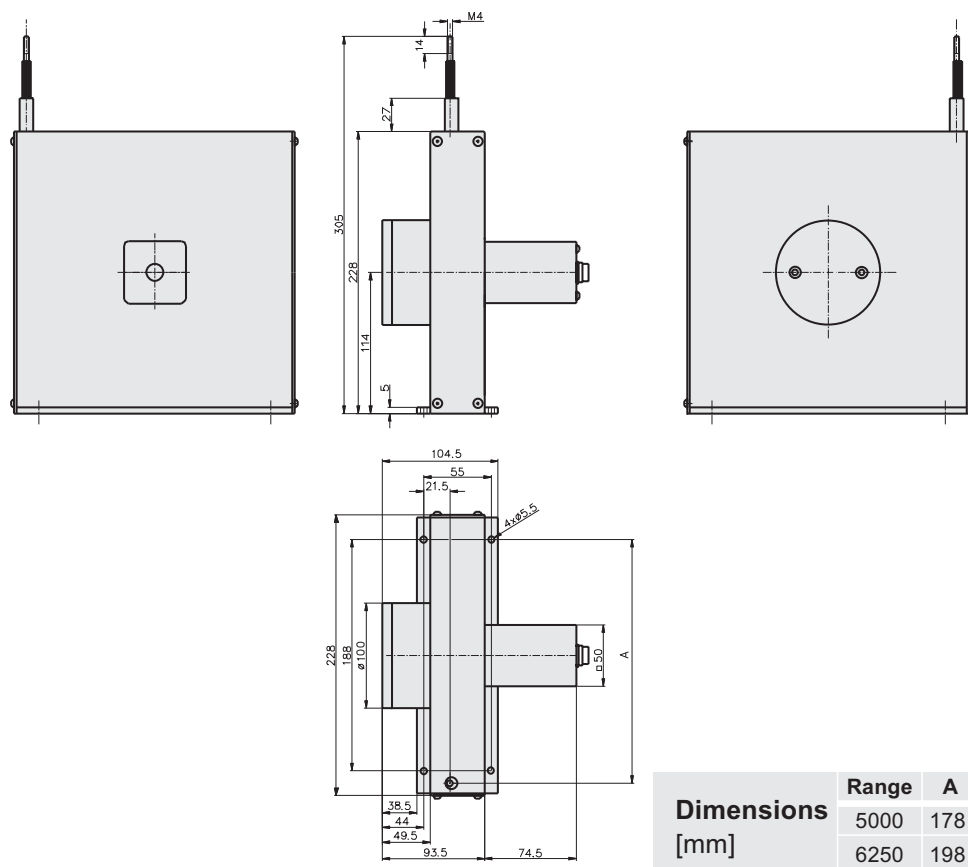


**Outline drawing**  
WS17KT-3000 / 4000



Dimensions informative only.  
For guaranteed dimensions consult factory

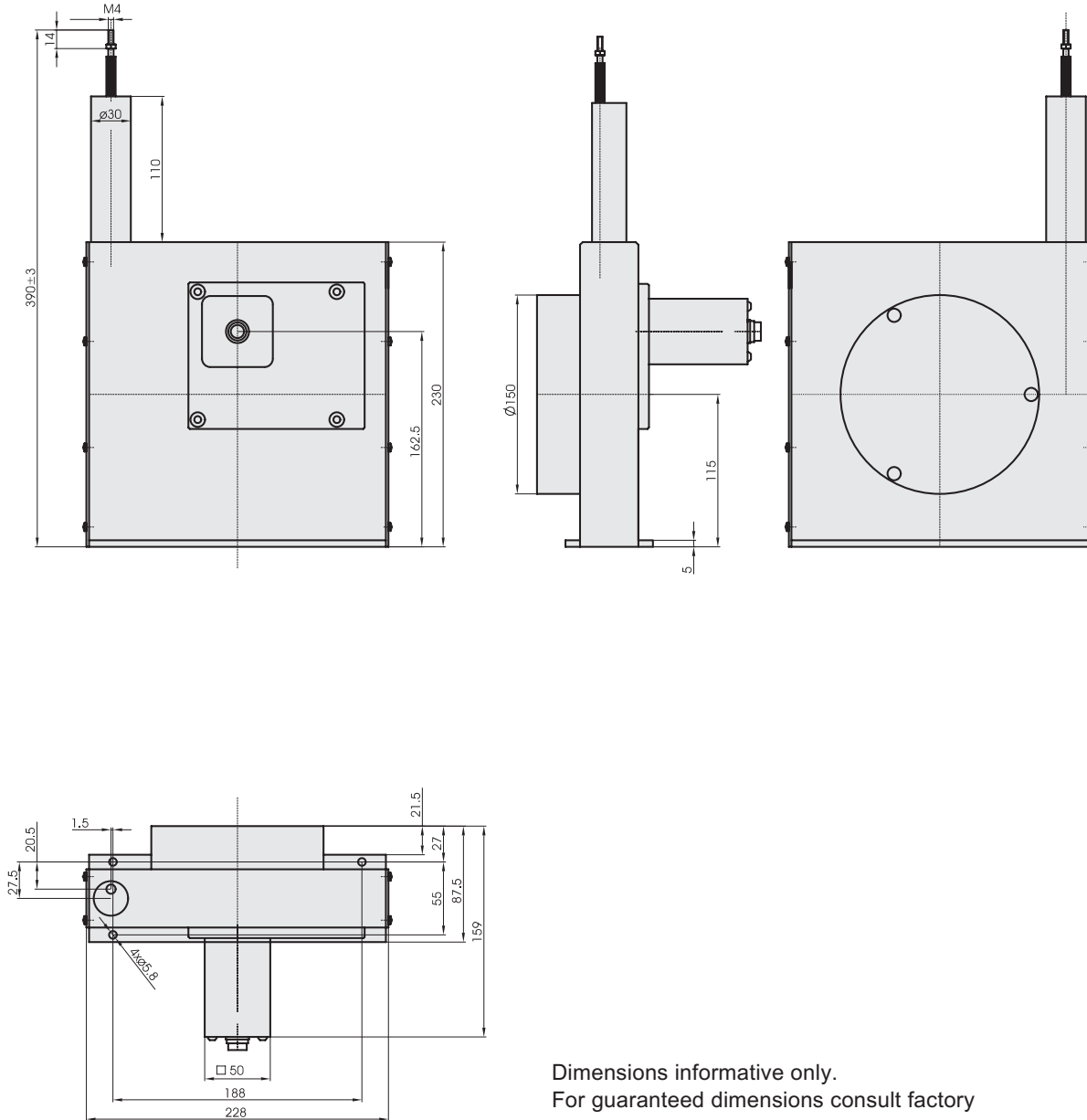
**Outline drawing**  
WS17KT-5000 / 6250



# Model WS17KT with analog or SSI output



**Outline drawing**  
WS17KT-10000 /  
12500 / 15000



Dimensions informative only.  
For guaranteed dimensions consult factory

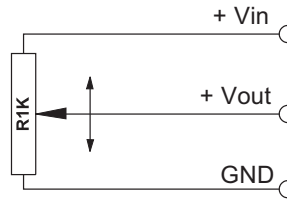
# Output Specifications

## R1K and 10V for WS position sensors

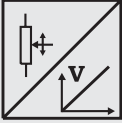


<b>Voltage divider R1K</b> Potentiometer 	Excitation Voltage	32 VDC max. at 1 k $\Omega$ (input power 1 W max.)
	Potentiometer Impedance	1 k $\Omega$ $\pm$ 10%
	Thermal coefficient	$\pm$ 25 x 10 <sup>-6</sup> / °C full scale
	Sensitivity	Depends on measurement range, individual sensitivity of sensor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

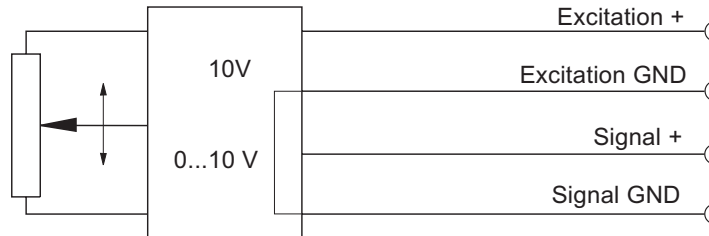
### Signal diagram



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

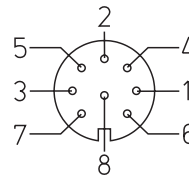


Signal Wiring	Output signals		Cable color	Connector pin no.
	R1K	10V		
	+ Vin	Excitation +	White	1
	GND	Excitation GND	Brown	2
	+ Vout	Signal +	Green	3
		Signal GND	Yellow	4

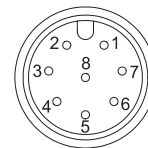
### Connection

#### Mating Connector

View to solder terminals



CONN-DIN-8F-W

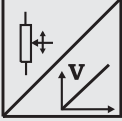


CONN-M12-8F-G

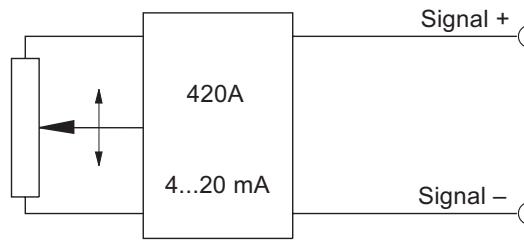
# Output Specifications

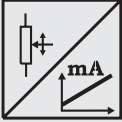
## 420A and 420T for WS position sensors



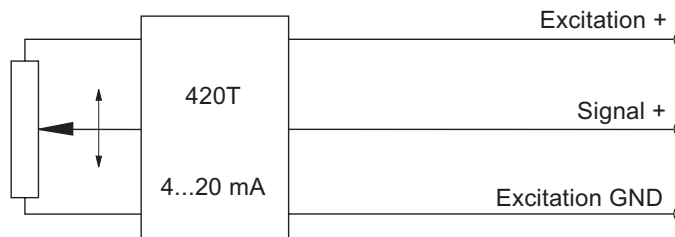
<b>Signal conditioner</b> <b>420A</b> Current output (2 wire) 	Excitation Voltage	+12 ... 27 VDC non stabilized, measured at the sensor terminals
	Excitation Current	35 mA max.
	Output Current	4 ... 20 mA equivalent to 0 ... 100% range
	Stability (Temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$ 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

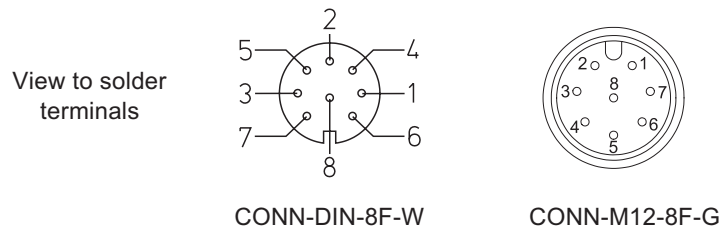
### Signal diagram



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

### Connection

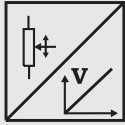
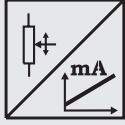
Mating Connector



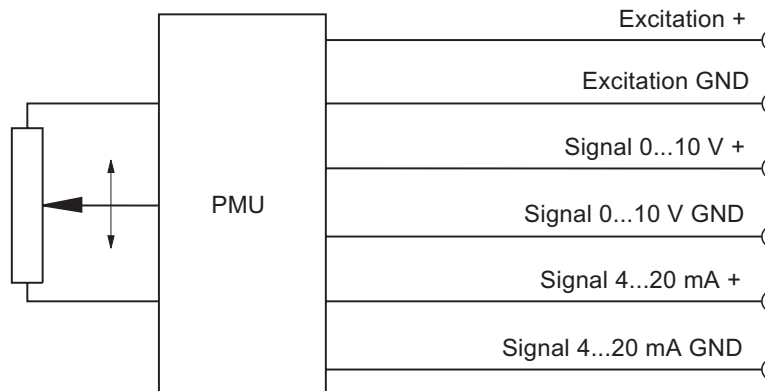
# Output Specification

## PMU for WS position sensors



<b>Signal Conditioner PMU, adjustable</b> Voltage output and current output (3 wire)    	Excitation voltage	+18 ... 27 V DC
	Excitation current	50 mA max.
	Voltage output	0 ... 10 V
	Output current	10 mA max.
	Output load	1 kΩ min.
	Current output	4 ... 20 mA (3 wire)
	Load resistor	500 Ω max.
	Adjustment	
	Activation of offset and gain adjust	Connect with excitation GND (0 V)
	Scalable range	90 % max. full scale
	Stability (Temperature)	$\pm 50 \times 10^{-6}$ / °C full scale
	Protection	Reverse polarity, short circuit
	Output noise	1 mV <sub>eff</sub>
Operating temperature	-20 ... +85 °C	
EMC	According to EN 61326:2004	

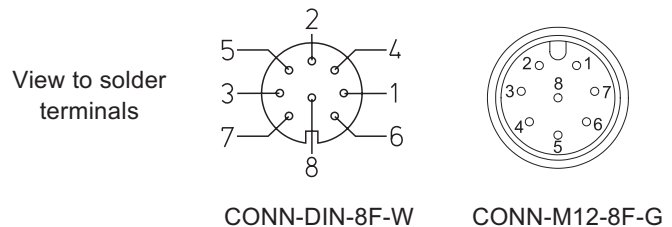
### Signal diagram



Signal wiring	Output signals	Connector pin no.
	Excitation +	1
	Excitation GND	2
	Signal 0...10 V +	3
	Signal 0...10 V GND	4
	Signal 4...20 mA +	5
	Signal 4...20 mA GND	6
	Offset	7
	Gain	8

### Connection

Mating Connector



# Output Specification

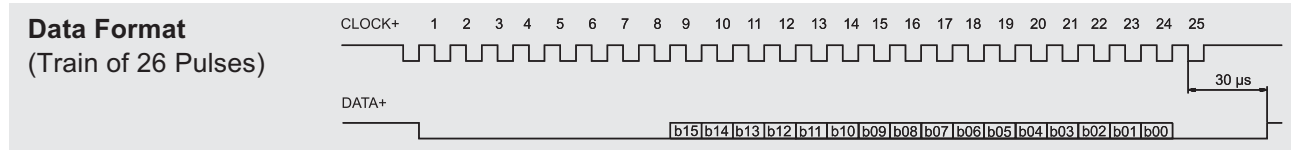
## ADSI16 for WS position sensors




- 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

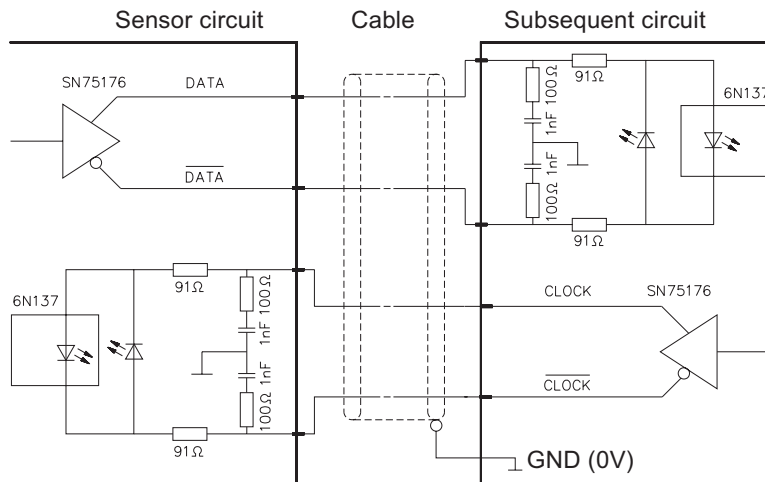
### Description

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.



<b>Signal Conditioner</b> <b>ADSI</b> 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



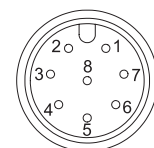
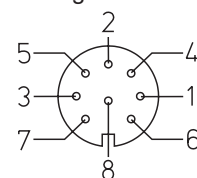
<b>Transmission rate</b>	<b>Cable length</b>	<b>Baud rate</b>
	< 50 m	< 300 kHz
	< 100 m	< 100 kHz

### 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.

<b>Signal Wiring</b>	<b>Signal names</b>	<b>Connector pin no.</b>
	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