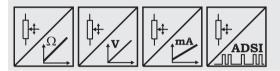




### **Compact sensor for medium ranges**

- 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)



0	Outputs	Potentiometer: 1 k $\Omega$
Specifications		Voltage: 010 V
		Current: 420 mA, 2 or 3 wire
		Voltage and current output, adjustable
		A/D converted synchronous serial max. 16 bit (SSI)
	Resolution	Essentially inifinite / ADSI16: max. 16 bit full scale
	***************************************	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	WS17KT		
Analog or SSI	Model Name		
	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 010 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		

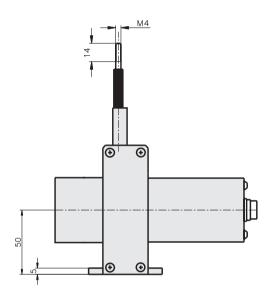
Order Code Mating Connector (see accessories p. 82) D8: CONN-DIN-8F-W M12: CONN-M12-8F-G

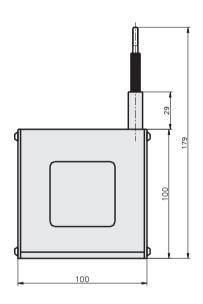
Order Example: WS17KT - 2500 - 10V - L10 - M4 - M12

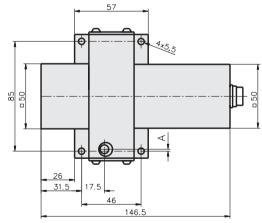


Cable Forces and	Range [mm]	Weight (approx.) [kg]	Maximum pull-out force [N]	Minimum pull-in force [N]
Weights	1500	1.4	11.0	6.2
typical at 20 °C	2000	1.4	8.5	4.8
3, p. 10.11. 2.1	2500	1.5	5.5	3.5
	3000	2.9	14.5	10.3
	4000	2.9	12.7	9.1
	5000	5.3	13.0	9.3
	6250	5.5	10.2	7.3
	10000	6.0	16.5	9.1
	12500	6.0	16.5	9.1
	15000	6.0	16.5	9.1

### Outline drawing WS17KT-1500 / 2000 / 2500



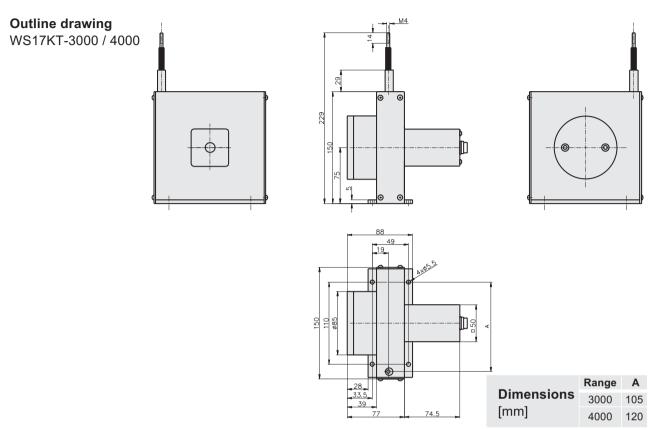




Dimensions informative only.
For guaranteed dimensions consult factory

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

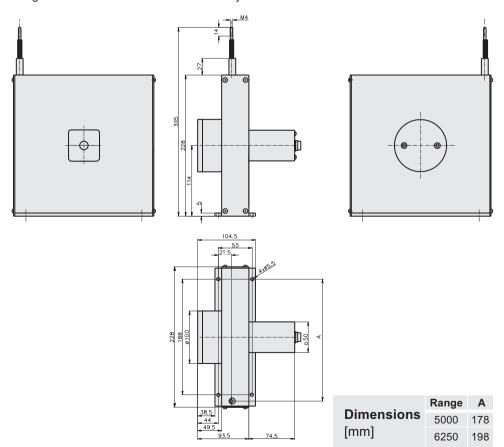




Dimensions informative only.
For guaranteed dimensions consult factory

### Outline drawing WS17KT-5000 / 6250

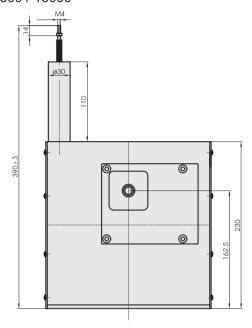
18

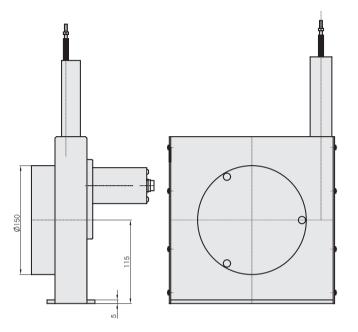


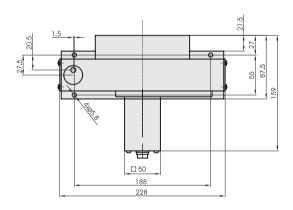


### **Outline drawing**

WS17KT-10000 / 12500 / 15000







Dimensions informative only.
For guaranteed dimensions consult factory

## Output Specifications R1K and 10V for WS position sensors

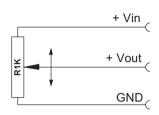


## Voltage divider R1K Potentiometer



Excitation Voltage	32 VDC max. at 1 k $\Omega$ (input power 1 W max.)
Potentiometer Impedance	1 kΩ ±10%
Thermal coefficient	±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



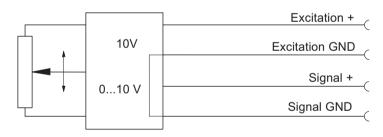
Note: The potentiometer must be connected as a voltage divider. The input impedance of the following processing circuit should be 10  $\mbox{M}\Omega$  min.

### Signal conditioner 10V 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 kΩ
Stability (Temperature)	±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

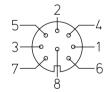


Signal Wiring	Output signals R1K	10V	Cable color	Connector pin no.
	+ Vin	Excitation +	White	1
	GND	Excitation GND	Brown	2
	+ Vout	Signal +	Green	3
		Signal GND	Yellow	4

### Connection

Mating Connector

View to solder terminals



CONN-DIN-8F-W



CONN-M12-8F-G

## Output Specifications 420A and 420T for WS position sensors



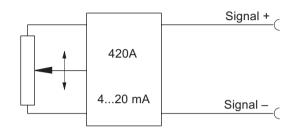
## Signal conditioner 420A

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)	±100 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**



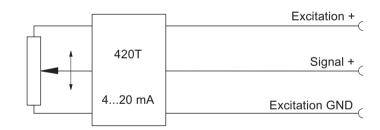
## Signal Conditioner 420T

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)	±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

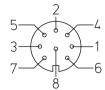


Signal Wiring	Output signals 420A	420T	Cable color	Connector pin no.
	Signal +	Excitation +	White	1
	Signal -	Excitation GND	Brown	2
		Signal +	Green	3

### Connection

**Mating Connector** 

View to solder terminals



CONN-DIN-8F-W

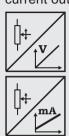


CONN-M12-8F-G

# Output Specification PMU for WS position sensors

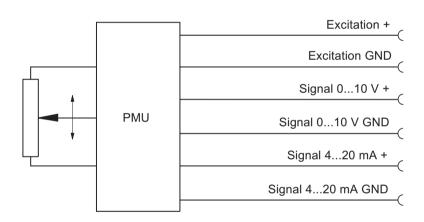


Signal Conditioner PMU, adjustable Voltage output and current output (3 wire)



Excitation voltage	+18 27 V DC
Excitation current	50 mA max.
Voltage output	0 10 V
Output current	10 mA max.
Output load	1 k $\Omega$ 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)	±50 x 10 <sup>-6</sup> / °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 010 V +	3
	Signal 010 V GND	4
	Signal 420 mA +	5
	Signal 420 mA GND	6
	Offset	7
	Gain	8

### Connection

Mating Connector

View to solder terminals



CONN-DIN-8F-W



CONN-M12-8F-G

### **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, Microcomputer) 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)



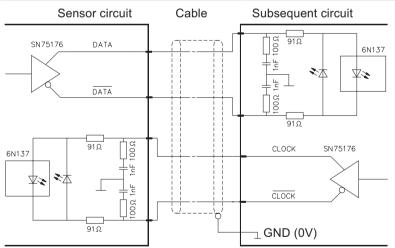
### **Signal Conditioner ADSI**

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
--------------	------

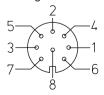
Cable length	Baud rate
< 50 m	< 300 kHz
< 100 m	< 100 kHz

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

#### 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.

Mating connector: view to solder terminals





CONN-DIN-8F-W

CONN-M12-8F-G