



perfect in sensors.



**POSIWIRE®**

**Cable Actuated  
Position Sensors WS**



# WS® Position Sensors

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# The Company and the Products



ASM is a leading company in the development and production of linear and angular position sensors. ASM sensors are used in industrial and commercial applications, where angle, inclination, displacement or position measurements are used to automate, test or monitor processes.

## Innovative Technologies that solve your Measuring Requirements

Our product range consists of various technologies to measure linear and rotative positions. With over 30 years of experience in the position sensor market, ASM offers innovative solutions for the most demanding applications.

## ASM Products Represent Quality and Reliability

The quality and precision of our products ensures consistent productivity. Our continuous research and development in our laboratories as well as our DIN EN 9001:2000 certified quality management system guarantee these high standards.

## ASM – Global Supplier of Position Sensors

ASM products are sold world-wide through sales offices, subsidiaries and a network of 50 distributors. With this global presence we ensure being close to our customers and provide quick product availability wherever ASM sensors are needed.

## The product range







- **POSIWIRE®** WS - Cable Actuated Position Sensors
- **POSITAPE®** WB - Tape Actuated Position Sensors
- **POSICHRON®** Magnetostrictive Position Sensors
- **POSIMAG®** Magnetic Scale Position Sensors
- **POSIROT®** Magnetic Angle Encoders
- **POSITILT®** Magnetic Inclinemeters
- **PRODIS®** Digital Process Meters



# POSIWIRE®

## Selection Guide for WS® Position Sensors


### Measure-by-wire







Model									
	WS31(C) / WS42(C)		WS10SG		WS10ZG / WS10		WS17KT	WS58C	WS19KT
Data sheet at page...	50/52	54/56	6	8	10/14	12/16	18	22	26
Sensing device	P	E	P	E	P	E	P	E	E
Measurement range 0 to ... [mm]									
100			●		●				
125			●		●				
250	●								
375			●		●				
500	●	●	●		●				
750	●		●		●				
1000		●	●		●				
1250			●	●	●	●			
1500							●		
2000							●		●
2500							●	●	
3000							●		●
3500									
4000							●		
5000							●		●
6000									
6250							●		
7500									
8000									●
10000							●		
12500							●		
15000							●		●
20000									
25000									
30000									
40000									
60000									
<b>Analog outputs, absolute</b>									
Potentiometer 1 kΩ/10 kΩ	●		●		●		●		
Voltage 0 ... 10 V	● <sup>3)</sup>		●		●		●		
Current 4 ... 20 mA	●		●		●		●		
PMUV/PMUI 0 ... 10 V/4 ... 20 mA			●		●		●		
<b>Incremental outputs</b>									
<b>TTL/HTL/RS422</b>									
Incremental encoder		●		●		●			●
<b>Digital outputs, absolute</b>									
SSI			● <sup>1)</sup>		● <sup>1)</sup>		● <sup>1)</sup>	●	●
Profibus								●	●
CAN / CANopen			● <sup>2)</sup>		● <sup>2)</sup>		● <sup>2)</sup>	●	●
DeviceNet								●	●
Interbus								●	●
<b>Linearity standard</b>	0.35%	0.20%	0.10%	0.05%	0.10%	0.05%	0.10%	0.05%	0.05%
optional	–	–	0.05%	–	0.05%	–	0.05%	0.01%	0.01%
<b>Protection class</b>	IP50		IP65		IP65		IP64 (IP66)	IP50 (IP64)	IP64
<b>Explosion protection</b>									
Dust-Ex proof	–	–	–	–	–	–	–	–	–

WS31C and WS42C also available without housing

Sensing device: P = Potentiometer E = Encoder

● = standard; ○ = optional; – = not available; <sup>1)</sup> = A/D converted SSI output 16 bit (optional 12 or 14 bit)  
<sup>2)</sup> = A/D converted CANopen bus 16 Bit <sup>3)</sup> = 0.5 ... 10 V

 = Instrumentation

     								Model	Selection features
WS7.5		WS60	WS12		WS10EX	WS12EX	WS100M		Data sheet at page...
32	33	36	38	40	42	44	46		Sensing device
P	E	E	P	E	P	P	P		Measurement range 0 to ... [mm]
			●		●	●			100
			●		●	●			125
					●				250
			●		●	●			375
			●		●	●			500
			●		●	●			750
			●		●	●			1000
			●	●	●	●			1250
			●	●		●			1500
			●	●		●	●		2000
			●	●		●			2500
			●	●		●			3000
							●		3500
									4000
									5000
									6000
									6250
							●		7500
									8000
●	●						●		10000
									12500
	●								15000
●	●								20000
	●								25000
●	●								30000
●	●								40000
		●							60000
									<b>Analog outputs, absolute</b>
●			●		●	●	●		Potentiometer 1 kΩ/10 kΩ
●			●		●	●	●		Voltage 0 ... 10 V
●			●		●	●	●		Current 4 ... 20 mA
●			●						PMUV / PMUI 0 ... 10V / 4 ... 20 mA
									<b>Incremental outputs TTL/HTL/RS422</b>
	●	●		●					Incremental encoder
									<b>Digital outputs, absolute</b>
● <sup>1)</sup>	●	●	● <sup>1)</sup>				○		SSI
	●	●					○		Profibus
● <sup>2)</sup>	●	●	● <sup>2)</sup>				○		CAN / CANopen
	●	●					○		DeviceNet
	●	●					○		Interbus
0.10%	0.05%	0.10%	0.10%	0.05%	0.10%	0.10%	0.10%		<b>Linearity standard</b>
0.05%	0.01%	0.025%	0.05%	–	0.05%	0.05%	0.05%		optional
IP52		IP52	IP67		IP65	IP67	IP68/IP69K		<b>Protection class</b>
									<b>Explosion protection</b>
–	–	–	–	–	●	●	–		Dust-Ex proof

  = Industry

  = Heavy Duty

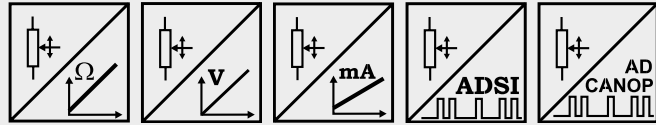
  = Offshore

# POSIWIRE® WS10SG Analog, SSI or CANopen Output



## Very compact sensor for industrial applications

- 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 Voltage or current output, programmable (PMUV/PMUI) 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	Aluminum, stainless steel and plastic; cable: stainless steel
	Protection class	IP65 (with mating connector only)
	Connection	Male 8 pin socket M12 (ADCANOP: 5 pin socket)
	Weight	350 g approx.
	EMC, temperature	Refer to output specification

## Order code WS10

WS10SG - [ ] - [ ] - [ ] - [ ] - [ ]

### 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  
 420T = 4 ... 20 mA signal conditioner  
 PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner  
 ADSI16 = A/D converted synchronous serial interface 16 bit (12 or 14 bit opt.)  
 ADCANOP = A/D converted CANopen bus

### 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 (not for ADCANOP)  
 M12/CAN = 5 pin socket M12 (only for ADCANOP)

Order code connector cable: see page 82/83

Order example: WS10SG - 1250 - 10V - L10 - M4 - M12

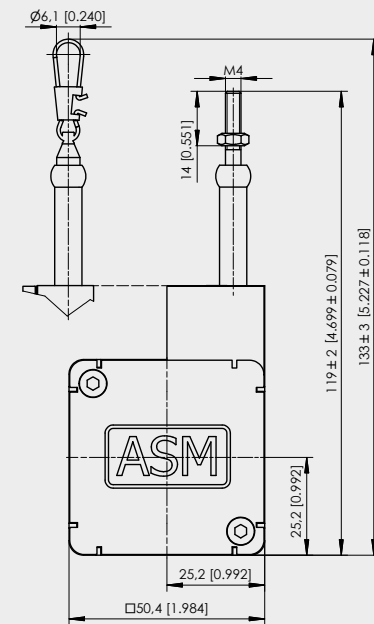
**POSIWIRE®**  
**WS10SG**  
**Analog, SSI or CANopen Output**



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

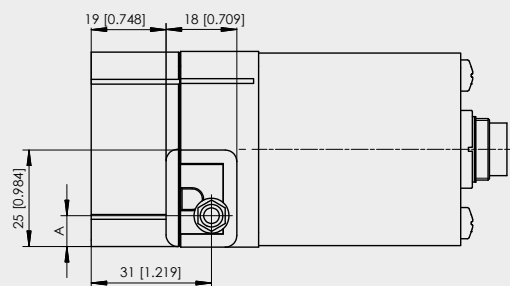
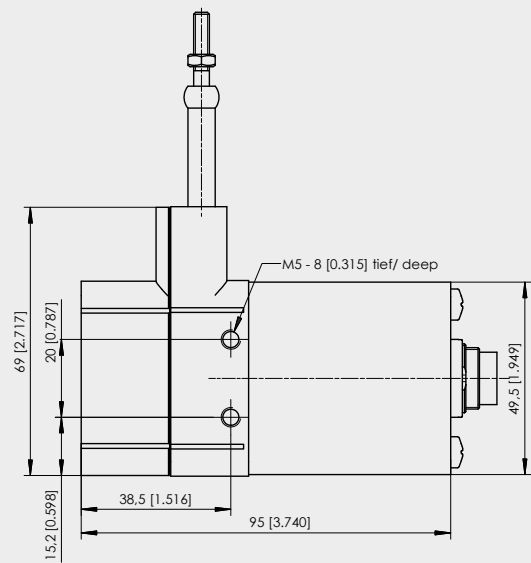
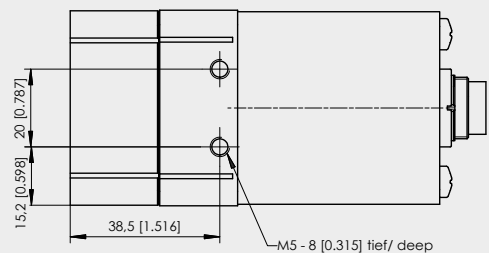
**Outline drawing**

Option SB0



Dimensions in mm [inch]

Dimensions informative only.  
 For guaranteed dimensions  
 consult factory.



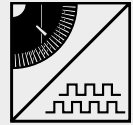
Dimensions in mm	Measurement range	A
	375; 750	12.4
	100; 125; 500; 1000; 1250	8

# POSIWIRE® WS10 Incremental Encoder Output



## Very compact sensor for industrial applications

- Protection class IP65
- Measurement range 0 ... 1250 mm
- Incremental encoder output



Specifications	Outputs	Incremental encoder output with differential push-pull circuit for reliable data transmission. The output is compatible with TTL and HTL.
	Resolution	10 or 25 pulses per mm (1/40 mm or 1/100 mm with external edge counting mode)
	Linearity	±0.05% f.s.
	Sensing device	Incremental encoder
	Material	Aluminum, stainless steel and plastic; cable: stainless steel
	Protection class	IP65 (with mating connector only)
	Connection	Male 8 pin socket M12
	Weight	Approx. 400 g
	EMC, temperature	Refer to output specification

## Order code WS10SG

WS10SG - [ ] - [ ] - [ ] - [ ] - [ ]

### Model name

### Measurement range (in mm)

1250

### Pulses per mm

10 = 10 pulses per mm

25 = 25 pulses per mm

Other numbers of pulses on request

### Output

PP530 = Incremental output 5 ... 30 V

IE41LI = Incremental encoder TTL compatible

IE41HI = Incremental encoder HTL compatible

### Cable fixing

M4 = M4 cable fixing

SB0 = Cable clip

### Connection

M12 = 8 pin socket M12

Order code connector cable: see page 82

Order example: WS10SG - 1250 - 10 - PP530 - M4 - M12

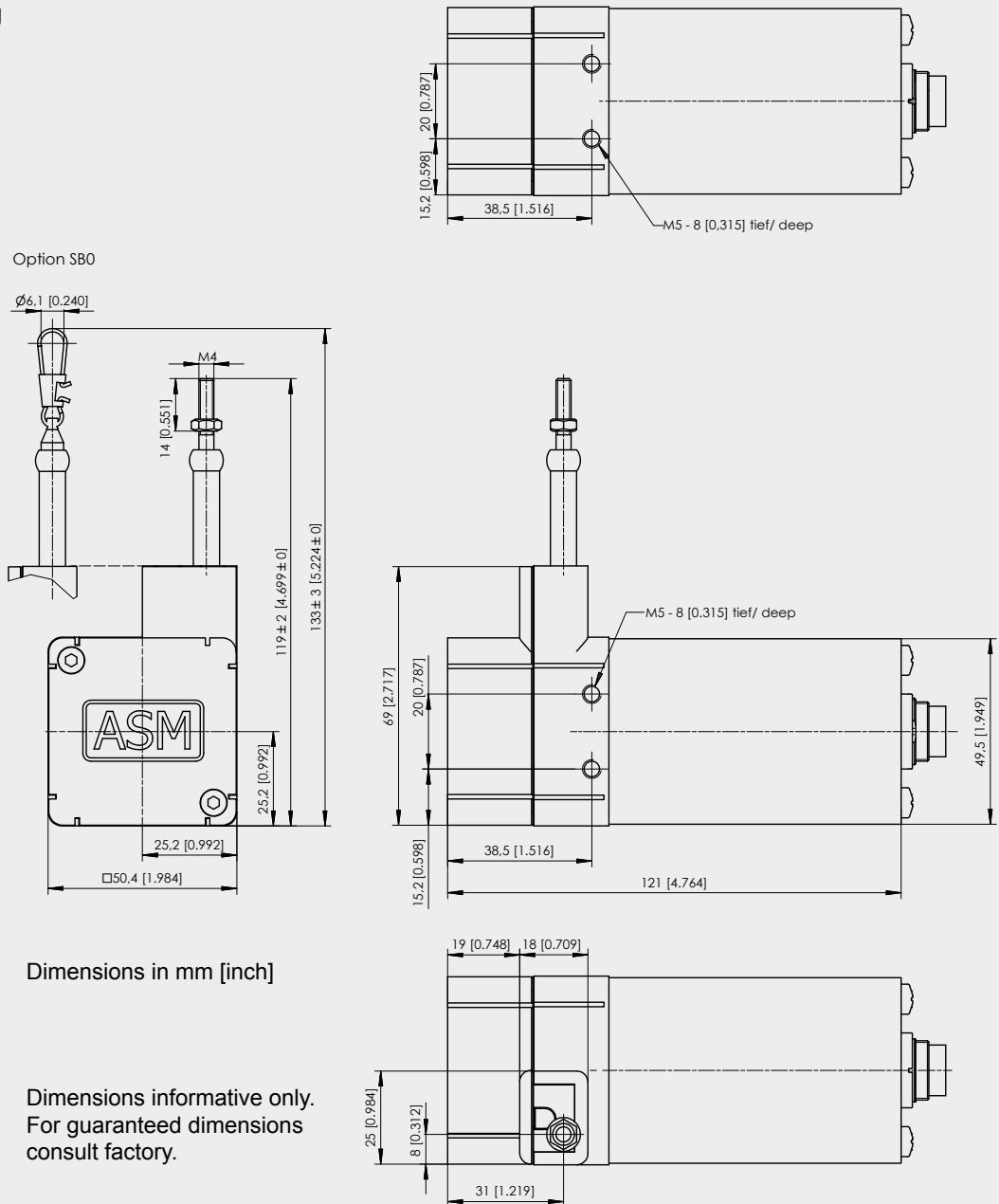


# POSIWIRE® WS10 Incremental Encoder Output



Cable forces, typical at 20 °C	Resolution	Max. pull-out force	Min. pull-in force
	[pulses per mm]	[N]	[N]
	10 / 25	5.8	3.0

## Outline drawing



Dimensions in mm [inch]

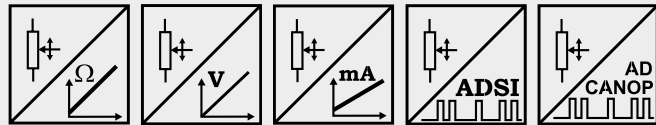
Dimensions informative only.  
For guaranteed dimensions  
consult factory.

**POSIWIRE®**  
**WS10ZG**  
**Analog, SSI or CANopen Output**



**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



<b>Specifications</b>	Outputs	Potentiometer 1 kΩ Voltage 0 ... 10 V Current 4 ... 20 mA, 2 or 3 wire Voltage or current output, programmable (PMUV/PMUI) 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, aluminium and stainless steel; cable: stainless steel
	Protection class	IP65 (with mating connector only)
	Connection	Male 8 pin socket M12 (ADCANOP: 5 pin socket)
	Weight	1.1 kg approx.
EMC, temperature	Refer to output specification	

**Order code 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
- 420T = 4 ... 20 mA signal conditioner
- PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner
- ADSI16 = A/D converted synchronous serial interface 16 bit (12 or 14 bit opt.)
- ADCANOP = A/D converted CANopen bus

**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 (not for ADCANOP)
- M12/CAN = 5 pin socket M12 (for ADCANOP)

**Order code connector cable:** see page 82/83

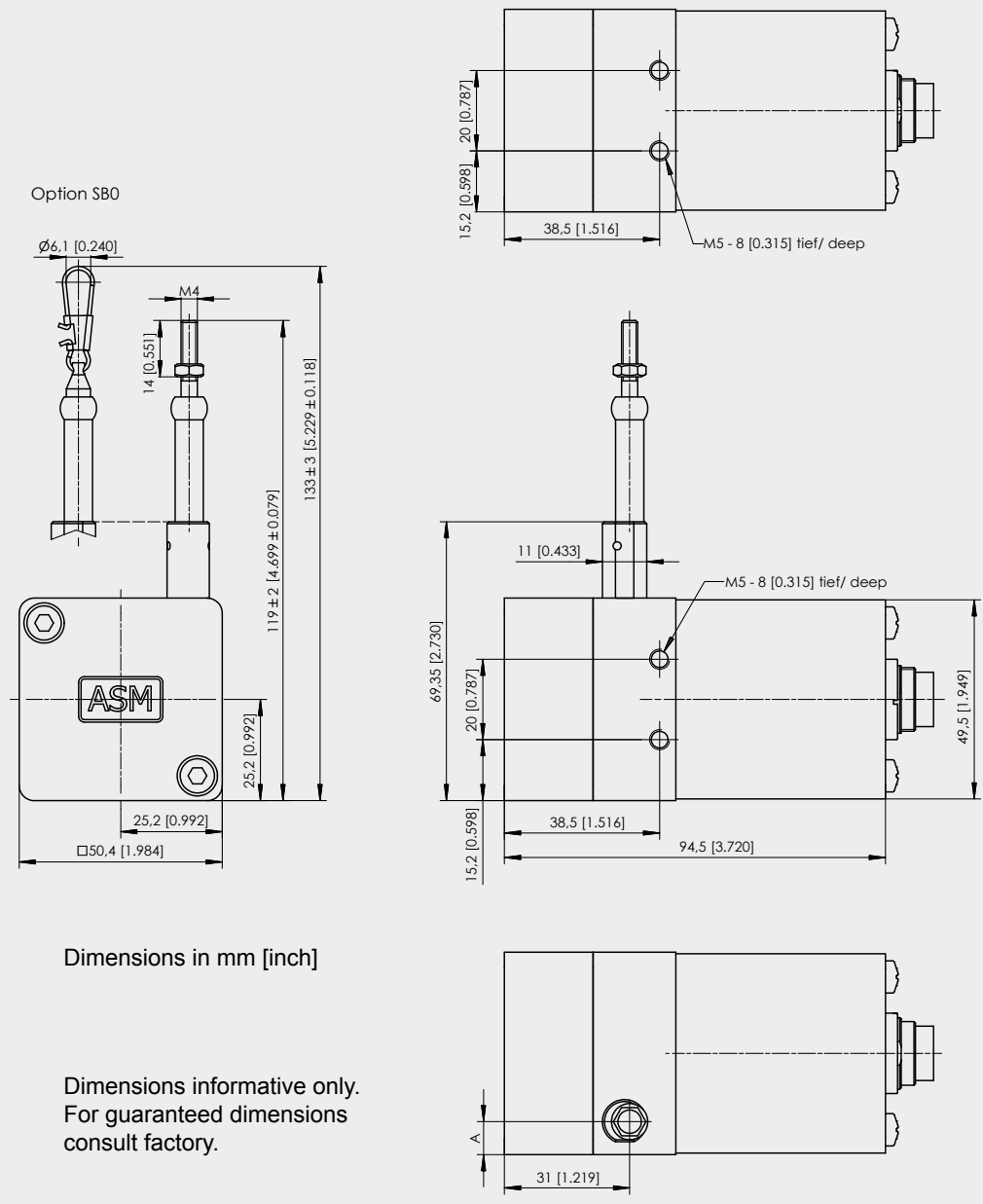
**Order example: WS10ZG - 1250 - 10V - L10 - M4 - M12**

# POSIWIRE® WS10ZG 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



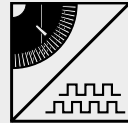
Dimensions in mm	Measurement range	A
	375; 750	12.4
100; 125; 500; 1000; 1250	8	

**POSIWIRE®**  
**WS10ZG**  
**Incremental Encoder Output**



**WS10 in a zinc diecast housing**

- Protection class IP65
- Measurement range 0 ... 1250 mm
- Incremental encoder output



<b>Specifications</b>	Outputs	Incremental encoder output for reliable data transmission. The output is compatible with TTL and HTL.
	Resolution	10 or 25 pulses per mm (1/40 mm or 1/100 mm with external edge counting mode)
	Linearity	±0.05% f.s.
	Sensing device	Incremental encoder
	Material	Zinc diecast, aluminum and stainless steel; measuring cable: stainless steel
	Protection class	IP65 (with mating connector only)
	Connection	Male 8 pin socket M12
	Weight	Approx. 1.1 kg
EMC, temperature	Refer to output specification	

**Order code WS10ZG**



**Model name**

**Measurement range (in mm)**

1250

**Pulses per mm**

10 = 10 pulses per mm

25 = 25 pulses per mm

Other numbers of pulses on request

**Output**

PP530 = Incremental output 5 ... 30 V

IE41LI = Incremental encoder TTL compatible

IE41HI = Incremental encoder HTL compatible

**Cable fixing**

M4 = M4 cable fixing

SB0 = Cable clip

**Connection**

M12 = 8 pin socket M12

Order code connector cable: see page 82

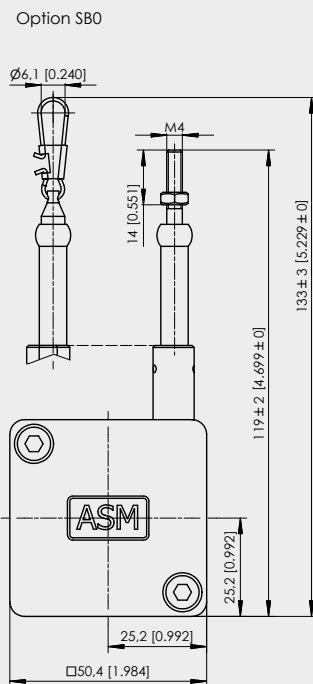
**Order example: WS10ZG - 1250 - 10 - PP530 - M4 - M12**

# POSIWIRE® WS10ZG Incremental Encoder Output



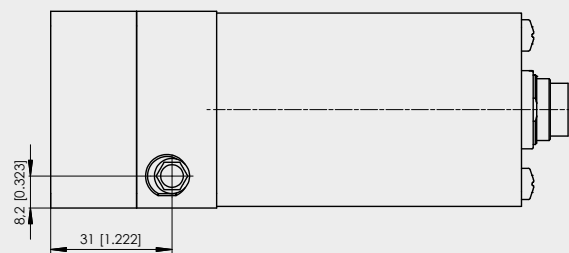
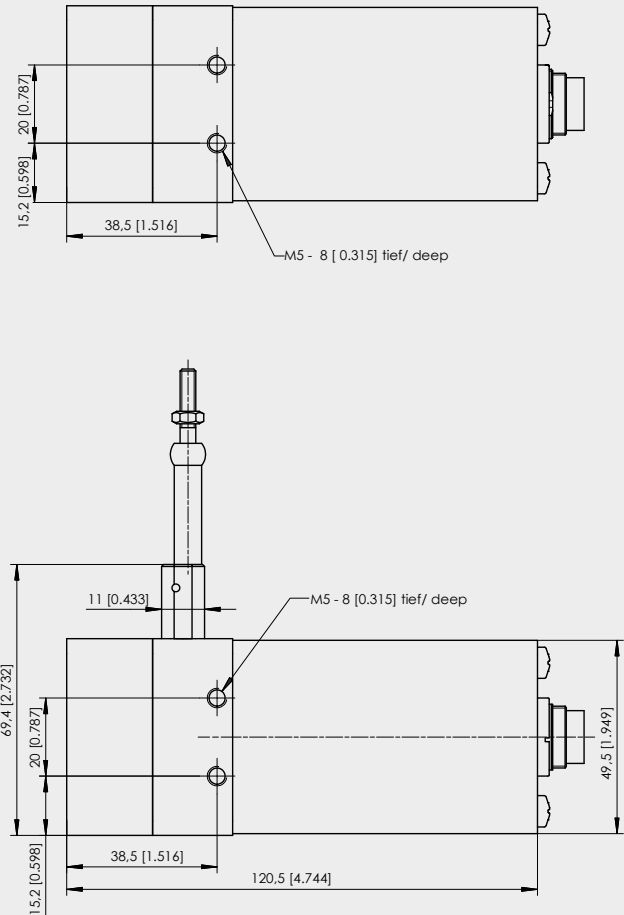
Cable forces, typical at 20 °C	Resolution	Max. pull-out force	Min. pull-in force
	[pulses per mm]	[N]	[N]
	10 / 25	5.8	3.0

## Outline drawing



Dimensions in mm [inch]

Dimensions informative only.  
For guaranteed dimensions  
consult factory.

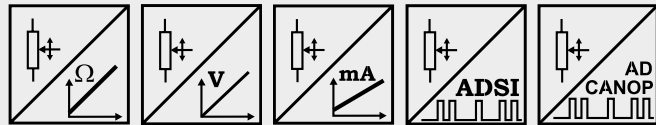


# POSIWIRE® WS10 Analog, SSI or CANopen Output



## Very compact sensor for industrial applications

- 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 Voltage or current output, programmable (PMUV/PMUI) 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	Aluminum and stainless steel; cable: stainless steel
	Protection class	IP65 (with mating connector only)
	Connection	Male 8 pin socket M12 (ADCANOP: 5 pin socket)
	Weight	800 g approx.
	EMC, temperature	Refer to output specification

## Order code WS10

### 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  
 420T = 4 ... 20 mA signal conditioner  
 PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner  
 ADSI16 = A/D converted synchronous serial interface 16 bit (12 or 14 bit opt.)  
 ADCANOP = A/D converted CANopen bus

### 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 (not for ADCANOP)  
 M12/CAN = 5 pin socket M12 (only for ADCANOP)



Order code connector cable: see page 82/83

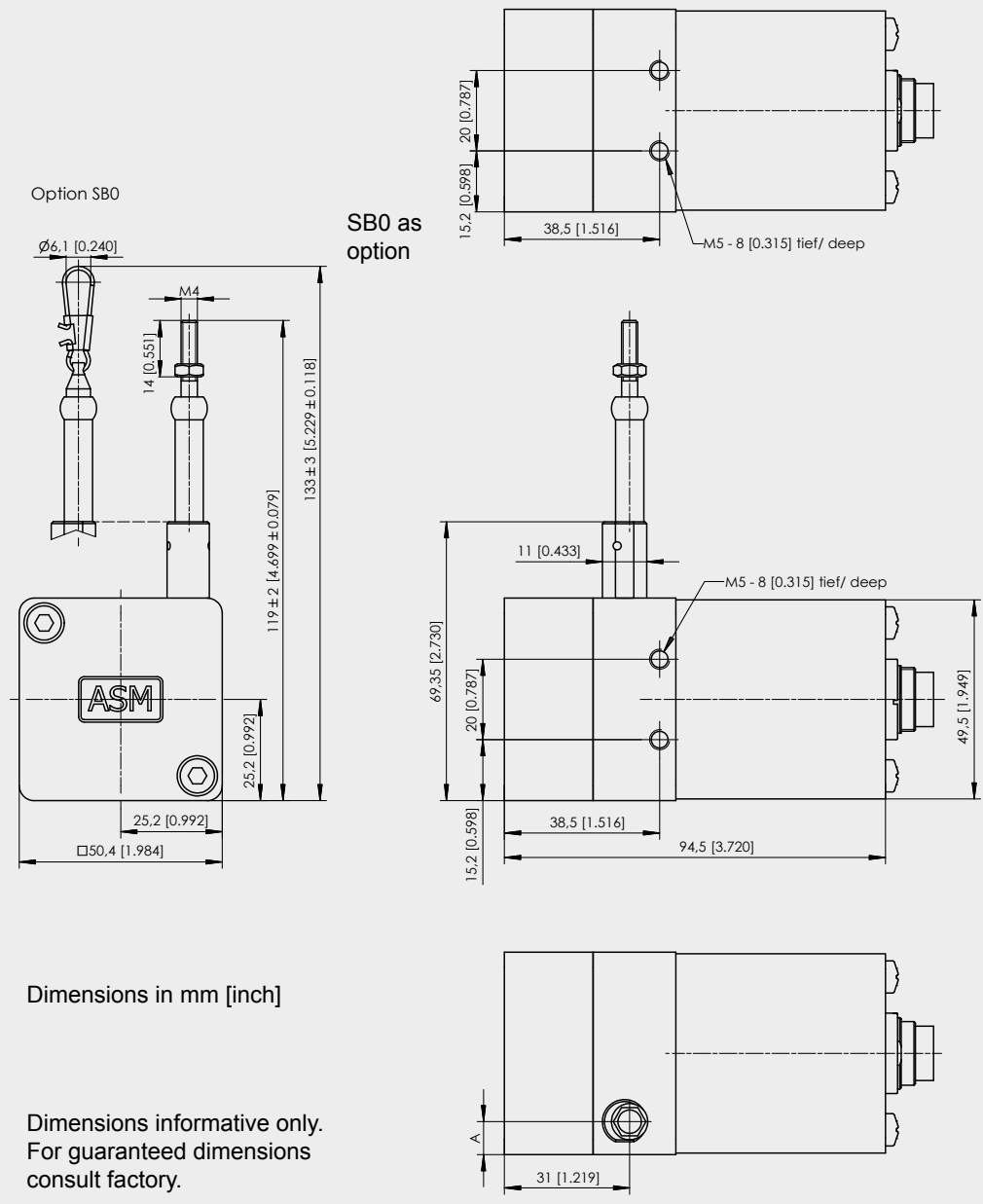
Order example: **WS10 - 1250 - 10V - L10 - M4 - M12**

# POSIWIRE® WS10 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



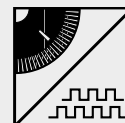
Dimensions in mm	Measurement range	A
	375; 750	12.4
100; 125; 500; 1000; 1250	8	

# POSIWIRE® WS10 Incremental Encoder Output



## Very compact sensor for industrial applications

- Protection class IP65
- Measurement range 0 ... 1250 mm
- Incremental encoder output



Specifications	Outputs	Incremental encoder output reliable data transmission. The output is compatible with TTL and HTL.
	Resolution	10 or 25 pulses per mm (1/40 mm or 1/100 mm with external edge counting mode)
	Linearity	±0.05% f.s.
	Sensing device	Incremental encoder
	Material	Aluminum and stainless steel; cable: stainless steel
	Protection class	IP65 (with mating connector only)
	Connection	Male 8 pin socket M12
	Weight	Approx. 800 g
	EMC, temperature	Refer to output specification

## Order code WS10

WS10 - [ ] - [ ] - [ ] - [ ] - [ ]

### Model name

### Measurement range (in mm)

1250

### Pulses per mm

10 = 10 pulses per mm

25 = 25 pulses per mm

Other numbers of pulses on request

### Output

PP530 = Incremental output 5 ... 30 V

IE41LI = Incremental encoder TTL compatible

IE41HI = Incremental encoder HTL compatible

### Cable fixing

M4 = M4 cable fixing

SB0 = Cable clip

### Connection

M12 = 8 pin socket M12

Order code connector cable: see page 82

Order example: WS10 - 1250 - 10 - PP530 - M4 - M12

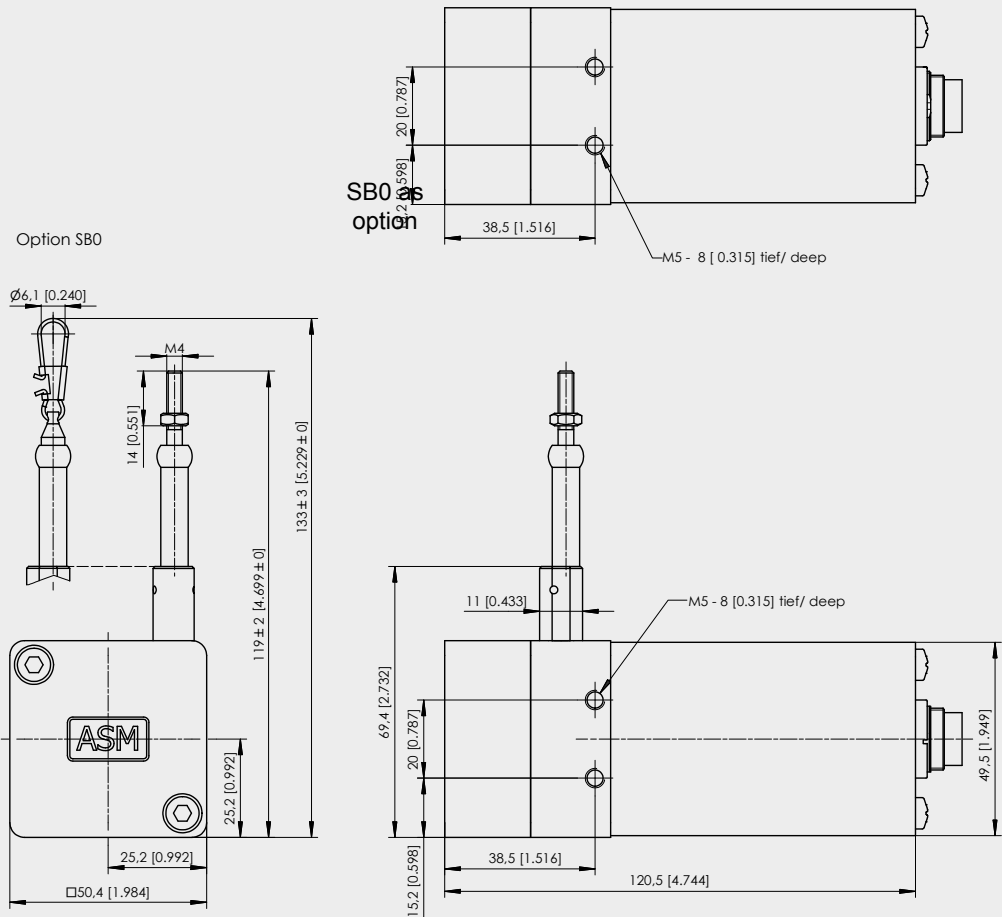


# POSIWIRE® WS10 Incremental Encoder Output



Cable forces, typical at 20 °C	Resolution	Max. pull-out force	Min. pull-in force
	[pulses per mm]	[N]	[N]
	10 / 25	5.8	3.0

## Outline drawing



Dimensions in mm [inch]

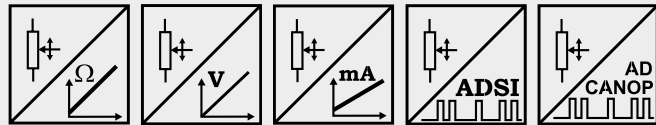
Dimensions informative only.  
For guaranteed dimensions  
consult factory.

**POSIWIRE®**  
**WS17KT**  
**Analog, SSI or CANopen Output**



**Compact sensor for medium ranges**

- Protection class IP64 (as option IP66)
- Measurement range 0 ... 1500 mm to 0 ... 15000 mm
- Analog output or  
A/D converted synchronous serial output (SSI) or  
A/D converted CANopen output



<b>Specifications</b>	Outputs	Potentiometer 1 kΩ Voltage 0 ... 10 V Current 4 ... 20 mA, 2 or 3 wire Voltage or current output, programmable (PMUV/PMUI) 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	Aluminum and stainless steel; cable: stainless steel
	Protection class	IP64 (with mating connector only), IP66 as option
	Connection	Male 8 pin socket M12 (ADCANOP: 5 pin socket)
Weight	See table next page	
EMC, temperature	Refer to output specification	

**Order code WS17KT**



**Model name**

**Measurement range (in mm)**

1500 / 2000 / 2500 / 3000 / 4000 / 5000 / 6250 / 10000 / 12500 / 15000

**Output**

- R1K = Potentiometer 1 kΩ
- 10V = 0 ... 10 V signal conditioner
- 420A = 4 ... 20 mA signal conditioner
- 420T = 4 ... 20 mA signal conditioner
- PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner
- ADSI16 = A/D converted synchronous serial interface 16 bit (12 or 14 bit opt.)
- ADCANOP = A/D converted CANopen bus

**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 (not for ADCANOP)
- M12/CAN = 5 pin socket M12 (only for ADCANOP)

**Order code connector cable:** see page 82/83

**Order example: WS17KT - 2500 - 420T - L10 - M4 - M12**

# POSIWIRE®

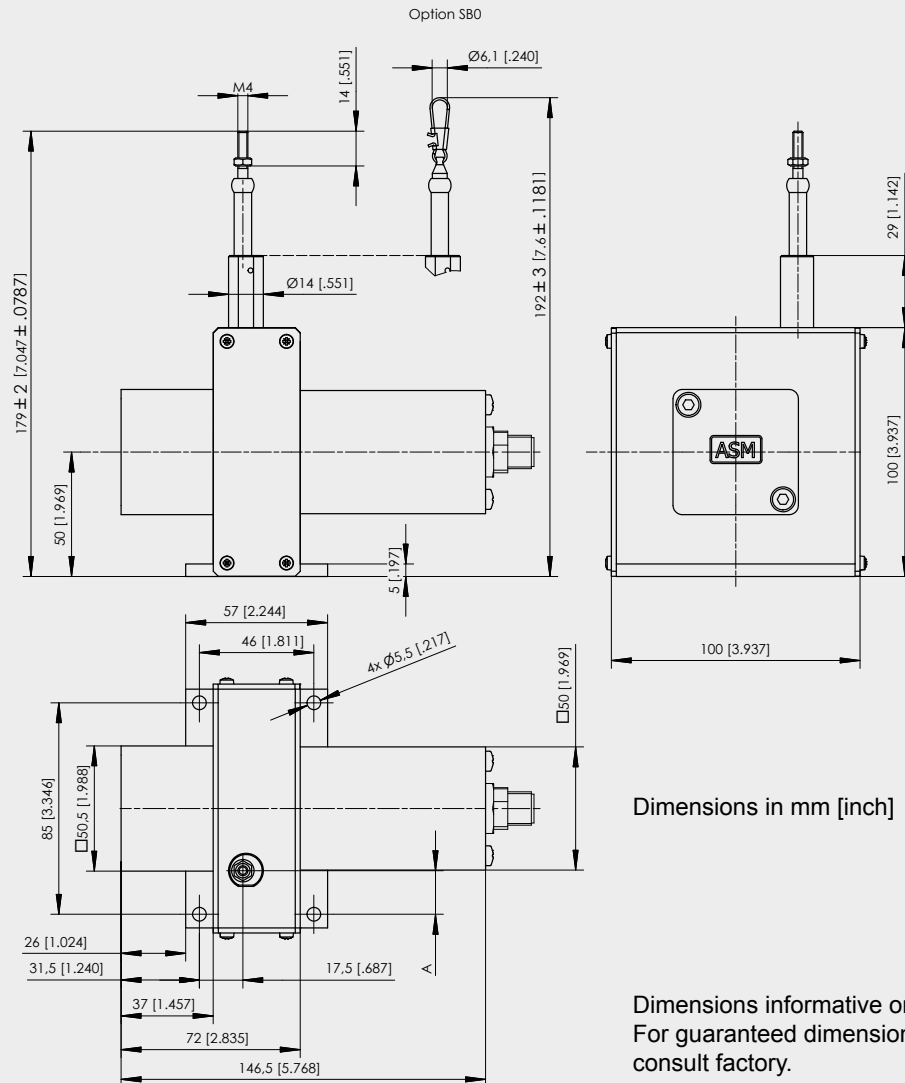
## WS17KT

### Analog, SSI or CANopen output



Cable forces, typical at 20 °C	Measurement range	Weight (approx.)	Max. pull-out force	Min. pull-in force
	[mm]	[kg]	[N]	[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

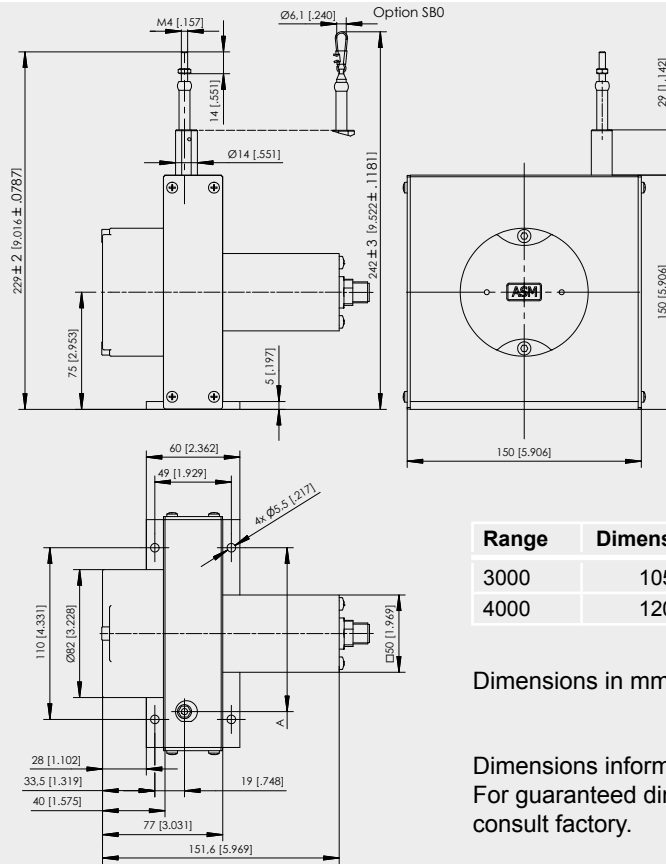


Dimensions in mm	Measurement range	Dimension A
	1500	17.5
2000	9.5	
2500	2.5	

**POSIWIRE®**  
**WS17KT**  
**Analog, SSI or CANopen Output**



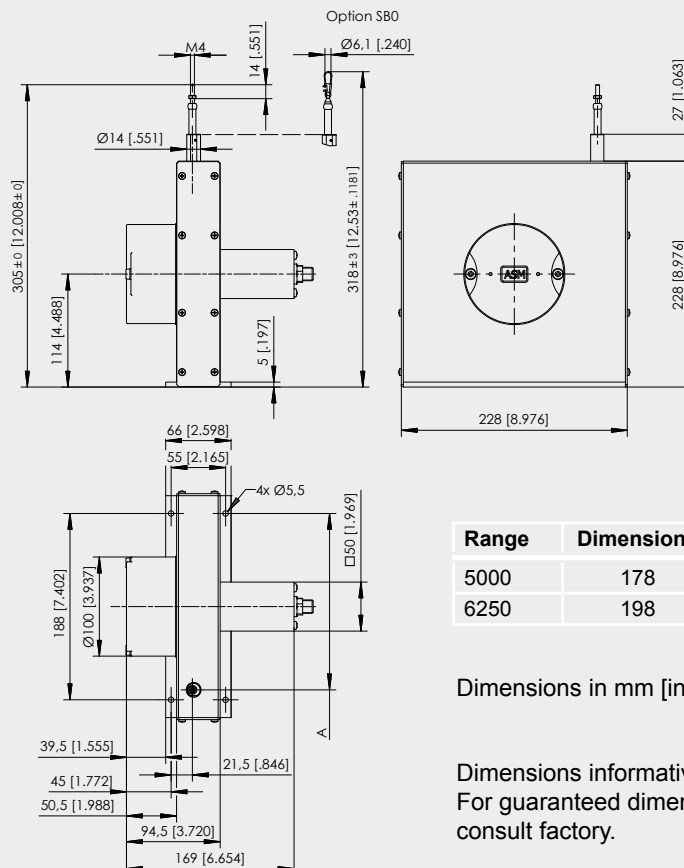
**Outline drawing**  
**WS17KT-3000 / 4000**



Dimensions in mm [inch]

Dimensions informative only.  
 For guaranteed dimensions  
 consult factory.

**Outline drawing**  
**WS17KT-5000 / 6250**



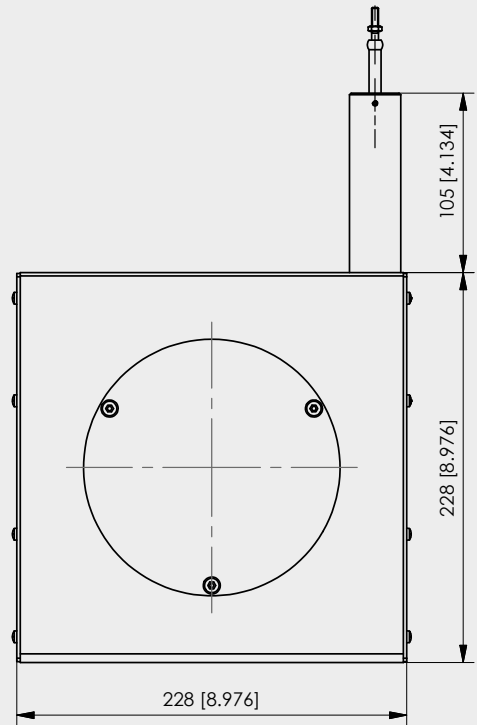
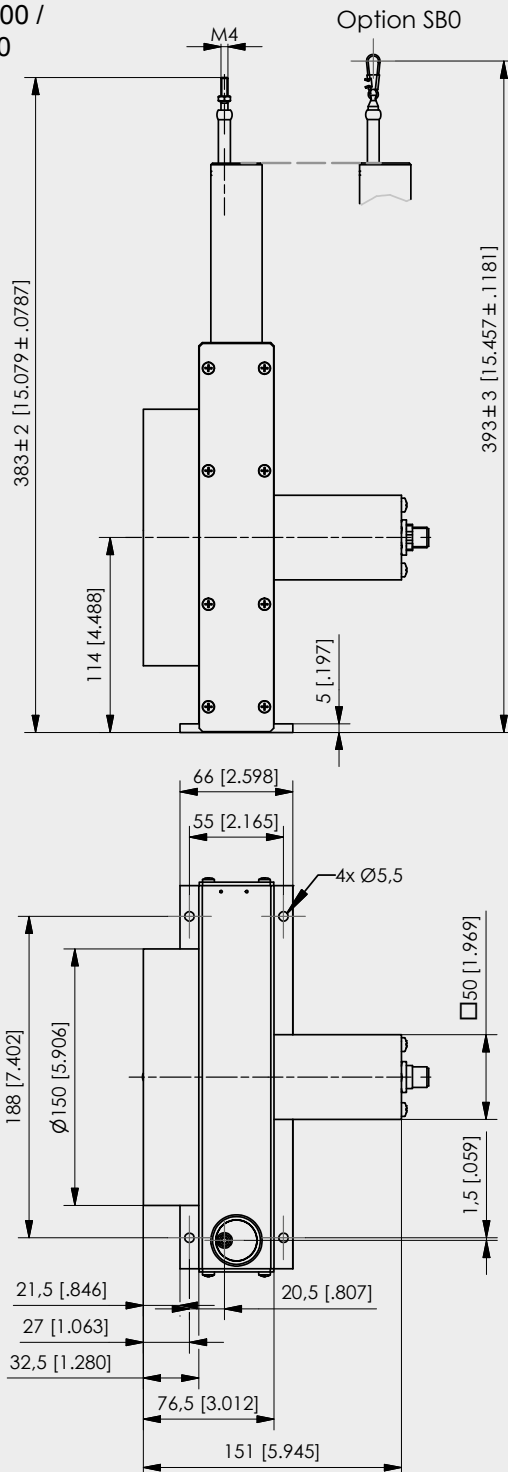
Dimensions in mm [inch]

Dimensions informative only.  
 For guaranteed dimensions  
 consult factory.

**POSIWIRE®**  
**WS17KT**  
**Analog, SSI or CANopen output**



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



Dimensions in mm [inch]

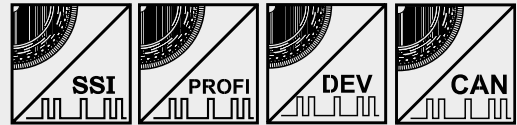
Dimensions informative only.  
 For guaranteed dimensions consult factory.

# POSIWIRE® WS58C Absolute Encoder Output



## Very compact position sensor

- Measuring range 0 ... 2500 mm
- With absolute encoder output
- High precision linearity up to  $\pm 0.01\%$  full scale



Specifications		
Output		See order code
Resolution for 12 bit/revolution (4096 steps/revolution)		0.04 mm Distance/revolution 163.84 mm
Linearity		$\pm 0.05\%$ f.s.; $\pm 0.01\%$ f.s. as option
Sensing device		Absolute encoder
Material		Aluminium and stainless steel; cable: stainless steel
Protection class		IP50 (IP64 as option), depend on the encoder
Connection		Depend on the encoder type: connector or bus cover
Weight		0.6 kg max., depending on the encoder
EMC, temperature		Refer to output specification

## Order code WS58C

WS58C - [ ] - [ ] - [ ] - [ ]

### Model name

### Measurement range (in mm)

2500

### Output

HSSI = Absolute encoder with synchronous serial interface (SSI)

HPROF = Absolute encoder with Profibus interface

HDEV = Absolute encoder with DeviceNet interface

HCAN = Absolute encoder with CAN interface

HCANOP = Absolute encoder with CANopen interface

### Linearity (option)

L01 =  $\pm 0.01\%$

### Cable fixing

M4 = M4 cable fixing

SB0 = Cable clip

## Order code mating connector

HSSI: **CONN-CONIN-12F-G**

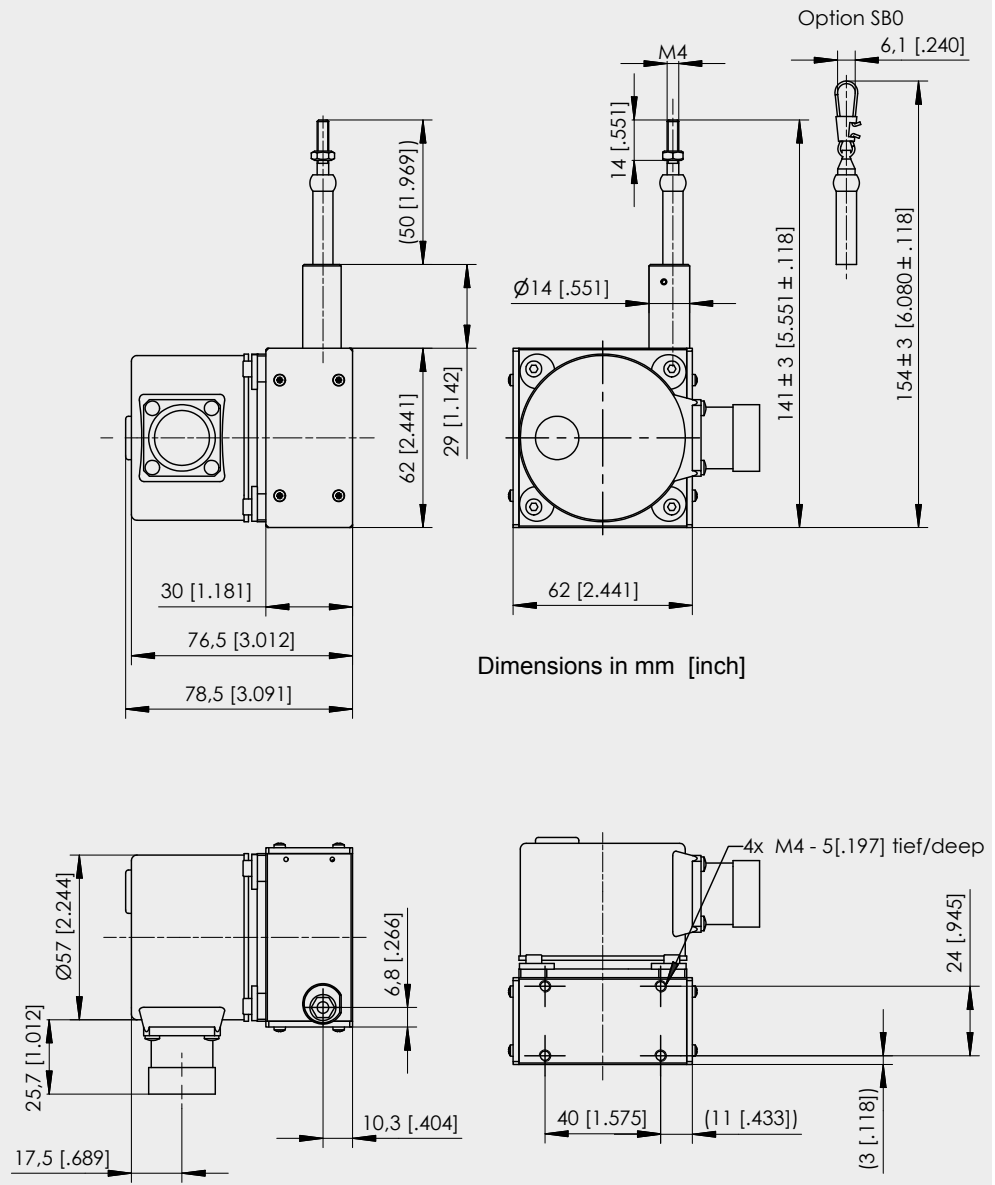
**Order example: WS58C - 2500 - HSSI - M4**

**POSIWIRE®**  
**WS58C**  
**Absolute Encoder Output**



Cable forces typical at 20 °C	Range	Max. pull-out force	Min. pull-in force
	[mm]	[N]	[N]
	2500	4.0	16

**Outline drawing  
HSSI**

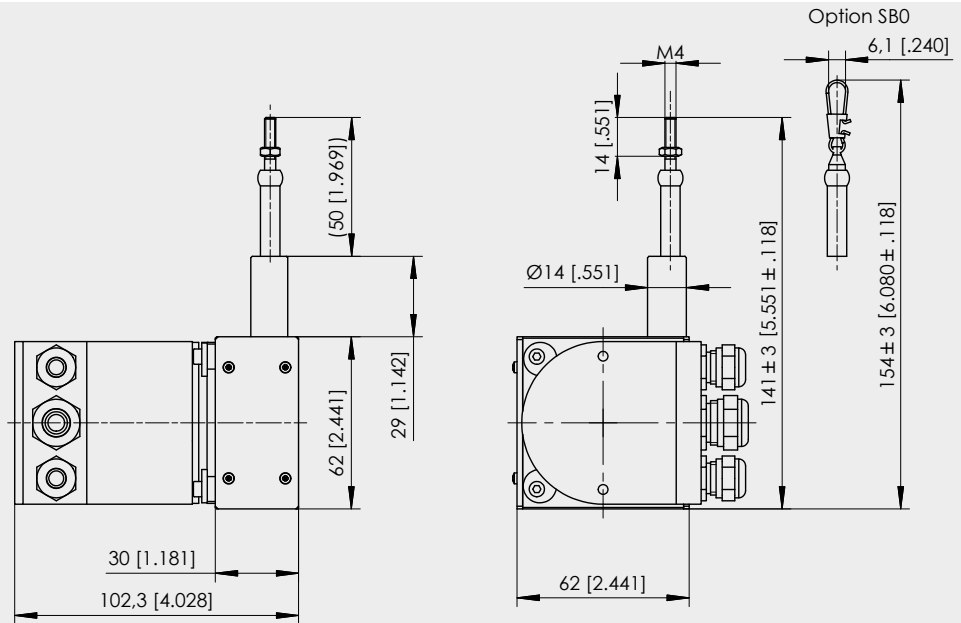


Dimensions informative only.  
For guaranteed dimensions consult factory.

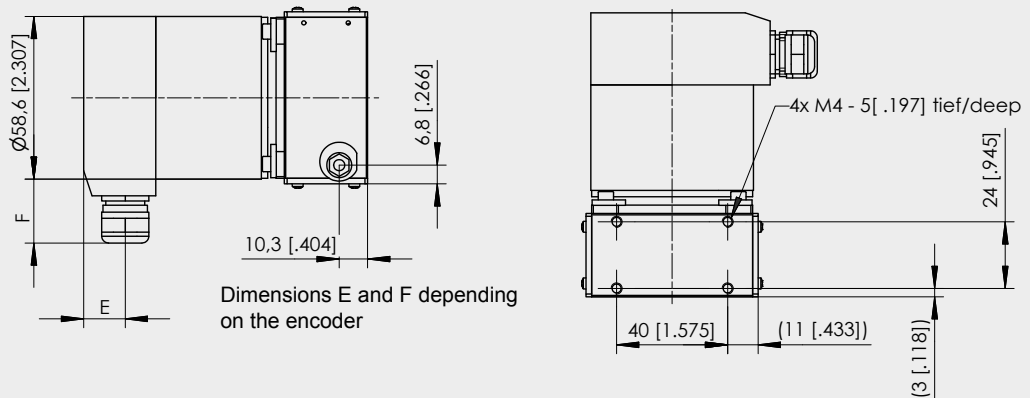
**POSIWIRE®**  
**WS58C**  
**Absolute Encoder Output**



Outline drawing  
 HPROF/HDEV/  
 HCAN/HCANOP



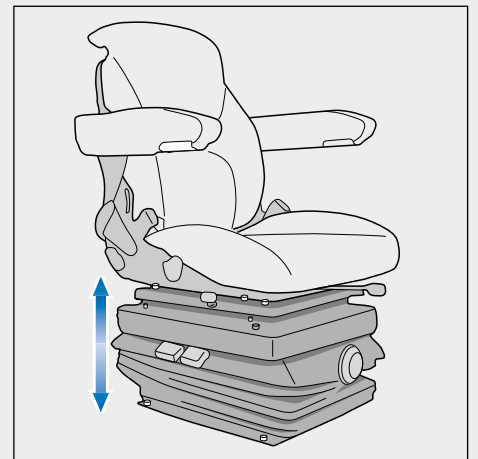
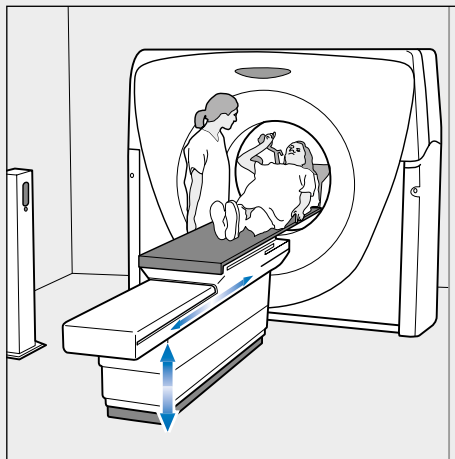
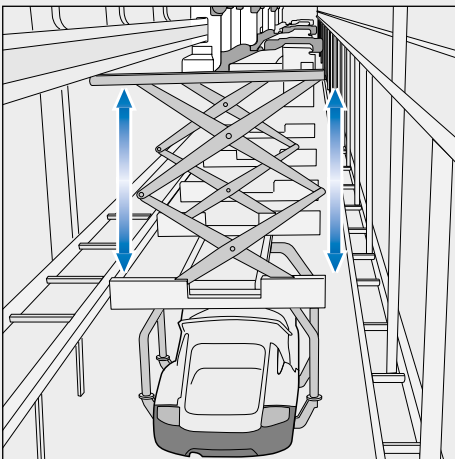
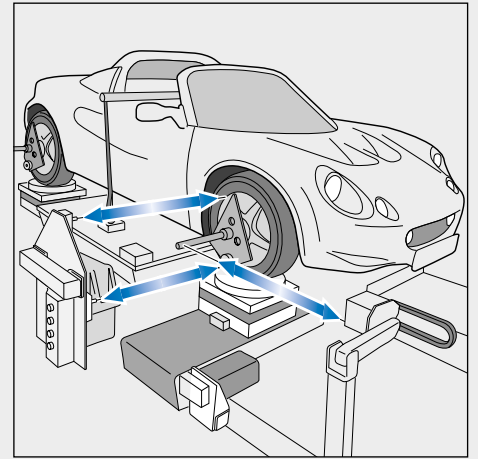
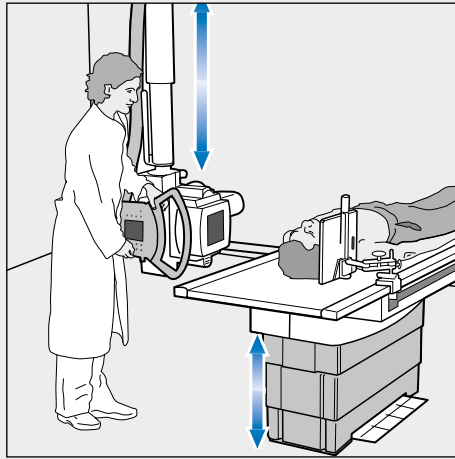
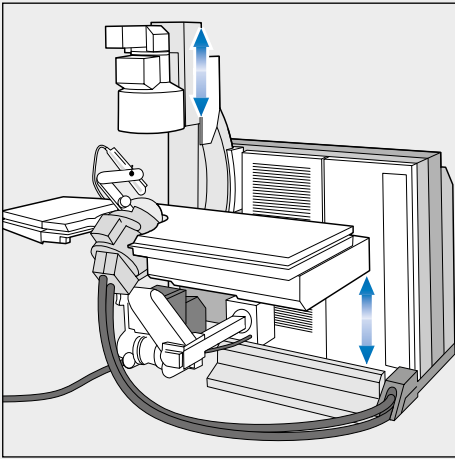
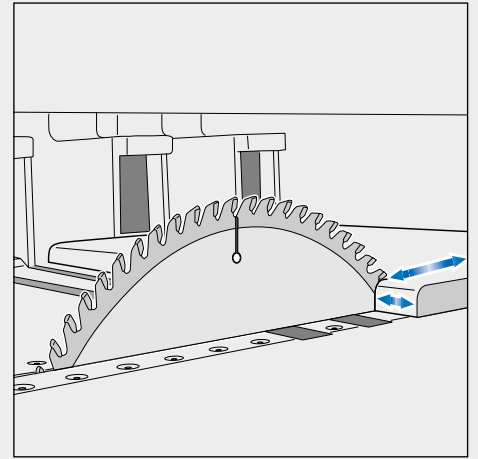
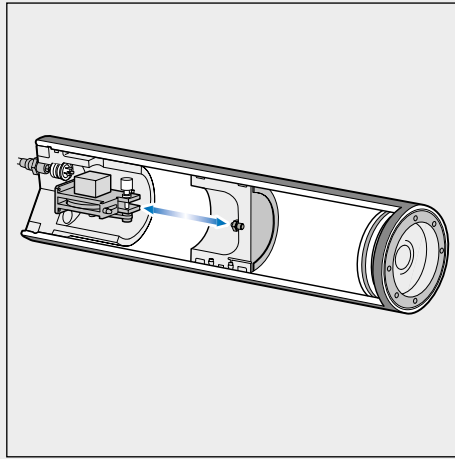
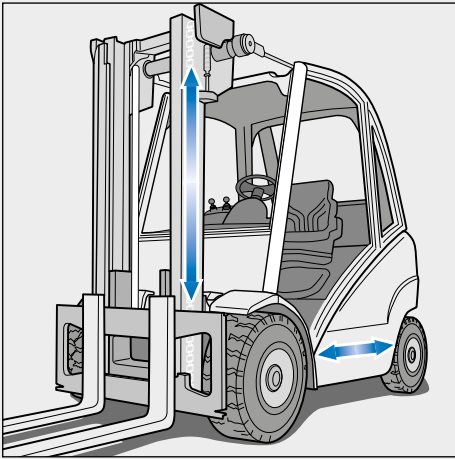
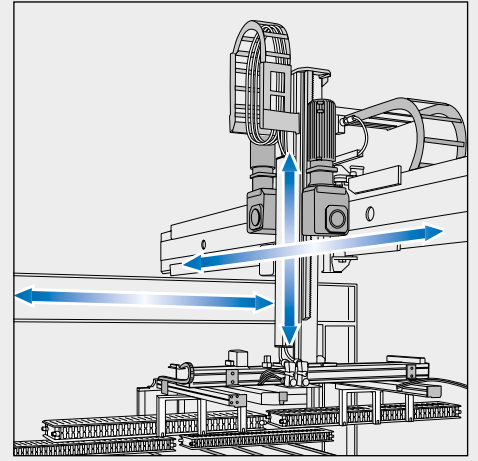
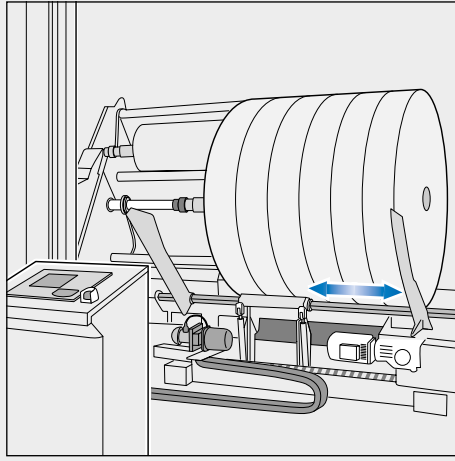
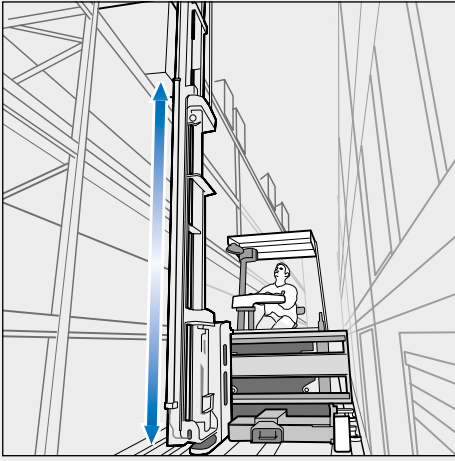
Dimensions in mm [inch]



Dimensions informative only.  
 For guaranteed dimensions consult factory.



# Applications for Position Sensors

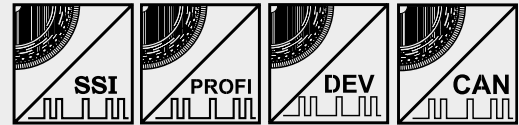


**POSIWIRE®**  
**WS19KT**  
**Absolute Encoder Output**



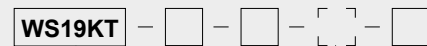
**Robust Sensor with heavy duty encoder**

- Protection class IP64
- Measurement range 0 ... 2000 mm to 0 ... 15000 mm
- Absolute encoder output



Specifications	Outputs	See order code		
	Resolution for 12 bit per revolution (4096 steps/revolution)	WS19KT-2000 WS19KT-3000 WS19KT-5000 WS19KT-8000 WS19KT-15000	Resolution 0.04 mm 0.063 mm 0.10 mm 0.162 mm 0.146 mm	Dist./rev. 163.84 mm 260.09 mm 409.60 mm 667.90 mm 600.00 mm
Linearity	±0.05% f.s.; ±0.01% f.s. as option			
Sensing device	Absolute encoder			
Material	Aluminum and stainless steel; cable: stainless steel			
Protection class	IP64			
Connection	Depend on the encoder type: connector or bus cover			
Weight	See table page 28			
EMC, temperature	Refer to output specification			

**Order code WS19KT**



**Model name**

**Measurement range (in mm)**

2000 / 3000 / 5000 / 8000 / 15000

**Outputs**

- HSSI = Absolute encoder with synchronous serial output (SSI)
- HPROF = Absolute encoder with Profibus interface
- HINT = Absolute encoder with Interbus interface
- HDEV = Absolute encoder with DeviceNet interface
- HCAN = Absolute encoder with CAN interface
- HCANOP = Absolute encoder with CANopen interface

**Linearity (option)**

L01 = ±0.01% f.s.

**Cable fixing**

- M4 = M4 cable fixing
- SB0 = Cable clip

**Order code mating connector**

**HSSI:** **CONN-CONIN-12F-G**

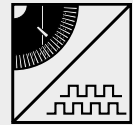
**Order example: WS19KT - 3000 - HSSI - M4**

# POSIWIRE® WS19KT Incremental Encoder Output



## Robust Sensor with heavy duty encoder

- Protection class IP64
- Measurement range 0 ... 2000 mm to 0 ... 15000 mm
- Incremental encoder output



Specifications	Outputs	Incremental output TTL or HTL compatible	
	Resolution for 12 bit per revolution (4096 steps/revolution)	WS19KT-2000	25 pulses
	WS19KT-3000	15.75 pulses	
	WS19KT-5000	10 pulses	
	WS19KT-8000	6.13 pulses	
	WS19KT-15000	6.83 pulses	
Linearity	±0.05% f.s.; ±0.01% f.s. as option		
Sensing device	Incremental encoder		
Material	Aluminum and stainless steel; cable: stainless steel		
Protection class	IP64		
Connection	Male 12 pin socket		
Weight	See table page 28		
EMC, temperature	Refer to output specification		

## Order code WS19KT



### Model name

### Measurement range (in mm)

2000 (smaller measurement ranges included) / 3000 / 5000 / 8000 / 15000

### Outputs

LD5VC = Incremental encoder TTL compatible

PP24VC = Incremental encoder HTL compatible

### Linearity (option)

L01 = ±0.01% f.s.

### Cable fixing

M4 = M4 cable fixing

SB0 = Cable clip

## Order code mating connector

**CONN-CONIN-12F-G**

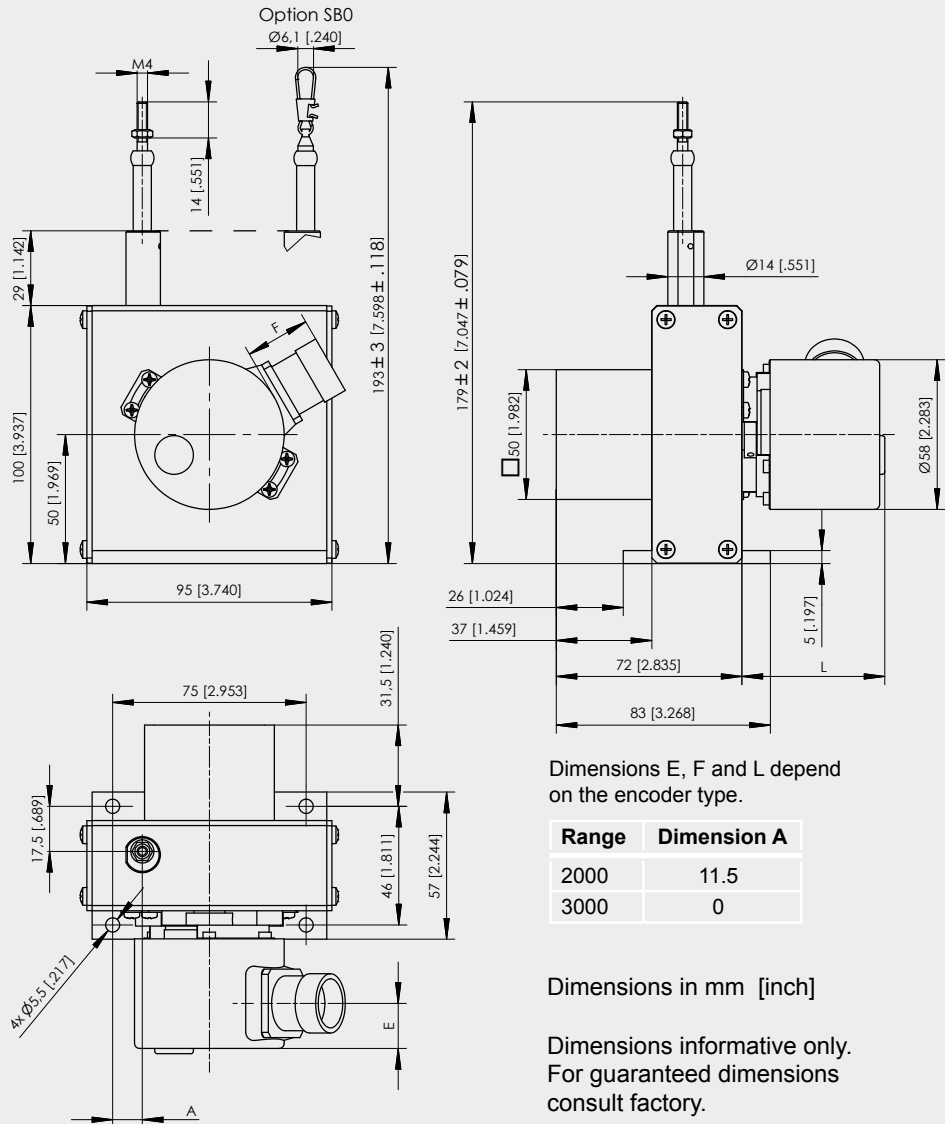
Order example: **WS19KT - 5000 - LD5VC - M4**

# POSIWIRE® WS19KT Absolute or Incremental Encoder Output



Cable forces, typical at 20 °C	Range	Weight (approx.)	Max. pull-out force	Min. pull-in force
	[mm]	[kg]	[N]	[N]
	2000	1.3	11.0	6.0
	3000	1.6	8.1	4.9
	5000	3.0	12.0	9.0
	8000	5.6	10.5	6.8
	15000	6.1	16.5	9.1

## Outline drawing WS19KT-2000 / 3000

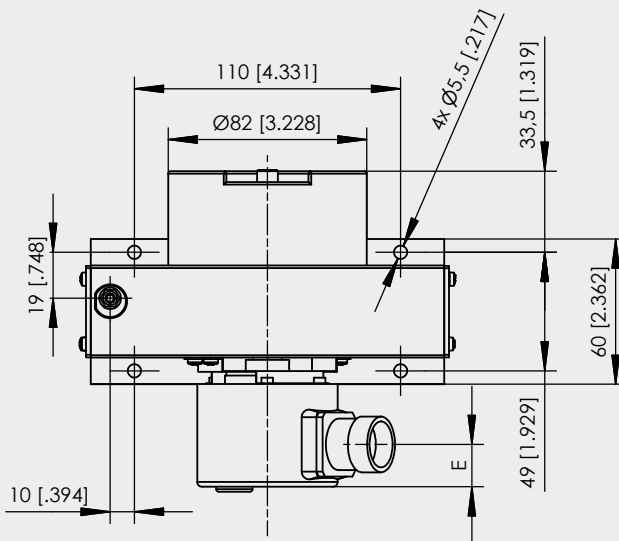
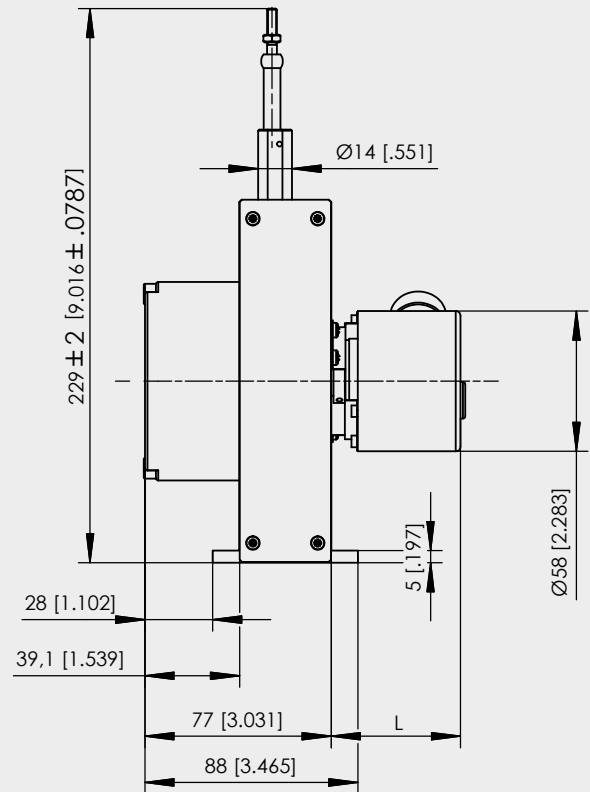
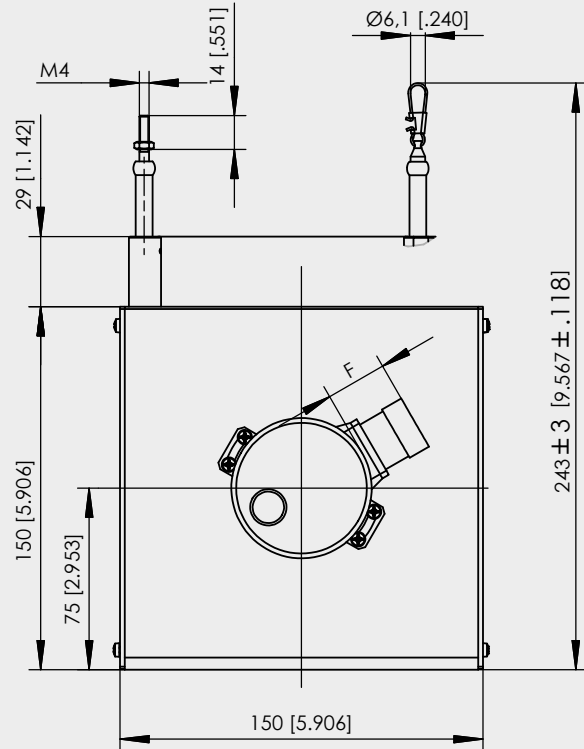


**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**



Outline drawing  
 WS19KT-5000

Option SB0



Dimensions E, F and L depend on the encoder type.

Dimensions in mm [inch]

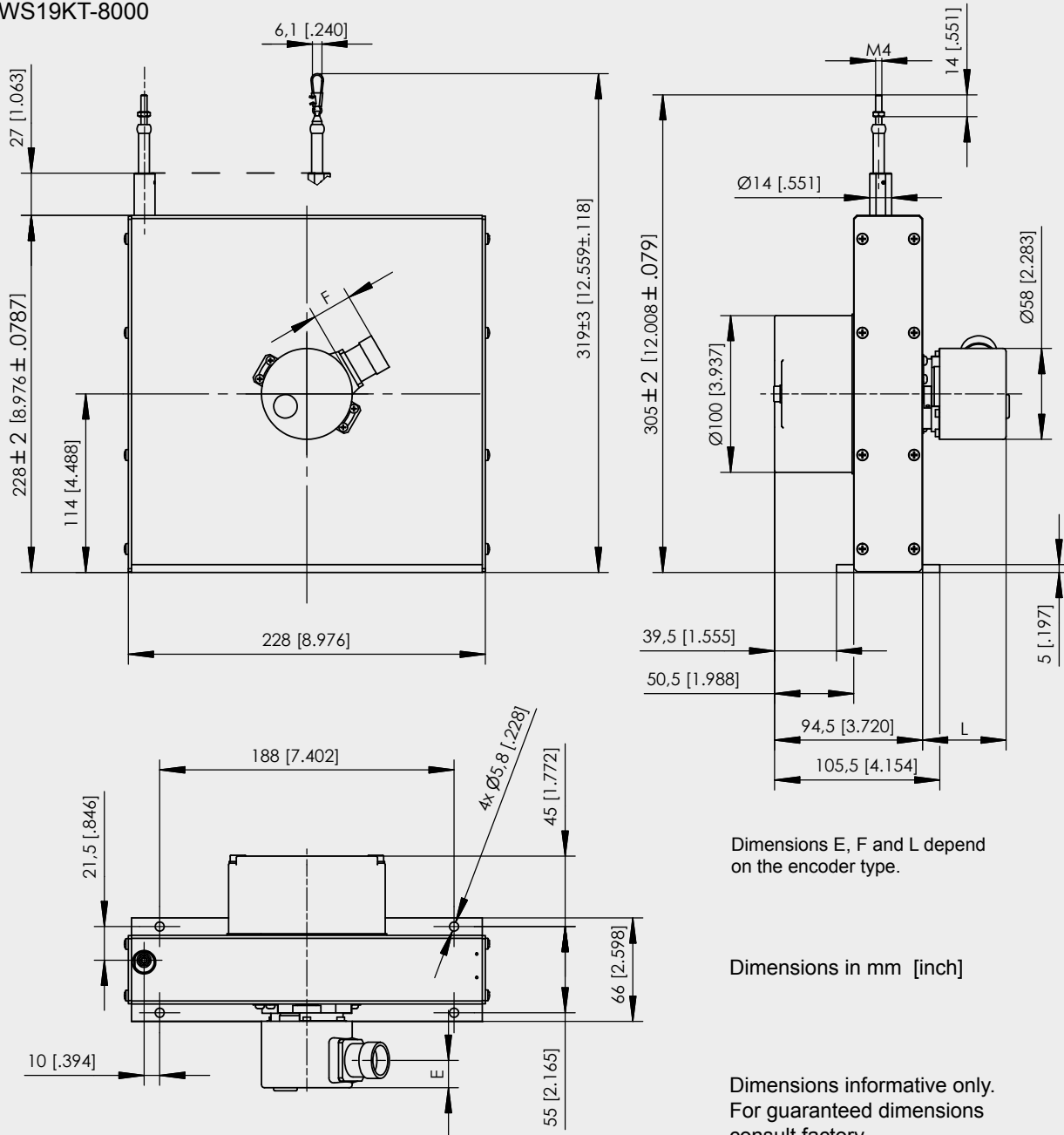
Dimensions informative only.  
 For guaranteed dimensions consult factory.

**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**



**Outline drawing**  
**WS19KT-8000**

Option SB0



Dimensions E, F and L depend on the encoder type.

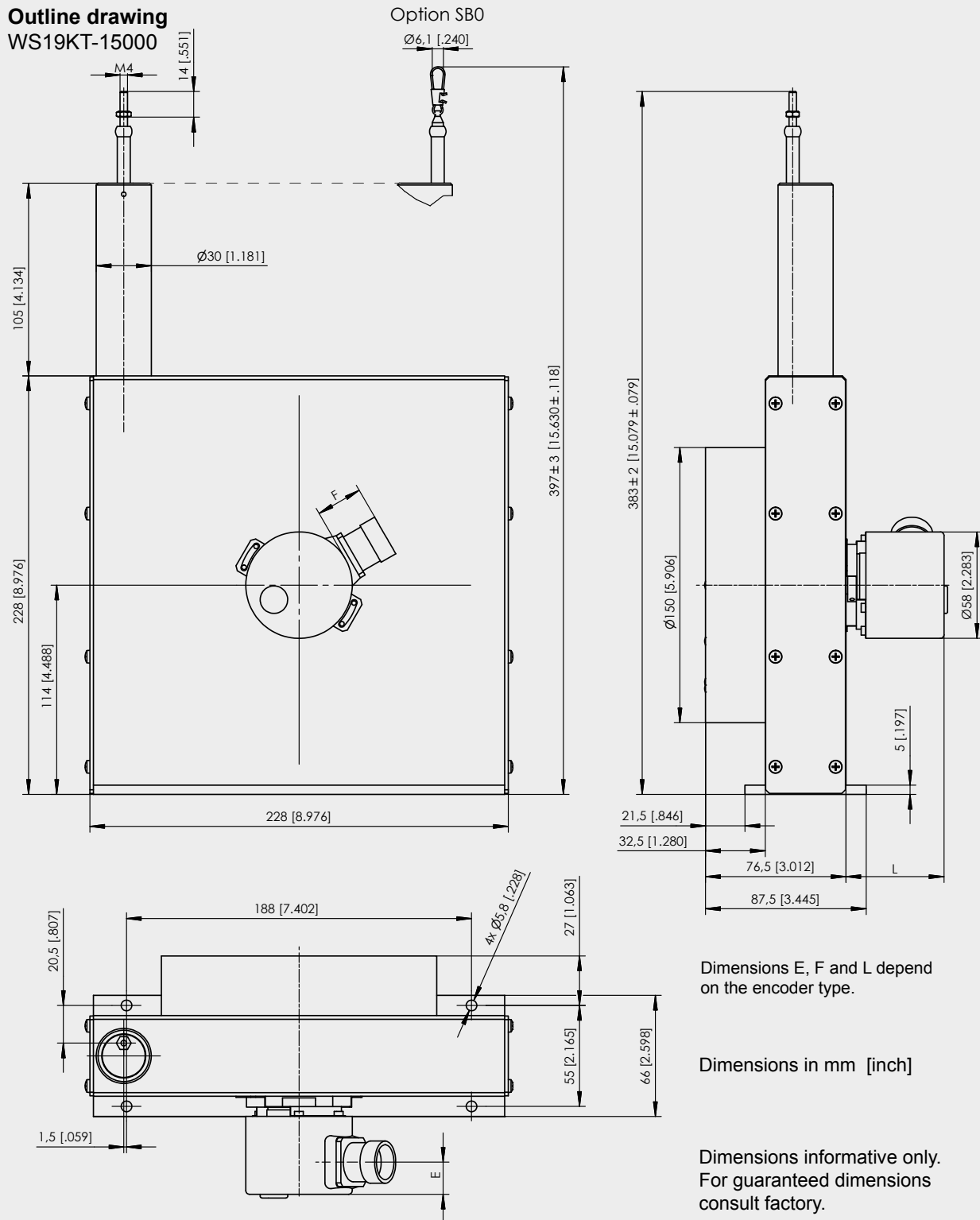
Dimensions in mm [inch]

Dimensions informative only. For guaranteed dimensions consult factory.

**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**



**Outline drawing**  
**WS19KT-15000**

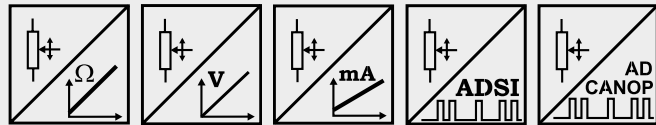


**POSIWIRE®**  
**WS7.5**  
**Analog, SSI or CANopen Output**



**Compact industrial sensor for long ranges**

- Protection class IP52
- Measurement ranges 0 ... 10000 mm to 0 ... 40000 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 Voltage or current output, programmable (PMUV/PMUI) 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		Aluminum and stainless steel; cable: stainless steel
Protection class		IP52
Connection		Male 8 pin socket M12 (ADCANOP: 5 pin socket)
Weight		Approx. 10 kg maximum
EMC, temperature		Refer to output specification

**Order code WS7.5**



**Model name**

**Measurement range (in mm)**

10000 / 20000 / 30000 / 40000

**Output**

- R1K = Potentiometer 1 kΩ
- 10V = 0 ... 10 V signal conditioner
- 420A = 4 ... 20 mA signal conditioner
- 420T = 4 ... 20 mA signal conditioner
- PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner
- ADSI16 = A/D converted synchronous serial interface 16 bit (12 or 14 bit opt.)
- ADCANOP = A/D converted CANopen bus

**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 (not for ADCANOP)
- M12/CAN = 5 pin socket M12 (for ADCANOP)

**Order code connector cable:** see page 82/83

**Order example: WS7.5 - 30000 - 420T - L10 - M4 - M12**





**Compact industrial sensor for long ranges**

- Protection class IP52
- Measurement range 0 ... 10000 mm to 0 ... 40000 mm
- Absolute or incremental encoder



<b>Specifications</b>	Outputs	See order code
	Resolution for 12 bit per revolution (4096 steps/revolution)	Up to 30000: 0.073 mm; 40000: 0.088 mm
	Linearity	±0.05% f.s.; ±0.01% f.s. as option
	Sensing device	Absolute encoder / incremental encoder
	Material	Aluminum and stainless steel; cable: stainless steel
	Protection class	IP52, encoder IP64
	Connection	Depend on the encoder type: connector or bus cover
	Weight	Approx. 10 kg maximum
EMC, temperature	Refer to output specification	

**Order code WS7.5**

**Model name**

**Measurement range (in mm)**

10000 / 15000 / 20000 / 25000 / 30000 / 40000

**Outputs**

- ME = Mechanism only for installation of suitable multiturn encoders
- BK = Customer sources encoder for fitting by ASM
- LD5VC = Incremental encoder TTL compatible, inverted
- PP24VC = Incremental encoder HTL compatible, inverted
- HSSI = Absolute encoder with synchronous serial output (SSI)
- HINT = Absolute encoder with Interbus interface
- HPROF = Absolute encoder with Profibus interface
- HDEV = Absolute encoder with DeviceNet interface
- HCAN = Absolute encoder with CAN interface
- HCANOP = Absolute encoder with CANopen interface

**Linearity (option)**

L01 = ±0.01% f.s.

**Cable fixing**

- M4 = M4 cable fixing
- SB0 = Cable clip



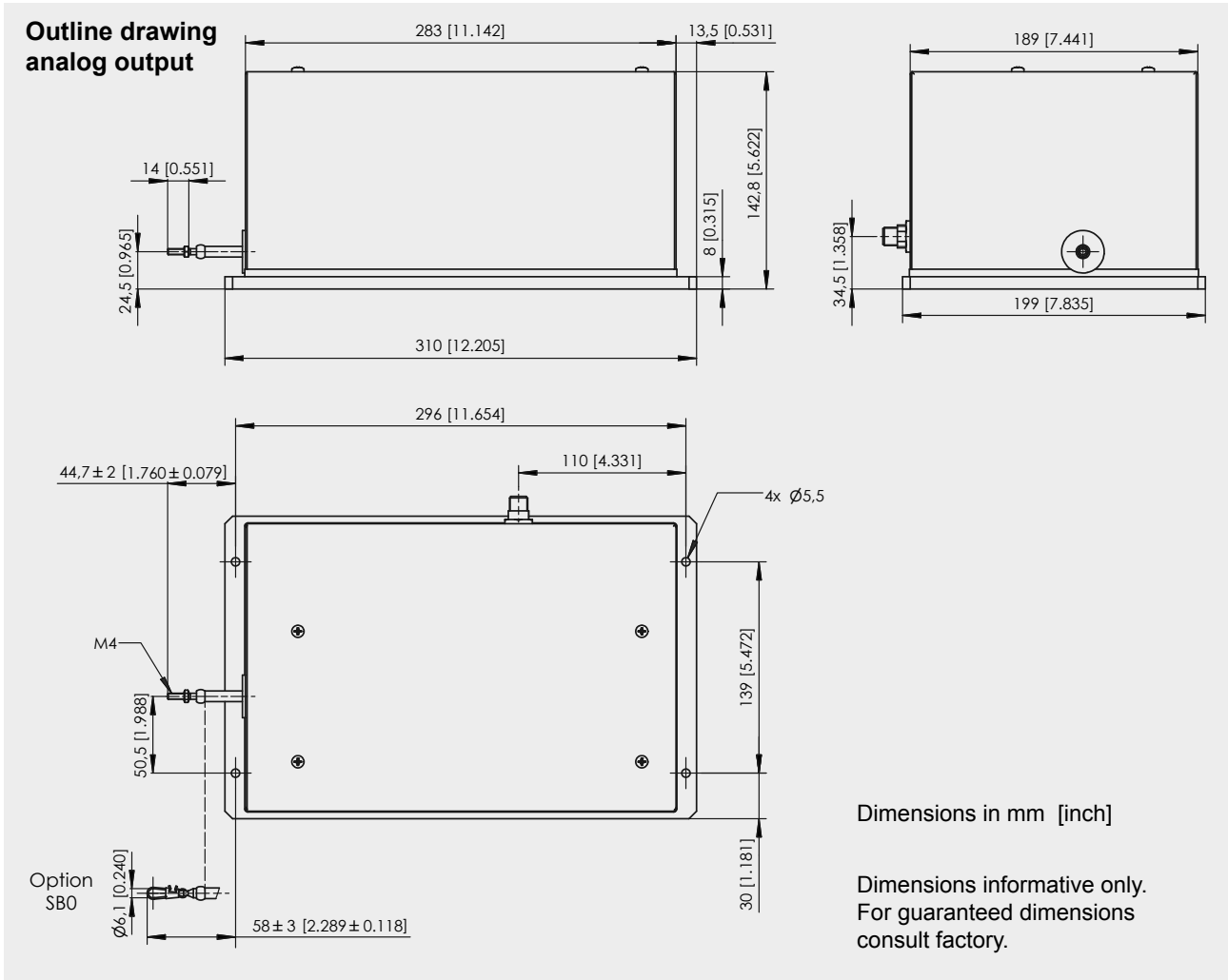
**Order code mating connector**

**incremental, HSSI:**

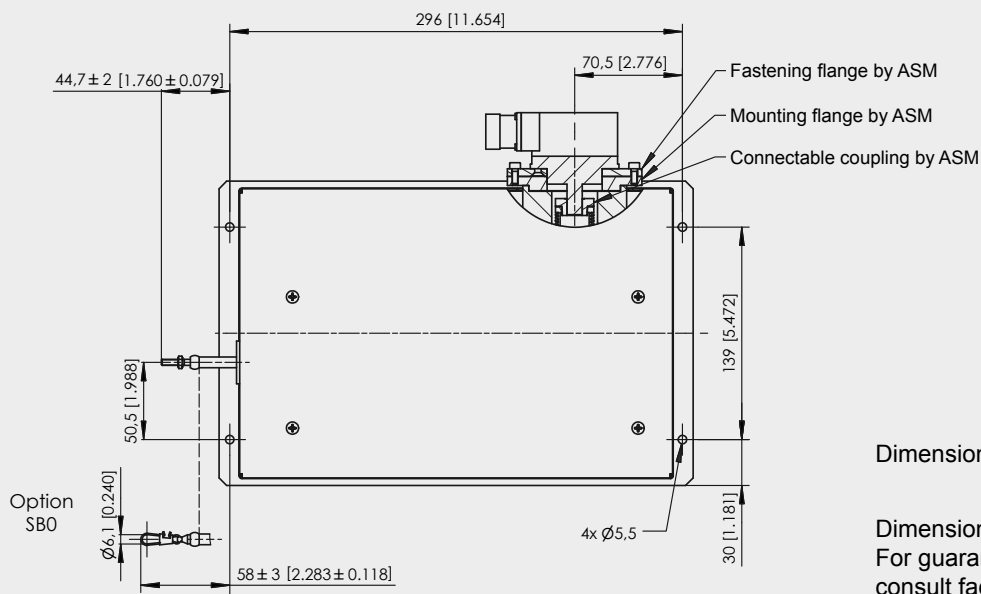
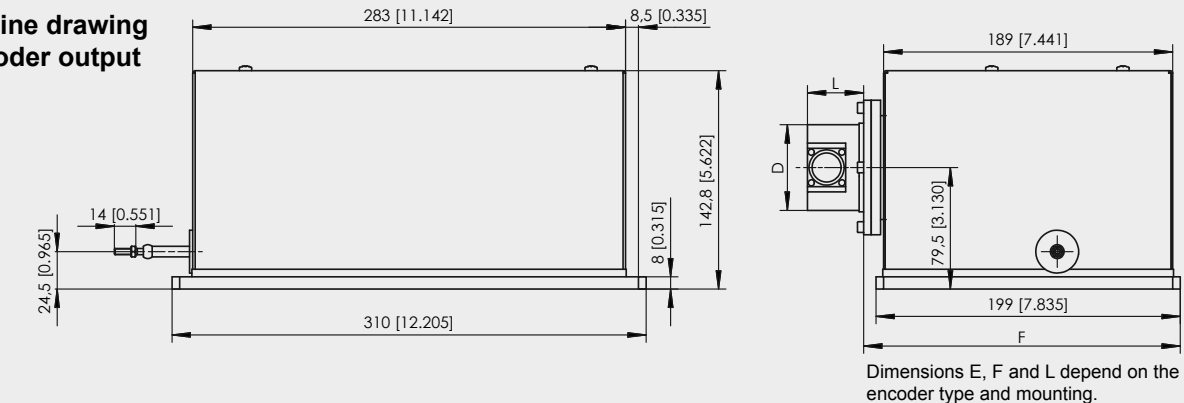
**CONN-CONIN-12F-G**

**Order example: WS7.5 - 30000 - HSSI - M4**

Cable forces, typical at 20 °C	Range	Max. pull-out force	Min- pull-in force
	[mm]	[N]	[N]
	10000 - 30000	8.0	4.2
40000	7.0	3.4	



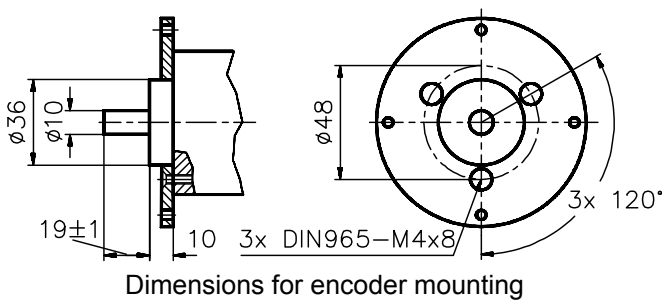
**Outline drawing encoder output**



Dimensions in mm [inch]

Dimensions informative only.  
For guaranteed dimensions consult factory.

**Output ME**



**Connectable coupling in two parts (output ME)**

The outer part of the coupling should be fitted to the encoder shaft. Adjust a 0.5 mm clearance between the fastening and the mounting flanges to give an initial tension on the coupling when the mounting bolts are tightened.



**Industrial position sensor for very long measurement ranges**

- Protection class IP52
- Measurement ranges 0 ... 60000 mm
- Absolute or incremental encoder



<b>Specifications</b>	Outputs	Incremental encoder with TTL or HTL output Absolute encoder see order code
	Resolution	8 pulses/steps per mm
	Linearity	±0.10 % f.s.; optional 0.025 % f.s.
	Sensing device	Absolute encoder / incremental encoder
	Material	Aluminium and stainless steel; Cable: stainless steel
	Protection class	IP52, encoder IP64
	Connection	Depending at the encoder type: connector or bus cover
	Weight	Approx. 15 kg maximum
	EMC, temperature	Refer to output specification

**Order code WS60**

**Model name** \_\_\_\_\_

**Measurement range (in mm)**  
60000

**Outputs**  
 LD5VC = Incremental encoder TTL compatible  
 PP24VC = Incremental encoder HTL compatible  
 HSSI = Absolute encoder with synchronous serial output (SSI)  
 HPROF = Absolute encoder with Profibus interface  
 HINT = Absolute encoder with Interbus interface  
 HDEV = Absolute encoder with DeviceNet interface  
 HCAN = Absolute encoder with CAN interface  
 HCANOP = Absolute encoder with CANopen interface

**Linearity (option)**  
L025 = ±0.025% f.s.

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

Diagram showing a sequence of boxes: WS60 - [ ] - [ ] - [ ] - [ ] with lines connecting the fields to the corresponding boxes in the sequence.

**Order code mating connector**

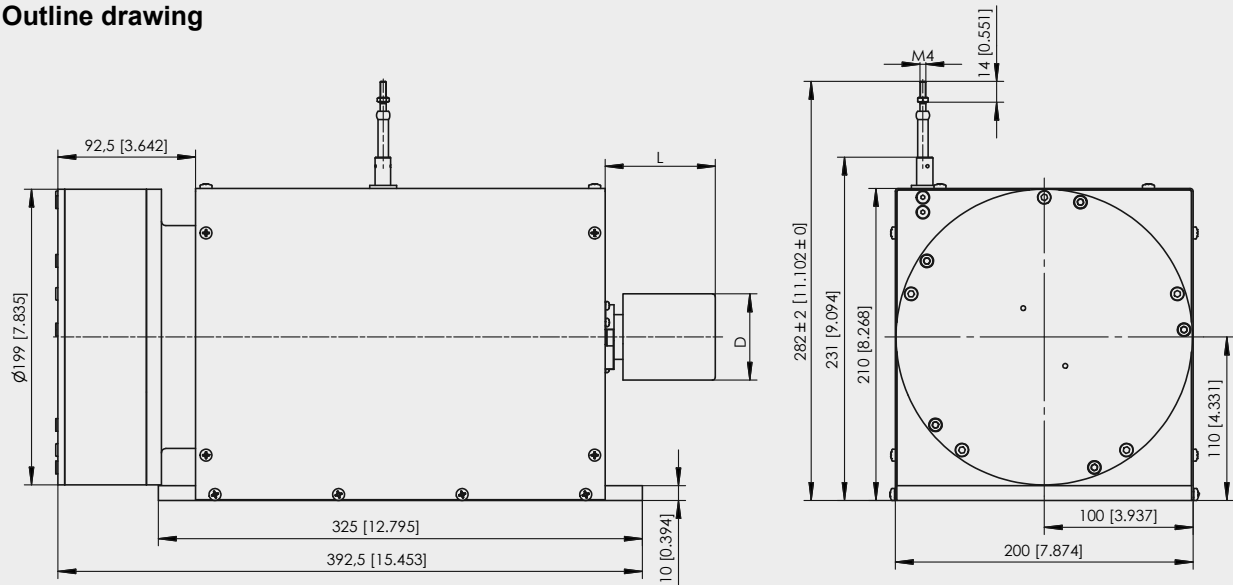
**incremental, HSSI:**

**CONN-CONIN-12F-G**

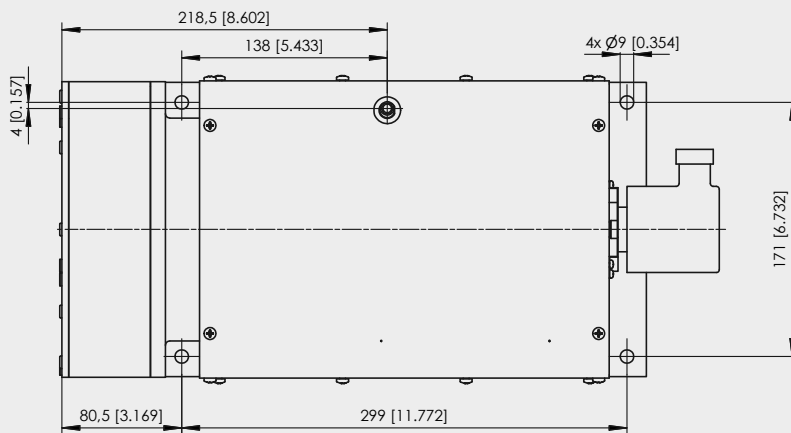
**Order example: WS60 - 60000 - HSSI - M4**

Cable forces, typical at 20 °C	Range	Max. pull-out force	Min. pull-in force
	[mm]	[N]	[N]
	60000	17.0	6.5

**Outline drawing**



Dimensions D and L depend on the encoder type



Dimensions in mm [inch]

Dimensions informative only.  
For guaranteed dimensions  
consult factory.

# POSIWIRE®

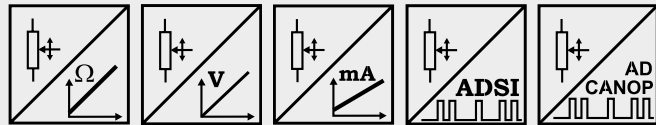
## WS12

### Analog, SSI or CANopen Output



#### Sensor for hostile environments

- Protection class IP67
- Measurement ranges 0 ... 100 mm to 0 ... 3000 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 Voltage or current output, programmable (PMUV/PMUI) 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	Aluminum and stainless steel; cable: stainless steel
	Protection class	IP67 (with mating connector only)
	Connection	Male 8 pin socket M12 (ADCANOP: 5 pin socket)
	Weight	≤1500 mm: 1 kg; ≥2000 mm: 1.5 kg
	EMC, temperature	Refer to output specification

#### Order code WS12

##### Model name

##### Measurement range (in mm)

100 / 125 / 500 / 1000 / 1250 / 1500 / 2000 / 2500 / 3000

##### Output

R1K = Potentiometer 1 kΩ  
 10V = 0 ... 10 V signal conditioner  
 420A = 4 ... 20 mA signal conditioner  
 420T = 4 ... 20 mA signal conditioner  
 PMUV/PMUI = Programmable 0... 10 V or 4 ... 20 mA signal conditioner  
 ADSI16 = A/D converted synchronous serial interface 16 bit (12 or 14 bit opt.)  
 ADCANOP = A/D converted CANopen bus

##### 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 (not for ADCANOP)  
 M12/CAN = 5 pin socket M12 (for ADCANOP)



Order code connector cable: see page 82/83

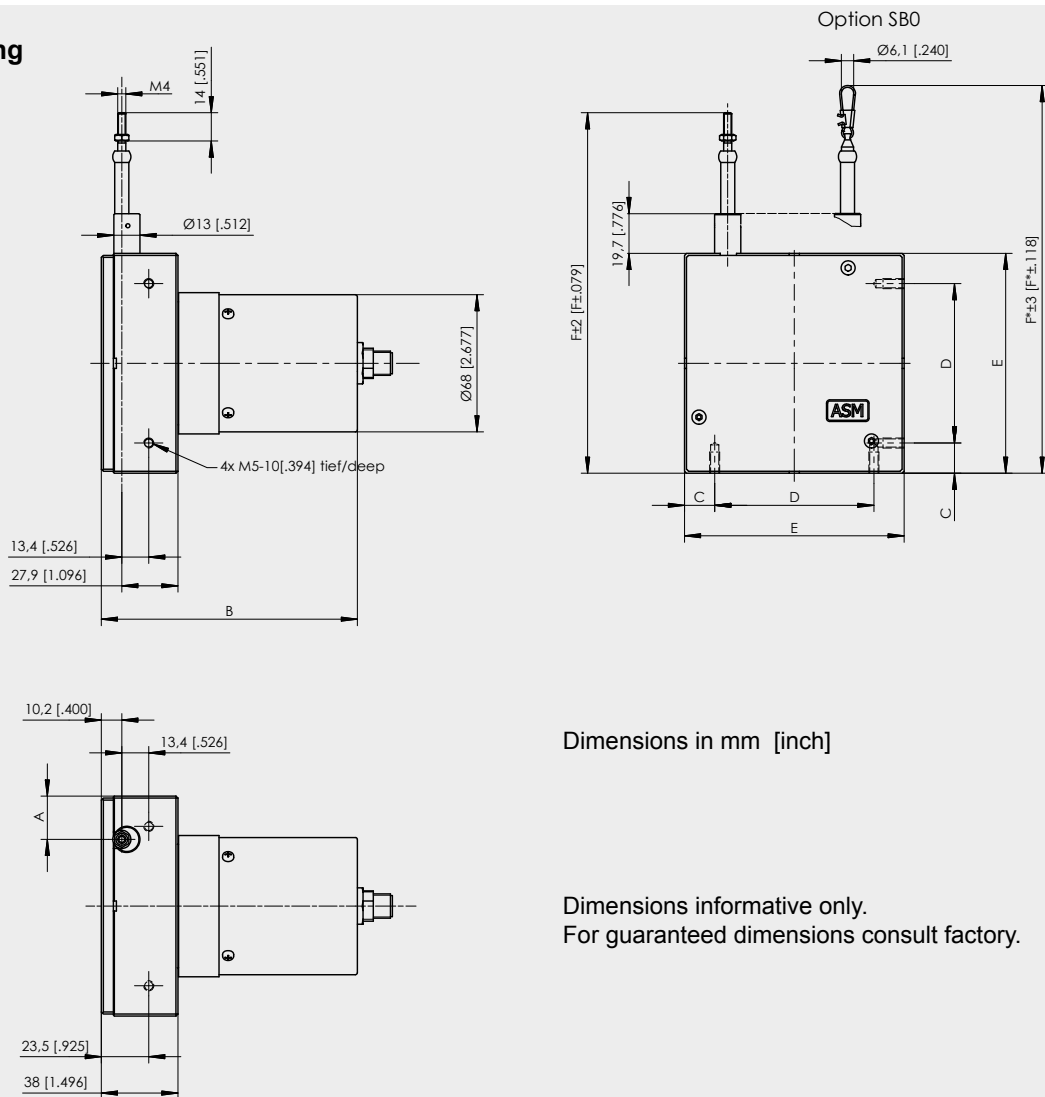
Order example: WS12 - 2500 - 10V - L10 - M4 - M12

# POSIWIRE® WS12 Analog, SSI or CANopen Output



Cable forces, typical at 20 °C	Range	Max. pull-out force	Min. pull-in force
	[mm]	[N]	[N]
	100	5.2	2.8
	125	4.6	2.5
	500	5.9	2.6
	1000	5.5	2.4
	1250	4.8	2.1
	1500	10.4	6.4
	2000	8.1	5.0
	2500	6.7	4.0
	3000	6.2	3.0

## Outline drawing



Dimensions in mm [inch]

Dimensions informative only.  
For guaranteed dimensions consult factory.

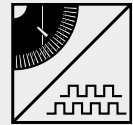
Dimensions in mm	Range	A	B	C	D	E	F	F*
	100; 500; 1000	18.3	112	14	43	71	141	154
125; 1250	14.5	112	14	43	71	141	154	
1500	10.7	127	14	43	71	141	154	
2000	21.5	127	15	79	109	179	192	
2500	13.3	127	15	79	109	179	192	
3000	9.2	127	15	79	109	179	192	

**POSIWIRE®**  
**WS12**  
**Incremental Encoder Output**



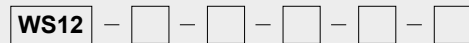
**Sensor for hostile environments**

- Protection class IP67
- Measurement ranges 0 ... 1250 mm to 0 ... 3000 mm
- Incremental encoder output



<b>Specifications</b>	Outputs	Incremental encoder output for reliable data transmission. The output is compatible with TTL and HTL.
	Resolution	5 or 10 pulses per mm (1/20 mm or 1/40 mm with external edge counting mode)
	Linearity	±0.05% f.s.
	Sensing device	Incremental encoder
	Material	Aluminum, stainless steel and plastic; cable: stainless steel
	Protection class	IP67
	Connection	Male 8 pin socket M12
	Weight	≤1500 mm: approx. 1 kg; ≥2000 mm: approx. 1.5 kg
EMC, temperature	Refer to output specification	

**Order code WS12**



**Model name**

**Measurement range (in mm)**

1250 / 1500 / 2000 / 2500 / 3000

**Pulses per mm**

10 = 10 pulses per mm (1250, 1500 mm)

5 = 5 pulses per mm (2000, 2500, 3000 mm)

Other numbers of pulses on request

**Output**

PP530 = Incremental output 5 ... 30 V

IE41LI = Incremental encoder TTL compatible

IE41HI = Incremental encoder HTL compatible

**Cable fixing**

M4 = M4 cable fixing

SB0 = Cable clip

**Connection**

M12 = 8 pin socket M12

**Order code connector cable:** see page 82/83

**Order example: WS12 - 2500 - 5 - PP530 - M4 - M12**

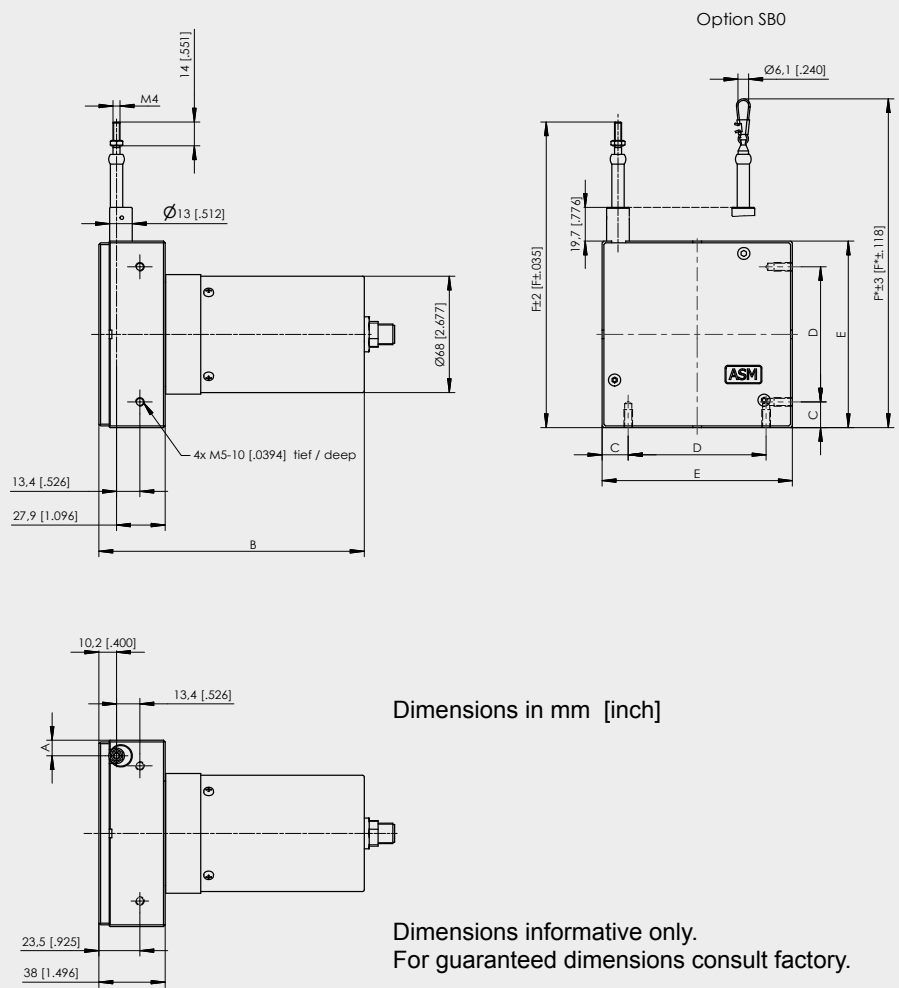


**POSIWIRE®**  
**WS12**  
**Incremental Encoder Output**



Cable forces, typical at 20 °C	Range	Max. pull-out force	Min. pull-in force
	[mm]	[N]	[N]
	1250	6.6	2.7
	1500	10.6	6.5
	2000	5.7	4.1
	2500	5.7	4.1
	3000	5.8	4.0

**Outline drawing**



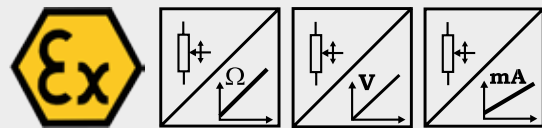
Dimensions in mm	Range	A	B	C	D	E	F	F*
	1250	18.3	137	14	43	71	141	154
1500	10.7	152	14	43	71	141	154	
2000	9.2	152	15	79	109	179	192	
2500	9.2	152	15	79	109	179	192	
3000	9.2	152	15	79	109	179	192	

**POSIWIRE®**  
**WS10EX**  
**Analog Output, Dust Explosion-Proof**



**Very compact sensor for dust explosive areas**

- Protection class IP65
- Measurement range 0 ... 100 mm to 0 ... 1250 mm
- Analog output
- Dust ex-proof, category 3, zone 22
- II 3D Ex tD A22 IP65 T80°C X



Specifications	Outputs	Potentiometer 1 kΩ Voltage 0 ... 10 V Current 4 ... 20 mA, 2 or 3 wire
Resolution		Essentially infinite
Linearity		Up to ±0.05% f.s.
Sensing device		Precision potentiometer
Material		Aluminum and stainless steel; cable: stainless steel
Connection		Cable output, standard length 2 m
Weight		Approx. 800 g max.
Temperature		-20 to +40 °C
Environmental		
Explosion-proof		EN 61241-0:2007; EN 61241-1:2005 X = Tested with low impact energy 4 J
EMC		EN 61326:2006
Protection class of housing		EN 60529:2000, IP65
Shock		EN 60068-2-27:1993, 50 g 11 ms, 100 shocks
Vibration		EN 60068-2-6:1995, 20 g, 10 Hz - 2 kHz, 10 cycles

**Order code WS10EX**



**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

**Linearity**

L10 = ±0.10 % option: L05 = ±0.05 % L25 = ±0.25 %

**Cable fixing**

- M4 = M4 cable fixing
- SB0 = Cable clip

**Connection**

KAB2M = Cable output, standard length 2 m

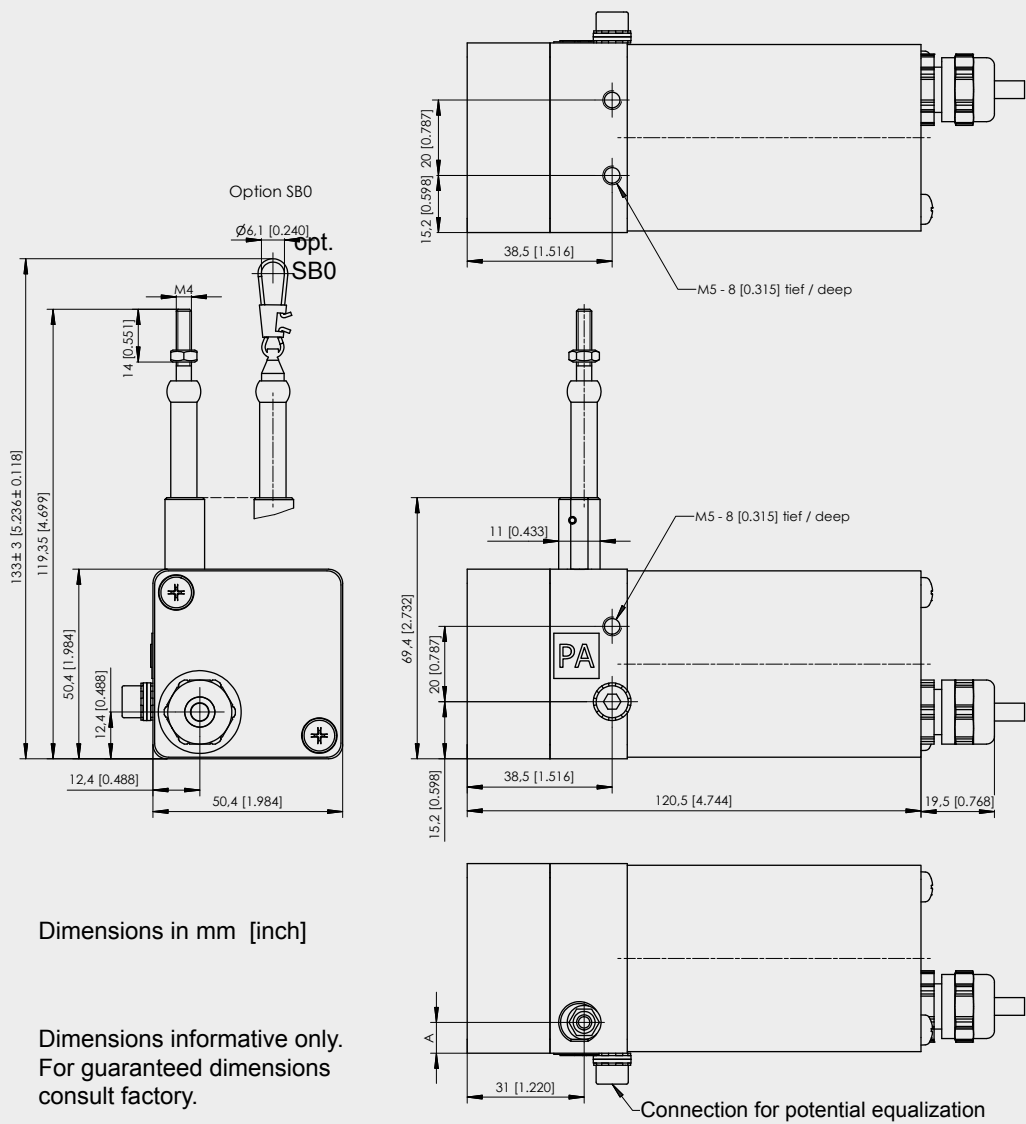
**Order example: WS10EX - 1250 - 420A - L10 - M4 - KAB2M**

**POSIWIRE®**  
**WS10EX**  
**Analog Output, Dust Explosion-Proof**



Cable forces, typical at 20 °C	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**



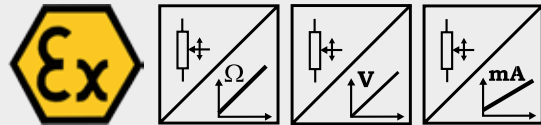
Dimensions in mm	Range	A
	375; 750	12.4
100; 125; 500; 1000; 1250	8	

**POSIWIRE®**  
**WS12EX**  
**Analog Output, Dust Explosion-Proof**



**Sensor for hostile environments**

- Protection class IP67
- Measurement range 0 ... 100 mm to 0 ... 3000 mm
- Analog output
- Dust ex-proof, category 3, zone 22
- II 3D Ex tD A22 IP67 T80°C



Specifications	Outputs	Potentiometer 1 kΩ Voltage 0 ... 10 V Current 4 ... 20 mA, 2 or 3 wire
Resolution	Essentially infinite	
Linearity	Up to ±0.05% f.s.	
Sensing device	Precision potentiometer	
Material	Aluminum and stainless steel; cable: stainless steel	
Connection	Cable output, standard length 2 m	
Weight	≤1500 mm: approx. 1 kg; ≥2000 mm: approx. 1.5 kg	
Temperature	-20 to +40 °C	
Environmental		
Explosion-proof	EN 61241-0:2007; EN 61241-1:2005	
EMC	EN 61326:2006	
Protection class of housing	EN 60529:2000, IP67	
Shock	EN 60068-2-27:1993, 50 g 11 ms, 100 shocks	
Vibration	EN 60068-2-6:1995, 20 g, 10 Hz - 2 kHz, 10 cycles	

**Order code WS12EX**



**Model name**

**Measurement range (in mm)**

100 / 125 / 500 / 1000 / 1250 / 1500 / 2000 / 2500 / 3000

**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

**Linearity**

L10 = ±0.10 % option: L05 = ±0.05 % L25 = ±0.25 %

**Cable fixing**

- M4 = M4 cable fixing
- SB0 = Cable clip

**Connection**

KAB2M = Cable output, standard length 2 m

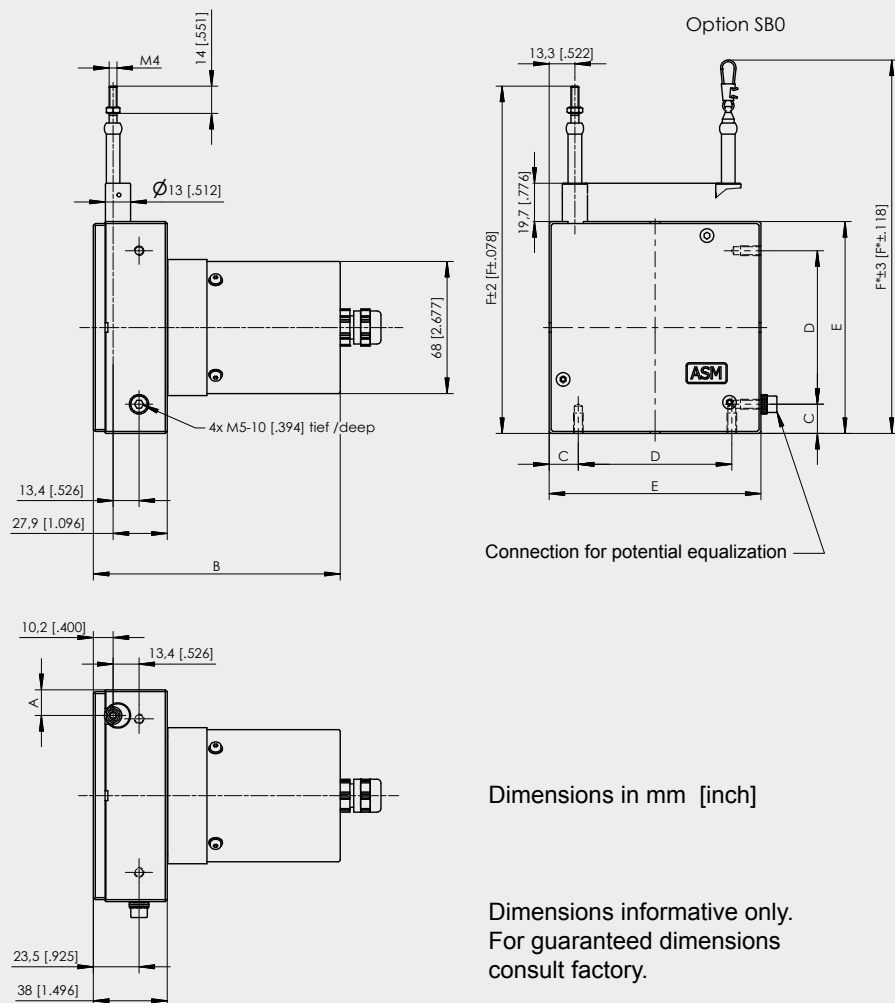
**Order example: WS12EX - 2500 - 420A - L10 - M4 - KAB2M**

**POSIWIRE®**  
**WS12EX**  
**Analog Output, Dust Explosion-Proof**



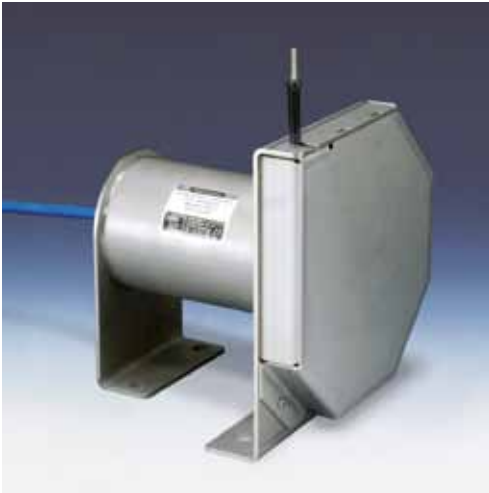
Cable forces, typical at 20 °C	Range	Max. pull-out force	Min. pull-in force
	[mm]	[N]	[N]
	100	5.2	2.8
	125	4.6	2.5
	500	5.9	2.6
	1000	5.5	2.4
	1250	4.8	2.1
	1500	10.4	6.4
	2000	8.1	5.0
	2500	6.7	4.0
	3000	6.2	3.0

**Outline drawing**



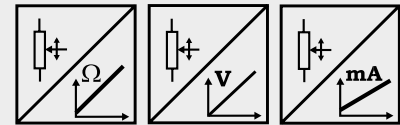
Dimensions in mm	Range	A	B	C	D	E	F	F*
	100; 500; 1000	18.3	112	14	43	71	141	154
125; 1250	14.5	112	14	43	71	141	154	
1500	10.7	127	14	43	71	141	154	
2000	21.5	127	15	79	109	179	192	
2500	13.3	127	15	79	109	179	192	
3000	9.2	127	15	79	109	179	192	

**POSIWIRE®**  
**WS100M**  
**Analog Output**



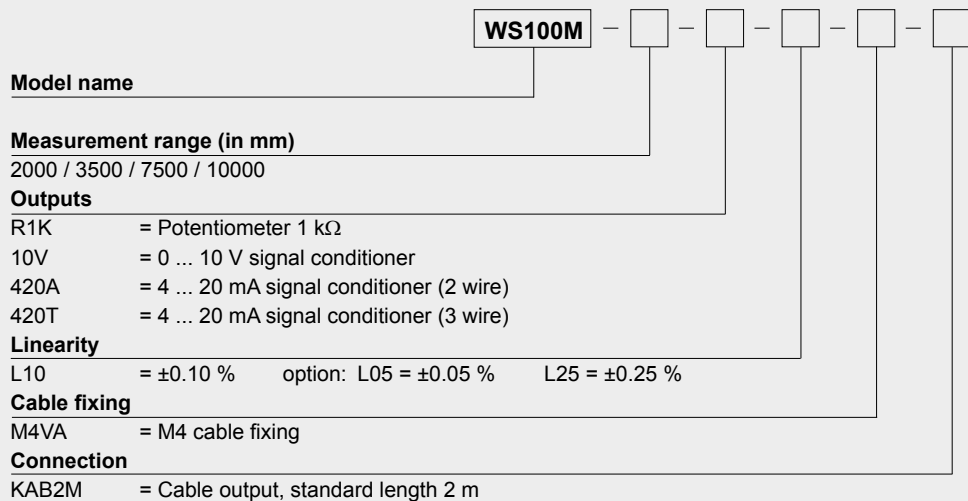
**Sensor for hostile environments and offshore applications**

- Protection class IP68/IP69K
- Measurement ranges 0 ... 2000 mm to 0 ... 10000 mm
- Analog output



<b>Specifications</b>	Outputs	Potentiometer 1 kΩ Voltage 0 ... 10 V Current 4 ... 20 mA, 2 or 3 wire
	Resolution	Essentially infinite
	Linearity	Up to ±0.05 % f.s.
	Sensing device	Hybrid precision potentiometer
	Material	Stainless steel; cable: stainless steel
	Protection class	IP68/IP69K
	Connection	Cable output, standard length 2 m
EMC, temperature	Refer to output specification	

**Order code WS100M**

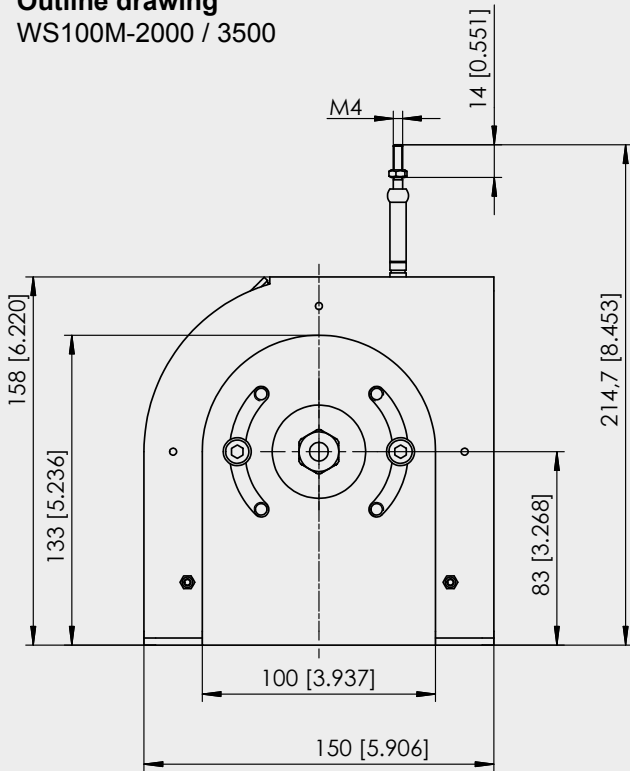


**Order example: WS100M - 7500 - 420T - L10 - M4VA - KAB2M**

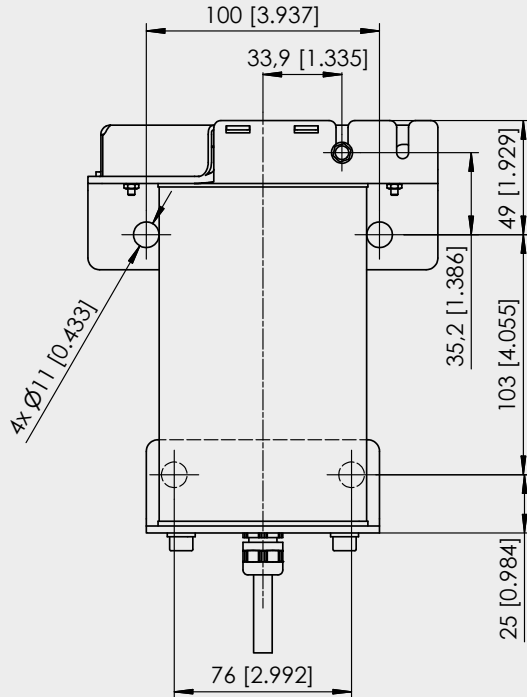
**POSIWIRE®**  
**WS100M**  
**Analog Output**



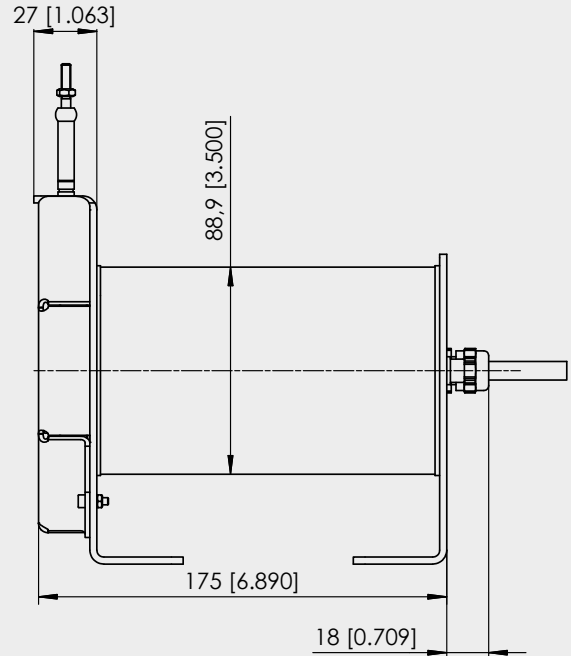
**Outline drawing**  
 WS100M-2000 / 3500



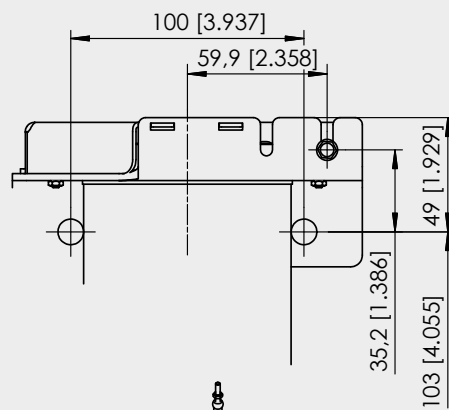
**Measurement range 2000 mm**



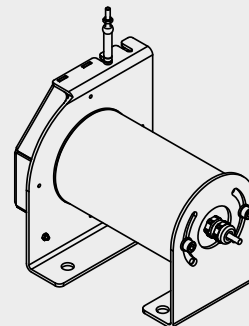
Dimensions in mm [inch]



**Measurement range 3500 mm**



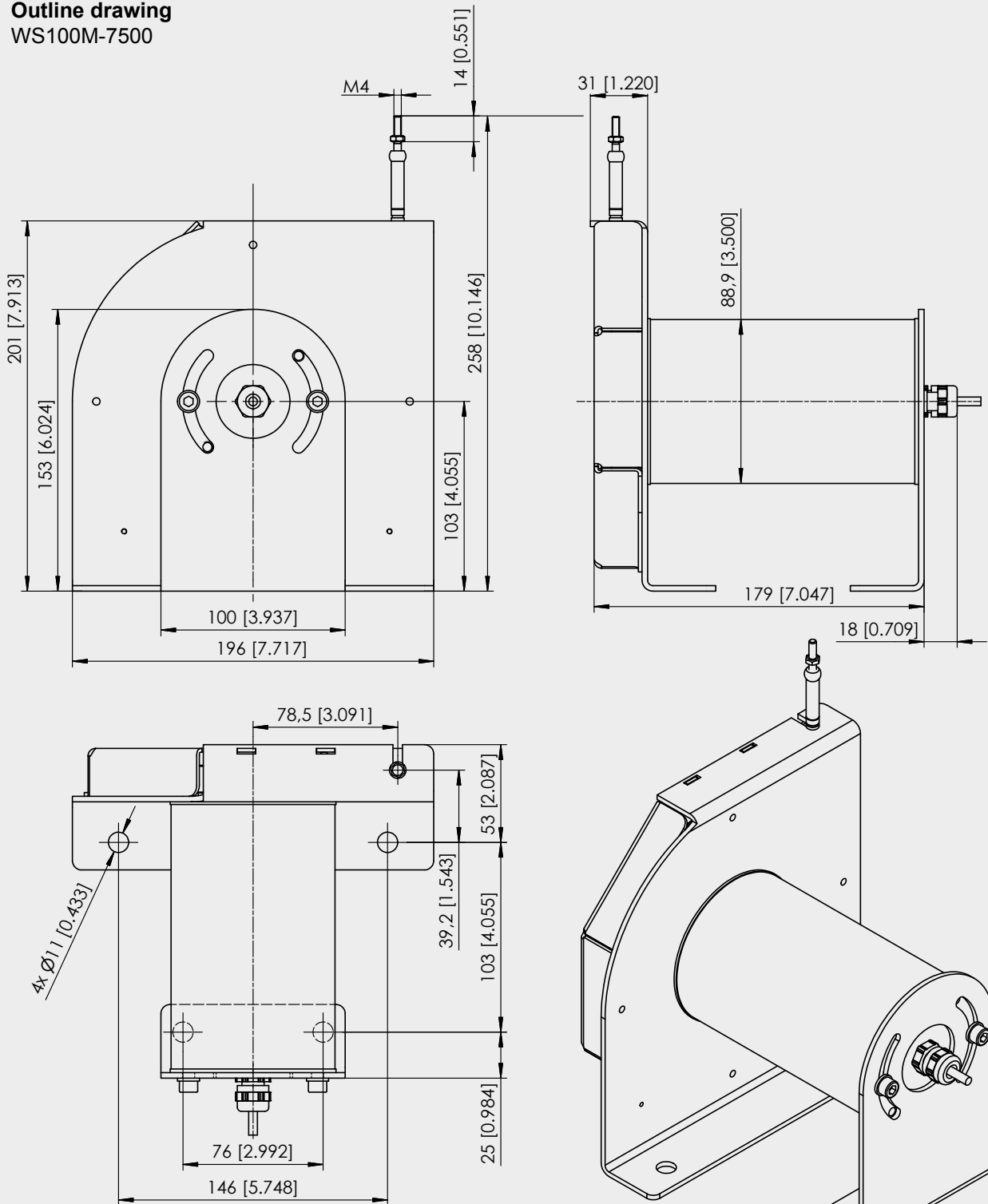
Dimensions informative only.  
 For guaranteed dimensions consult factory.



**POSIWIRE®**  
**WS100M**  
**Analog Output**



**Outline drawing**  
 WS100M-7500



Dimensions in mm [inch]

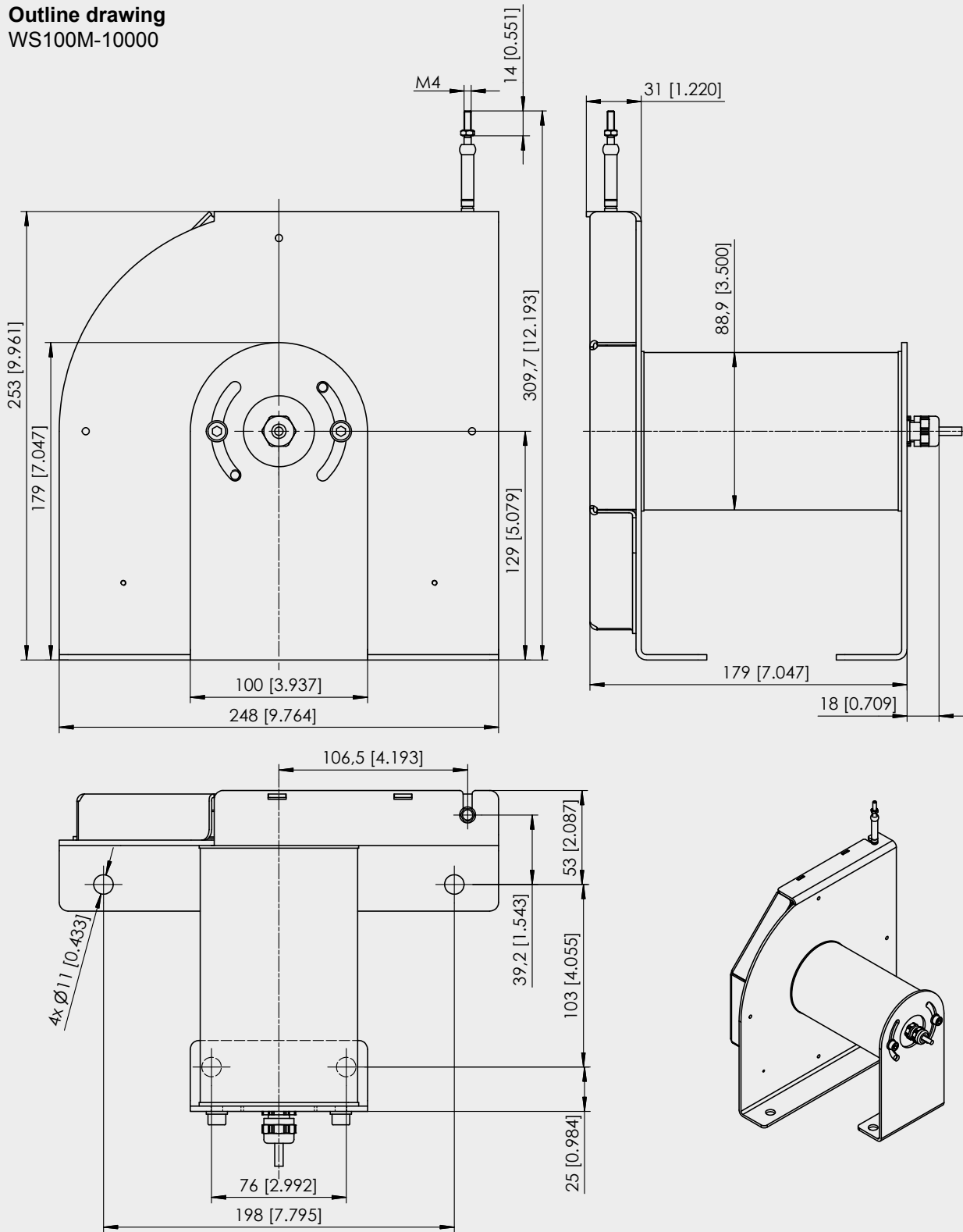
Dimensions informative only.  
 For guaranteed dimensions consult factory.



**POSIWIRE®**  
**WS100M**  
**Analog Output**



**Outline drawing**  
 WS100M-10000



Dimensions in mm [inch]

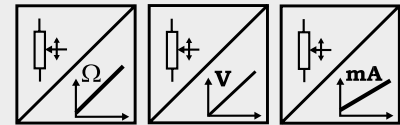
Dimensions informative only.  
 For guaranteed dimensions consult factory.

# POSIWIRE® WS31C Analog Output



## Compact OEM sensor for large order volumes

- Protection class IP50
- Economical design
- Compact outline
- Measurement range 0 ... 250 mm to 0 ... 750 mm
- Mounting optional with mounting brackets or spacer nuts with internal thread
- Analog output



Specifications	Outputs	Potentiometer 1 kΩ Voltage 0.5 ... 10 V Current 4 ... 20 mA, 2 wire
Resolution	Resolution	Essentially infinite
Linearity	Linearity	±0.35% f.s., other values on request
Sensing device	Sensing device	Precision potentiometer
Material	Material	Housing: plastic; cable drum: aluminum; cable: stainless steel
Protection class	Protection class	IP50
Connection	Connection	Cable output, standard length 2 m
Temperature	Temperature	-15 ... +60 °C, max. 85 % r. h., non condensing
Weight	Weight	Approx. 90 g
Pull-out force	Pull-out force	250 mm: 1.5 N 500 mm: 1.7 N 750 mm: 1.2 N
EMC	EMC	Refer to output specification

## Order code WS31C

### Model name

### Measurement range (in mm)

250 / 500 / 750

### Outputs

R1K = Potentiometer 1 kΩ

10V5 = Signal conditioner 0.5 ... 10 V

420A = Signal conditioner 4 ... 20 mA, 2 wire

### Linearity

L35 = ±0.35 %

Other values on request

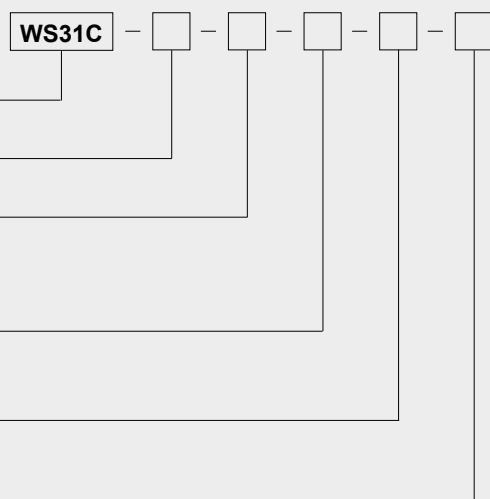
### Mounting

1 = Mounting brackets

2 = Spacer nuts

### Connection

KAB2M = Cable output, standard length 2 m

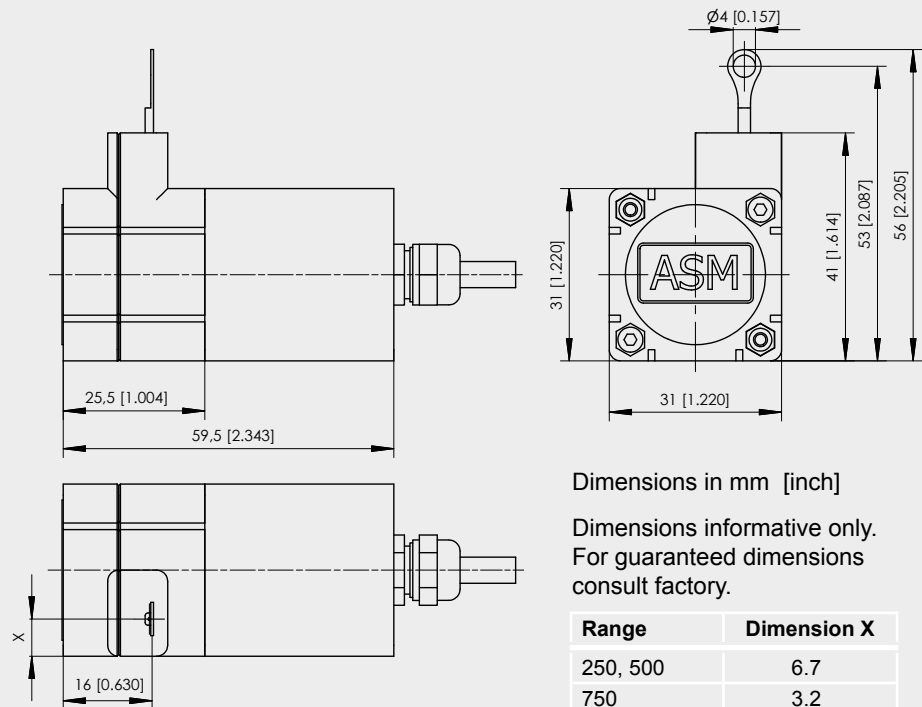


Order example: WS31C - 250 - 420A - L35 - 1 - KAB2M

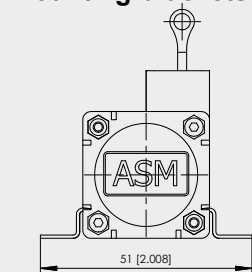
# POSIWIRE® WS31C Analog Output



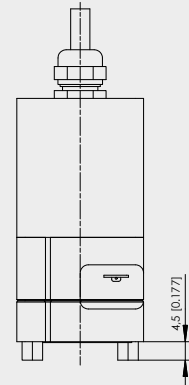
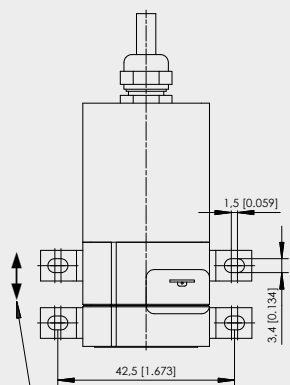
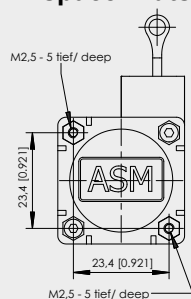
## Outline drawing



## Mounting with mounting brackets

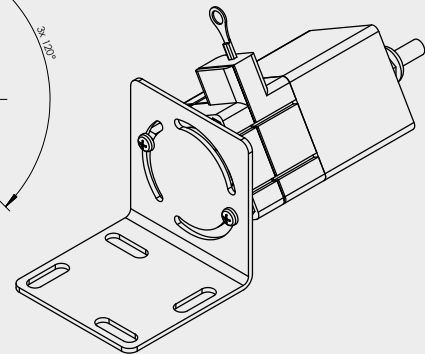
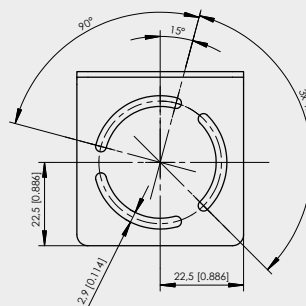
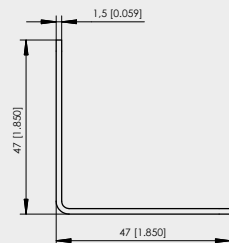
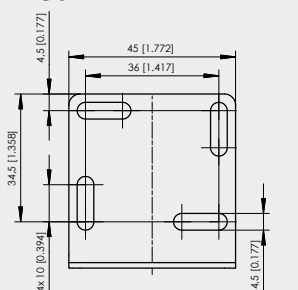


## Mounting with spacer nuts



All mounting brackets are moveable along the whole groove while not fixed

## Mounting bracket WS31-BFW1

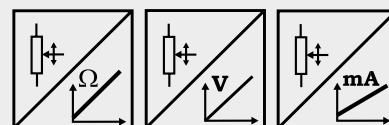


# POSIWIRE® WS42C Analog Output



## Compact OEM sensor for large order volumes

- Protection class IP50
- Economical design
- Compact outline
- Measurement range 0 ... 750 mm and 0 ... 1000 mm
- Mounting optional with mounting brackets or spacer nuts with internal thread
- Analog output



Specifications	Outputs	Potentiometer 1 kΩ Voltage 0.5 ... 10 V Current 4 ... 20 mA, 2 wire
Resolution		Essentially infinite
Linearity		±0.35% f.s., other values on request
Sensing device		Precision potentiometer
Material		Housing: plastic; cable drum: aluminum; cable: stainless steel
Protection class		IP50
Connection		Cable output, standard length 2 m
Temperature		-15 ... +60 °C, max. 85 % r. h., non condensing
Weight		Approx. 125 g
Pull-out force		750 mm: 2.5 N 1000 mm: 1.7 N
EMC		Refer to output specification

## Order code WS42C



### Model name

### Measurement range (in mm)

750 / 1000

### Outputs

R1K = Potentiometer 1 kΩ

10V5 = Signal conditioner 0.5 ... 10 V

420A = Signal conditioner 4 ... 20 mA, 2 wire

### Linearity

L35 = ±0.35 %

Other values on request

### Mounting

1 = Mounting brackets

2 = Spacer nuts

### Connection

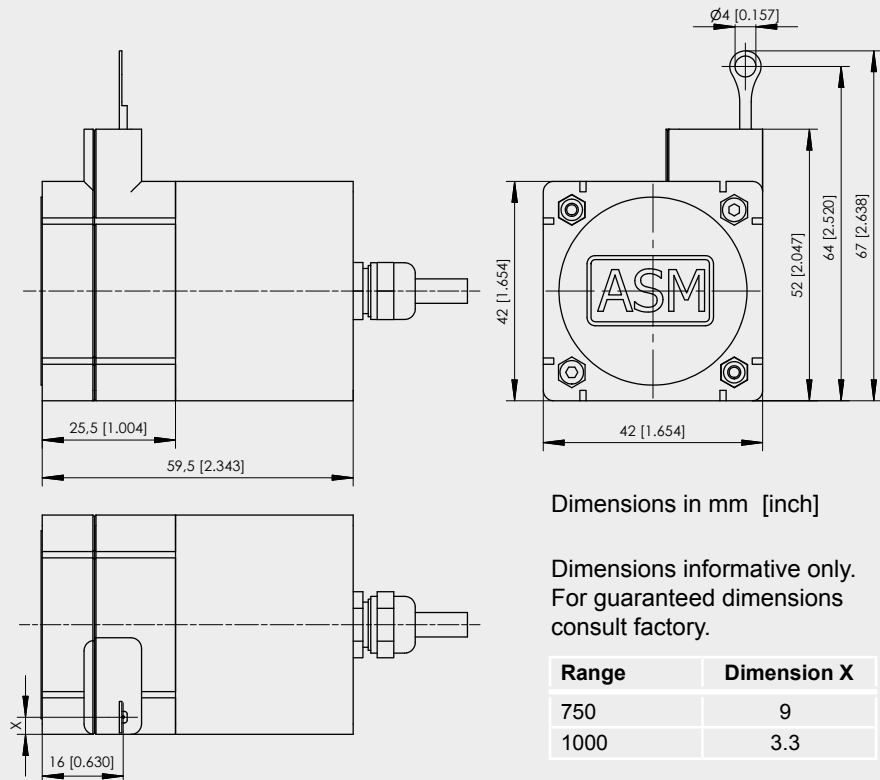
KAB2M = Cable output, standard length 2 m

Order example: WS42C - 750 - 420A - L35 - 1 - KAB2M

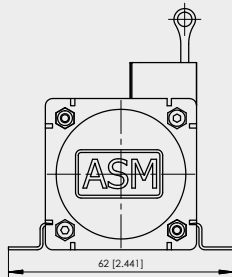
# POSIWIRE® WS42C Analog Output



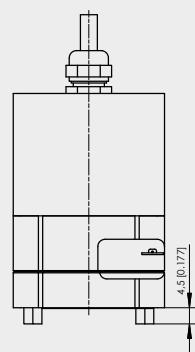
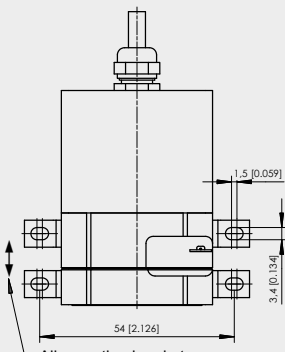
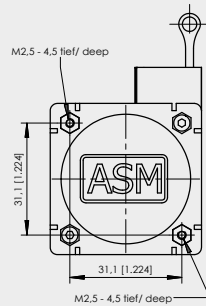
## Outline drawing



## Mounting with mounting brackets

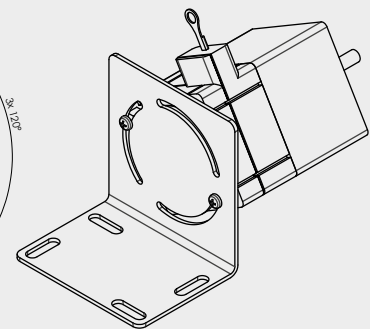
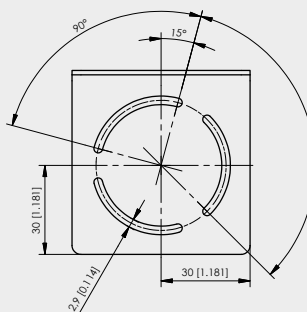
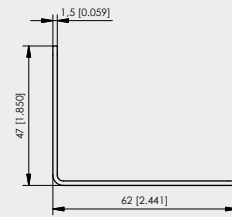
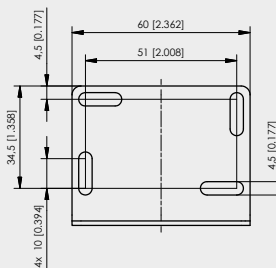


## Mounting with spacer nuts



All mounting brackets are  
moveable along the whole  
groove while not fixed

## Mounting bracket WS42-BFW1

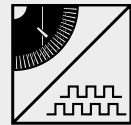


**POSIWIRE®**  
**WS31**  
**Incremental Encoder Output**



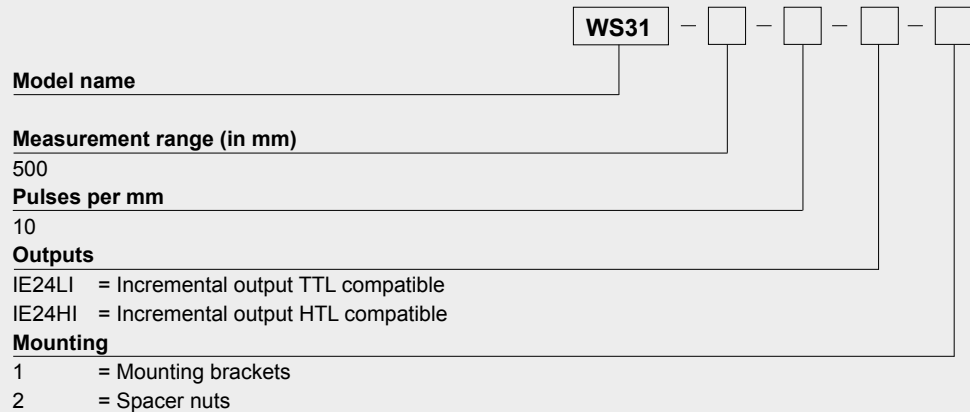
**Compact OEM sensor for large order volumes**

- Protection class IP50
- Economical design
- Compact outline
- Measurement range 0 ... 500 mm
- Resolution 10 pulses per mm
- Mounting optional with mounting brackets or spacer nuts with internal thread
- Incremental encoder output



Specifications		
Output	Incremental encoder	
Resolution	10 pulses per mm	
Linearity	±0.20% f.s., other values on request	
Sensing device	Incremental encoder	
Material	Housing: plastic; cable drum: aluminum; cable: stainless steel	
Protection class	IP50	
Connection	Cable output radial, length approx. 3 m	
Temperature	0 ... +60 °C, max. 85 % r.h., non condensing	
Weight	Approx. 95 g	
Pull-out force	1.5 N	
EMC	Refer to output specification	

**Order code WS31**

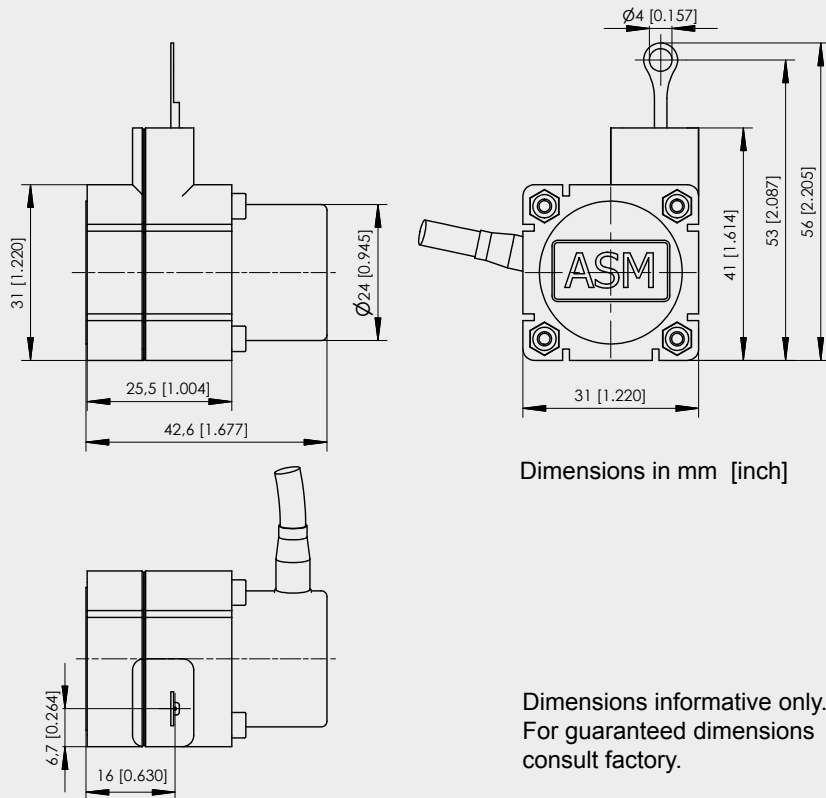


**Order example: WS31 - 500 - 10 - IE24HI - 1**

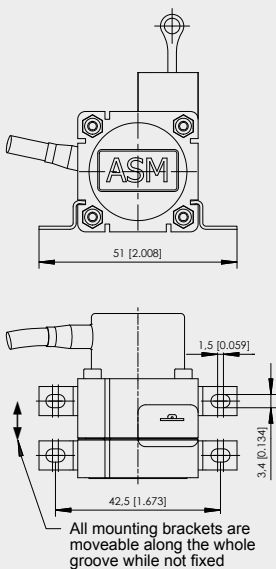
**POSIWIRE®**  
**WS31**  
**Incremental Encoder Output**



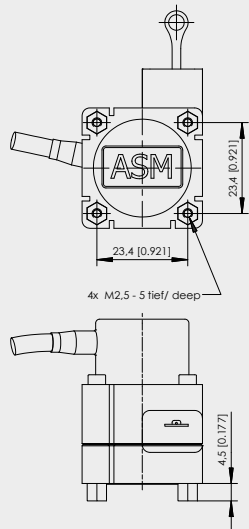
**Outline drawing**



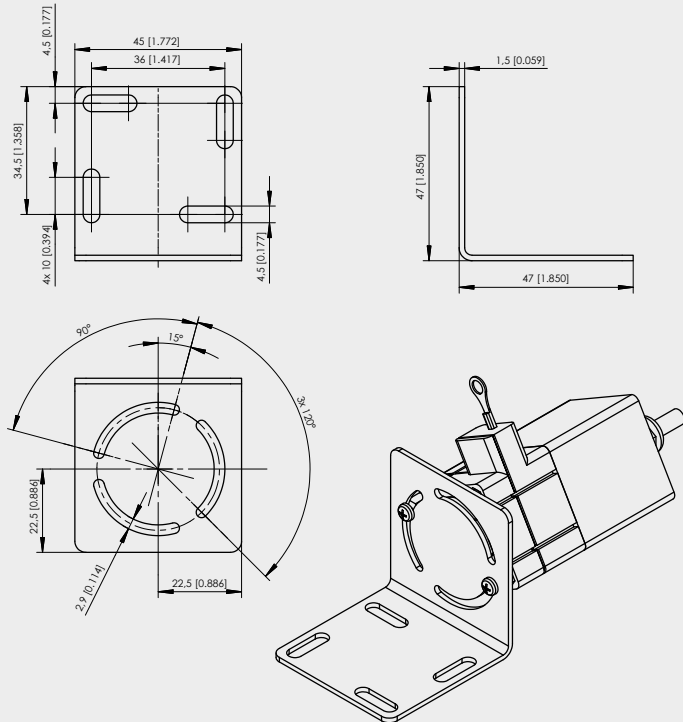
**Mounting with  
 mounting brackets**



**Mounting with  
 spacer nuts**



**Mounting bracket  
 WS31-BFW1**

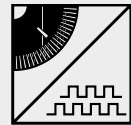


**POSIWIRE®**  
**WS42**  
**Incremental Encoder Output**



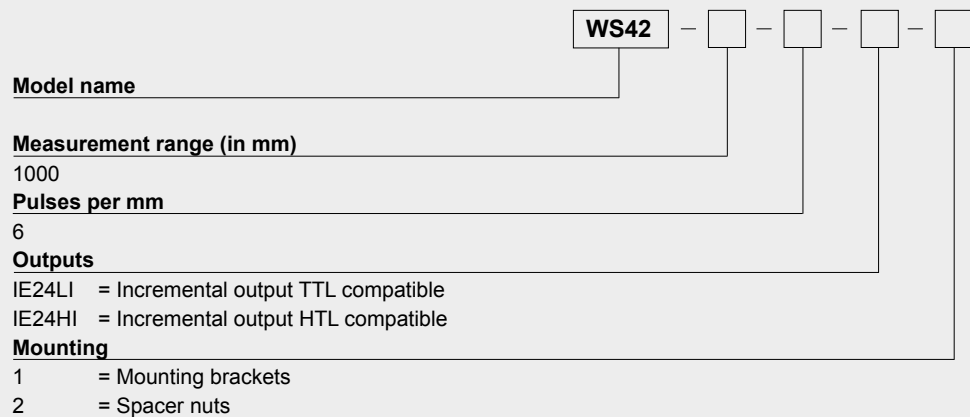
**Compact OEM sensor for large order volumes**

- Protection class IP50
- Economical design
- Compact outline
- Measurement range 0 ... 1000 mm
- Resolution 6 pulses per mm
- Mounting optional with mounting brackets or spacer nuts with internal thread
- Incremental encoder output



Specifications		
Output	Incremental encoder	
Resolution	6 pulses per mm	
Linearity	±0.20% f.s., other values on request	
Sensing device	Incremental encoder	
Material	Housing: plastic; cable drum: aluminum; cable: stainless steel	
Protection class	IP50	
Connection	Cable output radial, length approx. 3 m	
Temperature	0 ... +60 °C, max. 85 % r.h., non condensing	
Weight	Approx. 130 g	
Pull-out force	1.7 N	
EMC	Refer to output specification	

**Order code WS42**



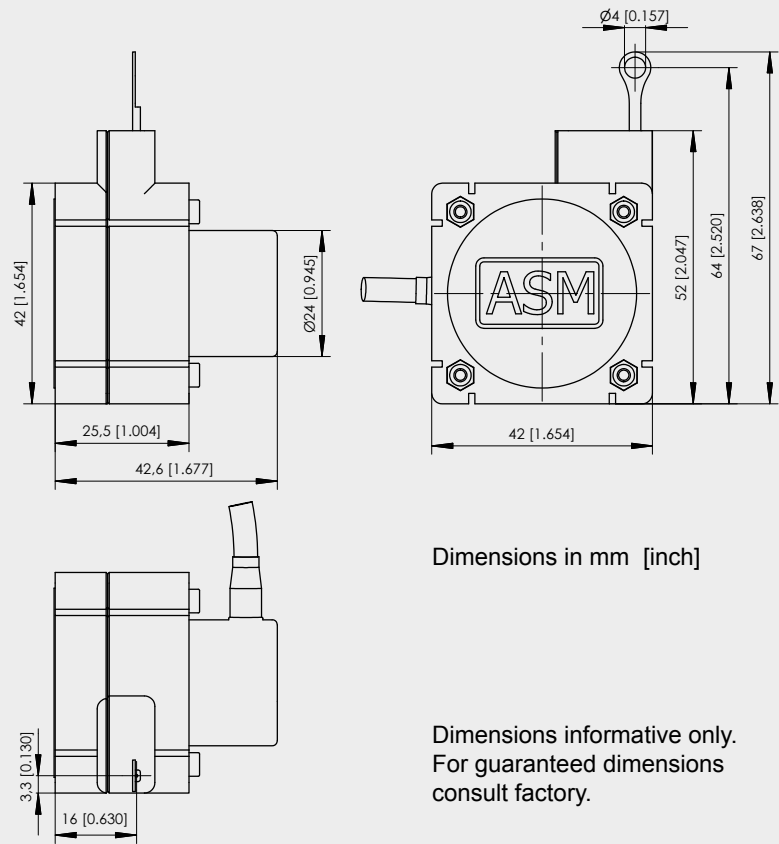
**Order example: WS42 - 1000 - 6 - IE24LI - 1**



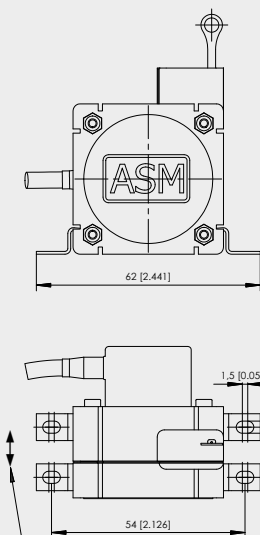
**POSIWIRE®**  
**WS42**  
**Incremental Encoder Output**



**Outline drawing**

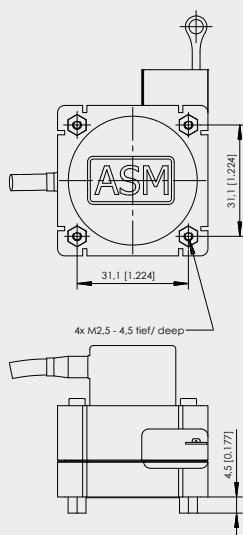


**Mounting with  
 mounting brackets**

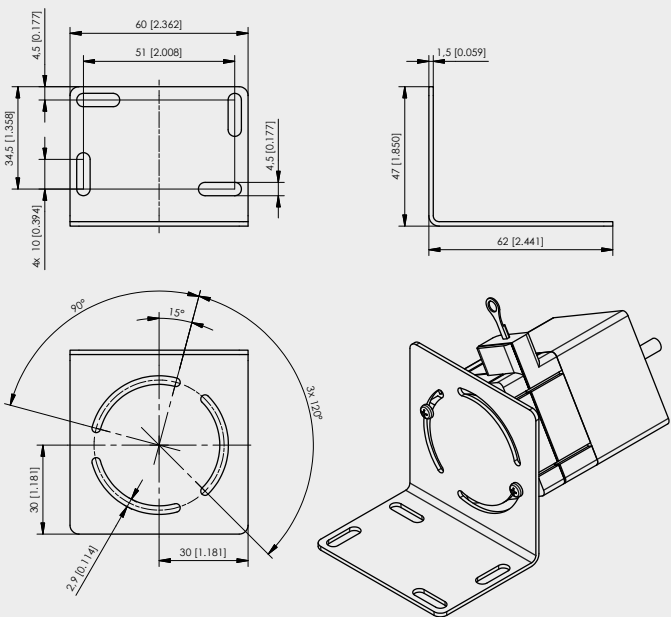


All mounting brackets are  
 moveable along the whole  
 groove while not fixed

**Mounting with  
 spacer nuts**



**Mounting bracket  
 WS42-BFW1**

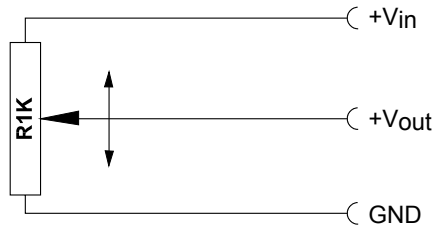


# POSIWIRE® R1K and 10V Analog Output



<b>Voltage divider R1K Potentiometer</b> 	Excitation voltage	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	-20 ... +85 °C

## Output signals



**Note:** The Potentiometer must be connected as a voltage divider. The input impedance of the following processing circuit should be 10 MΩ min.

<b>Signal conditioner 10V and 10V5 Voltage output</b> 	Excitation voltage	18 ... 27 V DC non stabilized
	Excitation current	20 mA max.
	Output voltage	<b>10V:</b> 0 ... 10 V DC; <b>10V5:</b> 0.5 ... 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	-20 ... +85 °C
	EMC	According EN 61326:2006

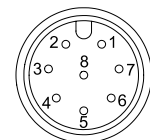
## Output signals



Signal wiring	Signal name 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

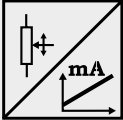
View to sensor connector



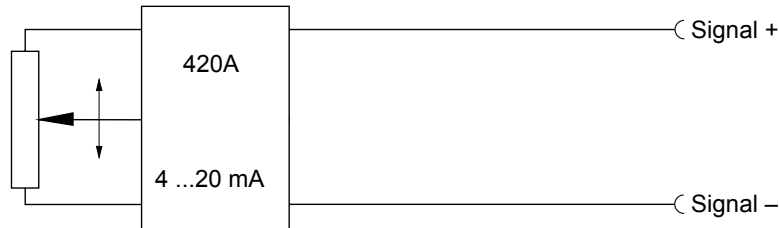
CONN-M12-8F

# POSIWIRE® 420A and 420T Analog Output



<b>Signal conditioner 420A</b> Current output (2 wire) 	Excitation voltage	12 ... 27 V DC non stabilized, 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>RMS</sub>
	Operating temperature	-20 ... +85 °C
	EMC	According to EN 61326:2006

## Output signals



<b>Signal conditioner 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 for 0 ... 100 % range
	Stability (temperature)	$\pm 50 \times 10^{-6} / ^\circ\text{C}$ f.s.
	Protection	Reverse polarity, short circuit
	Output noise	0.5 mV <sub>RMS</sub>
	Operating temperature	-20 ... +85 °C
	EMC	According to EN 61326:2006

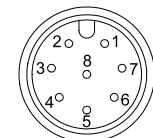
## Output signals



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

## Connection

View to sensor  
connector

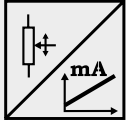
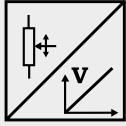


CONN-M12-8F

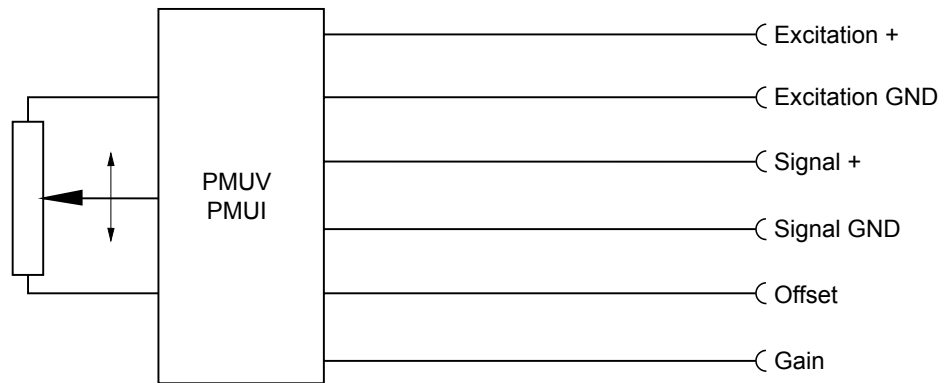
# POSIWIRE® PMUV / PMUI Programmable Analog Output



<b>Signal conditioner PMUV / PMUI</b> Voltage or current output (3 wire)	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 (3 wire)
	Working resistance	500 Ω max.
	Scaling	
	Activation of offset and gain adjust	Connect with excitation GND (0 V)
	Scalable range	90% max. f.s.
	Stability (temperature)	±50 x 10 <sup>-6</sup> / °C f.s.
Operating temperature	-20 ... +85 °C	
Protection	Reversed polarity, short circuit	
EMC	According to EN 61326:2006	



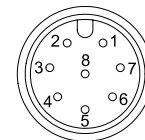
## Output signals



Signal name	Connector pin no.
Excitation +	1
Excitation GND	2
Signal +	3
Signal GND	4
Not used	5
Not used	6
Offset	7
Gain	8

## Connection

View to sensor  
connector

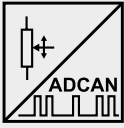


CONN-M12-8F

Signal name	Connector pin no.
Excitation +	1
Excitation GND	2
Not used	3
Not used	4
Signal +	5
Signal GND	6
Offset	7
Gain	8

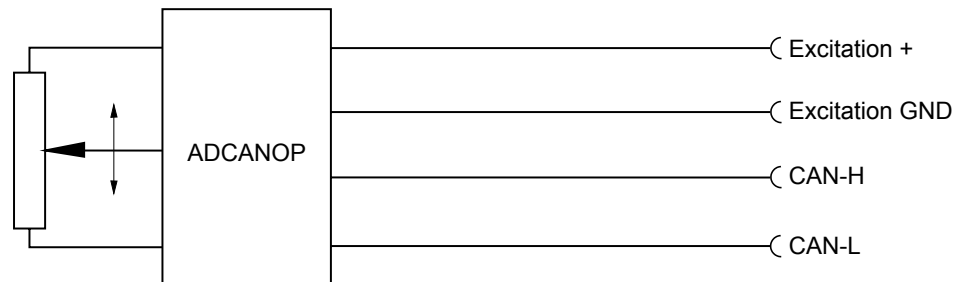
# POSIWIRE® ADCANOP A/D Converted CANopen Bus



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

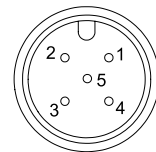
Specifications	Excitation voltage	8 ... 36 V DC
	Excitation current	Typ. 15/30 mA for 24/12 V, max. 100 mA
	Resolution	16 bit f.s.
	Measuring rate	1 kHz (asynchronous)
	Stability (temperature)	$\pm 50 \times 10^{-6}$ / °C f.s.
	Repeatability	1 LSB
	Operating temperature	-20 ... +85 °C
	Protection	Reverse polarity, short circuit
	Dielectric strength	1 kV (V AC, 50 Hz, 1 min.)
	Environment - EMC Automation	EN 61326:2006

## Signal diagram



View to sensor connector

Signal wiring / connection	Signal name	Connector pin no.
	Shield	1
	Excitation +	2
	GND	3
	CAN-H	4
	CAN-L	5



# POSIWIRE® PP530 Incremental Output

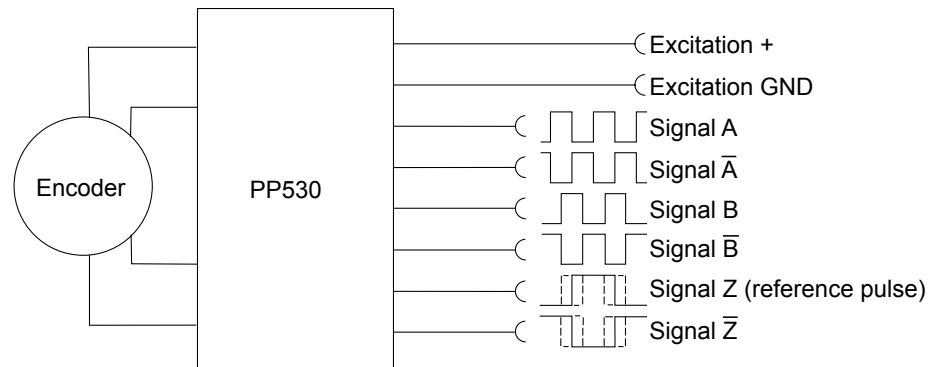


## Signal conditioner PP530 Incremental

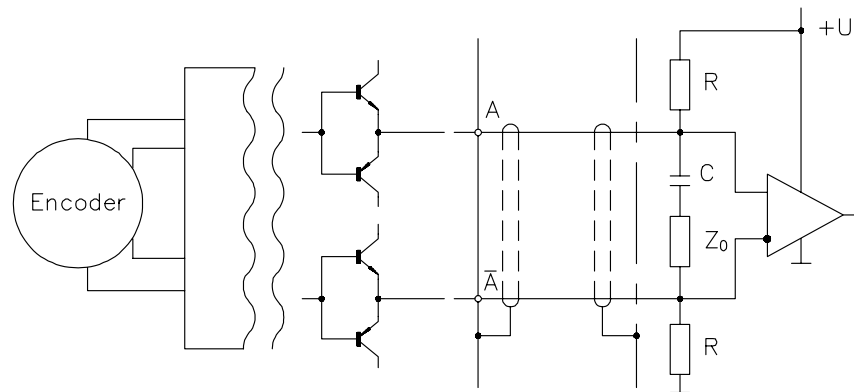


Excitation voltage	5 ... 30 V DC
Excitation current	25 mA typ. (w/o load), 200 mA max.
Output frequency	200 kHz max.
Output	Linedriver, Push-Pull, CMOS, TTL- and HTL-compatible
Output current	30 mA max.
Output voltage	Depends on the excitation voltage (e.g. to obtain TTL signals the excitation voltage must be 5 V). Compatible to EIA RS422/RS485
Saturation voltage high/low	$I_a < 10 \text{ mA}, U_B 5 \text{ V}/24 \text{ V}: < 0.5 \text{ V}$ $I_a < 30 \text{ mA}, U_B 5 \text{ V}/24 \text{ V}: < 1 \text{ V}$
Stability (temperature)	$\pm 20 \times 10^{-6} / ^\circ\text{C}$ f.s. (sensor mechanism)
Operation temperature	-10 ... +70 °C
Storage temperature	-30 ... +80 °C
Transition time positive edge	<200 ns
Transition time negative edge	<200 ns
Protection	Reverse polarity, short circuit
EMC	According to EN 61326:2006

## Signal diagram



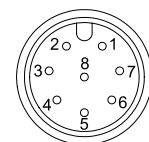
## Recommended processing circuit



## Signal wiring / connection

Output signal name	Connector pin no.
Excitation +	1
Excitation GND (0 V)	2
Signal A	4
Signal $\bar{A}$	6
Signal B (A + 90°)	3
Signal $\bar{B}$	5
Signal Z (reference pulse)	7
Signal $\bar{Z}$	8

## View to sensor connector



CONN-M12-8F

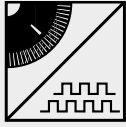
# POSIWIRE®

## IE24LI and IE24HI

### Incremental Output

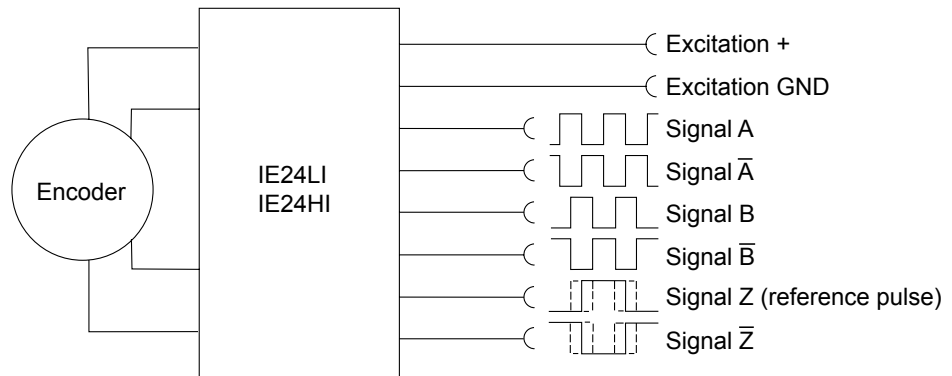


#### Signal conditioner IE24LI and IE24HI Incremental

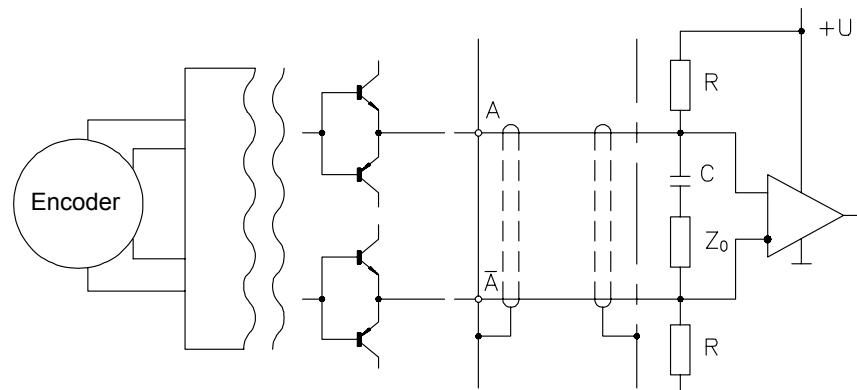


	IE24LI	IE24HI
Excitation voltage	5 V DC $\pm 10\%$	10 ... 30 V DC
Excitation current	100 mA max.	
Output frequency	200 kHz max.	
Output	Push pull and inverted signals	
Output current	10 mA max.	
Output voltage	Depending on the excitation voltage	
Stability (temperature)	$\pm 20 \times 10^{-6}$ / °C f.s. (sensor mechanism)	
Operating temperature	-20 ... +85 °C	
Protection	Short circuit	
EMC	According to EN 61326:2006	

#### Output signals



#### Recommended processing circuit



Signal wiring	Signal name	Cable color (WS31/42)
	Excitation +	Brown
	Excitation GND (0 V)	White
	Signal A	Green
	Signal A-bar	Yellow
	Signal B (A + 90°)	Gray
	Signal B-bar	Pink
	Signal Z (reference pulse)	Blue
	Signal Z-bar	Red

# POSIWIRE®

## IE41LI and IE41HI

### Incremental Output

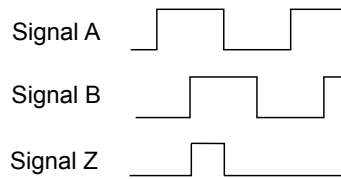


#### Signal conditioner IE41LI and IE41HI Incremental

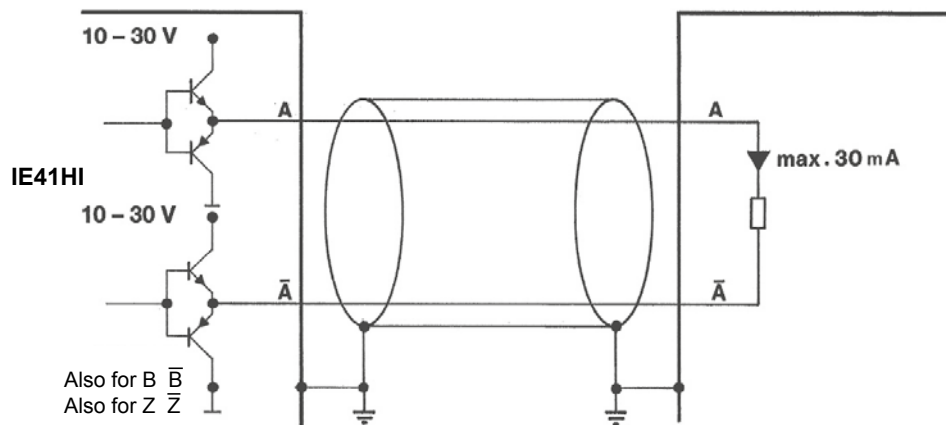
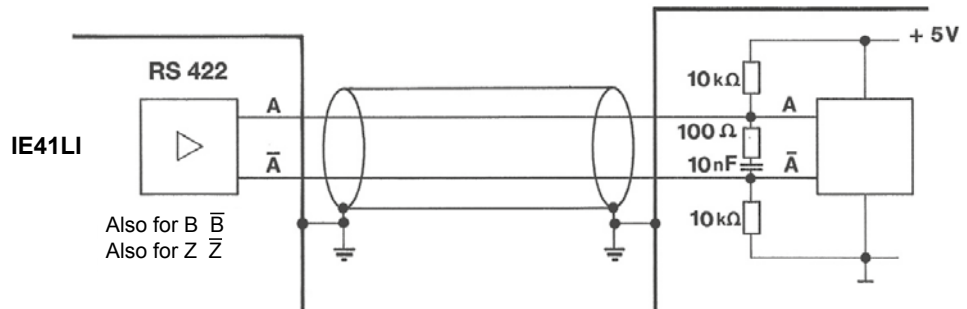


	IE41LI	IE41HI
Excitation voltage	5 V DC $\pm 10\%$	10 ... 30 V DC
Excitation current	150 mA max. w/o load	
Output frequency	300 kHz max.	200 kHz max.
Output	RS422	Push-pull antivalent
Output current	$\pm 30$ mA max.	30 mA
Output voltage	Depending on the excitation voltage	
Stability (temperature)	$\pm 20 \times 10^{-6}$ / °C f.s. (sensor mechanism)	
Operating temperature	-10 ... +70 °C	
Protection against short circuit	One channel for 1 s	Yes
EMC	According to EN 61326:2006	

#### Output signals



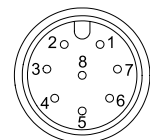
#### Recommended processing circuit



#### Signal wiring / connection

Signal name	Connector pin no. WS10	Connector pin no. WS12
Excitation +	1	1
Excitation GND (0 V)	2	2
Signal A	4	3
Signal $\bar{A}$	6	5
Signal B (A + 90°)	3	4
Signal $\bar{B}$	5	6
Signal Z (reference pulse)	7	7
Signal $\bar{Z}$	8	8

View to sensor  
connector




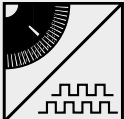
CONN-M12-8F



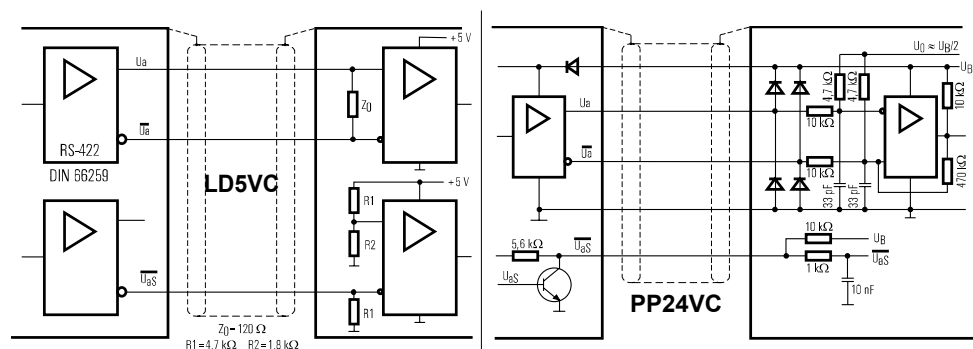
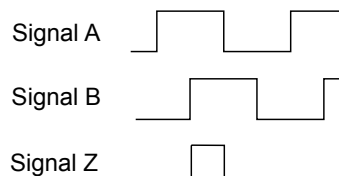
# POSIWIRE® LD5VC and PP24VC Incremental Output



<b>Signal conditioner LD5VC Incremental</b>  	Interface	Line driver RS422
	Excitation voltage	5 V DC $\pm 10\%$
	Excitation current	150 mA max. w/o load
	Output frequency	300 kHz max.
	Output current	20 mA per channel
	Signal level	
	Ud High at Id=20 mA	$\geq 2.5$ V
	Ud Low at Id=20 mA	$\leq 0.5$ V
	Transition time positive edge	<100 ns
	Transition time negative edge	<100 ns
	Stability (temperature)	$\pm 20 \times 10^{-6}$ / °C f.s. (sensor mechanism)
	Operation temperature	-20 ... +85 °C
	Protection	Short circuit, overvoltage
EMC	According to EN 61326:2006	

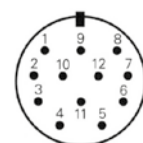
<b>Signal conditioner PP24VC Incremental</b>  	Interface	Push-pull line driver (24 V-HTL)
	Excitation voltage	10 ... 30 V DC
	Excitation current	150 mA max. w/o load
	Output frequency	300 kHz max.
	Output current	100 mA per channel
	Signal level	
	Ud High at Id=20 mA, Ub=24 V	$\geq 21$ V
	Ud Low at Id=20 mA, Ub=24 V	$\leq 2.8$ V
	Transition time positive edge	<200 ns
	Transition time negative edge	<200 ns
	Stability (temperature)	$\pm 20 \times 10^{-6}$ / °C f.s. (sensor mechanism)
	Operating temperature	-20 ... +85 °C
	Protection	Reverse polarity, short circuit, overvoltage
EMC	According to EN 61326:2006	

## Output signals



Signal name	CONN-CONIN-12F, connector pin no.
Excitation +	12
Excitation GND (0 V)	10
Signal A	5
Signal $\bar{A}$	6
Signal B (A + 90°)	8
Signal B	1
Signal Z (reference pulse)	3
Signal $\bar{Z}$	4
Fault detection signal $\bar{U}_{as}$	7
Shield	Housing

View to sensor connector



CONN-CONIN-12F

# POSIWIRE®

## ADSI16

### A/D Converted SSI Output

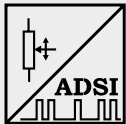


- Resolution 16 bit, synchronous serial data transmission/SSI
- Optional available with 12 bit (ADSI) or 14 bit (ADSI14) resolution
- No loss of data at power down
- Easy to connect to PLC's with SSI input circuitry

#### Description

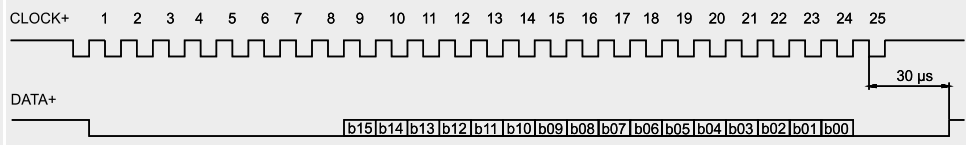
The sensing device of the ADSI is a precision potentiometer. The position information is given by an analog/digital converter output serialized as a data word. Data transmission takes place by means of the signals CLOCK and DATA. The processing unit (PLC, Micro-computer) sends pulse sequences which clock 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.

#### Signal conditioner ADSI16 A/D converted synchronous serial

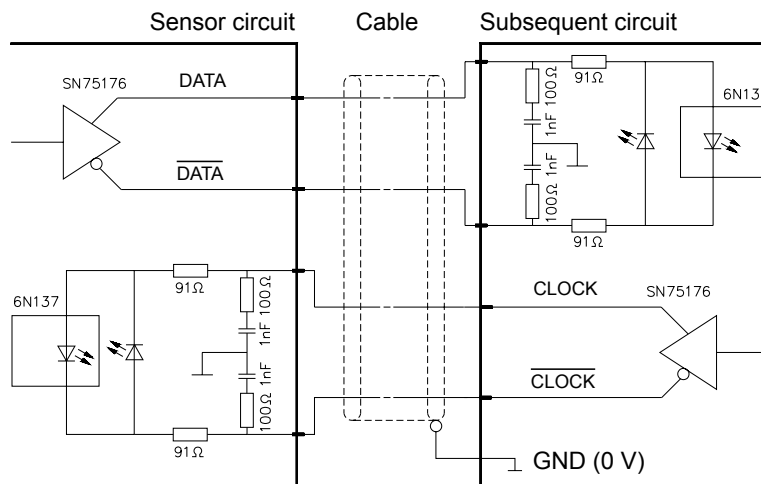


Interface	EIA RS422, RS485, short-circuit proof
Excitation voltage	11 ... 27 V DC
Excitation current	200 mA max.
Clock frequency	70 ... 500 kHz
Code	Gray code, continuous progression
Delay between pulse trains	30 µs min.
Resolution	16 bit (65536 counts) f.s.; optional 12 (ADSI) bit resp. 14 bit (ADSI14)
Stability (temperature)	±50 x 10 <sup>-6</sup> / °C f.s.
Operating temperature	-20 ... +85 °C
EMC	According to EN 61326:2006

#### Data format (train of 26 pulses)



#### Recommended processing circuit



#### Transmission rate

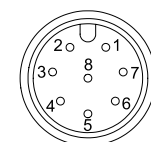
Cable length	Baud rate
< 50 m	< 300 kHz
< 100 m	< 100 kHz

#### Note:

Extension of the cable length will reduce the maximum transmission rate.

#### Signal wiring

Signal name	Connector pin no.
Excitation +	1
Excitation GND (0 V)	2
CLOCK	3
$\overline{\text{CLOCK}}$	4
DATA	5
$\overline{\text{DATA}}$	6
Shield	not connected



CONN-M12-8F


View to sensor  
connector

# POSIWIRE®

## HSSI

### Absolute SSI Encoder



<b>Signal conditioner</b> <b>HSSI</b> Absolute encoder synchronous serial 	Excitation voltage	10 ... 30 V DC
	Excitation current	100 mA
	Interface	Standard SSI
	Lines / drivers	Clock and data / RS422
	Code	Gray
	Resolution	12 + 12 Bit
	3 dB cutoff frequency	500 kHz
	Control input	$\overline{\text{Direction}}$
	Preset key	Zero adjustment with optical response
	Alarm output	Alarm bit (SSI option), warning bit
	Status LED	Green = OK, red = alarm
	Connection	12 pin male socket

<b>Data format</b>	<b>Resolution</b>	<b>Clock</b>												
		T1	T2	T3	...	T12	T13	...	T21	T22	T23	T24	T25	T26
		<b>Data bits</b>												
24 bit	M11	M10	M9	...	M0	S11	...	S3	S2	S1	S0	0		

Mx = multiturn bits, Sx = singleturn bits

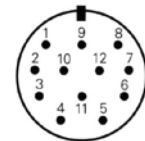
<b>Transmission rate</b>	<b>Cable length</b>	<b>Baud rate</b>	<b>Note:</b> Extension of the cable length will reduce the maximum transmission rate.
	< 50 m	< 400 kHz	
	< 100 m	< 300 kHz	
	< 200 m	< 200 kHz	
	< 400 m	< 100 kHz	

<b>Signal wiring</b>	<b>Signal name</b>	<b>Color</b>	<b>Connector pin no.</b>
	Excitation +	White	8
	Excitation GND (0 V)	Brown	1
	CLOCK	Yellow	3
	$\overline{\text{CLOCK}}$	Green	11
	DATA	Pink	2
	$\overline{\text{DATA}}$	Gray	10
	$\overline{\text{Direction}}$ *	Blue	5
	0 V Signal output	Black	12

\* Excitation + = cw increasing code, 0 V = cw decreasing code

### Connection

View to sensor  
connector



CONN-CONIN-12F

**POSIWIRE®**  
**HPROF**  
**Absolute Profibus Encoder**



**Interface HPROF**  
 Absolute encoder  
 Profibus



Excitation voltage	10 ... 30 V DC
Excitation current	250 mA
Interface	RS485
Protocol	Profibus DP with encoder profile C2
Resolution	12 (10 ... 14) + 12 bit
Output code	Binary
Baud rate	Automatically selected between 9,6 kBaud and 12 MBaud
Programmability	Resolution, preset, direction
Integrated special functions	Velocity, acceleration, operating time
Bus terminating resistor	Selectable via DIP switch
Connection	Bus cover with T manifold
EMC	EN 61326: class A

**Signal wiring**

Signal name	Cable terminal no. (bus cover)
U <sub>B</sub> in	1
0V in	2
U <sub>B</sub> out	3
0V out	4
B in	5
A in	6
B out	7
A out	8

# POSIWIRE®

## HINT

### Absolute Interbus Encoder



<b>Interface HINT</b> Absolute encoder Interbus 	Excitation voltage	10 ... 30 V DC
	Excitation current	250 mA
	Interface	Interbus, ENCOM profile K3 (configurable), K2
	Output code	32 Bit binary
	Baud rate	500 kBaud
	Data refresh	Every 600 µs
	Resolution	12 (10 ... 14) + 12 bit
	Programmability	Direction, preset, offset, resolution
	Connection	Bus cover with T manifold
	EMC	EN 50081-2, EN 50082-2

<b>Data format</b> Interbus K2/K3		Differential signals (RS485) ENCOM profile K3, K2, 32 Bit, binary process data				
	DT-Format	Supi address	0	1	2	3
	(according to the Phoenix company)	Byte No.	3	2	1	0
	ID code K2	36 H (= 54 dec.)				
	ID code K3	37 H (= 55 dec.)				

Signal wiring	Signal name	Cable terminal no. (bus cover)
		U <sub>B</sub> +
	GND	2
	DI1	3
	$\overline{DI1}$	4
	DO1	5
	$\overline{DO1}$	6
	DO2	7
	$\overline{DO2}$	8
	DI2	9
	$\overline{DI2}$	10
	RBST	11
	GND	12

# POSIWIRE®

## HDEV

### Absolute DeviceNet Encoder



#### Interface HDEV

Absolute encoder  
DeviceNet



Excitation voltage	10 ... 30 V DC
Excitation current	250 mA
Interface	CAN highspeed according to ISO/DIS 11898 CAN specification 2.0 A (11 bit identifier)
Protocol	DeviceNet according rev. 2.0, programmable encoder
Resolution	12 (10 ... 14) + 12 bit
Output code	Binary
MAC-ID	Selectable via DIP switch
Data refresh	Every 5 ms
Baud rate	Selectable via DIP switch: 125 kBaud, 250 kBaud, 500 kBaud
Programmability	Resolution, preset, direction
Bus terminating resistor	Selectable via DIP switch
Connection	Bus cover with T manifold
EMC	EN 50081-2, EN 50082-2

#### Recommended transmission

Characteristic impedance	135 ... 165 $\Omega$ (3 ... 20 MHz)
Operating capacity	< 30 pF
Loop resistance	< 110 $\Omega$ /km
Wire diameter	> 0.63 mm
Wire width	> 0.34 mm <sup>2</sup>

#### Transmission rate


Segment length	Kbit/s
500 m	125
250 m	250
100 m	500

#### Signal wiring

Signal name	Cable terminal no. (bus cover)
U <sub>b</sub> in	1
0V in	2
CAN-L	3
CAN-H	4
Drain	5
Drain	6
CAN-H	7
CAN-L	8

**POSIWIRE®**  
**HCAN/HCANOP**  
**Absolute CAN / CANopen Encoder**



<b>Interface</b> <b>HCAN/HCANOP</b> Absolute encoder CANopen/CAN Layer 2 	Excitation voltage	10 ... 30 V DC
	Excitation current	250 mA
	Interface	CAN highspeed according to ISO/DIS 11898
	Protocol	CANopen according DS301 with encoder profile DSP406, programmable encoder according class C2
	Resolution	12 (10 ... 14) + 12 bit
	Output code	Binary
	Data refresh	Every millisecond (selectable), on request
	Baud rate	Selectable 10 up to 1000 kbit/s
	Base identifier	Selectable via DIP switch
	Programmability	CANopen: direction, resolution, preset, offset CAN L2: direction, limit values
	Integrated special functions	CANopen: velocity, acceleration, rotary axis, limit values CAN L2: direction, limit values
	Connection	Bus cover with T manifold
	EMC	EN 50081-2, EN 50082-2

Signal wiring	Signal name	Cable terminal no. (bus cover)
	U <sub>B</sub> in	1
	0V in	2
	CAN in – (dominant L)	3
	CAN in + (dominant H)	4
	CAN GND in	5
	CAN GND out	6
	CAN out + (dominant H)	7
	CAN out – (dominant L)	8
	0V out	9
	U <sub>B</sub> out	10

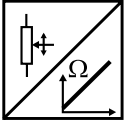
# POSIWIRE®

## R1K and 10V

### Output Information for WS Position Sensors

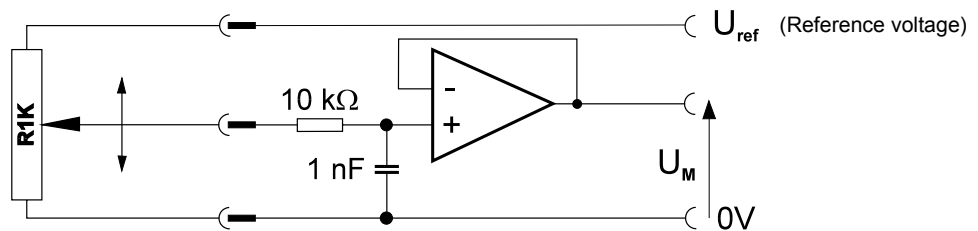


#### Voltage divider R1K Potentiometer

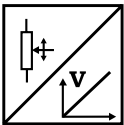


The output signal is the ratiometric voltage of a potentiometer. The potentiometer is supplied by a reference voltage source. The ratio of the output signal to the reference voltage is proportional to the measuring cable extension. For optimum performance of the sensor 94% (3% to 97%) of the potentiometers total span is used for the specified measurement range. Provision for setting the electrical zero and voltage amplification must be made in the subsequent signal processing circuit. To avoid linearity error the output load should be as low as possible. Therefore the input impedance of the processing circuit must be  $\geq 10\text{ M}\Omega$ .

#### Processing of the output signal

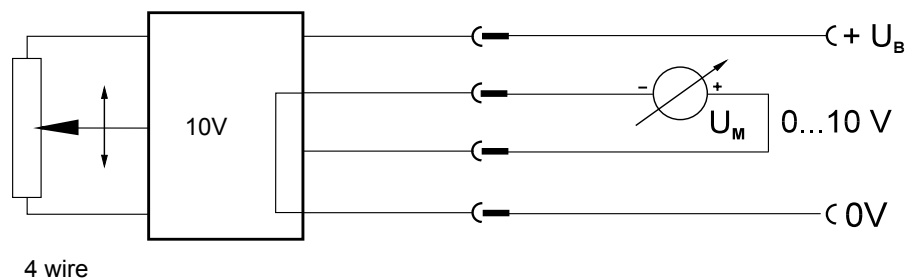
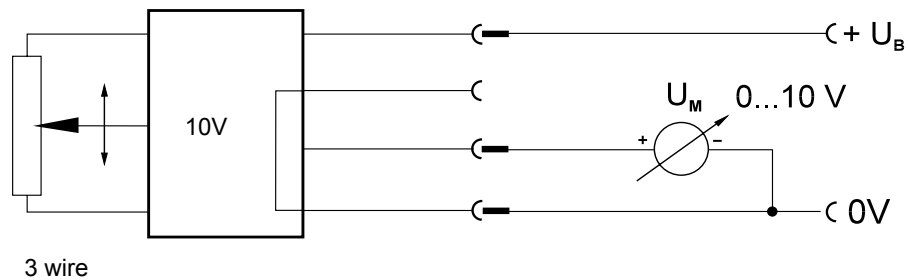


#### Voltage output 10V 0 ... 10 V



This output signal is 0 to 10 Volts proportional to the measuring cable extension of 0 to 100%. This is an industry standard output which is widely accepted because of its simple signal processing and suitability for all display, recording and automation systems. For analog signal processing the voltage output is the proven best choice, e.g. for Waveform Analyzers, Data Loggers and for analog and digital Oscilloscopes. ASM's 0...10 V output supports a wide range of excitation voltages and is well protected against electromagnetic interference.

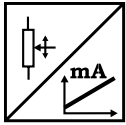
#### Processing of the output signal



The above information is provided as a user guide only and is not part of our specific technical product data.

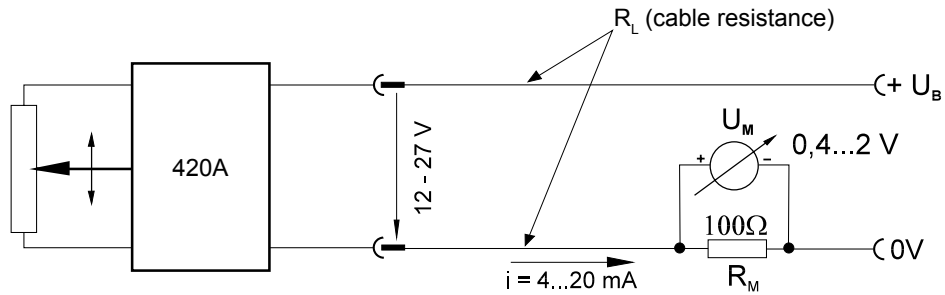


**Current output 420A**  
4 ... 20 mA (2 wire)

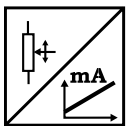


This output signal is a 4 to 20 mA current loop proportional to the measuring cable extension of 0 to 100%. It is an industry standard two-wire system for the transmission of measured values. The current loop is both measurement signal and sensor excitation current. The measured value is represented as a voltage drop across a load resistor  $R_M$ . The current is constant and the signal cable resistance ( $R_L$ ) will have no effect on the measured value. Therefore long signal cables can be used, limited only by the cable resistance (impedance). Signal cable disconnection or failure can be detected by a 0 mA current signal.

**Processing of the output signal**

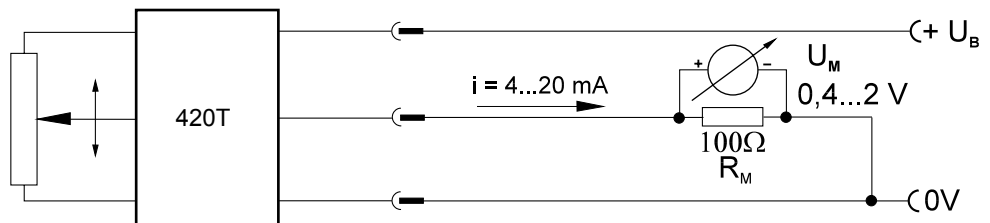


**Current output 420T**  
4 ... 20 mA (3 wire)



This output signal is a 4 to 20 mA current loop (alternatively 0 to 20 mA) proportional to the measuring cable extension of 0 to 100%. The 3 wire current loop system is especially resistant to electromagnetic interference because of the separate sensor excitation and the low resistance (impedance) of the signal processing electronics. As in the two-wire system the measured value is represented as a voltage drop across a load resistor  $R_M$  and is, within limits, independent of the cable resistance (impedance).

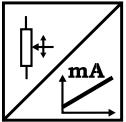
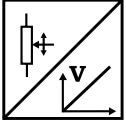
**Processing of the output signal**



The above information is provided as a user guide only and is not part of our specific technical product data.

**Signal conditioner  
PMUV/PMUI, adjustable**

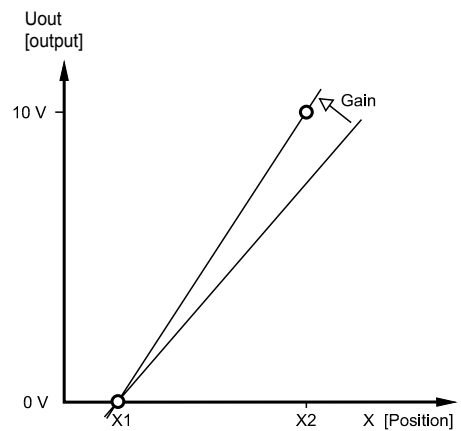
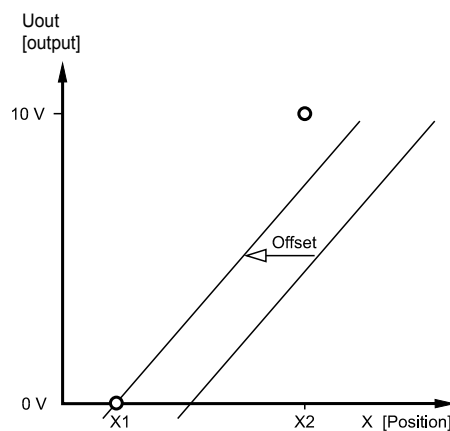
Voltage or  
current output



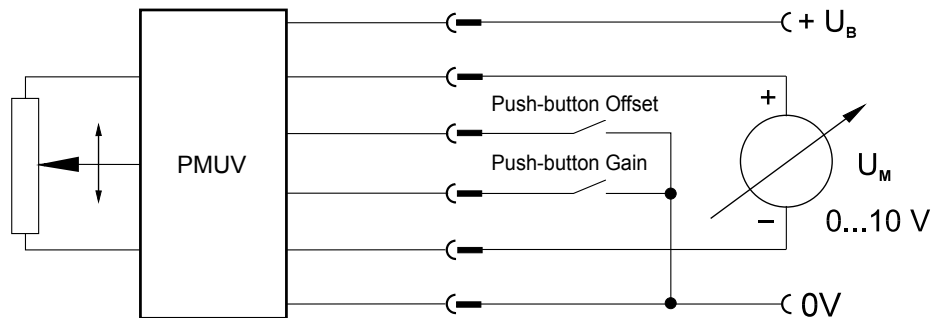
**Adjustment of  
the minimum and  
maximum value**

The signal conditioner PMU has voltage **or** current output. The minimum and maximum output values can be adjusted by using the two push-buttons **Offset** and **Gain**.

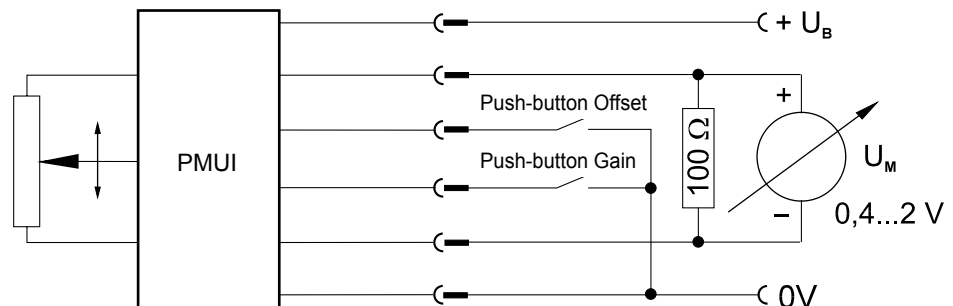
Setting up procedure: Move the sensor to the required start (zero) position and depress and release the **Offset** pushbutton. The signal conditioner will be adjusted automatically to the 0 V or 4 mA output level. Using a similar procedure, move the sensor to the full scale position, depress and release the **Gain** pushbutton, and the signal conditioner will automatically be adjusted for full scale output.



**Suggested output  
circuit PMUV  
(0 ... 10 V)**



**Suggested output  
circuit PMUI  
(4 ... 20 mA)**



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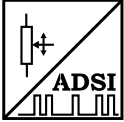
# POSIWIRE®

## ADSI, SSI, IExxLI / IExxHI and RS232

### Output Information for WS® Position Sensors



**ADSI16**  
A/D converted  
synchronous  
serial output



The sensing device of the ADSI16 is a precision potentiometer. The position information is given by the analog/digital converter output as a data word. The 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 at 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.

ADSI16 is the cost-effective solution where a synchronous serial interface with a high transmission rate is required. It can be connected to all automation systems with SSI input circuits.

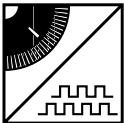
**SSI**  
Absolute encoder  
with synchronous  
serial output



The sensing device of the SSI is a 24-bit absolute multiturn encoder. Parallel information is fed into a shift register and the processing unit (PLC, Microcomputer) sends pulse sequences which clock the shift register at the required transfer rate. With the first falling edge of the pulse sequence the position of the sensor is recorded and stored. The following rising edges control the bit-by-bit transmission of the data word. After a delay time the next new position information will be transmitted.

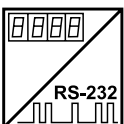
The SSI synchronous serial interface is an industry standard output and is supported by most suppliers of automation systems.

**IExxLI and IExxHI**  
Incremental output



The cable extension is measured and incrementally transmitted as a sequence of square pulses. Output signals A, B in quadrature format are provided. After switching on the power the signal processing circuit can be synchronised by a periodic index (reference) pulse Z and/or a reference switch placed along the measurement range of the sensor. Because of the direct digitising and the delay-free transmission of the measured value this output is particularly good for positioning applications with high resolution requirements. Depending on the excitation voltage the output levels are compatible with TTL/RS-422 or HTL.

**RS-232**  
Serial interface



ASM Position Sensors can be connected to a PC, a Laptop or a process automation system by using them in conjunction with the ASM Process Meters PRODIS-ADC or PRODIS-INC which all have an RS-232 Interface. Data transmission is easily achieved with ASCII commands from any computer with standard terminal programs or from all common programming languages.

**Electromagnetic interference and cabling**

Screened cables should always be used for the sensors electrical connection. If the GND (Common) connection between the sensor and signal processing unit is not of a low resistance or different reference potentials exist then the common cable screen should only be connected at the signal processing unit end. To limit high frequency effects on sensors and signal cables the common screen should be connected at both ends and a separate GND connection between the sensor and signal processing unit must be installed. If a separate ground connection is not possible, then only one end of the cable screen should be connected to avoid current flow in the cable screen.

The above information is provided as a user guide only and is not part of our specific technical product data.

# POSIWIRE® Calibration Data for WS® Position Sensors

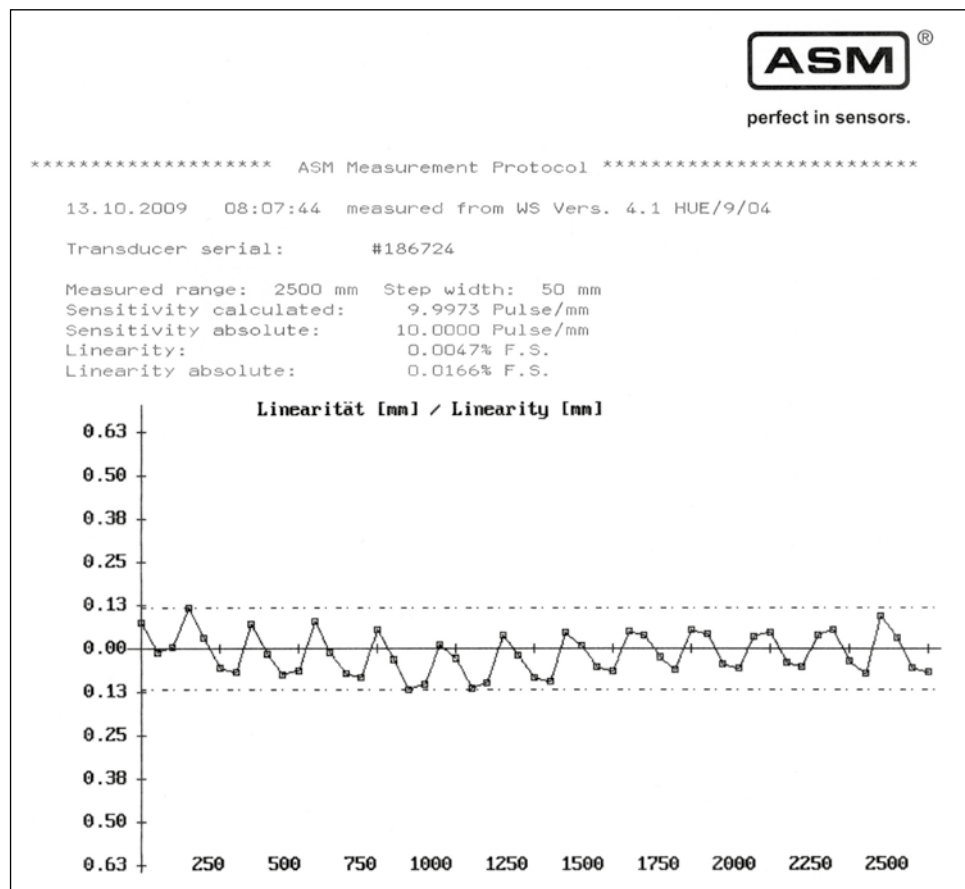


**Measurement protocol document and manufacturers test certificate (ISO9001)**

ASM carries out a full and complete calibration procedure on all new position sensors manufactured to ensure all units meet the required performance parameters and to maintain the highest quality standards. Each sensor is checked using state-of-the-art measuring equipment which is fully traceable to national standards. All test results are recorded. A **Measurement Protocol Document** and a **Manufacturers Test Certificate** can be issued for each sensor supplied to a customer. Both can be ordered with a new sensor or will be supplied when the sensor is re-tested. The recommended re-test period is 1 year.

**Measurement protocol document (linearity)**

A minimum of 50 measurement values are recorded at equidistant points along the sensors measurement range. These values are then processed to show the ideal "best-fit" line. The "best-fit" line and the measured values are shown on the graph. The sensitivity and linearity results are printed above the graph.



**Order code measurement protocol document**

MESSPROTOKOLL - WS -  -  MM

**Language**  
 D = German / E = English

**Measurement range up to (mm)**  
 1250 / 2500 / 5000 / 25000

**Order example: MESSPROTOKOLL - WS - E - 5000MM**

**POSIWIRE®**  
**Calibration Data**  
**for WS® Position Sensors**



**Manufacturers test certificate**

The Manufacturers Test Certificates produced by ASM meet the requirements of quality control standards ISO 9001, etc. The measurement system used and its traceability to national standards are fully described on the certificate and a record of all 50 measurement values is provided.

<b>ASM-Calibration Certificate Nr.: 2009231692</b> Position Transducers WS/WGS - Protocol and Test Results -		
<b>Type of transducer:</b>	WS17KT-2500-420T-L05-M4-M12	
<b>Serial:</b>	WS0923269497	
<b>Order No.:</b>	KA072412	
<b>Company:</b>	Example, Inc.	
<b>Calibration instruments:</b>		
Stepping motor unit with crystal controlled timebase.	ASM No.:	08/001
Precision linear module	Accuracy:	25µ/300mm
Calibrated with Renishaw Laserinterferometer ML 10	SN:	H24152
Certificate of Calibration No.:		H24152-100304/1
Keithley DVM 2000 Certificate of Calibration No.:		E11713 DKD-K-05352 09-04
<b>Environmental:</b>		
Temperature:	23°C ± 4°C	Humidity: 60 % ± 20 %
<b>Calibration procedure:</b>		
The transducer cable is moved over at least 90% of its measurement span. At least 50 points are measured and stored in the computer. The sensitivity of the best fitting line and the corresponding linearity error is calculated and printed. The accuracy is calculated and printed (Not with R1K). A linearity diagram is also printed.		
<b>Result:</b>		
Sensitivity of best fitting line:	0,0064 mA/mm	
Specified Sensitivity: (not noted with R1K)	0,0064 mA/mm	
Linearity: (related to best fitting line)	0,0282 % of F.S.	
Accuracy: (not noted with R1K)	0,0302 % of F.S.	
<b>Specified accuracy: 0.05 % of full scale</b>		
1 measurement protocol is attached to this certificate		
Date of issue: 15.10.2009	Person responsible: i. A. Hünemörder <i>i.A. Hünemörder</i>	

**Order code manufacturers test certificate**

ZERTIFIKAT -  -  -  MM

**Sensor type**

WS = POSITION

**Language**

D = German / E = English / F = French

**Measurement range up to (mm)**

1250 / 2500 / 5000 / 25000

**Order example: ZERTIFIKAT - WS - E - 2500MM**

# POSIWIRE®

## Mounting hints

### for WS® Position Sensors



#### Cable fixing

#### CAUTION!

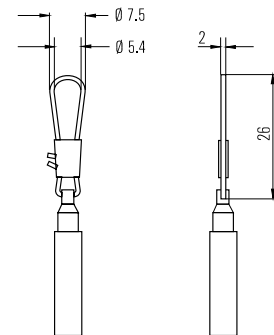
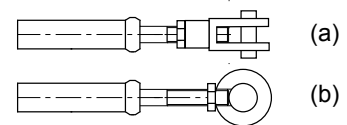
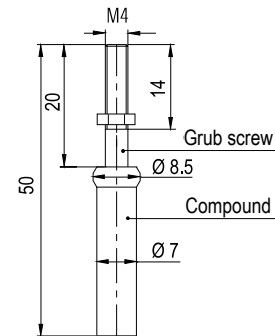
Snap back of the measuring cable during sensor mounting must be avoided or the sensor may be damaged!

#### Cable fixing M4 (standard)

The M4 connection consists of a M4 grub screw with locknut and a compound sleeve as cable stop block. The compound sleeve reduces the risk of cable breakage as far as possible during an uncontrolled cable return. In addition corrosion is prevented between the cable crimp and the stop block. Connection to the moving part of the machine or system is made with a through hole and a M4 nut.

**Note:** Do not screw the M4 connection itself into a stationary object, otherwise the measuring cable will be twisted!

The M4 cable connection is easy to use, it can be combined with the GK1 attachment head (a) or with a fastening eye (b) OE1 (accessories).

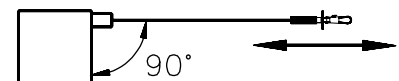


#### Cable clip SB0 (option)

The cable clip consists of a rotatable steel clip and an compound sleeve. Connection to the moving part of the machine or system is made with an M5 set screw (Allen screw) preferably using the GK1/GK2 attachment head. The steel cable clip can be opened for easy fixing.

#### Cable alignment

When mounting the WS Position Sensor, linear travel of the cable must be at 90° to the sensor body face on which the cable outlet is situated (see diagram).



#### Important:

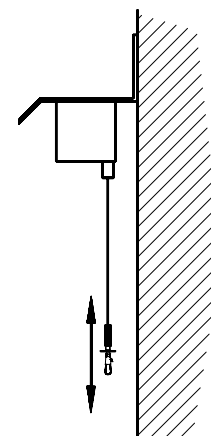
Any deviation from the 90° angle will reduce the lifecycle of both cable and cable outlet!

#### Mounting position

The WS Position Sensor must be firmly mounted in a position which allows free cable movement and where damage to the sensor or cable from foreign objects is unlikely. The sensor will operate in any orientation but where cable contamination by oil, water or particulate matter is possible the sensor should be mounted in the vertical plane with the cable pointing down (as per diagram).

Where necessary a sensor shield should be incorporated in the mounting assembly to protect the sensor from falling solids or liquid media.

It is also good practice to mount the sensor onto or close by a rigid part of the machine or system (see diagram).



The above information is provided as a user guide only and is not part of our specific technical product data.

# POSIWIRE®

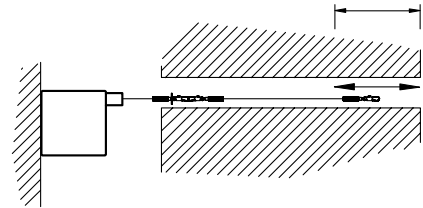
## Mounting hints for WS® Position Sensors



### Cable extension

In certain restricted access situations it is impossible to mount the sensor close to the part of the machine or system where the linear motion is measured. In this case the SV1 cable extension (see accessories) can be used to connect the sensor cable to the moving part (see diagram).

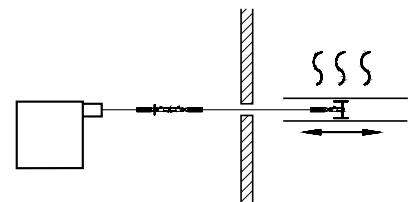
The SV1 cable extension is also ideal for applications where measurement under water is required. The WS Position sensor can be mounted in a dry, protected position above the surface and the SV1 cable extension used to connect the sensor cable to the underwater moving part.



### High temperature

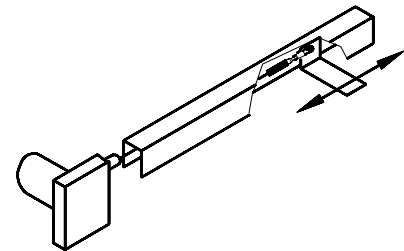
Standard WS Position Sensors and measuring cables are rated at a maximum of 85 °C ambient operating temperature. The SV1 cable extension can be used on temperatures up to 200°C. The sensor and sensor cable can be placed in a normal temperature area and the cable extension passed through a small access hole into the hot area connecting the sensor cable to the moving part (see diagram).

Please Note: Heat shielding and/or forced air cooling of the sensor is recommended where 85°C may be exceeded for even short periods.



### Hostile environments

WS position sensors can be used in very hostile environments if suitable shielding and protection of the sensor and cable is provided. A shielding channel of metal or rigid plastic is recommended where cable damage or contamination may occur (see diagram).

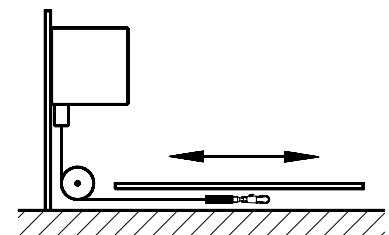


### Cable runs using pulleys

The SR2 low friction cable pulley (see accessories) can be used where it is necessary to have the cable linear movement in a different plane to the sensor mounting or restricted access makes direct mounting of the sensor impossible.

The angle should not exceed 90°!

**NOTE:** The use of cable pulleys will reduce the lifecycle of the cable, so the use should be avoided whenever it is possible!



The above information is provided as a user guide only and is not part of our specific technical product data.

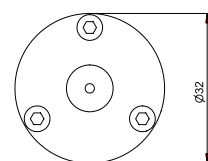
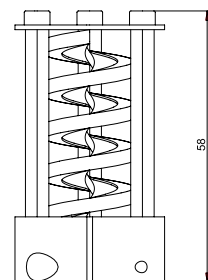
# POSIWIRE® Accessories for WS® Position Sensors



## Cable dust wiper SAB5

The SAB5 cable dust wiper avoids the penetration of troublesome particles and media through the cable outlet by using a fiber brush. The sensor is protected against non abrasive particles and thin liquids. SAB5 is not useable with abrasive dust and thick liquids.

With SAB5 the height of the cable outlet will be raised by 50 mm max. (for guaranteed dimensions consult factory).



**NOTE:** SAB5 can be used with the following sensors: WS10, WS12, WS17KT (1500 to 6250 mm), WS19KT (2000 to 8000 mm) and WS60.

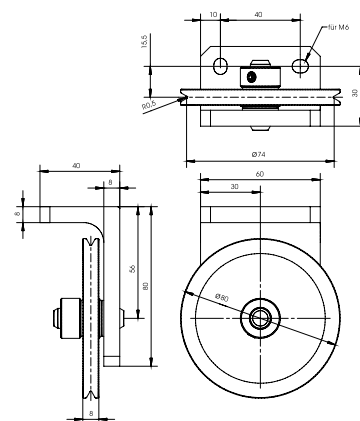
## Cable pulley SR2

The cable pulley SR2 is necessary for installation situations where straight-line motion of the sensor cable is not possible or where the sensor must be located outside of the motion area due to limited space.

Turn Angle: 0 to 90°

Order Code: **SR2**

**NOTE:** The use of cable pulleys will reduce the lifecycle of the cable, so the use should be avoided whenever it is possible!



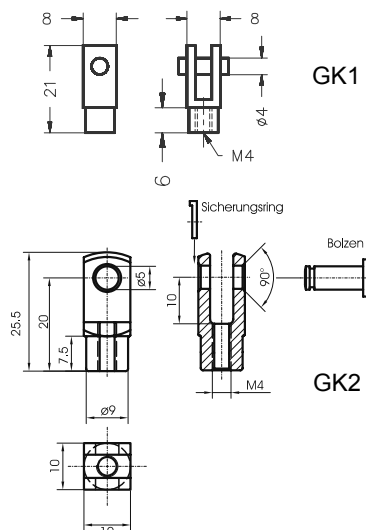
## Attachment head GK1/GK2

The cable attachment head GK1/GK2 can be used in many cases to attach the measurement cable to the moving object, and makes an easy to remove connection.

Order Code:

Metal version **GK1**

Plastic version  
(for isolated installation) **GK2**





# POSIWIRE® Accessories for WS® Position Sensors



## Magnetic clamp MAG1

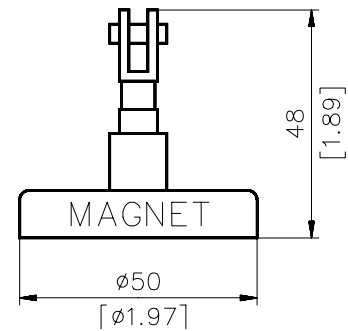
The magnetic clamp MAG1 is an easy way to fasten the measurement cable to ferromagnetic materials on the moving parts. The user can easily change from one application to another using this device.

Minimum Adhesive Force:  $\geq 200$  N (on bare steel)

**Note:** Coated surfaces will reduce the adhesive force.

Order Code:

**MAG1**



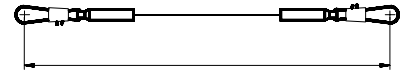
## Cable extension SV1

Cable extension for ASM position sensors with cable clip

Order Code:

**SV1** – **M**

Cable length in m (from 0.2 m)



## Float

For best accuracy half the volume of the float has to be immersed in the fluid. The float should be filled with the same or a neutral liquid.

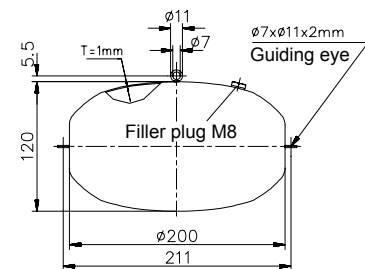
Weight: 1 kg approx.

Material: V4A Steel, DIN 1.4571

In running media the float can be stabilized by two guiding cables.

Order Code:

**SCHWIMMER-200MM**



# POSIWIRE® Accessories for WS® Position Sensors



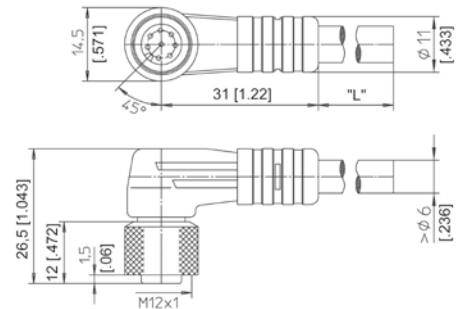
**Connector cable  
for WS® position  
sensors**  
8 pin M12

The 8-lead shielded cable is supplied with a mating 8-pin 90° M12 connector at one end and 8 wires at the other end. Available lengths are 2 m, 5 m and 10 m. Wire: cross sectional area 0.25 mm<sup>2</sup>.

Order code:

**KAB - XM - M12/8F/W - LITZE**  
**IP69K: KAB - XM - M12/8F/W/69K - LITZE**

Length in m



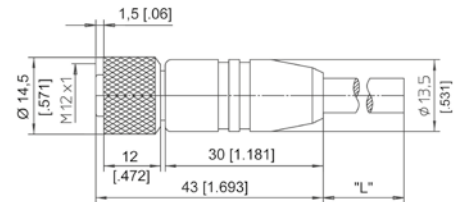
**Connector cable  
for WS® position  
sensors**  
8 pin M12

The 8-lead shielded cable is supplied with a mating 8-pin M12 connector at one end and 8 wires at the other end. Available lengths are 2 m, 5 m and 10 m. Wire: cross sectional area 0.25 mm<sup>2</sup>.

Order code:

**KAB - XM - M12/8F/G - LITZE**  
**IP69K: KAB - XM - M12/8F/G/69K - LITZE**

Length in m



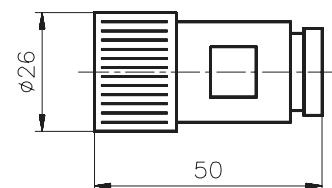
Connector cable wiring - M12, 8 pin	Connector pin / cable color							
	1	2	3	4	5	6	7	8
	White	Brown	Green	Yellow	Gray	Pink	Blue	Red

**Connector for WS®  
position sensors**  
12 pin CONIN

Female connector.

Order code:

**CONN - CONIN - 12F - G**



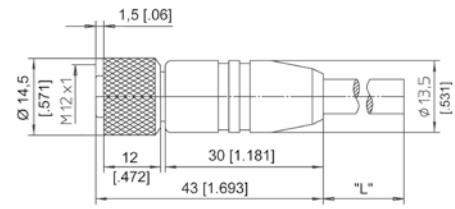
# POSIWIRE® Accessories for WS® Position Sensors



## Connector/bus cable for WS® position sensors

5 pin M12  
CAN bus/DeviceNet

The 5-lead shielded cable is supplied with a female 5-pin M12 connector at one end and a male 5-pin M12 connector at the other end. Available lengths are 0.3 m, 2 m, 5 m and 10 m.



Order code:

**KAB - XM - M12/5F/G - M12/5M/G - CAN**

**IP69K: KAB - XM - M12/5F/G/69K - M12/5M/G/69K - CAN**

Length in m

## T-piece for bus cable

5 pin M12  
CAN bus/DeviceNet

Order code:

**KAB - TCONN - M12/5M - 2M12/5F - CAN**



## Terminating resistance

5 pin M12  
CAN bus/DeviceNet

Order code:

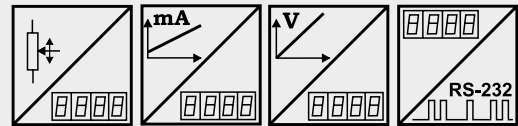
**KAB - RTERM - M12/5M/G - CAN**



# PRODIS® PD-ADC Digital Process Meter for analog Sensors



- For WS® position sensors with analog output:
  - Voltage 0 ... 10 V
  - Current 0/4 ... 20 mA
  - Potentiometer (voltage divider)
- Integrated sensor supply
- 6-digit LED display
- RS-232 interface
- Optional 4 comparator Output
- Easy programming



## Description

PRODIS-ADC is designed for use with analog position sensors to display angle and displacement. A high resolution A/D converter processes signals from sensors with voltage or current output.

The meter is programmable to display values within preset start/end range or values in units as inches, mm or degrees. A tare function or programming lock can be activated with two control terminals.

Sensor excitation is supplied by the meter. With four membrane keys all parameters can be programmed for the special applications. Optional comparator functions with 4 NPN open-collector Output are available, additional 2 of them have relay output.

Specifications		
Display		6-digit, 7-segment LED, height 14 mm, decimal point programmable
Counting rate		1 ... 25/s programmable
Measurement accuracy		±0.05 % f.s.
Excitation voltage/current		24 V DC ±10%/150 mA, residual ripple 1% <sub>pp</sub> ; 85-250 V AC, 50-60 Hz/180 mA max.
Sensor excitation		24 V DC/300 mA; 5 V/10 mA
Input		Two channels, each for: Voltage 10V; U1; U2; U3; max. 24V Current I1, load 100 Ω, I <sub>max</sub> <30 mA Voltage divider R <sub>min</sub> =500 Ω, 0 ... 5 V One input or the difference between both inputs can be chosen by programming
Control input		2 control inputs 24 V, active low
Comparator Output (option)	Relay NPN	250 V AC/5 A, 30 V DC/5 A 24 V max./50 mA to GND
Connection		Terminal strip 12 pole, excitation 3 pole
Temperature coefficient		±20 x 10 <sup>-6</sup> / °C
Operating temperature		-10...+40 °C
Storage temperature		-20...+85 °C

## Order Code PRODIS-ADC

### Model Name

### Excitation Voltage

24VDC = 24 V DC

230VAC = 85...250 V AC

### Options

REL2 = Comparator

DT = Desktop version

PD-ADC

**Order example: PD - ADC - 24VDC - REL2**

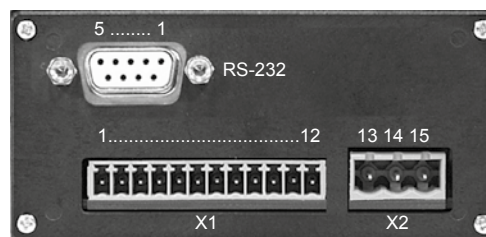
# PRODIS® PD-ADC Digital Process Meter for analog Sensors



<b>Specifications</b> (continuation)	Weight	24 V DC: approx. 250 g; 230 V AC: approx. 400 g
	Protection class	Front IP60, rear IP40
	Humidity	Max. 80 % R. H., non condensing
	Safety of equipment	Directive 73/23/EWG: DIN EN61010:2002-03
	Electromagnetic compatibility, EMC	Directive 89/336/EWG
<b>Programmable parameters / value range</b>	Value range offset, limit values	-999999 to +999999
	Divisor, multiplier	0 to 999999
	Other programmable parameters	Decimal point position, display brightness
	Control input terminals	Key lock, display value hold, tare function

<b>Wiring basic unit</b>	<b>Signals</b>	<b>Connector X1 pin no.</b>	<b>Connector X2 pin no.</b>
		Sensor excitation +U <sub>B</sub> 24 V	1
	Sensor excitation 0 V (GND)	2	
	Control input terminal 1: tare function	3	
	Control input terminal 2: programming lock	4	
	Voltage input terminal 0 ... 10 V, channel 1	5	
	Voltage input terminal 0 ... 10 V, channel 2	6	
	Current input terminal 0/4 ... 20 mA, channel 1	7	
	Current input terminal 0/4 ... 20 mA, channel 2	8	
	Voltage divider input terminal, channel 1	9	
	Voltage divider input terminal, channel 2	10	
	Sensor excitation, R1K +U <sub>B</sub> 5V	11	
	GND	12	
	PD-ADC-24VDC		
	Excitation +24 V		13
	Excitation 0 V (GND)		14
	PD-ADC-230VAC		
	Excitation		13, 15
	Protective ground		14

Rear view without  
comparator Output



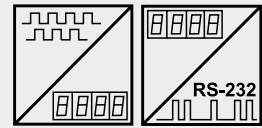
<b>RS-232 interface</b>	Level	RS-232: ±8 V, galvanically isolated	
	Data format	1 start bit, 8 data bits, 1 stop bit, no parity	
	Transmission rate	9600 Baud	
	<b>Signals</b>	<b>Connector X3, Pin No.</b>	<b>D-Sub, Pin No.</b>
	TxD	17	2
RxD	16	3	
GND	18	5	

For rear view with comparator Output and outline drawings see pages 90 and 91.

**PRODIS®**  
**PD-INC**  
**Digital process meter for incremental sensors**



- For WS® position sensors with incremental outputs
- Integrated sensor supply
- Counting rate up to 250 kHz (<1 MHz edge frequency)
- 6-digit LED display
- RS-232 interface
- Optional 4 comparator outputs
- Easy programming



**Description**

PRODIS-INC is designed for use with incremental position sensors to display angles and displacements. The fast counter processes 90° phase shifted A,B signals (quadrature signals) for direction and counting information. Sensor excitation is supplied from the meter. With four membrane keys all parameters can be programmed for the special application. An zero signal and a reference signal can be used for calibration of the measurement system. Optional comparator functions with 4 NPN open-collector outputs are available, additional 2 of them have relay output.

**Specifications**

Display	6-digit, 7-segment LED, height 14 mm, decimal point programmable
Counting frequency	250 kHz max., 1 MHz edge frequency
Excitation voltage/current	24 V DC ±10%/150 mA, residual ripple 1% <sub>ss</sub> ; 85-250 V AC, 50-60 Hz/180 mA max.
Sensor excitation	24 V DC/300 mA or 5V DC/500 mA
Inputs	A, B, Z, T (reference signal)
Comparator outputs (option)	Relay NPN
	250 V AC/5 A, 30 V DC/5 A 24 V max./50 mA to GND
Connection	Terminal strip 12-pole, excitation 3-pole
Operating temperature	-10 ... +40 °C
Storage temperature	-20 ... +85 °C
Weight	24 V DC: approx. 250 g; 230 V AC: approx. 400 g
Protection class	Front IP60, rear IP40
Humidity	Max. 80 % R.H., non condensing
Safety of equipment	Directive 73/23/EWG: DIN EN61010:2002-03
EMC	Directive 89/336/EWG

**Order Code PRODIS-INC**



**Model name**

**Excitation voltage**

24VDC = 24 V DC

230VAC = 85...250 V AC

**Sensor excitation voltage**

G24V = 24 V DC

G5V = 5 V DC

**Sensor signal**

HTL = HTL level with excitation voltage G24V

TTL = TTL level with excitation voltage G5V or G24V

**Options**

REL2 = Comparator

DT = Desktop version

**Order example: PD - INC - 24VDC - G24V - HTL - REL2**

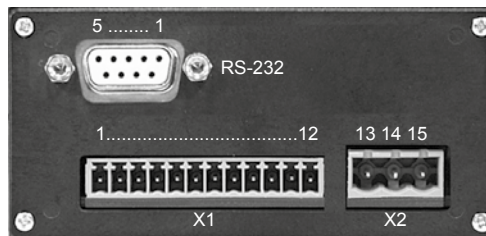
**PRODIS®**  
**PD-INC**  
**Digital process meter for incremental sensors**



<b>Programmable parameters / value range</b>	Value range display, offset, limit values	-999999 to +999999
	Divisor, Multiplier	0 to 999999
	Other programmable parameters	Counting direction, decimal point position, last-value memory, Z signal evaluation, display brightness
	Signal T	Manual zero, key lock, display value hold, Z release, relative measurement activation

<b>Wiring basic unit</b>	<b>Signals</b>	<b>Connector X1 pin no.</b>	<b>Connector X2 pin no.</b>
	Sensor +U <sub>B</sub>	1	
	Sensor 0 V (GND)	2	
	Signal A	4	
	Signal $\bar{A}$	5	
	Signal B	6	
	Signal $\bar{B}$	7	
	Signal Z (zero signal)	8	
	Signal $\bar{Z}$ (zero signal)	9	
	Signal T (reference signal)	10	
	Signal $\bar{T}$ (reference signal)	11	
	GND	12	
	PD-INC-24VDC		
	Excitation +24 V		13
	Excitation 0 V (GND)		14
	PD-INC-230VAC		
	Excitation		13, 15
	Protective ground		14

Rear view without comparator outputs



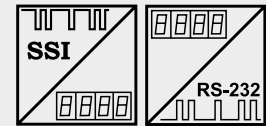
<b>RS-232 interface</b>	Level	RS-232: ±8 V, galvanically isolated	
	Data format	1 start bit, 8 data bits, 1 stop bit, no parity	
	Transmission rate	4800 / 9600 / ... / 115200 Baud	
	<b>Signals</b>	<b>Connector X3 Pin No.</b>	<b>D-Sub Pin No.</b>
	TxD	17	2
RxD	16	3	
GND	18	5	

Rear view with comparator outputs and outline drawings see pages 90 and 91

# PRODIS® PD-SSI Digital Process Meter for Sensors with SSI output



- For WS® position sensors with SSI output
- Integrated sensor supply
- 6-digit LED display
- RS-232 interface
- Easy programming



## Description

PRODIS-SSI is designed for use with SSI position sensors to display angle and displacement. Via the CLOCK lines, a sequence of pulses will be transmitted, the input DATA lines will read the sensor's serial bit sequence. The meter is programmable to display values within preset start/end range or values in units as inches, mm or degrees. A tare function or programming lock can be activated with two control terminals.

Sensor excitation is supplied by the meter. With four membrane keys, all parameters can be programmed for the special applications.

Specifications		
Display	6-digit, 7-segment LED, 14 mm high, decimal point programmable	
Sampling rate	100/s	
Excitation voltage/current	24 V DC $\pm 10\%$ /150 mA, residual ripple 1% <sub>pp</sub> ; 85-250 V AC, 50-60 Hz/180 mA max.	
Sensor excitation	24 V DC/300 mA or 5 V DC/800 mA	
Inputs	DATA, $\overline{\text{DATA}}$ (RS422)	
Output	CLOCK, $\overline{\text{CLOCK}}$ (RS422)	
Control inputs	2 control inputs 24 V, active low	
Connection	Terminal strip 12-pole, excitation 3-pole	
Operating temperature	-10 ... +40 °C	
Storage temperature	-20 ... +85 °C	
Weight	24 V DC: approx. 250 g; 230 V AC: approx. 400 g	

## Order Code PRODIS-SSI

**Model name**

**Excitation Voltage**

24VDC = 24 V DC

230VAC = 85...250 V AC

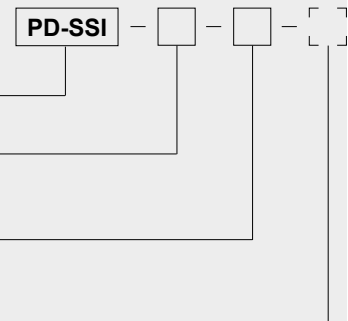
**Sensor Excitation**

G24V = 24 V DC

G5V = 5 V DC

**Options**

DT = Desktop version



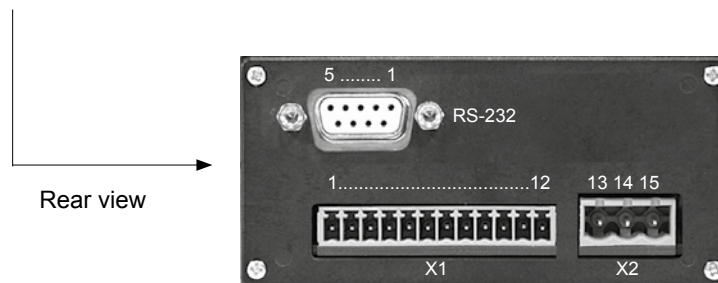
**Order example: PD - SSI - 230VAC - G24V**



# PRODIS® PD-SSI Digital Process Meter for Sensors with SSI output



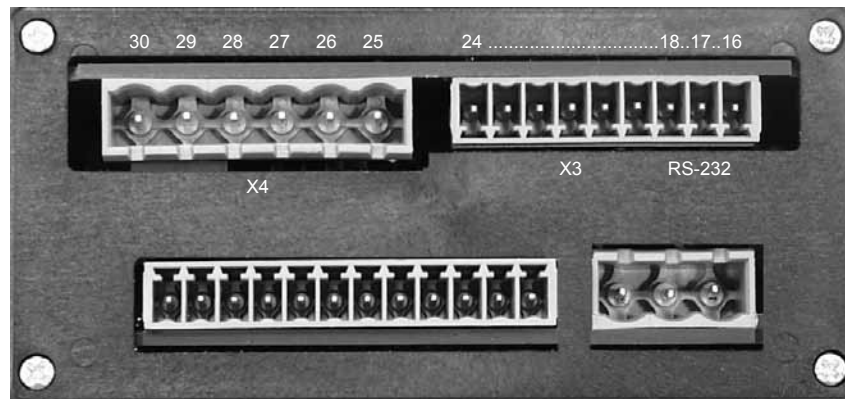
<b>Specifications</b> (continuation)	Protection class	Front IP60, back IP40	
	Humidity	Max. 80 % r.h., non condensing	
	Safety of equipment	Directive 73/23/EWG: DIN EN61010:2002-03	
	Electromagnetic compatibility, EMC	Directive 89/336/EWG	
<b>Programmable Parameters / Value range</b>	Value range offset	-999999 to +999999	
	Divisor, multiplier	0 to 999999	
	Other programmable parameters	Decimal point position, display brightness	
	Programmable SSI parameters	Gray/dual code, sign, sampling rate, data format	
	Control inputs	Key lock, display value hold, tare function	
<b>Wiring basic unit</b>	<b>Signals</b>	<b>Connector X1 pin no.</b>	<b>Connector X2 pin no.</b>
	Sensor excitation +U <sub>B</sub> (24 V or 5 V)	1	
	Sensor excitation 0 V (GND)	2	
	Control input 1: tare function	3	
	Control input 2: programming lock	4	
	Not used	5 / 6	
	Output C <small>LOCK</small>	7	
	Output C <small>LOCK</small>	8	
	Input DATA	9	
	Input DATA	10	
	Do not connect!	11	
	GND	12	
	PD-SSI-24VDC Excitation +24 V		13
	Excitation 0 V (GND)		14
	PD-SSI-230VAC Excitation		13, 15
	Protective ground		14



<b>RS-232 interface</b>	Level	RS-232: ±8 V, galvanically isolated	
	Data format	1 start bit, 8 data bits, 1 stop bit, no parity	
	Transmission rate	4800 / 9600 / 19200 / 115200 Baud	
	<b>Signals</b>	<b>Connector X3, pin no.</b>	<b>D-Sub, pin no.</b>
	TxD	17	2
	RxD	16	3
GND	18	5	

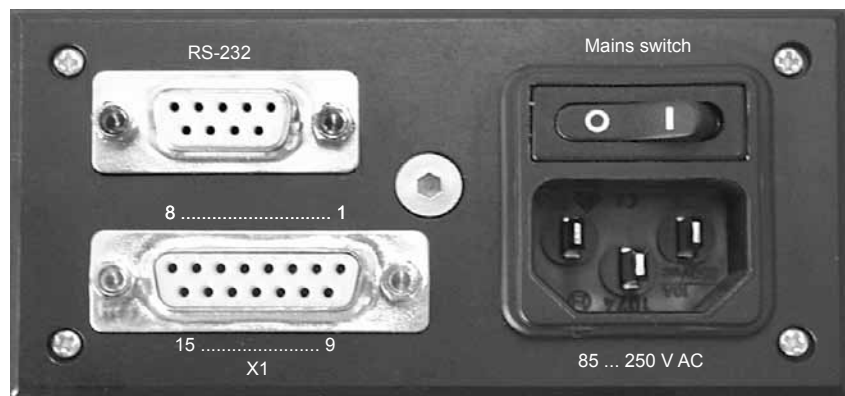
Outline drawings see the following pages.

Rear view with  
 comparator Output



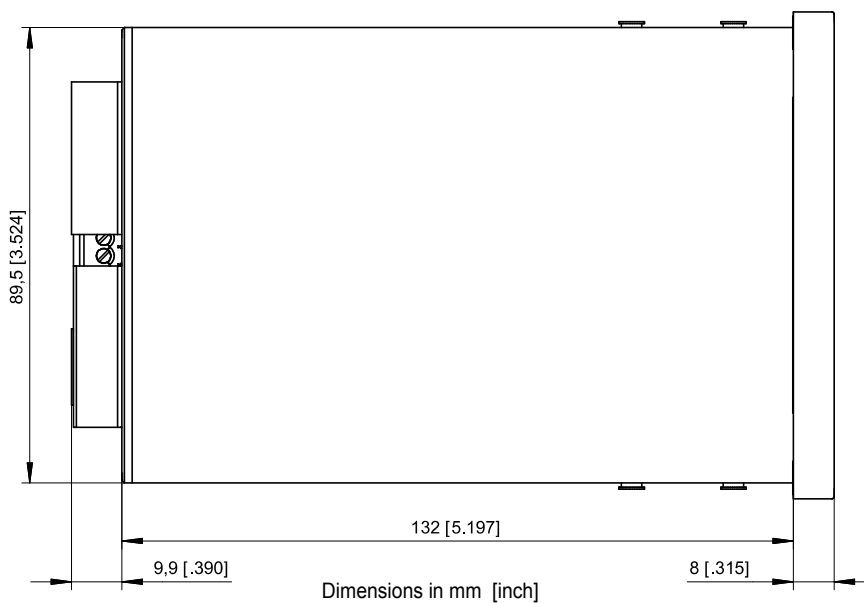
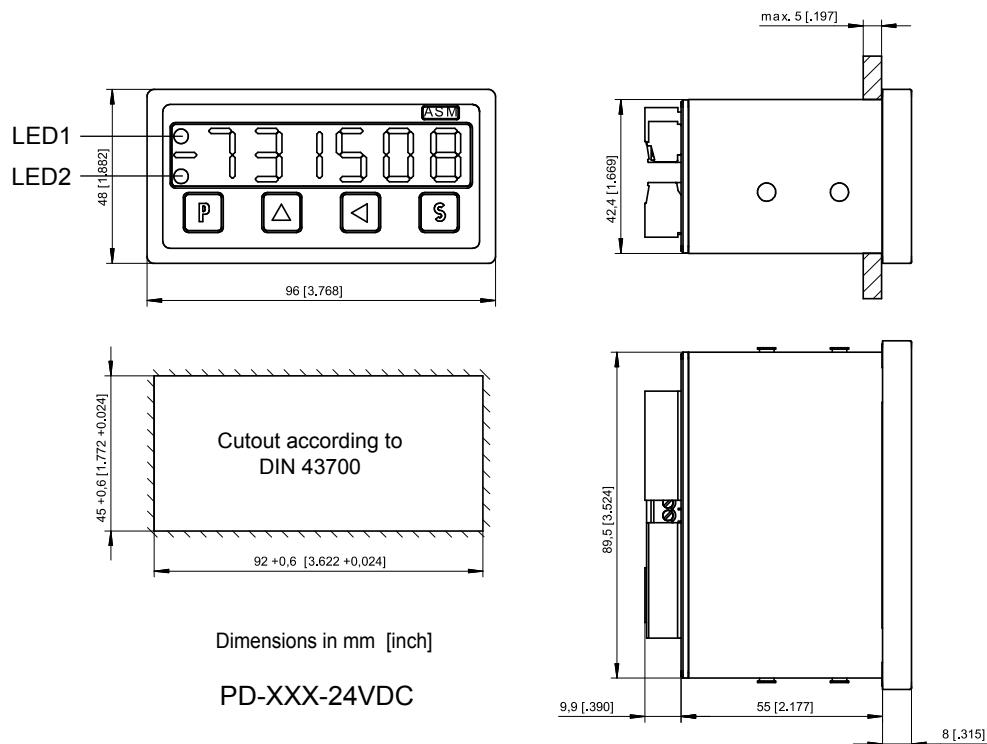
Comparator function (option)	Comparator	Comparator output				LED
	NPN Collector	Connector X3 pin no.	Relay	Connector X4 pin no.		
Comparator 1	NPN1	20	Relay 1	25	LED1	
			NO			27
Comparator 2	NPN2	21	Relay 2	28	LED2	
			NO			30
Comparator 3	NPN3	22	Common	26		
Comparator 4	NPN4	23				
	NPN GND	24				
	NPN U <sub>B</sub> (+24V)	19				

**Desktop version**  
 (option)



Wiring of connector X1 see table at page 85 (PD-ADC), page 87 (PD-INC) resp. page 89 (PD-SSI).

**Outline drawing**



PD-XXX-230VAC

Dimensions informative only.  
 For guaranteed dimensions  
 consult factory.

# Other ASM Products




**ASM**  
perfect in sensors.

**POSITAPE®**  
Tape Actuated Position Sensors

Ultra Compact Design

Heavy Duty Models

Large Measurement Ranges




**ASM**  
perfect in sensors.

**POSICHRON®**  
Magnetostrictive Position Sensors

Round Profile Design

Square Profile Design & Flat Profile Design

Rod Style Design



**ASM**  
perfect in sensors.

**POSIMAG®**  
Magnetic Scale Position Sensors



**ASM**  
perfect in sensors.

**POSIROT®**  
Magnetic Angle Sensors

**POSIROT®**  
Magnetic Angle Encoders

**POSITILT®**  
Magnetic Inclinometers

• Please send me detailed information/catalog on the following products:

- POSITAPE® Tape Actuated Position Sensors
- POSICHRON® Magnetostrictive Position Sensors
- POSIMAG® Magnetic Scale Position Sensors
- POSIROT®/POSITILT® Magnetic Angle Sensors and Inclinometers

**Fax +49-(0)8123-986-500  
for UK: +44-(0)845-1222-124**

Company: \_\_\_\_\_

Mr./Ms.: \_\_\_\_\_

Department: \_\_\_\_\_

Street: \_\_\_\_\_

City: \_\_\_\_\_

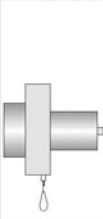

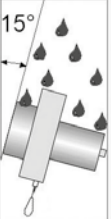
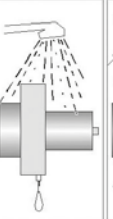
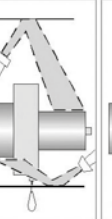
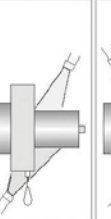
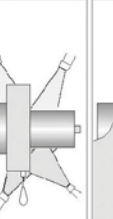


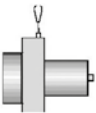
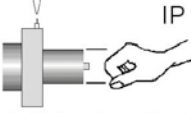
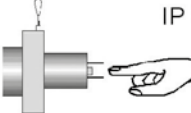
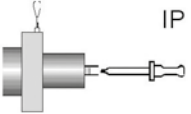
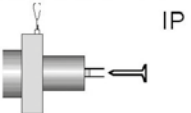
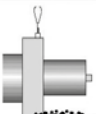
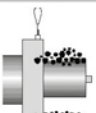
Tel. / Fax: \_\_\_\_\_

e-mail: \_\_\_\_\_

Website: \_\_\_\_\_

# Protection classes according to EN 60529



2 <sup>nd</sup> char. numeral: Protection against ingress of water  1 <sup>st</sup> char.numeral: Protection against solid foreign objects									
Protection against ...	Non protected	Falling water drops vertical / 15°		Spraying water	Splashing water	Water jets	Powerful water jets	Temporary immersion	Continuous Immersion
IEC 529	IP .. 0	IP .. 1	IP .. 2	IP .. 3	IP .. 4	IP .. 5	IP .. 6	IP .. 7	IP .. 8
 IP 0 .. Non protected	IP 00								
 IP 1 .. Solid foreign objects diameter ≥ 50 mm	IP 10	IP 11	IP 12						
 IP 2 .. Solid foreign objects diameter ≥ 12,5 mm	IP 20	IP 21	IP 22	IP 23					
 IP 3 .. Solid foreign objects diameter ≥ 2,5 mm	IP 30	IP 31	IP 32	IP 33	IP 34				
 IP 4 .. Solid foreign objects diameter ≥ 1 mm	IP 40	IP 41	IP 42	IP 43	IP 44				
 IP 5 .. Dust-protected	IP 50		IP 52	IP 53	IP 54	IP 55	IP 56		
 IP 6 .. Dust-tight	IP 60				IP 64	IP 65	IP 66	IP 67	IP 68

\* Depth and duration of immersion must be specified!

IP69K - Water at high pressure / steam jet cleaning  
 Note: IP67/IP69K does not include IP68



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