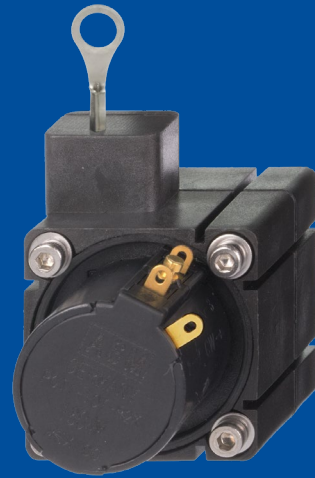




**WS31**

Displacement sensor with  
measurement length up to 1,000 mm



- Protection class IP50
- High-performance POM housing
- With precision potentiometer or optical encoder

### Product versions



Analog output



Incremental encoder output



WS31 - Cable Extension Position Sensor  
Version with analog output

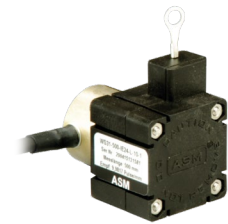
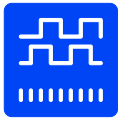
Specifications

		Order options	
Measurement range	250 / 500 / 750 mm	<b>1</b>	250 / 500 / 750
Resolution	Analog: quasi infinite		
Output	Potentiometer 1 KΩ	<b>2</b>	R1K
Linearity	±0.35% f.s., other values on request	<b>3</b>	L35
Mounting	Mounting brackets Spacer nuts	<b>4</b>	1 2
Sensing device	Precision potentiometer		
Material	POM measuring cable: stainless steel		
Protection class	IP50		
Connection	Potentiometer (soldering eye)		
Temperature range	-15 ... +60 °C, max. 85 % RH, non condensing		
Weight	Approx. 90 g		
Pull-out force	250 mm: 1.5 N 500 mm: 1.7 N 750 mm: 1.2 N		
EMC	DIN EN 61326-1:2013		

Order code

WS31	-	<b>1</b>	-	<b>2</b>	-	<b>3</b>	-	<b>4</b>
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Order example: WS31 – 500 – R1K – L35 – 1



WS31 - Cable Extension Position Sensor  
**Version with incremental encoder output**

**Specifications**

		Order options	
Measurement range	500 mm	<b>1</b>	500
Resolution	10 pulses / mm (40 edges / mm)	<b>2</b>	10
Output	Incremental encoder TTL compatible Incremental encoder HTL compatible	<b>3</b>	IE24LI IE24HI
Linearity	±0.20% f.s.		
Mounting	Mounting brackets Spacer nuts	<b>4</b>	1 2
Sensing device	Incremental encoder		
Material	POM, aluminum measuring cable: stainless steel		
Protection class	IP50		
Connection	Cable output radial, length approx. 3 m		
Temperature range	0 ... +60 °C, max. 85 % RH, non condensing		
Weight	Approx. 90 g		
Pull-out force	1.7 N		
EMC	DIN EN 61326-1:2013		

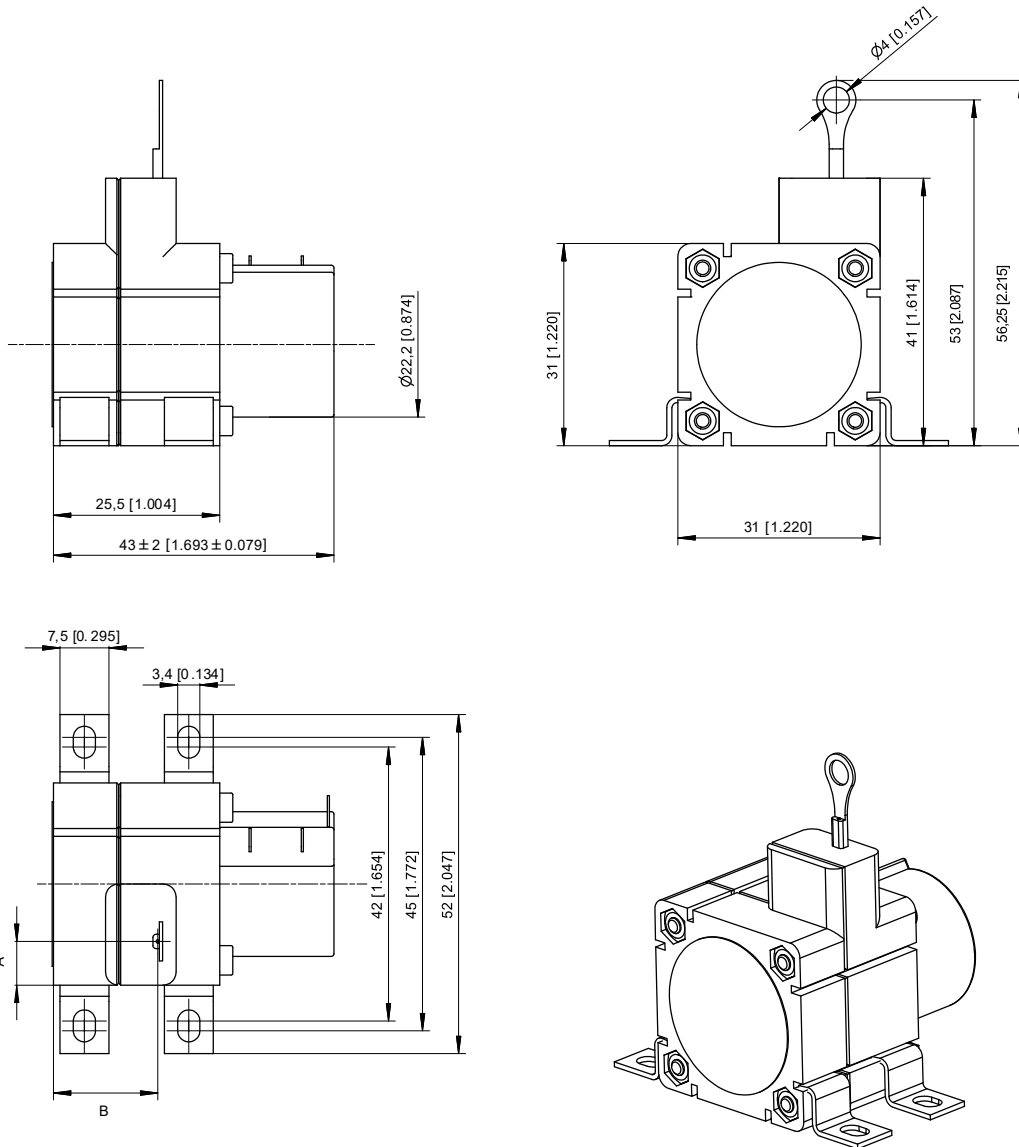
**Order code**

WS31	-	<b>1</b>	-	<b>2</b>	-	<b>3</b>	-	<b>4</b>
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**Order example:** WS31 – 500 – 10 – IE24HI – 1

## Dimensions

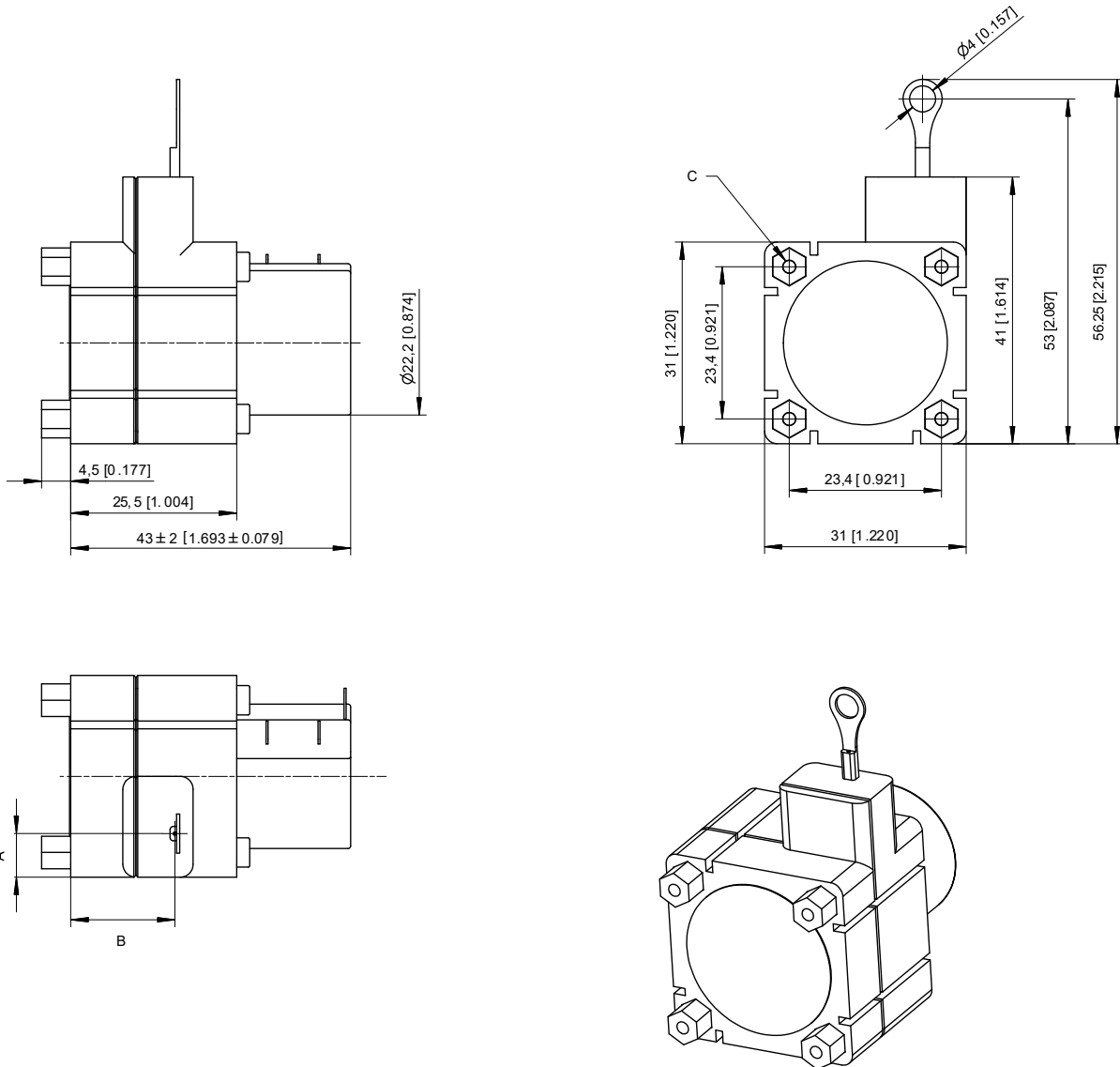
Measurement range 250 ... 500 ... 750 mm, R1K, mounting brackets



Dimensions in mm	Measurement range	A	B
	250; 500	6.7	16
	750	3.2	15.5

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

Measurement range 250 ...500 ... 750 mm, R1K, spacer nuts

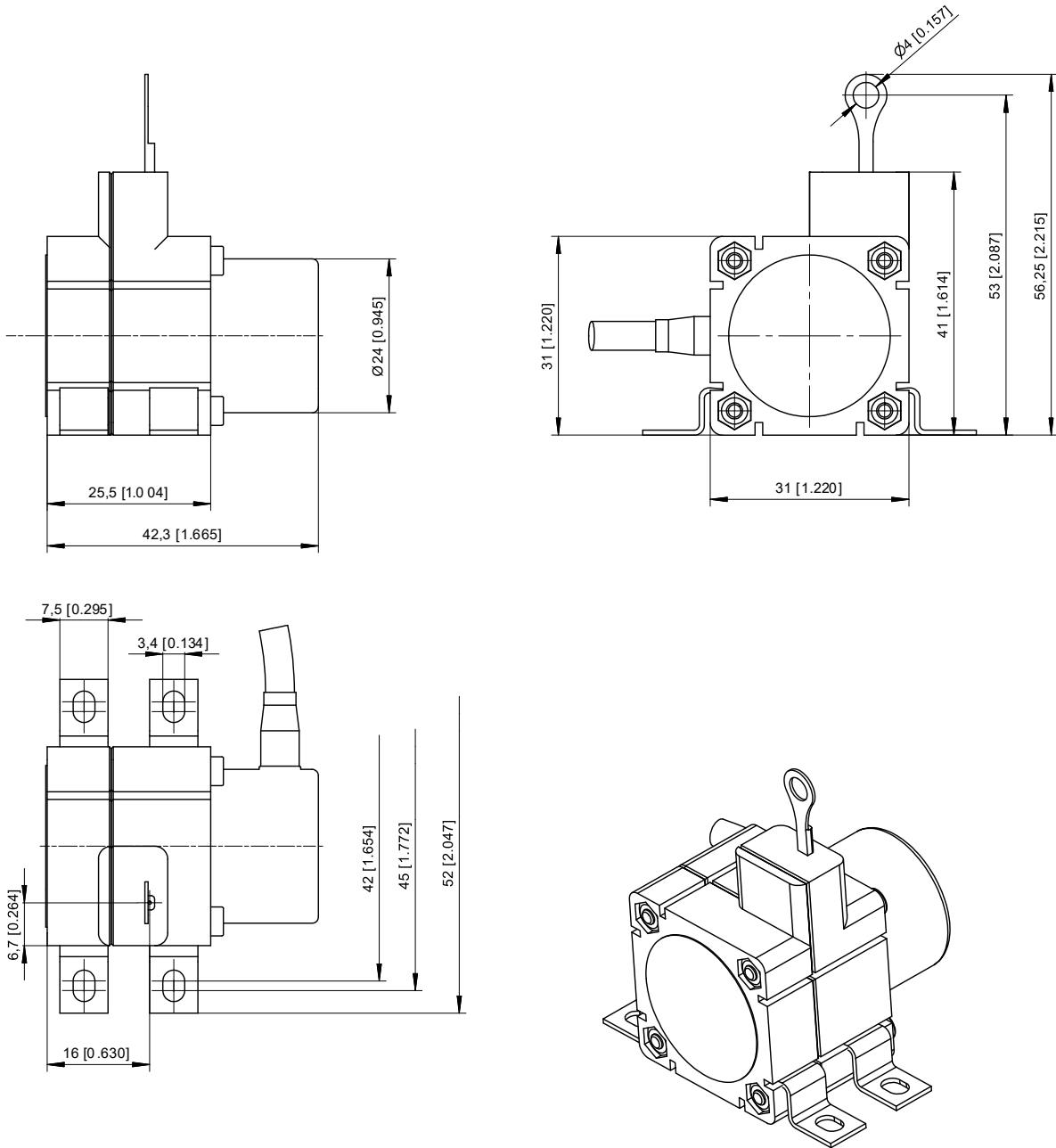


Dimensions in mm	Measurement range	A	B
	250; 500	6.7	16
	750	3.2	15.5

C – M2,5 – 4 [.157] deep

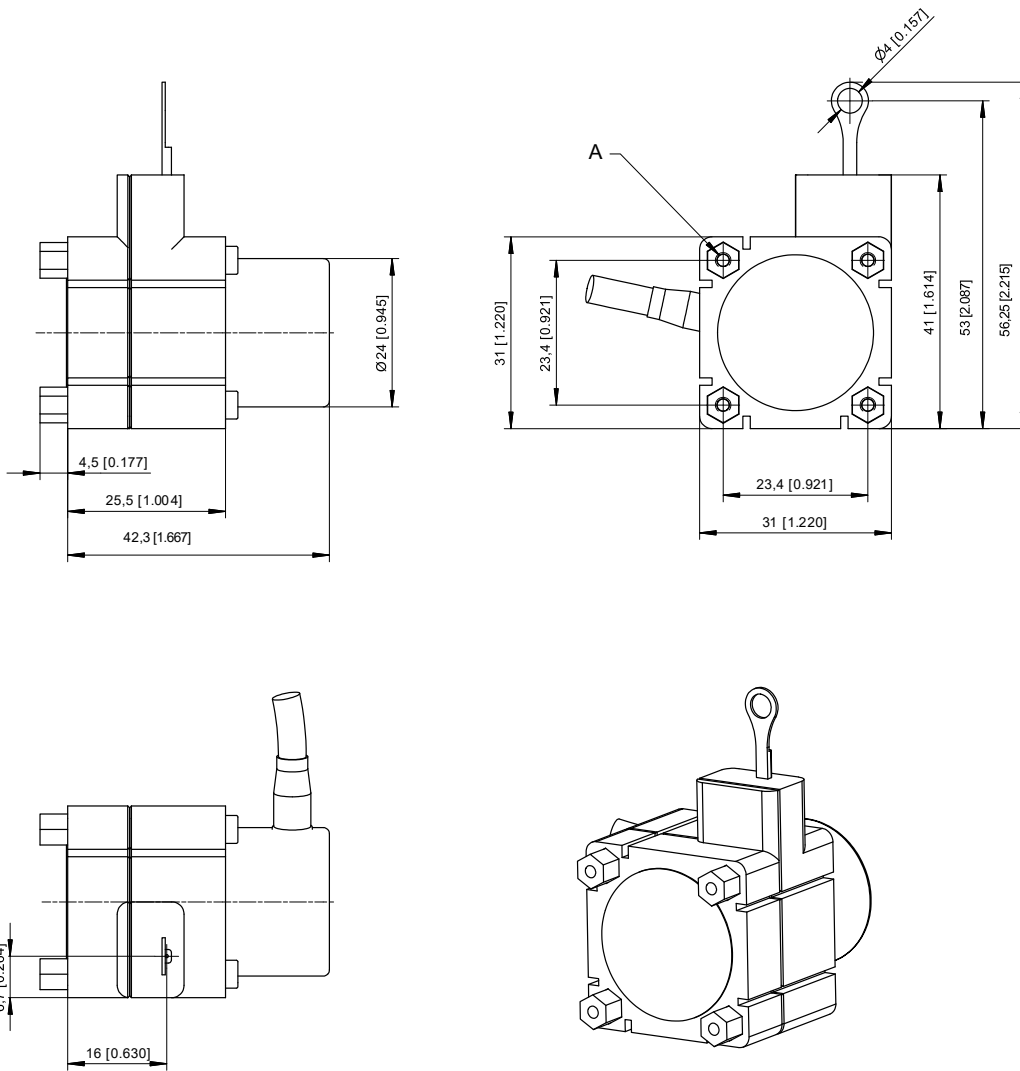
Dimensions in mm [inch]  
Dimensions informative only.  
For guaranteed dimensions consult factory.

Measurement range 500 mm, IE24, mounting brackets



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

Measurement range 500 mm, IE24, spacer nuts




A – M2,5 - 4 [.157] deep

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

## Output specifications Analog outputs

### Voltage divider

<b>R1K</b> Potentiometer 	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 % ... approx. 97 %
	Operating temperature	Refer to output specification
	EMC	EN 61326-1:2013

### NOTICE

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

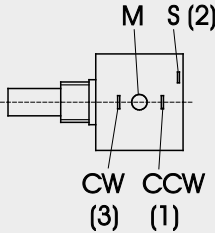
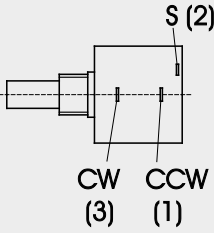
- The metal wiper of the potentiometer must be protected against current load

Additional information:

[https://www.asm-sensor.com/en/downloads.html?file=files/asmTheme/pdf/ws\\_poti\\_technote\\_en.pdf](https://www.asm-sensor.com/en/downloads.html?file=files/asmTheme/pdf/ws_poti_technote_en.pdf)

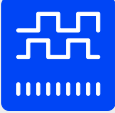
ws\_poti\_technote\_en.pdf

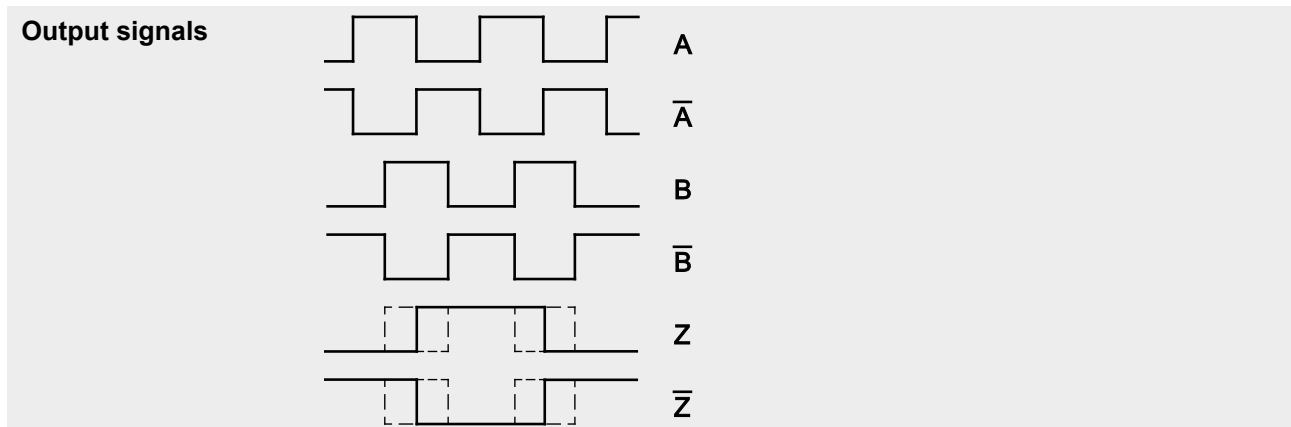
### Signal wiring potentiometer

Output signals	CT-Poti / 5-Turn WS31: 250 mm	Multi-Turn-Poti / 10-Turn WS31: 500 / 750 mm
		
Poti +	M	CCW
Poti GND	CW	CW
Poti slider	S	S



## Incremental output

IE24LI and IE24HI Incremental interface	IE24LI	IE24HI	
	Excitation voltage	5 V DC ±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)	±20 x 10 <sup>-6</sup> / °C f.s. (sensor mechanism)	
	Operating temperature	Refer to output specification of the sensor	
	Protection	Short circuit	
	EMC	DIN EN 61326-1:2013	



Signal wiring	Output signals	Cable color
	Excitation +	brown
	Excitation GND	white
	Signal A	green
	Signal $\bar{A}$	yellow
	Signal B (A + 90°)	grey
	Signal $\bar{B}$	pink
	Signal Z (reference pulse)	blue
	Signal $\bar{Z}$	red

**Accessories**  
**Mounting bracket WS31 / WS31C**

(only for sensors with spacer nuts)

Order code **WS31-BFW1**

