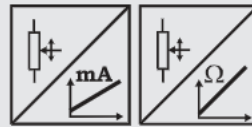


# Model WS31C with analog output



## OEM sensors for large order volumes

- Protection class IP50
- Low Cost
- Compact outline
- Plastic housing
- Measuring ranges: 0 ... 250 mm and 0 ... 500 mm
- Resolution essentially infinite
- Mounting selectable between mounting brackets or spacer nuts with internal thread



Specifications	Output	Potentiometer: 1 kΩ Current: 4 ... 20 mA (2 wire)
	Resolution	Essentially infinite
	Material	Housing: plastic Cable drum: aluminium Measuring cable: stainless steel
	Sensor element	High-precision potentiometer
	Connection	Cable output, length 1 m (standard)
	Linearity	±0.35% full scale; other values on request
	Protection class	IP50
	Operation temperature range	-15 ... +60°C (max. 85% r. h., non condensing)
	Weight	90 g approx.
	Cable force	250 mm: 1.5 N 500 mm: 1.7 N

## Order Code WS31C

WS31C - [ ] - [ ] - [ ] - [ ] - [ ]

### Model Name

### Measurement range (in mm)

250 / 500

### Output (see pages 57 and 58)

R1K = Potentiometer 1 kΩ

420A = With signal conditioner 4 ... 20 mA (2 wire)

### Linearity

L35 = ±0.35%

Other values on request

### Sensor Mounting

1 = Mounting brackets

2 = Spacer nuts

### Connection

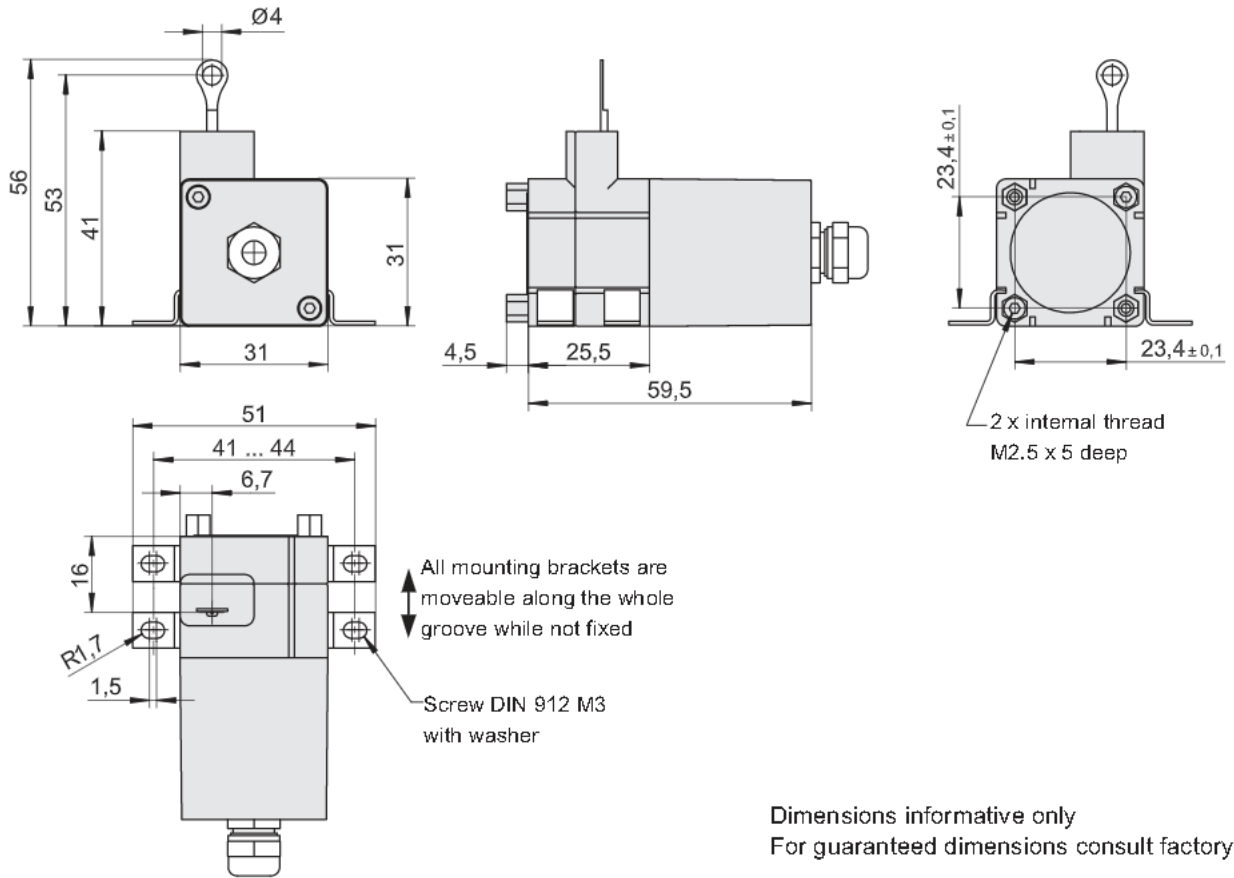
KAB1M = Cable output, length 1 m (standard)

**Order Example: WS31C - 500 - 420A - L35 - 2 - KAB1M**

# Model WS31C with analog output



## Outline drawing



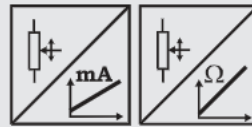
Dimensions informative only  
For guaranteed dimensions consult factory.

# Model WS42C with analog output



### OEM sensors for large order volumes

- Protection class IP50
- Low Cost
- Compact outline
- Plastic housing
- Measurement ranges: 0 ... 750 mm and 0 ... 1000 mm
- Resolution essentially infinite
- Mounting selectable between mounting brackets or spacer nuts with internal thread



Specifications	Output	Potentiometer: 1 kΩ Current: 4 ... 20 mA (2 wire)
	Resolution	Essentially infinite
	Material	Housing: plastic Cable drum: aluminium Measuring cable: stainless steel
	Sensor element	High-precision potentiometer
	Connection	Cable output, length 1 m (standard)
	Linearity	±0.35% full scale; other values on request
	Protection class	IP50
	Operation temperature range	-15 ... +60°C (max. 85% r. h., non condensing)
	Weight	125 g approx.
	Cable force	750 mm: 2.5 N 1000 mm: 1.7 N

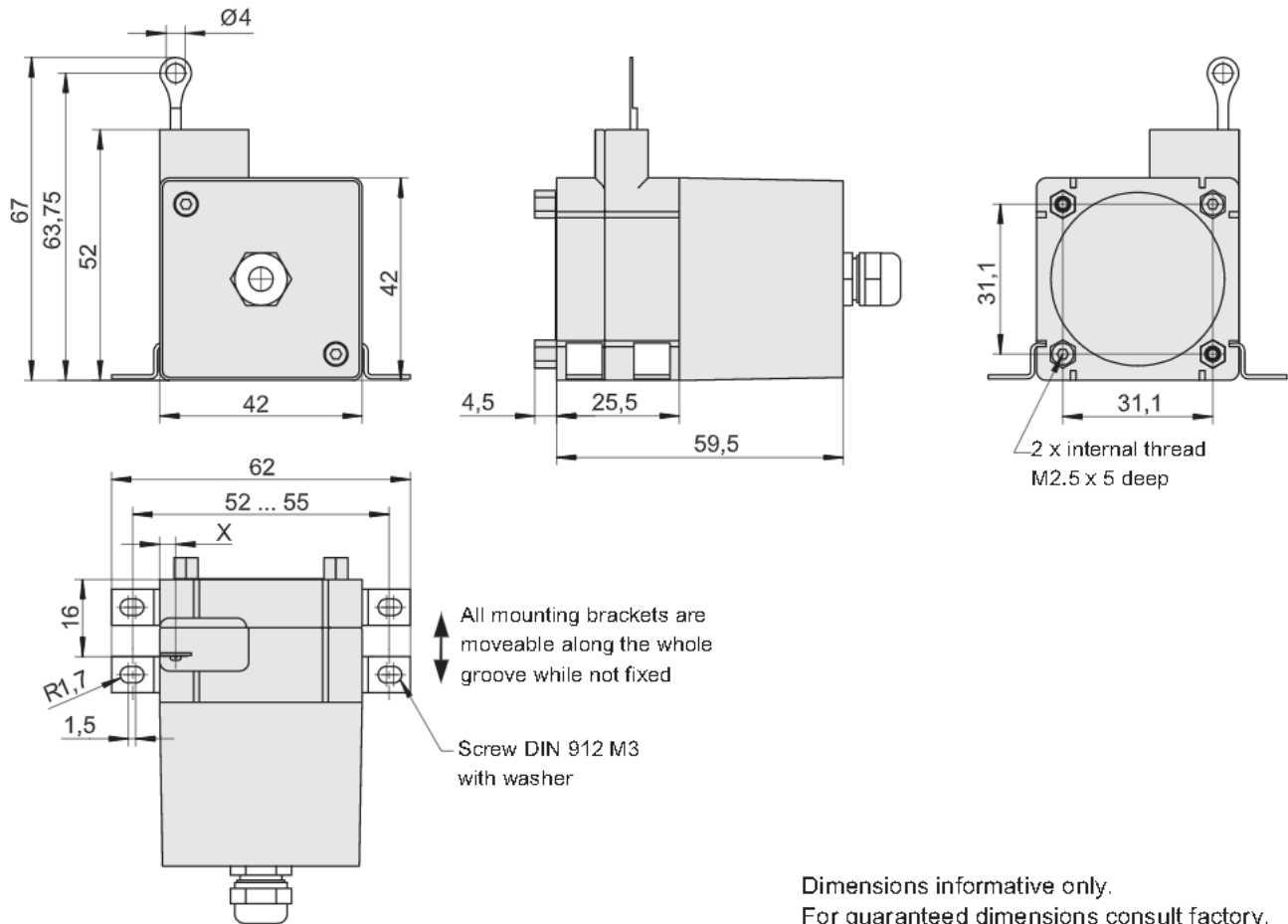
Order Code WS42C	WS42C - [ ] - [ ] - [ ] - [ ] - [ ]
<b>Model Name</b>	WS42C
<b>Measurement range (in mm)</b>	750 / 1000
<b>Output (see pages 57 and 58)</b>	R1K = Potentiometer 1 kΩ 420A = With signal conditioner 4 ... 20 mA (2 wire)
<b>Linearity</b>	L35 = ±0.35% Other values on request
<b>Sensor Mounting</b>	1 = Mounting brackets 2 = Spacer nuts
<b>Connection</b>	KAB1M = Cable output, length 1 m (standard)

**Order Example: WS42C - 1000 - 420A - L35 - 2 - KAB1M**

# Model WS42C with analog output



## Outline drawing



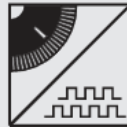
Dimensions	Measurement range	X
	[mm]	
	750	9
	1000	3,3

# Model WS31 with incremental encoder output



## OEM sensors for large order volumes

- Low Cost
- Compact outline
- Plastic housing
- Measuring range: 0 ... 500 mm
- Resolution: 10 pulses per mm
- Mounting selectable  
between mounting brackets or  
spacer nuts with internal thread



<b>Specifications</b>	Output	Incremental encoder
	Resolution	10 pulses per mm
	Material	Housing: Plastic; Cable drum: Aluminium Measuring cable: Stainless steel
	Sensor element	Incremental encoder
	Connection	Cable output, approx. 3 m
	Linearity	±0.20 % full scale; other values on request
	Operation temperature range	0 ... +60°C (max. 85% r. h., non condensing)
	Weight	Approx. 95 g
	Cable force	1.5 N

## Order Code WS31 incremental

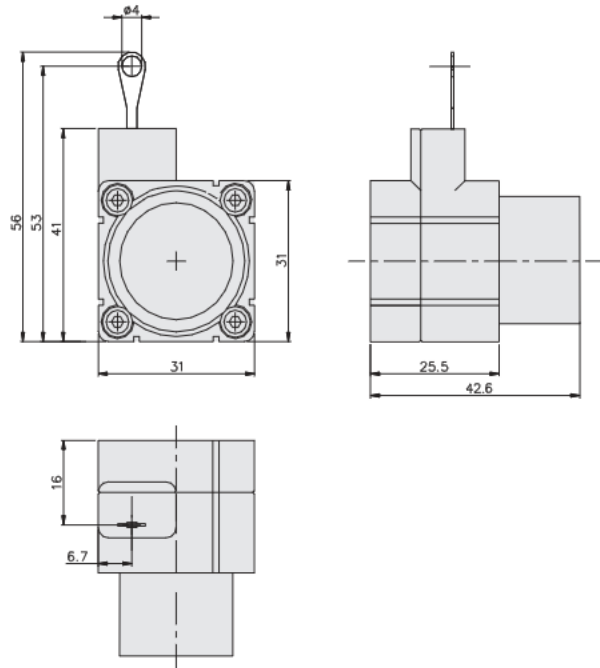
<b>Model Name</b>	WS31 - [ ] - [ ] - [ ] - [ ]
<b>Measurement Range (in mm)</b>	500
<b>Pulses per mm</b>	10
<b>Outputs (see page 60)</b>	IE24LI = Incremental output TTL compatible inverted IE24HI = Incremental output HTL compatible inverted
<b>Sensor Mounting</b>	1 = Mounting brackets 2 = Spacer nuts

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

# Model WS31 with incremental encoder output

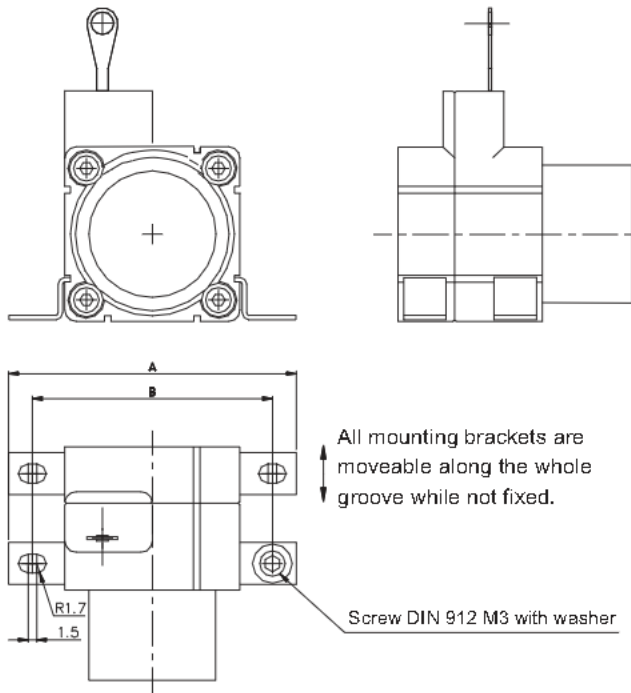


## Outline Drawing WS31



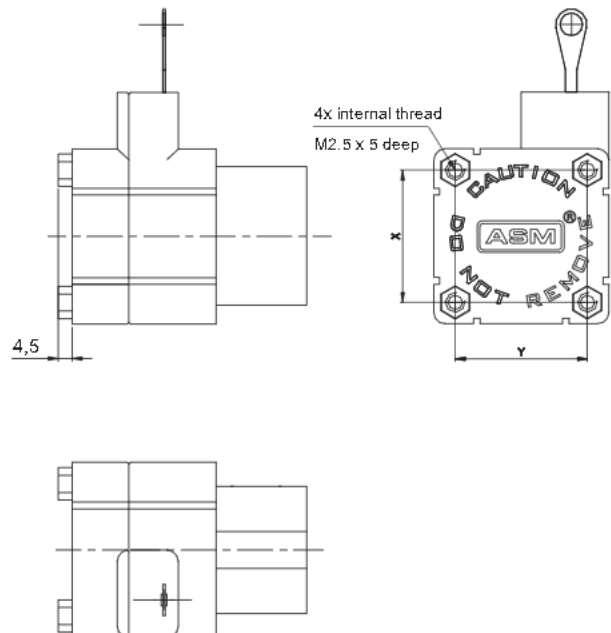
### Mounting with mounting brackets

Dimensions WS31  
 A 51  
 B 41...44



### Mounting with spacer nuts

Dimensions  
 X = Y 23,4



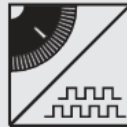
Dimensions informative only.  
 For guaranteed dimensions consult factory.

# Model WS42 with incremental encoder output



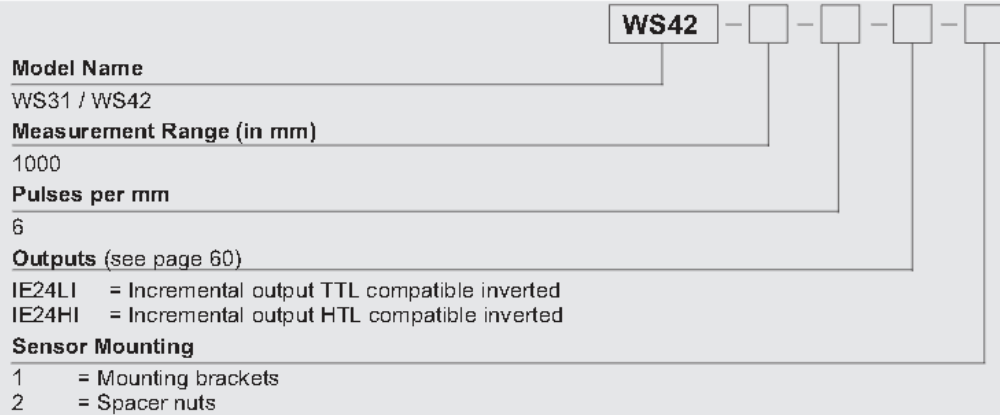
## OEM sensors for large order volumes

- Low Cost
- Compact outline
- Plastic housing
- Measuring range: 1000 mm
- Resolution: 6 pulses per mm
- Mounting selectable  
between mounting brackets or  
spacer nuts with internal thread



<b>Specifications</b>	Output	Incremental encoder
	Resolution	6 pulses per mm
	Material	Housing: plastic; Cable drum: aluminium Measuring cable: stainless steel
	Sensor element	Incremental encoder
	Connection	Cable output, approx. 3 m
	Linearity	±0.20 % f.s.; other values on request
	Operation temperature range	0 ... +60°C (max. 85% r. h., non condensing)
	Weight	Approx. 130 g
	Cable force	1.7 N

## Order Code WS42 incremental

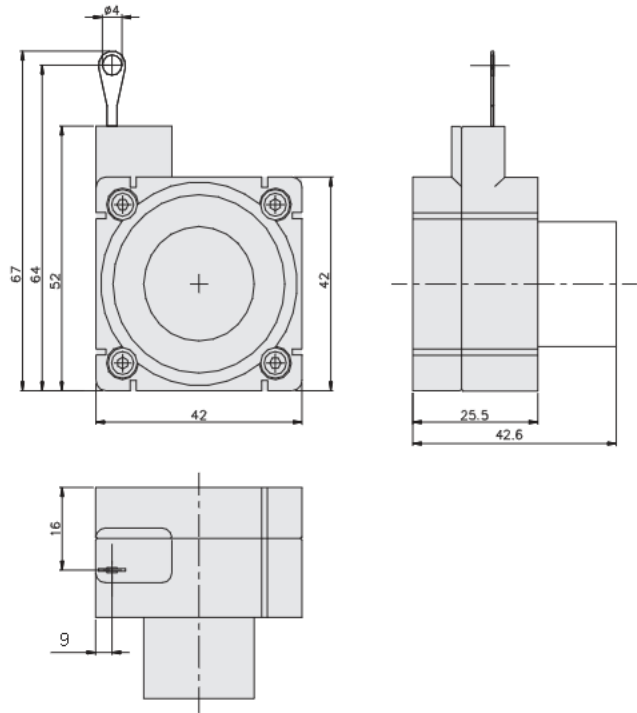


**Order Example: WS42 - 100 - 6 - IE24HI - 1**

# Model WS42 with incremental encoder output

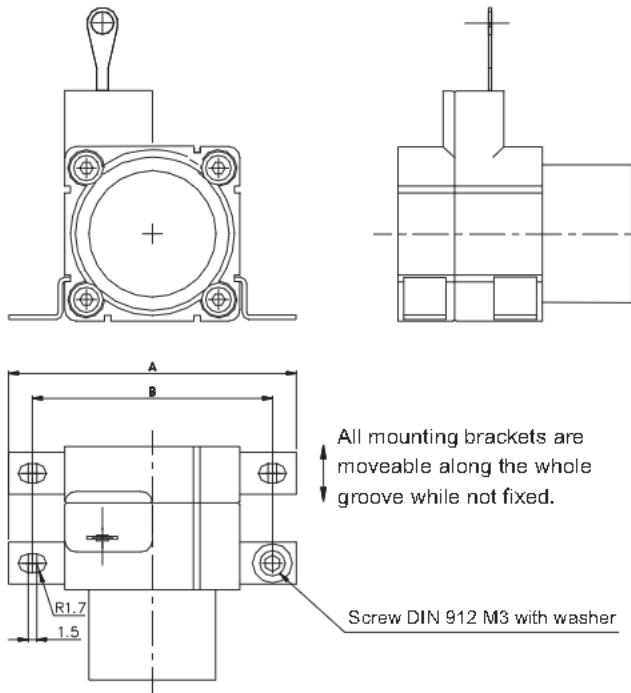


## Outline Drawing WS42



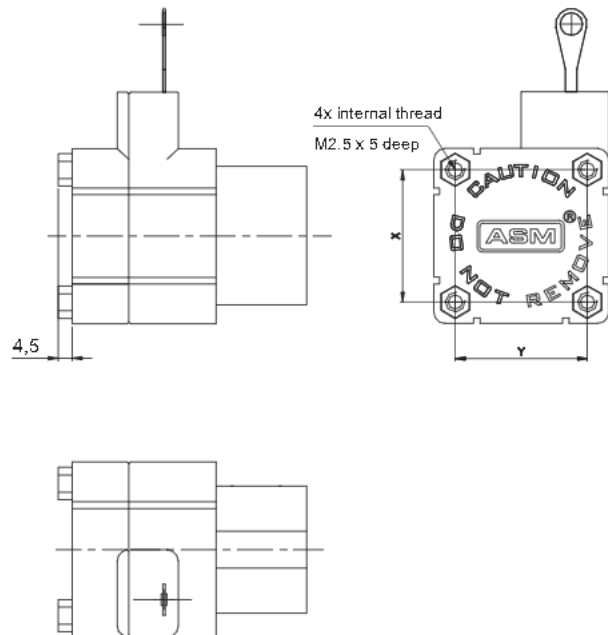
### Mounting with mounting brackets

Dimensions WS42  
A 62  
B 52...55



### Mounting with spacer nuts

Dimensions  
X = Y 31,1



Dimensions informative only.  
For guaranteed dimensions consult factory.



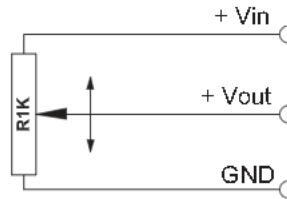
# Output Specifications

## R1K and 10V for WS position sensors

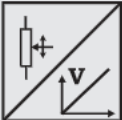


<b>Voltage divider R1K</b> Potentiometer 	Excitation Voltage	32 VDC max. at 1 kΩ (input power 1 W max.)
	Potentiometer Impedance	1 kΩ ±10%
	Thermal coefficient	±25 x 10 <sup>-6</sup> / °C full scale
	Sensitivity	Depends on measurement range, individual sensitivity of sensor specified on label
	Voltage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

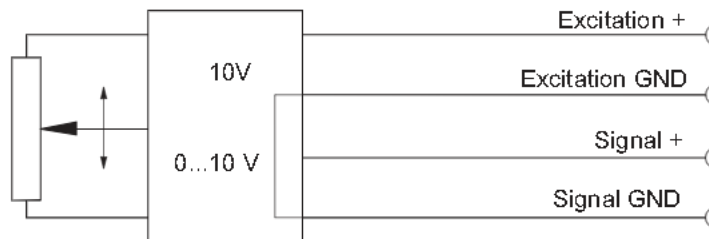
### Signal diagram



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

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

### Signal diagram

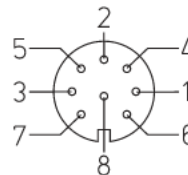


Signal Wiring	Output signals		Cable color	Connector pin no.
	R1K	10V		
	+ Vin	Excitation +	White	1
	GND	Excitation GND	Brown	2
	+ Vout	Signal +	Green	3
		Signal GND	Yellow	4

### Connection

#### Mating Connector

View to solder terminals



CONN-DIN-8F-W

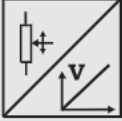


CONN-M12-8F-G

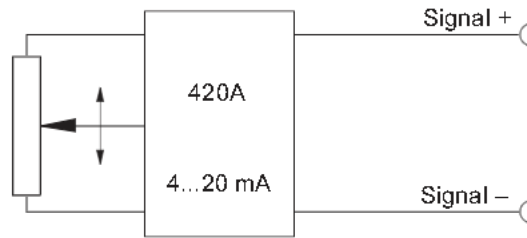
# Output Specifications

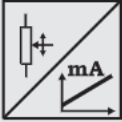
## 420A and 420T for WS position sensors



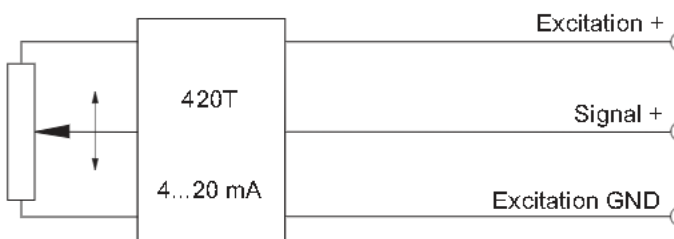
<b>Signal conditioner</b> <b>420A</b> Current output (2 wire) 	Excitation Voltage	+12 ... 27 VDC non stabilized, measured at the sensor terminals
	Excitation Current	35 mA max.
	Output Current	4 ... 20 mA equivalent to 0 ... 100% range
	Stability (Temperature)	$\pm 100 \times 10^{-6} / ^\circ\text{C}$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

### Signal Diagram



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

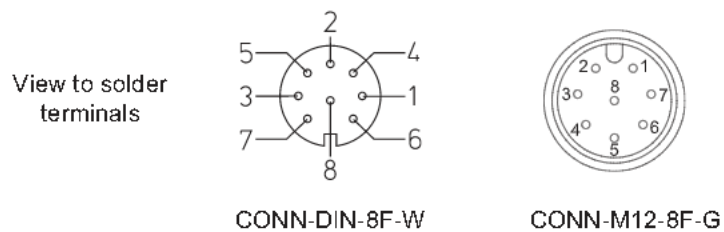
### Signal diagram



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

### Connection

#### Mating Connector



# Output Specifications

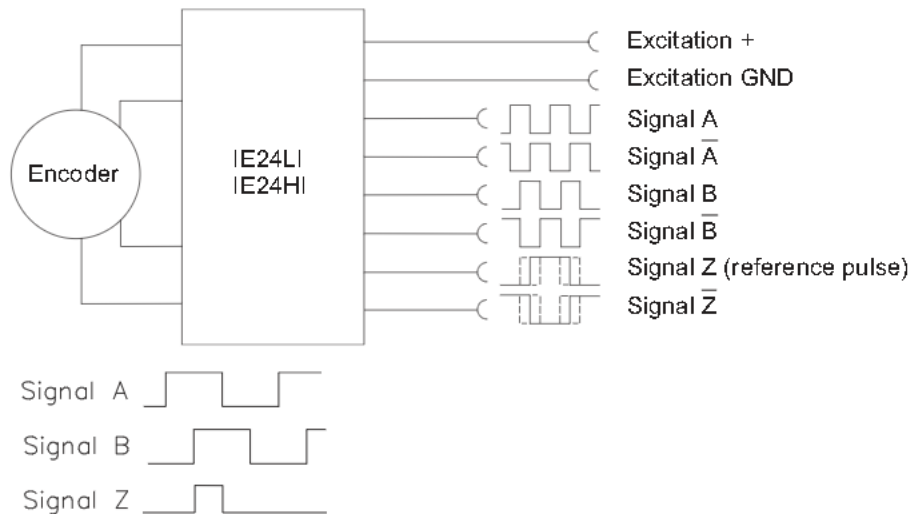
## IE24LI and IE24HI for WS position sensors



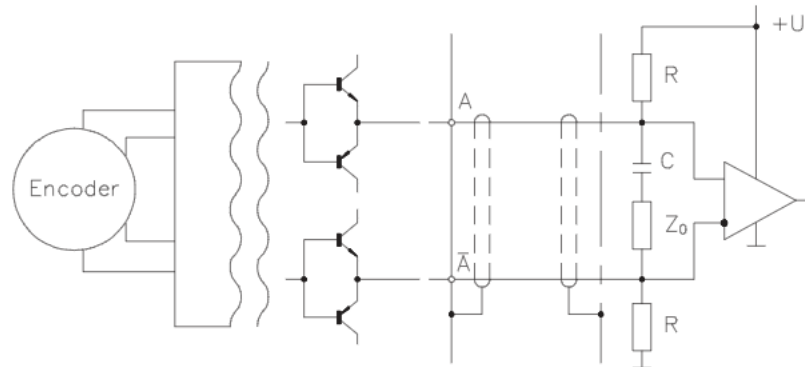
IE24LI and IE24HI incremental	IE24LI		IE24HI
	Excitation voltage	5 V DC $\pm 10\%$	10 ... 30 V DC
Excitation current	100 mA max.		
Output frequency	200 kHz		
Output	Push-pull and inverted signals		
Output current	10 mA max.		
Output voltage	Depending on the excitation voltage		
Stability (temperature)	$\pm 20 \times 10^{-6} / ^\circ\text{C}$ f.s. (sensor mechanism)		
Operation temperature	-20 ... +85 $^\circ\text{C}$		
Protection	Short circuit		
EMC	According to EN 61326:2004		



### Output signals



### Output circuit and recommended processing input circuit



Signal wiring	Output signals	Cable color	Connector pin no.
	Excitation +	Brown	1
	Excitation GND	White	2
	Signal B (A + 90°)	Grey	3
	Signal A	Green	4
	Signal B-bar	Pink	5
	Signal A-bar	Yellow	6
	Signal Z (reference pulse)	Blue	7
	Signal Z-bar	Red	8

### Connection

#### Mating connector

