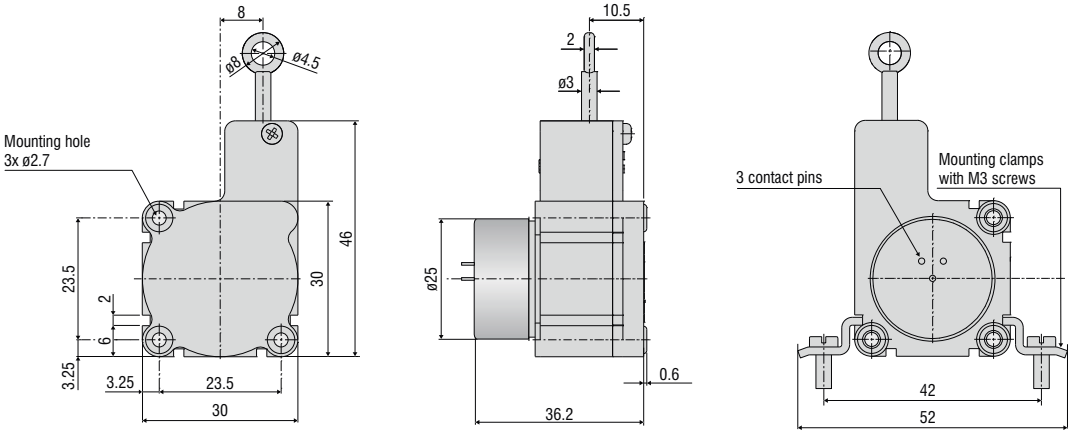
MICRO-EPSILON

More Precision.

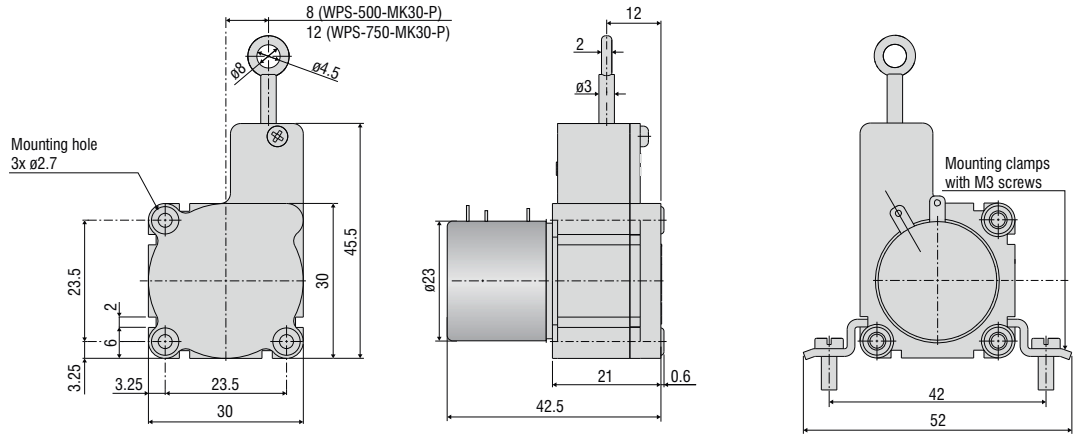
wireSENSOR // Draw-wire displacement sensors

- *Robust plastic housing*
- *Customer-specific designs*
- *Conductive plastic/wire/hybrid potentiometer*
- *Smallest design in its class*

MK30-P model (measuring range 50 mm)



MK30-P model (measuring range 150/250/500/750 mm)



Dimensions in mm, not to scale.

Model			WPS-50-MK30	WPS-150-MK30	WPS-250-MK30	WPS-500-MK30	WPS-750-MK30
Measuring range			50 mm	150 mm	250 mm	500 mm	750 mm
Analog output			Potentiometer				
Resolution	Conductive plastic potentiometer		towards infinity				
	Wire potentiometer		-	0.1 mm	0.1 mm	0.15 mm	0.2 mm
	Hybrid potentiometer		towards infinity				
Linearity	Conductive plastic potentiometer P50	≤ ±0.5 % FSO	≤ ±0.25 mm	-	-	-	-
	Wire potentiometer P25	≤ ±0.25 % FSO	-	-	-	≤ ±1.25 mm	≤ ±1.87 mm
	Hybrid potentiometer P25	≤ ±0.25 % FSO	-	≤ ±0.375 mm	≤ ±0.625 mm	-	-
	Hybrid potentiometer P10	≤ ±0.1 % FSO	-	-	≤ ±0.25 mm	≤ ±0.5 mm	≤ ±0.75 mm
Sensor element			Conductive plastic/wire/hybrid potentiometer				
Wire extension force (max.)			approx. 2.5 N				
Wire retraction force (min.)			approx. 1 N				
Wire acceleration (max.)			approx. 5 g				
Material		Housing	Plastics				
		Measuring wire	Polyamide-coated stainless steel (ø 0.36 mm)				
Wire mounting			Eyelet (ø 4.5 mm)				
Mounting			Mounting holes or mounting grooves on the sensor housing				
Temperature range		Storage	-20 … +80 °C				
		Operation	-20 … +80 °C				
Connection			Soldering tags				
Shock (DIN EN 60068-2-27)			50 g / 5 ms in 3 axes, 2 directions and 1000 shocks each				
Vibration (DIN EN 60068-2-6)			20 g / 20 … 2000 Hz in 3 axes and 10 cycles each				
Protection class (DIN EN 60529)			IP20				
Weight			approx. 45 g				

FSO = Full Scale Output
Specifications for analog outputs from page 54 onwards.

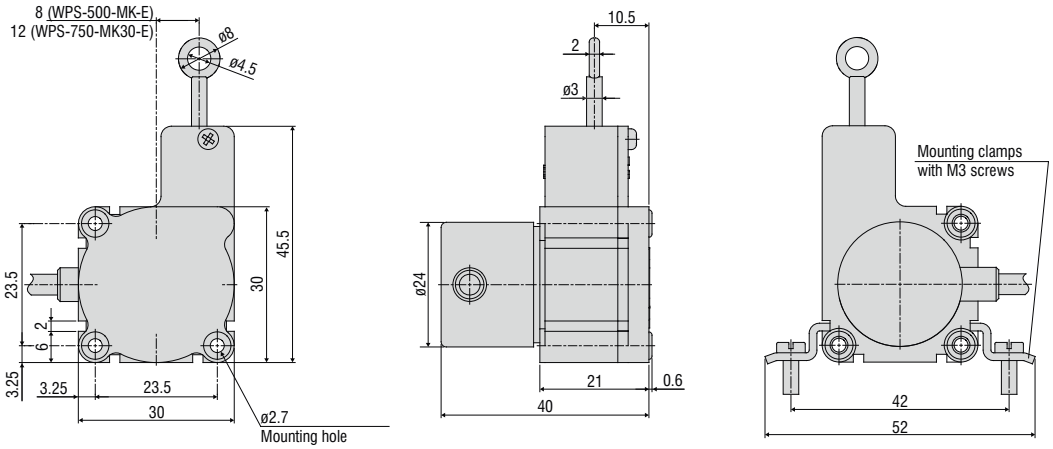
Article designation

WPS - 50 - MK30 - P25

- **P25** — Output type :
  Potentiometer P50 (linearity ±0.5 % FSO)
  Potentiometer P25 (linearity ±0.25 % FSO)
  Potentiometer P10 (linearity ±0.1 % FSO)
- **MK30** — MK30 series
- **50** — Measuring range in mm

- *Robust plastic housing*
- *Customer-specific designs*
- *Smallest design in its class*
- *Incremental encoder*

MK30 model (measuring range 500/750 mm)



Dimensions in mm, not to scale.

Model		WPS-500-MK30	WPS-750-MK30
Measuring range		500 mm	750 mm
Digital output		Encoder: E (5 … 24 VDC) / Encoder E830 (8 … 30 VDC)	
Resolution		10 pulses/mm	6.7 pulses/mm
		0.1 mm	0.15 mm
Linearity	≤ ±0.05 % FSO	≤ ±0.25 mm	≤ ±0.375 mm
Sensor element		Incremental encoder	
Wire extension force (max.)		approx. 2.5 N	
Wire retraction force (min.)		approx. 1 N	
Wire acceleration (max.)		approx. 5 g	
Material	Housing	Plastics	
	Measuring wire	Polyamide-coated stainless steel (ø 0.36 mm)	
Wire mounting		Eyelet (ø 4.5 mm)	
Mounting		Mounting holes or mounting grooves on the sensor housing	
Temperature range	Storage	-20 … +80 °C	
	Operation	-20 … +80 °C	
Connection		integrated cable, radial, length 1 m	
Shock (DIN EN 60068-2-27)		50 g / 5 ms in 3 axes, 2 directions and 1000 shocks each	
Vibration (DIN EN 60068-2-6)		20 g / 20 … 2000 Hz in 3 axes and 10 cycles each	
Protection class (DIN EN 60529)		IP54	
Weight		approx. 80 g (incl. cable)	

FSO = Full Scale Output
Specifications for digital outputs from page 55 onwards.

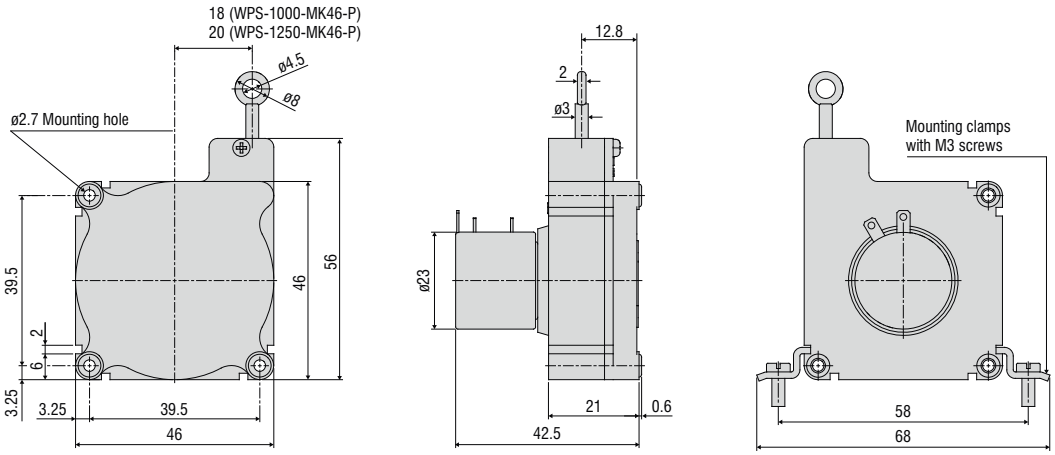
Article designation

WPS - 500 - MK30 - E830

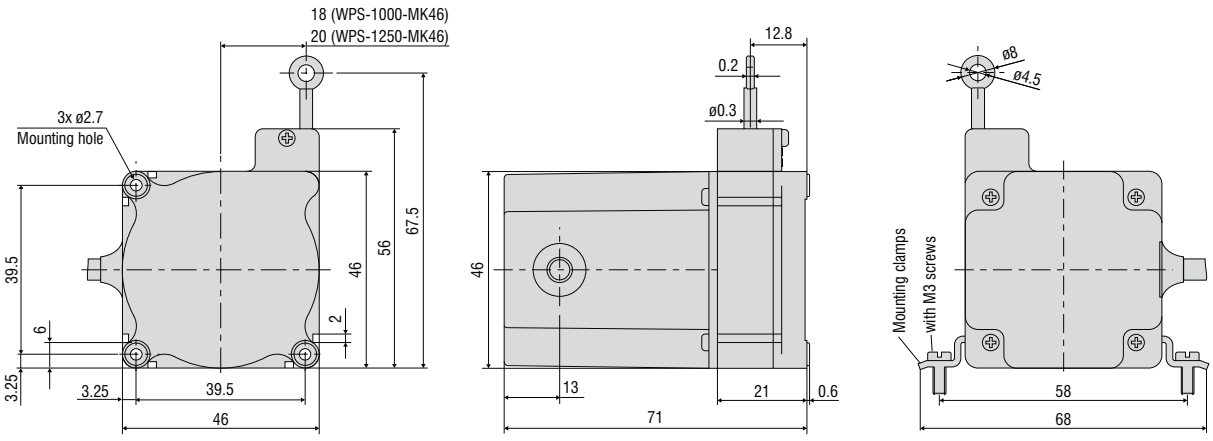
- **E830**: Output type: Encoder E (5 ... 24 VDC) / Encoder E830 (8 ... 30 VDC)
- **MK30**: MK30 series
- **500**: Measuring range in mm

- *Robust plastic housing*
- *Customer-specific designs*
- *Wire or hybrid potentiometer*

MK46 model Output P10/P25



MK46 model Output CR-P25/CR-U10/CR-I10



Dimensions in mm, not to scale.

Model			WPS-1000-MK46	WPS-1250-MK46
Measuring range			1000 mm	1250 mm
Analog output			Potentiometer	Potentiometer, current, voltage
Resolution	Wire potentiometer P25		0.3 mm	0.4 mm
	Hybrid potentiometer P10/U10/I10		towards infinity	
Linearity	Wire potentiometer P25	≤ ±0.25 % FSO	≤ ±2.5 mm	≤ ±3.12 mm
	Hybrid potentiometer P10/U10/I10	≤ ±0.1 % FSO	≤ ±1 mm	≤ ±1.2 mm
Sensor element			Wire/hybrid potentiometer	
Wire extension force (max.)			approx. 1.6 N	approx. 1.5 N
Wire retraction force (min.)			approx. 1 N	
Wire acceleration (max.)			approx. 5 g	
Material	Housing		Plastics	
	Measuring wire		Polyamide-coated stainless steel (ø 0.36 mm)	
Wire mounting			Eyelet (ø 4.5 mm)	
Mounting			Mounting holes or mounting grooves on the sensor housing	
Temperature range	Storage		-20 … +80 °C	
	Operation		-20 … +80 °C	
Connection	P10/P25		Soldering tags	
	CR-P25/CR-U10/CR-I10		integrated cable, radial, length 1 m	
Shock (DIN EN 60068-2-27)			50 g / 5 ms in 3 axes, 2 directions and 1000 shocks each	
Vibration (DIN EN 60068-2-6)			20 g / 20 … 2000 Hz in 3 axes and 10 cycles each	
Protection class (DIN EN 60529)			IP20	
Weight			approx. 80 g	

FSO = Full Scale Output
Specifications for analog outputs from page 54 onwards.

Article designation

WPS - 1000 - MK46 - P25

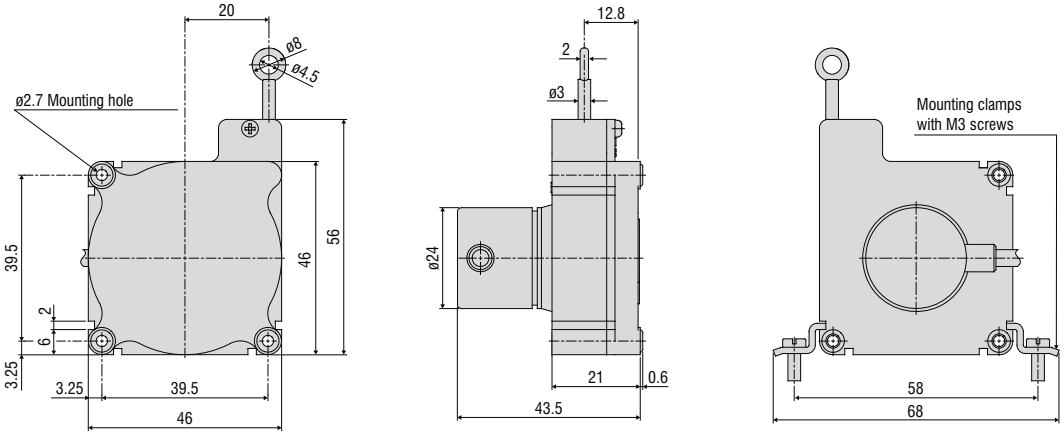
- Output type:
  P25: Potentiometer
  P10: Potentiometer
  CR-P25: Potentiometer, integrated cable, radial, 1 m
- MK46 series
- Measuring range in mm

WPS - 1250 - MK46 - P25

- Output type:
  P25: Potentiometer
  P10: Potentiometer
  CR-P25: Potentiometer, integrated cable, radial, 1 m
  CR-U10: Voltage, integrated cable, radial, 1 m
  CR-I10: Current, integrated cable, radial, 1 m
- MK46 series
- Measuring range in mm

- *Robust plastic housing*
- *Customer-specific designs*
- *Incremental encoder*

MK46 model



Dimensions in mm, not to scale.

Model		WPS-1250-MK46
Measuring range		1250 mm
Digital output		Encoder: E (5 … 24 VDC) / Encoder E830 (8 … 30 VDC)
Resolution		4 pulses/mm
		0.25 mm
Linearity	≤ ±0.05 % FSO	≤ ±0.625 mm
Sensor element		Incremental encoder
Wire extension force (max.)		approx. 1.5 N
Wire retraction force (min.)		approx. 1 N
Wire acceleration (max.)		approx. 5 g
Material	Housing	Plastics
	Measuring wire	Polyamide-coated stainless steel (ø 0.36 mm)
Wire mounting		Eyelet (ø 4.5 mm)
Mounting		Mounting holes or mounting grooves on the sensor housing
Temperature range	Storage	-20 … +80 °C
	Operation	-20 … +80 °C
Connection		integrated cable, radial, length 1 m
Shock (DIN EN 60068-2-27)		50 g / 5 ms in 3 axes, 2 directions and 1000 shocks each
Vibration (DIN EN 60068-2-6)		20 g / 20 … 2000 Hz in 3 axes and 10 cycles each
Protection class (DIN EN 60529)		IP54
Weight		approx. 120 g (incl. cable)

FSO = Full Scale Output
Specifications for digital outputs from page 55 onwards.

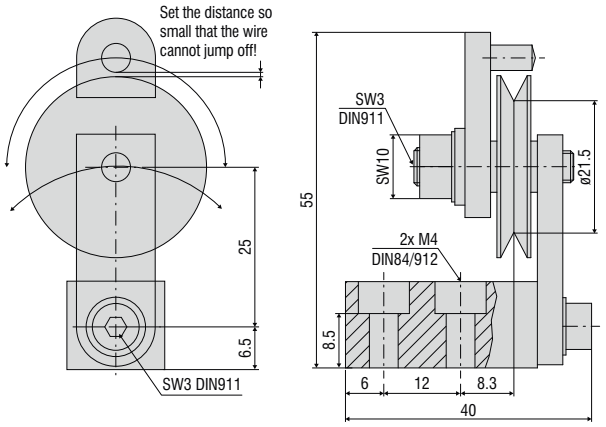
Article designation

WPS - 1250 - MK46 - E

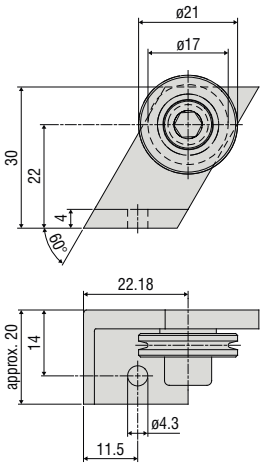
- E: Output type: Encoder E (5 ... 24 VDC) / Encoder E830 (8 ... 30 VDC)
- MK46: MK46 series
- 1250: Measuring range in mm

Wire deflection pulleys for external installation	
TR1-WDS	Wire deflection pulley, adjustable, for sensors with a wire diameter ≤ 0.45 mm
TR3-WDS	Wire deflection pulley, fixed, for sensors with a wire diameter ≤ 0.45 mm
TR4-WDS	Wire deflection pulley, fixed, for sensors with a wire diameter of 0.8 mm to 1 mm

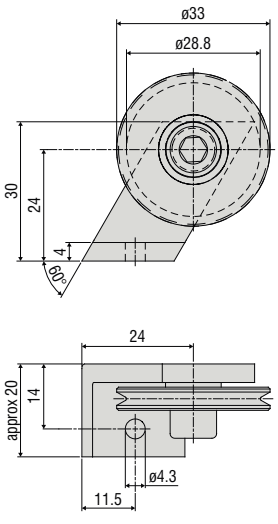
TR1-WDS
Wire deflection pulley, adjustable, for sensors with a wire diameter ≤ 0.45 mm



TR3-WDS
Wire deflection pulley, fixed, for sensors with a wire diameter ≤ 0.45 mm



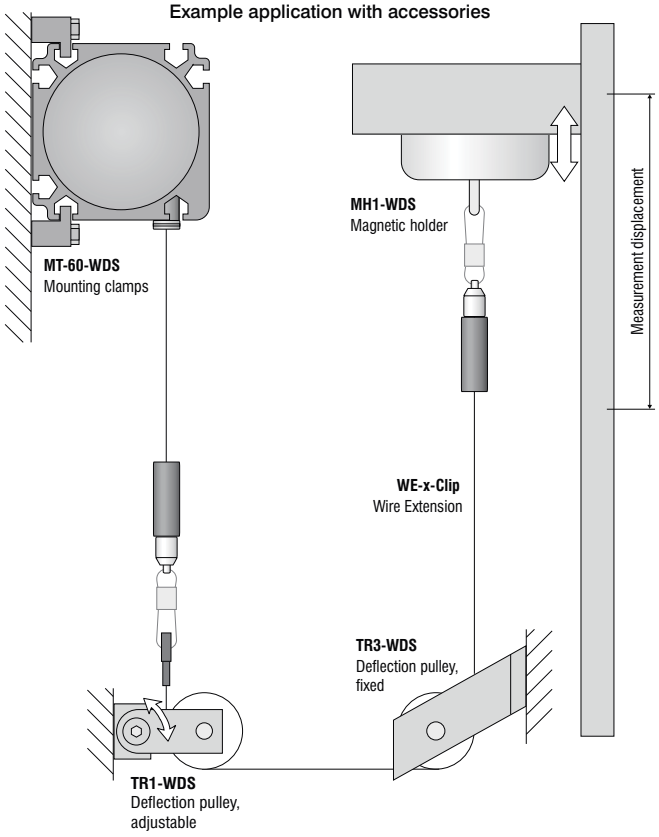
TR4-WDS
Wire deflection pulley, fixed, for sensors with a wire diameter of 0.8 mm to 1 mm



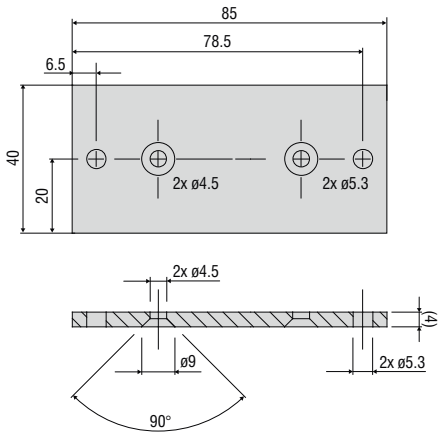
Dimensions in mm, not to scale.

Accessories	
WE-xxxx-M4	Wire extension with M4 wire connection, x=wire length
WE-xxxx-Clip	Wire extension with eyelet, x = wire length
WE-xxx-Clip-WSS	Wire extension with clip and uncoated wire d=0.45 mm
WE-xxxx-Ring-PW	Wire extension with plastic ring and para-aramid wire, 1 mm
GK1-WDS	Fork head for M4
MH1-WDS	Magnetic holder for wire attachment
MH2-WDS	Magnetic holder for sensor mounting
MT-60-WDS	Mounting clamps for WDS-P60
FC8	Mating plug for WDS straight, 8-pin
FC8/90	Mating plug, 90° angled for WDS
PC3/8-WDS	Sensor cable, 3 m long
PS2020	Power supply unit 24 V / 2.5 A; input 100-240 VAC, output 24 VDC / 2.5 A; mounting onto symmetrical standard rail 35 mm x 7.5 mm, DIN 50022)
WDS-MP60	Mounting plate for P60 models
PC2/10-WDS-A	Cable for SSI encoder, 2 m long
PC2/10-WDS-E	Cable for incremental encoder, 2 m long
PC10/10-WDS-A	Cable for SSI encoder, 10 m long
PC10/10-WDS-E	Cable for incremental encoder, 10 m long

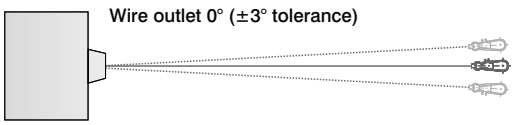
Example application with accessories



WDS-MP60
Mounting plate for P60 models

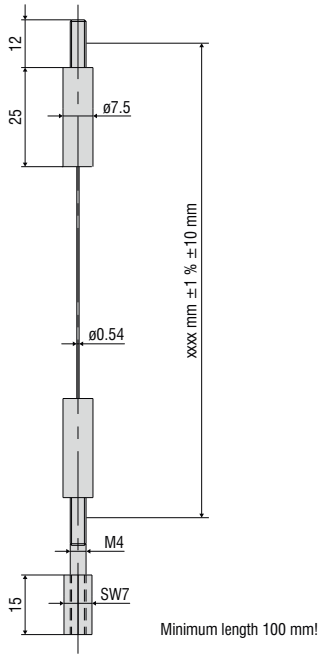


Installation instructions:
Wire attachment: during installation, do not allow at any time the measuring wire to freely return.
Angle of wire outlet: Make sure during installation that the wire outlet is straight (tolerance of ±3°). Exceeding this tolerance leads to increased wear of the wire material and on the wire outlet.

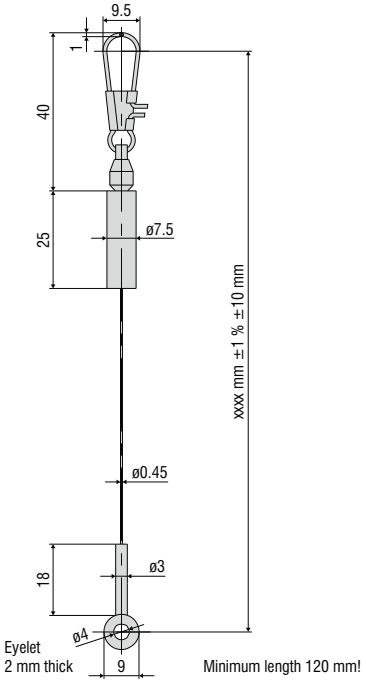


Dimensions in mm, not to scale.

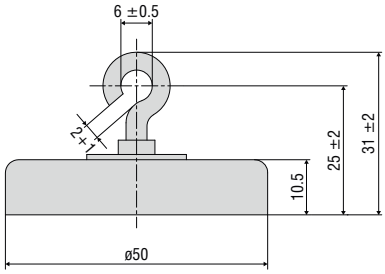
WE-xxxx-M4
Wire extension with M4 wire connection, x=wire length



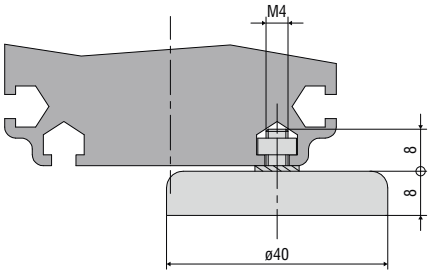
WE-xxxx-Clip
Wire extension with eyelet, x = wire length



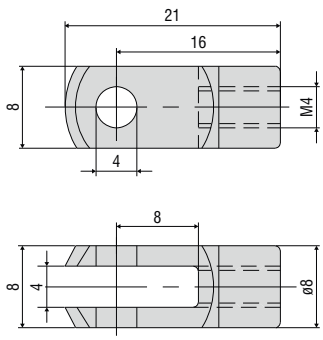
MH1-WDS
Magnetic holder for wire attachment



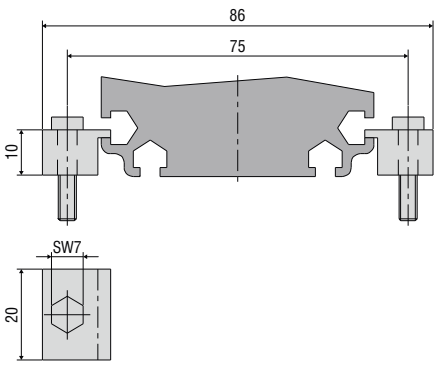
MH2-WDS
Magnetic holder for sensor mounting



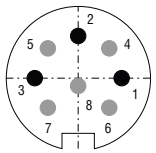
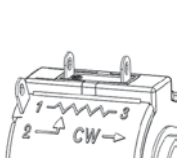
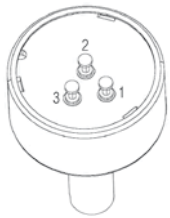
GK1-WDS
Fork head for M4

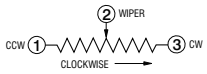


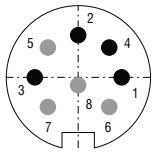
MT-60-WDS
Mounting clamps for WDS-P60

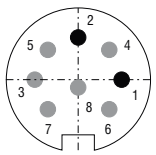


Output	Connector M16 -SA / -SR	Integrated cable -CA / -CR	Open contacts

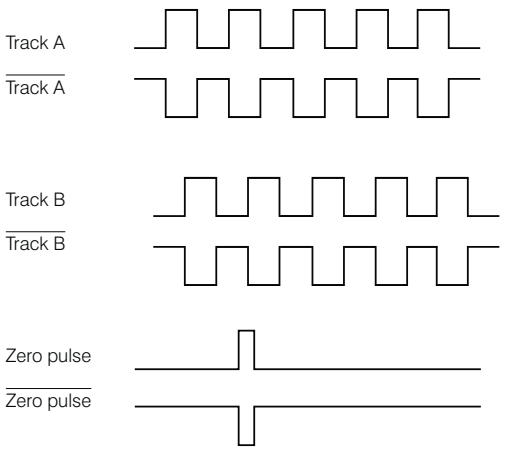
Potentiometer output (P)				
Input voltage	max. 32 VDC with 1 kOhm / max. 1 W	 Sensor side		 
Resistance	1 kOhm ±10 % (resistance divider)			
Temperature coefficient	±0.0025 % FSO/°C			
		1 = Input + 2 = Ground 3 = Signal	White = Input + Brown = Ground Green = Signal	1 = Input + 2 = Signal 3 = Ground



Voltage output (U)				
Supply voltage	14 ... 27 VDC (non-stabilized)	 Sensor side		
Current consumption	max. 30 mA			
Output voltage	0 ... 10 VDC Option 0 ... 5 / ±5 V			
Load resistance	>5 kOhm			
Output noise	0.5 mV_{eff}			
Temperature coefficient	±0.005 % FSO/°C			
Electromagnetic compatibility (EMC)	EN 61000-6-4 EN 61000-6-2			
Adjustment range (if supported by the model)		1 = Power supply 2 = Ground 3 = Signal 4 = Ground	White = Supply Brown = Ground Green = Signal Yellow = Ground	
Zero	±20 % FSO			
Sensitivity	±20 %			

Current output (I)				
Supply voltage	14 ... 27 VDC (non-stabilized)	 Sensor side		
Current consumption	max. 35 mA			
Output current	4 ... 20 mA			
Load	<600 Ohm			
Output noise	<1.6 μA_{eff}			
Temperature coefficient	±0.01 % FSO/°C			
Electromagnetic compatibility (EMC)	EN 61000-6-4 EN 61000-6-2			
Adjustment range (if supported by the model)		1 = Power supply 2 = Ground	White = Supply Brown = Ground	
Zero	±18 % FSO			
Sensitivity	±15 %			

Output signals



TTL Output	Line driver (5 VDC)	
High level	≥ 2.5 V	(with I = -20 mA)
Low level	≤ 0.5 V	(with I = 20 mA)
Load High	≤ 20 mA	
Tracks	A, $\overline{A}$, B, $\overline{B}$, 0	

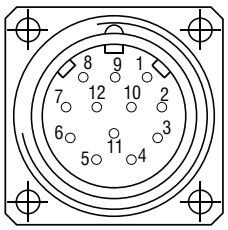
Output TTL01/ TTL02	NPN (5 VDC ±5 %)
High level	> 4.5 V
Low level	< 1.0 V
Load High	≤ 3 mA
Tracks (TTL01)	A, B, 0
Tracks (TTL02)	A, $\overline{A}$, B, $\overline{B}$, 0

Output HTL	Push-pull (10 ... 30 VDC)	
High level	≥ V+ -3 V	(with I = -20 mA)
Low level	≤ 1.5 V	(with I = 20 mA)
Load High	≤ 40 mA	
Tracks	A, $\overline{A}$, B, $\overline{B}$, 0	

Output E	Push-pull (5 VDC)
High level	≥ V+ -2.5 V
Low level	≤ 0.5 V
Load High	≤ 50 mA
Tracks	A, B, 0

Output E830	Push-pull (8 ... 30 VDC)
High level	≥ V+ -3 V
Low level	≤ 2.5 V
Load High	≤ 50 mA
Tracks	A, B, 0

Pin assignment TTL, HTL		
Connector	Cable color	Assignment
Pin 1	Pink	Track B inv.
Pin 2	Blue	V+ Sense
Pin 3	Red	Track N (zero pulse)
Pin 4	Black	Track N inv. (zero pulse inv.)
Pin 5	Brown	Track A
Pin 6	Green	Track inv.
Pin 7	-	-
Pin 8	Gray	Track B
Pin 9	-	-
Pin 10	White-green	GND
Pin 11	White	GND Sense
Pin 12	Brown-green	V+



V+ Sense and GND Sense are directly connected to V+ or GND. Recommendation: Use twisted-pair cables (e.g. A/A inv.) from a cable length of 10 m.

Pin assignment E, E830	
Cable color	Assignment
White	0V
Brown	V+
Green	A
-	$\overline{A}$
Yellow	B
-	$\overline{B}$
Gray	0

Pin assignment TTL01	
Cable color	Assignment
Brown	0V
Gray	V+
White	A
Green	B
Yellow	0

Pin assignment TTL02	
Cable color	Assignment
Red	V+
Black	0V
Brown	A
Black	$\overline{A}$
Orange	B
Black	$\overline{B}$
Yellow	0
Black	n. c.

Sensors and Systems from Micro-Epsilon

Sensors and systems for displacement, distance and position

Sensors and measurement devices for non-contact temperature measurement

Measuring and inspection systems for metal strips, plastics and rubber

Optical micrometers and fiber optics, measuring and test amplifiers

Color recognition sensors, LED analyzers and inline color spectrometers

3D measurement technology for dimensional testing and surface inspection

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