MICRO-EPSILON

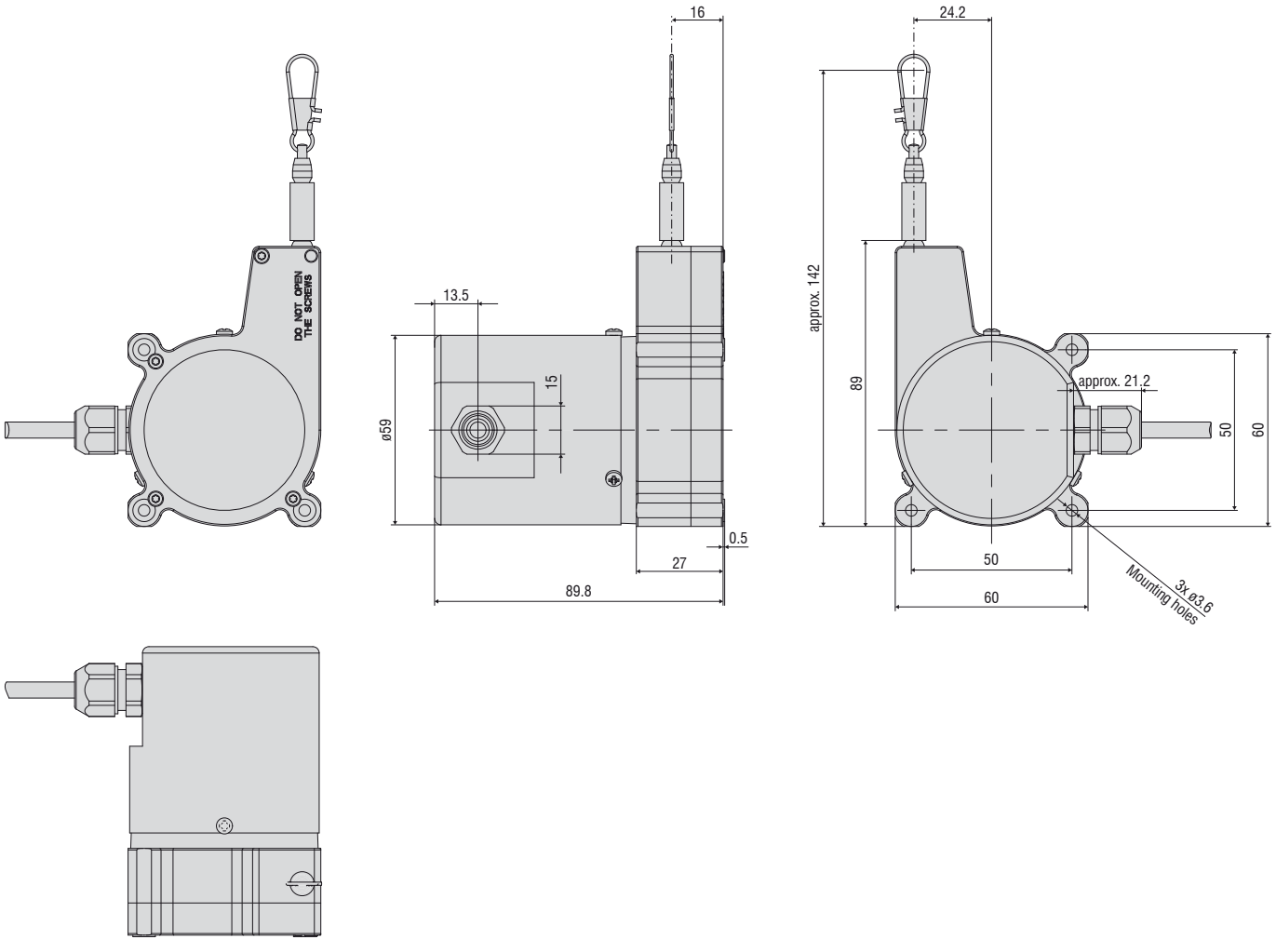
More Precision.

wireSENSOR // Draw-wire displacement sensors

wireSENSOR MK60 analog

- *Robust plastic housing*
- *Customer-specific designs*
- *Potentiometer, current or voltage output*

MK60 model



Dimensions in mm, not to scale.

Model			WPS-1500-MK60
Measuring range			1500 mm
Analog output			Potentiometer, current, voltage
Resolution	Hybrid potentiometer P10		towards infinity
Linearity	Hybrid potentiometer P10	≤ ±0.15 % FSO	≤ ±2.25 mm
Sensor element			Hybrid potentiometer
Wire extension force (max.)			approx. 8 N
Wire retraction force (min.)			approx. 1 N
Wire acceleration (max.)			approx. 5 g
Material		Housing	Glass-fiber reinforced plastic (PBT GF20)
		Measuring wire	Polyamide-coated stainless steel (ø 0.45 mm)
Wire mounting			Wire clip
Mounting			Mounting holes
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)			IP65
Weight			approx. 290 g (incl. cable)

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

Article designation

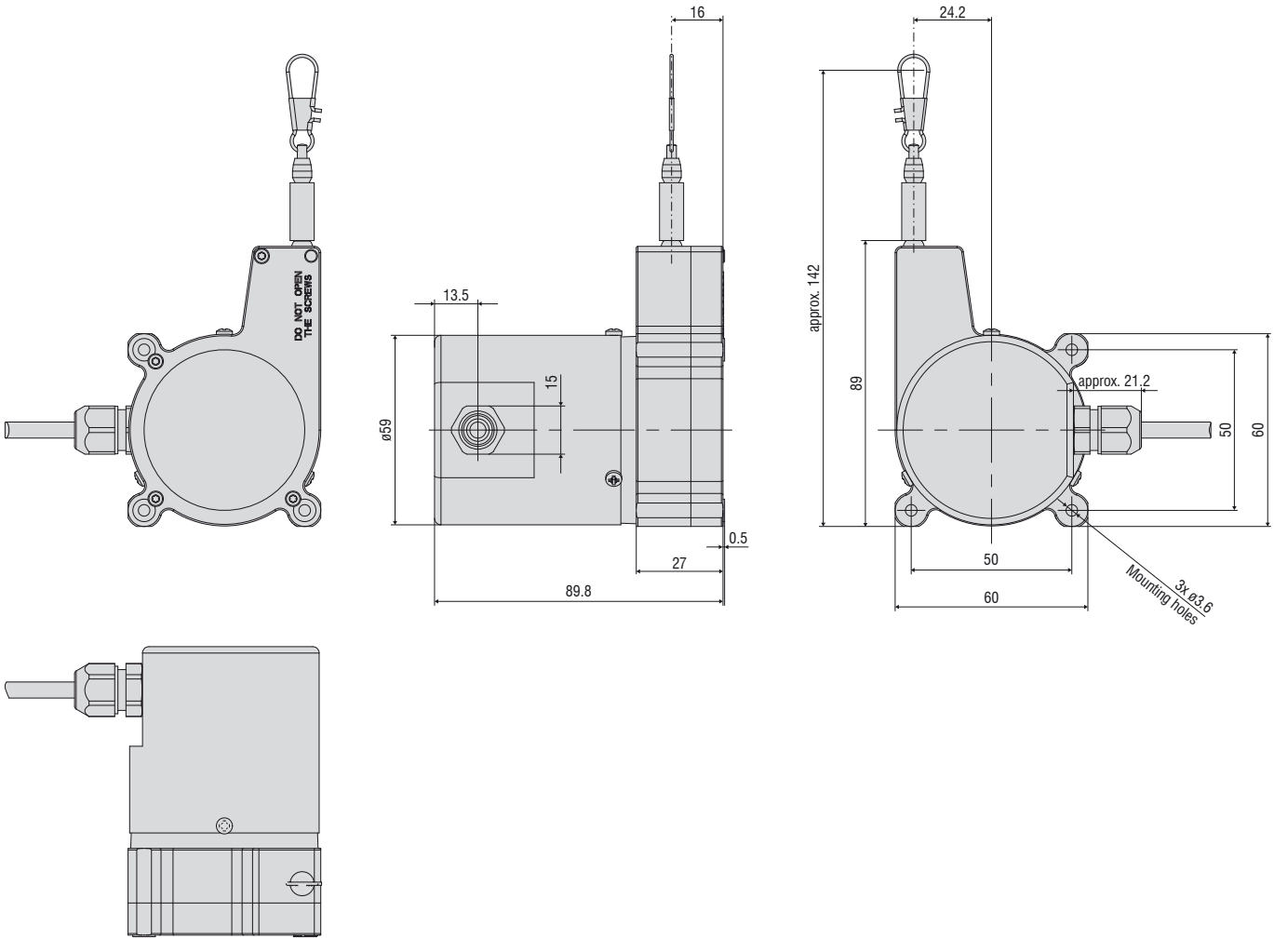
WPS - 1500 - MK60 - CR - P

- P: Output: P: potentiometer, U: voltage, I: current
- CR: Connection CR: integrated cable, radial, 1 m
- MK60: MK60 series
- 1500: Measuring range in mm

wireSENSOR MK60 digital

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

MK60 model



Dimensions in mm, not to scale.

Model		WPS-2400-MK60-CR
Measuring range		2400 mm
Digital output		TTL01 (A,B, 0) / TTL02 (A, $\overline{A}$, B, $\overline{B}$, O)
Resolution		6.83 pulses/mm
		0.146 mm
Linearity	≤ ±0.05 % FSO	≤ ±1.2 mm
Sensor element		Incremental encoder
Wire extension force (max.)		approx. 8 N
Wire retraction force (min.)		approx. 1 N
Wire acceleration (max.)		approx. 5 g
Material	Housing	Glass-fiber reinforced plastic (PBT GF20)
	Measuring wire	Polyamide-coated stainless steel (ø 0.45 mm)
Wire mounting		Wire clip
Mounting		Mounting holes
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)		IP65
Weight		approx. 290 g (incl. cable)

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

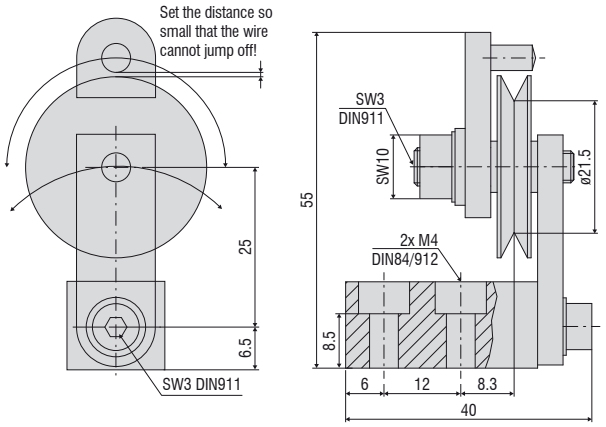
Article designation

WPS - **2400** **MK60 -** **CR -** **TTL01**

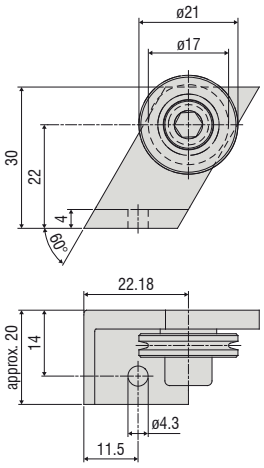
- TTL01: Output: TTL01: A, $\underline{B}$, 0 TTL02: A, $\overline{A}$, B, $\overline{B}$, O
- CR: Connection CR: integrated cable, radial, 1 m
- MK60: MK60 series
- 2400: Measuring range in mm

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

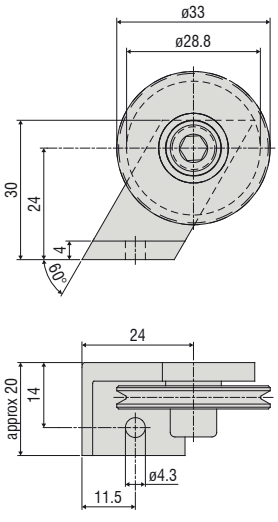
TR1-WDS
Wire deflection pulley, adjustable, for sensors with a wire diameter ≤ 0.45 mm



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



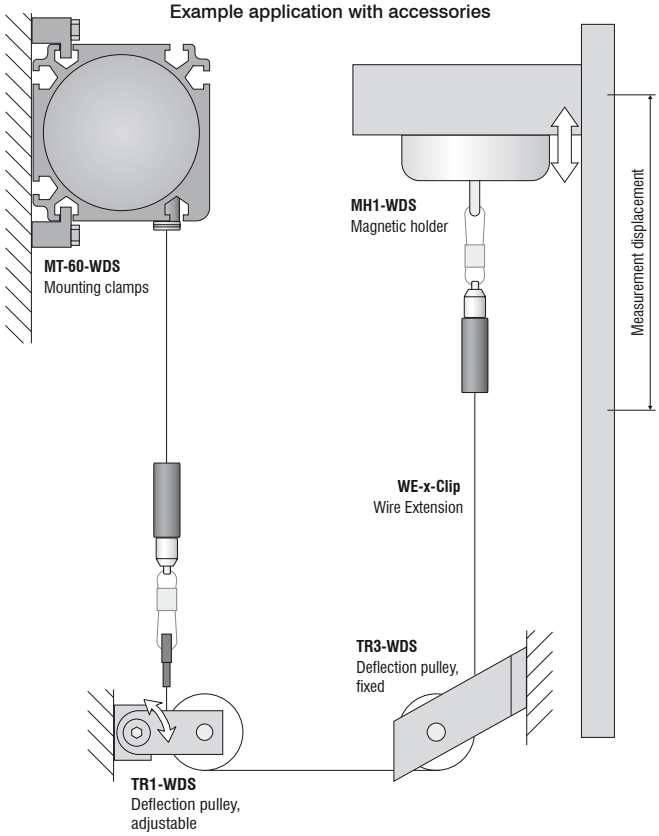
TR4-WDS
Wire deflection pulley, fixed, for sensors with a wire diameter of 0.8 mm to 1 mm



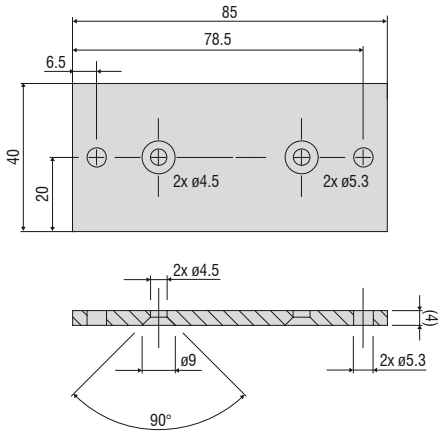
Dimensions in mm, not to scale.

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

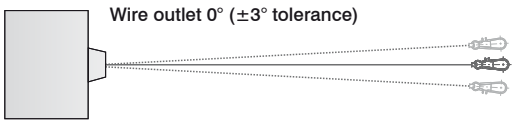
Example application with accessories



WDS-MP60
Mounting plate for P60 models

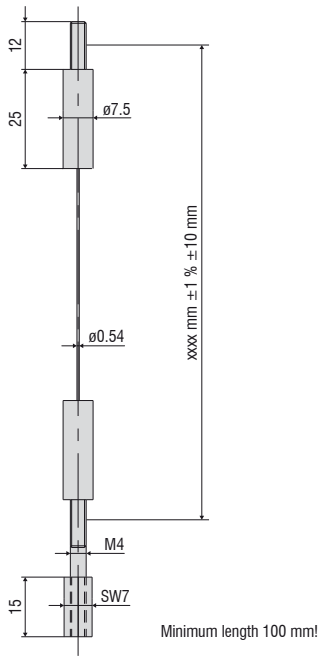


Installation instructions:
Wire attachment: during installation, do not allow at any time the measuring wire to freely return.
Angle of wire outlet: Make sure during installation that the wire outlet is straight (tolerance of ±3°). Exceeding this tolerance leads to increased wear of the wire material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

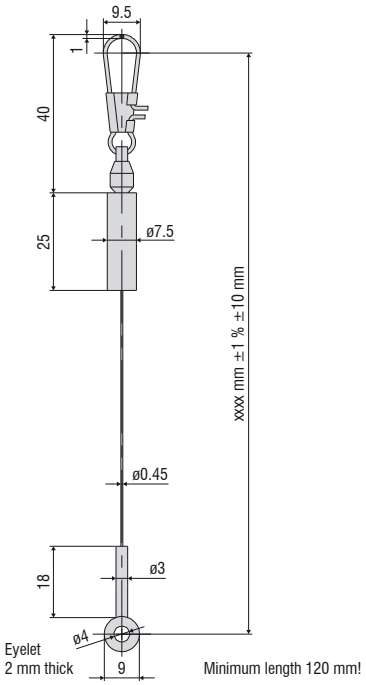


Dimensions in mm, not to scale.

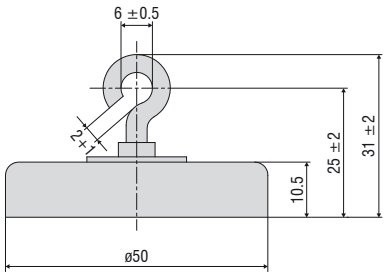
WE-xxxx-M4
Wire extension with M4 wire connection, x=wire length



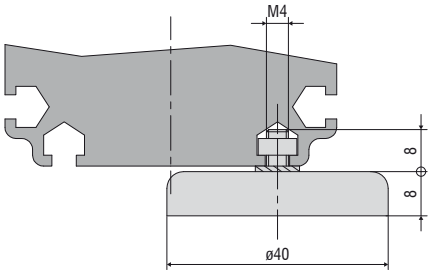
WE-xxxx-Clip
Wire extension with eyelet, x = wire length



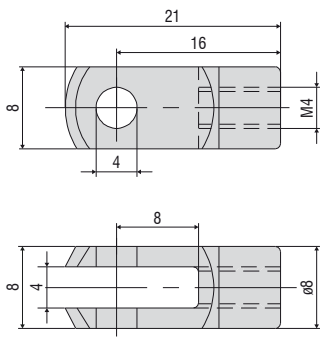
MH1-WDS
Magnetic holder for wire attachment



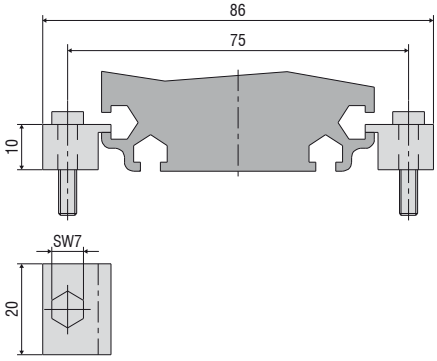
MH2-WDS
Magnetic holder for sensor mounting



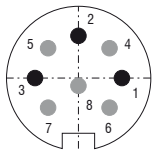
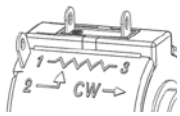
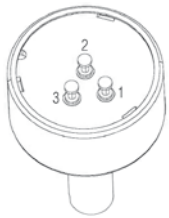
GK1-WDS
Fork head for M4

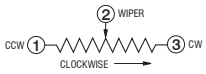


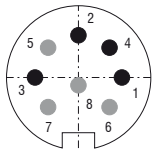
MT-60-WDS
Mounting clamps for WDS-P60

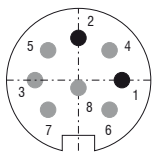


Output	Connector M16 -SA / -SR	Integrated cable -CA / -CR	Open contacts

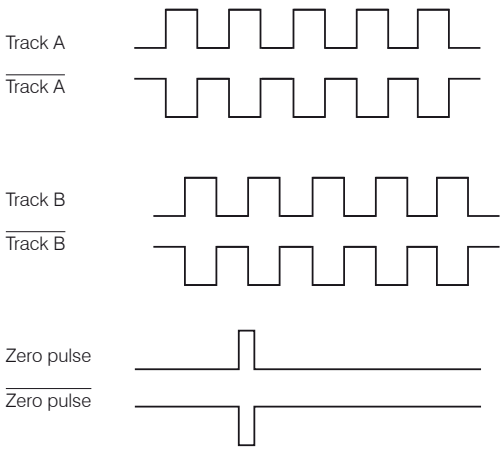
Potentiometer output (P)				
Input voltage	max. 32 VDC with 1 kOhm / max. 1 W	 Sensor side		 
Resistance	1 kOhm ±10 % (resistance divider)			
Temperature coefficient	±0.0025 % FSO/°C			
		1 = Input + 2 = Ground 3 = Signal	White = Input + Brown = Ground Green = Signal	1 = Input + 2 = Signal 3 = Ground



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	

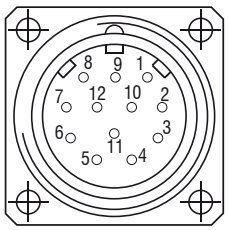
Output TTL01/ TTL02	NPN (5 VDC ±5 %)
High level	> 4.5 V
Low level	< 1.0 V
Load High	≤ 3 mA
Tracks (TTL01)	A, B, 0
Tracks (TTL02)	A, $\overline{A}$, B, $\overline{B}$, 0

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.

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MICRO-EPSILON

MICRO-EPSILON USA
8120 Brownleigh Dr. · Raleigh, NC 27617 / USA
Phone +1/919/787-9707 · Fax +1/919/787-9706
me-usa@micro-epsilon.com · **www.micro-epsilon.com**