

# Encoders without bearings - incremental

Sensor head with magnetic wheel

Max. 4096 pulses per revolution

## MIR10



MIR10

### Features

- Sensor head with magnetic wheel
- Robust magnetic sensing method
- Max. 4096 pulses per revolution
- Output signals A 90° B with zero pulse
- Output circuits: HTL/push-pull and TTL/RS422
- Non-contact, wear-free sensing system
- High resistance to dirt and vibrations

### Technical data - electrical ratings

Short-circuit proof	Yes
Pulses per revolution	320...4096
Initializing time	≤50 ms after power on (see general informations)
Interpolation	10-fold, 20-fold, 32-fold, 64-fold
Output signals	A+, B+, R+, A-, B-, R-
Reference signal	Zero pulse, width 90° (zero pulse only with magnet rotor incl. reference magnet)
Output frequency	≤350 kHz
System accuracy	Typ. ±0.7° (+20 °C)
Sensing method	Magnetic
Output stages	HTL/push-pull TTL/RS422
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approvals	CE, UL

### Technical data - electrical ratings (HTL)

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption typ.	20 mA (w/o load)

### Technical data - electrical ratings (TTL)

Voltage supply	5 VDC ±5 %
Consumption typ.	30 mA (w/o load)
Recommended cable termination	On control side each channel pair 120 Ohm

### Technical data - mechanical design

Shaft type	ø6...43.5 mm (through hollow shaft)
Dimensions (sensor head)	10 x 15 x 45.5 mm
Protection DIN EN 60529	IP 66, IP 67
Operating speed	≤10000 rpm (50 and 64 poles) ≤20000 rpm (up to 36 poles)
Working distance	0.1...0.6 mm (axial/radial)
Material	Housing: zinc diecast, plated
Operating temperature	-40...+85 °C
Relative humidity	EN 60068-2-78:2010 EN 60068-2-30:2005 93 % condensation permitted
Resistance	DIN EN 60068-2-6 Vibration 30 g, 10-2000 Hz DIN EN 60068-2-27 Shock 500 g, 6 ms
Weight approx.	130 g
Connection	Cable 2 m Cable 0.3 m with connector M12

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## Part number

## Sensor head

MIR10-S0.   .    .A

### Reference signal

- N Without reference signal
- A Zero pulse via side mounted manget

### Interpolation

- 010 10 pulses per pole
- 020 20 pulses per pole
- 032 32 pulses per pole
- 064 64 pulses per pole

### Voltage supply / output stages

- N 10...30 VDC / HTL/push-pull, 6 channel (with an adequate magnetic rotor with reference magnet)
- R 10...30 VDC / HTL/push-pull, 4 channel
- K 10...30 VDC / HTL/push-pull, 3 channel (with an adequate magnetic rotor with reference magnet)
- S 10...30 VDC / HTL/push-pull, 2 channel
- E 5 VDC  $\pm 5\%$  / TTL/RS422, 6 channel (with an adequate magnetic rotor with reference magnet)
- C 5 VDC  $\pm 5\%$  / TTL/RS422, 4 channel

### Connection

- L Cable 2 m
- C Cable 0.3 m with connector M12, 8-pin, pin terminals, CCW

## Magnetic wheel

MIR10-P.   .    S

### Bore diameter\*

- 006  $\varnothing 6$  mm
- 5Z8  $\varnothing 5/8$ " (15.875 mm)
- 025  $\varnothing 25$  mm
- 1Z0  $\varnothing 1$ " (25.4 mm)

### Reference

- N Without reference magnet
- A With reference magnet

### Number of poles

- 032.0.031 32 poles (Bore diameter max. 17.5 mm)
- 036.0.031 36 poles (Bore diameter max. 17.5 mm)
- 050.0.056 50 poles (Bore diameter max. 43.5 mm)
- 064.0.056 64 poles (Bore diameter max. 43.5 mm)

\* Other bore diameter on request.

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### Selection of sensor head / magnetic wheel

The pulses are a result of the interpolation factor of the sensor head and the number of poles on the magnetic wheel. The table below shows as an example which sensor head and which magnetic wheel have to be combined in order to achieve a certain number of pulses. Other pulses are available on request.

Sensor head MIR10-S Interpolation factor	Magnetic wheel MIR10-P				
	32 poles	36 poles	50 poles	64 poles	
10	320	<b>360</b>	<b>500</b>	640	
20	640	<b>720</b>	<b>1000</b>	1280	
32	<b>1024</b>	1152	1600	<b>2048</b>	
64	<b>2048</b>	2304	3200	<b>4096</b>	

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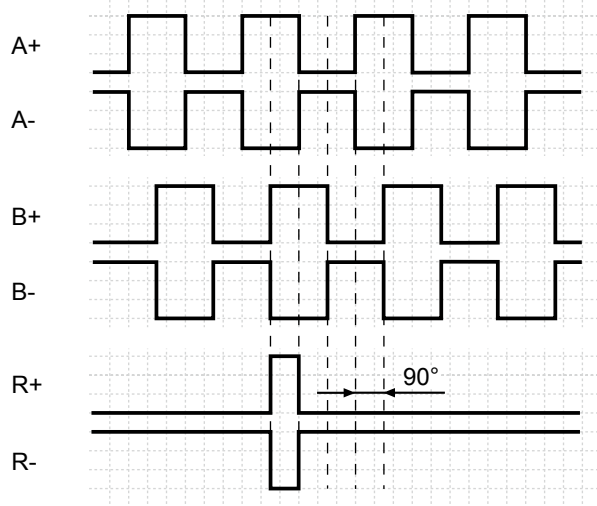
## Accessories

### Connectors and cables

10146775	Female connector M12, 8-pin, straight, without cable
11170528	Female connector M12, 8-pin, straight, shielded, 5 m cable (ESG 34FH0500GVS)
11177375	Female connector M12, 8-pin, straight, shielded, 10 m cable (ESG 34FH1000GVS)
11091511	Female connector M12, 8-pin, straight, shielded, 20 m cable

## Output signals

With clockwise rotation shown below.



## Trigger level

Outputs	HTL/push-pull
Output level High	>+Vs -2.2 V
Output level Low	<0.7 V
Load	≤20 mA

Outputs	TTL/RS422
Output level High	>2.4 V
Output level Low	<0.7 V
Load	≤20 mA

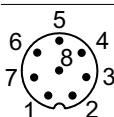
## General information

The initializing time of the sensor is 50 ms. Output signals may not be processed during this time.

## Terminal assignment

### Cable or cable 0.3 m with connector M12

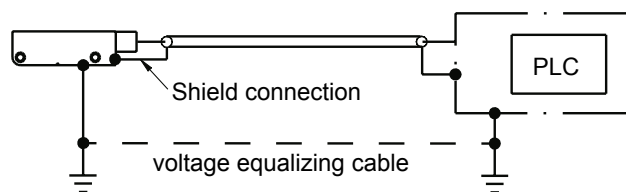
Connector	Core colour	Signals
Pin 1	white	0 V
Pin 2	brown	+Vs
Pin 3	green	A+
Pin 4	yellow	A-
Pin 5	grey	B+
Pin 6	pink	B-
Pin 7	blue	R+ (zero pulse)
Pin 8	red	R- (zero pulse inv.)



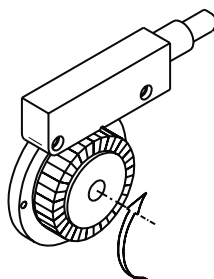
Cable screen: connected to sensor housing or connector M12 and sensor housing.

Cable data: PUR 4 x 2 x 0.14 mm<sup>2</sup>, shielded  
 Bending radius: >50 mm (fix) / >100 mm (cable chain)  
 Outer diameter: 6.3 mm

## Recommended grounding concept



## Rotational or linear direction





# Encoders without bearings - incremental

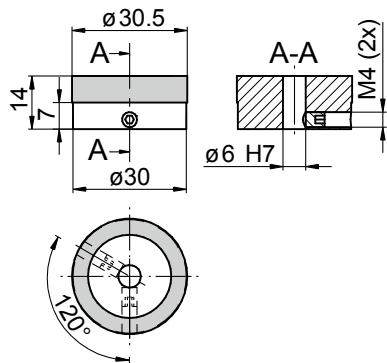
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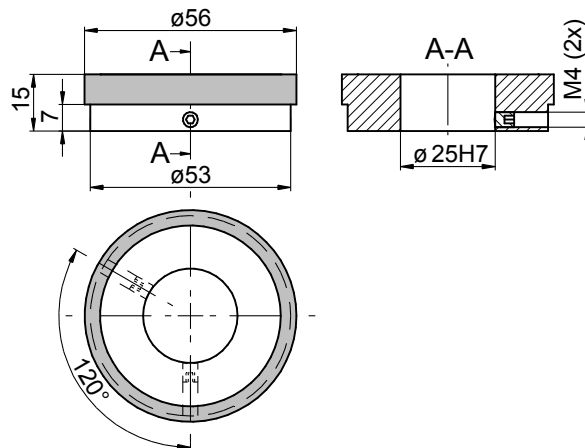
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## Magnetic wheel without reference magnet

MIR10-P with 32, 36 poles

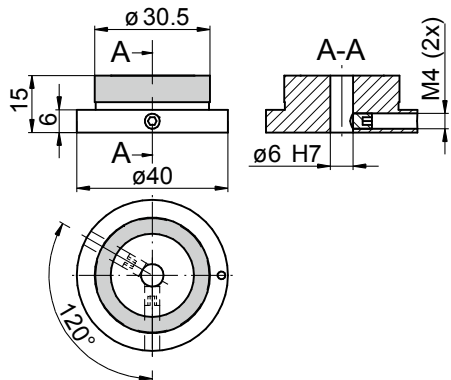


MIR10-P with 50, 64 poles



## Magnetic wheel with reference magnet

MIR10-P with 32, 36 poles



MIR10-P with 50, 64 poles

