



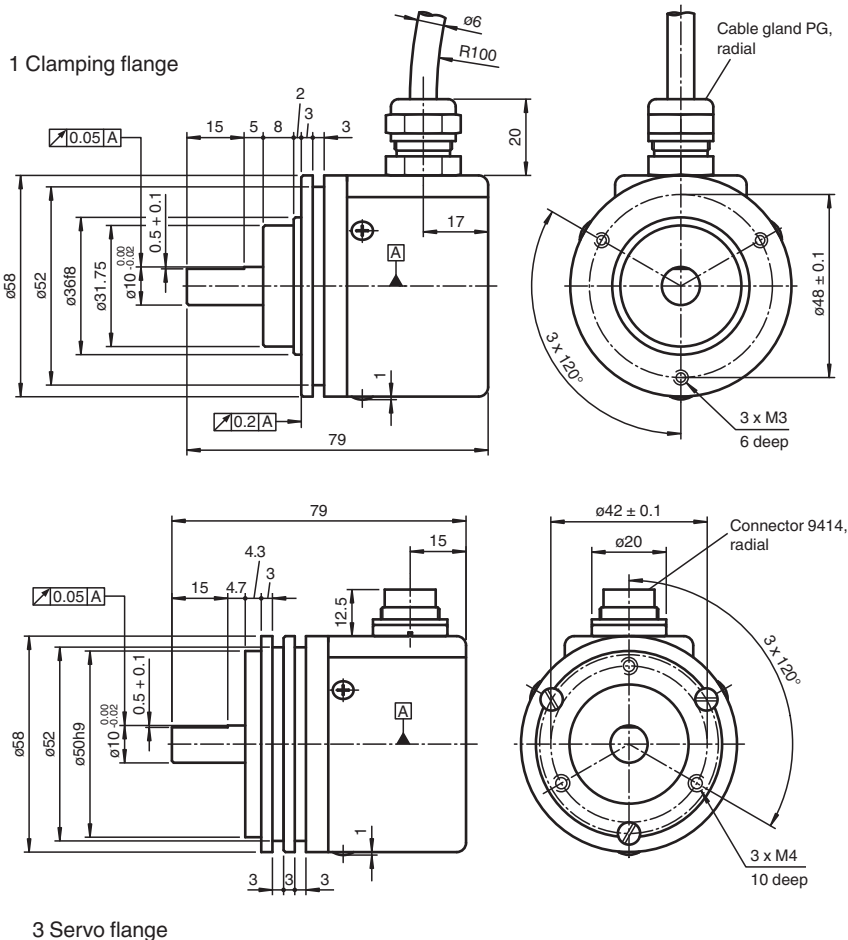
# Incremental rotary encoder

10-\*\*\*\*X

- Industrial standard housing Ø58 mm
- Up to 5000 ppr
- Servo flange, square flange or clamping flange
- Special flanges with special shafts on demand
- Stainless steel version
- 10 V ... 30 V with RS 422 interface



## Dimensions



Release date: 2024-11-22 Date of issue: 2024-11-22 Filename: t2406\_eng.pdf

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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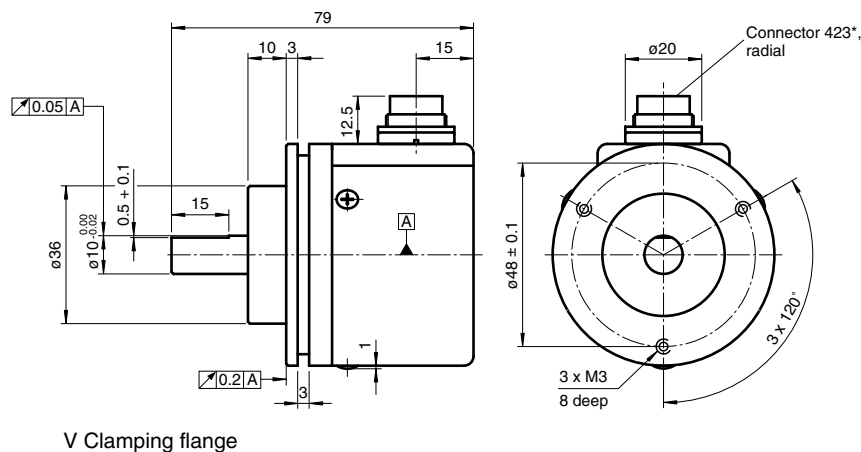
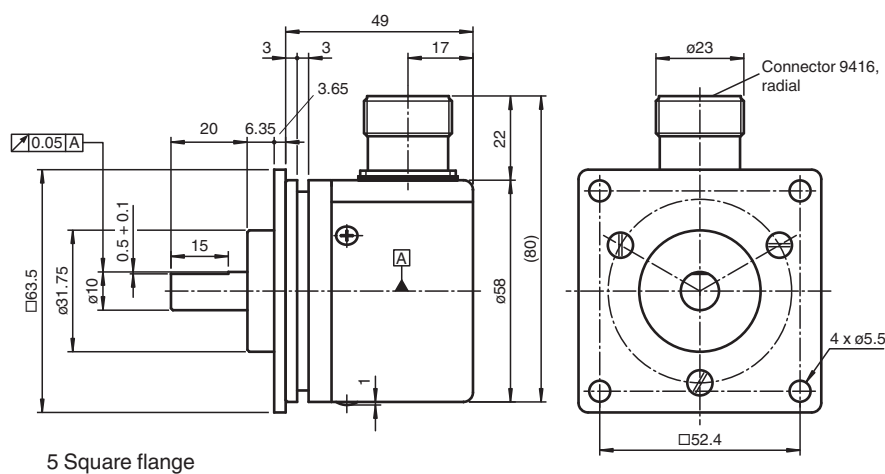
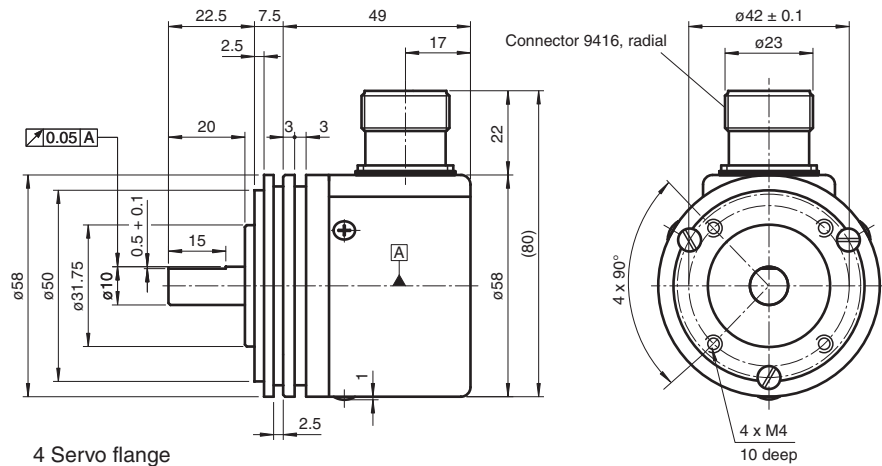
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**PEPPERL+FUCHS**

## Dimensions



## Technical Data

### General specifications

|             |           |
|-------------|-----------|
| Pulse count | max. 5000 |
|-------------|-----------|

### Electrical specifications

|                        |       |                |
|------------------------|-------|----------------|
| Operating voltage      | $U_B$ | 10 ... 30 V DC |
| No-load supply current | $I_0$ | max. 150 mA    |

### Output

|              |                                                                                        |
|--------------|----------------------------------------------------------------------------------------|
| Output type  | RS 422, incremental                                                                    |
| Load current | max. per channel 20 mA , conditionally short-circuit proof, reverse polarity protected |

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**PEPPERL+FUCHS**

## Technical Data

|                                   |           |                                                                                                         |
|-----------------------------------|-----------|---------------------------------------------------------------------------------------------------------|
| Output frequency                  |           | max. 100 kHz                                                                                            |
| Rise time                         |           | 100 ns                                                                                                  |
| De-energized delay                | $t_{off}$ | 100 ns                                                                                                  |
| <b>Connection</b>                 |           |                                                                                                         |
| Connector                         |           | type 42306 (M16), 6-pin<br>type 42308 (M16), 8-pin<br>type 9414 (M16), 5-pin<br>type 9416 (M23), 12-pin |
| Cable                             |           | Ø6 mm, 4 x 2 x 0.14 mm <sup>2</sup> , 2 m                                                               |
| <b>Standard conformity</b>        |           |                                                                                                         |
| Degree of protection              |           | DIN EN 60529, IP65                                                                                      |
| Climatic testing                  |           | DIN EN 60068-2-3, no moisture condensation                                                              |
| Emitted interference              |           | EN 61000-6-4:2007/A1:2011                                                                               |
| Noise immunity                    |           | EN 61000-6-2:2005                                                                                       |
| <b>Approvals and certificates</b> |           |                                                                                                         |
| UL approval                       |           | cULus Listed, General Purpose, Class 2 Power Source                                                     |
| <b>Ambient conditions</b>         |           |                                                                                                         |
| Operating temperature             |           |                                                                                                         |
| Glass disk                        |           | -20 ... 70 °C (-4 ... 158 °F)                                                                           |
| Plastic disk                      |           | -20 ... 60 °C (-4 ... 140 °F)                                                                           |
| Storage temperature               |           |                                                                                                         |
| Glass disk                        |           | -40 ... 70 °C (-40 ... 158 °F)                                                                          |
| Plastic disk                      |           | -40 ... 60 °C (-40 ... 140 °F)                                                                          |
| <b>Mechanical specifications</b>  |           |                                                                                                         |
| Material                          |           |                                                                                                         |
| Combination 1                     |           | housing: diecast zinc<br>flange: aluminum 3.1645<br>shaft: stainless steel 1.4305 / AISI 303            |
| Combination 2 (Inox)              |           | housing: stainless steel<br>flange: stainless steel<br>shaft: stainless steel                           |
| Mass                              |           | approx. 335 g (combination 1)<br>approx. 1400 g (combination 2)                                         |
| Rotational speed                  |           | max. 10000 min <sup>-1</sup>                                                                            |
| Moment of inertia                 |           | ≤ 30 gcm <sup>2</sup>                                                                                   |
| Starting torque                   |           | ≤ 1.5 Ncm                                                                                               |
| Shaft load                        |           |                                                                                                         |
| Axial                             |           | 60 N                                                                                                    |
| Radial                            |           | 80 N                                                                                                    |

Function

Practical applications have shown again and again that standards are useful and beneficial. There are always applications, however, in which the desired result cannot be obtained with a standard incremental rotary encoder.

Even the mechanical interface varies quite often in accordance with the overall conditions of the application, as is shown by an example: If you intend to use the incremental rotary encoder with a measurement wheel, we recommend a shaft diameter of 10 mm. Standardisation prescribes a clamping flange in this case. This will be useful in most cases, but not in all.

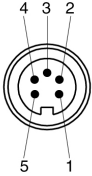
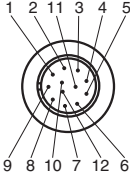
Series 10 allows you to create individual combinations of specific features. In this way, the shaft with a diameter of 10 mm from the example can also be combined with a square flange.

Normally, the housing of an incremental rotary encoder is manufactured from an aluminium cold extrusion part. For series 10, the housing is produced from a zinc pressure diecast. This gives an extra level of sturdiness to the incremental rotary encoder. If a pressure diecast housing is not sufficient, the housing and flange can also be manufactured from stainless steel.

Up to a limit of 1500 pulses, the pulse disk is designed using plastic. In addition, pulse disks are also manufactured from glass.

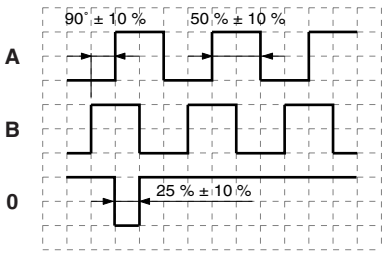
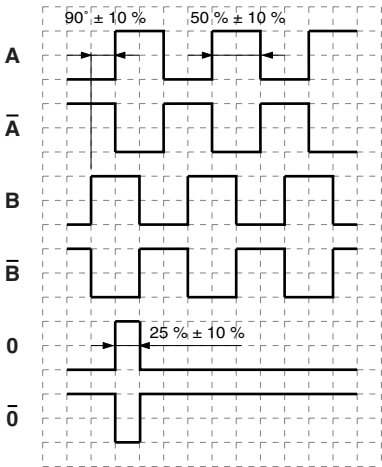
These properties make series 10 the most versatile of our incremental rotary encoders with a diameter of 58 mm.

Connection

| Signal          | Cable Ø6 mm, 8-core | Connector 9414, 5-pin                                                               | Connector 9416, 12-pin                                                              | Connector 42306, 6-pin                                                                | Connector 42308, 8-pin                                                                |
|-----------------|---------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| GND             | White               | 1                                                                                   | 1                                                                                   | 1                                                                                     | 1                                                                                     |
| +U <sub>b</sub> | Brown               | 2                                                                                   | 2                                                                                   | 2                                                                                     | 2                                                                                     |
| A               | Green               | 3                                                                                   | 3                                                                                   | 3                                                                                     | 3                                                                                     |
| B               | Grey                | 4                                                                                   | 4                                                                                   | 4                                                                                     | 4                                                                                     |
| $\bar{A}$       | Yellow              | -                                                                                   | 5                                                                                   | -                                                                                     | 5                                                                                     |
| $\bar{B}$       | Pink                | -                                                                                   | 6                                                                                   | -                                                                                     | 6                                                                                     |
| 0               | Blue                | 5                                                                                   | 7                                                                                   | 5                                                                                     | 7                                                                                     |
| $\bar{0}$       | Red                 | -                                                                                   | 8                                                                                   | -                                                                                     | 8                                                                                     |
|                 |                     |  |  |  |  |

Operation

Signal outputs



At the encoder version with output switching 1 and signal output 3 (see order code) the zero signal is inverted.

↻ cw - with view onto the shaft

Type Code

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Order code

|   |   |   |  |  |  |  |  |  |  |   |  |  |  |  |
|---|---|---|--|--|--|--|--|--|--|---|--|--|--|--|
| 1 | 0 | - |  |  |  |  |  |  |  | - |  |  |  |  |
|---|---|---|--|--|--|--|--|--|--|---|--|--|--|--|

**Pulse count** 60, 100, 120, 180, 200, 250, 256, 300, 314, 360, 400, 500, 512, 600, 720, 900, 1000, 1024, 1200, 1250, 1500, 1800, 2000, 2048, 2400, 2500, 3000, 3600, 4000, 4096, 5000

Further pulse counts on demand!

**Exit position**

- A Axial\*
- R Radial

**Housing material**

- diecast zinc
- I Inox\*

**Output switching**

- 1 10 V ... 30 V, push-pull
- 6 5 V, RS 422
- X 10 V ... 30 V, RS 422

**Connection type**

- 2 Plug connector type 9414, 5-pin
- 3 Cable Ø6 mm, 2 x 4 x 0,14 mm², 2 m
- 5 Plug connector type 9416, 12-pin
- C Plug connector type 42306, 6-pin
- D Plug connector type 42308, 8-pin

**Signal output**

- 3 A + B + 0
- 6 A + B + 0 and  $\overline{A} + \overline{B} + \overline{0}$

**Flange version** (Special flanges on demand)

- 1 Clamping flange
- 3 Servo flange
- 4 Servo flange with additional centring collar
- 5 Square flange
- V Clamping flange

**Shaft dimension** (Special shafts on demand)

- 1 Shaft Ø10 mm x 20 mm
- 2 Shaft Ø6 mm x 10 mm

\*For housing material I only axial connector output A possible.