

# Incremental encoders

End or hollow shaft  $\varnothing 12$  mm

Resolution 10...10000 pulses

BHF, BHG



BHF with end shaft

## Features

- Encoder with end or hollow shaft  $\varnothing 12$  mm
- Optical sensing
- Resolution max. 10000 ppr
- Small profile depth
- Versatile mounting accessories

## Technical data - electrical ratings

|                             |   |
|-----------------------------|---|
| Voltage supply              | 5 VDC $\pm 10$ %<br>10...30 VDC<br>4.5...30 VDC                                     |
| Consumption w/o load (typ.) | 80 mA (5 VDC)<br>180 mA (4.5 VDC)<br>60 mA (24 VDC)                                 |
| Resolution (steps/turn)     | 10...10000  |
| Reference signal            | Zero pulse, width 90°   |
| Sensing method              | Optical   |
| Output frequency            | $\leq 750$ kHz  |
| Output signals              | A 90° B, N + inverted   |
| Output circuit              | Antivalent<br>Push-pull short-circuit proof<br>Push-pull antiv. short-circuit proof |
| Interference immunity       | DIN EN 61000-6-2  |
| Emitted interference        | DIN EN 61000-6-3  |
| Approval                    | UL approval / E217823   |

## Technical data - mechanical design

|                         |   |
|-------------------------|---|
| Housing                 | $\varnothing 58$ mm   |
| Protection DIN EN 60529 | IP 42, IP 65  |
| Operating speed         | $\leq 12000$ rpm IP 42<br>$\leq 6000$ rpm IP 65   |
| Operating temperature   | -20...+85 °C  |
| Relative humidity       | 95 % non-condensing   |
| Resistance              | DIN EN 60068-2-6<br>Vibration 10 g, 10-200 Hz<br>DIN EN 60068-2-27<br>Shock 50 g, 11 ms |
| Connection              | Connector M23, 12-pin<br>Cable 2 m  |
| Weight approx.          | 300 g   |

## BHF

|                       |   |
|-----------------------|---|
| Shaft                 | $\varnothing 12$ mm end shaft   |
| Operating torque typ. | 0.009 Nm IP 42<br>0.037 Nm IP 65  |
| Materials             | Housing: aluminium<br>Housing: steel (connection -5)<br>Flange: aluminium |

## BHG

|                       |   |
|-----------------------|---|
| Shaft                 | $\varnothing 12$ mm hollow shaft        |
| Operating torque typ. | 0.0175 Nm IP 42<br>0.047 Nm IP 65       |
| Materials             | Housing: aluminium<br>Flange: aluminium |

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## Part number

### End shaft

BHF 16.   -  -

#### Connection

5 Cable 2 m, radial  
A Connector M23, radial

#### Shaft

12 End shaft ø12 mm, IP 42  
B2 End shaft ø12 mm, IP 42, with clamping ring  
E2 End shaft ø12 mm, IP 65, with clamping ring  
L2 End shaft ø12 mm, IP 65

See part number (pulses)

#### Voltage supply / signals

05A 5 VDC / antivalent (TTL compatible)  
24K 10...30 VDC / push-pull short circuit-proof  
25W 4.5...30 VDC / push-pull antivalent short-circuit-proof

### Hollow shaft

BHG 16.   -  -

#### Connection

5 Cable 2 m, radial  
A Connector M23, radial

#### Shaft

B2 Hollow shaft ø12 mm, IP 42, with clamping ring  
E2 Hollow shaft ø12 mm, IP 65, with clamping ring

See part number (pulses)

#### Voltage supply / signals

05A 5 VDC / antivalent (TTL compatible)  
24K 10...30 VDC / push-pull short circuit-proof  
25W 4.5...30 VDC / push-pull antivalent short-circuit-proof

## Part number (pulses)

|    |     |      |      |       |
|----|-----|------|------|-------|
| 10 | 100 | 360  | 1250 | 5000  |
| 30 | 120 | 500  | 2000 | 7200  |
| 50 | 200 | 1000 | 2500 | 8192  |
| 60 | 250 | 1024 | 3600 | 10000 |

Other pulse numbers upon request.

## Accessories

### Connectors and cables

|          |   |
|----------|---|
| 10107687 | Female connector M23, 12-pin, straight            |
| 10130367 | Female connector M23, 12-pin, straight, 2 m cable |
| 10118532 | Female connector M23, 12-pin, straight, 5 m cable |

### Mounting accessories

|          |  |
|----------|--|
| 10136635 | Set of spring coupling for encoders ø58 mm |
| 10110616 | Clamp set                                  |
| 10107540 | Torque pin                                 |
| 10109520 | Torque spring washer                       |

## Trigger level

### Outputs 05A

|                   |                     |
|-------------------|---------------------|
| Output level High | >2,4 V (I = -20 mA) |
| Output level Low  | <0,4 V (I = 20 mA)  |
| Load High         | <20 mA              |
| Load Low          | <20 mA              |

### Complementary Linedriver RS422

### Outputs 24K (25 Ω)

|                   |                           |
|-------------------|---------------------------|
| Output level High | >+Vs - 3,7 V (I = -30 mA) |
| Output level Low  | <2,5 V (I = 30 mA)        |
| Load High         | <30 mA                    |
| Load Low          | <30 mA                    |

### Push-pull short-circuit protection

### Outputs 25W

|                   |                           |
|-------------------|---------------------------|
| Output level High | >+Vs - 3,7 V (I = -30 mA) |
| Output level Low  | <2,5 V (I = 30 mA)        |
| Load High         | <40 mA                    |
| Load Low          | <40 mA                    |

### Push-pull complementary short-circuit protection

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### Terminal assignment

#### Cable

for connection reference -5

**05A, 25W**

**24K**

| Core colour | Signals                  | Core colour              | Signals |
|-------------|--------------------------|--------------------------|---------|
| brown       | +Vs                      | brown                    | +Vs     |
| green       | CHA                      | green                    | CHA     |
| red         | CHA compl.               | –                        | –       |
| yellow      | CHB                      | yellow                   | CHB     |
| blue        | CHB compl.               | –                        | –       |
| pink        | CHN                      | pink                     | CHN     |
| grey        | CHN compl.               | –                        | –       |
| white       | 0 V                      | white                    | 0 V     |
| Cable data  | 8 x 0.14 mm <sup>2</sup> | 5 x 0.14 mm <sup>2</sup> |         |
| Screen      | connected to flange      |                          |         |

#### Connector M23 male

for connection reference -A

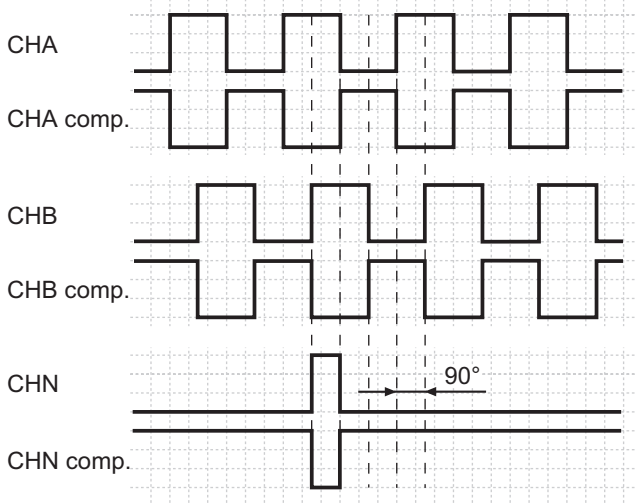
**05A, 24K, 25W**

| Connector | Signals    |
|-----------|------------|
| Pin 1     | CHA compl. |
| Pin 2     | +Vs        |
| Pin 3     | CHN        |
| Pin 4     | CHN compl. |
| Pin 5     | CHB        |
| Pin 6     | CHB compl. |
| Pin 7     | n.c.       |
| Pin 8     | CHA        |
| Pin 9     | Housing    |
| Pin 10    | 0 V        |
| Pin 11    | 0 V        |
| Pin 12    | + Vs       |

### Output signals

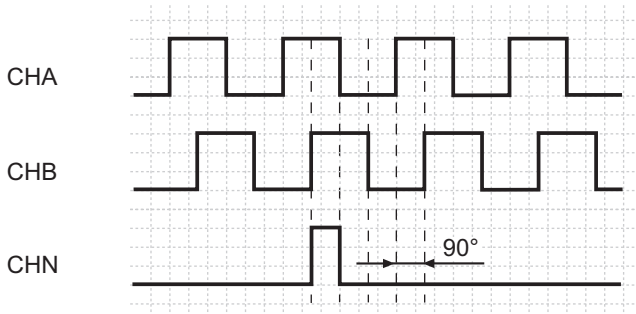
Counter clockwise rotating direction when looking at the flange.

**05A, 25W**

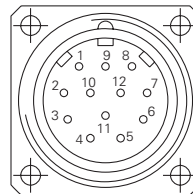


Counter clockwise rotating direction when looking at the flange.

**24K**



Push-pull version **24K** without CHx complementary signals



# Incremental encoders

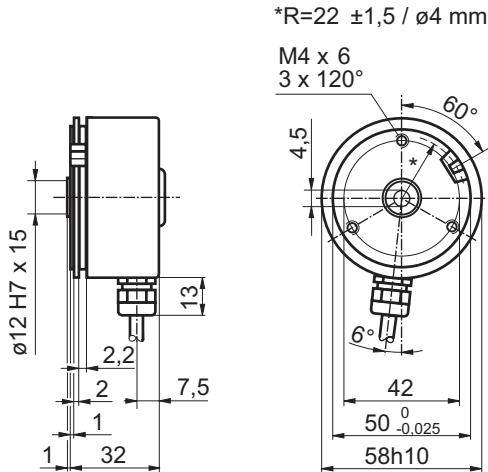
End or hollow shaft  $\varnothing 12$  mm

Resolution 10...10000 pulses

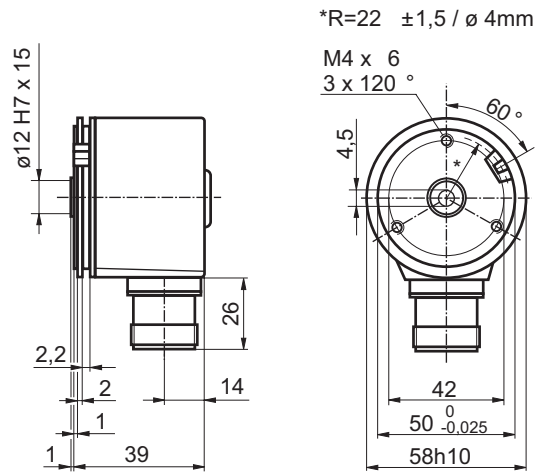
BHF, BHG

## Dimensions

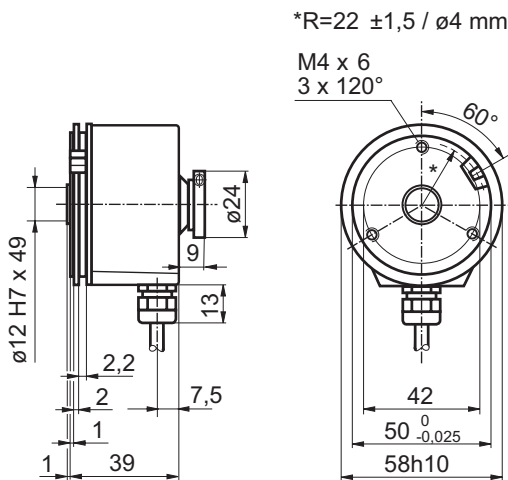
### BHF cable radial



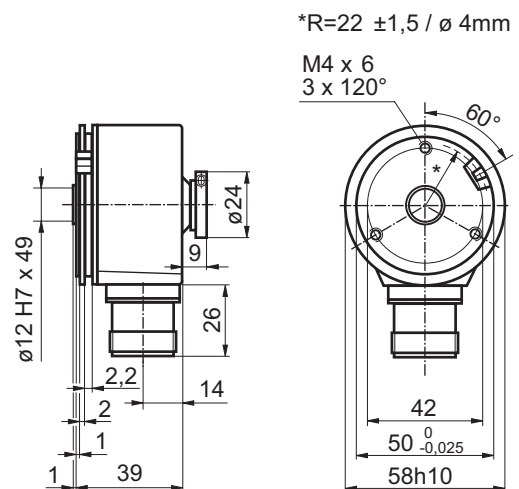
### BHF connector output radial



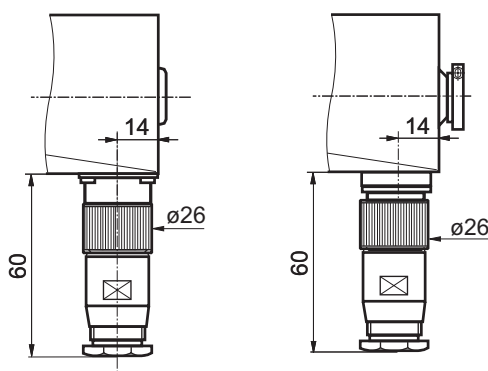
### BHG cable radial



### BHG connector output radial



### BHF/BHG connector dimensions



### BHF/BHG clamping ring

