

# Incremental encoders

## Solid shaft with clamping or synchro flange

### 5...6000 pulses per revolution

#### GI355, GI356



GI355 with clamping flange

#### Technical data - electrical ratings

|                             |   |
|-----------------------------|---|
| Voltage supply              | 5 VDC $\pm$ 10 %<br>4.75...30 VDC<br>10...30 VDC  |
| Reverse polarity protection | Yes (4.75...30 VDC)                               |
| Consumption w/o load        | $\leq$ 30 mA (24 VDC)<br>$\leq$ 60 mA (5 VDC)     |
| Pulses per revolution       | 5...6000  |
| Reference signal            | Zero pulse, width 90°                             |
| Sensing method              | Optical   |
| Output frequency            | $\leq$ 150 kHz                                    |
| Output signals              | A 90° B, N + inverted                             |
| Output stages               | Linedriver/RS422<br>Push-pull short-circuit proof |
| Interference immunity       | DIN EN 61000-6-2                                  |
| Emitted interference        | DIN EN 61000-6-4                                  |
| Approval                    | UL approval / E63076                              |

#### Features

- Encoder with solid shaft  $\varnothing$ 10 mm or  $\varnothing$ 6 mm
- Max. 6000 pulses per revolution
- Optical sensing method
- Clamping or synchro flange
- Industrial standard
- High rotation speed up to 10000 rpm

#### Optional

- Stainless steel design GE355
- ATEX-approved, see X 700
- Corrosion protection for offshore applications

#### Technical data - mechanical design

|                         |  |
|-------------------------|--|
| Size (flange)           | $\varnothing$ 58 mm  |
| Admitted shaft load     | $\leq$ 20 N axial<br>$\leq$ 40 N radial  |
| Protection DIN EN 60529 | IP 54 (without shaft seal),<br>IP 65 (with shaft seal)                                   |
| Operating speed         | $\leq$ 10000 rpm   |
| Starting torque         | $\leq$ 0.015 Nm (+25 °C, IP 54)<br>$\leq$ 0.03 Nm (+25 °C, IP 65)                        |
| Rotor moment of inertia | 14.5 gcm <sup>2</sup>  |
| Materials               | Housing: aluminium<br>Flange: aluminium  |
| Operating temperature   | -25...+100 °C (5 VDC)<br>-25...+85 °C (24 VDC)<br>-40...+85 °C (optional)                |
| Relative humidity       | 95 % non-condensing  |
| Resistance              | DIN EN 60068-2-6<br>Vibration 10 g, 16-2000 Hz<br>DIN EN 60068-2-27<br>Shock 200 g, 6 ms |
| Connection              | Connector M23, 12-pin<br>Cable 1 m   |
| Weight approx.          | 250 g  |
| <b>GI355</b>            |  |
| Shaft type              | $\varnothing$ 10 mm solid shaft  |
| Flange                  | Clamping flange  |
| <b>GI356</b>            |  |
| Shaft type              | $\varnothing$ 6 mm solid shaft   |
| Flange                  | Synchro flange   |

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#### Part number

#### Clamping flange

GI355.

Pulse number - see table

Connection

- C2 Connector M23, 12-pin, axial
- C3 Connector M23, 12-pin, radial
- 31 Cable 1 m, axial
- 41 Cable 1 m, radial

Voltage supply / signals

- 22 5 VDC / linedriver RS422
- 70 4.75...30 VDC / push-pull
- 72 10...30 VDC / linedriver RS422 (5 VDC)

Flange / Solid shaft

- 0 Clamping flange / ø10 mm, IP 54
- A Clamping flange / ø10 mm, IP 65

#### Synchro flange

GI356.

Pulse number - see table

Connection

- C2 Connector M23, 12-pin, axial
- C3 Connector M23, 12-pin, radial
- 31 Cable 1 m, axial
- 41 Cable 1 m, radial

Voltage supply / signals

- 22 5 VDC / linedriver RS422
- 70 4.75...30 VDC / push-pull
- 72 10...30 VDC / linedriver RS422 (5 VDC)

Flange / Solid shaft

- 1 Synchro flange / ø6 mm, IP 54
- B Synchro flange / ø6 mm, IP 65

#### Part number (pulse number)

|          |          |           |           |
|----------|----------|-----------|-----------|
| 49 (5)   | 05 (180) | 16 (512)  | 28 (2000) |
| 36 (10)  | 06 (200) | 17 (600)  | 29 (2048) |
| 37 (20)  | 08 (240) | 19 (720)  | 30 (2500) |
| 50 (25)  | 09 (250) | 21 (900)  | 47 (3000) |
| 39 (50)  | 10 (256) | 22 (1000) | 31 (3600) |
| 40 (60)  | 11 (300) | 23 (1024) | 34 (4096) |
| 41 (100) | 13 (360) | 61 (1200) | 35 (5000) |
| 01 (120) | 14 (400) | 24 (1250) | 48 (6000) |
| 57 (128) | 15 (500) | 26 (1500) |           |

Other pulse numbers on request.

Example: part number 23 = 1024 pulses.

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##### Accessories

##### Connectors and cables

|          |   |
|----------|---|
| 10127371 | Female connector M23, 12-pin, without cable (Z 141.001) |
| 10166044 | Female connector M23, 12-pin, 2 m cable (Z 141.003)     |
| 10124780 | Female connector M23, 12-pin, 5 m cable (Z 141.005)     |
| 11034204 | Female connector M23, 12-pin, 10 m cable (Z 141.007)    |

##### Mounting accessories for GI355

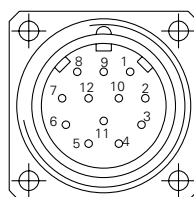
|          |   |
|----------|---|
| 10141255 | Adaptor plate for clamping flange for modification into synchro flange (Z 119.013)              |
| 10125051 | Mounting adaptor for encoders with clamping flange (M3) (Z 119.017)                             |
| 11034088 | Adaptor plate for clamping flange, mounting by eccentric fixings (order separately) (Z 119.025) |
| 10141132 | Spring washer coupling D1=6 / D2=10 (Z 121.C01)   |
| 10141133 | Spring washer coupling D1=10 / D2=10 (Z 121.C03)  |

##### Mounting accessories for GI356

|          |   |
|----------|---|
| 10117669 | Eccentric fixing, single (Z 119.006)                          |
| 10117667 | Mounting adaptor for encoders with synchro flange (Z 119.015) |
| 10158124 | Bearing flange for encoders with synchro flange (Z 119.035)   |
| 10141131 | Spring washer coupling D1=6 / D2=6 (Z 121.C02)                |
| 10141132 | Spring washer coupling D1=6 / D2=10 (Z 121.C01)               |

##### Terminal assignment

| Connector | Core colour | Assignment                     |
|-----------|-------------|--------------------------------|
| Pin 1     | pink        | Track B inv.                   |
| Pin 2     | blue        | UB-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 A inv.                   |
| Pin 7     | –           | –                              |
| Pin 8     | grey        | Track B                        |
| Pin 9     | –           | –                              |
| Pin 10    | white/green | GND                            |
| Pin 11    | white       | GND-Sense                      |
| Pin 12    | brown/green | UB                             |



UB-Sense and GND-Sense are directly connected to UB resp. GND. Please use cores twisted in pairs (for example track A / track A inv.) for extension cables of more than 10 m length.

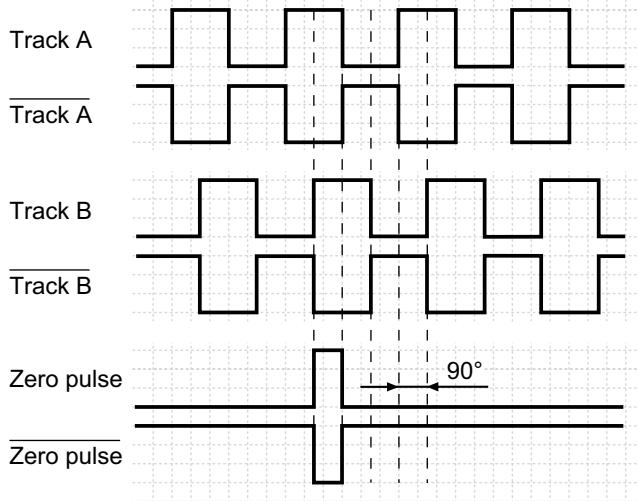
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## Output signals

Clockwise rotating direction when looking at flange.



## Trigger level

| Outputs           | Linedriver RS422    |
|-------------------|---------------------|
| Output level High | >2.5 V (I = -20 mA) |
| Output level Low  | <0.5 V (I = 20 mA)  |
| Load High / Low   | <20 mA              |

| Outputs           | Push-pull short-circuit proof |
|-------------------|-------------------------------|
| Output level High | >UB -3 V (I = -20 mA)         |
| Output level Low  | <0.5 V (I = 20 mA)            |
| Load High / Low   | <20 mA                        |

# Incremental encoders

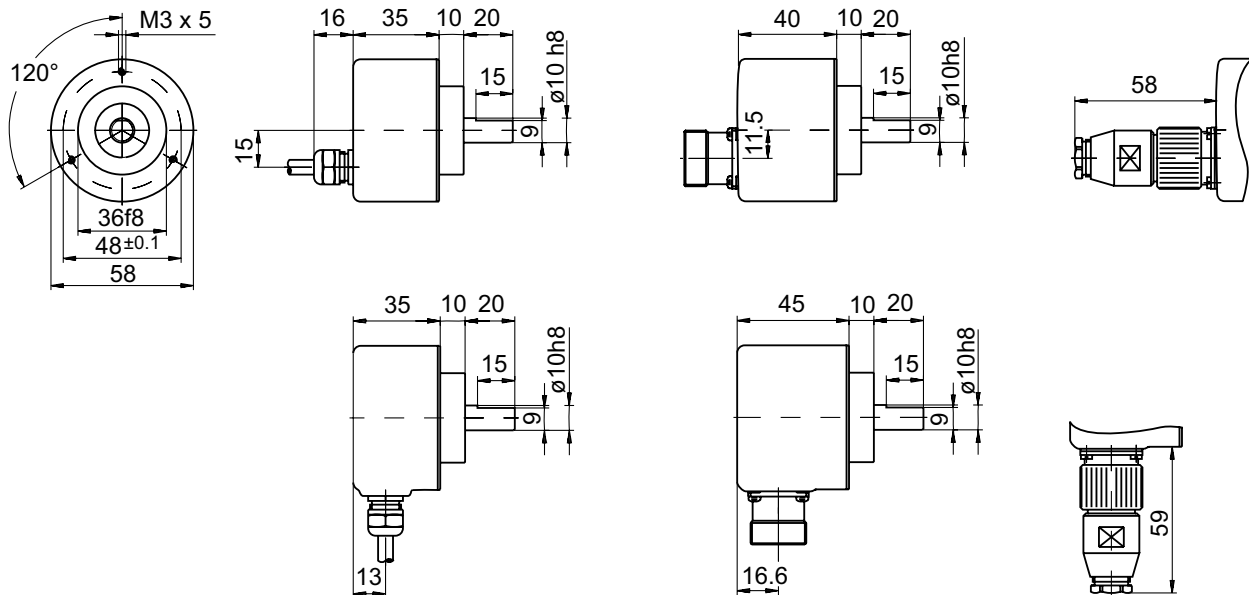
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### Dimensions

#### GI355 - clamping flange



#### GI356 - synchro flange

