# Absolute encoders - bus interfaces

## Shaft with clamping or synchro flange

## Optical multiturn encoders 18 bit ST / 14 bit MT, CANopen

### GBP5W - CANopen

GBP5W with clamping flange

**Features**

- **Encoder multiturn / CANopen**
- **Optical sensing**
- **Resolution: singleturn 18 bit, multiturn 14 bit**
- **Clamping or synchro flange**
- **High resistance to shock and vibrations**
- **LED status display**
- **CANopen Profile CIA DSP 406**
- **Permanent check of code continuity**

**Technical data - electrical ratings**

| | |
|---|---|
| Voltage supply | 10...30 VDC |
| Reverse polarity protection | Yes |
| Consumption w/o load | ≤50 mA (24 VDC) |
| Initializing time (typ.) | 250 ms after power on |
| Interface | CANopen |
| Function | Multiturn |
| Transmission rate | 10...1000 kBaud |
| Profile conformity | CANopen CiA DSP 406 V 3.0 |
| Operating mode | Event-triggered / Time-triggered<br>Remotely-requested<br>Sync (cyclic) / Sync (acyclic) |
| Identifier | 11 bit |
| Steps per turn | ≤262144 / 18 bit |
| Number of turns | ≤16384 / 14 bit |
| Absolute accuracy | ±0.01 ° |
| Sensing method | Optical |
| Code | Binary |
| Code sequence | CW/CCW programmable |
| Output circuit | CAN bus standard ISO / DIS 11898 |
| Interference immunity | DIN EN 61000-6-2 |
| Emitted interference | DIN EN 61000-6-4 |
| Programmable parameters | Operating modes<br>Total resolution<br>Scaling<br>Rotation speed monitoring |
| Diagnostic functions | Position or parameter error<br>Multiturn sensing |
| Status indicator | DUO-LED integrated in housing |
| Approval | UL approval / E63076 |

**Technical data - mechanical design**

| | |
|---|---|
| Dimensions (flange) | ø58 mm |
| Shaft | ø10 mm (clamping flange)<br>ø6 mm (synchro flange) |
| Flange | Clamping or synchro flange |
| Protection DIN EN 60529 | IP 54 (without shaft seal),<br>IP 65 (with shaft seal) |
| Operating speed | ≤10000 rpm (mechanical)<br>≤6000 rpm (electric) |
| Starting torque | ≤0.015 Nm (IP 54)<br>≤0.03 Nm (IP 65) |
| Rotor moment of inertia | 20 gcm² |
| Shaft loading | ≤20 N axial<br>≤40 N radial |
| Materials | Housing: steel<br>Flange: aluminium |
| Operating temperature | -25...+85 °C<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 |
| Weight approx. | 500 g |
| Connection | Connector M12, 5-pin<br>Connector M23, 12-pin<br>Connector D-SUB, 9-pin |

## GBP5W - CANopen

### Part number

**GBP5W.** | | **10** | | |

Interface
- 06 CANopen DSP 406 / galvanically isolated
- 16 CANopen DSP 406 / not galvanically isolated

Connection
- A3 Connector M23, 12-pin, radial
- D3 Connector D-SUB, 9-pin, radial
- M1 Connector M12, 5-pin, radial
- M2 Connector 2 x M12, 5-pin axial
- M3 Connector 2 x M12, 5-pin radial

Voltage supply
- 10 10...30 VDC

Flange / Shaft
- 0 Clamping flange / ø10 mm IP 54
- A Clamping flange / ø10 mm IP 65
- 1 Synchro flange / ø6 mm IP 54
- B Synchro flange / ø6 mm IP 65

### Accessories

**Connectors and cables**

| | |
|---|---|
| Z 148.001 | Female connector M23, 12-pin, less cable |
| Z 148.003 | Female connector M23, 12-pin, 2 m cable |
| Z 148.005 | Female connector M23, 12-pin, 5 m cable |
| Z 148.007 | Female connector M23, 12-pin, 10 m cable |
| Z 180.003 | Female connector M12, 5-pin, A-coded, 2 m cable, CANopen |
| Z 180.005 | Female connector M12, 5-pin, A-coded, 5 m cable, CANopen |
| Z 180.007 | Female connector M12, 5-pin, A-coded, 10 m cable, CANopen |
| Z 181.005 | Cable connector M12, 5-pin, A-codage, 5 m cable, CANopen, connection continuative bus |

**Mounting accessories**

| | |
|---|---|
| Z 119.006 | Eccentric fixing, single |
| Z 119.013 | Adaptor plate for clamping flange for modification into synchro flange |
| Z 119.015 | Mounting adaptor for synchro flange |
| Z 119.017 | Mounting angle for clamping flange (M3) |
| Z 119.035 | Bearing flange for encoders with synchro flange |

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### GBP5W - CANopen

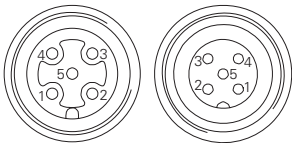
| Terminal significance | |
|---|---|
| UB | Encoder voltage supply |
| GND B | Encoder ground connection relating to UB |
| CAN_L | CAN bus signal (dominant Low) |
| CAN_H | CAN bus signal (dominant High) |
| CAN_GND | GND relating to CAN interface.<br>Depending on model separated from GND B either by galvanic isolation or by inductive earthing. |

| CANopen features | |
|---|---|
| Bus protocol | CANopen |
| Device profile | CANopen - CiA DSP 406, V 3.0<br>(Device Class 2, CAN 2.0B) |
| Operating modes | Event-triggered / Time-triggered<br>Remotely-requested<br>Sync (cyclic) / Sync (acyclic) |
| Preset | Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder. |
| Rotating direction | Parameter for defining the rotating direction in which there have to be ascending or descending position values. |
| Scaling | Parameter defining the steps per turn as well as the total resolution. |
| Diagnosis | The encoder supports the following error warnings:<br>- Position and parameter error<br>- Lithium battery voltage control (Multiturn) |
| Node Monitoring | Heartbeat or Nodeguarding |
| Default | 50 kbit/s, Node ID 1 |

**Terminal assignment**

**M12-connector**

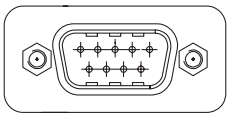
| Connector | Core colour | Assignment |
|---|---|---|
| Pin 1 | brown | GND B |
| Pin 2 | white | UB |
| Pin 3 | blue | CAN_GND |
| Pin 4 | black | CAN_H |
| Pin 5 | grey | CAN_L |




Please use cores twisted in pairs (for example CAN_H / CAN_L) for extension cables of more than 10 m length.

**D-SUB connector**

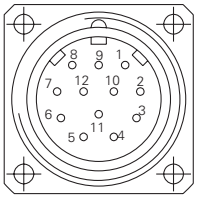
| Connector | Assignment |
|---|---|
| Pin 1 | – |
| Pin 2 | CAN_L |
| Pin 3 | CAN_GND |
| Pin 4 | – |
| Pin 5 | – |
| Pin 6 | GND B |
| Pin 7 | CAN_H |
| Pin 8 | – |
| Pin 9 | UB |



Please use cores twisted in pairs (for example CAN_H / CAN_L) for extension cables of more than 10 m length.

**M23-connector**

| Connector | Core colour | Assignment |
|---|---|---|
| Pin 1 | brown/green | UB |
| Pin 2 | white/green | GND B |
| Pin 3 | pink | CAN_L |
| Pin 4 | grey | CAN_H |
| Pin 5 | white | CAN_GND |
| Pin 6-12 | – | – |

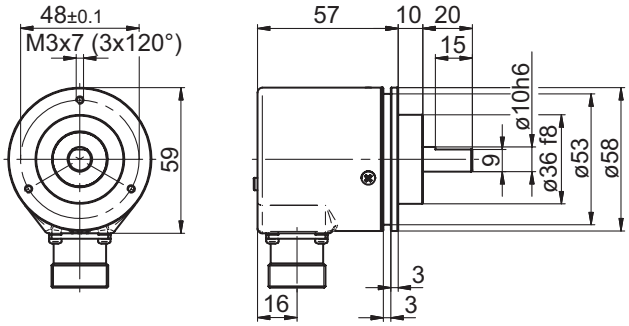



Please use cores twisted in pairs (for example CAN_H / CAN_L) for extension cables of more than 10 m length.

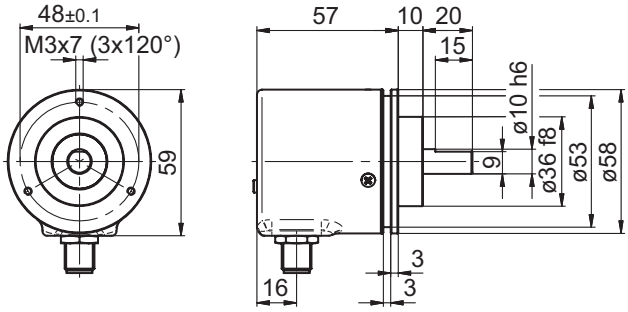
## GBP5W - CANopen

### Dimensions

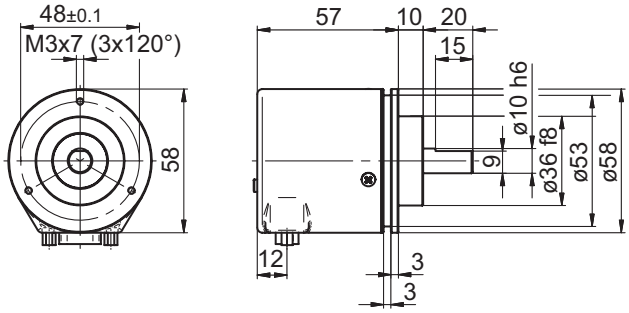
**GBP5W - clamping flange / connector M23**



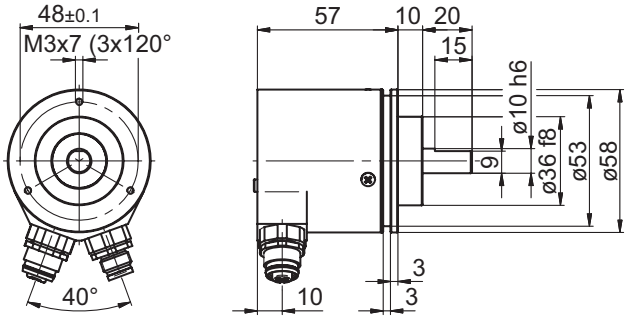

**GBP5W - clamping flange / connector M12**



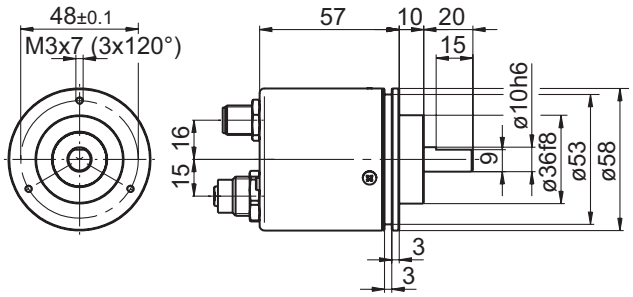

**GBP5W - clamping flange / D-SUB**



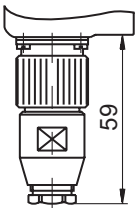

**GBP5W - clamping flange, 2 x M12, radial**




**GBP5W - clamping flange, 2 x M12, axial**




**GBP5W - connector dimensions**




**GBP5W - synchro flange**