

Absolute Rotary Encoder EXAG – Explosion Proof

Device Net



Main Features

- Approval: II 2 G/D EEx d II C T6
- Heavy-duty industrial model
- Interface: Device Net
- Max. 65536 steps per revolution (16 Bit)
- Max. 16384 revolutions (14 Bit)
- Code: Binary

Programmable Parameters

- Direction of rotation (complement)
- Resolution per revolution
- Total resolution
- Preset value
- Transmission mode:
Polled mode, Change of State, Cyclic

Mechanical Structure

- Ex-proof, flameproof enclosure
- Flange and housing of Aluminum
- Shaft of stainless steel
- Precision ball bearings with sealing or cover rings
- Code disc made of unbreakable and durable plastic

Electrical Features

- Address and baudrate setting via rotary switches
- Connection via connection cap
- Temperature insensitive IR-opto-receiver-ASIC with integrated signal conditioning
- Highly integrated circuit in SMD-technology
- Polarity inversion protection
- Over-voltage-peak protection

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Technical Data

Electrical Data

| | |
|----------------------|--|
| Interface | Transceiver according ISO/DIS 11898, up to 64 nodes galvanically isolated by opto-couplers |
| Transmission rate | 150 kBaud, 250 kBaud, 500kBaud |
| Device addressing | Adjustable by rotary switches in connection cap |
| Supply voltage | 10 – 30 V DC (absolute limits) * |
| Current consumption | max. 230 mA with 10 V DC, max. 100 mA with 24 V DC |
| Power consumption | max. 2.5 Watts |
| Step frequency LSB | 800 kHz |
| Accuracy of division | $\pm \frac{1}{2}$ LSB (12 bit), ± 2 LSB (16 bit) |
| EMC | Emitted interference: EN 61000-6-4 |
| | Noise immunity: EN 61000-6-2 |
| Electrical lifetime | $> 10^5$ h |

* Supply voltage according to EN 50 178 (safety extra-low voltage)

Mechanical Data

| | | |
|---------------------------|--|---|
| Housing | Aluminum | |
| Max. shaft loading | Axial 50 N, radial 50 N | |
| Inertia of rotor | $\leq 35 \text{ gcm}^2$ | |
| Friction torque | IP65 | $\leq 0.05 \text{ Nm at } 25^\circ\text{C}$ |
| | IP67 | $\leq 0.2 \text{ Nm at } 25^\circ\text{C}$ |
| RPM max. | IP65 | 3,000 RPM |
| | IP54 | 6,000 RPM |
| | IP67 | 1,200 RPM |
| Shock (EN 60068-2-27) | $\leq 100 \text{ g (halfsine, 11 ms)}$ | |
| Vibration (EN 60068-2-6) | $\leq 10 \text{ g (10 Hz ... 2,000 Hz)}$ | |
| Weight (standard version) | Approx. 1200 g | |
| Flange | | |
| Clamp (C) | | |
| Shaft diameter | 10 mm | |
| Shaft length | 20 mm | |

Environmental Conditions

| | |
|-----------------------------|-----------------------------|
| Operating temperature | - 40 .. + 70°C |
| Storage temperature | - 40 .. + 85 °C |
| Humidity | 98 % (without liquid state) |
| Protection class (EN 60529) | IP 65 (others on request) |

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Note:

For ambient temperatures below –10°C and above +60°C use field wiring suitable for both minimum and maximum ambient temperature.

Ex-Protection

SCANCON encoders type series EXAG are classified according to  II 2 G/D EEx d II C T6:

| | | | | | | | | |
|--|----|---|-----|-----|---|----|---|----|
|  | II | 2 | G/D | EEx | d | II | C | T6 |
| Temperature Class T6: Maximum surface temperature: + 85°C | | | | | | | | |
| Explosion Sub-Group C: Hydrogen (H ₂) , Acetylene (C ₂ H ₂), Carbon Disulfide (CS ₂) | | | | | | | | |
| Explosion Group: for all areas except for mining | | | | | | | | |
| Method of protection: flameproof enclosure | | | | | | | | |
| Device in compliance with EN50014 and EN50018 | | | | | | | | |
| Application Area: permitted for gas und dust | | | | | | | | |
| Equipment-Category 2: permitted for zone 1 / zone 21 | | | | | | | | |
| Equipment-Group II: for all applications except for mining | | | | | | | | |
| Ex-Proof Device | | | | | | | | |

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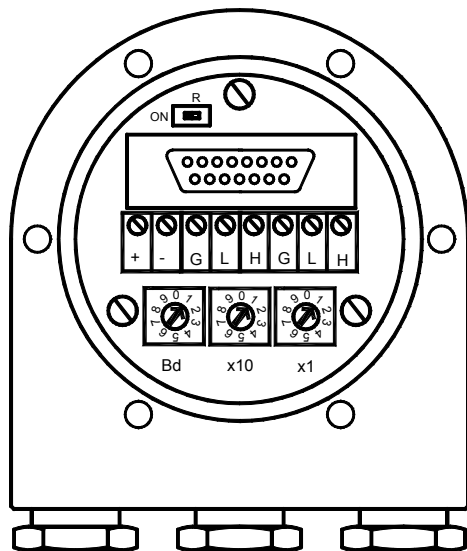
Device Net

Interface

Installation connection cap

The rotary encoder is connected with two or three cables depending on whether the power supply is integrated into the bus cable or connected separately. If the power supply is integrated into the bus cable, one of the cable glands can be fitted with a plug (unused cable entries have to be closed with a blind plug-> accessories). Two cable glands are suitable for cable diameters from 8 up to 9.5 mm (bus cable), one cable gland is suitable for cable diameters from 6.5 up to 8 mm (power supply).

Follow the instructions in the installation manual carefully, otherwise the ATEX-certification will be repealed!



| Clamp | Description |
|-----------|----------------------|
| ⊥ | Ground |
| + | 24 V Supply voltage |
| - | 0 V Supply voltage |
| G (left) | CAN Ground (Bus In) |
| L (left) | CAN Low (Bus In) |
| H (left) | CAN High (Bus In) |
| G (right) | CAN Ground (Bus Out) |
| L (right) | CAN Low (Bus Out) |
| H (right) | CAN High (Bus Out) |

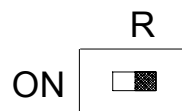
Configuration connection cap

The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 63 whereby every address can only be used once.

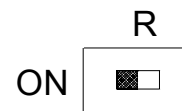
The baudrate is set with the third rotary switch in the cap.

The connection cap can be opened for installation by removing the six cap screws.

A termination resistor is integrated in the cap. The resistor must be switched on if the encoder is connected at the end or at the beginning of the bus:



device X



last device

Separation of Bus In and Bus Out signals if termination resistor is activated.

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Programmable Encoder - Parameter

| | |
|---------------------------|--|
| Operating Parameters | As operating parameters the code sequence (complement) can be programmed. This parameter determines the counting direction, in which the output code increases or decreases. |
| Resolution per Revolution | The parameter resolution per revolution is used to program the desired number of steps per revolution. Each value between 1 and 4,096 can be programmed. |
| Total Resolution | This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder. If the encoder is used in a continuous measuring application, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual. |
| Preset Value | The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter pre-set. |

Programmable Transmission Modes

| | |
|-----------------|--|
| Polled Mode | By a telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier. |
| Change of State | The absolute rotary encoder transmits the actual process value. The process value is transmitted when the position changes. This is useful to reduce the bus activity. |
| Cyclic | The absolute rotary encoder transmits the actual process value event controlled by an internal timer. This is also useful to reduce the bus activity. |

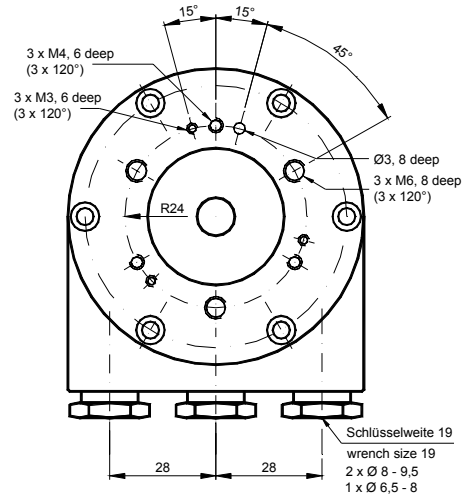
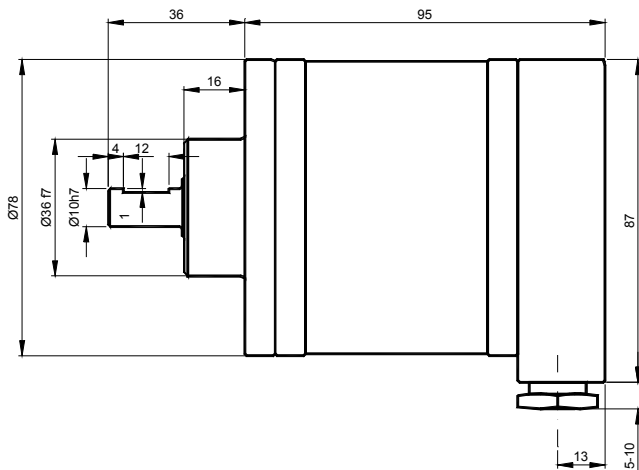
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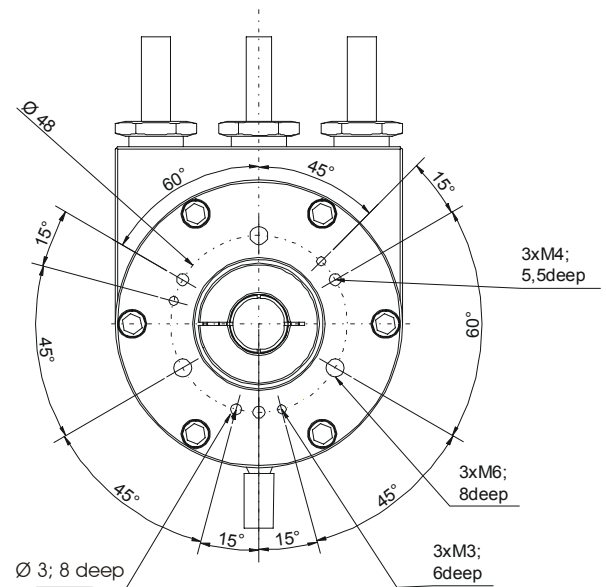
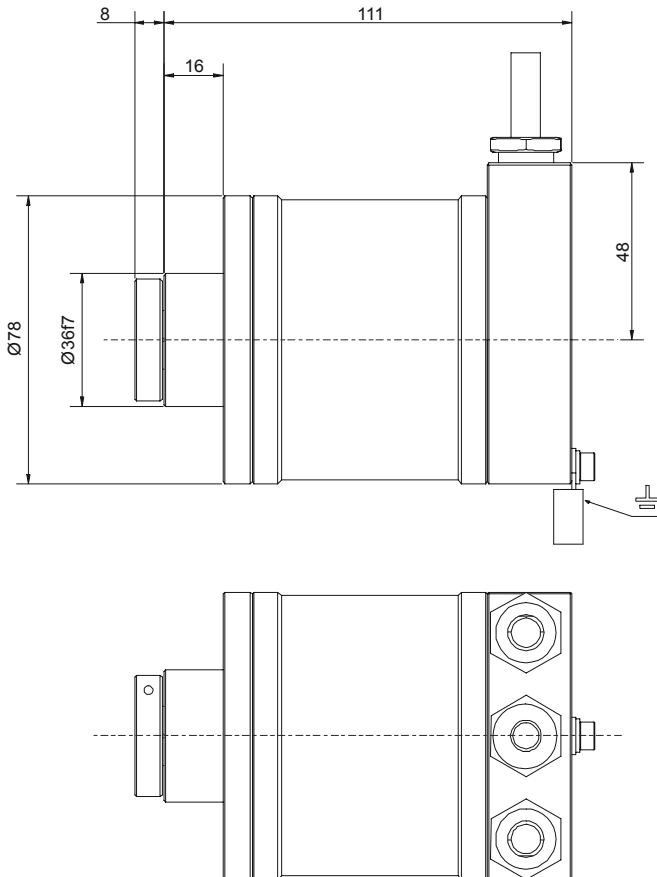
Mechanical Drawings

Clamp flange (C)

Shaft



Hollow Shaft



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