

AMG 11

Encoder with solid shaft $\varnothing 11$ mm and EURO flange B10

Single and multiturn 13 bit ST / 12 or 16 bit MT SSI / Profibus / CANopen® / DeviceNet / PROFINET

Overview

- Multiturn SSI / Profibus / CANopen® / DeviceNet / PROFINET
- Optical sensing method
- Singleturn 13 bit, multiturn 12 bit / 16 bit
- EURO flange B10 / solid shaft $\varnothing 11$ mm
- Multiturn sensing with microGen technologie, without gear or battery
- Available with redundant absolute signals
- Special protection against corrosion



Technical data

Technical data - electrical ratings

| | |
|-------------------------|---|
| Voltage supply | 9...30 VDC |
| Consumption w/o load | ≤ 100 mA (per interface SSI) ≤ 250 mA (per interface bus) |
| Initializing time | ≤ 200 ms after power on |
| Interface | SSI Profibus-DPV0 CANopen® DeviceNet PROFINET |
| Function | Multiturn |
| Transmission rate | 9.6 ... 12000 kBaud (Profibus) 10 ... 1000 kBaud (CANopen®) 125 ... 500 kBaud (DeviceNet) 100 MBaud (PROFINET) |
| Profile conformity | Profibus-DPV0 CANopen® CiA DSP 406 V 3.0 Device Profile Encoder V 1.0 Encoder profile PNO 3.162 |
| Device adress | Rotary switches in bus cover |
| Steps per revolution | 8192 / 13 bit |
| Number of revolutions | ≤ 65536 / 16 bit |
| Additional outputs | Square-wave TTL (RS422) Square-wave HTL |
| Sensing method | Optical |
| Code | Gray (version SSI) |
| Code sequence | CW default |
| Inputs | SSI clock (version SSI) |
| Interference immunity | EN 61000-6-2 |
| Emitted interference | EN 61000-6-3 |
| Programmable parameters | Depending on the selected absolute interface |

Technical data - electrical ratings

| | |
|---------------------|---------------------------------|
| Diagnostic function | Position or parameter error |
| Status indicator | DUO-LED integrated in bus cover |
| Approval | CE UL approval / E217823 |

Technical data - mechanical design

| | |
|-------------------------|---|
| Size (flange) | $\varnothing 115$ mm |
| Shaft type | $\varnothing 11$ mm solid shaft |
| Flange | EURO flange B10 |
| Protection EN 60529 | IP 67 |
| Operating speed | ≤ 3500 rpm (mechanical) |
| Operating torque typ. | 12 Ncm |
| Rotor moment of inertia | 780 gcm^2 |
| Admitted shaft load | ≤ 250 N axial, ≤ 350 N radial |
| Material | Housing: aluminium alloy Shaft: stainless steel |
| Corrosion protection | IEC 60068-2-52 Salt mist for ambient conditions CX (C5-M) according to ISO 12944-2 |
| Operating temperature | -20...+85 °C |
| Resistance | IEC 60068-2-6 Vibration 10 g, 10-2000 Hz IEC 60068-2-27 Shock 100 g, 6 ms |
| Explosion protection | II 3 G Ex ec IIC T4 Gc (gas) II 3 D Ex tc IIIC T135°C Dc (dust) (only with option ATEX) |
| Weight approx. | 3 kg (depending on version) |
| Connection | Bus cover Terminal box or flange connector M23, 12 pin (SSI/incremental) |

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Optional

- Additional incremental output (TTL / HTL)

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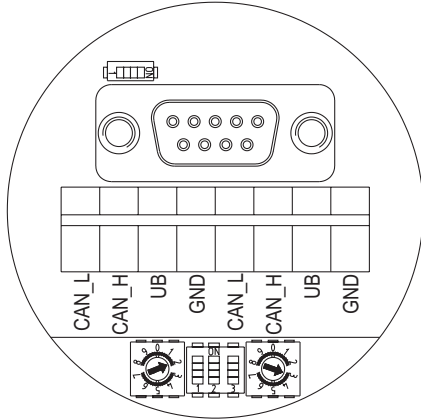
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CANopen® features

Terminal assignment

View A - Connecting terminal in bus cover



Terminal significance

| | |
|-------|--------------------------------|
| CAN_L | CAN Bus signal (dominant Low) |
| CAN_H | CAN Bus signal (dominant High) |
| UB | Voltage supply 9...30 VDC |
| GND | Ground connection for UB |

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

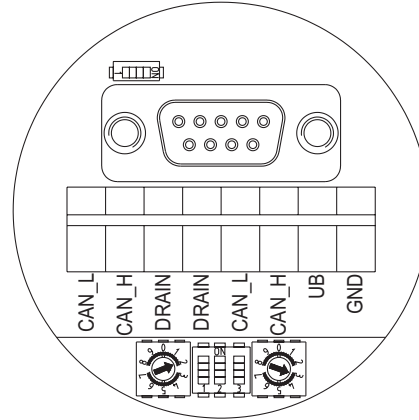
Features

| | |
|-----------------|--|
| Bus protocol | CANopen® |
| Features | Device Class 2 CAN 2.0B |
| Device profile | CANopen® CiA DSP 406, V 3.0 |
| Operating modes | <ul style="list-style-type: none"> ■ Polling mode (asynch, via SDO) ■ Cyclic mode (asynch-cyclic) ■ Synch mode (synch-cyclic) ■ Acyclic mode (synch-acyclic) |
| Diagnosis | The encoder supports the following error warnings: <ul style="list-style-type: none"> ■ Position error |
| Factory setting | User address 00 |

DeviceNet features

Terminal assignment

View A - Connecting terminal in bus cover



Terminal significance

| | |
|-------|--------------------------------|
| CAN_L | CAN Bus Signal (dominant Low) |
| CAN_H | CAN Bus Signal (dominant High) |
| DRAIN | Shield |
| UB | Voltage supply 9...30 VDC |
| GND | Ground for UB |

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

Features

| | |
|---------------------|--|
| Bus protocol | DeviceNet |
| Device profile | Device Profil for Encoders V 1.0 |
| Operating modes | <ul style="list-style-type: none"> ■ I/O-Polling ■ Cyclic ■ Change of State |
| Preset value | The „Preset“ parameter can be used to set the encoder to a predefined value that corresponds to a specific axis position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder. |
| Parameter functions | <p>Rotating direction: The relationship between the rotating direction and rising or falling output code values can be set in the operating parameter.</p> <p>Scaling: The parameter values set the number of steps per turn and the overall resolution.</p> |
| Diagnostic | The encoder supports the following error warnings: <ul style="list-style-type: none"> ■ Position and parameter error |
| Factory setting | User address 00 |

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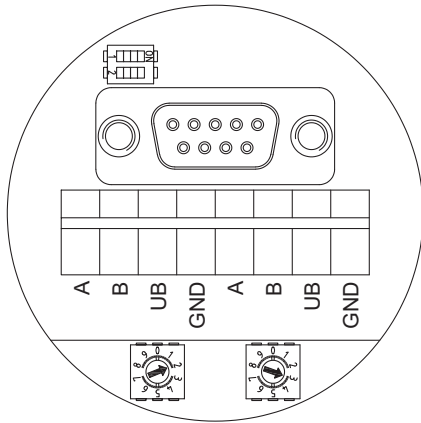
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Profibus-DP features

Terminal assignment

View A - Connecting terminal in bus cover



Terminal significance

| | |
|-----|--|
| A | Negative serial data transmission, pair 1 and pair 2 |
| B | Positive serial data transmission, pair 1 and pair 2 |
| UB | Voltage supply 9...30 VDC |
| GND | Ground connection for UB |

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

Features

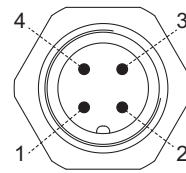
| | |
|-------------------------|---|
| Bus protocol | Profibus-DP V0 |
| Features | Device Class 1 and 2 |
| Data exchange functions | Input: Position value Output: Preset value |
| Preset value | The „Preset“ parameter can be used to set the encoder to a predefined value that corresponds to a specific axis position of the system. |
| Parameter functions | Rotating direction: The relationship between the rotating direction and rising or falling output code values can be set in the operating parameter. Scaling: The parameter values set the number of steps per turn and the overall resolution. |
| Diagnostic | The encoder supports the following error messages: <ul style="list-style-type: none"> Position error |
| Factory setting | User address 00 |

PROFINET features

Terminal assignment

View D - View onto connector „Voltage supply“

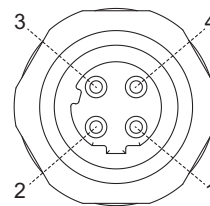
| Male | Connection | Description |
|------|------------|----------------------------|
| 1 | UB | Voltage supply 10...30 VDC |
| 2 | - | Do not use |
| 3 | GND | Ground for UB |
| 4 | - | Do not use |



Connector M12 (male)
4-pin, A-coded

View E - View into connector „Data transmission“

| Female | Connection | Description |
|--------|------------|--------------------|
| 1 | TxD+ | Transmission data+ |
| 2 | RxD+ | Receiving data+ |
| 3 | TxD- | Transmission data- |
| 4 | RxD- | Receiving data- |



Connector M12 (female)
4-pin, D-coded

Features

| | |
|----------------|---|
| Bus protocol | PROFINET |
| Device profile | Encoder Profil PNO 3.162 |
| Features | <ul style="list-style-type: none"> 100 MBaud Fast Ethernet IP address programmable Realtime (RT) Class 1, IRT Class 2, IRT Class 3 |
| Process data | Position value 32 bit input data |

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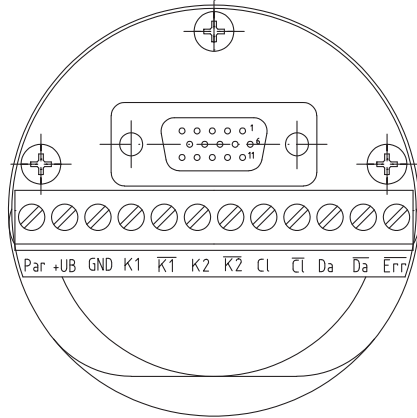
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SSI/Incremental features

Terminal assignment

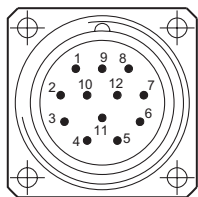
View B - Connecting terminal in cover



View C - Option

Flange connector M23, 12-pin, male contacts, counter-clockwise

| Male | Assignment |
|------|------------|
| 1 | K2 |
| 2 | Clock * |
| 3 | Data * |
| 4 | Data * |
| 5 | K1 |
| 6 | K1-bar |
| 7 | Param * |
| 8 | K2 |
| 9 | Error * |
| 10 | GND |
| 11 | Clock * |
| 12 | +UB * |

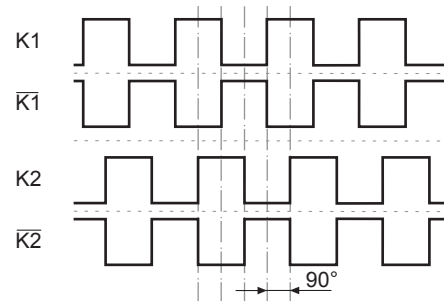


* only for SSI

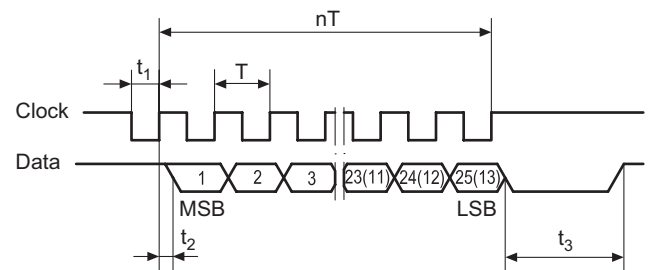
Output signals

HTL/TTL

At positive rotating direction (see dimension)



Data transfer



$T = 1.25 \dots 10 \mu s$

$t_1 = 0.63 \dots 5 \mu s$

$t_2 = 0.4 \mu s$

$t_3 = 12 \dots 30 \mu s$

$n =$ Number of bits

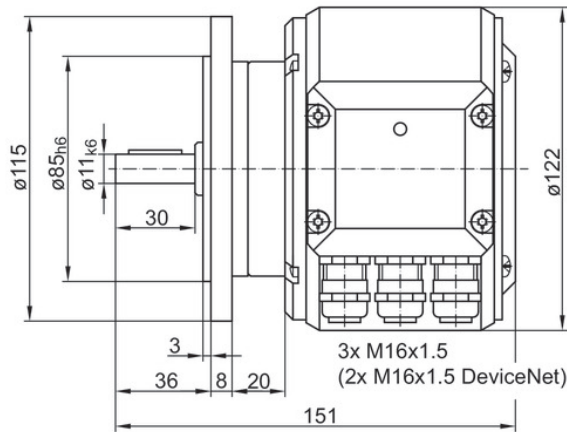
Clock frequency $100 \dots 800 \text{ kHz}$

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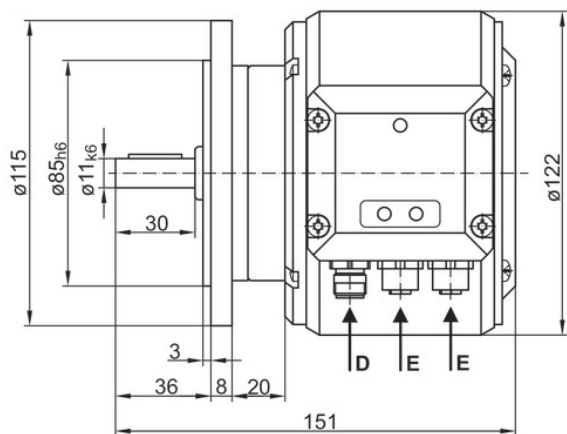
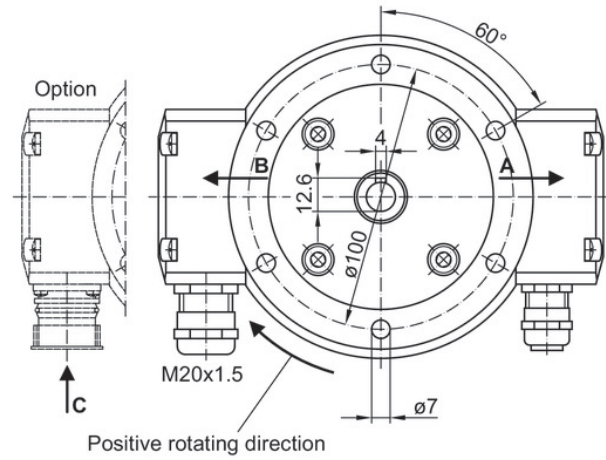
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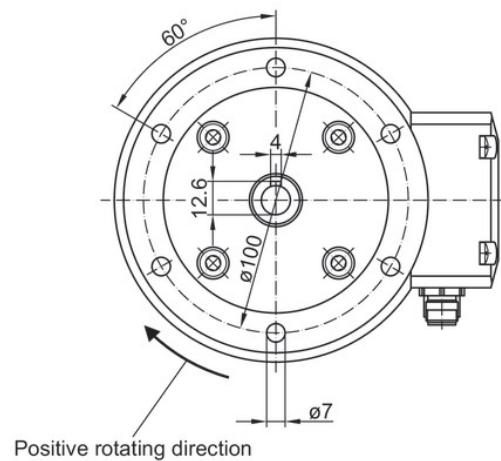
Dimensions



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Ordering reference

| | AMG11 | # | ## | ##### | ##### |
|---|-------|----|----|-------|--------|
| Product | AMG11 | | | | |
| Interface/interfaces | | | | | |
| SSI | | S | | | |
| Profibus | | P | | | |
| CANopen® | | C | | | |
| DeviceNet | | D | | | |
| PROFINET | | N | | | |
| 2 x SSI | | SS | | | |
| Profibus and SSI | | PS | | | |
| CANopen® and SSI | | CS | | | |
| DeviceNet and SSI | | DS | | | |
| 2 x Profibus | | PP | | | |
| CANopen® and Profibus | | CP | | | |
| DeviceNet and Profibus | | DP | | | |
| 2 x CANopen® | | CC | | | |
| DeviceNet and CANopen® | | DC | | | |
| 2 x DeviceNet | | DD | | | |
| Absolute share | | | | | |
| 13 bit singleturn | | | 13 | | |
| 13 bit singleturn + 12 bit multiturn | | | 25 | | |
| 13 bit singleturn + 16 bit multiturn | | | 29 | | |
| Additional output⁽¹⁾ | | | | | |
| Without | | | | Z0 | |
| TTL level, 1024 pulses | | | | T1024 | |
| TTL level, 2048 pulses | | | | T2048 | |
| HTL level, 1024 pulses | | | | H1024 | |
| HTL level, 2048 pulses | | | | H2048 | |
| Connection | | | | | |
| Without SSI/incremental | | | | | |
| Terminal box, radial | | | | | KLK |
| Flange connector M23, radial (only SSI/incremental) | | | | | ST-M23 |

(1) The incremental signals are duplicated with configuration SS

Please note: additional incremental output signals are not feasible with PP, CP, DP, CC, DC and DD interface.

Accessories

Mounting accessories

Spring disk coupling K 35 (shaft $\varnothing 6 \dots 12$ mm)

Spring disk coupling K 60 (shaft $\varnothing 11 \dots 22$ mm)