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HENGSTLER

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HENGSTLER

Absolute Shaft Encoders Type AX 70 / 71

Explosion proof



Version AX 70 - Aluminium



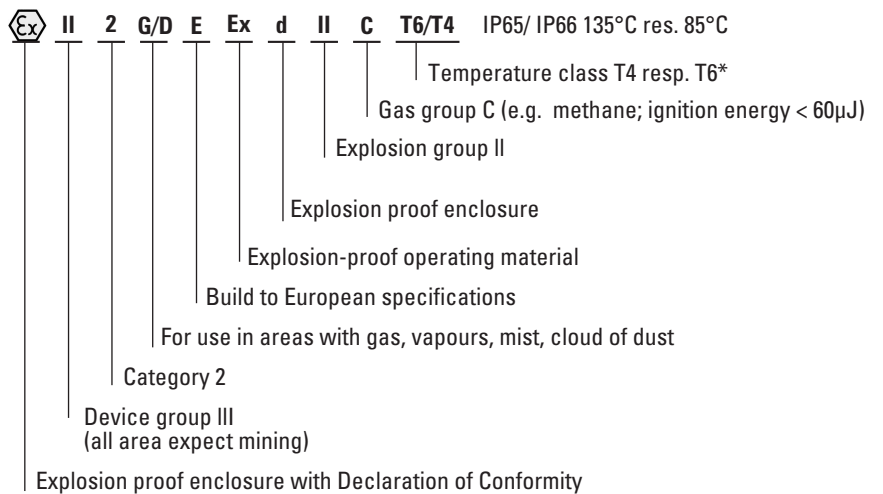
Version AX 71 - Stainless steel

- ATEX certification for gas and dust explosion proof
- Same electrical performance as ACURO industry
- Protection class up to IP67
- Diameter only 70 mm
- Robust design
- Also available with stainless steel
- Resolution up to 29 Bit (17 Bit ST, 12 Bit MT)
- Applications:
 - enamelling production line
 - petro chemistry
 - bottling machines
 - mixers
 - silo works, mills
- Interfaces: SSI, SSI programmable, Profibus, CANopen



EX-CLASSIFICATION

The absolute shaft encoder line ACURO is available in explosion proof design with explosion proof enclosure "d" under AX 70 and AX 71 (stainless steel). The PTB has assured with the Declaration of Conformity that the AX 70 / 71 meets the requirements of safety and health according to EN 50014 and EN 50018. Therefore it is approved in explosive areas, code „Ex II 2 G/D E Ex d II C T4/T6 IP65/ IP66 135°C resp. 85°C“. For applications under tough environmental conditions and food industry the stainless steel version AX 71 is available.



T6 = Highest permissible surface temperature +85°C (max. speed = 6000 U/min⁻¹)
 T4 = Highest permissible surface temperature +130°C (max. speed = 10000 U/min⁻¹)

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TECHNICAL DATA mechanical (for all interfaces)

| | Temperature class T4 | Temperature class T6 |
|--------------------------------------|--|--|
| Housing diameter | 70 mm | 70 mm |
| Shaft diameter | 10 mm | 10 mm |
| Protection class housing | IP67 or IP65 | IP65 |
| Protection class shaft | IP67 or IP64 | IP64 |
| Max. speed | 10000 min ⁻¹ | 6000 min ⁻¹ |
| Torque | ≤ 1 Ncm | ≤ 1 Ncm |
| Moment of inertia | approx. 20 gcm ² | approx. 20 gcm ² |
| Max. shaft load | axial 40 N/ radial 100 N | axial 40 N/ radial 100 N |
| Vibration resistance (IEC 68-2-6) | 100 m/s ² (10 - 500 Hz) | 100 m/s ² (10 - 500 Hz) |
| Shock resistance (IEC 68-2-27) | 1000 m/s ² (6 ms) | 1000 m/s ² (6 ms) |
| Operating temperature | -40 ...+60°C | -40 ...+40°C |
| Storage temperature | -25...+80°C | -25...+80°C |
| Material shaft / housing | Aluminium (AX70) Stainless steel (AX71) | Aluminium (AX70) Stainless steel (AX71) |
| Weight approx. ST/MT | 1 000 g (AX 70) 1 900 g (AX 71) | 1 000 g (AX 70) 1 900 g (AX 71) |

TECHNICAL DATA ELECTRICAL Profibus, CANopen

| | Profibus | CANopen |
|------------------------------|--|--|
| Supply voltage | DC 10-30 V | DC 10-30 V |
| Max. current w/o load ST/MT | 220 mA/ 250 mA | max. 250 mA |
| Profile/ Protocol | Profibus DP with encoder profile class C2 (programmable) | CANopen according DS 301 with encoder profile DSP 406 |
| Output code | binary | binary |
| Resolution singleturn | 10 - 14 Bit | 10 - 14 Bit |
| Resolution multiturn | | 12 Bit |
| Baud rate | is automatically set within a range of 9.6 Kbit/s through 12Mbit/s | set via DIP-switches |
| Bus terminating resistor | external mounting | external mounting |
| Device address | set via Bus | - |
| Node ID | - | set via Bus |
| Integrated special functions | Speed, acceleration, operating time | Speed, acceleration, round axis, limit values operating time |
| Programmable | Resolution, Preset, Direction | Resolution, Preset, Limit value, Direction |
| Connection | Cable axial | Cable axial |

PIN ASSIGNMENT Profibus, CANopen

| Color | Profibus | CANopen |
|--------------|-------------------------------------|-------------|
| yellow | B in | CAN in+ |
| green | A in | CAN in - |
| pink | B out | CAN out+ |
| grey | A out | CAN out - |
| blue | GND1 (M5V ¹) | CAN GND in |
| brown | VCC1 (P5V ¹) | CAN GND out |
| white 0.5 mm | DC 10 ... 30 V | UB in |
| brown 0.5 mm | 0 V | 0 V in |
| Screen | Screen connected to encoder housing | |

¹ used for power supply for an external bus termination resistor

Absolute Shaft Encoders Type AX 70 / 71

Explosion proof

TECHNICAL DATA ELECTRICAL SSI, SSI PROGRAMMABLE

| | SSI | SSI programmable |
|---|--------------------------------------|---|
| Supply voltage | DC 10-30 V | DC 10-30 V |
| Max. current w/o load ST/MT | 220 mA/ 250 mA | max. 250 mA |
| Lines / Drivers | clock and data RS422 | clock and data RS422 |
| Output code | binary or gray | binary or gray |
| Resolution singleturn | 10 - 17 Bit | 9 - 22 Bit |
| Resolution multiturn | 12 Bit | 12 Bit |
| Programmable (with ACURO soft + appropriate hardware) | code type, direction, warning, alarm | - |
| Programmable (with WIN SSI) | - | code type, direction, output code, warning, alarm |
| Control input | <u>Direction</u> | Direction, Preset 1, Preset 2 |
| Alarm output | Alarm bit | Alarm bit |
| Connection | Cable axial | Cable axial |

PIN ASSIGNMENT SSI, SSI programmable

| Color | No. | SSI | SSI programmable |
|---------------|-----|---------------------------------|--------------------|
| white 0.14 mm | 6 | DC 10 ... 30 V | RS232 RxD |
| brown 0.14 mm | 5 | 0 V supply voltage | RS232 TxD |
| green | 10 | <u>Clock</u> | <u>Clock</u> |
| yellow | 9 | Clock | Clock |
| grey | 8 | <u>Data</u> | <u>Data</u> |
| pink | 7 | Data | Data |
| blue | 3 | <u>Direction</u> | Direction |
| black | 4 | 0 V signal output | 0 V signal output |
| red | 1 | - | Preset 1 |
| violet | 2 | - | Preset 2 |
| brown 0.5 mm | 11 | - | 0 V supply voltage |
| white 0.5 mm | 12 | - | DC 10 ... 30 V |
| Screen | | Screen connected to the housing | |

RECOMMENDED DATA TRANSFER RATE WITH SSI

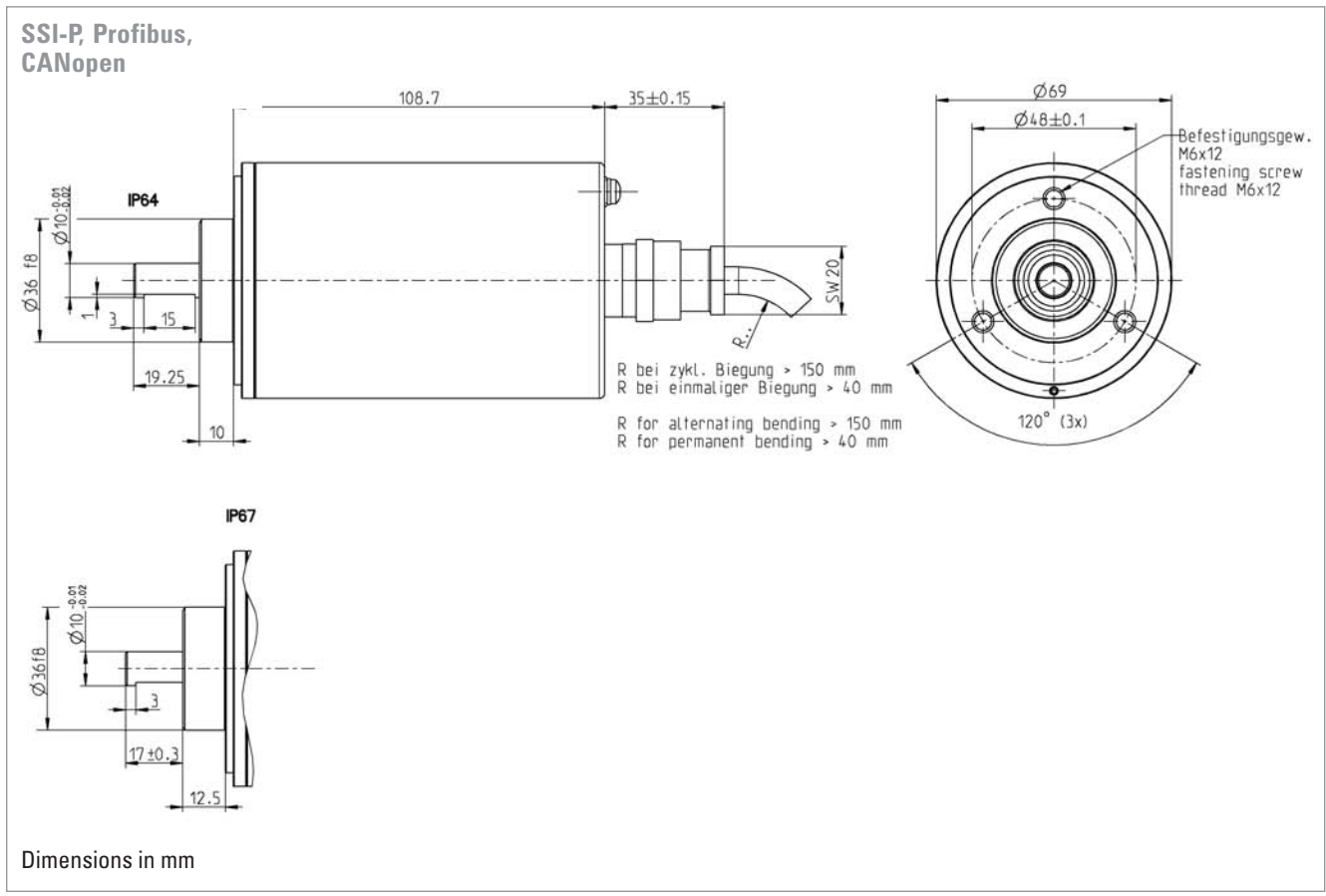
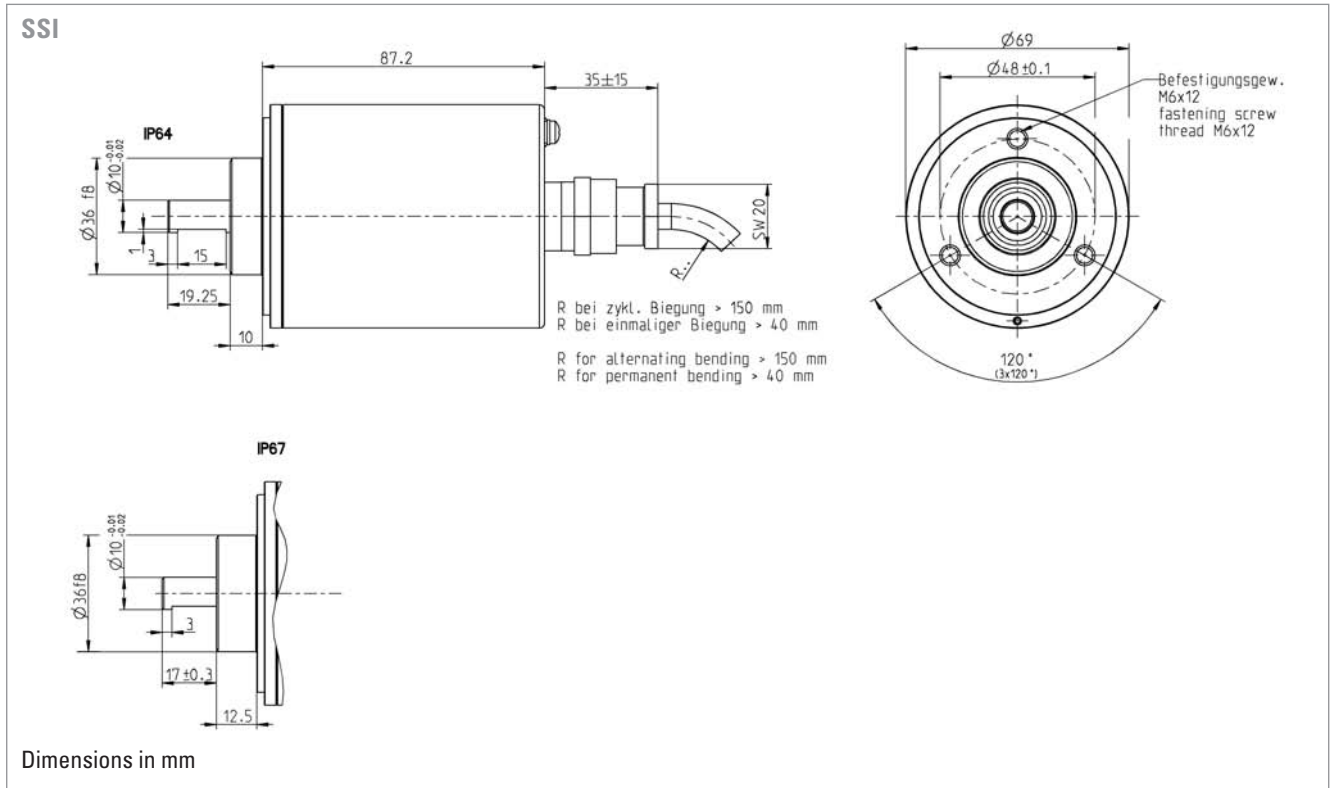
The max. data transfer rate depends on the cable length.
For Clock/ Clock and Data/ Data please use twisted pairs. Use shielded cable.

| Lead length | Baud rate |
|-------------|-----------|
| < 50 m | < 400 kHz |
| < 100 m | < 300 kHz |
| < 200 m | < 200 kHz |
| < 400 m | < 100 kHz |

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DIMENSIONAL DRAWINGS



Absolute Shaft Encoders Type AX 70 / 71

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ACCESSORIES

| | |
|--|-------------------------|
| SSI | |
| Software ACURO soft | on request |
| SSI programmable | |
| Technical Manual German | 2 565 287 (or homepage) |
| Technical Manual English | 2 565 289 (or homepage) |
| Software Win SSI | on request |
| Profibus | |
| GSD-file as download from our homepage | www.hengstler.com |
| Technical Manual German | 2 565 090 (or homepage) |
| Technical Manual English | 2 565 255 (or homepage) |
| CANopen | |
| EDS-file as download from our homepage | www.hengstler.com |
| Technical Manual German | 2 565 250 (or homepage) |

ORDERING INFORMATION ACURO industry with SSI

| Type | Resolution | Supply voltage | Flange, Protection, Shaft | Output | Connection |
|---|---|--------------------------|---|--|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| AX70- Aluminum AX71- Stainless steel | 0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0017 17 Bit ST ** 0360 360 Incr. ST ¹ 0720 720 Incr. ST ² 1212 12 Bit MT+12 Bit ST 1213 12 Bit MT+13 Bit ST higher resolutions on request | E DC 10 - 30 V | K.42 Clamping flange, IP64, 10x19.5 mm K.72* Clamping flange, IP67, 10x19.5 mm | SB SSI Binary SG SSI Gray | A-F0 Cable axial 5 m A-K0 Cable axial 10 m |
| * only with temperature class 4; IP67 is necessary for use in areas with clouds of dust ** When resolution > 14 Bit → max. clock frequency 178 kHz ¹ with Offset 76 (value range 76...435) ² with Offset 152 (value range 152...871) | | | | | |

Absolute Shaft Encoders Type AX 70 / 71

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ORDERING INFORMATION
ACURO industry with SSI programmable

| Type | Resolution | Supply voltage | Flange, Protection, Shaft | Output | Connection |
|---|--|--------------------------|---|----------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| AX70- Aluminum AX71- Stainless steel | 0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0017 17 Bit ST 1212 12 Bit MT+12 Bit ST 1213 12 Bit MT+13 Bit ST 1214 12 Bit MT+14 Bit ST 1217 12 Bit MT+17 Bit ST higher resolutions on request | E DC 10 - 30 V | K.42 Clamping flange, IP64, 10x19.5 mm K.72* Clamping flange, IP67, 10x19.5 mm | SP SSI programmable | A-F0 Cable axial 5 m A-K0 Cable axial 10 m |
| * only with temperature class 4; IP67 is necessary for use in areas with clouds of dust | | | | | |

ORDERING INFORMATION
ACURO industry with Profibus

| Type | Resolution | Supply voltage | Flange, Protection, Shaft | Output | Connection |
|---|---|--------------------------|---|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| AX70- Aluminum AX71- Stainless steel | 0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 1212 12 Bit MT+12 Bit ST 1213 12 Bit MT+13 Bit ST 1214 12 Bit MT+14 Bit ST | E DC 10 - 30 V | K.42 Clamping flange, IP64, 10x19.5 mm K.72* Clamping flange, IP67, 10x19.5 mm | DP Profibus | A-F0 Cable axial 5 m A-K0 Cable axial 10 m |
| * only with temperature class 4; IP67 is necessary for use in areas with clouds of dust | | | | | |

ORDERING INFORMATION
ACURO industry with CANopen

| Type | Resolution | Supply voltage | Flange, Protection, Shaft | Output | Connection |
|---|---|--------------------------|---|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| AX70- Aluminum AX71- Stainless steel | 0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 1212 12 Bit MT+12 Bit ST 1213 12 Bit MT+13 Bit ST 1214 12 Bit MT+14 Bit ST | E DC 10 - 30 V | K.42 Clamping flange, IP64, 10x19.5 mm K.72* Clamping flange, IP67, 10x19.5 mm | OL CANopen | A-F0 Cable axial 5 m A-K0 Cable axial 10 m |
| * only with temperature class 4; IP67 is necessary for use in areas with clouds of dust | | | | | |