SERIES AX70/AX71 HENGSTLER

Optical Absolute Encoder

Key Features

- **Up to 22 bit of Singleturn, 12 bit of True Multiturn Absolute Positioning**
- **ATEX Certification for Explosion Proof Requirements**
- **Ingress Protection up to IP67**
- **Stainless Steel or Aluminum Housing**
- **Multiple Communication Options**

IEC Ex PTB 12.0002X CE EN 61326 Ex D II C T6/T4

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS:
Code: Absolute, Optical
Absolute Accuracy: ±35" (BiSS/SSI)
Linearity:
BiSS/SSI: ± ½LSB (± 1 LSB for resolution > 13 Bit)
CANopen: ± ½LSB (± 1 LSB for resolution 13, 14, 25, 26 Bit)
Profibus: ± ½ LSB (± 1 LSB for resolution 13, 14, 25, 26 Bit)
DeviceNet: ± ½ LSB (± 1 LSB for resolution 13, 14, 25, 26 Bit)

ELECTRICAL:
Connection: Cable, axial and radial
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Tested to EN61326-1

Interface: BiSS/SSI/ SSI Programmable
Input Power: 10-30 VDC
Current Consumption:
BiSS/ SSI: 220 mA (ST) / 250 mA (MT)
SSI Programmable: max. 250 mA (ST / MT)
Line/Drivers: Clock and Data RS422
Output Code: Binary or Gray
Resolution Single-turn:
BiSS/ SSI: 10-22 Bit
SSI Programmable: 10-17 Bit
Resolution Multi-turn: 12 Bit
Programmable (with WIN SSI): Resolution, Code Type, Direction, Output Format, Warning, Alarm, Preset Values
Control Input:
BiSS/ SSI: Direction
SSI Programmable: Direction, Preset 1, Preset 2
Alarm Output: Alarm bit

Interface: Profibus
Input Power: 10-30 VDC
Current Consumption: 220 mA (ST) / 250 mA (MT)
Protocol: Profibus DP with encoder profile CLASS C2 (parameterizable)
Output Code: Binary
Resolution Single-Turn: 10-14 Bit
Resolution Multi-turn: 12 Bit
Frequency Response (Baud Rate): Is automatically set within a range of 9.6 Kbit/s through 12Mbit/s
Bus Terminating Resistor: External Mounting
Device Address: Set via Bus
Integrated Special Functions: Speed, Acceleration, Operating Time
Programmable: Resolution, Preset, Direction

Interface: CANopen
Input Power: 10-30 VDC
Current Consumption: 250 mA (ST, MT)
Protocol: CANopen according DS 301 with encoder profile DSP 406
Output Code: Binary
Resolution Single-Turn: 10-16 Bit
Resolution Multi-turn: 12 Bit
Frequency Response (Baud Rate): set via bus within a range of 10 to 1000 Kbit/s (Standard setting for baud rate is 800 Kbit/s ex works
Bus Terminating Resistor: External Mounting
Node ID: Set via Bus
Integrated Special Functions: Speed, Acceleration, Rotary Axis, Limited Values, Operating Time
Programmable: Resolution, Preset, Direction

Interface: DeviceNet
Input Power: 10-30 VDC
Current Consumption: 220 mA (ST) / 250 mA (MT)
Protocol: DeviceNet according to Rev. 2.0, programmable encoder
Output Code: Binary
Resolution Single-Turn: 10-14 Bit
Resolution Multi-turn: 12 Bit
Frequency Response (Baud Rate): 500KBaud
Bus Terminating Resistor: Activated
Mac-ID: =1
Programmable: Resolution, Preset, Direction

MECHANICAL
Shaft Diameter: 10 mm (Solid shaft)
Mounting: Clamping flange
Max. Shaft Load: Axial= 40 N, Radial= 100 N
Max. Shaft Speed: T4= 10 000 rpm; T6= 6000 rpm
Starting Torque: ≤1 Ncm
Moment of Inertia: approx. 20 gcm²
Housing Material: AX 70= Aluminum; AX 71= Stainless Steel
Shaft Material: Stainless Steel
Disc Material: Glass
Weight: AX 70= approx. 1.4 kg; AX 71= approx. 4.8 kg

ENVIRONMENTAL
Ambient Temperature: T4= -40°C to +60°C; T6= -40°C to +40°C
Storage Temperature: -25°C to +85°C
Shock (DIN EN 60068-2-27): 1000 m/s² (6 ms)
Vibration (DIN EN 60068-2-6): 100 m/s² (10 to 500 Hz)
Humidity: Up to 75%, (No Condensation Allowed)
Enclosure Rating:
Housing: (EN 60529/ A1:2000-02): T4: IP65 or IP67; T6: IP65
Shaft: (EN 60529/ A1:2000-02) T4: IP64 or IP67 ; T6: IP64

* No standing water allowed at the shaft entrance or cable entrance or at the ball bearing.

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MAXIMUM SPEED VS TEMPERATURE CLASS

Interface	Protection Class	Max. Speed	Ambient Temperature	Temperature Class
SSI / BiSS	IP64	1000 rpm	-40 °C … +60 °C	T6
		10000 rpm	-40 °C … +40 °C	T6
		10000 rpm	-40 °C … +60 °C	T4
	IP67	1000 rpm	-40 °C … +60 °C	T6
		6000 rpm	-40 °C … +60 °C	T4
		10000 rpm	-40 °C … +55 °C	T4
Profibus CANopen DeviceNet SSI-P	IP64	1000 rpm	-40 °C … +60 °C	T6
		6000 rpm	-40 °C … +50 °C	T6
		10000 rpm	-40 °C … +60 °C	T4
	IP67	1000 rpm	-40 °C … +55 °C	T6
		3000 rpm	-40 °C … +40 °C	T6
		6000 rpm	-40 °C … +60 °C	T4
		10000 rpm	-40 °C … +40 °C	T4

T6 = Highest permissible surface temperature +85°C (max. speed = 6000 /min^{-1})
T4 = Highest permissible surface temperature +130°C (max. speed = 10,000 /min^{-1})

ELECTRICAL CONNECTIONS — SSI-P

Wire Color	Pin No.	SSI-P Function
White 0.14 mm	6	RS232 RxD
Brown 0.14 mm	5	RS232 TxD
Green	10	$\overline{\text{Clock}}$
Yellow	9	Clock
Gey	8	$\overline{\text{Data}}$
Pink	7	Data
Blue	3	Direction
Black	4	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 encoder housing

ELECTRICAL CONNECTIONS — SSI/BiSS

Wire Color	Pin No.	SSI Function
White 0.25 mm	12	Vcc 10 to 30VDC
Brown 0.25 mm	11	0 V Gnd.
Green	10	$\overline{\text{Clock}}$
Yellow	9	Clock
Gey	8	$\overline{\text{Data}}$
Pink	7	Data
Blue	3	$\overline{\text{Direction}}$
Black	4	0 V Gnd.

ELECTRICAL CONNECTIONS — Profibus

Wire Color	Profibus Function
Yellow	B in
Green	A in
Pink	B out
Grey	A out
Blue	GND1 (M5V[1])
Brown	VCC1 (P5V[1])
White 0.5 mm	DC 10 - 30 V
Brown 0.5 mm	0 V
Screen	Connected to encoder housing

[1] used for power supply for an external bus termination resistor

SSI / SSI-P RECOMMENDED DATA TRANSFER RATE (bei SSI)

Cable length	Frequency
<50 m	<400 kHz
<100 m	<300 kHz
<200 m	<200 kHz
<400 m	<100 kHz

The max.data transfer rate depends on the cable length.

For Clock /$\overline{\text{Clock}}$ and Data /$\overline{\text{Data}}$ please use twisted pairs. Use shielded cable.

ORDERING INFORMATION SSI / BiSS

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: Resolution[1]	Code 3: Voltage	Code 4: Mounting	Code 5: Protection Class	Code 6: Shaft Size	Code 7: Interface	Code 8: Connection	Code 9: Cable Length
Ordering Information								
AX70	☐☐☐☐	☐	☐ •	☐	☐	☐	☐	☐☐
AX70 Heavy Duty Absolute encoder, Aluminum Housing	**0010** 10 ST **0012** 12 ST **0013** 13 ST **0014** 14 ST **0017** 17 ST **0019** 19 ST **0022** 22 ST	**E** 10-30VDC	**K** Clamping Flange	**4** IP64 **7** IP67[2,3]	**2** 10mm	**BI** BiSS-B **BE** BiSS-C **SB** SSI-Binary **SG** SSI-Gray	**A** Axial Cable **B** Radial Cable	**F0** 5 m **K0** 10 m **P0** 15 m **U0** 20 m **V0** 25 m **W0** 30 m **X0** 40 m **Y0** 50 m
AX71 Stainless Steel Housing	**1212** 12 MT +12 ST **1213** 12 MT +13 ST **1214** 12 MT +14 ST **1217** 12 MT +17 ST **1219** 12 MT +19 ST **1222** 12 MT +22 ST							

Notes:

[1] When resolution > 14 Bit: max. clock frequency 178 kHz

[2] Only with temperature class 4; IP67 is necessary for use in areas with cloud of dust

[3] Dust explosion-proof certification (D) only for IP67

SERIES AX70/AX71

by DYNAPAR™

ORDERING INFORMATION SSI - PROGRAMMABLE

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: Resolution	Code 3: Voltage	Code 4: Mounting	Code 5: Protection Class	Code 6: Shaft Size	Code 7: Interface	Code 8: Connection	Code 9: Cable Length
Ordering Information								
AX70	□□□□	□	□ •	□	□	□	□	□
AX70 Heavy Duty Absolute encoder, Aluminum Housing **AX71** Stainless Steel Housing	**0010** 10 ST **0012** 12 ST **0013** 13 ST **0014** 14 ST **0017** 17 ST **1212** 12 MT +12 ST **1213** 12 MT +13 ST **1214** 12 MT +14 ST **1217** 12 MT +17 ST	**E** 10-30VDC	**K** Clamping Flange	**4** IP64 **7** IP67[1,2]	**2** 10mm	**SP** SSI-Programmable	**A** Axial Cable **B** Radial Cable	**F0** 5 m **K0** 10 m **P0** 15 m **U0** 20 m **V0** 25 m **W0** 30 m **X0** 40 m **Y0** 50 m

Notes:

[1] IP67 only with temperature class 4

[2] Dust explosion-proof certification (D) only for IP67

ORDERING INFORMATION Profibus, CANopen, DeviceNet

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: Resolution	Code 3: Voltage	Code 4: Mounting	Code 5: Protection Class	Code 6: Shaft Size	Code 7: Interface	Code 8: Connection	Code 9: Cable Length
Ordering Information								
AX70	□□□□	□	□ •	□	□	□	□	□
AX70 Heavy Duty Absolute encoder, Aluminum Housing **AX71** Stainless Steel Housing	**0010** 10 ST **0012** 12 ST **0013** 13 ST **0014** 14 ST **1212** 12 MT +12 ST **1213** 12 MT +13 ST **1214** 12 MT +14 ST **Available only for CANopen** **0016** 16 ST	**E** 10-30VDC	**K** Clamping Flange	**4** IP64 **7** IP67[1,2]	**2** 10mm	**DP** Profibus **OL** CANopen **VD** DeviceNet	**A** Axial Cable **B** Radial Cable	**F0** 5 m **K0** 10 m **P0** 15 m **U0** 20 m **V0** 25 m **W0** 30 m **X0** 40 m **Y0** 50 m

Notes:

[1] IP67 only with temperature class 4

[2] Dust explosion-proof certification (D) only for IP67

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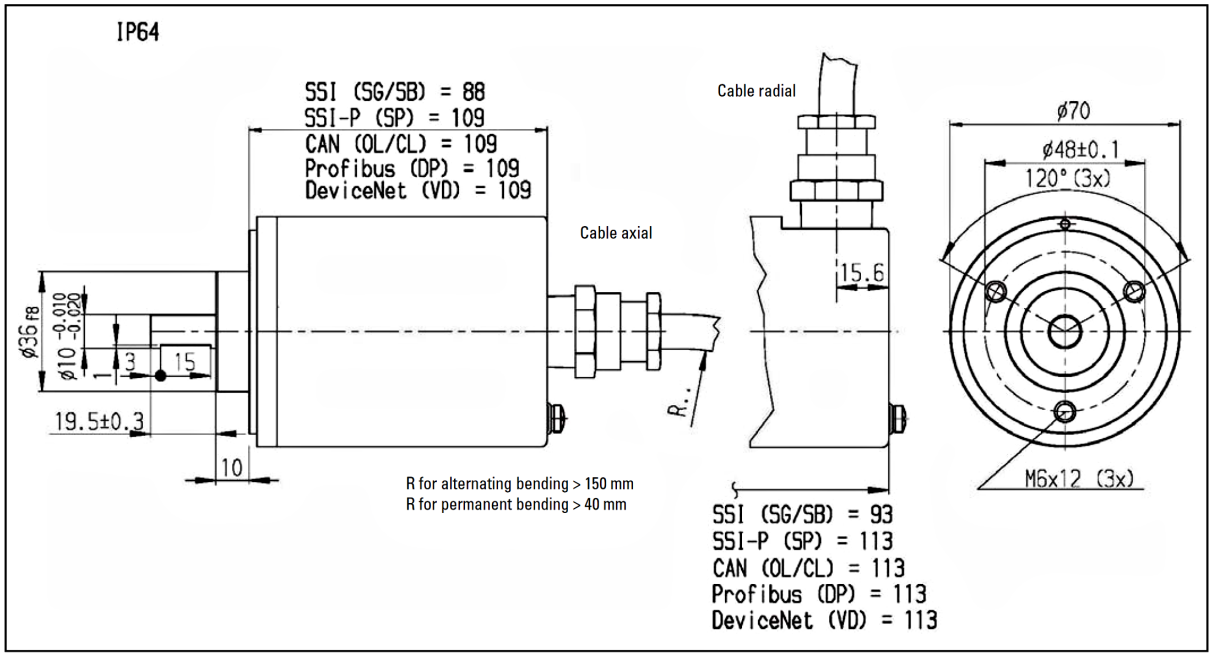
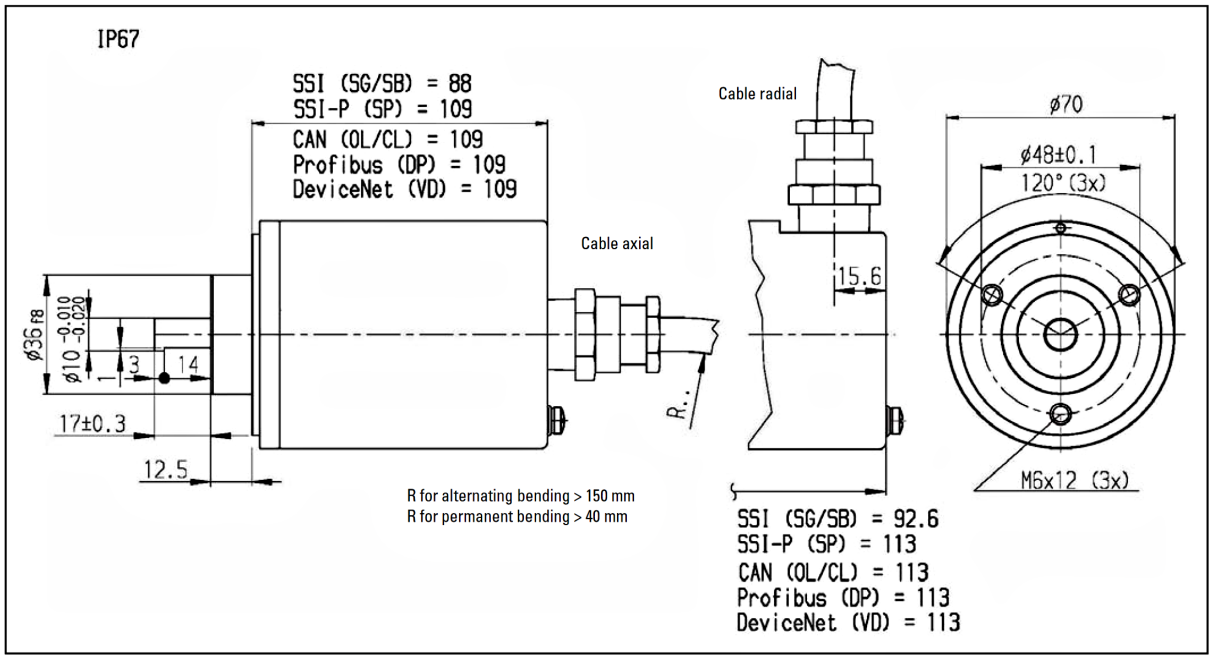
DIMENSIONS mm

WITH IP64



WITH IP67



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