

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



EN 61326

Ex D II C T6/T4

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS:

Code: Absolute, Optical

Absolute Accuracy: $\pm 35''$ (BiSS/SSI)

Linearity:

BiSS/SSI: $\pm \frac{1}{2}$ LSB (± 1 LSB for resolution > 13 Bit)

CANopen: $\pm \frac{1}{2}$ LSB (± 1 LSB for resolution 13, 14, 25, 26 Bit)

Profibus: $\pm \frac{1}{2}$ LSB (± 1 LSB for resolution 13, 14, 25, 26 Bit)

DeviceNet: $\pm \frac{1}{2}$ 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 Rx/D
Brown 0.14 mm	5	RS232 Tx/D
Green	10	Clock
Yellow	9	Clock
Gey	8	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	Clock
Yellow	9	Clock
Gey	8	Data
Pink	7	Data
Blue	3	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 /Clock and Data /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:

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

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

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

SERIES AX70/AX71

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:

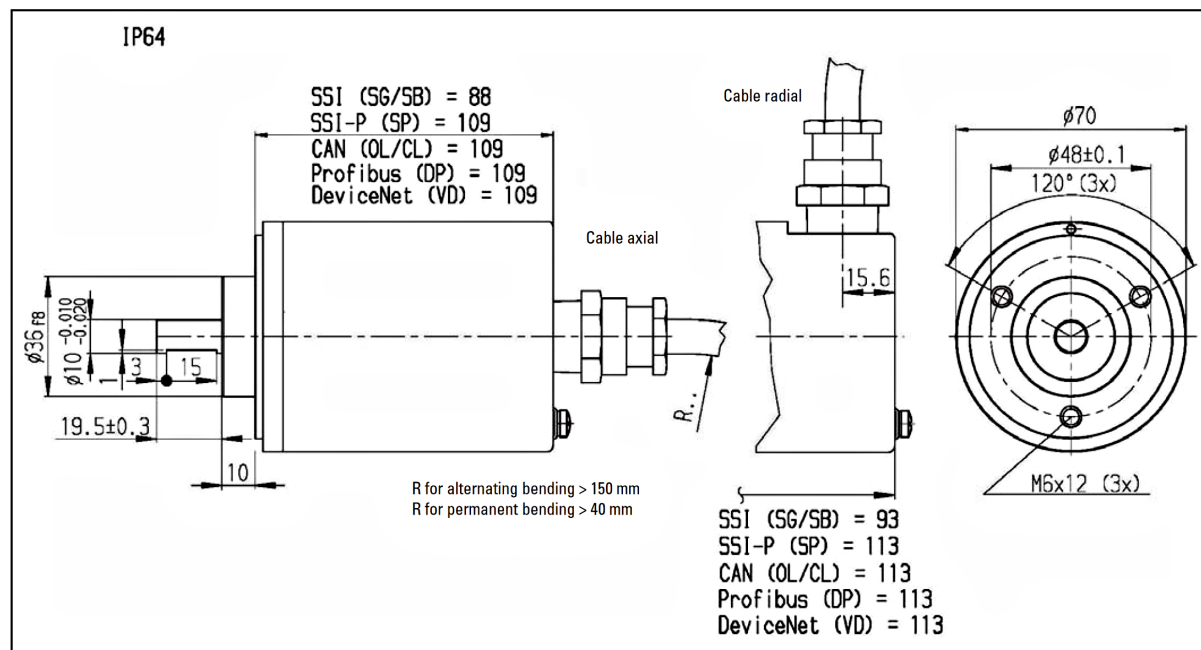
Code 1: Model	Code 2: Resolution	Code 3: Voltage	Code 4: Mounting	Code 5: Protection Class	Code 6: Shaft Size	Code 7: Interface	Code 8: Connection	Code 9: Cable Length
Ordering Information								
AX70								
AX70 Heavy Duty Absolute encoder, Aluminum Housing AX71 Stainless Steel Housing	0010 10 ST 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

WITH IP64



WITH IP67

