Absolute encoders - SSI

Through hollow shaft ø10 to ø14 mm

Optical single- or multiturn encoders max. 14 bit ST / 24 bit MT

ATD 2S A 4 Y 7

ATD 2S A 4 Y 7 with through hollow shaft

Features

- **Encoder single- or multiturn / SSI**
- **Optical sensing singleturn, magnetical sensing multiturn**
- **Resolution: max. singleturn 14 bit, multiturn 24 bit**
- **Through hollow shaft ø10...14 mm**
- **Self-diagnostic**
- **Electronic zero point adjustment**
- **Flange connector radial**

Optional

- **HTL or TTL incremental signals**
- **Sine signals**

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤70 mA (24 VDC)
Interfaces	SSI, SSI + incremental
Function	Singleturn, Multiturn
Steps per revolution	≤16384 / 14 bit
Number of revolutions	≤16777216 / 24 bit
Sensing method	Optical (singleturn) Magnetical (multiturn)
Code	Gray or binary
Code sequence	CW: ascending values with clockwise sense of rotation; looking at mounting surface CW/CCW be selectable by input V/R
Inputs	SSI clock Zero setting input
Output stages	SSI data: linedriver RS485 Diagnostic output: error
Incremental output	2048 pulses A90°B + inv. HTL (optional) 2048 pulses A90°B + inv. TTL (optional) 2048 sinewaves A, B, sine 1 Vpp (optional)
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-3

Technical data - mechanical design

Size (flange)	ø58 mm
Shaft type	ø10 mm (through hollow shaft) ø12 mm (through hollow shaft) ø14 mm (through hollow shaft)
Protection DIN EN 60529	IP 65
Operating speed	≤8000 rpm (mechanical) ≤8000 rpm (electric)
Starting torque	≤0.02 Nm (+20 °C)
Materials	Housing: aluminium Shaft: stainless steel
Operating temperature	-20...+85 °C
Relative humidity	90 % non-condensing
Resistance	DIN EN 60068-2-6 Vibration 10 g, 55-2000 Hz DIN EN 60068-2-27 Shock 30 g, 11 ms
Weight approx.	325 g
Connection	Connector M23 type 2, 12-pin Connector M23 type 2, 17-pin
Mounting kit	002

ATD 2S A 4 Y 7

Part number

ATD 2S A 4 Y 7		SS			S		IP65	002

Mounting kit
002 Mounting kit 002

Protection
IP65 IP 65

Through hollow shaft
10 ø10 mm
12 ø12 mm
14 ø14 mm

Operating temperature
S -20...+85 °C

Connection
D2SR12 Flange connector type 2, pin contacts, radial, 12-pin
D2SR17 Flange connector type 2, pin contacts, radial, 17-pin (SSI + incremental signals resp. SSI + sine signals)

Output signals
GR Gray code
BI Binary code

Interface
SS Serial SSI

Resolution
9 9 bit singleturn
10 10 bit singleturn
11 11 bit singleturn
12 12 bit singleturn
13 13 bit singleturn
14 14 bit singleturn
9/12 9/12 bit single-/multiturn
10/12 10/12 bit single-/multiturn
11/12 11/12 bit single-/multiturn
12/12 12/12 bit single-/multiturn
13/12 13/12 bit single-/multiturn

Other resolutions on request.

Accessories

Connectors and cables

11011122	Connector S2BG12, 1 m cable (ATD)
11071747	Connector S2BG12, 2 m cable (ATD)
11071749	Connector S2BG12, 5 m cable (ATD)
11070261	Connector S2BG17, 1 m cable (ATD)
11070262	Connector S2BG17, 2 m cable (ATD)
11070263	Connector S2BG17, 5 m cable (ATD)

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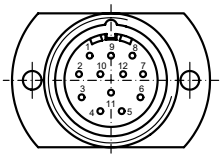
Terminal significance	
UB	Encoder supply voltage.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential-linedriver.
Clock+	Positive SSI clock input. Clock+ together with clock- forms a current loop. A current of approx. 7 mA towards clock+ input means logic 1 in positive logic.
Clock-	Negative SSI clock input. Clock- together with clock+ forms a current loop. A current of approx. 7 mA towards clock- input means logic 0 in positive logic.
Reset	Reset input for setting zero position value at any desired point within the entire resolution. The resetting process is triggered by apply of UB.
V/$\overline{R}$	V/$\overline{R}$ counting direction input. This input is standard on High. V/$\overline{R}$ means increasing values with clockwise shaft rotation when looking at the mounting side (CW). V/$\overline{R}$-Low means decreasing values with clockwise shaft rotation when looking at the mounting side (CCW).
Error	Diagnostic output (Open Collector with internal 10 kΩ pullup-resistor). The output is high-active, that means if no fault submitted, the output is to GND interconnected.

Terminal assignment

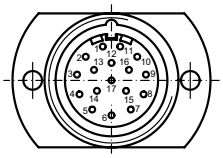
ATD 2S A 4 Y 7

Connector	Assignment
Pin 1	clock-
Pin 2	clock+
Pin 3	data+
Pin 4	data-
Pin 5	–
Pin 6	–
Pin 7	reset
Pin 8	V/$\overline{R}$
Pin 9	– (do not use)
Pin 10	error
Pin 11	UB
Pin 12	GND



ATD 2S A 4 Y 7 with incremental output signals

Connector	Assignment
Pin 1	clock-
Pin 2	clock+
Pin 3	data+
Pin 4	data-
Pin 5	–
Pin 6	–
Pin 7	reset
Pin 8	V/$\overline{R}$
Pin 9	– (do not use)
Pin 10	error
Pin 11	UB
Pin 12	GND
Pin 13	–
Pin 14	track A+
Pin 15	track A-
Pin 16	track B+
Pin 17	track B-



ATD 2S A 4 Y 7

Trigger level

SSI	Circuit
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485

Control input	Input circuit
Input level High	≥0,7 UB
Input level Low	≤0,3 UB
Input resistance	10 kΩ

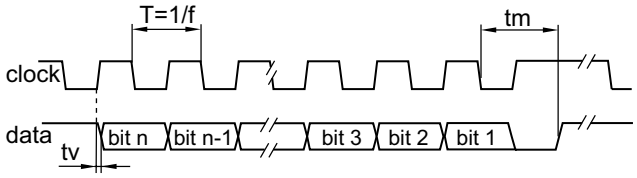
Diagnostic outputs	Output circuit
Output level	Open Collector with internal 10 kΩ PullUp-resistance

Incremental outputs	**HTL - Line Driver** short-circuit proof
Output level High	≥UB -3 V
Output level Low	≤0,5 V
Load	≤30 mA

Incremental outputs	**TTL - Line Driver** short-circuit proof
Output level High	≥2,4 V
Output level Low	≤0,5 V
Load	≤30 mA

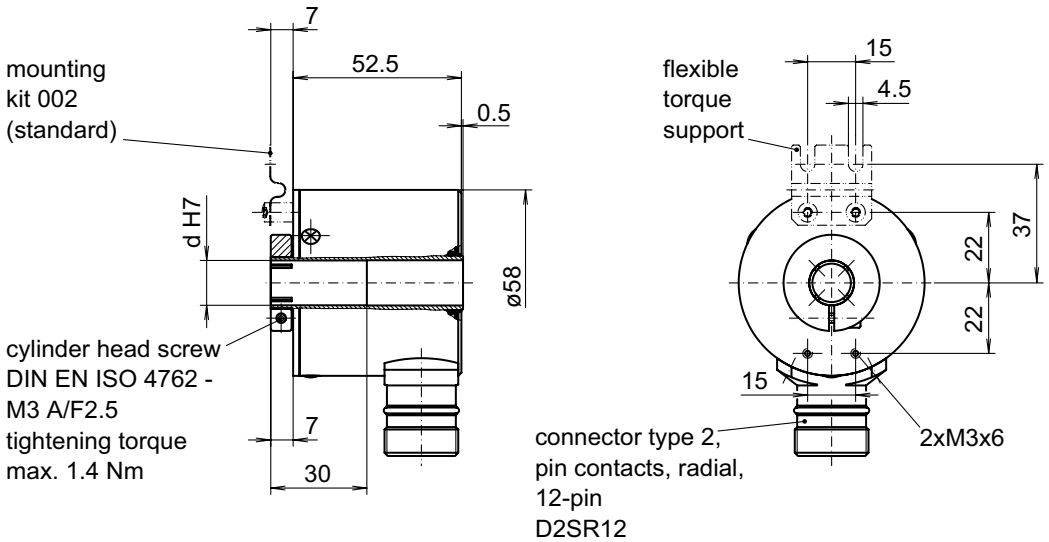
Outputs	Sine / Cosine
Output amplitude	1 V_{PP} at Z_0 = 120 Ω

Data transfer



Clock frequency f	80...1000 kHz
Duty cycle of T	40...60 %
Delay time tv	150 ns
Monoflop time tm	20 µs + T/2
Clock interval tp	26 µs

Dimensions



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