Absolute encoders - SSI

Hollow shaft ø20 to ø27 mm

Optical single- or multiturn encoders max. 15 bit ST / 24 bit MT

ATD 4S A 4 Y10

ATD 4S A 4 Y10 with hollow shaft

Features

- **Encoder single- or multiturn / SSI**
- **Optical sensing**
- **Resolution: max. singleturn 15 bit, multiturn 24 bit**
- **Hollow shaft ø20-27 mm**
- **Self-diagnostic**
- **Electronic zero point adjustment**
- **Flange socket radial**

Optional

- **Incremental signals**

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤70 mA (24 VDC)
Interface	SSI
Function	Singleturn Multiturn
Steps per turn	≤32768 / 15 bit
Number of turns	≤16777216 / 24 bit
Incremental output	4096 pulses A, B + inv. (optional) 4096 pulses A, B, sine 1 Vpp (optional)
Offset sine/cosine amplitude	≤1 Vss at Z0 (120 Ohms)
Overlaying constant share	≤2.5 V
Sensing method	Optical
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 Reset input
Output circuit	SSI data: linedriver RS485 Diagnostic output: error
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 55011

Technical data - mechanical design

Dimensions (flange)	ø80 mm
Shaft	ø20 mm hollow shaft ø22 mm hollow shaft ø25 mm hollow shaft ø27 mm hollow shaft
Protection DIN EN 60529	IP 65
Operating speed	≤5000 rpm (mechanical) ≤7000 rpm (electric)
Starting torque	≤0.02 Nm
Materials	Housing: aluminium, black, powder-coated 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.	700 g
Connection	Connector M23 type 2, 12-pin Connector M23 type 2, 17-pin
Motor shaft tolerance	0.25 mm axial 0.1 mm radial
Mounting kit variant	056

ATD 4S A 4 Y10

Part number

ATD 4S A 4 Y10		SS			S		IP65	056

Mounting kit
- 056 Mounting accessory kit 056

Protection
- IP65 IP 65

Hollow shaft
- 20 Hollow shaft ø20 mm clamping ring
- 22 Hollow shaft ø22 mm clamping ring
- 25 Hollow shaft ø25 mm clamping ring
- 27 Hollow shaft ø27 mm clamping ring

Operating temperature
- S -20...+85 °C

Connection
- D2SR12 Flange socket type 2, pin contacts, radial, 12-pin
- D2SR17 Flange socket type 2, pin contacts, radial, 17-pin (SSI + incremental 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
- 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

Accessories

Connectors and cables

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

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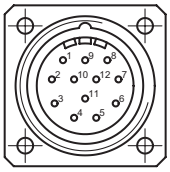
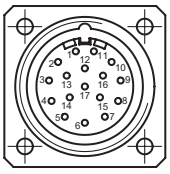
Terminal significance	
UB	Encoder supply voltage.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential-linedriver.
Clock+	Positive SSI clock input. Clock+ together with clock- forms a current loop. 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 4S A 4 Y10	
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 4S A 4 Y10 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 4S A 4 Y10

Trigger level

SSI	Circuit
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485

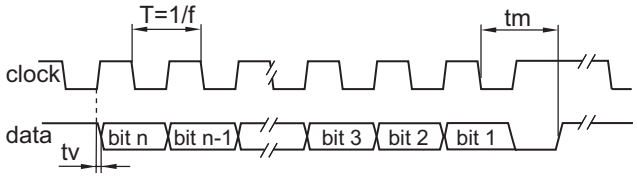
Control input	Input circuit
Input level High	≥0,7 UB
Input level Low	≤0,3 UB
Input resistance	10 kΩ

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

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

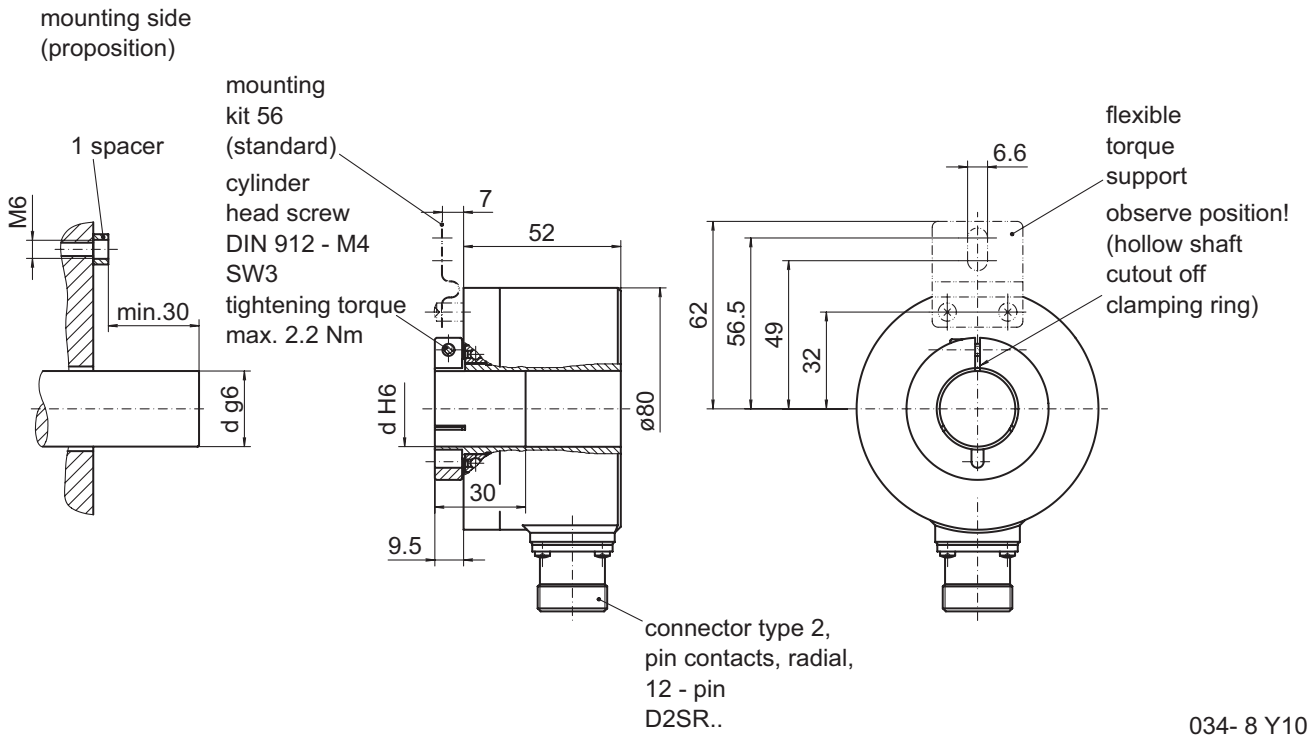
Outputs	Sine / Cosine
Output level	1 V_{PP} at Z_0 = 120 Ω

Data transfer



Clock frequency f	80...1000 kHz
Scan ratio of T	40...60 %
Time lag tv	150 ns
Monoflop time tm	20 µs + T/2
Clock interval tp	26 µs

Dimensions



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