Baumer
Passion for Sensors

Absolute encoders

ATD 2S A 4 Y 7

Through hollow shaft ø10 to ø14 mm

Optical multiturn encoders max. 24 bit MT

Overview

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

Technical data

Technical data - electrical ratings	
Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤70 mA (24 VDC)
Interface	SSI SSI + incremental
Function	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)

Technical data - electrical ratings	
Interference immunity	EN 61000-6-2
Emitted interference	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 EN 60529	IP 65
Operating speed	≤8000 rpm (mechanical) ≤8000 rpm (electric)
Starting torque	≤0.02 Nm (+20 °C)
Material	Housing: aluminium Shaft: stainless steel
Operating temperature	-20...+85 °C
Relative humidity	90 % non-condensing
Resistance	EN 60068-2-6 Vibration 10 g, 55-2000 Hz 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

Optional

- HTL or TTL incremental signals
- Sine signals

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Terminal assignment

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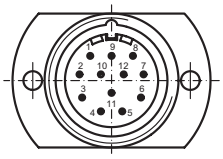
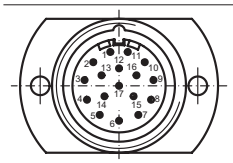
Connector	Assignment
Pin 1	clock-
Pin 2	clock+
Pin 3	data+
Pin 4	data-
Pin 5	–
Pin 6	–
Pin 7	reset
Pin 8	V/$\overline{R}$
Pin 9	– (do not use)
Pin 10	error
Pin 11	UB
Pin 12	GND



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-



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.

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

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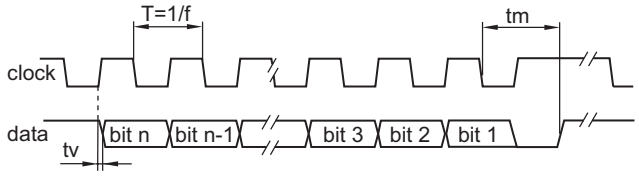
Data transfer



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

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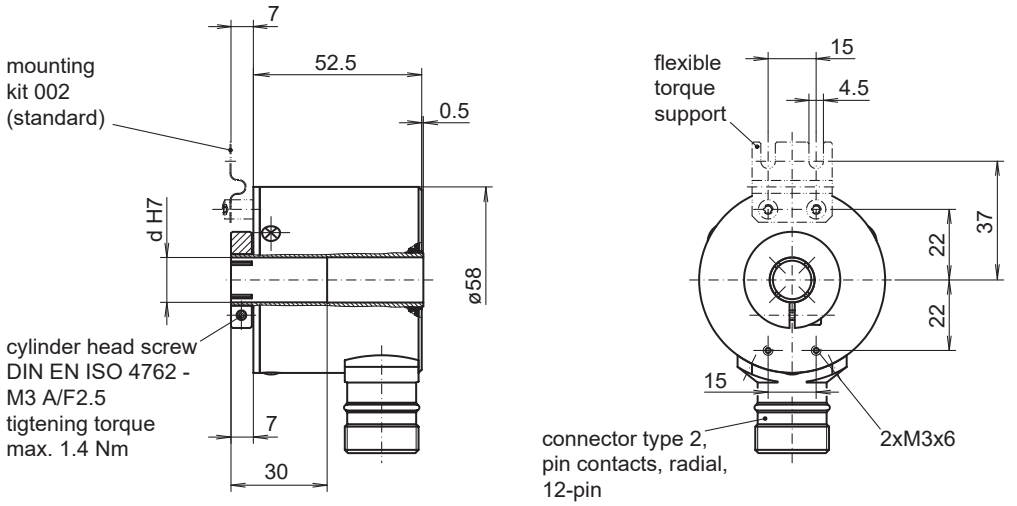
Dimensions



028- 5 Y 7

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Ordering reference

	ATD 2S A 4 Y 7	####	SS	####	######	S	##	IP65	002
Product									
	ATD 2S A 4 Y 7								
Resolution									
9/12 bit single-/multiturn		9/12							
10/12 bit single-/multiturn		10/12							
11/12 bit single-/multiturn		11/12							
12/12 bit single-/multiturn		12/12							
13/12 bit single-/multiturn		13/12							
Interface									
Serial SSI			SS						
Output signals									
Gray code				GR					
Binary code				BI					
Connection									
Flange connector type 2, pin contacts, radial, 12-pin					D2SR12				
Flange connector type 2, pin contacts, radial, 17-pin (SSI + incremental signals resp. SSI + sine signals)					D2SR17				
Operating temperature									
-20...+85 °C						S			
Through hollow shaft									
ø10 mm							10		
ø12 mm							12		
ø14 mm							14		
Protection									
IP 65								IP65	
Mounting kit									
Mounting kit 002									002

Other resolutions on request.