

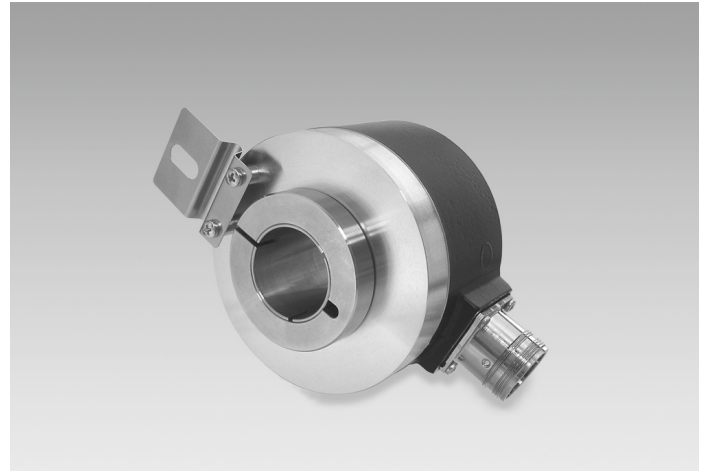
ATD 4S A 4 Y10

Through hollow shaft $\varnothing 20$ to $\varnothing 27$ mm

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

Overview

- Encoder single- or multiturn / SSI
- Optical sensing singleturn, magnetical sensing multiturn
- Resolution: max. singleturn 15 bit, multiturn 24 bit
- Through hollow shaft $\varnothing 20 \dots 27$ 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	Singleturn Multiturn
Steps per revolution	≤ 32768 / 15 bit
Number of revolutions	≤ 16777216 / 24 bit
Sensing method	Optical (singleturn) Magetical (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	4096 pulses A90°B + inv. HTL (optional) 4096 pulses A90°B + inv. TTL (optional) 4096 sinewaves A, B, sine 1 Vpp (optional)
Interference immunity	EN 61000-6-2

Technical data - electrical ratings

Emitted interference	EN 61000-6-3
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Technical data - mechanical design

Size (flange)	$\varnothing 80$ mm
Shaft type	$\varnothing 20$ mm (through hollow shaft) $\varnothing 22$ mm (through hollow shaft) $\varnothing 25$ mm (through hollow shaft) $\varnothing 27$ mm (through hollow shaft)
Protection EN 60529	IP 65
Operating speed	≤ 5000 rpm (mechanical) ≤ 7000 rpm (electric)
Starting torque	≤ 0.03 Nm (+20 °C)
Material	Housing: aluminium, black, powder-coated 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.	700 g
Connection	Connector M23 type 2, 12-pin Connector M23 type 2, 17-pin
Mounting kit	056

Optional

- HTL or TTL incremental signals
- Sine signals

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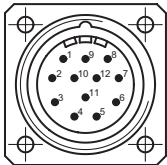
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Terminal assignment

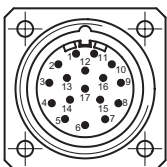
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Connector	Assignment
Pin 1	clock-
Pin 2	clock+
Pin 3	data+
Pin 4	data-
Pin 5	–
Pin 6	–
Pin 7	reset
Pin 8	V/R
Pin 9	– (do not use)
Pin 10	error
Pin 11	UB
Pin 12	GND



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/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/R	V/R counting direction input. This input is standard on High. V/R means increasing values with clockwise shaft rotation when looking at the mounting side (CW). V/R-Low means decreasing values with clockwise shaft rotation when looking at the mounting side (CCW).
Error	Diagnostic output (Open Collector with internal 10 k Ω pullup-resistor). The output is high-active, that means if no fault submitted, the output is to GND inter-connected.

Trigger level

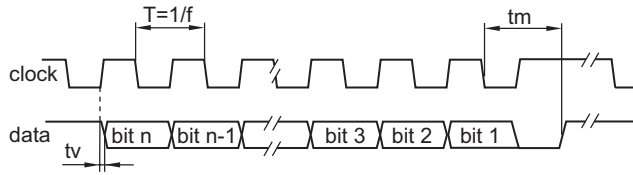
SSI	Circuit
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485
Control input	Input circuit
Input level High	$\geq 0,7$ UB
Input level Low	$\leq 0,3$ UB
Input resistance	10 k Ω
Diagnostic outputs	Output circuit
Output level	Open Collector with internal 10 k Ω PullUp-resistance
Incremental outputs	HTL - Line Driver short-circuit proof
Output level High	$\geq UB - 3$ V
Output level Low	$\leq 0,5$ V
Load	≤ 30 mA
Incremental outputs	TTL - Line Driver short-circuit proof
Output level High	$\geq 2,4$ V
Output level Low	$\leq 0,5$ V
Load	≤ 30 mA
Outputs	Sine / Cosine
Output amplitude	1 V _{PP} at Z ₀ = 120 Ω

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Data transfer



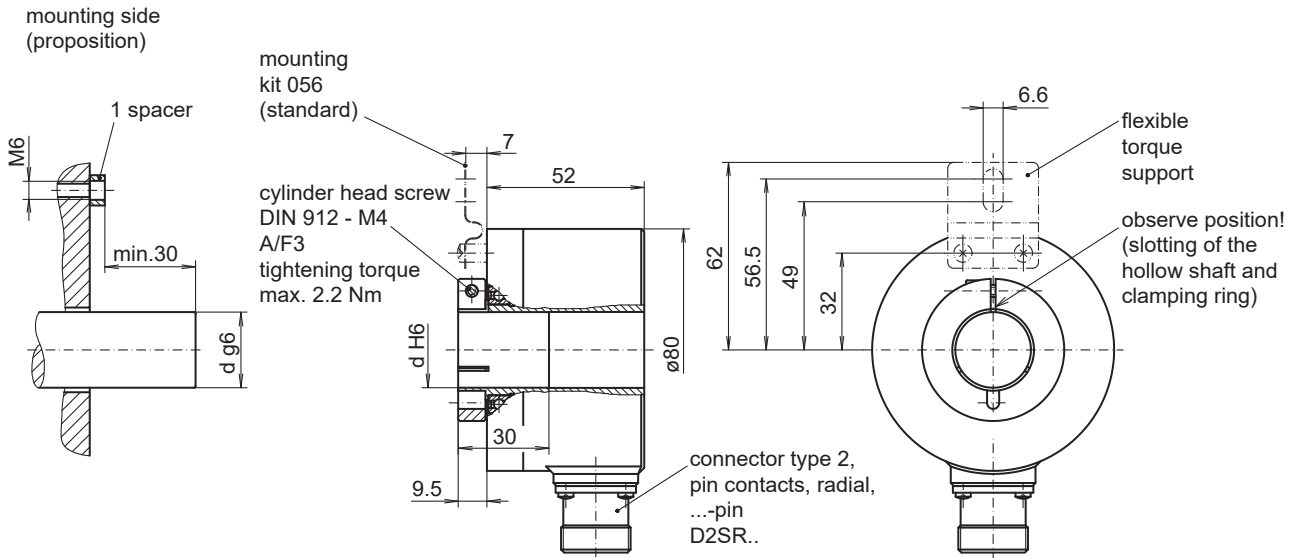
Clock frequency f	80...1000 kHz
Duty cycle of T	40...60 %
Delay time t_v	150 ns
Monoflop time t_m	$20 \mu s + T/2$
Clock interval t_p	26 μs

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Dimensions



ATD 4S A 4 Y10

Through hollow shaft ø20 to ø27 mm

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Ordering reference

		ATD 4S A 4 Y10	####	SS	####	#####	S	##	IP65	056
Product		ATD 4S A 4 Y10								
Resolution										
	10 bit singleturn		10							
	11 bit singleturn		11							
	12 bit singleturn		12							
	13 bit singleturn		13							
	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										
	ø20 mm							20		
	ø22 mm							22		
	ø25 mm							25		
	ø27 mm							27		
Protection										
	IP 65								IP65	
Mounting kit										
	Mounting kit 056									056

Other resolutions on request.