

# Absolute encoders - SSI

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

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

## ATD 4S A 4 Y10



ATD 4S A 4 Y10 with through hollow shaft

### Features

- Encoder single- or multiturn / SSI
- Optical sensing
- Resolution: max. singleturn 15 bit, multiturn 24 bit
- Through hollow shaft  $\varnothing 20 \dots 27$  mm
- Self-diagnostic
- Electronic zero point adjustment
- Flange socket 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)
Interface	SSI
Function	Singleturn Multiturn
Steps per turn	$\leq 32768$ / 15 bit
Number of turns	$\leq 16777216$ / 24 bit
Incremental output	4096 pulses A90°B + inv. HTL (optional) 4096 pulses A90°B + inv. TTL (optional) 4096 sine periods A, B, sine 1 Vpp (optional)
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 Zero setting input
Output stages	SSI data: linedriver RS485 Diagnostic output: error
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-3

### 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 DIN EN 60529	IP 65
Operating speed	$\leq 5000$ rpm (mechanical) $\leq 7000$ rpm (electric)
Starting torque	$\leq 0.02$ Nm (+20 °C)
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	056

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## Part number

ATD 4S A 4 Y10 

	SS			S		IP65	056
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Mounting kit  
056 Mounting kit 056

Protection  
IP65 IP 65

Through hollow shaft  
20  $\varnothing 20$  mm, clamping ring  
22  $\varnothing 22$  mm, clamping ring  
25  $\varnothing 25$  mm, clamping ring  
27  $\varnothing 27$  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 resp. SSI + sine signals)

Output signals  
GR Gray code  
BI Binary code

Interface  
SS Serial SSI

Resolution  
10 10 bit singleturn  
11 11 bit singleturn  
12 12 bit singleturn  
13 13 bit singleturn  
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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## ATD 4S A 4 Y10

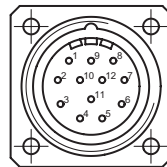
### Terminal significance

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

### Terminal assignment

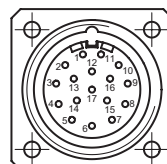
#### ATD 4S A 4 Y10

Connector	Assignment
Pin 1	clock-
Pin 2	clock+
Pin 3	data+
Pin 4	data-
Pin 5	–
Pin 6	–
Pin 7	reset
Pin 8	$V/\bar{R}$
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	$V/\bar{R}$
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-



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## Trigger level

SSI	Circuit
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485

## Control input

Control input	Input circuit
Input level High	$\geq 0,7$ UB
Input level Low	$\leq 0,3$ UB
Input resistance	10 k $\Omega$

## Diagnostic outputs

Diagnostic outputs	Output circuit
Output level	Open Collector with internal 10 k $\Omega$ 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	$\leq 30$ mA

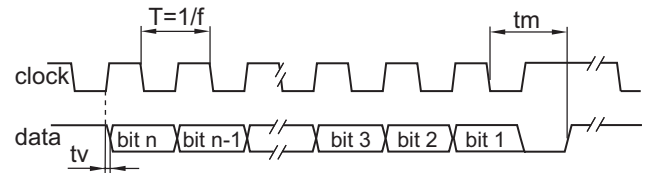
## Incremental outputs TTL - Line Driver short-circuit proof

Output level High	$\geq 2,4$ V
Output level Low	$\leq 0,5$ V
Load	$\leq 30$ mA

## Outputs

Output amplitude	1 V <sub>PP</sub> at Z <sub>0</sub> = 120 $\Omega$
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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 $\mu$ s + T/2
Clock interval tp	26 $\mu$ s

## Dimensions

