

# Absolute encoders - SSI

Through hollow shaft  $\varnothing 10$  to  $\varnothing 14$  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

### Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	$\leq 70$ mA (24 VDC)
Interfaces	SSI, SSI + incremental
Function	Singleturn, Multiturn
Steps per revolution	$\leq 16384$ / 14 bit
Number of revolutions	$\leq 16777216$ / 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

### Features

- Encoder single- or multiturn / SSI
- Optical sensing singleturn, magnetical sensing multiturn
- Resolution: max. singleturn 14 bit, multiturn 24 bit
- Through hollow shaft  $\varnothing 10...14$  mm
- Self-diagnostic
- Electronic zero point adjustment
- Flange connector radial

### Optional

- HTL or TTL incremental signals
- Sine signals

### Technical data - mechanical design

Size (flange)	$\varnothing 58$ mm
Shaft type	$\varnothing 10$ mm (through hollow shaft) $\varnothing 12$ mm (through hollow shaft) $\varnothing 14$ mm (through hollow shaft)
Protection DIN EN 60529	IP 65
Operating speed	$\leq 8000$ rpm (mechanical) $\leq 8000$ rpm (electric)
Starting torque	$\leq 0.02$ 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

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**ATD 2S A 4 Y 7**

#### Part number

ATD 2S A 4 Y 7 

	SS			S		IP65	002
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Mounting kit  
002 Mounting kit 002

Protection  
IP65 IP 65

Through hollow shaft  
10  $\varnothing 10$  mm  
12  $\varnothing 12$  mm  
14  $\varnothing 14$  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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## ATD 2S A 4 Y 7

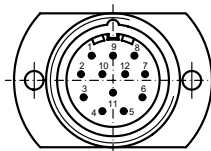
### Terminal significance

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

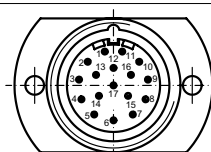
#### ATD 2S A 4 Y 7

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

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

## Diagnostic outputs Output circuit

Output level	Open Collector with internal 10 k $\Omega$ PullUp-resistance
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## 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

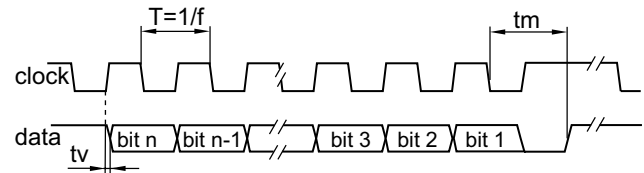
## Incremental outputs TTL - Line Driver short-circuit proof

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

## Outputs Sine / Cosine

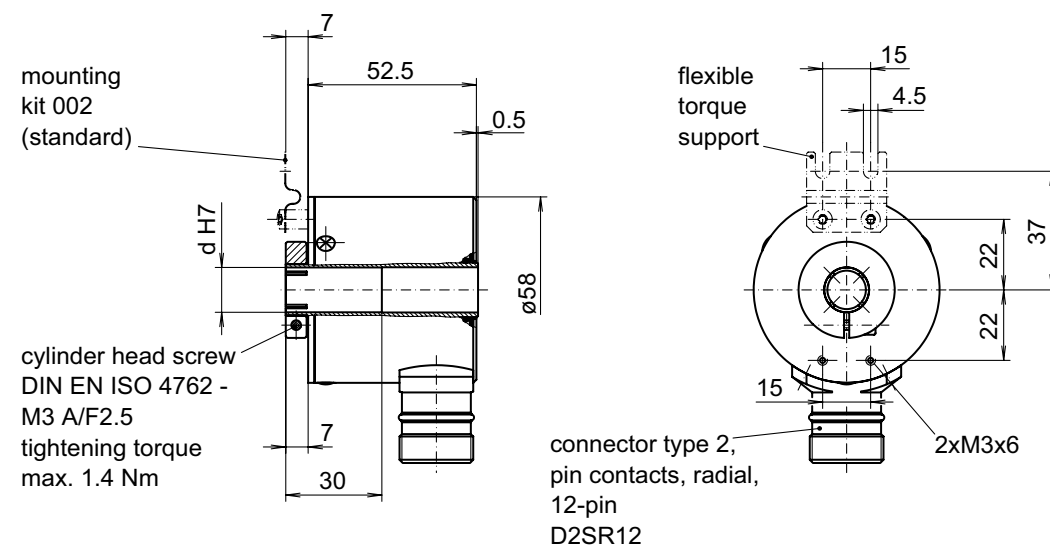
Output amplitude	1 V <sub>PP</sub> at Z <sub>0</sub> = 120 $\Omega$
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## Data transfer



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



028- 5 Y 7