Absolute encoders - analog

Through hollow shaft ø10 to ø14 mm

Optical single- or multiturn encoders with analog output

ATD 2A A 4 Y 7

ATD 2A A 4 Y 7 with through hollow shaft

Features

- **Encoder multiturn / analog output**
- **Voltage output or current output**
- **Control inputs reset and rotating direction**
- **Optical sensing method**
- **Self-diagnostic**
- **Total resolution: 16 bit**
- **Factory-set adjustable angle (0°-360° resp. up to 1024 x 360°)**
- **Flange connector radial**

Technical data - electrical ratings

Voltage supply	+UB= 12...30 VDC (IS-/IE-/US-/UT-version) -UB= -12...-26 VDC / +UB 12...30 VDC (UE-/UR-version)
Reverse polarity protection	Yes
Consumption w/o load	≤70 mA (24 VDC)
Interface analog	IS (current output, 4...20 mA) IE (current output, 0...20 mA) US (voltage output, 0...10 VDC) UE (voltage output, -10...+10 VDC) UT (voltage output, 0...5 VDC) UR (voltage output, -5...5 VDC)
Function	Singleturn, Multiturn
Measuring range	90°, 180°, 360° 2, 4, 8, 16...1024 revolutions
Load resistor	≥1 kΩ (recommended 10 kΩ) / voltage output ≤500 Ω (recommended 470 Ω) / current output
Resolution	16 bit
Steps per turn	16384 / 14 bit
Number of turns	1024 / 10 bit
Sensing method	Optical
Updating values	≤130 µs
Code sequence	CW: ascending values with clockwise sense of rotation; looking at mounting surface
Output stages	Voltage output (short-circuit proof) Current output (short-circuit proof)
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN 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 DIN EN 60529	IP 65
Operating speed	≤8000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤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
Motor shaft tolerance	0.25 mm axial 0.1 mm radial
Mounting kit	002

ATD 2A A 4 Y 7

Part number

ATD 2A A 4 Y 7			D2SR12	S		IP65	002

Mounting kit
002 Mounting kit 002

Protection
IP65 IP 65

Through hollow shaft
10 ø10 mm
12 ø12 mm
14 ø14 mm

Operating temperature
S -20...+85 °C

Connection
D2SR12 Flange connector type 2, pin contacts, radial, 12-pin

Interface
IS Current output, standard, 4...20 mA, Vin = 12...30 VDC
IE Current output, extended, 0...20 mA, Vin = 12...30 VDC
US Voltage output, standard, 0...+10 VDC, Vin = 12...30 VDC
UE Voltage output, extended, -10...+10 VDC, Vin = -12...-26 VDC / 12...30 VDC
UT Voltage output, 0...+5 VDC, Vin = 12...30 VDC
UR Voltage output, reduced, -5...+5 VDC, Vin = -12...-26 VDC / 12...30 VDC

Resolution
360A 360° mech. angle of rotation, alternating (singleturn)
180A 180° mech. angle of rotation, alternating (singleturn)
180H 180° mech. angle of rotation, High (singleturn)
180L 180° mech. angle of rotation, Low (Singleturn)
2U 2 x 360° mech. angle of rotation (multiturn)
4U 4 x 360° mech. angle of rotation (multiturn)
8U 8 x 360° mech. angle of rotation (multiturn)
16U 16 x 360° mech. angle of rotation (multiturn)

Other adjustment on request.

Accessories

Connectors and cables

11070180	Connector S2BG12, 10 m cable (ATD analog)

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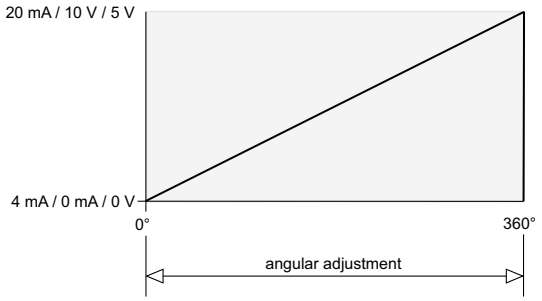
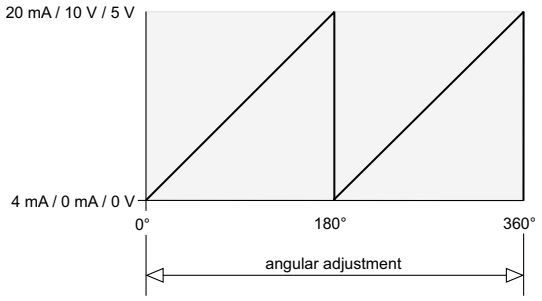
Output signals

Unipolar Output
(IS-/IE-/US-/UT-version)

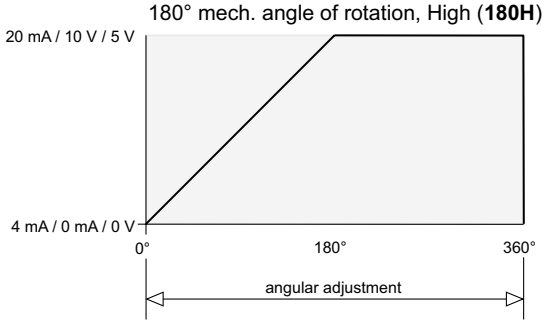
360° mech. angle of rotation, alternating (**360A**)



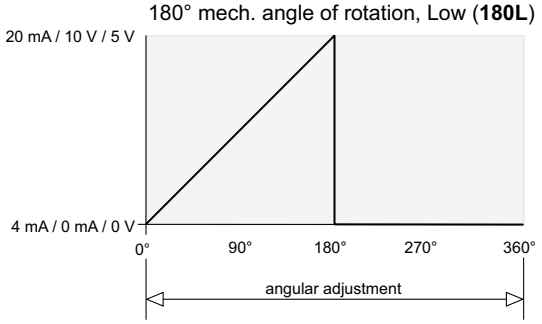
180° mech. angle of rotation, alternating (**180A**)



180° mech. angle of rotation, High (**180H**)

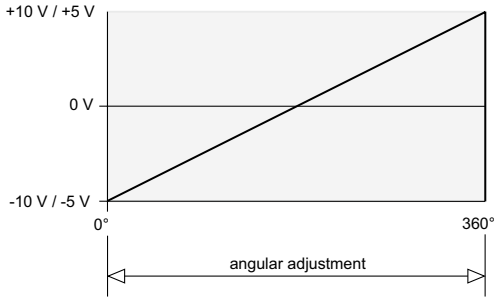


180° mech. angle of rotation, Low (**180L**)

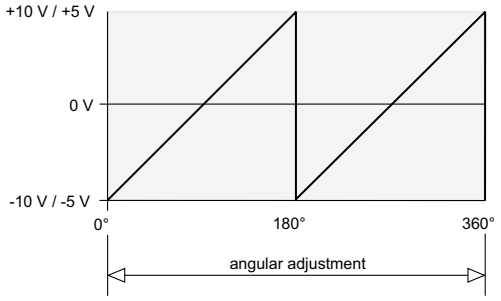


Bipolar Output
(UE-/UR-version)

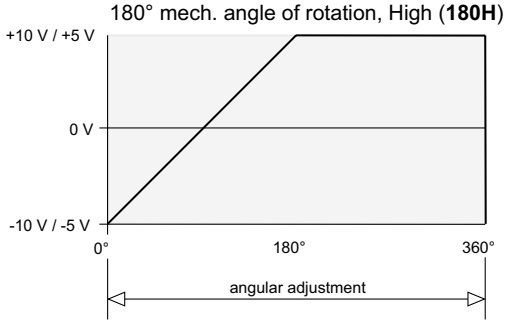
360° mech. angle of rotation, alternating (**360A**)



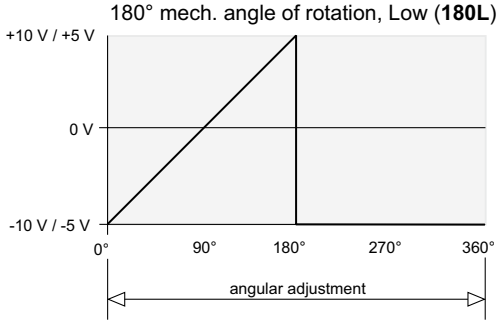
180° mech. angle of rotation, alternating (**180A**)



180° mech. angle of rotation, High (**180H**)



180° mech. angle of rotation, Low (**180L**)

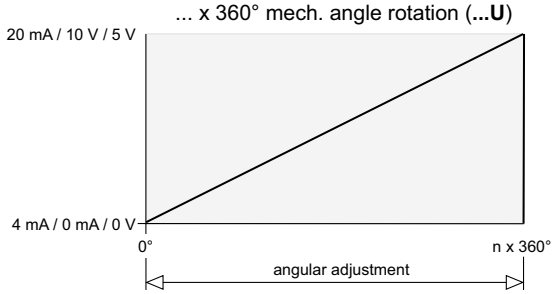


ATD 2A A 4 Y 7

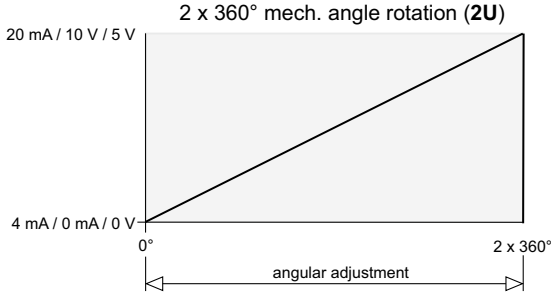
Output signals

Unipolar Output
(IS-/IE-/US-/UT-version)

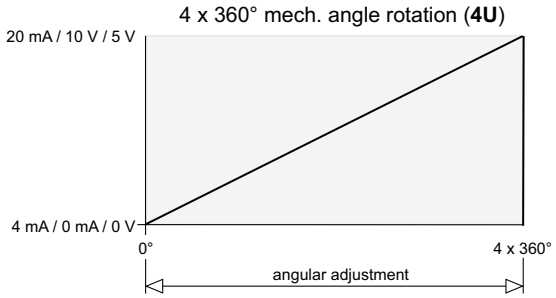
... x 360° mech. angle rotation (**...U**)



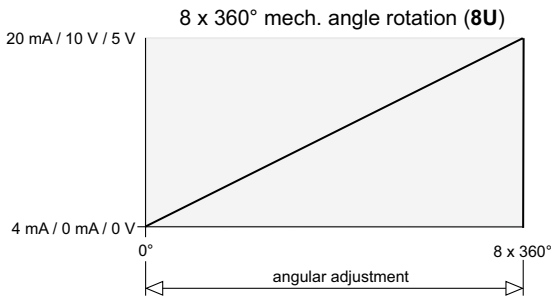
2 x 360° mech. angle rotation (**2U**)



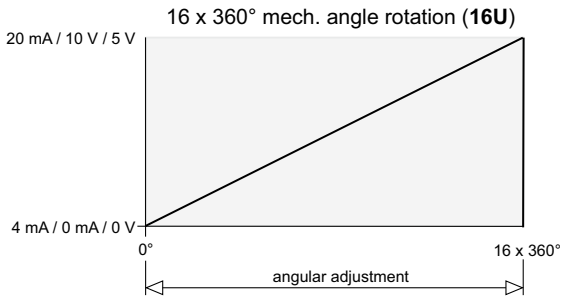
4 x 360° mech. angle rotation (**4U**)



8 x 360° mech. angle rotation (**8U**)

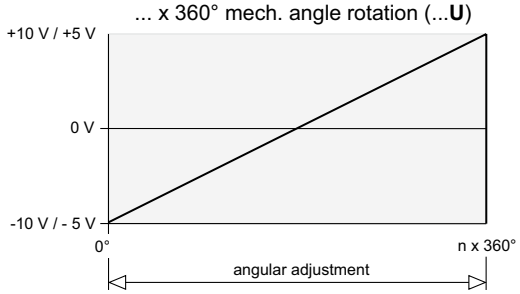


16 x 360° mech. angle rotation (**16U**)

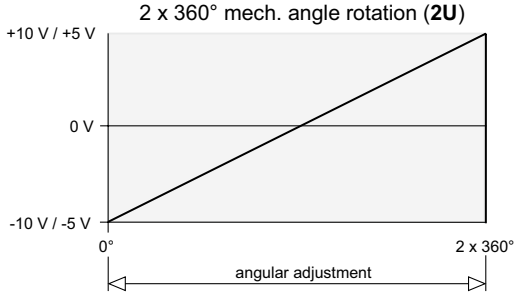


Bipolar Output
(UE-/UR-version)

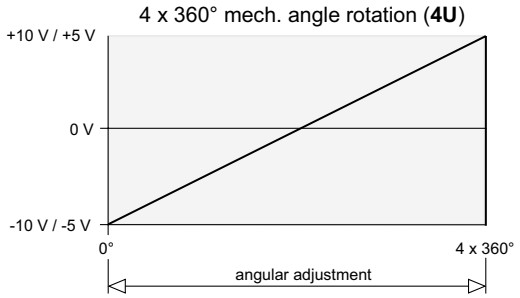
... x 360° mech. angle rotation (...**U**)



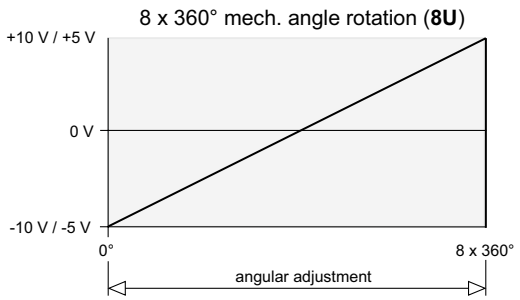
2 x 360° mech. angle rotation (**2U**)



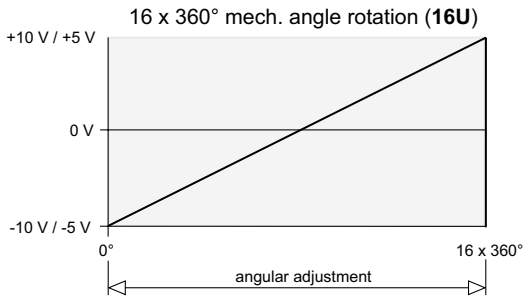
4 x 360° mech. angle rotation (**4U**)



8 x 360° mech. angle rotation (**8U**)



16 x 360° mech. angle rotation (**16U**)



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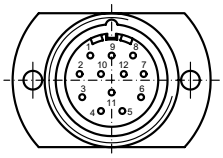
Trigger level	
Control input	**Input circuit**
Input level High	≥0,7 UB
Input level Low	≤0,3 UB
Input resistance	10 kΩ

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

Terminal significance	
+UB	Encoder supply voltage.
−UB	Negative encoder supply voltage −12 to −26 VDC (only at UE-/UR-version).
GND	Encoder ground connection relating to UB.
U_{OUT}	Voltage output increasing at clockwise rotation when looking at the mounting side.
I_{OUT}	Current output increasing at clockwise rotation when looking at the mounting side.
GND_{OUT}	Reference voltage for analogue output.
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. V/$\overline{R}$-Low means decreasing values with clockwise shaft rotation when looking at the mounting side.
$\overline{Error}$	Diagnostic output (Open Collector with internal 10 kΩ pullup-resistor). The output is low-active, that means if no fault submitted, the output is +UB.

Terminal assignment	
ATD 2A A 4 Y 7	
Connector	Assignment
Pin 1	–
Pin 2	–
Pin 3	–
Pin 4	GND_{OUT}
Pin 5	U_{OUT} resp. I_{OUT}
Pin 6	–
Pin 7	reset
Pin 8	V/$\overline{R}$
Pin 9	$\overline{error}$
Pin 10	GND
Pin 11	– / −UB (only at UE-/UR-version)
Pin 12	+UB



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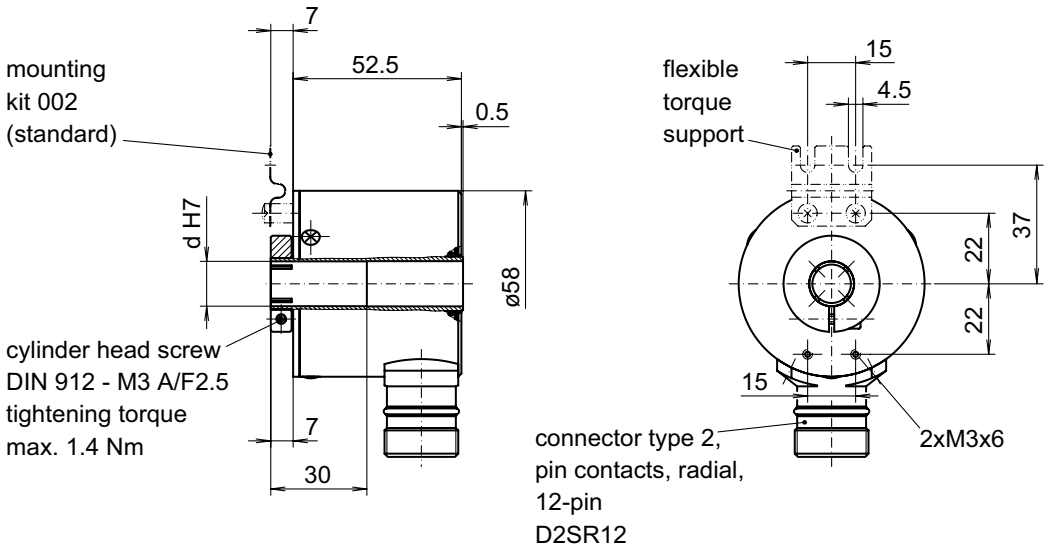
Dimensions



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