

TECHNICAL DATASHEET

Absolute Motor Feedback Encoder AD37 e-Series for Single Cable Solution - Functional Safety



- Singleturn and Multiturn Encoder for high performance motion control
- Encoder for Functional Safety applications (SIL2 PLd, SIL3 PLe, category 3)
- Single Cable Solution with ACURO® link interface for 4 wire applications
- Most compact absolute multiturn encoder of its class (Mounting depth: 29 mm)
- Motor winding temperature sensor input
- Resolution: up to 20 Bit ST + 12 Bit MT
- Wide operating temperature range (-40°C ... +115°C)
- Up to 12,000 rpm continuous operation
- Encoder data stored in "Electronic Data Sheet (EDS)" inside encoder

ACURO®
drive



TECHNICAL DATA mechanical

Housing diameter	38.3 mm
Shaft	Shaft with integrated Double-Cardanic coupling hub
Mounting depth	29.0 mm
Mounting flange	Direct flange mount (fixing screws M3)
Protection class shaft input	IP40
Protection class housing	IP40 (in combination with mating connector and plug)
Max. shaft load incl. coupling axial / radial	25 N / 6.5 N
Misalignment of shaft coupling:	COUNTEX 12 compatible
- Axial misalignment K_a	+1 mm / -0,5 mm max.
- Radial misalignment K_r	$\pm 0,1$ mm max. ($K_r + K_w \leq 100\%$)
- Angular misalignment K_w	$0,45^\circ$ max. ($K_w + K_r \leq 100\%$)
Max. speed	$\leq 12,000$ rpm (see ambient temperature)
Starting torque typ.	≤ 1 Ncm
Moment of inertia	1.05×10^{-6} kgm ²
Max. angular acceleration	2.5×10^5 rad/sec ²
Vibration resistance (DIN EN 60068-2-6)	300 m/s ² (10 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	1,000 m/s ² (6 ms)
Material shaft	Stainless Steel
Material housing / cover	Aluminum / Plastic
Weight	approx. 70 g
Connection (with strain relief)	1) ECU interface axial 2) Temperature sensor interface axial

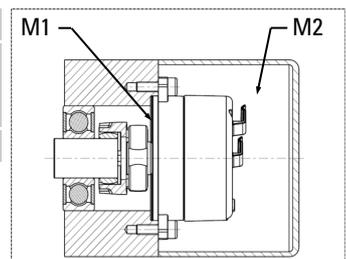
TECHNICAL DATA temperature characteristics

Operating temperature ¹	-40°C ... +115°C
Ambient temperature ²	-40°C...+105°C up to 6,000 rpm -40°C...+95°C up to 9,000 rpm -40°C...+85°C up to 12,000 rpm
Storage temperature ³	-30°C ... +80°C

¹ see measuring point M1

² see measuring point M2

³ due to packaging



Specifications subject to change without notice.

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TECHNICAL DATA electrical

General design	as per EN IEC 61010-1, protection class III, contamination level 2, overvoltage class II
Supply voltage	7 - 12 V DC
Current w/o load (typ.)	12 V: 48 mA (without load)
Resolution single-turn	20 Bit standard
Resolution multi-turn	12 Bit (magnetic gear)
Electrical Interface	4Wire: RS485
Data Protocol	ACURO® link for Single Cable Solution
Electronic Data Sheet (EDS)	512 bytes of storage for encoder data
Condition Monitoring Memory	1,0 kbyte
OEM Memory	6.5 kbytes of storage for motor and drive data
Absolute accuracy (typ.)	±36"
Repeatability (typ.)	±10"
Histograms	Motor-/Encoder-Temperature, Speed, Acceleration, Supply voltage

TECHNICAL DATA safety

Design Functional Safety AD37S	SIL2 according to EN IEC 61508, 62061, 61800-5-2, 61800-5-3 PLd according to EN ISO 13849-1
Design Functional Safety AD37E	SIL3 according to EN IEC 61508, 62061, 61800-5-2, 61800-5-3 PLe according to EN ISO 13849-1
Resolution for save position	9 Bit Singleturn
PFH-value	1.99×10^{-8} per hour
MTTFd	220 years
DCavg	≥ 99%
Realizable safety function according to EN 61800-5-2	SS1 (Safe Stop 1) ¹ SS2 (Safe Stop 2) ¹ SOS (Safe Operating Stop) SDI (Safe direction) SLS (Safe limited speed) SLI (Safe limited increment) SLA (Safe limited acceleration) SSR (Safe speed range) SAR (Safe acceleration range)

¹ deceleration controlled (-d) or ramp monitored (-r)

ELECTRICAL CONNECTIONS

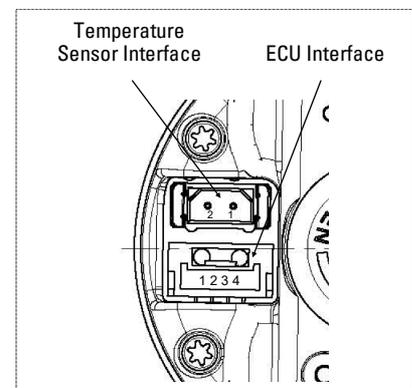
ECU Interface, 4 pole, with strain relief

PIN	Signal 4Wire
1	UB+
2	DATA+
3	DATA-
4	UB-

Temperature Sensor Interface, 2 pole, with strain relief²

PIN	Signal
1	Sensor+ (e.g. PT1000)
2	Sensor- (e.g. PT1000)

² Insulation resistance according to EN IEC 60204-1 PELV/SELV

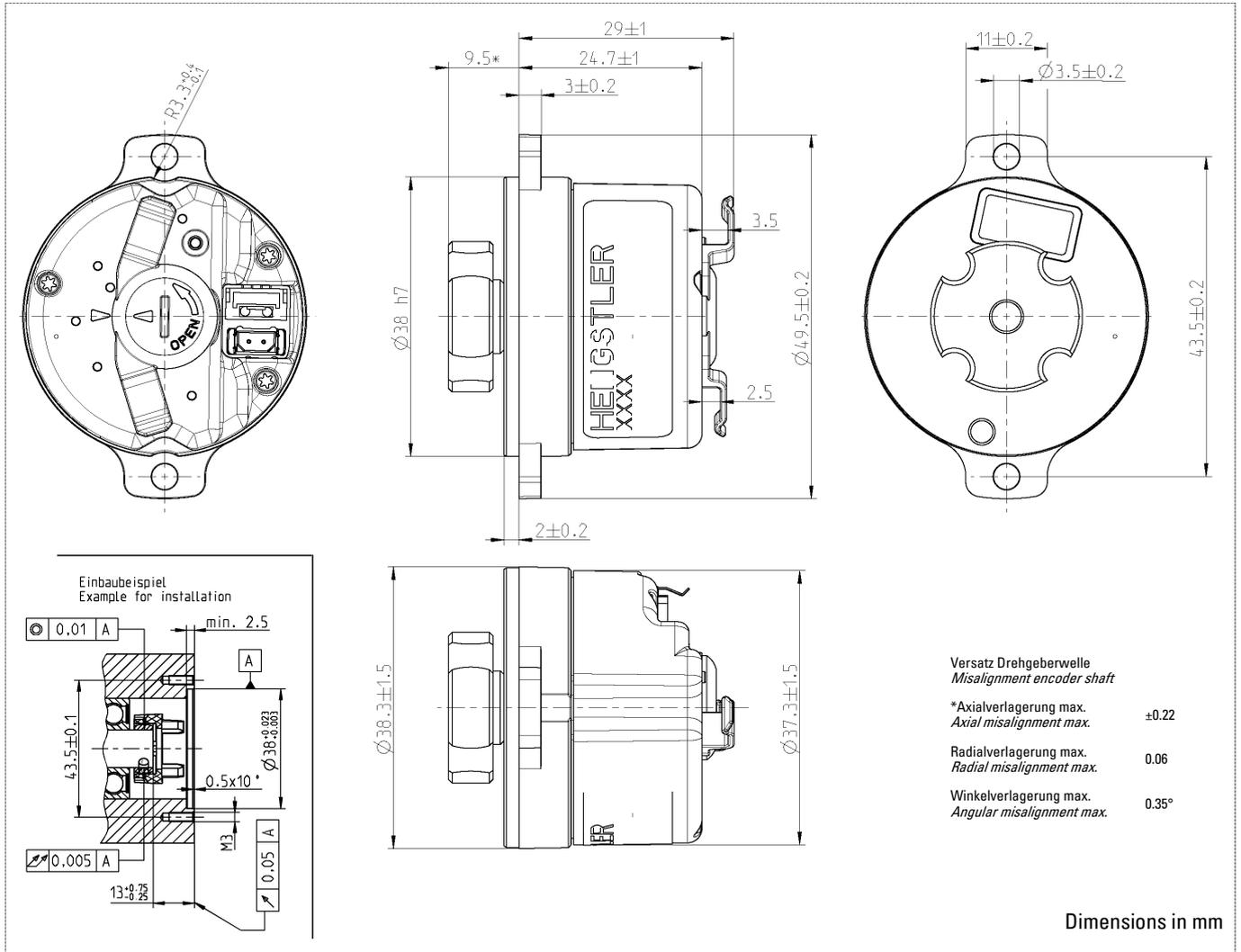


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DIMENSIONAL DRAWINGS



ORDERING INFORMATION

Type	Resolution	Supply voltage	Flange, Protection, Shaft	Interface	Connection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AD37/ none safety AD37S SIL2 PLd AD37E SIL3 PLe	0020 20 Bit ST 1220 20 Bit ST + 12 Bit MT	G 7 - 12 VDC	Z.0W Two-eared flange, IP40, Shaft with integrated coupling hub	4W ACURO® link 4 Wire	9 Data & power supply connector, axial, 4 pole + motor temperature sensor, axial, 2 pole

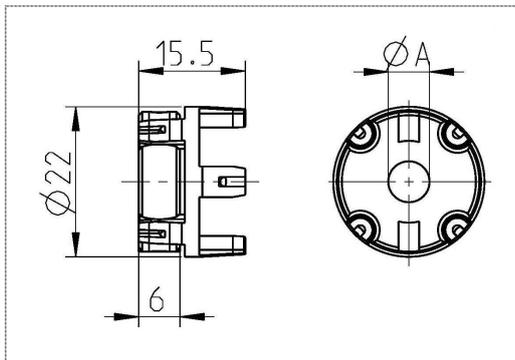
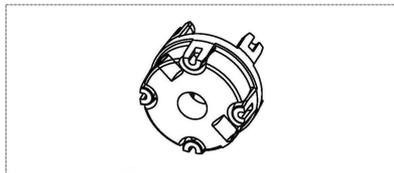
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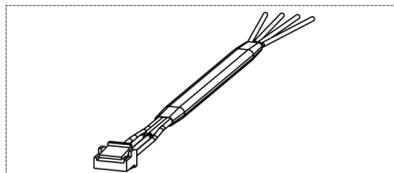
ACCESSORIES Shaft Coupling



Coupling to mate with AD37 encoder series (Diameter A)	Part Nr.
For shaft size-Ø A: 6 mm	1 572 028
For shaft size-Ø A: 8 mm	1 572 029
For shaft size-Ø A: 10 mm	1 572 030
For shaft size-Ø A: 12 mm	1 572 031

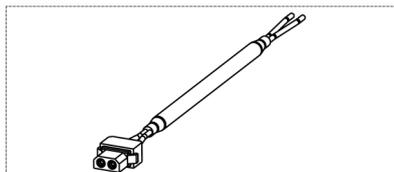
- * Recommended tightening torque for the M3 screw is 0.6 Nm
- ** Bore tolerance H7 / Shaft tolerance j6
- *** Other sizes available upon request

ACCESSORIES Motor Connection Cables



Motor Connection Cable with Connector	Part Nr.
Encoder power/interface harness assembly, 30 cm, 4-pin AD37-Series connector on one end with cut wires on the opposite end	1 572 019

Electrical connection		
PIN	Colour	Signal
1	white	UB+
2	yellow	DATA+
3	green	DATA-
4	brown	UB-



Motor Connection Cable with Connector	Part Nr.
Encoder motor winding temperature sensor harness assembly, 30 cm, 2-pin AD37-Series connector on one end and cut wires on the opposite end	1 572 020

Electrical connection		
PIN	Colour	Signal
1	green	Sensor+ (e.g. PT1000)
2	brown	Sensor- (e.g. PT1000)

TECHNICAL MANUALS

	Ordering code
Implementation Guide and User Manual, English	0 545 927
Protocol description ACURO link, English	2 572 040

SOFTWARE

	Ordering code
IP Core VHDL - ACURO link (for incorporation into drive)	on request

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