

Абсолютные энкодеры угла поворота ACURO AD58 DriveCliq, AD58

Технические характеристики

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TECHNICAL DATASHEET

Motor Feedback Absolute Encoder AD58 DRIVE-CLiQ



AD58 DRIVE-CLiQ

TECHNICAL DATA mechanical

- Singleturn and Multiturn Encoder for high performance motion control
- Encoder for Functional Safety applications (SIL2 PLd, category 3)
- Resolution: up to 24 Bit ST + 12 Bit MT
- DRIVE-CLiQ interface
- Wide operating temperature range
- Up to 10,000 rpm continuous operation
- Motor Temperature Logging and Temperature Monitoring of Encoder
- Optical encoder with a true geared multiturn

ACURO®
drive



Housing Diameter	58 mm		
Shaft Diameter	9.25 mm tapered Solid Shaft; Taper 1:10		
Flange (Mounting of Housing)	Spring Tether		
Protection Class Shaft Input (EN 60529)	IP50		
Protection Class Housing (EN 60529)	IP50		
Axial End Play of Mating Shaft (static)	± 0.5 mm		
Radial Runout of Mating Shaft (static)	± 0.05 mm		
Speed max.	10,000 rpm		
Starting Torque typ.	≤ 1.5 Ncm		
Moment of Inertia	3.1 x 10 ⁻⁶ kgm ²		
Vibration Resistance (EN 60068-2-6)	100 m/s ² (50 ... 2000 Hz)		
Shock Resistance (EN 60068-2-27)	1000 m/s ² (6 ms)		
Operating Temperature ¹	-25 °C ... +110 °C		
Storage Temperature ²	-20 °C ... +80 °C		
Relative Humidity (EN 60068-2-78)	≤ 90 % ; without condensation		
Measurement Point External Tem- perature Sensor	Type	KTY84-130	PT1000
	Temp. Measurement Range ³	-40 °C ... +200 °C	
	Resolution	0,2 K	0,2 K
Material Shaft	Stainless Steel		
Material Housing	Aluminum		
Weight	approx. 260 g (Singleturn) / 310 g (Multiturn)		
Connection	Data Connector Encoder axial 8-pole Motor winding temperature sensor input axial 2-pole		

¹ measured at TM, see dimensional drawing

² due to packaging

³ calibration temperature 100 °C

TECHNICAL DATASHEET

Motor Feedback Absolute Encoder AD58DRIVE-CLiQ

TECHNICAL DATA electrical

General design	as per EN IEC 61010-1, protection class III, contamination level 2, overvoltage class II
Supply Voltage	10-36 VDC
Power Consumption max.	2.5 W (at 24 V)
Current Consumption typ.	40 mA (at 24 V Singleturn) 60 mA (at 24 V Multiturn)
Interface / Protocol	DRIVE-CLiQ
Siemens-Software (Version: 12.2.2014)	Sinamics Simotion: ≥ V4.4 HF4 Sinumerik with safety: : ≥ V4.4 SP2
Resolution Singleturn	20 Bit 24 Bit
Resolution Multiturn	12 Bit
Absolute Accuracy	± 35" (at 20 Bit) ± 25" (at 24 Bit)
Cable Length	≤ 95 m

TECHNICAL DATA safety

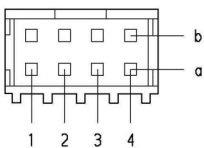
Design Functional Safety	SIL2 according to EN IEC 61508, 62061, 61800-5-2, 61800-5-3 PLd according to EN ISO 13849-1
Resolution for save position	9 Bit Singleturn
PFH-value	5.26×10^{-8} per hour (85°C)
MTTFd	169 years
DCavg	90%
Safe Position ¹	Encoder: 2° (Safety relevant measuring step: SM = 0,7°)
Realizable safety function according to EN 61800-5-2	SS1 (Safe Stop 1) ² SS2 (Safe Stop 2) ² 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) SLP (Safe limited position) ³ SCA (Safe cam) ³

¹ Further tolerances may occur in subsequent electronics after position value comparison (contact manufacturer of subsequent electronics)

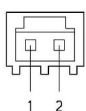
² deceleration controlled (-d) or ramp monitored (-r)

³ For SLP and SCA functions a safe reference run must be performed after „Power ON“ (see integration manual 0 580 935, chapter 8.1.2, S. 22)

ELECTRICAL CONNECTIONS PCB Connector, 8-pole



ELECTRICAL CONNECTIONS PCB Connector, 2-pole Temperature Sensor



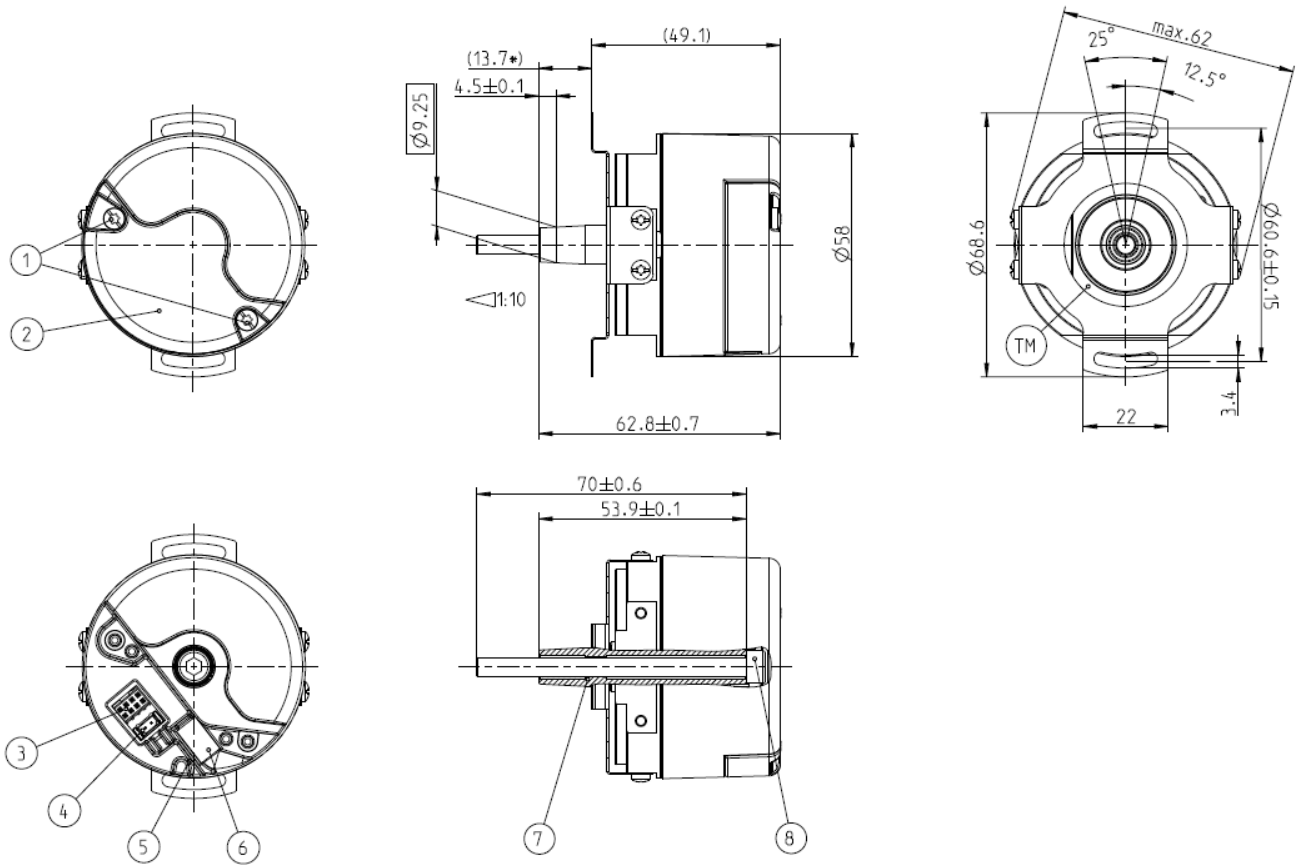
PIN	Signals
1a	RX-N
2a	RX-P
3a	TX-P
4a	TX-N
1b	Screen
2b	N.C.
3b	UB -
4b	UB +

PIN	Signals
1	T +
2	T -

TECHNICAL DATASHEET

Motor Feedback Absolute Encoder AD58 DRIVE-CLiQ

DIMENSIONAL DRAWING



TM: Measuring point temperature

1: Mounting screw for cover. Torx TX10, tightening torque $0.8 \pm 0.1 \text{ Nm}$

2: Cover

3: PCB connector 8 pole

4: KTY connector 2 pole

5: Cable outlet KTY

6: Cable outlet PCB connector

7: Back-off thread M6 / screw min. M6x60

8: Mounting screw DIN912 M5x70 - A2-70, tightening torque $3.5 \pm 0.5 \text{ Nm}$

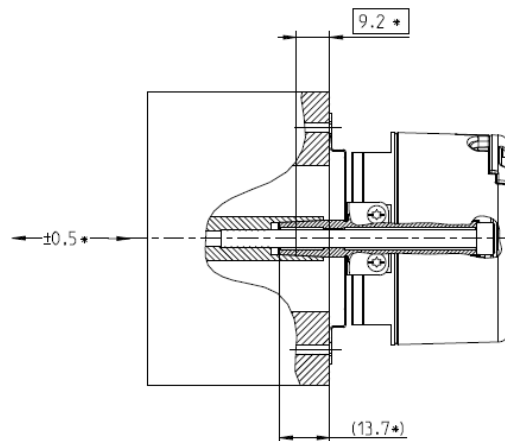
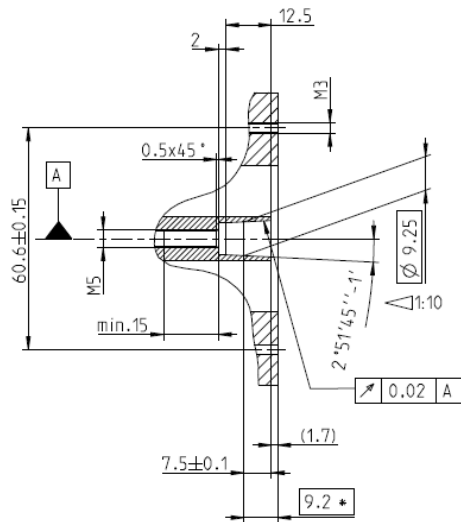
Connection is to be used as a materially bonding anti-rotation lock

Dimensions in mm

TECHNICAL DATASHEET

Motor Feedback Absolute Encoder AD58 DRIVE-CLiQ

EXAMPLE OF INSTALLATION



- * Drehmomentstützen-Ausgleichsmaß von Montage/- und Betriebstoleranzen und thermischen Ausdehnungen.
Max. zulässige Wellenbewegung / Vorspannung Drehmomentstütze.
Statisch $\pm 0.5\text{mm}$
- * Tether dimension compensation of mounting/- and operating-tolerances and thermal expansions.
max. permissible shaft movement / pretensioning tether.
Static $\pm 0.5\text{mm}$.

Dimensions in mm

ORDERING INFORMATION AD58 DRIVE-CLiQ

Type	Resolution	Supply voltage	Flange, Protection, Shaft	Interface	Connection
☐	☐	☐	☐	☐	☐
AD58S	0020 20 Bit ST 0024 24 Bit ST 1220 12 Bit MT + 20 Bit ST 1224 12 Bit MT + 24 Bit ST	E DC 10 - 30 V	2.1K Spring Tether, IP50, Taper 1:10	DQ DRIVE-CLiQ	3 PCB Connector, axial

TECHNICAL DATASHEET

Motor Feedback Absolute Encoder AD58 DRIVE-CLiQ Accessories

CONNECTING CABLES



Connecting cable with plug (socket) on both end matching to supply voltage / communication	Ordering Code
M12 Connector, 8-pole, Flange Socket, FEP-Cable, 0,15 m	1 580 022
M12 Connector, 8-pole, Flange Socket, FEP-Cable, 0,20 m	1 580 023
M12 Connector, 8-pole, Flange Socket, FEP-Cable, 0,30 m	1 580 024

ELECTRICAL CONNECTIONS

M12 Connector, 8-pole, Flange Socket

PIN	Signale	
1	UB +	
2	N.C.	
3	RX-P	
4	RX-N	
5	UB -	
6	TX-N	
7	TX-P	
8	N.C.	

Connecting cable with plug (socket) on one end matching to temperature sensor	Ordering Code
2-pole, Cable 0,23 m	1 580 021

ELECTRICAL CONNECTIONS

Temperature Sensor

Colour	Signals
Green	T +
Brown	T -

TECHNICAL DATASHEET

Absolute Encoder AD58



- For brushless servo motors
- All-digital and highspeed
- +120°C operating temperature
- 10,000 rpm continuous operation
- Optical encoder with a true geared multiturn
- Interface: SSI, BiSS-B or BiSS-C
- Option Sinewave 1 Vpp: Harmonic distortion less than 1%
- Bandwidth 500 kHz

ACURO®
industry

BiSS
INTERFACE

SSI

CE

UK
CA

cUL^{US}
LISTED

RoHS

The AD58 is an absolute encoder with a true geared Multiturn and optical sensing technology: The mechanical design consists of two ball bearings and a flexible torque support. The AD58 is ideally suited for integration into BLDC servo motors for demanding Applications such as CNC precision machining and printing in professional quality. Through its low current consumption the AD58 is contributing to lowering cost of ownership.

Fully digital control loop

The new and completely digital OptoAsic technology enables the transition to a truly digital drive system. The conventional absolute encoders still have analog sine wave signals for the feedback of speed and position data. The AD 58, however, provides fully digital position data up to 22 Bit (Singleturn) and 12 Bit (Multiturn) over the BiSS interface with a variable clock rate up to 10 MHz. This corresponds a singleturn resolution of more than 4 million measured steps.

TECHNICAL DATA mechanical

Housing diameter	58 mm
Shaft diameter	10 mm (Tapered hollow shaft) 10 mm (Tapered solid shaft) 10 mm / 12 mm (Hollow shaft)
Flange (Mounting of housing)	Tether
Protection class shaft input (EN 60529)	IP40
Protection class housing (EN 60529)	IP50
Axial endplay of mounting shaft (hubshaft)	±0.5 mm
Radial runout of mating shaft (hubshaft)	±0.1 mm
Max. speed	10,000 rpm (continuous) 12,000 rpm (short term)
Starting torque typ.	≤ 1 Nm
Moment of inertia	ca. $3.8 \times 10^{-6} \text{ kgm}^2$
Operating temperature	-15 °C ... +120 °C
Storage temperature ¹	-15 °C ... +85 °C
Vibration resistance (DIN EN 60068-2-6)	100 m/s ² (10 - 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	1000 m/s ² (6ms)
Weight	ca. 260 g (ST) / 310 g (MT)
Connection	PCB connector, 12 /14 pole

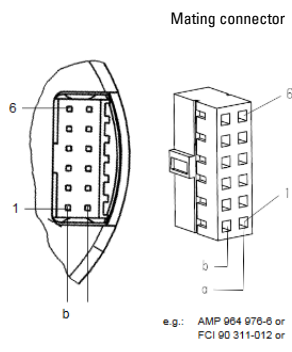
¹due to packing

TECHNICAL DATA

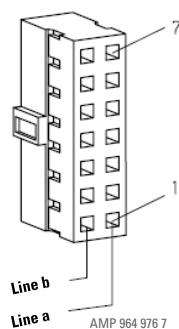
electrical

ELECTRICAL CONNECTIONS

PCB-connector, 12 pole



PCB-connector, 14 pole



TECHNICAL DATASHEET

Absolute Encoder AD58

Supply voltage	DC 5 V $\pm 10\%$ or DC 10 - 30 V
Current w/o load typ.	100 mA (ST), 150 mA (MT)
Resolution singleturn	12 - 22 Bit
Resolution multiturn	12 Bit (max. resolution 34 Bit)
Output code	Binary, Gray
Incremental signals	Sine-Cosine 1Vpp
Number of pulses	2048
3dB limiting frequency	500 kHz
Absolute accuracy typ.	$\pm 35''$
Repeatability typ.	$\pm 7''$
Parametrization	Resolution, Code type, Direction, Warning, Alarm
Alarm output	Alarm bit (SSI-Option), warning and alarmbit (BiSS)

Colour	PIN	Signals
violet	1a	Data/
green	2a	A+
brown/green	3a	0 V Sensor
blue	4a	B+
brown	5a	Clock/
red/blue	6a	5 V Sensor
green/pink	1b	DC 5 V / 7-30 V
white	2b	Clock
red	3b	B-
white/green	4b	0 V (UN)
yellow	5b	A-
black	6b	Data

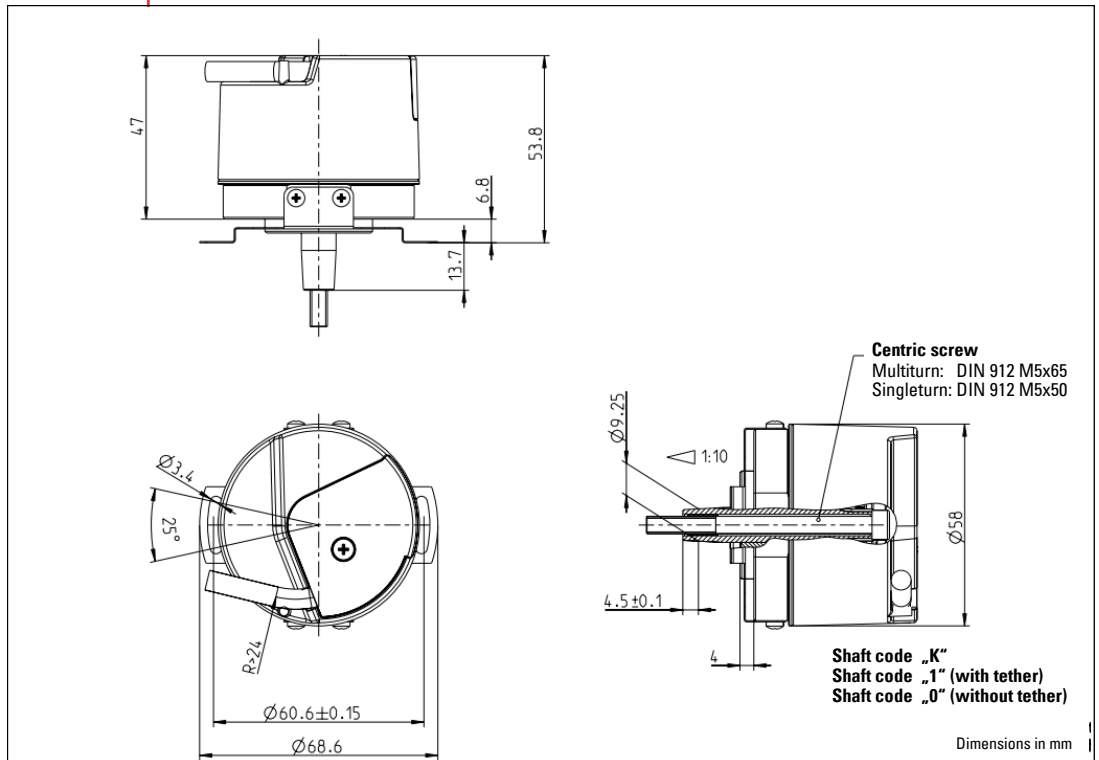
Colour	PIN	Signals
brown	1a	Data/
yellow	2a	A+
brown/green	3a	0 V Sensor
pink	4a	B+
red	5a	Clock/
violet	6a	5 V Sensor
red/blue	7a	Error/
green/pink	1b	DC 5 V / 7-30 V
black	2b	Clock
blue	3b	B-
grey	4b	0 V (UN)
white/green	5b	A-
green	6b	Data
white	7b	DIR/

TECHNICAL DATASHEET

Absolute Encoder AD58

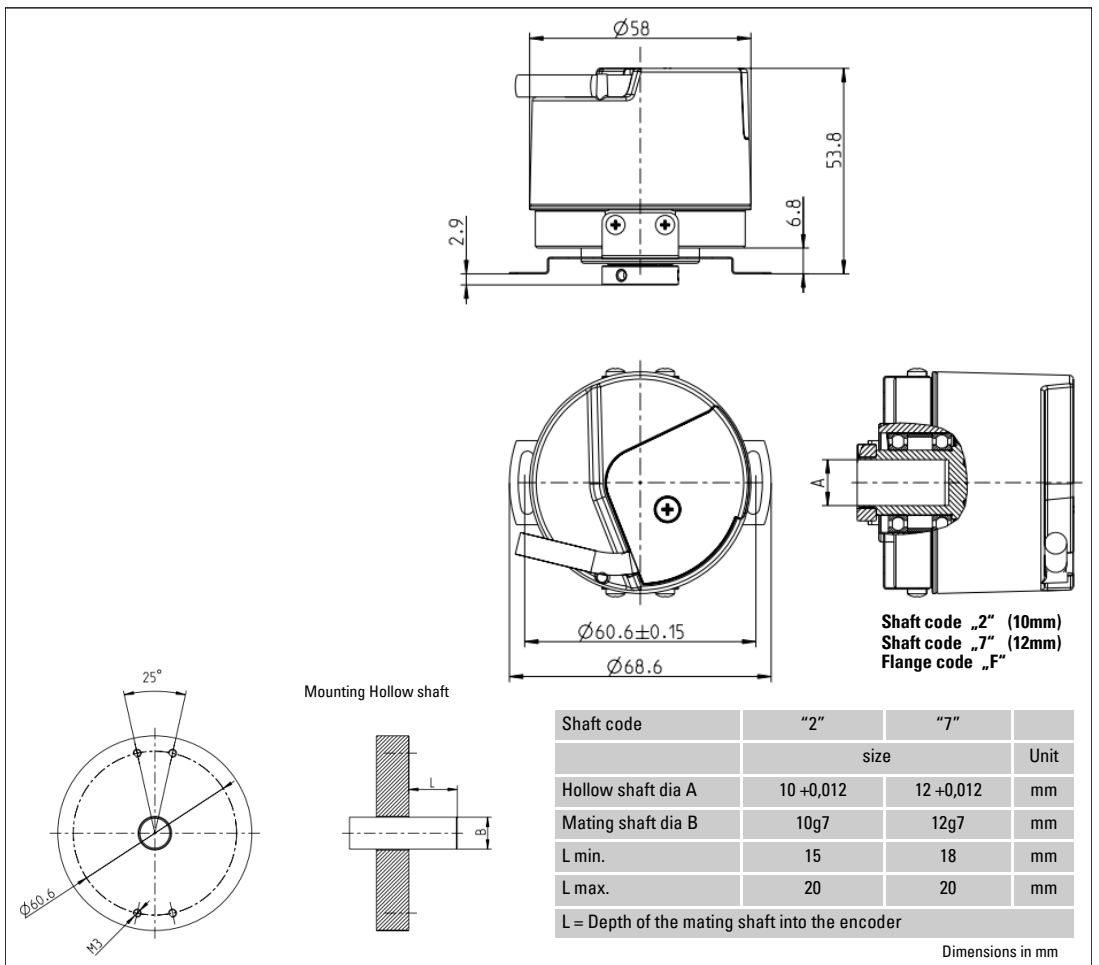
DIMENSIONED DRAWINGS

Tapered solid shaft 1:10



DIMENSIONED DRAWINGS

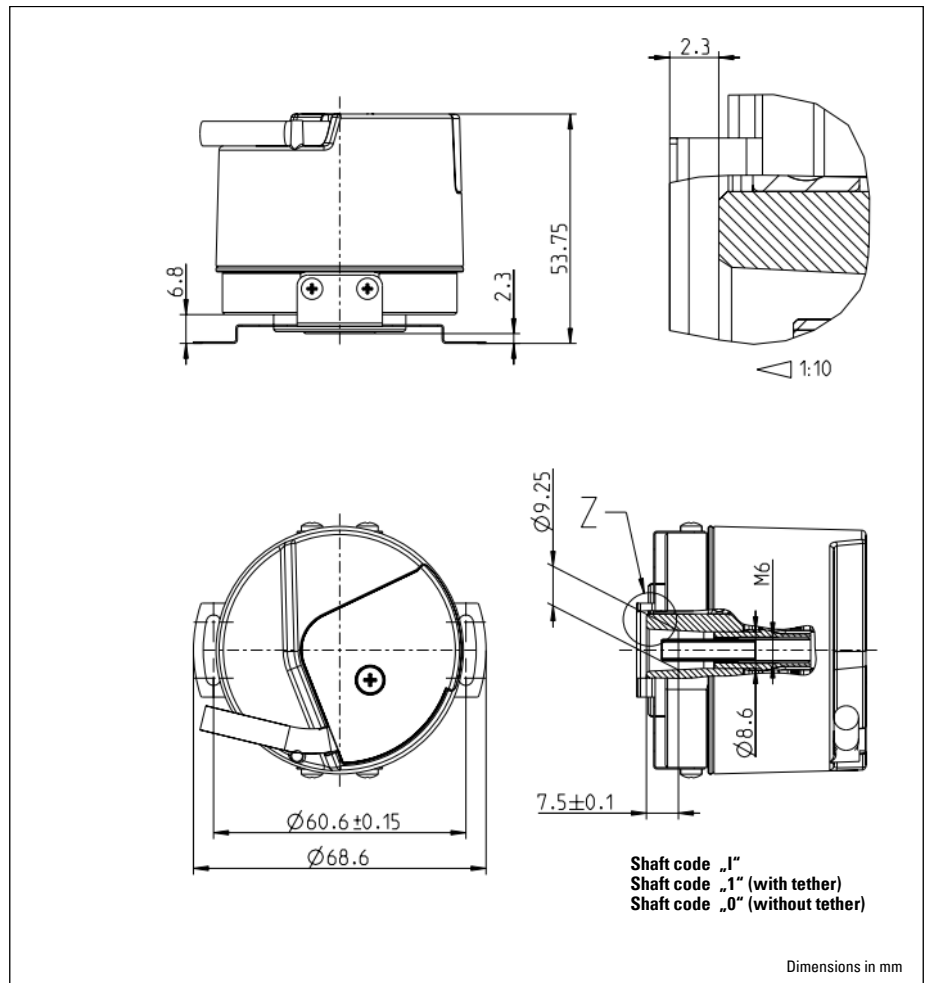
Hollow shaft (straight)



TECHNICAL DATASHEET

Absolute Encoder AD58

**DIMENSIONED
DRAWINGS**
Tapered hollow shaft 1:10



TECHNICAL DATASHEET

Absolute Encoder AD58

ORDERING INFORMATION

Type	Resolution	Supply voltage ¹	Flange, Protection, Shaft	Interface	Connection
AD58	0012 12 Bit ST 0013 13 Bit ST 0017 17 Bit ST 0019 19 Bit ST 0022 22 Bit ST 1212 12 Bit MT + 12 Bit ST 1213 12 Bit MT + 13 Bit ST 1217 12 Bit MT + 17 Bit ST 1219 12 Bit MT + 19 Bit ST 1220 12 Bit MT + 20 Bit ST 1222 12 Bit MT + 22 Bit ST Others on request	A DC 5 V ² E DC 10-30V	1.0K Spring tether, IP40, Tapered solid shaft 1:10 F.02 Spring tether, IP40, Hollow shaft 10 mm with Clamping ring F.07 Spring tether, IP40, Hollow shaft 12 mm with Clamping ring	BC BISS-B (+ SinCos 1Vpp) BV BISS-C (+ SinCos 1Vpp) SC SSI Gray (+ SinCos 1Vpp) SD SSI Binary (+ SinCos 1Vpp)	0 PCB Connector, axial, 12-pole B PCB Connector, radial, 12-pole, with mating connector + 0,5m cable 1 PCB Connector, axial, 14-pole

¹⁾ The encoder is designed to be connected to a SELV power supply. A connection to a DC voltage network is only permitted with the appropriate protective circuit.
A corresponding EMC protective circuit is generally required for cable lengths > 30 m .

²⁾ With a 5V supply there is no reverse polarity protection

TECHNICAL DATASHEET

Absolute Encoder AD58

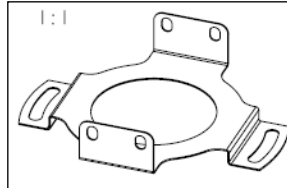
Accessories

CONNECTION CABLE

Article	Length (m)	Part.-Nr.
Cable 12 pole	0,5 m	1 547 049
Cable 14 pole	0,5 m	1 548 003

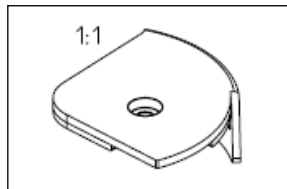
TETHER

Article	Part.-Nr.
Spring tether (for all Flange types)	E1 547 045



COVER

Article	Part.-Nr.
Cap with screws (Cover)	E1 547 295



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