

SERIES AI25 EtherCAT® HENGSTLER

Absolute Encoder

Key Features

- **Best Shock and Vibration Resistance In Its Class (400G shock, 30G vibration)**
- **High Speed 10,000 RPM Continuous Operation (12,000 RPM Short Term)**
- **Extremely Fast Cycle Times (62.5 μs)**
- **Extended Temperature Range (-40°C... +85°C)**
- **Customizable Resolution and Mounting Style**
- **Device Data: Position, Speed, Temperature, Diagnostic Data, Alarms**
- **Device Configuration: Resolution, Total Measuring Range, Preset, Offset, Direction, Position, Limits, Scaling, Residual Value Function, Speed Limits, Temperature Limits**



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS:

Code: Absolute, Optical
Resolution Single-turn: 10 - 22 Bit
Resolution Multi-turn: 12 Bit
Linearity: ±½ LSB up to 14 Bit
Absolute Accuracy (typ.): ±35"
Repeatability (typ.): ±10"

ELECTRICAL:

Interface: EtherCAT CoE, FoE
Output Code: Binary
Input Power: 7 - 30 VDC
Current w/o load: (typ.) 24V: 85 mA (ST) max; 200 mA (MT)
Device Data: position, speed, temperature, diagnostic data, alarms
Device Configuration: resolution, total measuring range, preset, offset, direction, position limits, scaling, residual value function, speed limits, temperature limits
Updating of values / Cycle Time: 62.5μs min.
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Tested to EN61326-1
Termination: Bus cover with 3x M12 connectors

MECHANICAL

Shaft Diameter: 6-12mm (solid shafts), 9.52mm – 14mm (hub shafts)
Mounting Flanges: Synchro Flange, Clamping Flange, Tether Flange, Square Flange
Shaft Load (axial / radial): 40 N / 80 N
Axial/Radial Endplay of Mating Shaft (Hub Shaft only): ±1.5 mm, ±0.2 mm
Maximum Speed: 10.000 U/min (continuous duty), max. 12.000 U/min (short term)
Starting Torque (at 20 °C): typ. ≤ 0,05 Nm (lower values available upon request)
Moment of Inertia: ca. 3.8 x 10⁻⁶ kgm²
Housing Material: Aluminum
Shaft Material: Stainless Steel
Disc Material: Glass
Weight: 4.8 oz. (420 g) ST/ 15.9 oz. (450 g) MT

ENVIRONMENTAL

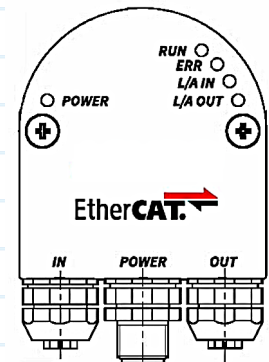
Operating Temperature: -40 °C ... +85 °C
Storage Temperature: -40 °C ... +85 °C
Shock: 400g, 4000 m/s² (2 ms) (half-sine)
Vibration: 30g, 300 m/s² (5 - 500 Hz)
Humidity: Up to 75%, (no condensation allowed)
Enclosure Rating:
Housing: IP65 and IP67
Shaft: IP64 or IP67
General Design: As per DIN EN 61010-1, protection class III, contamination level 2, overvoltage class II

ELECTRICAL CONNECTIONS

Bus cover with 3x M12 connectors

| Pin | BusPort IN | Supply voltage | Bus Port OUT |
|--------|---------------------|---------------------|---------------------|
| 1 | TxD+ | UB in | TxD+ |
| 2 | RxD+ | N.C. | RxD+ |
| 3 | TxD- | 0 V in | TxD- |
| 4 | RxD- | N.C. | RxD |
| Shield | Shield ¹ | Shield ¹ | Shield ¹ |

¹Shield connected to encoder housing



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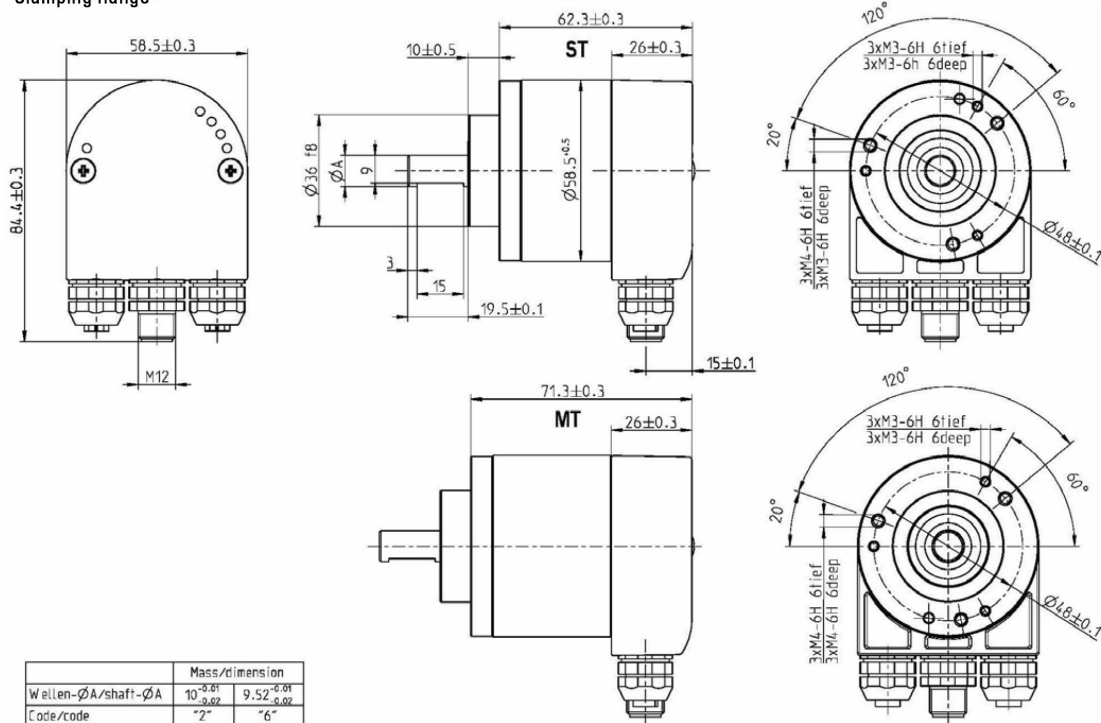
Ordering Information

To order, complete the model number with code numbers from the table below:

| Code 1: Model | Code 2: Resolution | Code 3 :Mounting | Code 4: Shaft Size | Code 5: Protocol | Code 6: Electrical | Code 7: Connector |
|--|---|---|---|------------------------|--------------------|---|
| AI25 | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | T | 3 | R |
| AI25 Size25 Absolute Encoder | 0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0016 16 Bit ST 0017 17 Bit ST 0018 18 Bit ST 0019 19 Bit ST 0020 20 Bit ST 0022 22 Bit ST 1212 12 Bit MT, 12 Bit ST 1213 12 Bit MT, 13 Bit ST 1214 12 Bit MT, 14 Bit ST 1216 12 Bit MT, 16 Bit ST 1217 12 Bit MT, 17 Bit ST 1218 12 Bit MT, 18 Bit ST 1219 12 Bit MT, 19 Bit ST 1220 12 Bit MT 20 Bit ST | Available when Code 4 is 0 or A 0 Servo* Available when Code 4 is 1, 2 or B, C 1 Clamping* 2 Square Flange** Available when Code 4 is 3, 4, 5 or 6 3 Hubshaft w/ Tether† | w/o Shaft Seal (IP64) 0 6 mm 1 3/8" 2 10 mm 3 3/8" Hubshaft 4 12 mm Hubshaft 5 1/2" Hubshaft 6 10 mm Hubshaft 7 14 mm Hubshaft 8 12 mm 9 8 mm w/ Shaft Seal (IP67) A 6 mm B 3/8" C 10 mm E 12 mm Hubshaft H 12 mm J 8 mm | T EtherCAT (EC) | 3 7-30 VDC | R Bus Cover with 3 M12 Connectors |

DIMENSIONS

Clamping flange



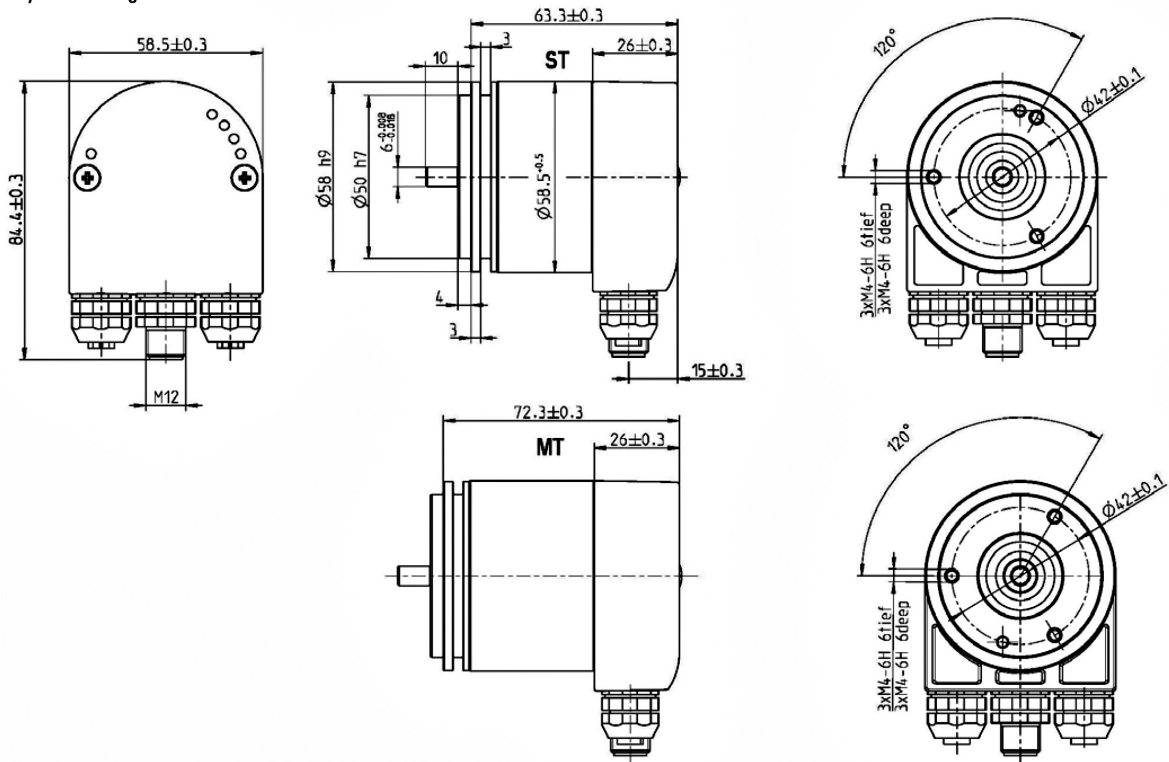
Dimensions in mm

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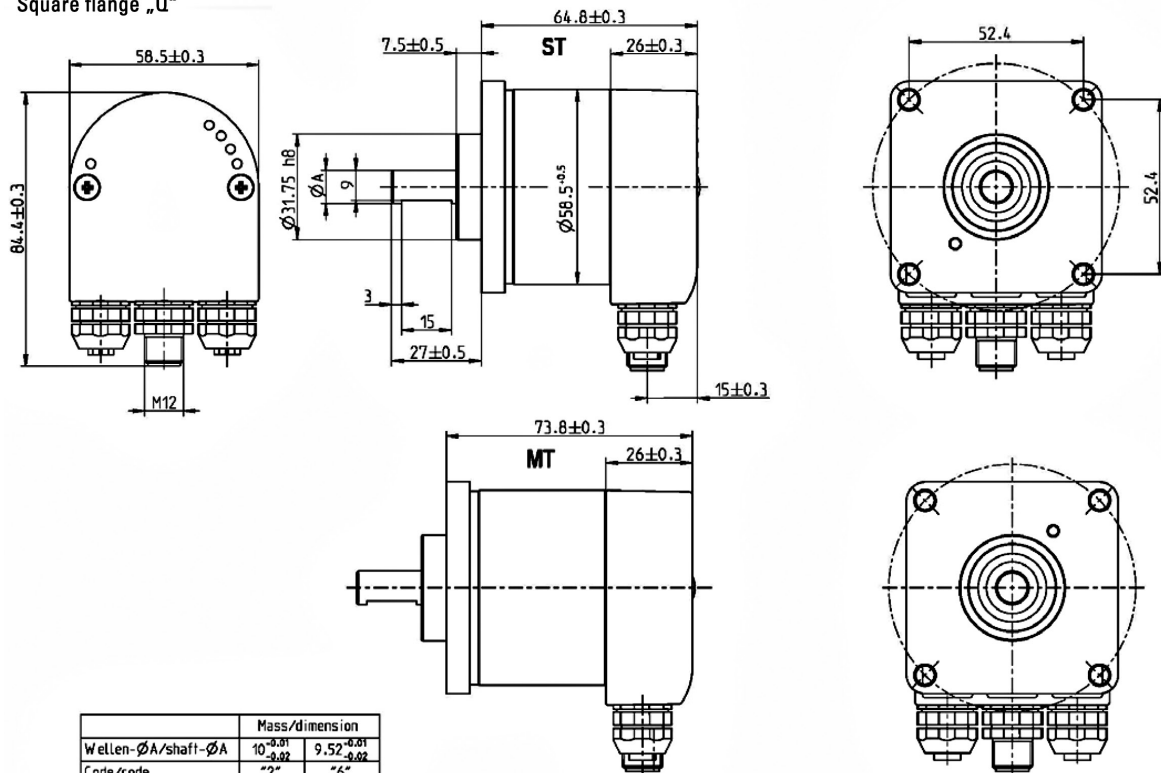
DIMENSIONS

Synchro flange



Dimensions in mm

Square flange „Q“



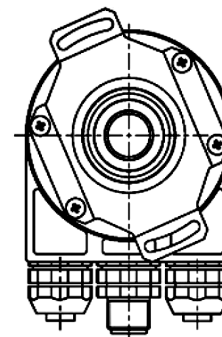
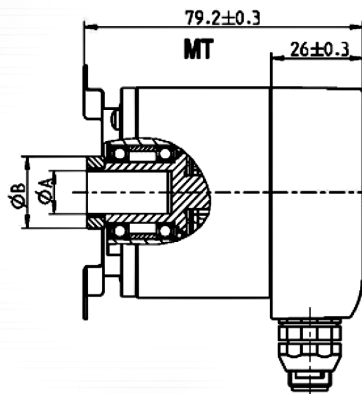
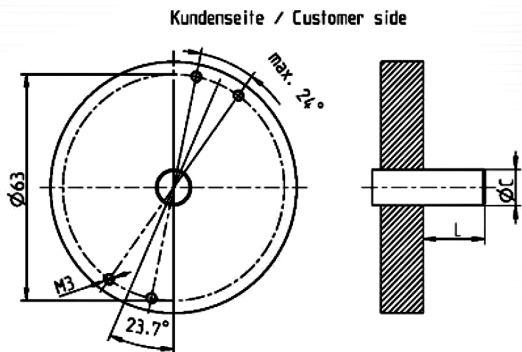
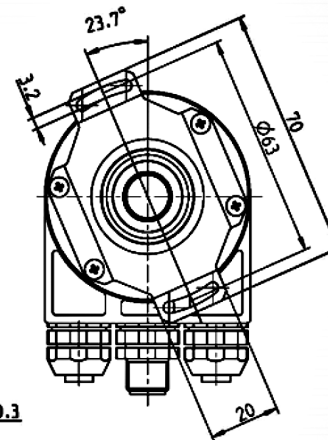
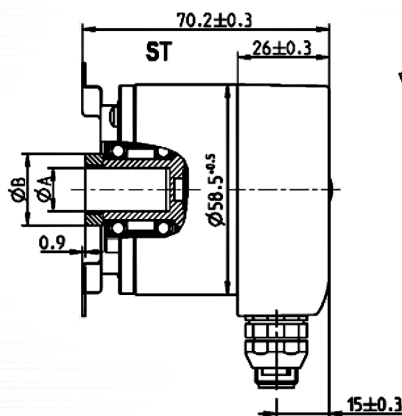
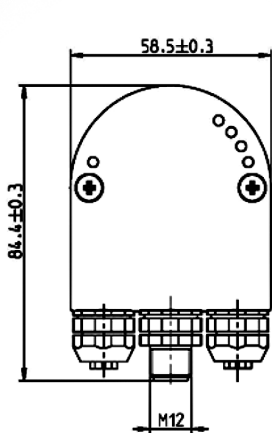
Dimensions in mm

| | Mass/dimension | |
|--------------------|--------------------------------------|--|
| Wellen-ØA/shaft-ØA | 10 ^{+0.01} _{-0.02} | 9.52 ^{+0.01} _{-0.02} |
| Code/code | "2" | "6" |

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DIMENSIONS

Hub shaft „F“



| | Mass/dimension | | | | Einheit/unit |
|--|----------------------|----------------------|------------------------|------------------------|--------------|
| | 10 ^{-0.002} | 12 ^{-0.002} | 9.52 ^{-0.002} | 12.7 ^{-0.002} | |
| Hohlwellen-ØA/hollow shaft-ØA | 10 _{g7} | 12 _{g7} | 9.52 _{g7} | 12.7 _{g7} | mm |
| Anschlusswellen-ØC/connecting shaft-ØC | 10 _{g7} | 12 _{g7} | 9.52 _{g7} | 12.7 _{g7} | mm |
| Klemmring-ØB/clamping ring-ØB | 18 | 20 | 18 | 22 | mm |
| L min. | 15 | 18 | 15 | 18 | mm |
| L max. | 20 | 20 | 20 | 20 | mm |
| Wellen-Code / shaft code | "2" | "7" | "6" | "E" | |

L = Eintauchtiefe der Anschlusswelle in den Geber
L = Length of customers shaft inside of encoder

Dimensions in mm



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