






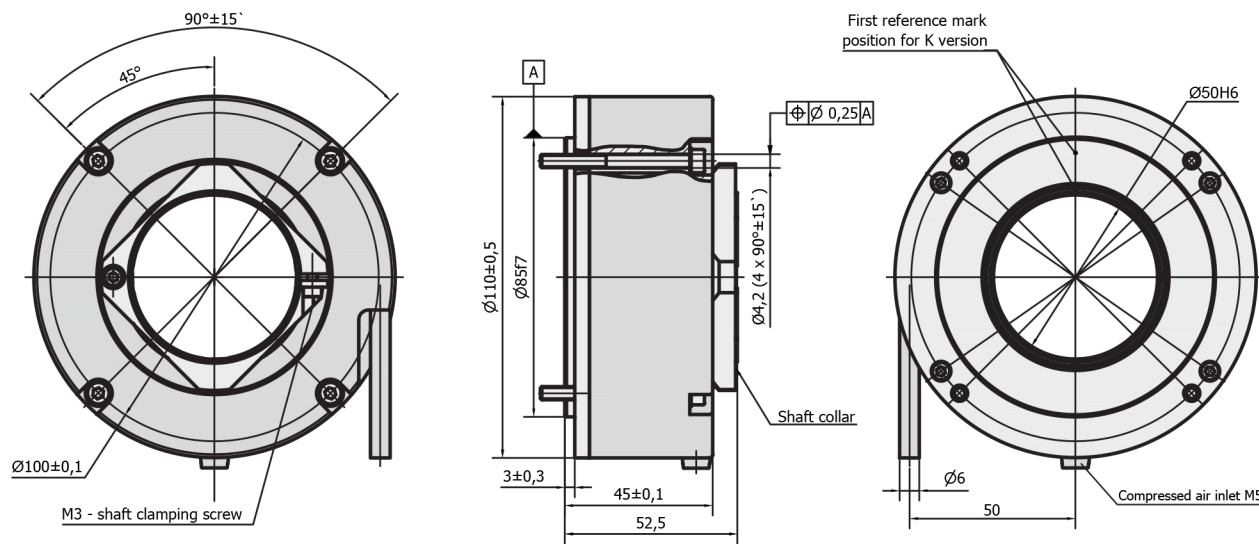
PHOTOELECTRIC ANGLE ENCODER

A110H

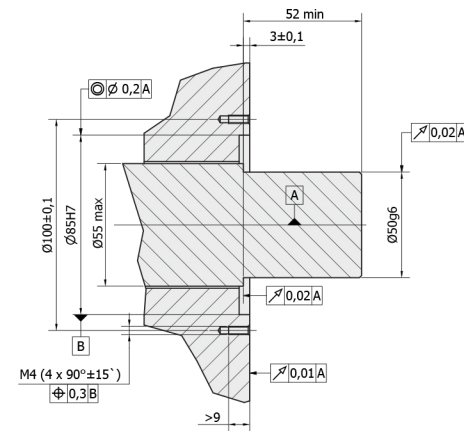
-  Analog output signals
-  High Resolutions
-  High precision
-  Distance Coded reference mark
-  Hollow Shaft



A110H is a photoelectric hollow shaft angle encoder that produces up to 1.800.000 output pulses per revolution and has the accuracy of ± 5 arc. sec.



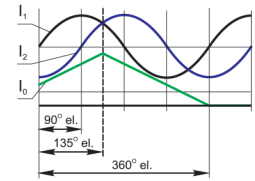
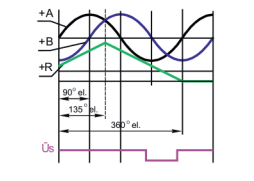
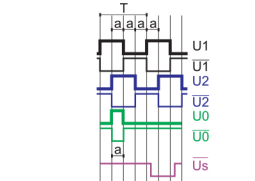
MOUNTING REQUIREMENTS



MECHANICAL DATA

| | | | |
|---|---|--|---|
| Line number on disc (Z) | 18000 | Permissible shaft runout: - axial - radial | 0,02 mm 0,05 mm |
| Number of output pulses per revolution | Z x k, where k = 1, 2, 3, 4, 5, 8, 10, 20, 25, 50, 100 (k - interpolation factor) | Starting torque at 20°C | $\leq 0,08$ Nm |
| Reference signal: - standard (S) - distance-coded (K) | One per shaft revolution 36 per shaft revolution | Rotor moment of inertia | $< 0,6 \times 10^{-4}$ kgm ² |
| Permissible mech. speed | ≤ 3000 rpm | Protection (IEC 529) | IP64 |
| Max. operating speed (depends on number of output pulses) | 600 to 1000 rpm | Maximum weight without cable | 1,2 kg |
| Accuracy grades: | $\pm 5,0$ arc. sec | Operating temperature | 0...+70 °C |
| | | Storage temperature | -30...+85 °C |
| | | Maximum humidity (non condensing) | 98 % |
| | | Permissible vibration | ≤ 100 m/s ² |
| | | Permissible shock (6 ms) | ≤ 300 m/s ² |

ELECTRICAL DATA

| Version | A110H-A $\sim 11 \mu\text{App}$ | A110H-AV $\sim 1 \text{Vpp}$ | A110H-F \square TTL |
|---|---|---|--|
| Supply voltage (U _p) | +5 V $\pm 5\%$ | +5 V $\pm 5\%$ | +5 V $\pm 5\%$ |
| Max. supply current (without load) | 100 mA | 120 mA | 120 mA |
| Light source | LED | LED | LED |
| Incremental signals | Two sinusoidal I ₁ and I ₂ Amplitude at 1 k Ω load: - I ₁ = 7-16 μA - I ₂ = 7-16 μA | Differential sine +A/-A and +B/-B Amplitude at 120 Ω load: - A = 0.6-1.2 V - B = 0.6-1.2 V | Differential square-wave U1/U1 and U2/U2. Signal levels at 20 mA load current: - low (logic "0") $\leq 0,5$ V - high (logic "1") $\geq 2,4$ V |
| Reference signal | One quasi-triangular I ₀ peak per revolution. Signal magnitude at 1 k Ω load: - I ₀ = 2-8 μA (usable component) | One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120 Ω load - R = 0.2-0.8 V (usable component) | One differential square-wave U0/U0 per revolution. Signal levels at 20 mA load current: - low (logic "0") $< 0,5$ V - high (logic "1") $> 2,4$ V |
| Fault detection signal \bar{U}_s - no error occur - error occur | - - - | one square-wave pulse high low | one square-wave pulse high low |
| Maximum operating frequency | (-3 dB) ≥ 160 kHz | (-3 dB) ≥ 180 kHz | 160-2000 kHz (depends on interpolation factor) |
| Direction of signals | I ₂ lags I ₁ for clockwise rotation (viewed from shaft side) | +B lags +A for clockwise rotation (viewed from shaft side) | U2 lags U1 with clockwise rotation (viewed from shaft side) |
| Maximum rise and fall time | - | - | $< 0,5 \mu\text{s}$ |
| Standard cable length | 1 m, without connector | 1 m, without connector | 1 m, without connector |
| Maximum cable length | 5 m | 25 m | 25 m |
| Output signals |  |  |  |

Note:

- Maximum working rotation speed (with proper encoder counting) is limited by maximum operating frequency and maximum mechanical rotation speed.
- If cable extension is used, power supply conductor cross-section should not be smaller than 0.5 mm².

ACCESSORIES

| CONNECTORS FOR CABLE | B12 12-pin round connector | C9 9-pin round connector | C12 12-pin round connector | D9 9-pin flat connector | D15 15-pin flat connector | RS10 10-pin round connector | ONC 10-pin round connector |
|-------------------------|-------------------------------|-----------------------------|-------------------------------|----------------------------|------------------------------|--------------------------------|-------------------------------|
| DIGITAL READOUT DEVICES | | | CS3000 | | | CS5500 | |
| COUPLING | | | | SC70 | | | |
| EXTERNAL INTERPOLATOR | | | | NK | | | |

ORDER FORM

| Output signal version (X1): | Pulse number per revolution (X2): | Reference signal (X3): | Cable Length (X4): | Connector type (X5): |
|-----------------------------|-----------------------------------|---|---|--|
| A AV F | 18000 ... 1800000* | S - one per revolution K - 36 per revolution, distance-coded | AR01 - 1m AR02 - 2m AR03 - 3m | W - without connector B12 - round, 12 pins C9 - round, 9 pins C12 - round, 12 pins D9 - flat, 9 pins D15 - flat, 15 pins RS10 - round, 10 pins ONC - round, 10 pins |

*only F signal version for >18000 pulses

ORDER EXAMPLE: 1) A110H-A-18000-K-AR01/W-0