

A170H

PHOTOELECTRIC ANGLE ENCODER



Precision photoelectric angle encoder A170H is used for precise angular displacement measurement of rotary tables, dividers, comparators, antennas and other high precision equipment.

It provides information about the value and direction of the motion. The encoder is used in automatic control, on-line gauging, process monitoring systems, etc.

The encoder has a rigid stainless steel construction and shaft collar coupling. Encoder is coupled via shaft collar.

Three versions of output signals are available:

- A170H-A - sinusoidal signals, with amplitude approx. 11 μ App;

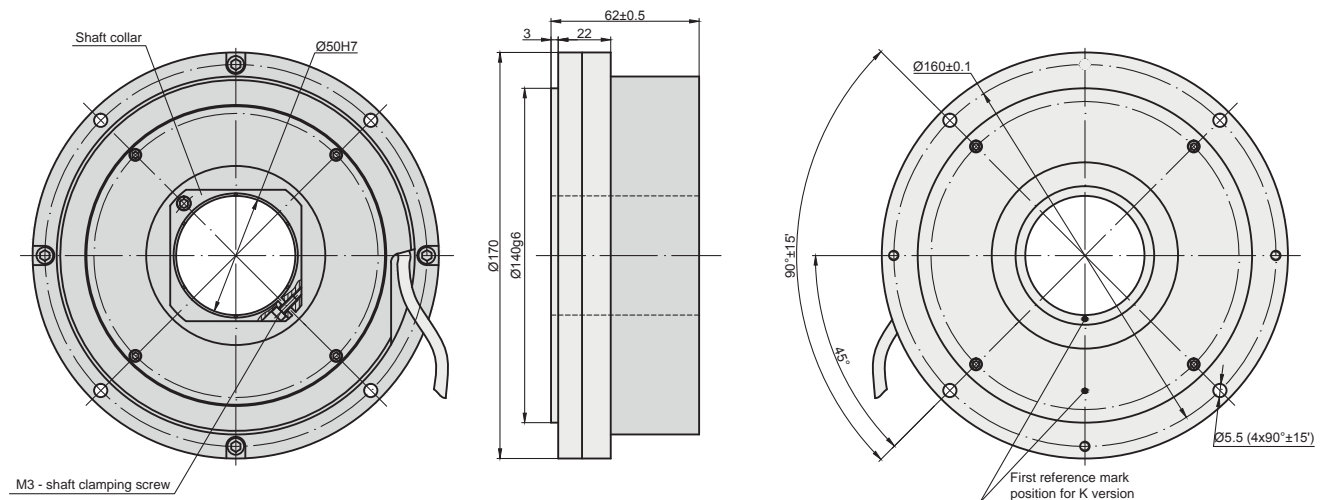


- A170H-AV - sinusoidal signals, with amplitude approx. 1 Vpp;
- A170H-F - square-wave signals (TTL) with integrated subdividing electronics for interpolation x1, x2, x5, x10, x20, x25, x50 and x100.

The modification with distance-coded reference marks is available.

MECHANICAL DATA

| | | | |
|---|---|-----------------------------------|--------------------------------------|
| Line number | 18000, 36000 | Accuracy | $\pm 2.0; \pm 2.5; \pm 5.0$ arc. sec |
| Number of output pulses per revolution for A170H-F | 18000; 36000; 72000; 90000; 180000; 360000; 720000; 450000; 900000; 1800000; 3600000 | Starting torque at 20°C | ≤ 0.5 Nm |
| Reference signal: | one per shaft revolution 36 per shaft revolution 72 per shaft revolution | Rotor moment of inertia | $< 0.9 \times 10^{-3}$ kgm |
| Permissible mech. speed | ≤ 1000 rpm | Protection (IEC 529) | IP64 |
| Max. operating speed (depends on number of output pulses) | 300 to 500 rpm | Maximum weight without cable | 4.1 kg |
| Permissible shaft load: | | Operating temperature | 0...+70 °C |
| - axial | 0,02 mm | Storage temperature | -30...+85°C |
| - radial | 0,02 mm | Maximum humidity (non condensing) | 98 % |
| | | Permissible vibration | ≤ 100 m/s ² |
| | | Permissible shock (6 ms) | ≤ 300 m/s ² |



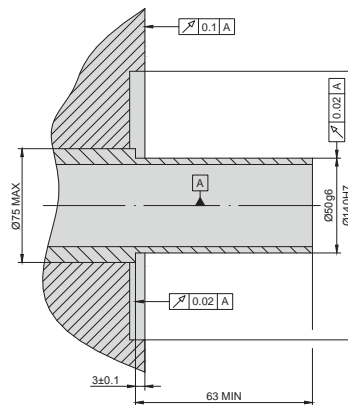
ELECTRICAL DATA

| VERSION | A170H-A $\sim 11 \mu\text{App}$ | A170H-AV $\sim 1 \text{Vpp}$ | A170H-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 | 150 mA |
| Light source | LED | LED | LED |
| Incremental signals | Two sinusoidal I_1 and I_2 Amplitude at 1 k Ω load: - $I_1 = 7 \dots 16 \mu\text{A}$ - $I_2 = 7 \dots 16 \mu\text{A}$ | 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 $U1/\overline{U1}$ and $U2/\overline{U2}$. Signal levels at 20 mA load current: - low (logic "0") ≤ 0.5 V - high (logic "1") ≥ 2.4 V |
| Reference signal | One quasi-triangular I_0 peak per revolution. Signal magnitude at 1 k Ω load: - $I_0 = 2 \dots 8 \mu\text{A}$ (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 $U0/\overline{U0}$ per revolution. Signal levels at 20 mA load current: - low (logic "0") ≤ 0.5 V - high (logic "1") > 2.4 V |
| Maximum operating frequency | (-3 dB cutoff) ≥ 160 kHz | (-3 dB cutoff) ≥ 180 kHz | 160-2500 kHz (depends on interpolation factor) |
| Direction of signals | I_2 lags I_1 for clockwise rotation (viewed from encoder mounting side) | +B lags +A for clockwise rotation (viewed from encoder mounting side) | $U2$ lags $U1$ with clockwise rotation (viewed from encoder mounting side) |
| Maximum rise and fall time | - | - | < 0.5 μs |
| 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.

MOUNTING REQUIREMENTS



ACCESSORIES

| | | | | | | | |
|--------------------------------|-------------------------------|------------------------------|-------------------------------|----------------------------|------------------------------|--------------------------------|-------------------------------|
| CONNECTORS FOR CABLE | B12 12-pin round connector | C9 12-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 | | | |
| EXTERNAL INTERPOLATOR | NK | | | | | | |

ORDER FORM

| OUTPUT SIGNAL VERSION: | PULSE NUMBER PER REVOLUTION: | OPTIONAL LINE NUMBER ON DISC (Z): | REFERENCE SIGNAL: | ACCURACY GRADE: | CABLE LENGTH: | CONNECTOR TYPE: |
|------------------------|------------------------------|--|---|---|--|--|
| A AV F | 18000 3600000 | 18000 36000 *only for A170H-F | S - one per revolution, K - distance-coded | 20 - ± 2.0 arc.sec. 25 - ± 2.5 arc.sec. 50 - ± 5.0 arc.sec. | 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 |
| ORDER EXAMPLES: | | 1) A170H-F-360000/36000-K-25-AR01/C12 2) A170H-F-360000-K-25-AR01/C12 | | | | |