A170

PHOTOELECTRIC ANGLE ENCODER

(A170-A, A170-AV, A170-F)

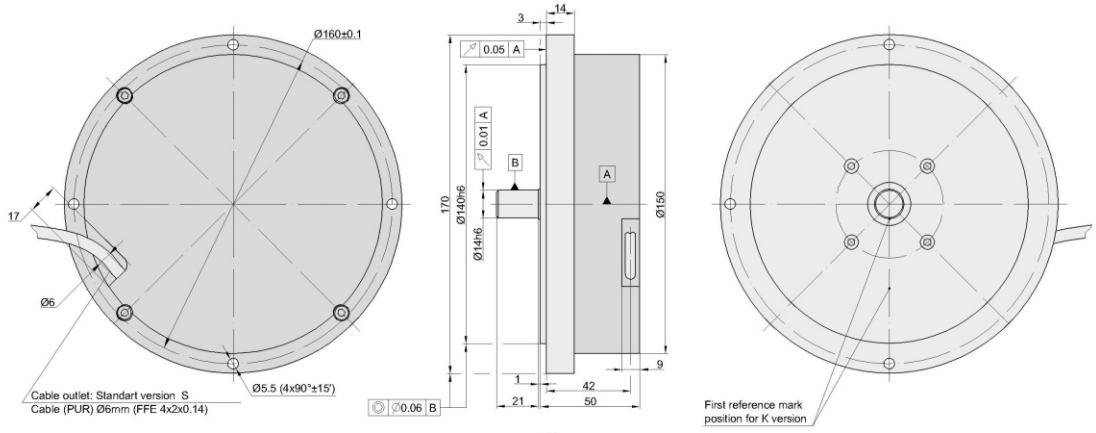
Precision photoelectric angle encoder **A170** is used for precise angular displacement measurement of rotary tables, dividers, comparators, antennas and other high precision equipment. It provides information about the value and direction of motion. The encoder is used in automatic control, on-line gauging, process monitoring systems, etc.
The stainless steel case of the encoder is mounted using screws. The angle encoder is connected to the motor shaft or spindle via coupling, available optionally.
Three versions of output signals are available:
- **A170-A** - sinusoidal signals, with amplitude approx. 11 μA_{pp};
- **A170-AV** - sinusoidal signals, with amplitude approx. 1 V_{pp};
- **A170-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
♦Number of output pulses per revolution for **A170-F**:	18000, 36000, 90000 180000, 360000, 450000, 900000, 1800000
♦Reference signal:	
- standard (S)	one per shaft revolution
- distance-coded (K) for z = 18000	36 per shaft revolution
- distance-coded (K) for z = 36000	72 per shaft revolution
♦Permissible mech. speed	≤ 1000 rpm
♦Max. operating speed (depends on number of output pulses)	300 to 500 rpm
♦Accuracy	±2.5; ±5.0 arc. sec.

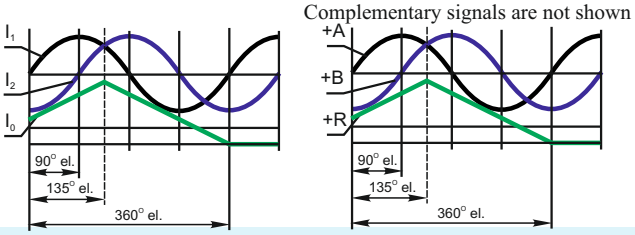
♦Permissible shaft load:	
- axial	≤ 30 N
- radial	≤ 30 N
♦Starting torque at 20°C	≤ 0.012 Nm
♦Rotor moment of inertia	$< 3.7\times10^{-4}$ kgm^2
♦Protection (IEC 529)	IP64
♦Maximum weight without cable	3.5 kg
♦Operating temperature	0...+70 °C
♦Storage temperature	-30...+85 °C
♦Maximum humidity (non condensing)	98 %
♦Permissible vibration (55 to 2000 Hz)	≤ 100 m/s^2

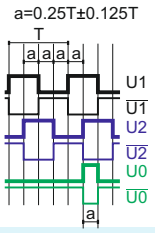


♦Electrical Data

Version	**A170-A** ∿ 11 µApp	**A170-AV** ∿ 1 Vpp	**A170-F** ⊓⊔ TTL
♦Power supply	+5 V ±5% / 100 mA max	+5 V ±5% / 120 mA max	+5 V ±5% / 150 mA max
♦Light source	LED	LED	LED
♦Incremental signals	Two sinusoidal I_1 and I_2. Amplitude at 1 kΩ 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/$\overline{U1}$ 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 kΩ load: - I_0 = 2...8 µA (usable component)	One quasi-triangular + R and its complementary- R per revolution. Signal 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
♦Max. operating frequency	(-3dB cutoff) ≥ 160 kHz	(-3dB cutoff) ≥ 180 kHz	160-1300 kHz (depends on interpolation f actor)
♦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 for clockwise rotation (viewed from encoder mounting side)
♦Max. 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

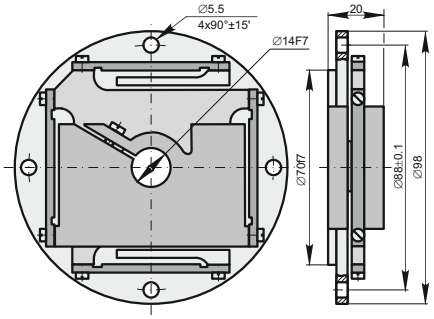
Note: 1. Maximum working rotation speed (with proper encoder counting) is limited by maximum operating frequency and maximum mechanical rotation speed. 2. If cable extension is used, power supply conductor cross-section should not be smaller than 0.5 mm^2.



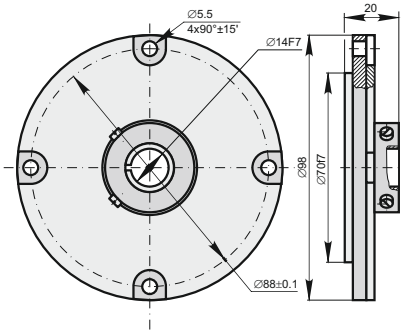


♦Accessories

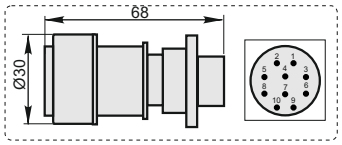
SC98-1
Coupling



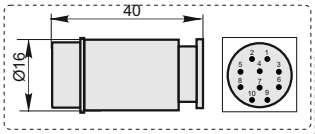
SC98-2
Coupling



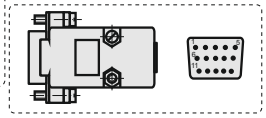
ONC
10-pin round connector for **all version of A170**



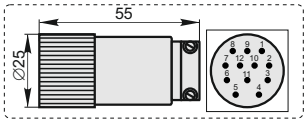
RS 10
10-pin round connector for **all version of A170**



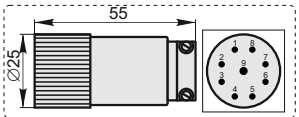
D15
15-pins flat connector for connection to DRO CS3000 and CS5500
Only for **A170-F**



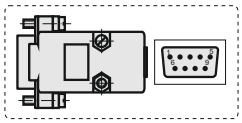
C12
12-pin round connector for **A170-AV** and **A170-F**



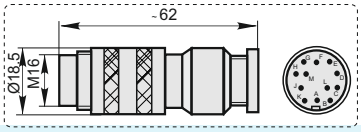
C9
9-pin round connector for **A170-A**



D9
9-pin flat connector for all **A170** versions



B 12
12-pin round connector for **all version of A170**



♦Order form

A170 – X – XXXXXX/XXXXX – X - XX - X - X X / X – X

- Output signals version: **A**, **AV** or **F**
- Pulse number per revolution: **18000** ...-... **3600000**
- (Optional) Line number on disc (z) 18000, 36000 only for F signals: **18000** **36000**
- Reference signal: **S** - one per revolution, **K** - distance-coded
- Accuracy grade: **25** - ±2.5 arc. sec. **50** - ±5.0 arc. sec.
- Cable or connector outlet: S - version S (cable outlet) **C** -version C (connector outlet)
- Cable length: **AR01** - 1m **AR02** - 2m **AR03** - 3m ...-...
- Connector type: **W** - without conn. **D9** - flat, 9 pins **C9** - round, 9 pins **C12** - round, 12 pins **D15** - flat, 15 pins **ONC** - round, 10 pins **RS 10** - round, 10 pins **B12** -round, 12 pins
- Coupling: **0** - without coupling **1** - SC98-1

Order example: A170-F-360000/36000-K-25-C-AR01/C12-1; A170-F-360000-K-25-S-AR01/C12-1