brown & sharpe
précizika

A170H PHOTOELECTRIC ANGLE ENCODER

(A170H-A, A170H-AV, A170H-F)

***A170H**–high precision, high resolution (up to 0.36 arc sec.) hollow shaft angle encoder. The encoder is similar to the Heidenhain RON 700 and RON 800 series encoders in electrical parameters, mounting and overall dimensions.*

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ISO 9002

The precision photoelectric angle encoder **A170H** is used for very precise position measurement of rotary tables, dividers, comparators, antennas and other high precision equipment. It gives information about the value and direction of the motion components. The encoder is used in automatic control, on-line gauging, in process monitoring systems, etc.

The encoder has a rigid stainless steal construction and an internal coupling. Hollow shaft of encoder is connected with an object shaft by screws.

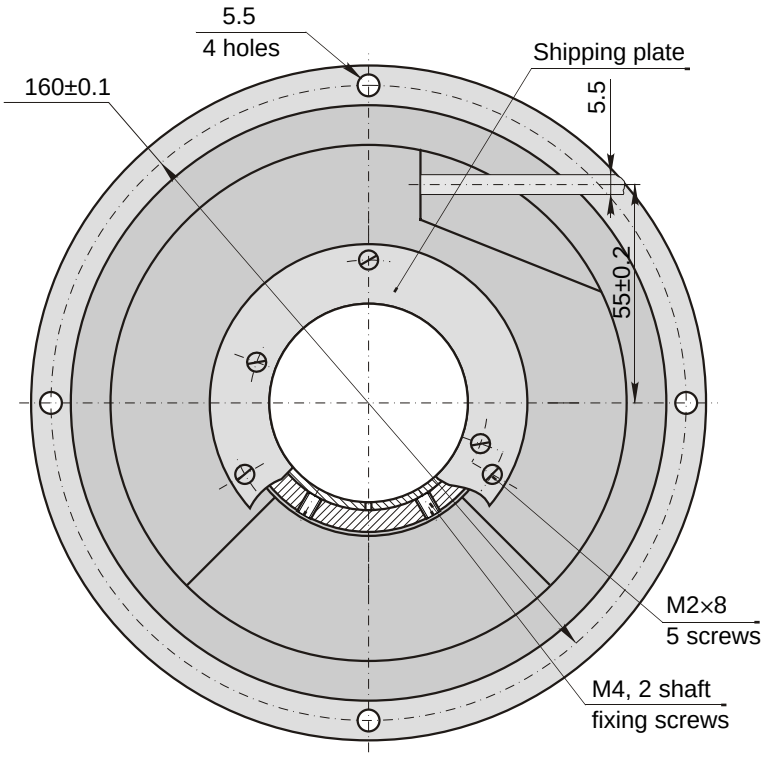
The encoder has three versions by its output signals:

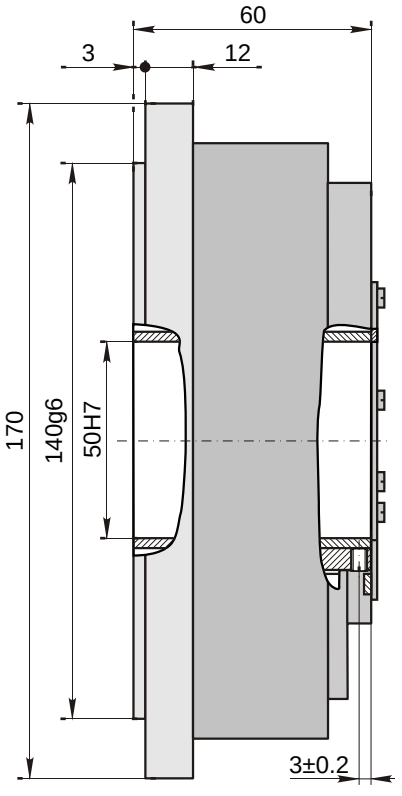
A170H-A - sinusoidal signals, with amplitude approx. 11 μA_{pp};
A170H-AV - sinusoidal signals, with amplitude approx. 1 V_{pp};
A170H-F - square-wave signals (TTL) with integrated subdividing electronics for interpolation x1, x2, x5, x10, x25 and x50.

Mechanical Data

♦ Line number:	18000
♦ Number of output pulses per revolution for **A170H-F**:	18000, 36000, 90000 180000, 450000, 900000
♦ Permissible mech. speed	≤ 1000 rpm
♦ Max. operating speed (depends on number of output pulses)	300 to 500 rpm
♦ Permissible motion of shaft:	
- axial	0.01 mm
- radial	±0.05 mm
♦ Accuracy	±2.5 arc. sec.

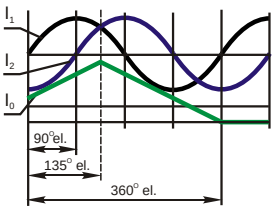
♦ Starting torque at 20°C	≤ 0.05 Nm
♦ Moment of inertia of rotor	< 0.9×10^{-3} kgm^2
♦ Protection (IEC 529)	IP64
♦ Maximum weight without cable	3.5 kg
♦ Operating temperature	0...+70 °C
♦ Storage temperature	-30...+85 °C
♦ Maximum humidity (without condensation of moisture)	98 %
♦ Permissible vibration (55 to 2000 Hz)	≤ 100 m/s^2
♦ Permissible shock (5 ms)	≤ 300 m/s^2

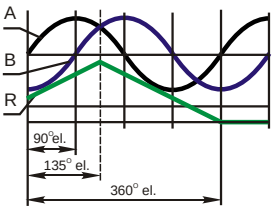


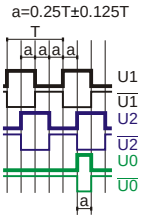


Electrical Data

Version	A170H-A ∿11 µApp	A170H-AV ∿1 Vpp	A170H-F ⊓⊔ TTL
♦ Power supply	+5 V ±5%	+5 V ±5%	+5 V ±5%
♦ Max. consumed 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 kΩ load: - I_1 = 7...16 µA - I_2 = 7...16 µA	Two sinusoidal A and B. Amplitude at 120 Ω load: - A = 0.6...1.2 V - B = 0.6...1.2 V	Square-wave U1, U2 and their inverted $\overline{U1}$, $\overline{U2}$. Signal levels at 20 mA load current: - low ("0" logic) ≤ 0.5 V - high ("1" logic) ≥ 2.4 V
♦ Reference signal	One quasi-triangle I_0 peak per revolution. Signal magnitude at 1 kΩ load: - I_0 = 2...8 µA (usable component)	One quasi-triangle R per revolution. Signal magnitude at 120 Ω load: - R = 0.2...0.8 V (usable component)	One square-wave U0 and its inverted $\overline{U0}$ per revolution. Signal levels at 20 mA load current: - low ("0" logic) ≤ 0.5 V - high ("1" logic) ≥ 2.4 V
♦ Max. operating frequency	(-3dB cutoff) ≥ 160 kHz	(-3dB cutoff) ≥ 180 kHz	150-4500 kHz (depends on interpolation factor)
♦ Direction of signals	I_2 lags I_1 with clockwise rotation (viewed from encoder mounting side)	B lags A with clockwise rotation (viewed from encoder mounting side)	U2 lags U1 with clockwise rotation (viewed from encoder mounting side)
♦ Max. rising and falling time			< 0.5 µs
♦ Standard cable length	1 m, without connector	1 m, without connector	1 m, without connector
♦ Cable diameter	5.5 mm	5.5 mm	5.5 mm
♦ Max. cable length	3 m	15 m	15 m

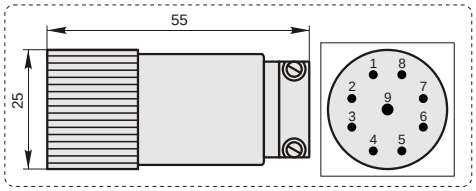




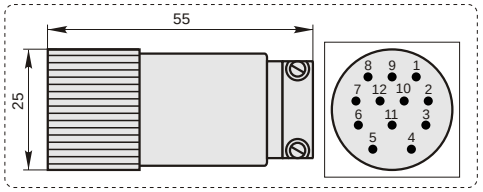


Accessories

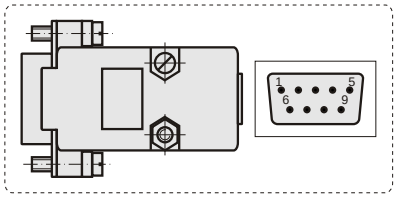
C9
9-pin round connector for **A170H-A**



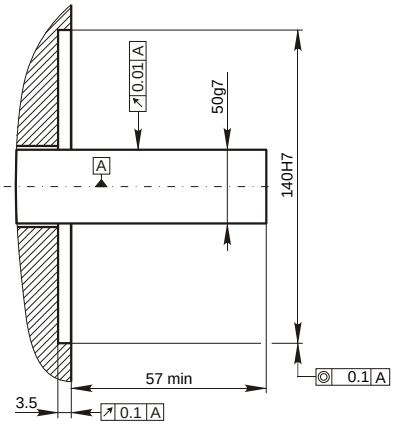
C12
12-pin round connector for **A170H-AV** and **A170H-F**



D9
9-pin flat connector for all versions of **A170H**



Required mating dimensions



Order form

A170H – X – X X X X X – X X / X

Version by output signals: **A**, **AV** or **F**	Impulse number: **18000**... **900000**	Cable length: **01** - 1m **02** - 2m **03** - 3m ... - ...	Type of connector: **W** - without connector **D9** - flat, 9 pins **C9** - round, 9 pins **C12** - round, 12 pins