brown & sharpe
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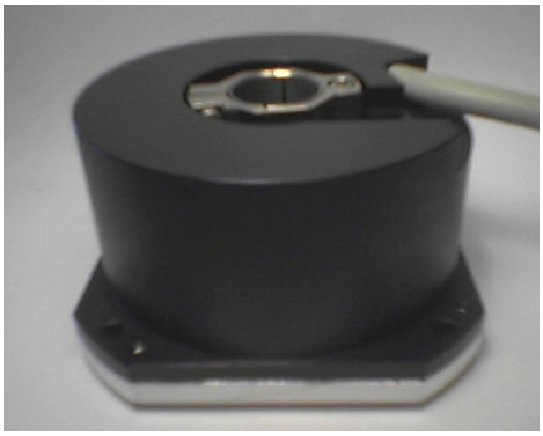
A90H PHOTOELECTRIC ROTARY ENCODER

(A90H-A, A90H-AV, A90H-F)



*The semi-precision hollow shaft encoder **A90H** has an integrated coupling and owing to it saves the needed installation space. The encoder is similar to RON 200 type encoder (Heidenhain) in electrical parameters, mounting and overall dimensions*

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ISO 9001:2000

The semi-precision photoelectric rotary encoder **A90H** is used to measure angular position of the key components of machines, industrial robots, comparators, rotary tables and to establish an informational link with DCC, NC or Digital Readout units. 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 case of the encoder is fixed to an object by means of four screws M4. The hollow shaft of the encoder is connected with an object shaft by means of clinching clamp.

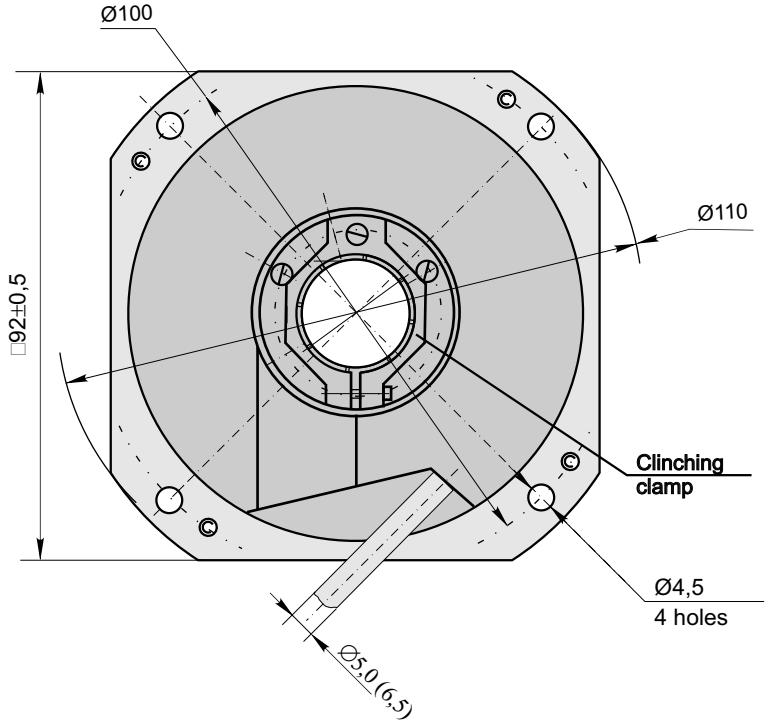
The encoder has three versions by its output signals:

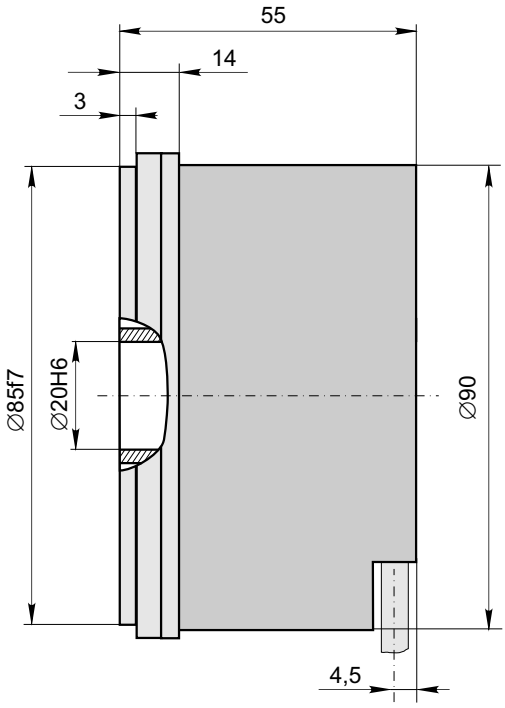
A90H-A - sinusoidal signals, with amplitude approx. 11 μApp;
A90H-AV - sinusoidal signals, with amplitude approx. 1 Vpp;
A90H-F - square-wave signals (TTL) with integrated subdividing electronics for interpolation x1, x2, x5, x10, x25 and x50.

■ Mechanical Data

♦Line number:	9000
♦Number of output pulses per revolution for **A90H-F**:	9000, 18000, 45000 90000
♦Permissible mech. speed	≤ 3000 rpm
♦Max. operating speed (depends on number of output pulses)	100 to 1060 rpm
♦Permissible motion of shaft:	
- axial	0.02 mm
- radial	±0.02 mm
♦Accuracy grades:	±5.0 arc. sec;

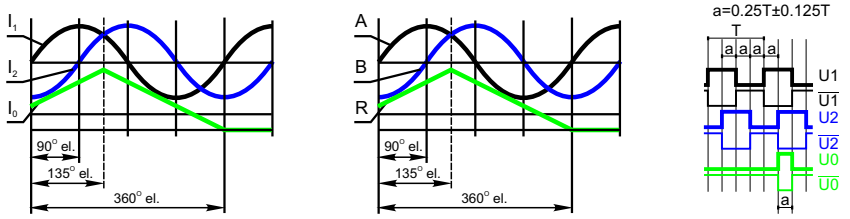
♦Starting torque at 20°C	≤ 0.07 Nm
♦Moment of inertia of rotor	$< 0.6\times10^{-4}$ kgm^2
♦Protection (IEC 529)	IP64
♦Maximum weight without cable	1.0 kg
♦Operating temperature	0...+70 °C
♦Storage temperature	-30...+85 °C
♦Maximum humidity (without condensation of moisture)	98 %
♦Permissible vibration (55 to 2000 Hz)	≤ 100 m/s^2
♦Permissible shock (5 ms)	≤ 300 m/s^2





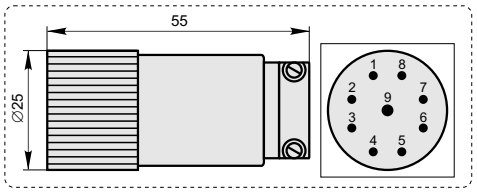
■ Electrical Data

Version	**A90H-A** ∿ 11 µApp	**A90H-AV** ∿ 1 Vpp	**A90H-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	160-4500 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			≤ 0.2 µs
♦Standard cable length	1 m, without connector	1 m, without connector	1 m, without connector
♦Cable diameter	5.0 (6.5) mm	5.0 (6.5) mm	5.0 (6.5) mm
♦Max. cable length	3 m	15 (with cable Ø6.5 mm) m	15 (with cable Ø6.5 mm) m

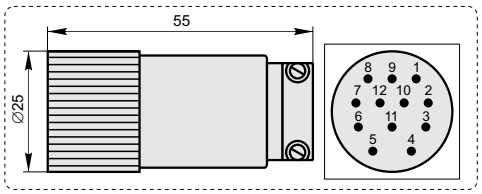


■ Accessories

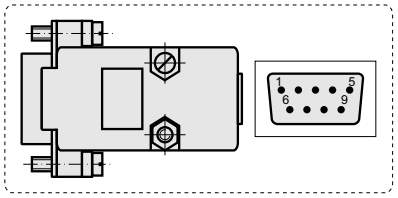
C9
9-pin round connector for **A90H-A**



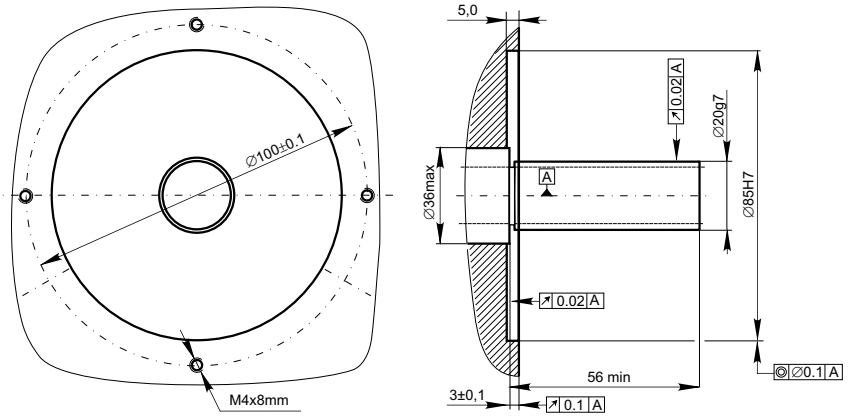
C12
12-pin round connector for **A90H-AV** and **A90H-F**



D9
9-pin flat connector for all versions of **A90H**



■ Required mating dimensions



■ Order form

A90H – X – XXXXX – XX – XX / X

Version by output signals: **A**, **AV** or **F**	Impulse number: **9000**... **450000**	Accuracy grade: **50** - ±5.0 arc. sec.	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