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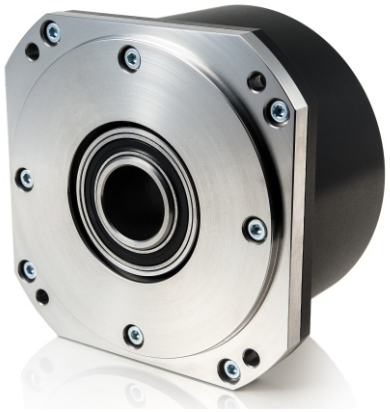
PRECIZIKA METROLOGY

A90H

PHOTOELECTRIC ANGLE ENCODER (A90H-A, A90H-AV, A90H-F



The semi-precision photoelectric angle encoder **A90H** is used to measure angular position of the key machine components, industrial robots, comparators, rotary tables and to establish an informational link with DCC, NC or Digital Readout Units. It provides information about the value and direction of motion. The encoder is used in automatic control, on-line gauging, process monitoring systems, etc.

Three versions of output signals are available:

- **A90H-A** - sinusoidal signals, with amplitude approx. 11 μA_{pp};
- **A90H-AV** - sinusoidal signals, with amplitude approx. 1 V_{pp};
- **A90H-F** - square-wave signals (TTL) with integrated subdividing electronics for interpolation x1, x2, x5, x10, x20, x25, x50 and 100.

The modification with distance-coded reference marks is available.

The encoder has two coupling versions: P- via shaft collar and H - via central screw.

♦Mechanical Data

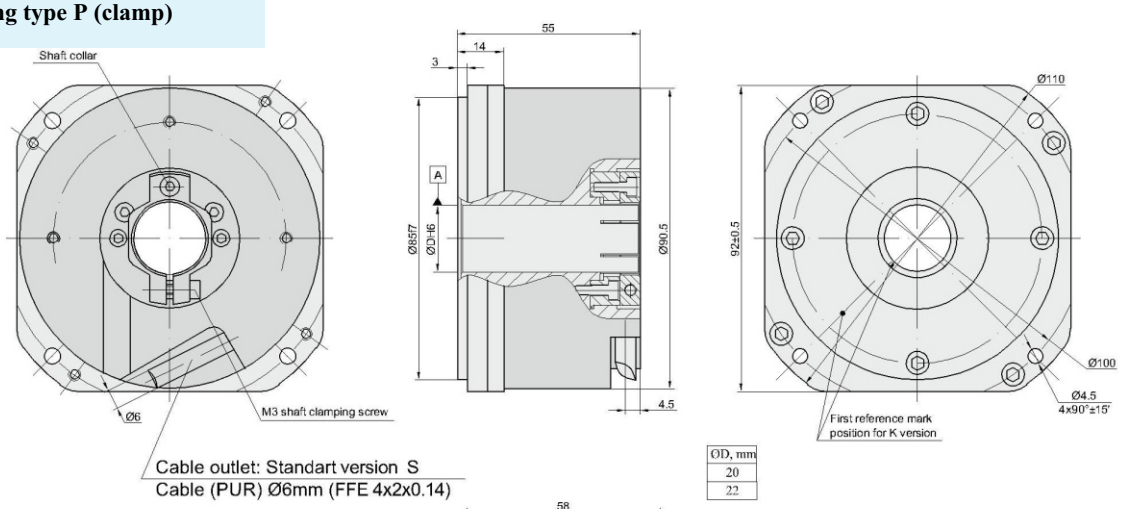
♦Line number (z):	18000
♦Number of output pulses per revolution for **A90H-F**:	18000, 36000, 90000, 180000, 360000, 450000, 900000, 1800000
♦Reference signal:	
- standard (S)	one per shaft revolution
- distance-coded (K)	36 per shaft revolution
♦Permissible mech. speed	≤ 3000 rpm
♦Max. operating speed (depends on number of output pulses)	600 to 1000 rpm
♦Permissible shaft runout:	
- axial	0.02 mm
- radial	±0.02 mm
♦Accuracy grades:	±5.0 arc. sec ; ±7.5 arc. sec
♦Starting torque at 20°C	≤ 0.08 Nm
♦Rotor moment of inertia	$< 0.6\times10^{-4}$ kgm^2
♦Protection (IEC 529)	IP64
♦Maximum weight without cable	1.2 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
♦Permissible shock (5 ms)	≤ 300 m/s^2

♦Electrical Data

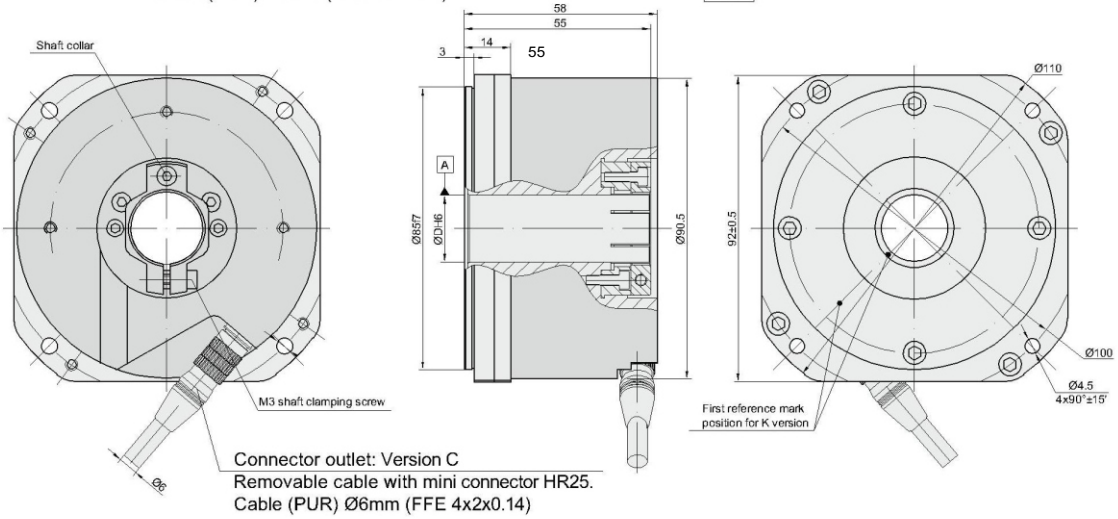
Version	**A90H-A** ∿ 11 μA_{pp}	**A90H-AV** ∿ 1 V_{pp}	**A90H-F** ⊓⊔ TTL
♦Supply voltage	+5 V ±5%	+5 V ±5%	+5 V ±5%
♦Max. supply current (without load)	100 mA	120 mA	150 mA
♦Light source	LED	LED	LED
♦Incremental signals	Two sinusoidal I_1 and I_2. Amplitude at 1 kΩ load: - I_1 = 7...16 µA - I_2 = 7...16 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 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 for clockwise rotation (viewed from encoder mounting side)
♦Max. rise and fall time			≤ 0.2 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 operating 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.

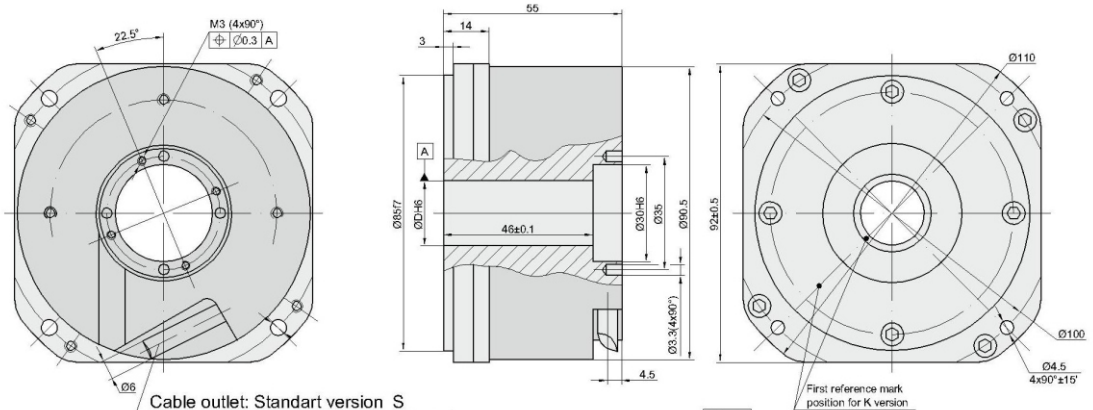
Mounting type P (clamp)



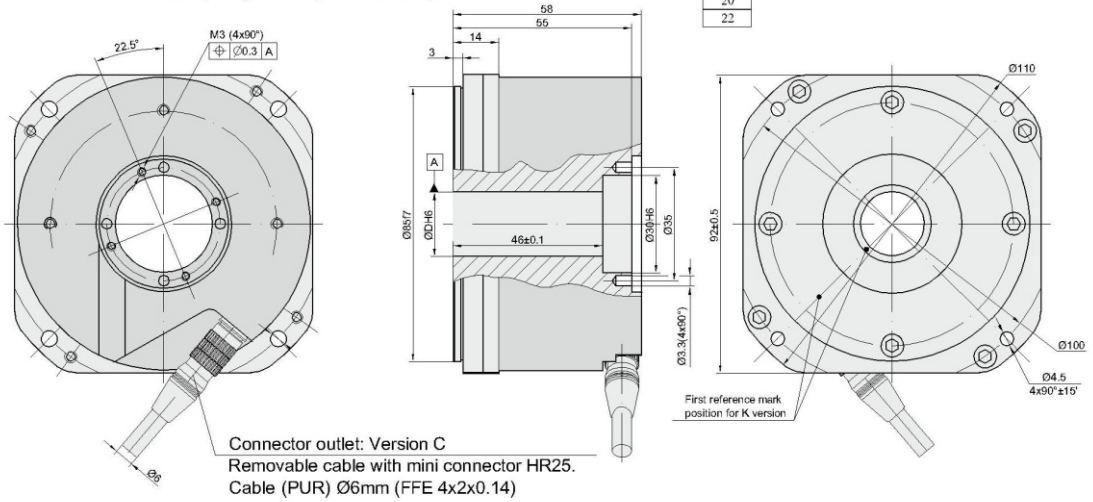
ØD, mm
20
22



Mounting type H (screw)

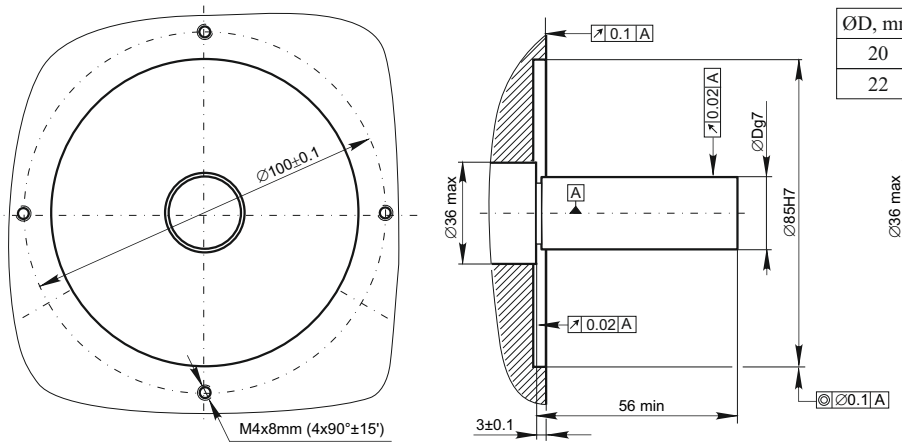


ØD, mm
20
22



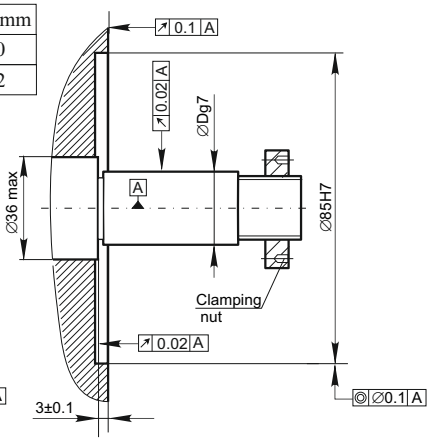
♦Mounting dimensions

Mounting type P (clamp)



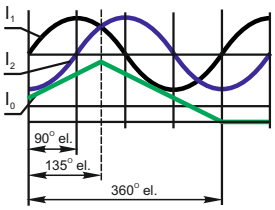
Mounting type H (screw)

ØD, mm
20
22

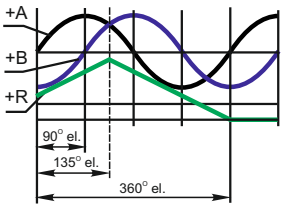


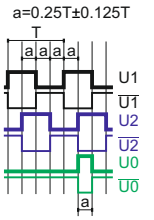
♦Output signals

Version	**A90H-A** ∿ 11 µApp	**A90H-AV** ∿ 1 Vpp	**A90H-F** ⊓⊔ TTL



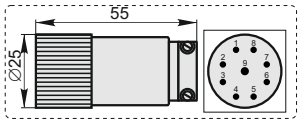
Complementary signals are not shown



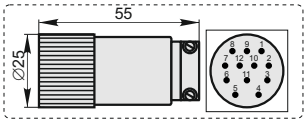


♦Accessories

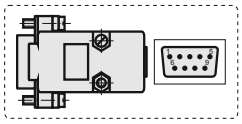
C9
9-pin round connector for **A90H-A**



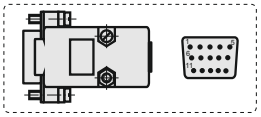
C12
12-pin round connector for **A90H-AV** and **A90H-F**



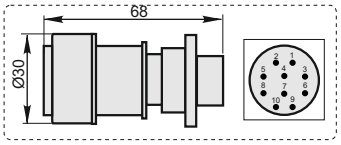
D9
9-pin flat connector for all **A90H** versions



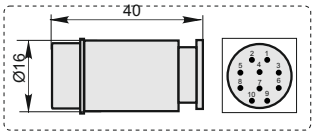
D15
15-pins flat connector for connection to DRO CS3000 and CS5500
Only for **A90H-F**



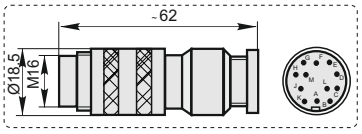
ONC
10-pin round connector for **all version of A90H**



RS 10
10-pin round connector for **all version of A90H**



B 12
12-pin round connector for all version of **L18**



• Order form

A90H – X – XXXXX – X - XX - XX – X - X - XX/X

Output signals version:	Pulse number per revolution:	Reference signal:	Accuracy grade:	Diameter of shaft hole:	Mounting type:	Cable or connector outlet:	Cable length:	Connector type:
A, **AV or F**	**18000** **...-...** **1800000**	**S** - one per revolution **K** - 36 per revolution, distance-coded	**50** - ±5.0 arc. sec. **75** - ±7.5 arc. sec.	**20** - 20 mm **22** - 22 mm	**P** - clamp **H** - screw	**S** - version S (cable outlet) **C**-version C (connector outlet)	**AR01** - 1m **AR02** - 2m **AR03** - 3m **...-...**	**W** - without connector **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

Order example: A90H-A-18000-K-50-20-P-S-AR01/W