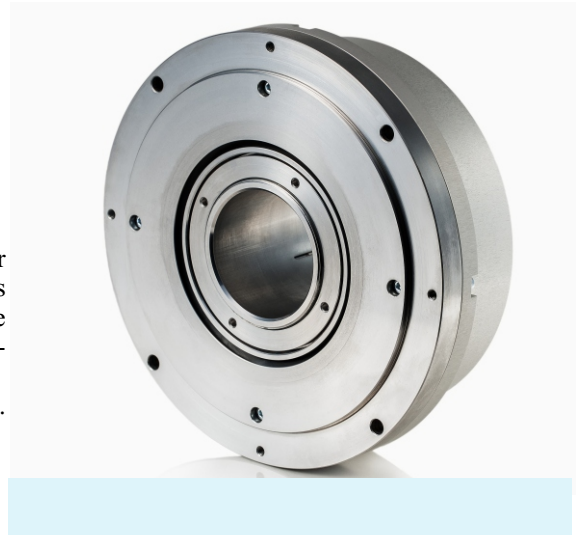


A170H

PHOTOELECTRIC ANGLE ENCODER

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



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 A_{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, x20, x25, x50 and x100.

The modification with distance-coded reference marks is available.

◆ Mechanical Data

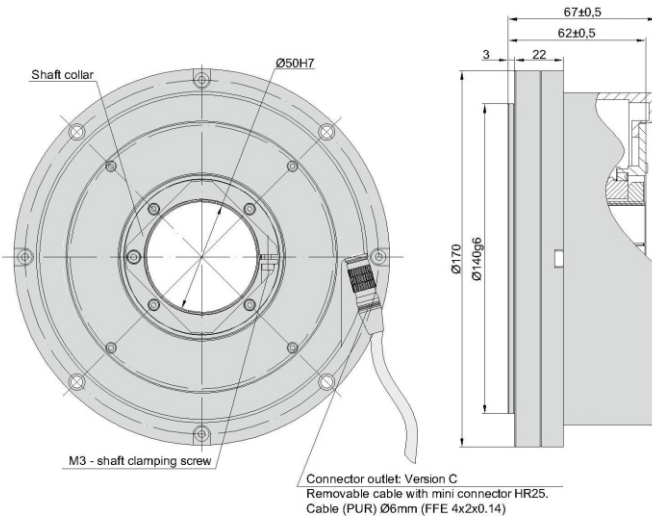
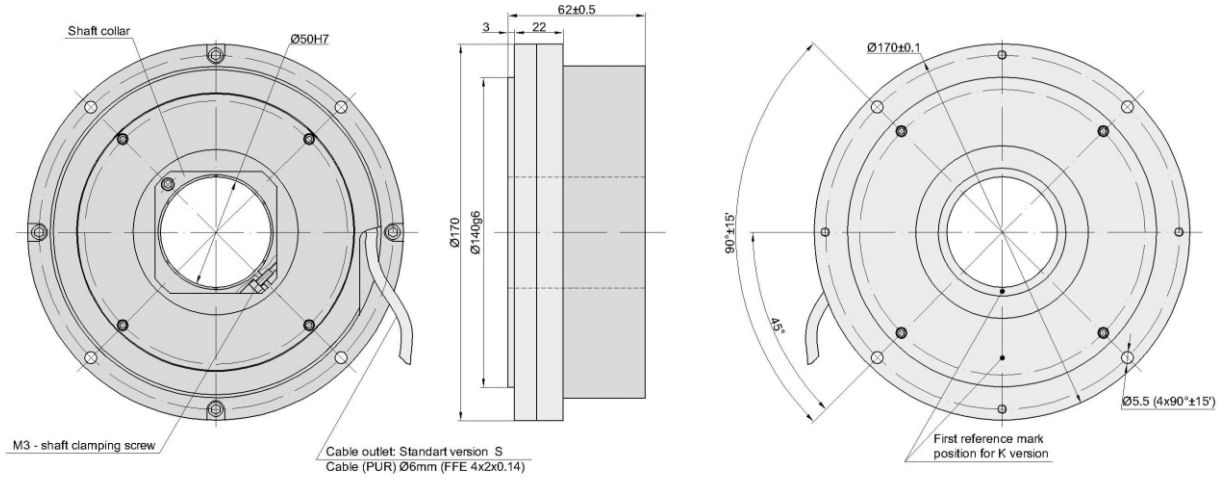
◆ Line number:	18000, 36000	◆ Accuracy	±2.5; ±5.0 arc. sec.
◆ Number of output pulses per revolution for A170H-F :	18000, 36000, 90000 180000, 360000, 450000, 900000, 1800000	◆ Starting torque at 20°C	≤ 0.5 Nm
◆ Reference signal:		◆ Rotor moment of inertia	< 0.9×10 ⁻³ kgm ²
- standard (S)	one per shaft revolution	◆ Protection (housing) (IEC 529)	IP64
- distance-coded (K) for z = 18000	36 per shaft revolution	◆ Maximum weight without cable	4.1 kg
- distance-coded (K) for z = 36000	72 per shaft revolution	◆ Operating temperature	0...+70 °C
◆ Permissible mech. speed	≤ 1000 rpm	◆ Storage temperature	-30...+85 °C
Max. operating speed (depends on number of output pulses)	300 to 500 rpm	◆ Maximum humidity (non condensing)	98 %
◆ Permissible shaft runout:		◆ Permissible vibration (55 to 2000 Hz)	≤ 100 m/s ²
- axial	0.02 mm	◆ Permissible shock (5 ms)	≤ 300 m/s ²
- radial	0.02 mm		

◆ Electrical Data

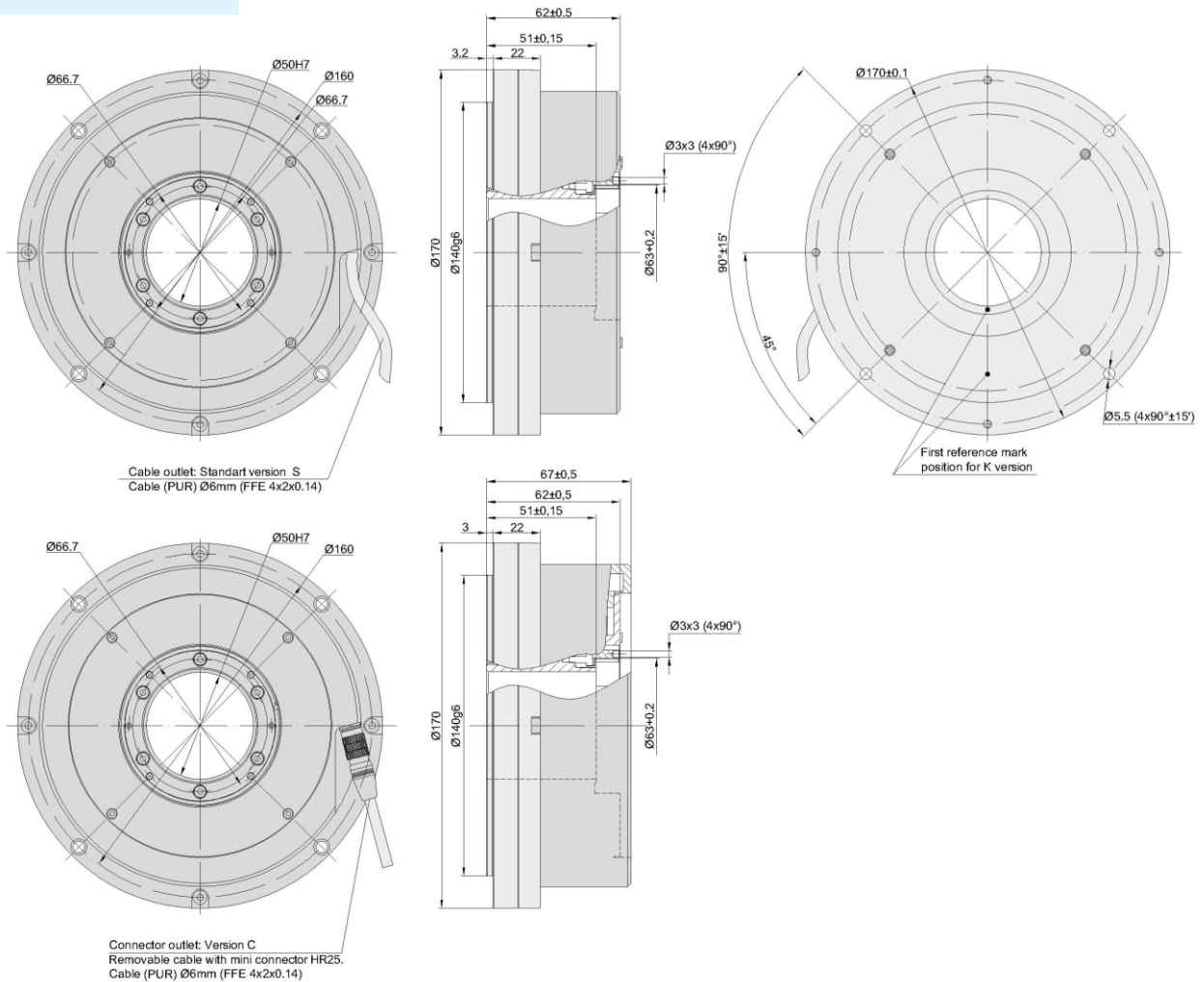
Version	A170H-A \sim 11 μ A _{pp}	A170H-AV \sim 1 V _{pp}	A170H-F \square TTL
◆ Supply voltage	+5 V ±5%	+5 V ±5%	+5 V ±5%
◆ Max. supply current (without load)	100 mA	120 mA	150 mA
◆ Light source	LED	LED	LED
◆ Incremental signals	Two sinusoidal I ₁ and I ₂ . Amplitude at 1 k Ω load: - I ₁ = 7...16 μ A - I ₂ = 7...16 μ 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...8 μ A (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			< 0.5 μ s
◆ 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 mm².

Mounting type P (clamp)

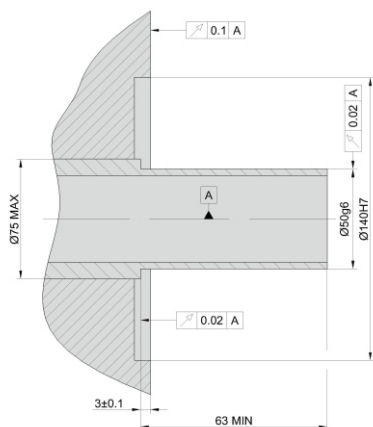


Mounting type H (screw)

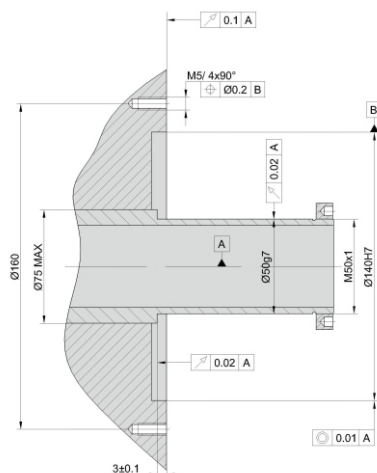


◆ Mounting dimensions

Mounting type P (clamp)

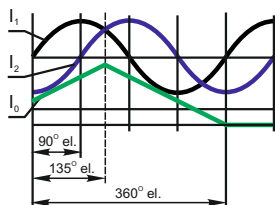


Mounting type H (screw)



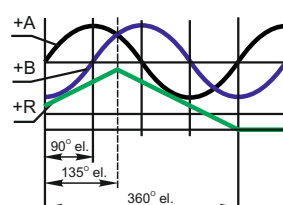
◆ Output signals

Version **A170H-A** $\sim 11 \mu\text{App}$

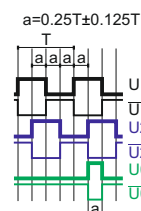


Version **A170H-AV** $\sim 1 \text{Vpp}$

Complementary signals are not shown



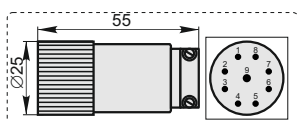
Version **A170H-F** \square TTL



◆ Accessories

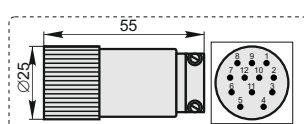
C9

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



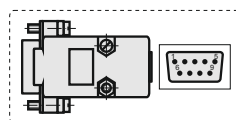
C12

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



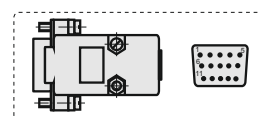
D9

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



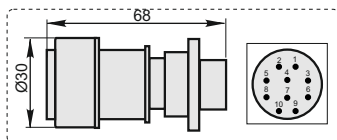
D15

15-pins flat connector for connection to DRO CS3000 and CS5500 Only for **A170H-F**



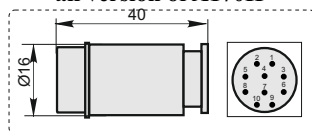
ONC

10-pin round connector for all version of **A170H**



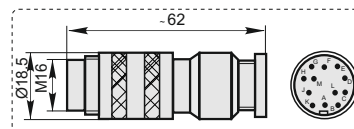
RS 10

10-pin round connector for all version of **A170H**



B 12

12-pin round connector for all version of **A170H**



◆ Order form

A170H - X - XXXXXX/XXXXX - XX - X - X - X - XX / X

Output signals version: A, AV or F	Pulse number per revolution: 18000, 360000	(Optional) Line number on disc (z) 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.	Mounting type: P - clamp H - screw	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
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Order example: **A170H-F-360000/36000-K-25-S-AR01/C12;**
A170H-F-360000-K-25-C-AR01/C12