






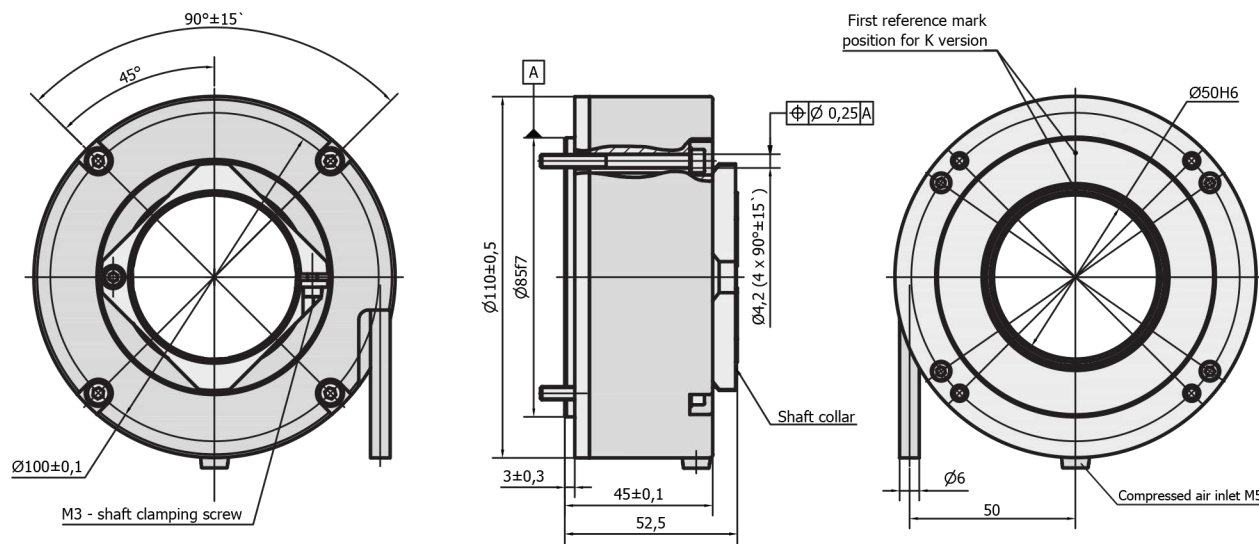
PHOTOELECTRIC ANGLE ENCODER

A110H

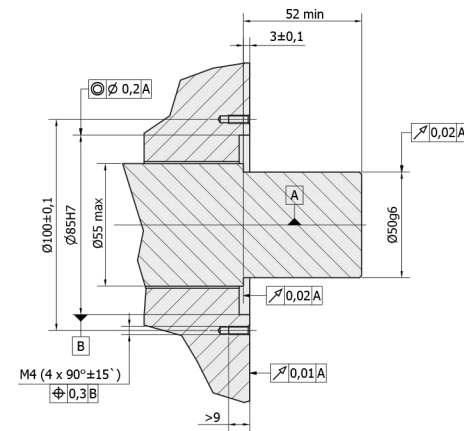
-  Analog output signals
-  High Resolutions
-  High precision
-  Distance Coded reference mark
-  Hollow Shaft



A110H is a photoelectric hollow shaft angle encoder that produces up to 1.800.000 output pulses per revolution and has the accuracy of ±5 arc. sec.



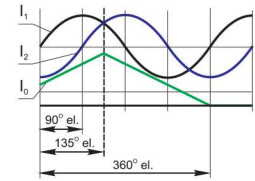
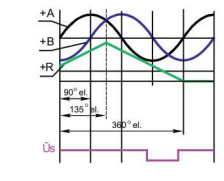
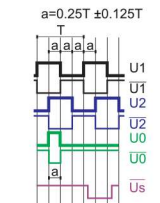
MOUNTING REQUIREMENTS



MECHANICAL DATA

Line number on disc (Z)	18000	Permissible shaft runout:	
Number of output pulses per revolution	Z x k, where k = 1, 2, 3, 4, 5, 8, 10, 20, 25, 50, 100 (k - interpolation factor)	- axial	0,02 mm
		- radial	0,05 mm
Reference signal:		Starting torque at 20°C	≤ 0,08 Nm
- standard (S)	One per shaft revolution	Rotor moment of inertia	< 0,6 × 10 ⁻⁴ kgm ²
- distance-coded (K)	36 per shaft revolution	Protection (IEC 529)	IP64
Permissible mech. speed	≤ 3000 rpm	Maximum weight without cable	1,2 kg
Max. operating speed (depends on number of output pulses)	600 to 1000 rpm	Operating temperature	0...+70 °C
		Storage temperature	-30...+85°C
Accuracy grades:	±5,0 arc. sec	Maximum humidity (non condensing)	98 %
		Permissible vibration	≤ 100 m/s ²
		Permissible shock (6 ms)	≤ 300 m/s ²

ELECTRICAL DATA

Version	A110H-A ~ 11 µApp	A110H-AV ~ 1 Vpp	A110H-F TTL
Supply voltage (U _p)	+5 V ± 5%	+5 V ± 5%	+5 V ± 5%;
Max. supply current (without load)	100 mA	120 mA	120 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/U1̄ and U2/U2̄. 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. Signals magnitude at 120 Ω load - R = 0.2-0.8 V (usable component)	One differential square-wave U0/U0̄ per revolution. Signal levels at 20 mA load current: - low (logic "0") < 0.5 V - high (logic "1") > 2.4 V
Fault detection signal Ūs	- - no error occur - error occur	one square-wave pulse high low	one square-wave pulse high low
Maximum operating frequency	(-3 dB) ≥ 160 kHz	(-3 dB) ≥ 180 kHz	160-2000 kHz (depends on interpolation factor)
Direction of signals	I ₂ lags I ₁ for clockwise rotation (viewed from shaft side)	+B lags +A for clockwise rotation (viewed from shaft side)	U2 lags U1 with clockwise rotation (viewed from shaft side)
Maximum 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
Output signals			

Note:

- Maximum working rotation speed (with proper encoder counting) is limited by maximum operating frequency and maximum mechanical rotation speed.
- If cable extension is used, power supply conductor cross-section should not be smaller than 0.5 mm².

ACCESSORIES

CONNECTORS FOR CABLE	B12 12-pin round connector	C9 9-pin round connector	C12 12-pin round connector	D9 9-pin flat connector	D15 15-pin flat connector	RS10 10-pin round connector	ONC 10-pin round connector
DIGITAL READOUT DEVICES			CS3000			CS5500	
COUPLING				SC70			
EXTERNAL INTERPOLATOR				NK			

ORDER FORM

A110H - X1 - X2 - X3 - X4/X5				
Output signal version (X1):	Pulse number per revolution (X2):	Reference signal (X3):	Cable Length (X4):	Connector type (X5):
A AV F	18000 ... 1800000*	S - one per revolution K - 36 per revolution, distance-coded	AR01 - 1m AR02 - 2m AR03 - 3m	W - without connector B12 - round, 12 pins C9 - round, 9 pins C12 - round, 12 pins D9 - flat, 9 pins D15 - flat, 15 pins RS10 - round, 10 pins ONC - round, 10 pins
*only F signal version for >18000 pulses				
ORDER EXAMPLE: 1) A110H-A-18000-K-AR01/W-0				