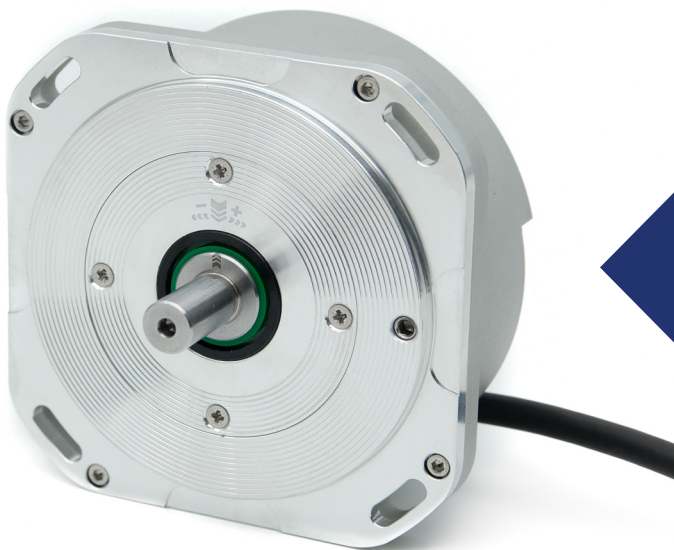


AK110

ABSOLUTE OPTICAL ANGLE ENCODER



ENCODER MANUAL

Absolute angle optical encoder AK110 is a high-end device that enables high accuracy angular measurement up to $\pm 5''$. Encoder design with integral bearings, solid $\varnothing 10$ mm shaft for a separate shaft coupling makes it ideal for demanding applications such as machine tools.

COMPLETE DELIVERY SET

DESCRIPTION	QUANTITY, PCS.
Standard:	
Absolute optical angle encoder	1
Operating manual	1
On option:	
Connector: D9, D15, C17, B12	1
Removable cable	1
ORDER SEPARATELY	ORDER CODE
SC70	E0255 ($D_1=10 / D_2=10$)
SC98-1 coupling	E035 ($D_1=10$)
SC98-2 coupling	E045 ($D_1=10$)

SPECIFICATIONS

SYSTEM SPECIFICATIONS	
Measuring standard	Glass scale with absolute track and incremental track (16 384 lines)
System accuracy ¹⁾	$\pm 5''$



MECHANICAL DATA

Shaft	Solid shaft 10 mm
Moment of inertia	50×10^{-6} kgm ²
Starting torque	≤ 0.02 Nm
Maximum mechanical speed	≤ 3000 rpm
Permissible shaft load:	
- axial	30 N
- radial (at shaft end)	30 N
Vibrations (55 Hz to 2000 Hz)	≤ 200 m/s ²
Shock (6 ms)	≤ 200 m/s ²
Operating temperature	0°C - 60°C
Storage temperature	-20°C - 60°C
Ingress Protection (EN 60529)	IP64
Mass (without cable)	~ 1 kg

ELECTRICAL DATA

Electrical Interface ¹⁾	SSI	BISS-C
Resolution (positions per turn)	up to 26 bits (67 108 864 positions)	
Clock frequency	≤ 4 MHz	≤ 10 MHz
Calculation time	≤ 5 us	≤ 5 us
Additional output signals	1 Vpp: 16 384 pulses/turn	Optional ²⁾

1) Select when ordering.

2) Contact the manufacturer.

ELECTRICAL SPECIFICATIONS

Electrical connection¹⁾:

Version S: standard cable outlet
Version C: detachable cable outlet

Supply voltage¹⁾:

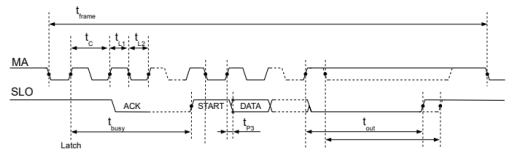
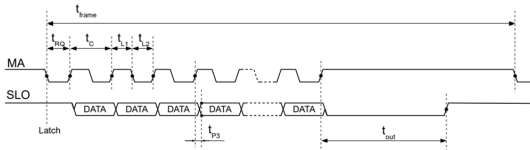
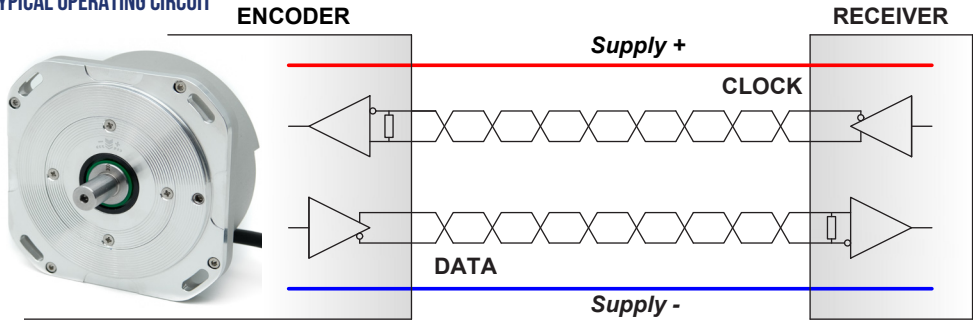
DC 5 V
DC 10...30 V

Current consumption

Max 200 mA

1) Select when ordering.

TYPICAL OPERATING CIRCUIT

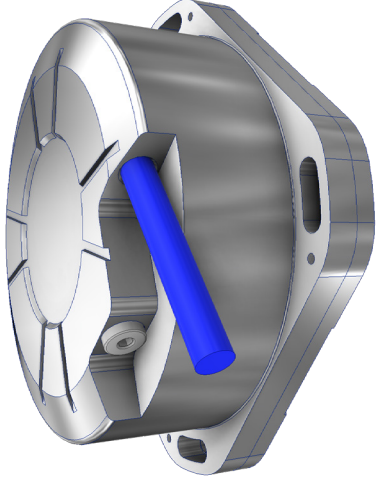


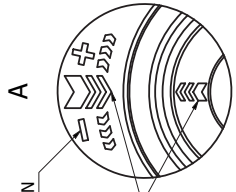
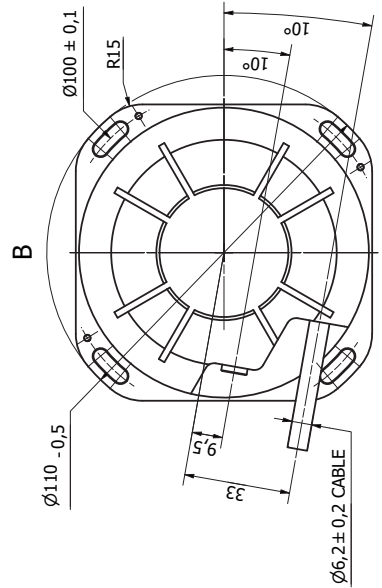
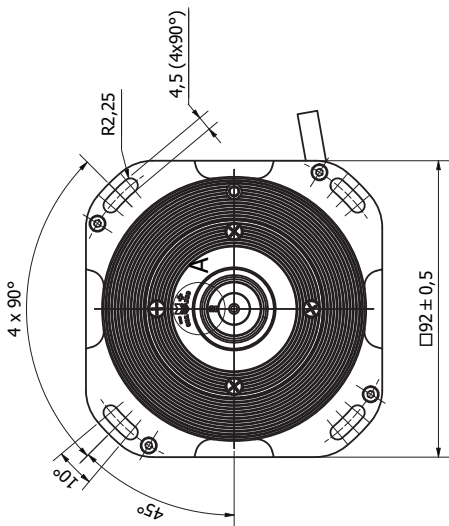
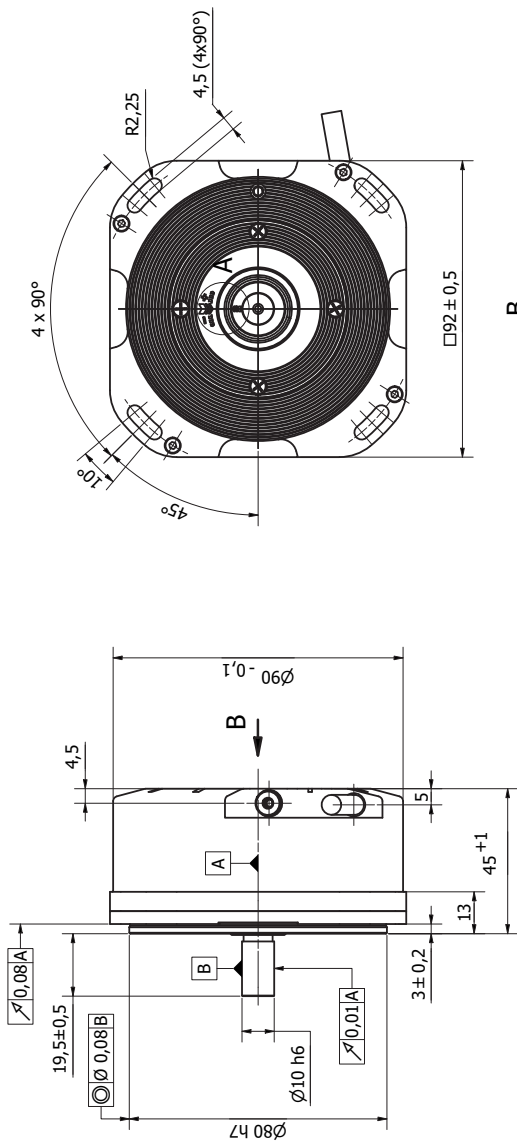
SYMBOL	PARAMETER	MIN	MAX	UNIT
tC	Permissible Clock Period	250		ns
tL1	Clock Signal Hi-Level Duration	125	tout	ns
tL2	Clock Signal Lo-Level Duration	125	tout	ns
tRQ	Request Time	500		ns
tP3	Output Propagation Delay		50	ns
tout	Slave Timeout	20	21	us
tFrame	Permissible Frame Repetition	tout+bit	indefinite	

SYMBOL	PARAMETER	MIN	MAX	UNIT
tC	Permissible Clock Period	100		ns
tL1	Clock Signal Hi-Level Duration	40	tout	ns
tL2	Clock Signal Lo-Level Duration	40	tout	ns
tbusy	Minimum Data Output Delay		2tC	
tbusy	Maximum Data Output Delay		400	ns
tP3	Output Propagation Delay		50	ns
tout	Slave Timeout	0.16	21	us
tFrame	Permissible Frame Repetition	tout+bit	indefinite	

AK110 VERSION S

AK110 is an absolute angle encoder with integrated bearing. Its design requires a separate shaft coupling to compensate axial movement as well as radial or angular misalignment between the shafts and prevent redundant encoder bearing loads.





COUNTING DIRECTION

MARK FOR ZERO POSITION $\pm 5^\circ$

Dimensions in mm



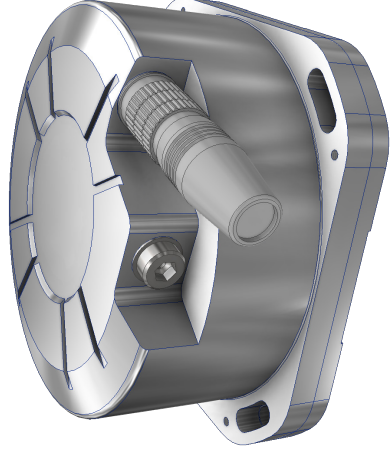
Tolerancing ISO 2768-m

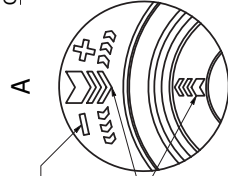
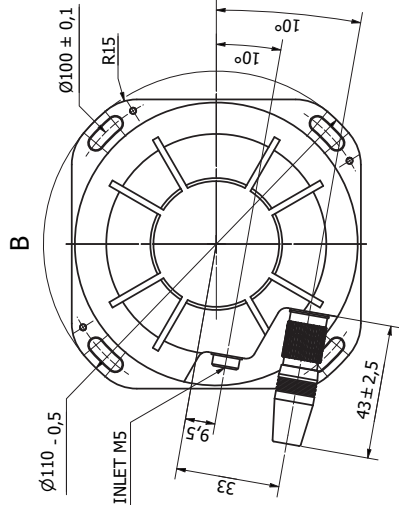
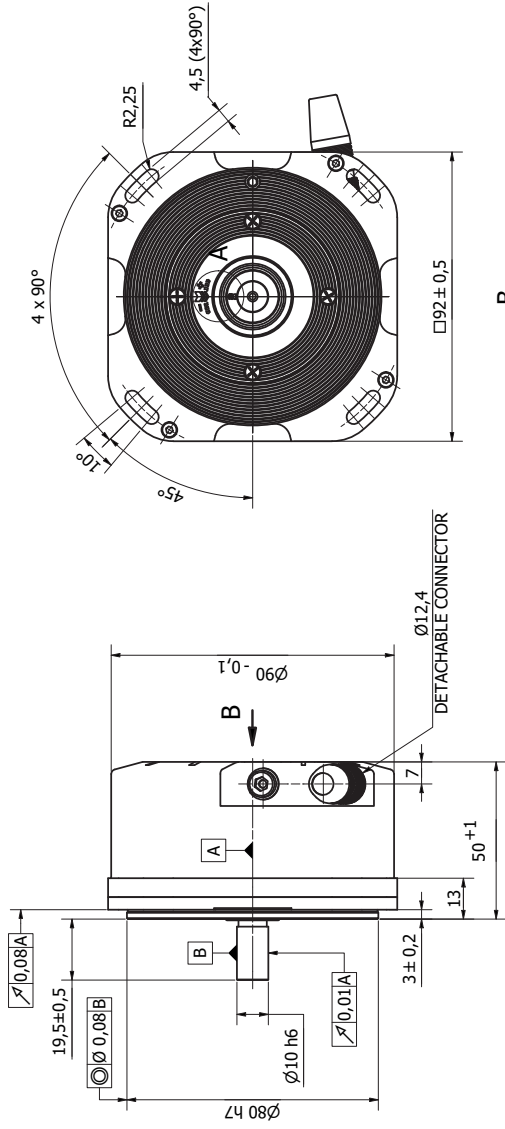
MECHANICAL DIMENSIONS OF AK110 VERSION S

AK110 VERSION C

AK110 is an absolute angle encoder with integrated bearing. Its design requires a separate shaft coupling to compensate axial movement as well as radial or angular misalignment between the shafts and prevent redundant encoder bearing loads.

Electrical connection outlet (version C) with a detachable cable with quick connector facilitates handling and makes the installation process more simple. It provides a possibility to disconnect the encoder or whole application from the communication cable lines of the facility.





Dimensions in mm
 Tolerancing ISO 2768-m

MECHANICAL DIMENSIONS OF AK 110 VERSION C

STORAGE AND HANDLING

IMPORTANT: the encoder is a precision device and requires appropriate means of storage and handling



Device transportation, handling and integration procedures must be performed in accordance with ESD requirements in order to avoid damage to the circuit. Do NOT touch electric circuits, connectors, wires or optical sensors without suitable ESD protection.

Do NOT use any unnecessary tools, handle carefully to avoid damage to the location faces when unpacking and installing.



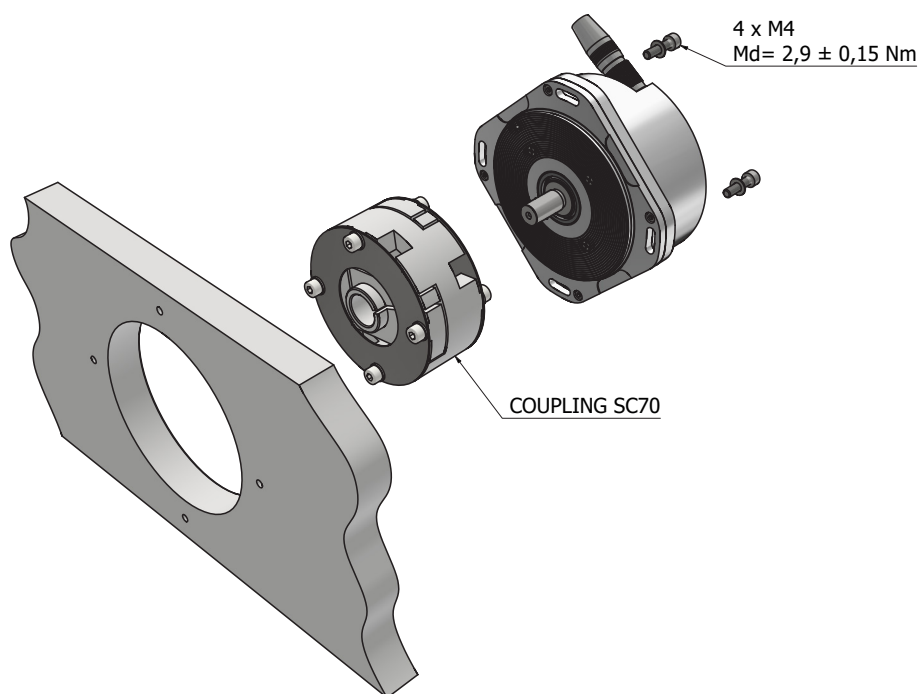
Make sure that the power supply is turned OFF before connecting the encoder.

INSTRUCTIONS FOR MOUNTING

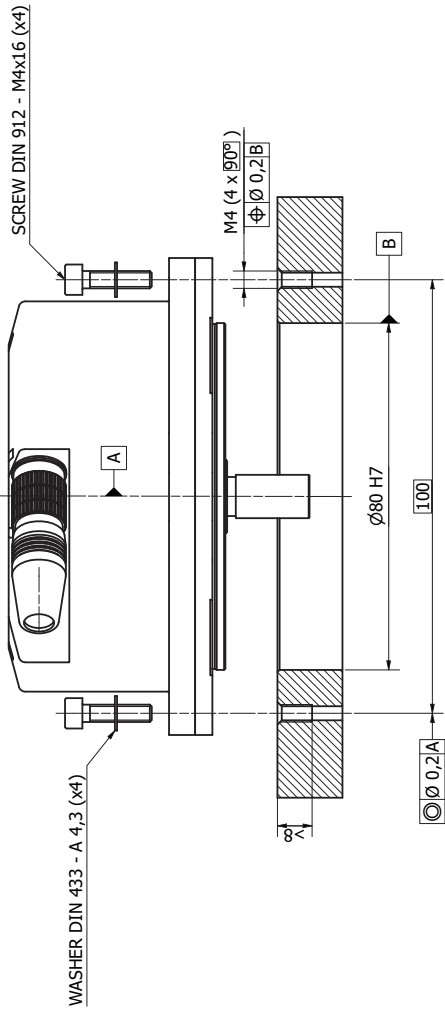
Warning! The encoder is a precision device and requires careful handling and keeping of mounting order described below:

1. The encoder is mounted through four fixing grooves in the flange via four screws M4. (fig.4)
2. The encoder is connected to the object shaft via coupling keeping the following requirements:
 - permissible radial play of object shaft not bigger than 0.05 mm;
 - permissible radial misalignment between encoder and object shaft on the length 50 mm not bigger than 0.06 mm.

MOUNTING OF ENCODER A110



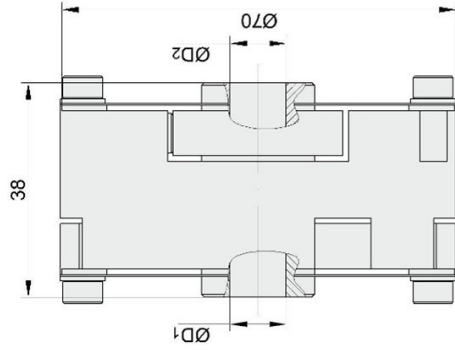
MOUNTING AK110



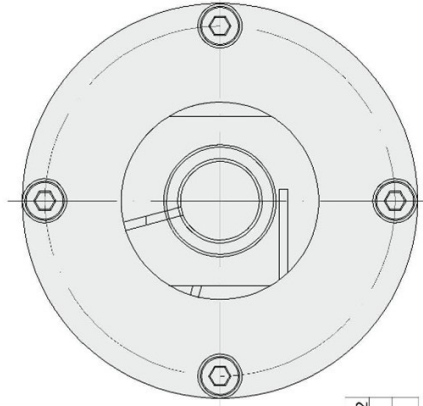
MOUNTING OF AK110

OPTIONAL ACCESSORIES

SC70 COUPLING

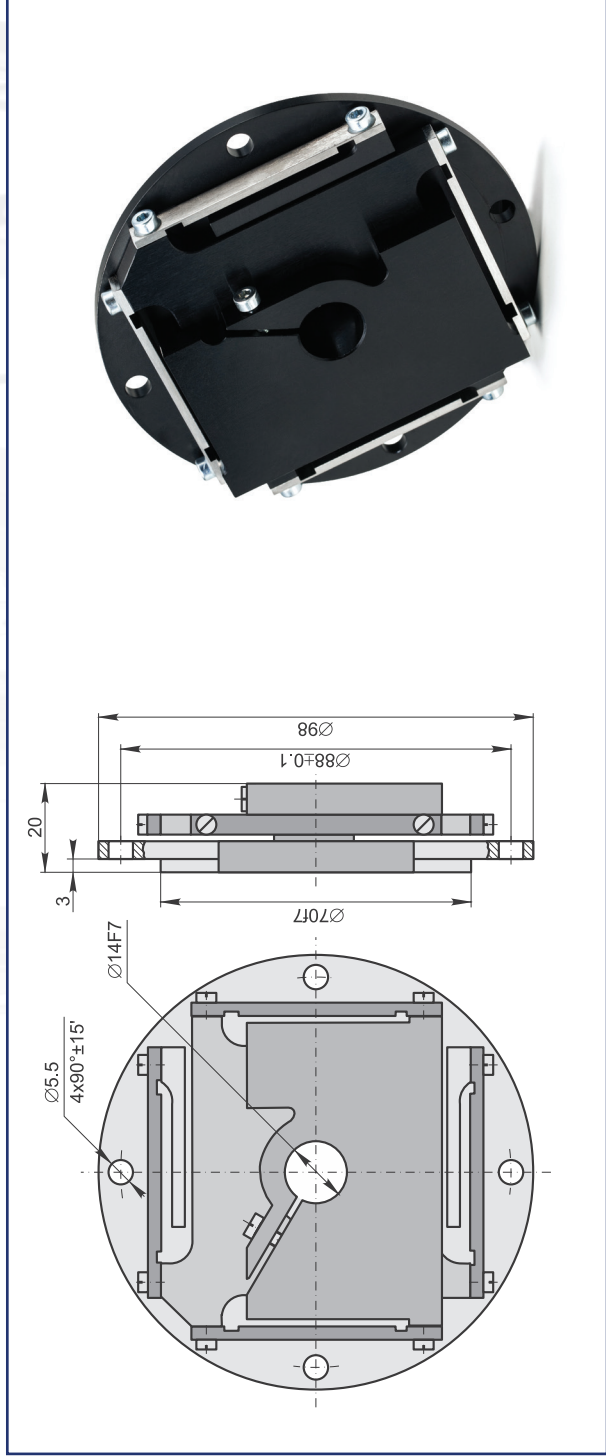


D1	D2
Ø10F7	Ø14F7

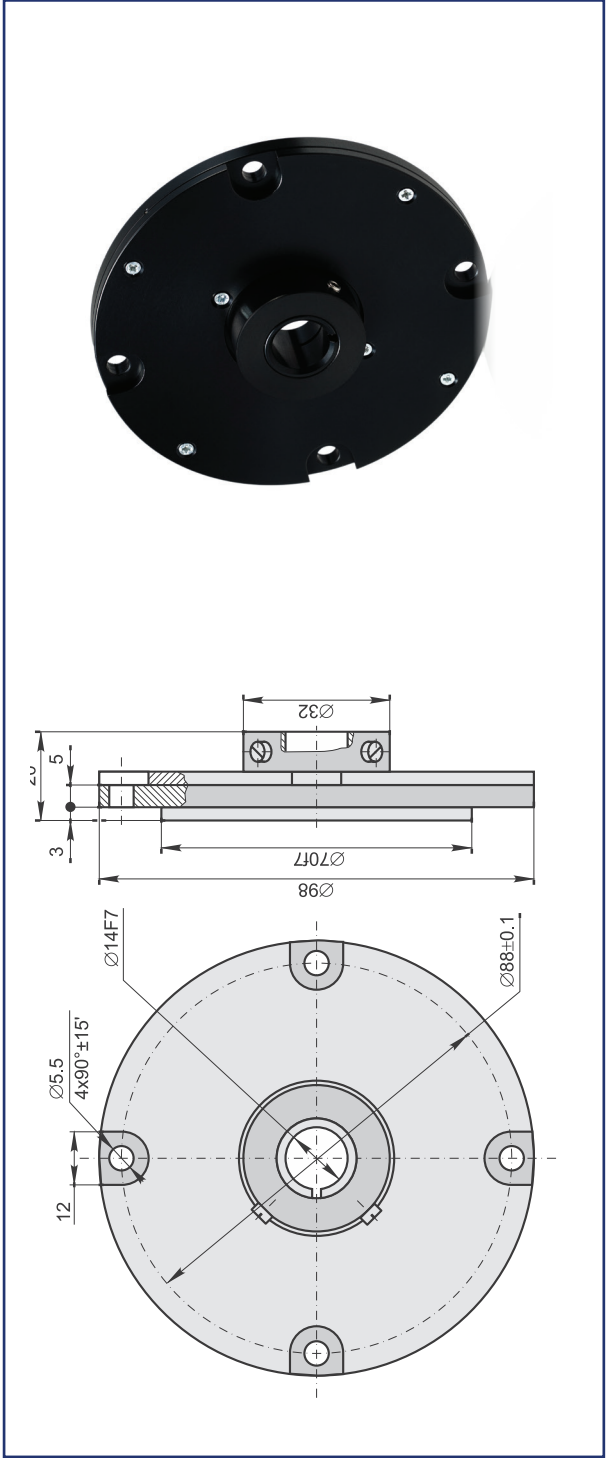


OPTIONAL ACCESSORIES

SC98-1 COUPLING



SC98-2 COUPLING



ELECTRICAL CONNECTION



ROUND CONNECTOR C17T, MALE



FLAT CONNECTOR D9/D15, MALE



ROUND CONNECTOR B12, MALE

ROUND CONNECTOR C17T, MALE

SSI + 1V_{pp} INTERFACE

Signal	A+	A-	B+	B-	DATA+	DATA-	CLOCK+	CLOCK-	+5V	0V	Sensor +5V	Sensor 0V	Shield
Color of cable wire	Pink	Grey	White	Brown	Green	Yellow	Blue - Red	Brown - Green	Red	Blue	Black	Violet	Connector housing
C17T	15	16	12	13	14	17	8	9	7	10	1	4	11

BISS C INTERFACE

Signal	A+	A-	B+	B-	DATA+	DATA-	CLOCK+	CLOCK-	+5V	0V	Sensor +5V	Sensor 0V	Shield
Color of cable wire	Pink	Grey	White	Brown	Green	Yellow	Blue - Red	Brown - Green	Red	Blue	Black	Violet	Connector housing
C17T	-	-	-	-	14	17	8	9	7	10	1	4	11

FLAT CONNECTOR D9/D15, MALE

SSI + 1V_{pp} INTERFACE

Signal	A+	A-	B+	B-	DATA+	DATA-	CLOCK+	CLOCK-	+5V	0V	Sensor +5V	Sensor 0V	Shield
Color of cable wire	Pink	Grey	White	Brown	Green	Yellow	Blue - Red	Brown - Green	Red	Blue	Black	Violet	Connector housing
D9	-	-	-	-	7	8	2	3	4	6	-	-	-
D15 (3 rows)	1	2	3	4	5	6	7	8	9	11	10	12	-

BISS C INTERFACE

Signal	A+	A-	B+	B-	DATA+	DATA-	CLOCK+	CLOCK-	+5V	0V	Sensor +5V	Sensor 0V	Shield
Color of cable wire	Pink	Grey	White	Brown	Green	Yellow	Blue - Red	Brown - Green	Red	Blue	Black	Violet	Connector housing
D9	-	-	-	-	7	8	2	3	4	6	-	-	-
D15 (3 rows)	1	2	3	4	5	6	7	8	9	11	10	12	-

ROUND CONNECTOR B12, MALE

SSI + 1V_{pp} INTERFACE

Signal	A+	A-	B+	B-	DATA+	DATA-	CLOCK+	CLOCK-	+5V	0V	Sensor +5V	Sensor 0V	Shield
Color of cable wire	Pink	Grey	White	Brown	Green	Yellow	Blue - Red	Brown - Green	Red	Blue	Black	Violet	Connector housing
B12	E	D	G	F	K	A	C	L	J	B	-	-	M

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MORE INFORMATION



You can find more information about Precizika Metrology encoder products on the official website: precizika.com/products

For more information about optical glass grating products refer to: precisionportal.eu



WARRANTY

The warranty term is 12 months from the day of encoder shipping.

The Manufacturer warrants within the warranty term to replace or repair faulty encoder free of charge on conditions that installation, operation and storage rules have been observed by Customer.

The Manufacturer warranty does not cover faulty encoder if encoder was installed improperly, not following Operating Instruction requirements, if during encoder operation mechanical and electrical parameters exceeded permissible values and if Customer individually repaired and disassembled the encoder.

The Manufacturer declines any responsibility for damages to people or properties deriving from the use of encoder, including any loss of profit or any other direct, indirect or incidental loss.



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