11.3 CZ*i* SENSOR

Name and drawing number

Name	Ordering number	Remarks			
		Number of teeth	Max. speed	Sensor ring	
				Inner diameter	Outer diameter
CZ*i* sensor 512	A860-2140-T411	512	15,000min^{-1}	ϕ82	ϕ102.8
CZ*i* sensor 768	A860-2140-T511	768	10,000min^{-1}	ϕ125	ϕ154
CZ*i* sensor 1024	A860-2140-T611	1024	8,000min^{-1}	ϕ160	ϕ205.2

Absolute maximum rating

Item	Specification
Power supply voltage	-0.5 to +7.0V
Operating temperature range	0 to +50°C
Humidity	95%RH or less

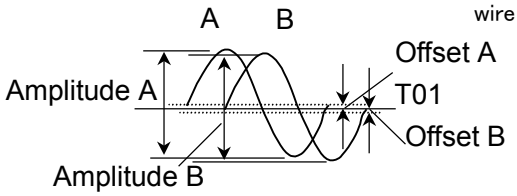
Electric specification

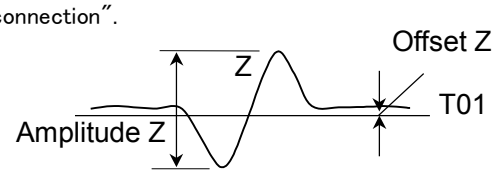
Item			Specification
Power supply voltage			5V±5%
Supply current			150mA or less
Output signals	VA,*VA VB,*VB	CZ*i* sensor 512	512λ/rev.
		CZ*i* sensor 768	768λ/rev.
		CZ*i* sensor 1024	1024λ/rev.
	VZ,*VZ	Common to all models	1λ/rev.

(Preamplifier output at ordinary temperatures and 500 min^{-1}.)

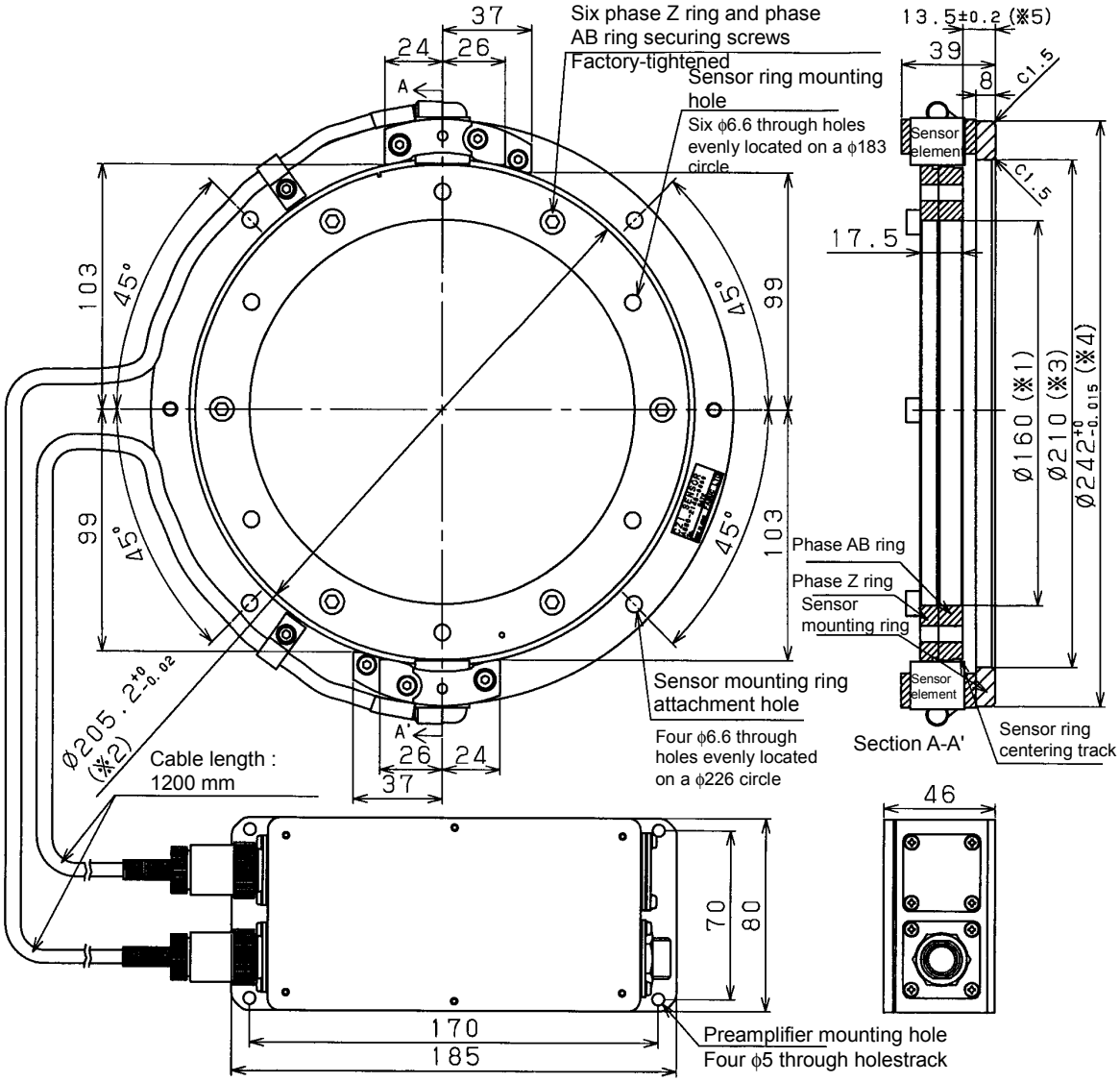
Signal name	Check pin	Output amplitude	Offset
Phase A Phase B	A (T01 reference) B (T01 reference)	1000±100mVp-p	±50mV
Phase Z	Z (T01 reference)	660 to 1650mVp-p	±50mV

For information on connector pins, see ″Specification of wire connection″.





CZ*i* sensor 1024
A860-2140-T611

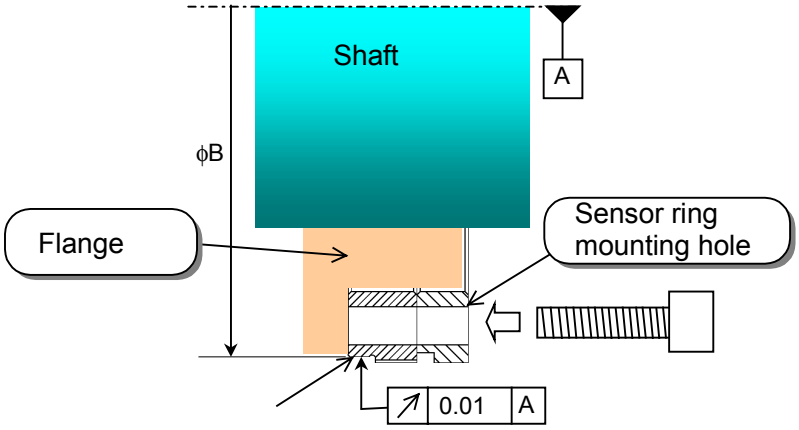


For details on mounting, see "Installation".

NOTE
- (*1) A positive tolerance is set for the inside diameter of the sensor ring.
  (*2) This value represents the outside diameter of the teeth surface of the sensor ring.
- (*3) A positive tolerance is set for the inside diameter of the sensor mounting ring.
  (*4) This value represents the outside diameter of the sensor mounting ring.
- (*5) This value represents the distance from the bottom of the sensor mounting ring to the bottom of the sensor ring.
- This equipment must be used at temperatures up to 50°C.
- Since the CZ*i* sensor is set in advance in combination with the ring and, sensor, and preamplifier, it must be treated as a integrated set.
- Since these are precision components, extreme caution must be taken to use them. In particular, do not apply external forces to the sensor elements.
- The detector is an electronic component. Dustproof and dripproof actions must be taken on the machine side to prevent chippings, oil, water, or other deleterious substances from being attached.
- The preamplifier box has water resistance equivalent to IP55. If cutting fluid is splashed continuously or it remains wet for an extended period of time, it may fail. Be careful to prevent cutting fluid from being splashed.
- Do not apply a vibration more that 1 G to the preamplifier box.
- Be sure to connect the shield cable. Ground the preamplifier box to a grounding terminal or the machine body.

Attachment
Attaching the sensor ring

Provide a flange on the shaft side and then attach the sensor ring in the axis direction using the sensor ring attachment hole. Secure it after performing centering so that the swing relative to the rotation center is 10 μm or less by using the centering track.

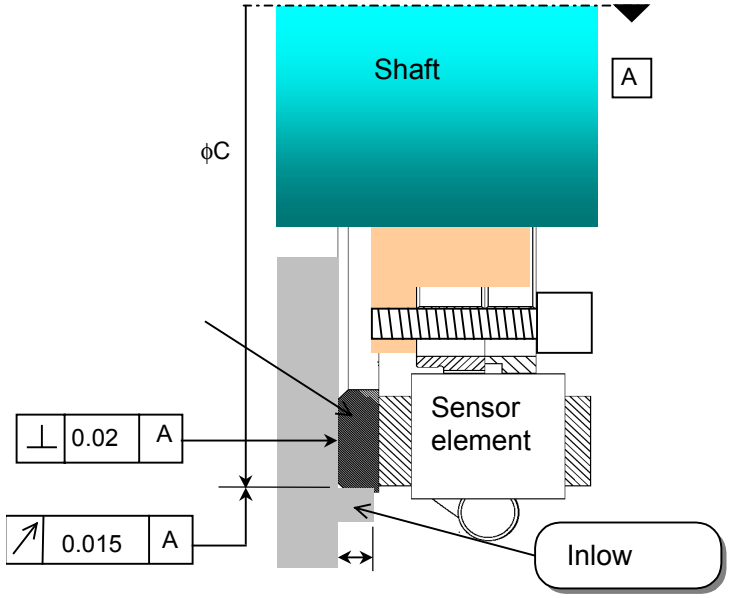


Specification	Outside diameter of the centering track (ϕB)	Sensor ring mounting hole position	Screw
A860-2140-T411	ϕ101	Six ϕ5.5 through holes evenly located on a ϕ92 circle	M5
A860-2140-T511	ϕ152.2	Six ϕ5.5 through holes evenly located on a ϕ140 circle	M5
A860-2140-T611	ϕ203.4	Six ϕ6.6 through holes evenly located on a ϕ183 circle	M6

NOTE
- Make design in such a way that the clearance between the outer surface of the flange and the inner diameter of the sensor ring is approximately 0.1 mm for centering.
- Secure the sensor ring using end face screwing instead of shrinkage fitting.
- The sensor ring consists of the phase Z ring and phase AB ring. Since it is secured by screws in advance, do not remove them. Since a countersunk hole is not provided, a machine must be designed so that the head of a screw is out of the way of it.
- To perform centering, be sure to use the centering track. (The outer surface of the phase Z ring and the teeth pitch circle do not have the same axis.) For centering, use a plastic hammer to prevent the teeth of a gear being damaged.
- Magnetic dust attached on the gear teeth may cause a detection error. Perform air blowing or the like upon completion of centering.

Attaching the sensor mounting ring

Provide an inlow on the machine side and then attach the sensor mounting ring by engaging the outer surface of the sensor mounting ring in the inner surface of the inlow. (The sizes related to the inlow parts on the machine side must meet the conditions shown below so that the detection accuracy is not degraded.) When securing it by screws, push the mounting ring from the CN1 sensor side against the inlow and then secure it as shown in the following figure. After securing it, use a feeler gage or other tool to verify that the gap between the sensor ring and the sensor is greater than 0.08 mm.

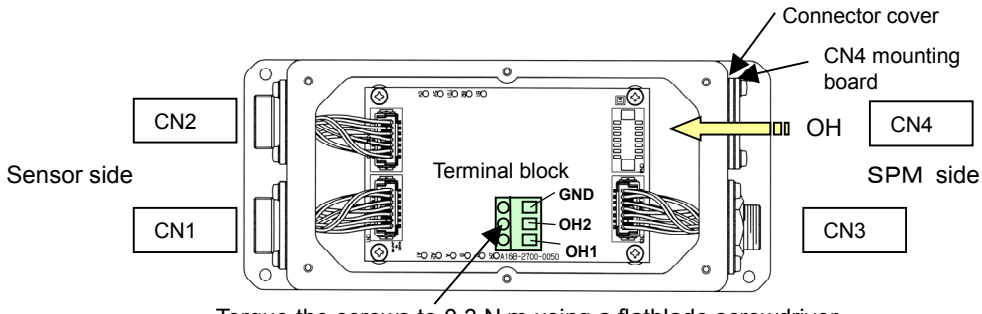


Specification	Outside diameter of the sensor mounting ring	Inside diameter of the inlow (ϕC)	Height of the inlow (D)	Distance from the bottom of the sensor mounting ring to the bottom of the sensor ring (E)
A860-2140-T411	$\phi 140^{+0}_{-0.015}$	$\phi 140^{+0.015}_{-0}$	5.5 or less	11.5±0.2
A860-2140-T511	$\phi 190^{+0}_{-0.015}$	$\phi 190^{+0.015}_{-0}$	7.5 or less	13.5±0.2
A860-2140-T611	$\phi 242^{+0}_{-0.015}$	$\phi 242^{+0.015}_{-0}$	7.5 or less	13.5±0.2

NOTE
- Provide an inlow, if possible, on the machine side and engage the sensor mounting ring to the inlow. Do not tap the outer surface of the sensor mounting ring for centering.

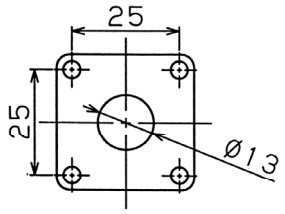
Connecting an OH cable

Open the lid of the preamplifier box and then remove the connector cover on the CN4 side. Draw the OH cable from the CN4 side and then connect it to the terminal block on the printed circuit board.



Torque the screws to 0.3 N·m using a flatblade screwdriver.

The cable clamp for an OH cable must be prepared by the user. To fix the cable clamp, use the CN4 connector attachment board.
Recommended cable clamp: SKINTOP ST-7 of LAPP CABLE
Outside diameter of an OH cable: ϕ5.2±0.3
Diameter of the holes in the CN4 connector attachment board: ϕ13



CN4 connector attachment

NOTE
- Since the sensor, preamplifier, and sensor ring are integrally adjusted, these components must be treated as a single component. In addition, since the variable resistor on the board within the preamplifier is adjusted in advance, the resistor value must not be changed.
- "CN1" (black) and "CN2" (blue) is marked in the connector section on the sensor side. The appropriate connectors must be connected as shown in the figure above.

Checking output signals

When checking output signals, see "Electric specification" (output signals do not need to be adjusted).

- When checking a waveform without connecting to the SPM, supply power to the 0 V and 5 V pins.
- The shape of the lissajous for A/B phase output signals is a perfect circle

