

ERN 10xx/ ERN 11xx/ ROD 10xx/ ROD 11xx Mounting Instructions

Rotary encoder consists of high-precision components. Exercise sufficient caution when handling the encoder.

[1] General Instructions

- To prevent damage to the encoder, never attempt to drop or hit the encoder against a hard object, and never attempt to hang the encoder holding the cable.
- Verify that you received your order.
Identify the specification on the nameplate of the encoder.



Model	ROD1xxx : Shaft Type	ERN1xxx : Hollow Shaft Type/Through Shaft Type
Output	TTL : Line Driver	HTL : Complementary OC : Open Collector

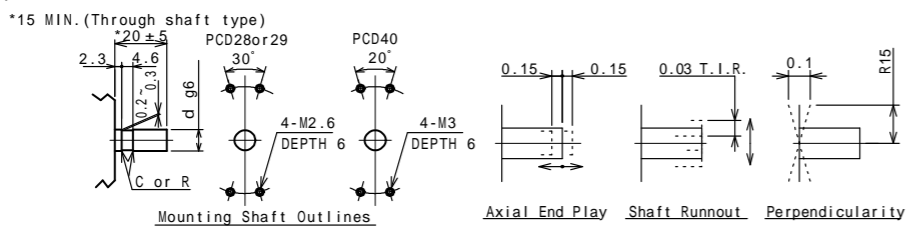
- Prepare the following items before use.
 - Power supply with 5% maximum ripple. (including noise)
Current Requirement (NO load): ≤70mA
Calculate proper power supply capacity based on the load to be used.
 - Receiver corresponding to the output of the encoder.
e.g., Line receiver IC corresponding to the line driver IC.
- Additional processing (filing, processing of shaft diameter, etc.) of the shaft end must not be done, for there is a possibility of damaging inside. Additional work could damage the inside of the encoder.
- Pay attention to the following points when storing.
 - Encoder must be stored at a place free from dewing condensation.
 - Do not put encoder in a bag which produces a lot of static electricity. Encoder is stored in the antistatic bag when shipping.
 - Do not store encoder in a place where corrosive gas exists. Pay special attention to gas containing sulfur.

[2] Installation

1. ERN10xx/11xx Series

The encoder must be installed according to the following instructions.

- Be sure that mounted device meets the following specifications. Exceeding the allowance range could cause poor performance and failure to the encoder.



- Make sure that the following attachments are included.

	PCD28 or 29	PCD40
Coupling	1	—
Pan-head screw (M2.6x5, W, SW)	4	—
Hexagon socket set screws (1.5mm diagonal) M3x3	2	2

- Jig for installation (torque screwdriver is recommended)
PCD28 or 29
 - Cross slot screwdriver
 - Hexagon wrench size 1.5mm
 - Adhesive to fix screws (e.g., #1401 : ByThreeBond)
 - Center-Positioning jig (See the right figure. An easy-to-use center-positioning jig is available.)
 - Pan-head screw (M2.6x5,W,SW) 4 pieces

- PCD40
 - Cross slot screwdriver
 - Hexagon wrench size 1.5mm
 - Adhesive to fix screws (e.g., #1401 : ByThreeBond)
 - Pan-head screw (M3x5,W,SW) 4 pieces

- Installation of PCD28 or 29

Fix the coupling on the mounting surface with four pan-head screws (M2.6). When fixing, adjust the center core so that the misalignment between the mounting shaft and the coupling is less than 0.1mm. Make sure to apply the adhesive to the bolts in order to avoid loosening in operation.

[Torque for screw locking : 0.35 N·m (3.6 kgf·cm)]

Insert the encoder to the mounting shaft, and align the encoder mounting tabs with mounting holes on the motor, and fix the encoder on the coupling with four pan-head screws.

[Torque for screw locking : 0.35 N·m (3.6 kgf·cm)]

Fix the encoder shaft on the mounting shaft with two hexagon socket set screws without load on coupling.

[Torque for screw locking : 0.59 N·m (6 kgf·cm)]

- Installation of PCD40

Fix the coupling on the mounting surface with four pan-head screws (M3). Make sure to apply the adhesive to the bolts in order to avoid loosening in operation.

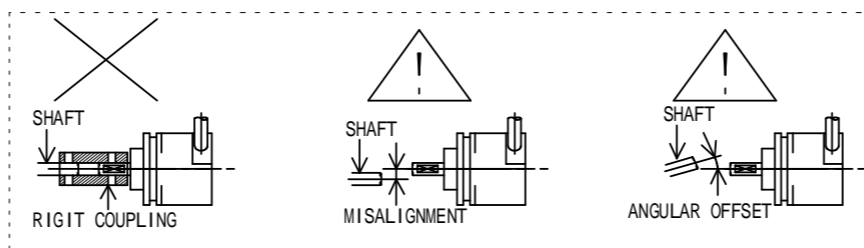
[Torque for screw locking : 0.59 N·m (6 kgf·cm)]

Fix the encoder shaft on the mounting shaft with two hexagon socket set screws without load on coupling.

[Torque for screw locking : 0.59 N·m (6 kgf·cm)]

2. ROD10xx/11xx Series

The encoder must be installed according to the following instructions.



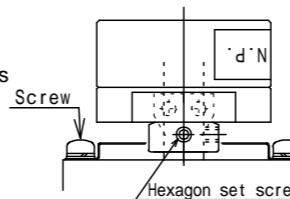
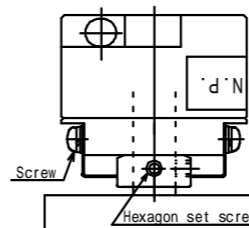
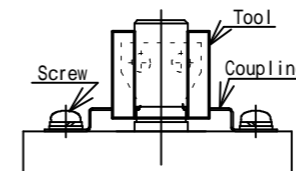
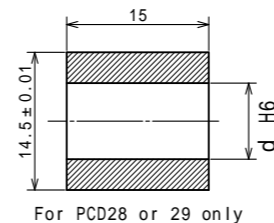
CAUTIONS

- The encoder must be securely fixed so that it will not be loosened due to machine vibration.
- Do not make the shaft connection with a rigid coupling.
- Do not hit pulley, gears or coupling when it is installed on the shaft. Excessive shock on the encoder could damage the inside of the encoder.
- When the shaft of the encoder is connected to the machine shaft, the load imposed on the shaft must not exceed the allowable range. Proper shaft misalignment is within 0.1mm (T.I.R.) and 0.5 ° angular offset.
- The weight of the coupling is included in the shaft load. A proper coupling must be selected to avoid misalignment. Apply screw locking adhesive to screws of a coupling to avoid loosening in operation.
- When the encoder shaft is connected with pulley or gears, pay attention to the radial load produced when rotating due to gear eccentricity and mass eccentricity.
- When the encoder shaft is connected to machine shaft, make sure to use a timing belt. Rotation angle will not be accurately transmitted by using any belt other than timing belt. Do not tense the belt too much, and ensure that the belt is free from loosening.

[3] Connections

The signal is output via shielded twisted pair cables. Incorrectly connecting could cause failure to the encoder.

Note) Fix the cable of ERN11xx Series with Plastic cover for no load on connector.



TTL with Commutation Signal		
PINNO.	Color	Signal
13	White	+5V
14	Black	0V
1	Red	Ua1
2	Pink	Ua1
3	Olive	Ua2
4	Blue	Ua2
5	Yellow	Ua0
6	Orange	Ua0
7	Beige	U
8	Brown	U
9	Green	V
10	Gray	V
11	Light Blue	W
12	Violet	W
15	Shield	FG

TTL Output		
PINNO.	Color	Signal
13	White	+5V
14	Black	0V
1	Red	Ua1
2	Pink	Ua1
3	Olive	Ua2
4	Blue	Ua2
5	Yellow	Ua0
6	Orange	Ua0
15	Shield	FG

Other output		
PINNO.	Color	Signal
13	White	Up
14	Black	0V
1	Red	Ua1
2	Pink	0V
3	Olive	Ua2
4	Blue	0V
5	Yellow	Ua0
6	Orange	0V
15	Shield	FG

Up=5V or 12-24V

CAUTIONS

- When touching the cable terminal directly by hand, remove the static electricity from your body.
- When the soldering iron or power tool is used, be sure to ground the tool.
- Do not bundle the cable with the line including many electric noises and do not put them in the same piping.
- Since the transmittable distance and response frequency change with the output circuit, make sure that there are no errors in transmission. In case of a long-distance transmission, a line driver output is recommended.
- Check that the voltage to be supplied to the encoder is correct and do not reverse + (Up) and - (0V) of the power supply. The supply voltage to the encoder must be within the rating range at the encoder. See nameplate for rated range of power voltage.
- Terminal block connection or connector connection are recommended to avoid loosening.
- Metallic box or metallic connector must be used to cover the connection point so that it may not be influenced by noises. Connecting should be done within a suitable protection structure under the environment where dewing condensation or dripping occurs.
- Use twist-pair shielded cable for cable extension. Relationship of signal pair accords under following pair:
a) Differential output (Line Driver output) : Up-0V, Ua1-Ua1, Ua2-Ua2, Ua0-Ua0
b) Single ended output (Voltage, Open Collector, Complementary output) : Up-0V, Ua1-0V, Ua2-0V, Ua0-0V
Since supply voltage is reduced when cable is extended, the thick extension cable must be used. Run a shield wire to the end of receiving circuit. Be sure that the shielded cable is not connected to Frame Gland at the relay point.
- Insulating must be done for unused output signal lines. Do not allow the other lines, the power supply or Frame Gland to touch the unused output signal lines. These conditions could cause failure to the encoder.
- Shielded wire of the encoder side is connected to the encoder body. Check if the shielded wire of the cable terminal is connected to Frame Gland.
- After the wiring was completed, check if the connection is correct. Incorrectly connecting could make encoder out of control.

[4] Limited Warranty

HEIDENHAIN warrants its products against defects in materials and workmanship under normal use and service for period of ONE (1) year from the date of original shipment.

[5] Information

Any questions are welcome to **HEIDENHAIN K.K.**

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