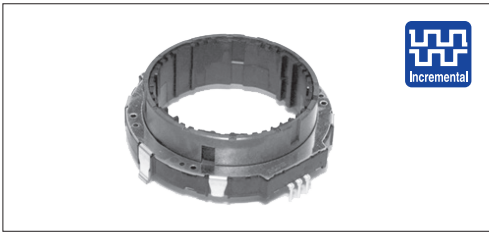


# EC50A 50mm Size Ring Type

Large encoder with 37mm inside diameter even takes a small LCD



## Typical Specifications

| Items                       | Specifications |
|-----------------------------|----------------|
| Rating                      | 1mA 5V DC      |
| Operating life              | 40,000 cycles  |
| Operating temperature range | -40°C to +85°C |

## Product Line

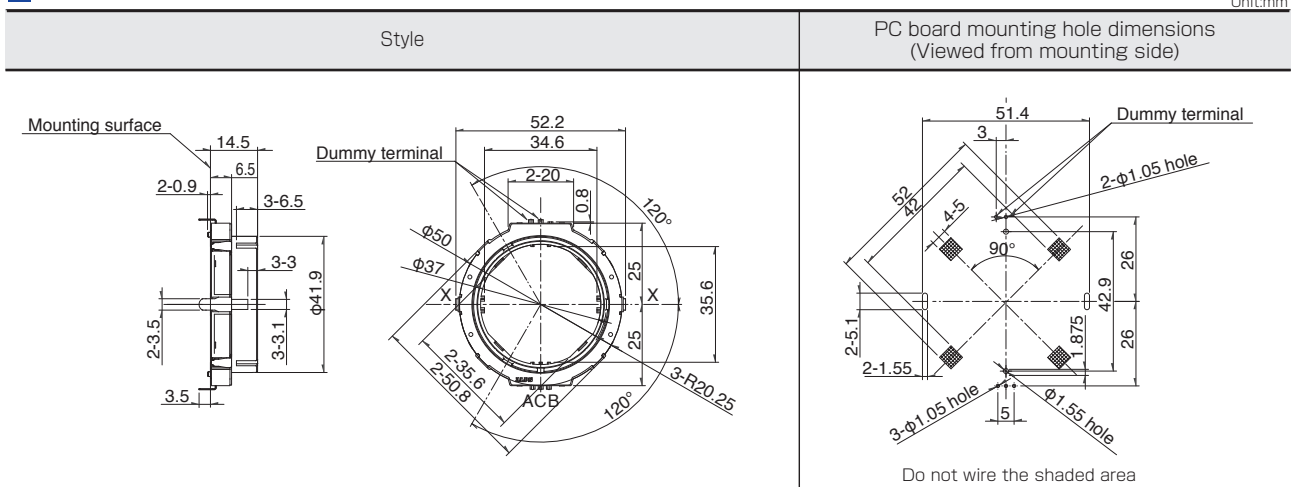
| Actuator length (mm) | Detent torque (mN·m) | Number of detent | Number of pulse | Minimum order unit (pcs.) |        | Product No.         |
|----------------------|----------------------|------------------|-----------------|---------------------------|--------|---------------------|
|                      |                      |                  |                 | Japan                     | Export |                     |
| 14.5                 | 40±14                | 18               | 9               | 200                       | 400    | <b>EC50A0920404</b> |

## Packing Specifications

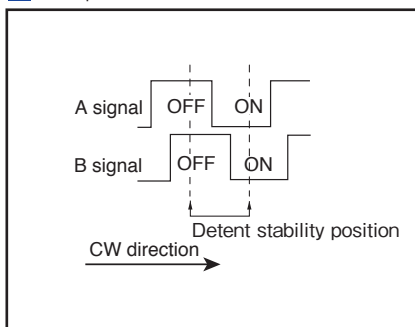
Tray

| Number of packages (pcs.) |                        | Export package measurements (mm) |
|---------------------------|------------------------|----------------------------------|
| 1 case /Japan             | 1 case /export packing |                                  |
| 200                       | 400                    | 360×540×290                      |

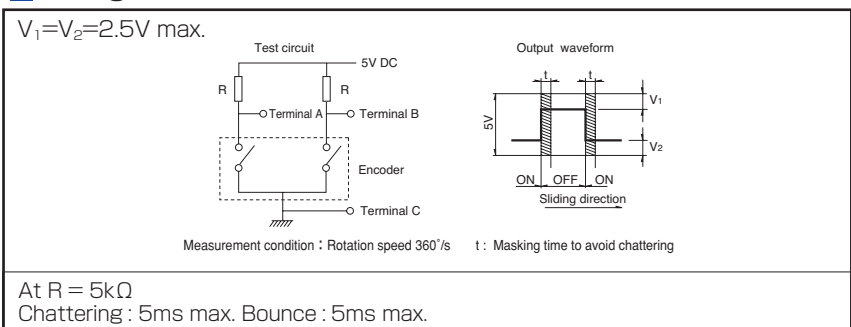
## Dimensions



## Output Wave











## Sliding Noise



# Encoders

## List of Varieties

| Type                                  |   | Ring type   |   |   |   |
|---------------------------------------|---|---|---|---|---|
|                                       |   | 40mm size   | 45mm size   | 50mm size   | 60mm size   |
| Series                                |   | <b>EC40A</b>  | <b>EC45A</b>  | <b>EC50A</b>  | <b>EC60B</b>  |
| Photo                                 |   |  |  |  |  |
| Output                                |   | Incremental<br>(Two phase A and B)  | Absolute type   | Incremental<br>(Two phase A and B)  |   |
| Shaft types                           |   | Ring type   |   |   |   |
| Number of pulse /<br>Number of detent |   | 15/30   | 31 positions  | 9/18  | 15/30   |
| Dimensions<br>(mm)                    | W   | 40.4  | 44.5  | 50.8  | 62.4  |
|                                       | D   | 43  | 45  | 50  | 60  |
|                                       | H   | 9   |   | 6.5   | 7.5   |
| Operating temperature range           |   | -40°C to +85°C  |   |   |   |
| Operating life                        |   | 30,000 cycles   |   | 40,000 cycles   |   |
| Automotive use                        |   | ●   | ●   | ●   | ●   |
| Life cycle (availability)             |   |  |  |  |  |
| Electrical<br>performance             | Rating  | 0.5mA 5V DC   |   | 1mA 5V DC   | 10mA 5V DC  |
|                                       | Max./min. operating<br>current (Resistive load) | —   | —   | —   | —   |
|                                       | Insulation resistance                           | 10MΩ min. 50V DC  |   | 10MΩ min. 250V DC   | 100MΩ min. 250V DC  |
|                                       | Voltage proof                                   | 50V AC for 1 minute   | 50V AC for 1 minute or 60V AC for 2s  |   | 300V AC for 1 minute<br>or 360V AC for 1s   |
| Mechanical<br>performance             | Detent torque                                   | 20±11mN·m<br>40±16mN·m  | 36±16mN·m   | 40±14mN·m   | 40±10mN·m   |
|                                       | Push-pull<br>strength                           | Push  | 100N  |   |   |
|                                       |   | Pull  | 50N   |   | 100N  |
| Shaft configuration                   |   | Ring type   |   |   |   |
| Terminal type                         |   | Insertion   |   |   |   |
| Switch<br>Specifications              | Switch type                                     | —   | —   | —   | —   |
|                                       | Contact<br>arrangement                          | —   | —   | —   | —   |
|                                       | Travel (mm)                                     | —   | —   | —   | —   |
|                                       | Operating force (N)                             | —   | —   | —   | —   |
|                                       | Switch ON position                              | —   | —   | —   | —   |
|                                       | Rotational torque                               | —   | —   | —   | —   |
|                                       | Rating  | —   | —   | —   | —   |
|                                       | Contact resistance                              | —   | —   | —   | —   |
|                                       | Operating life                                  | —   | —   | —   | —   |
| Page                                  |   | 303   | 304   | 305   | 306   |

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 Encoders Cautions . . . . . 308

**Note**  
 ● Indicates applicability to all products in the series.

## Reference for Manual Soldering

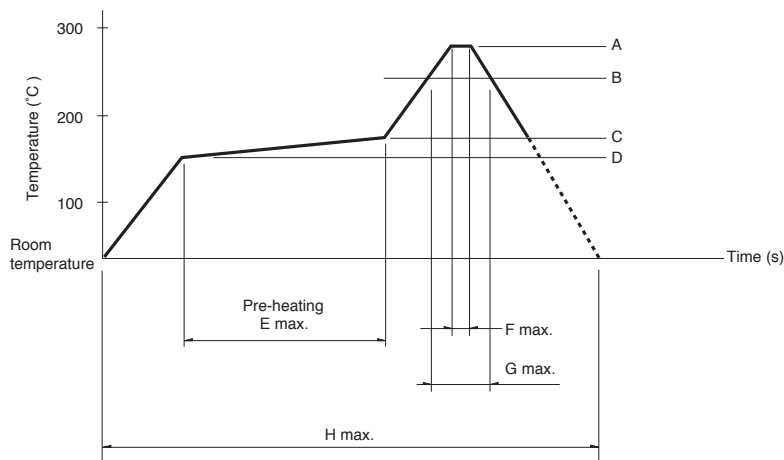
| Series  | Tip temperature | Soldering time                 | No. of solders |
|---|-----------------|--------------------------------|----------------|
| <b>EC05E, EC09E, EC10E, EC111, EC11B, EC11E, EC11G, EC11K, EC12D, EC12E, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC40A, EC45A, EC50A, EC60B, EM11B, EM20B, EC21C</b> | 350°C max.      | 3s max.                        | 1 time         |
| <b>EC11J</b>  | 350±10°C        | 3 <sup>+1</sup> <sub>0</sub> s | 2 time         |

## Reference for Dip Soldering

| Series   | Preheating                    |              | Dip soldering         |                | No. of solders |
|--|-------------------------------|--------------|-----------------------|----------------|----------------|
|  | Soldering surface temperature | Heating time | Soldering temperature | Soldering time |                |
| <b>EC09E, EC11B, EC111, EC11E, EC11G, EC11K, EC18A, EC21A, EC28A, EC35A, EC35AH, EC35B, EC50A, EC60B</b> | 100°C max.                    | 2 min. max.  | 260±5°C               | 5±1s           | 2 time max.    |
| <b>EC10E, EC12D, EC12E, EM11B</b>  | 100°C max.                    | 1 min. max.  | 260±5°C               | 3±1s           | 2 time max.    |
| <b>EC40A</b>   | 110°C max.                    | 1 min. max.  | 260°C max.            | 10s max.       | 1 time         |
| <b>EC45A</b>   | 100°C max.                    | 2 min. max.  | 260°C max.            | 5s max.        | 2 time max.    |
| <b>EM20B</b>   | 80°C max.                     | 1 min. max.  | 260°C max.            | 3s max.        | 2 time max.    |

## Example of Reflow Soldering Condition

Temperature profile



| Series       | A              | B          | C     | D     | E           | F  | G          | H           | No. of reflows |
|--------------|----------------|------------|-------|-------|-------------|----|------------|-------------|----------------|
| <b>EC11J</b> | 260°C          | 230°C      | 180°C | 150°C | 2 min. max. | 3s | 40s        | 4 min. max. | 2 time max.    |
| <b>EC05E</b> | 250°C min.     | 230°C min. | 180°C | 150°C | 60s to 120s | —  | 30s to 40s | —           | 2 time max.    |
| <b>EC21C</b> | 230°C to 245°C | 220°C      | 200°C | 150°C | 60s to 120s | —  | 25s to 60s | 300 max.    | 1 time max.    |

### 注記

- When using an infrared reflow oven, solder may sometimes not be applied. Be sure to use a hot air reflow oven or a type that uses infrared rays in combination with hot air.
- The temperatures given above are the maximum temperatures at the terminals of the encoder when employing a hot air reflow method. The temperature of the PC board and the surface temperature of the encoder may vary greatly depending on the PC board material, its size and thickness. Ensure that the surface temperature of the encoder does not rise to 250°C or greater.
- Conditions vary to some extent depending on the type of reflow bath used. Be sure to give due consideration to this prior to use.