

SERIES: C14 | **DESCRIPTION:** PANEL MOUNT ENCODER

FEATURES

- 2-bit quadrature output
- compact
- rugged metal design
- 1 million cycle life
- multiple termination options
- IP65 rating option
- plastic shaft options available for medical applications


ELECTRICAL

| parameter | conditions/description | min | typ | max | units |
|-------------------|----------------------------------------------------------------------------|-------|-------|-------|-------|
| power supply | 3.3Vdc input models | 3.168 | 3.3 | 3.432 | Vdc |
| | 5Vdc input models | 4.75 | 5 | 5.25 | Vdc |
| supply current | 3.3Vdc input models | | | 40 | mA |
| | 5Vdc input models | | | 20 | mA |
| output | open collector | | | | |
| output code | 2-bit quadrature, channel A leads channel B by 90° with clockwise rotation | | | | |
| power consumption | 3.3Vdc input models | | | 132 | mW |
| | 5Vdc input models | | | 100 | mW |
| output resolution | 4 ppr (16 cpr), 8 ppr (32 cpr) | | | | |
| angle of throw | 16 detent position models | | 22.5 | | ° |
| | 32 detent position models | | 11.25 | | ° |

PUSH SWITCH SPECIFICATIONS

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----------|-----|--------|
| rating | 12 Vdc at 50 mA | | | | |
| contact resistance | | | | 200 | mΩ |
| isolation voltage | for 1 minute | | 250 | | Vac |
| insulation resistance | | 100 | | | MΩ |
| operating push force | | 3.5 | 4.5 | 5.5 | N |
| travel | | 0.2 | 0.5 | 0.8 | mm |
| bounce | | | | 10 | ms |
| push switch life | | | 1,000,000 | | cycles |

ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------------------------------|-----|-----|-----|-------|
| operating temperature | | -10 | | 70 | °C |
| storage temperature | | -20 | | 80 | °C |
| vibration | 10-55Hz with a peak to peak amplitude of 1.5mm | | | | |
| shock | half sine wave for 11ms | | 50 | | G |
| cold test | at -20°C for 96 hours | | | | |
| heat test | at +80°C for 96 hours | | | | |

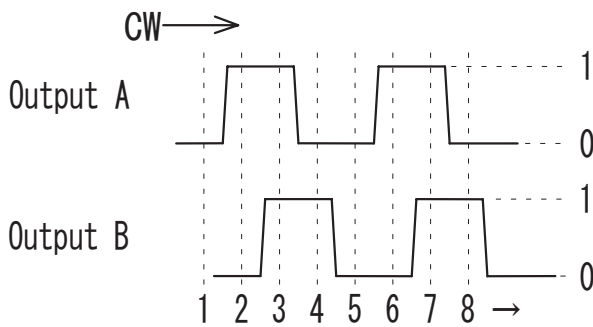
ENVIRONMENTAL (CONTINUED)

| parameter | conditions/description | min | typ | max | units |
|-------------------------|---------------------------------------|-----|-----|-----|-------|
| temperature change test | at -10~70°C for 30 minutes each | | | | |
| humidity test | at 40°C, 90~95% humidity for 96 hours | | | | |
| RoHS | yes | | | | |

MECHANICAL

| parameter | conditions/description | min | typ | max | units |
|--------------------|------------------------|-----|-----------|-----|--------|
| shaft load | radial | | | 10 | N |
| | axial | | | 15 | N |
| operational torque | without detent | 0.2 | 0.4 | 0.2 | N-cm |
| | with detent | | | 0.6 | N-cm |
| mounting torque | | | 100 | | N-cm |
| rotational life | | | 1,000,000 | | cycles |
| weight | | | 11 | | g |

OUTPUT WAVEFORMS



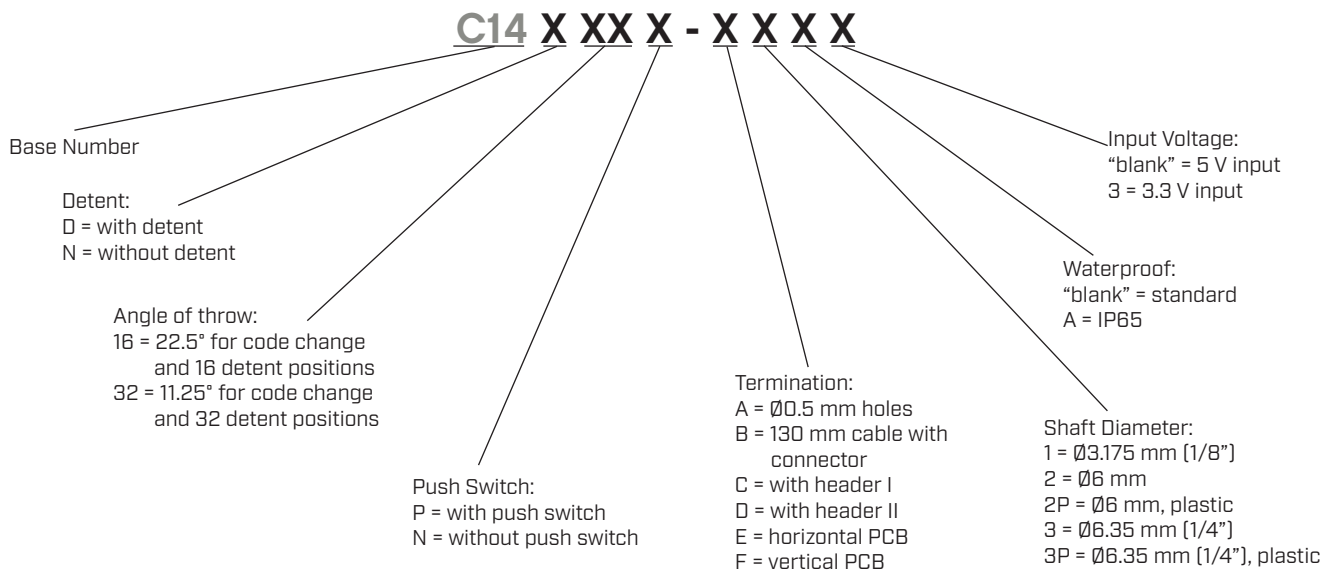
| Position \ Output | 1 | 2 | 3 | 4 | 5 |
|-------------------|---|---|---|---|---|
| A | 0 | 1 | 1 | 0 | 0 |
| B | 0 | 0 | 1 | 1 | 0 |

*The code repeats from 1 to 4.

(1) 3.3V : "0":0.8V max. "1":2.3V min.

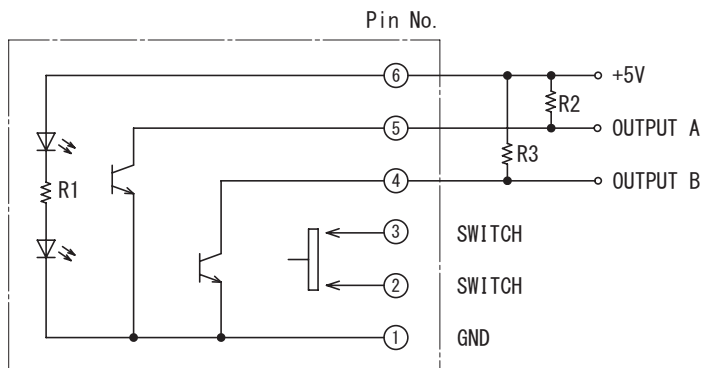
(2) 5V : "0":1.0V max. "1":3.0V min.

PART NUMBER KEY



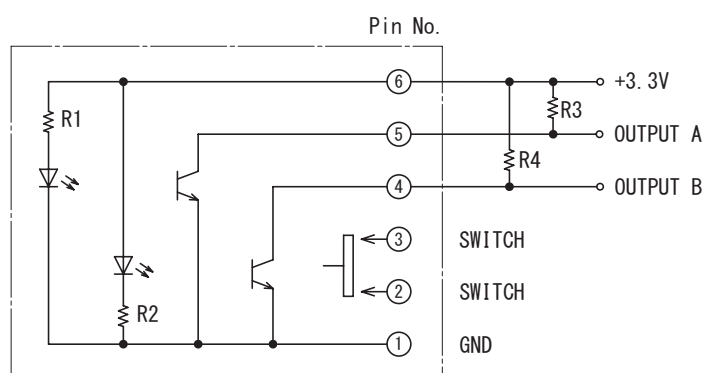
OUTPUT CIRCUIT

5V Input



* R2, R3: External pull-up resistors 5.1K Ω

3.3V Input

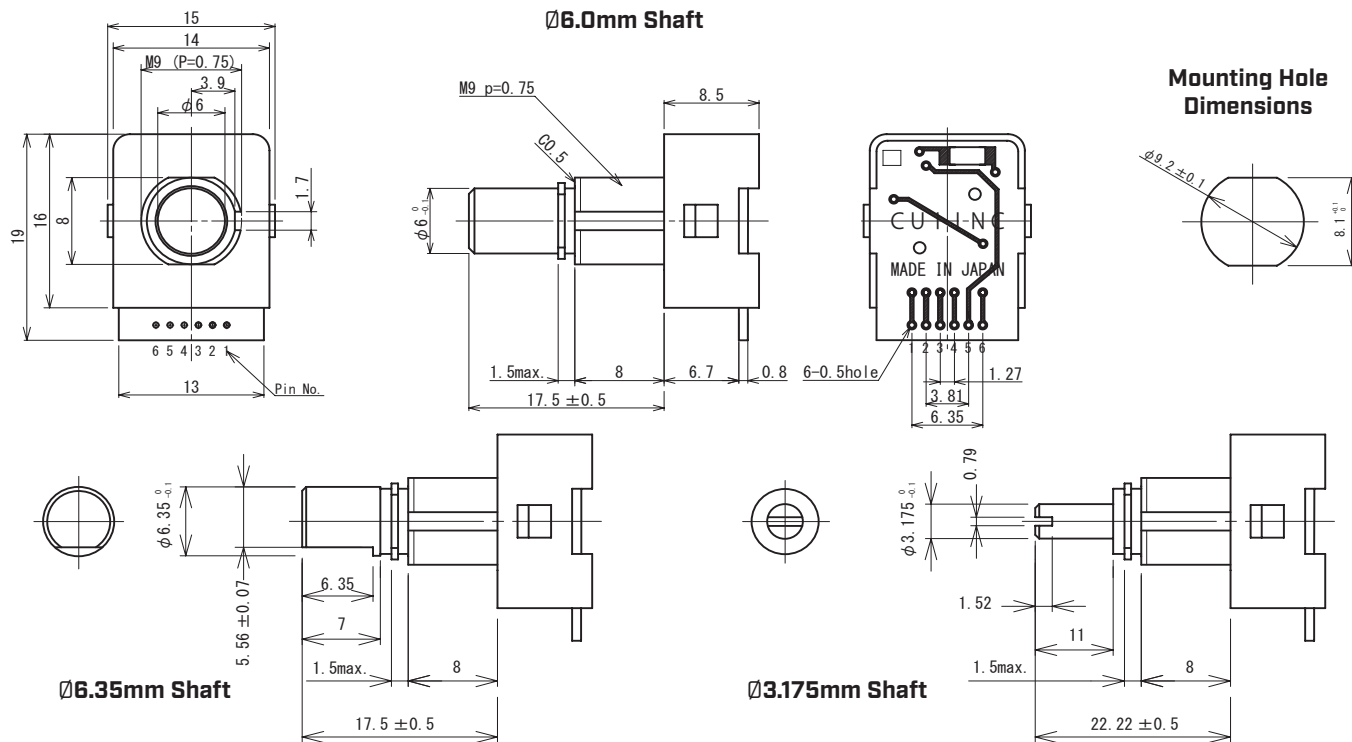


* R3, R4: External pull-up resistors 5.1K Ω

MECHANICAL DRAWING

5V INPUT, WITH PUSH SWITCH

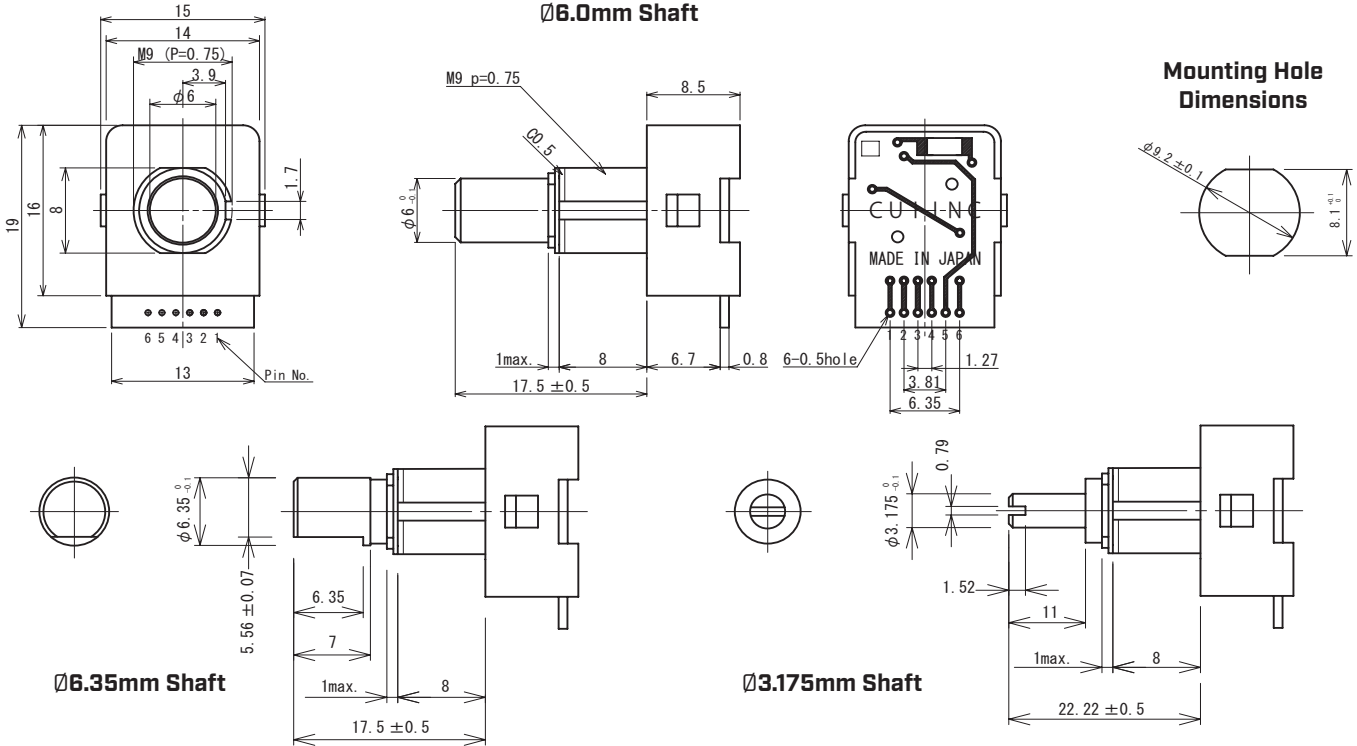
units: mm



MECHANICAL DRAWING (CONTINUED)

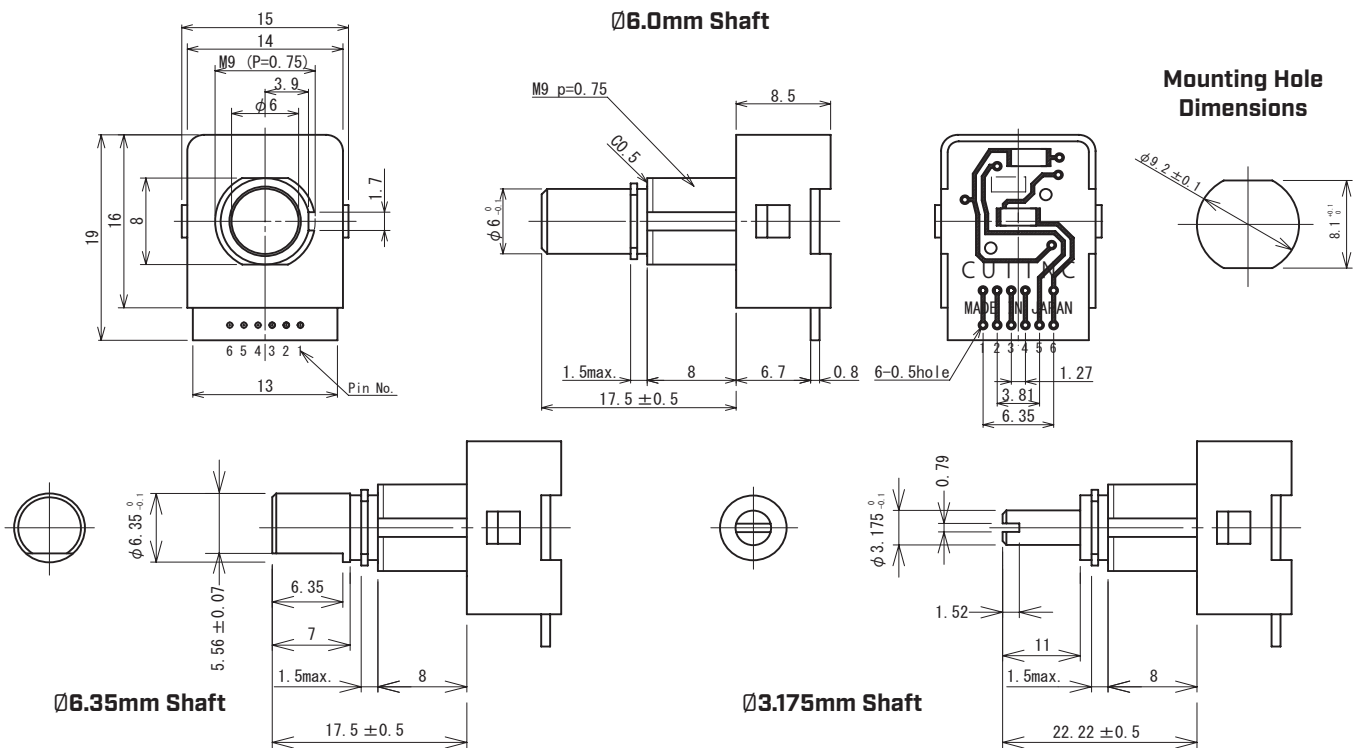
5V INPUT, WITHOUT PUSH SWITCH

units: mm



3.3V INPUT, WITH PUSH SWITCH

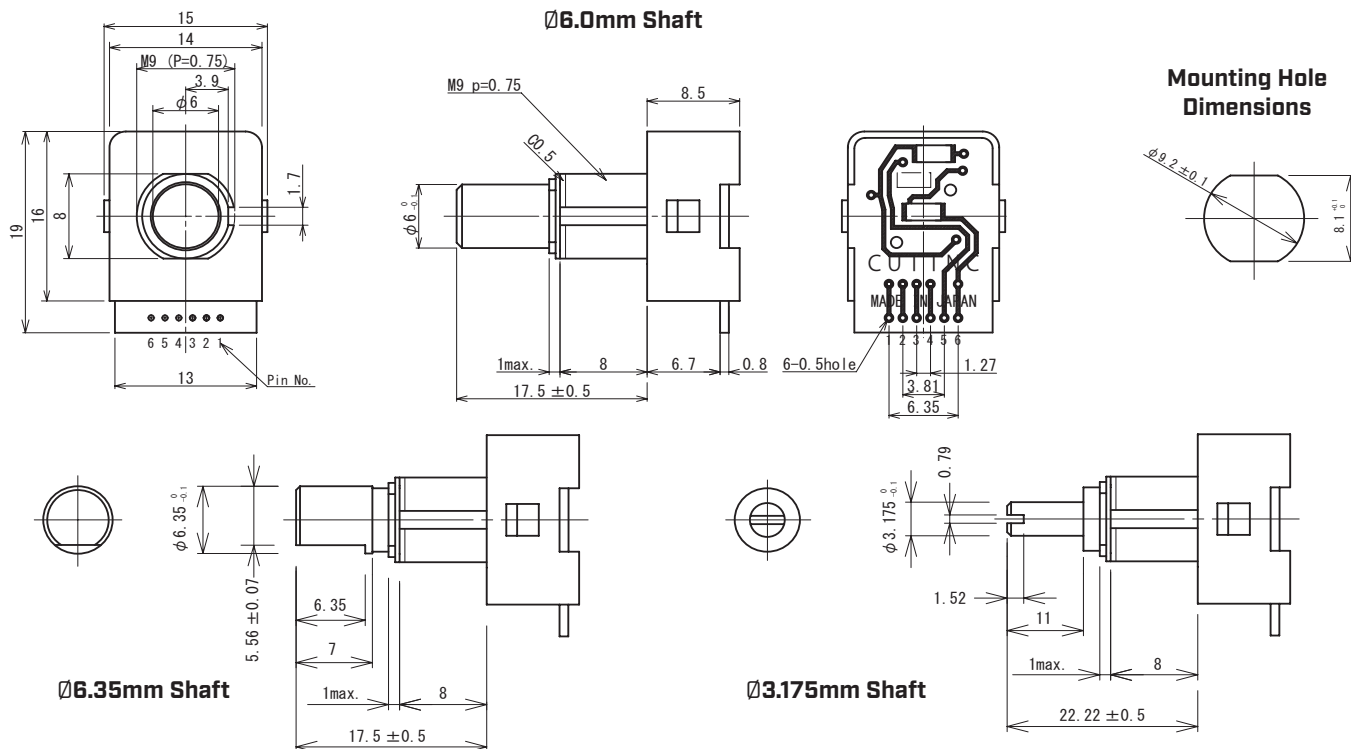
units: mm



MECHANICAL DRAWING (CONTINUED)

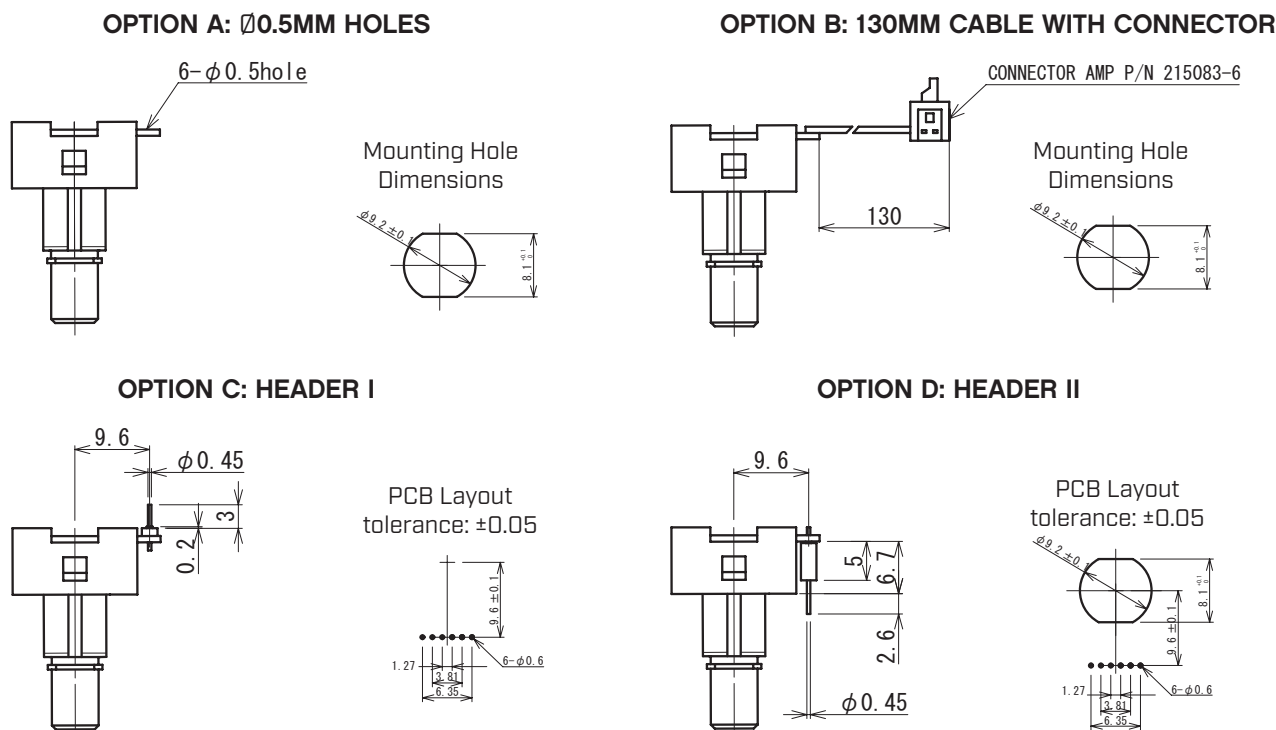
3.3V INPUT, WITHOUT PUSH SWITCH

units: mm



MECHANICAL DRAWING, TERMINATION OPTIONS

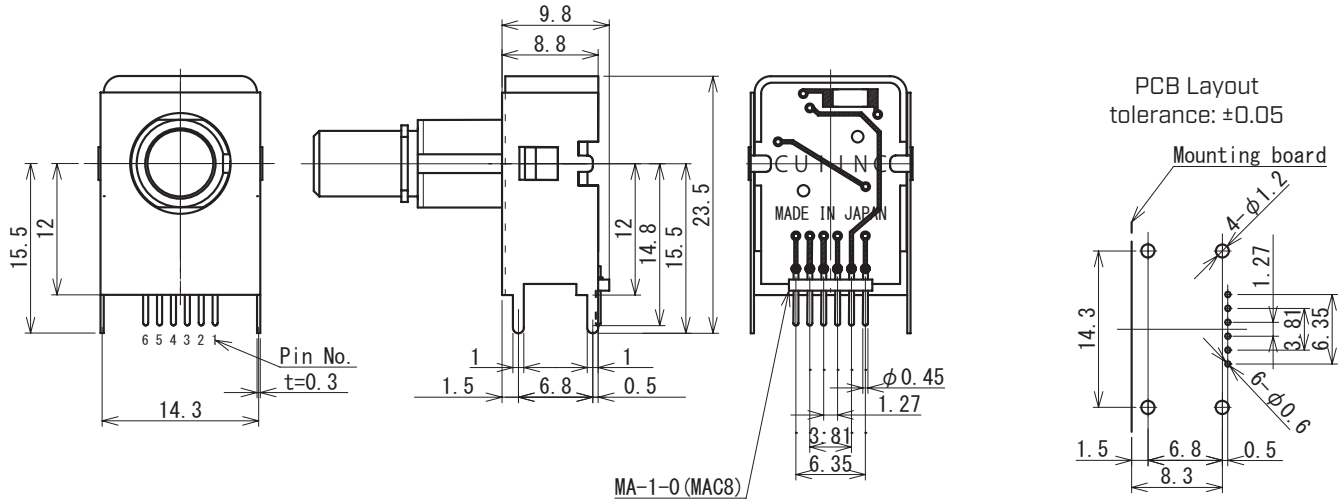
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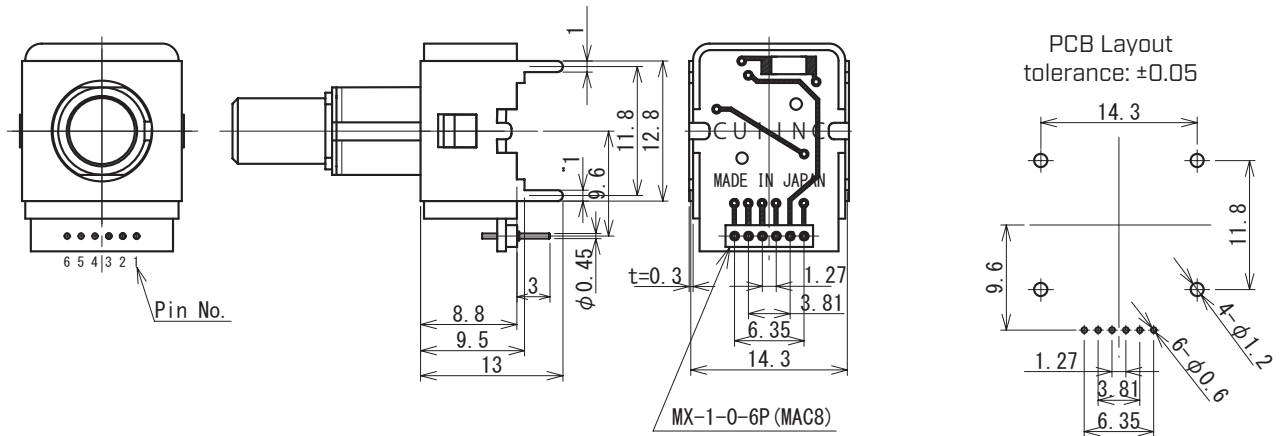
MECHANICAL DRAWING, TERMINATION OPTIONS (CONTINUED)

units: mm

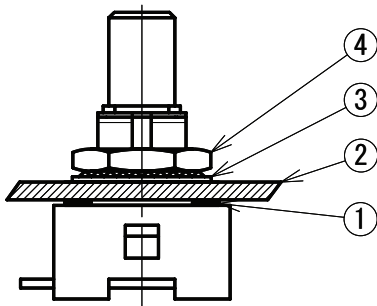
OPTION E: HORIZONTAL PCB



OPTION F: VERTICAL PCB



WATERPROOF MOUNTING



| No. | Qty. | Component |
|-----|------|---------------------|
| 1 | 1 | waterproof washer |
| 2 | 1 | panel |
| 3 | 1 | toothed lock washer |
| 4 | 1 | nut |

Note: 1. Protects against ingress of water (IP65) from front side of panel only.

REVISION HISTORY

| rev. | description | date |
|------|----------------------------------------------------------------------------|------------|
| 1.0 | initial release | 02/25/2009 |
| 1.01 | applied new spec template, updated operating temperature, updated 3.3V PCB | 05/20/2014 |
| 1.02 | brand update | 10/04/2019 |
| 1.03 | added plastic shaft models | 10/14/2020 |
| 1.04 | logo, datasheet style update | 08/05/2022 |

The revision history provided is for informational purposes only and is believed to be accurate.



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