



Volume Controls Model DCU 193



Features

- For BTE or ITE applications
- 2nd generation Digital Control Unit
- Continuous rotation with no end stop
- 5, 7, 10 or 15 switch activations per rotation
- 3 round Ø 0.2 mm terminals
- SMD terminals available in Base Styles No. 02, 23 and 26
- Base 8 terminal pin-out equivalent to PJ 77 pin-out

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Sonion reserves the right to make changes at any time to improve reliability, function or design, in order to provide the best product possible.

1. History Revision

Revision Number/Date	Change from last revision
01 / Jan 07	History revision added.
02 / Oct 07	Mounting screw information for Base 08 added.
MT1036.A (07/08)	No technical updates
003/JUL-09-2009	Terminal lengths corrected and tolerances added
004/FEB-09-2010	State diagram added
005/FEB-14-2011	Storage humidity added. Operational temperature and humidity removed. Terminal lengths 0.5 and 0.75 mm for terminal style No. 04 removed. 7 pulses available for Knob No. 66 and 67.
006/NOV-18-2011	Drawing "Terminal Style No. 04" corrected.
007/2014-01-17	Updated design
008/2019-09-03	Change of storage temperature and humidity (CR3860)

2. Mechanical Specifications

Rotational angle	Continuous rotation, no end stop
Rotational speed	Min. 4 rpm. Max. 30 rpm
Rotational torque	Min. 2 cNcm. Max. 8 cNcm
Switch contact lifetime	Min. 50,000 cycles. 1 cycle = 360° CW followed by 360° CCW rotation.

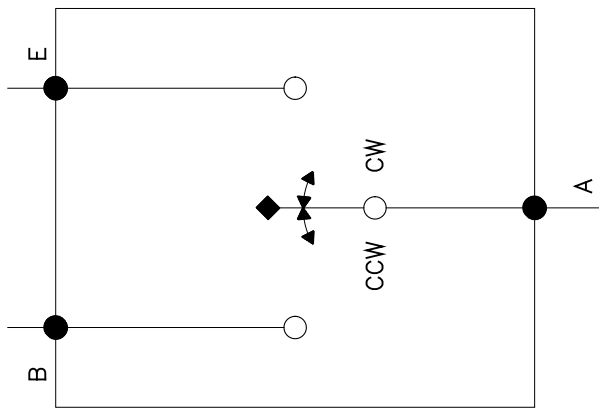
Knob retention force	
BTE Knob Styles	Min. 3.5 N
ITE Knob Styles, PJ 87/88	Min. 12 N

Bending of solder terminals	Min. 1 bending cycle 90°
Terminal retention force	Min. 5 N

3. Electrical Specifications

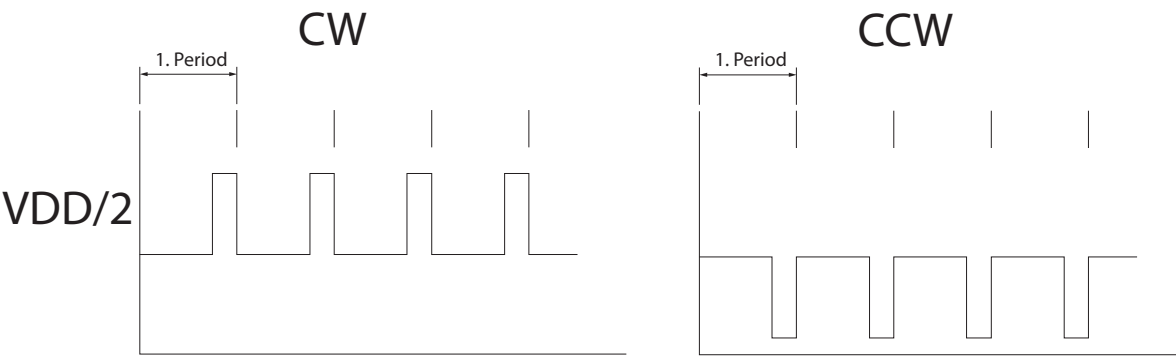
Number of pulses per rotation	5, 7, 10, or 15 pulses
Contact resistance	Max. 150 mΩ
Insulation resistance	Min. 1 MΩ
Parasitic capacitance	Max. 10 pF between any two leads
Max. switching current	Max. 0.1 mA Pulses As the DCU 193 is a passive device, no pulses are generated. Pulses are interpreted as changes in the internal switch state.
Pulse width	2° - 13°
Bounce time	Max. 20 mS. Measured at 25 rpm, 2 μA and 0.7 V
Pulse counting accuracy	1 pulse per 100 pulses. Measured at 25 rpm

4.Switching Diagram



State Diagram

Static	CW Rotation	CCW Rotation
Undefined	A Pulses to E	A Pulses to B



5.Material Specifications

All materials comply with RoHS directive (2011/65/EU)

Terminals	Ag, gold flash plated
Knob	PA 6.6
Timing gear	PA 6.6
Base	PEEK

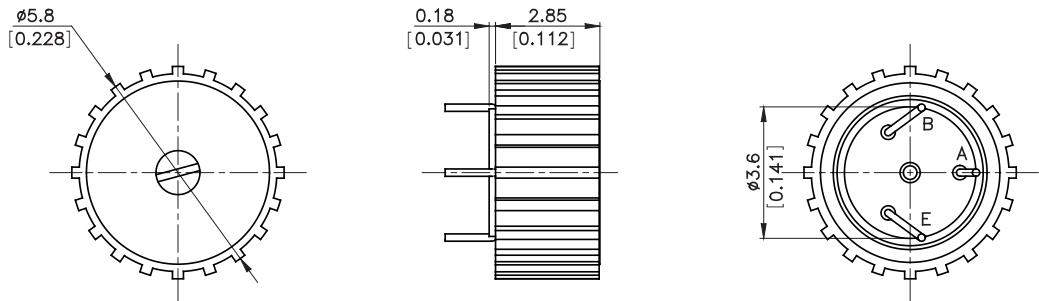
6.Environmental Conditions

Storage temperature	25°C
Storage humidity	60% RH
Purpose is to protect from high humidity and keep at driest condition as possible	

7.Recommended Processing Conditions

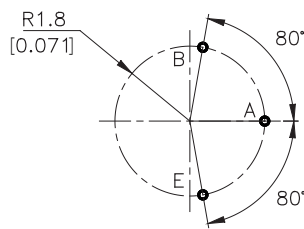
Gluing	
Recommended types of glue	Non-blooming cyanoacrylates, i.e Loctite 401, 408, 460, and Sicomet 50, 63, 77 Non-blooming types must be used to ensure- that residuals from the curing process do notdegrade the component
Soldering	
Soldering temperature and time	300°C [572°F] for 3 s or 350°C [662°F] for 1 s
Soldering distance	Min. 0.3 mm [0.012"] from housing Mechanical stress on soldering terminals must be avoided during soldering
Cleaning	
Recommended cleaning solvents	For example aqua wash with Alpha 2110 or benzine Ultrasonic cleaning must be avoided as it may remove the lubricant inside the component8

8.Mechanical Dimensions



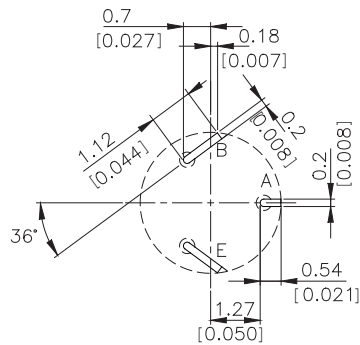
Note:
The standard measurement tolerance on the drawings is ±0.05 mm/[0.002"]. Tolerances which differ from this value will be indicated on the drawings.

Terminal Style No. 01



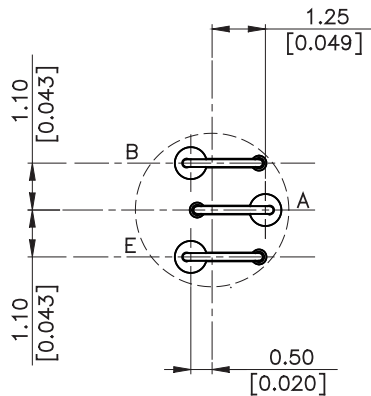
For Base Style Nos. 03, 04, 05 and 07

Terminal Style No. 02



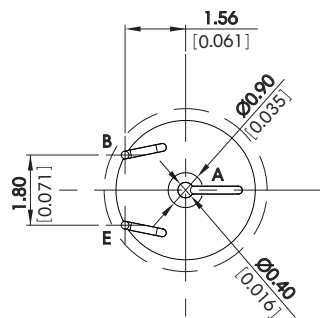
For Base Style Nos. 02 and 23

Terminal Style No. 03



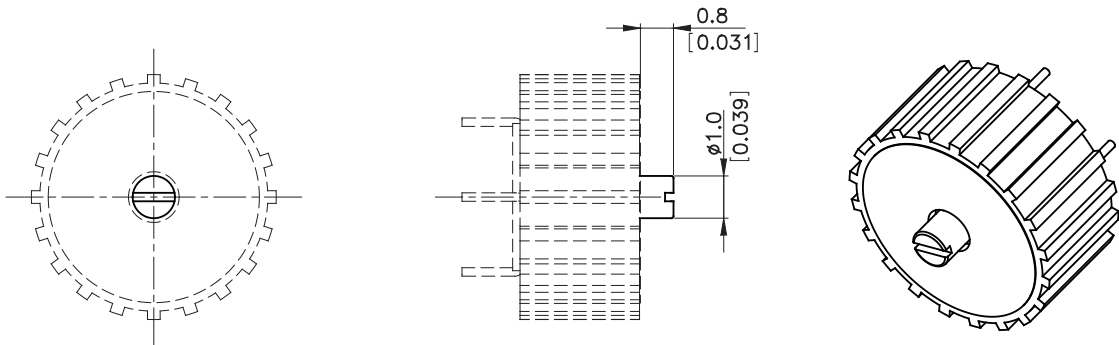
For Base Style No. 26

Terminal Style No. 04



For Base Style No. 08

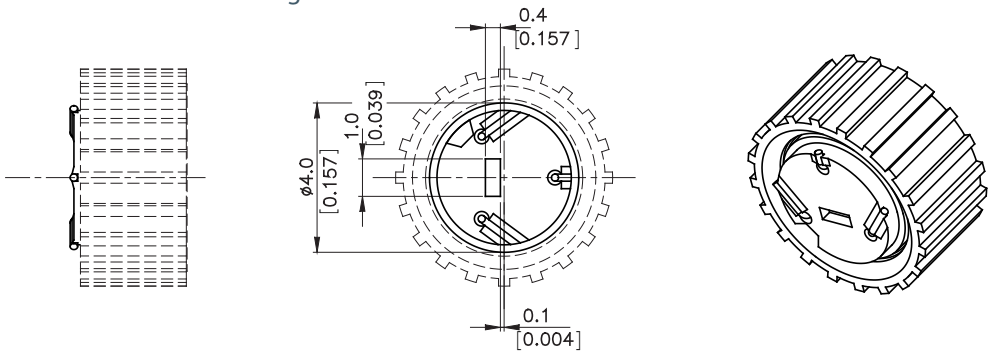
Extended Axle Option



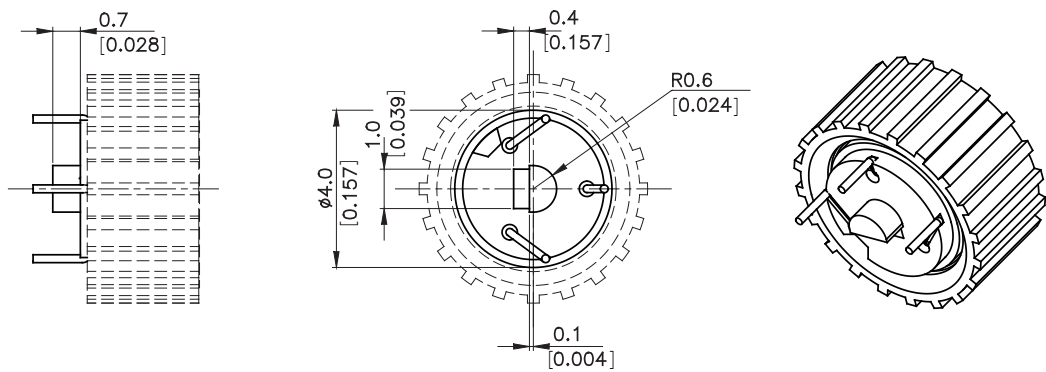
Only available for Knob Style 66

9.Base Styles

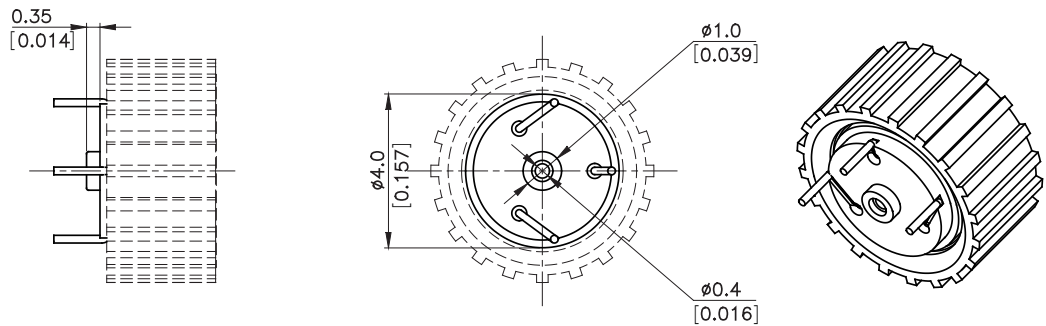
No. 02 - For SMD mounting



No. 03

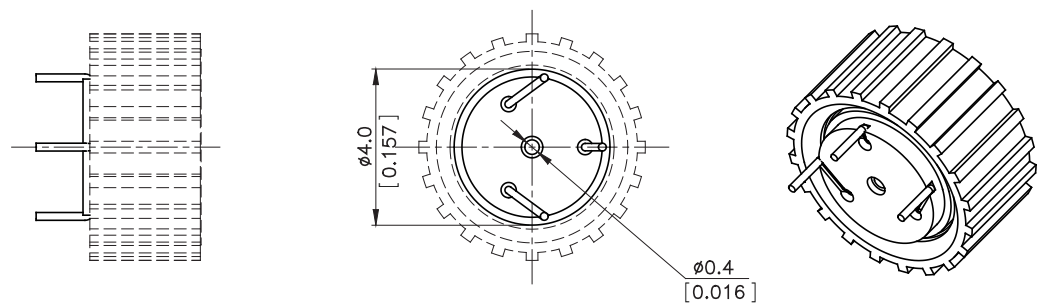


No. 04



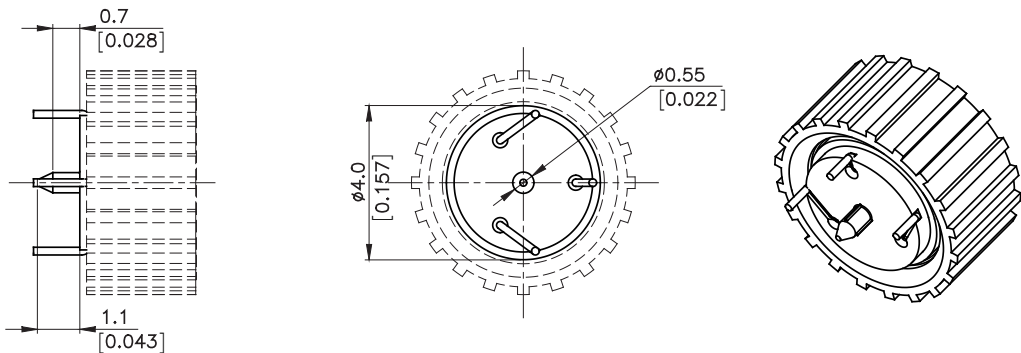
Hole in Base Style No. 04 fits Mounting Screw No. 01

No. 05

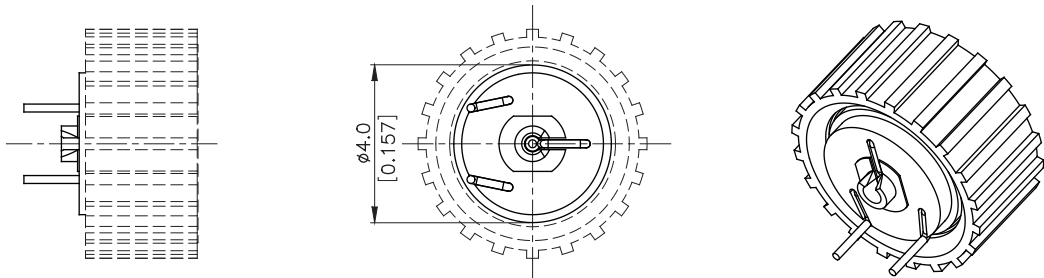


Hole in Base Style No. 05 fits Mounting Screw No. 01

No. 07

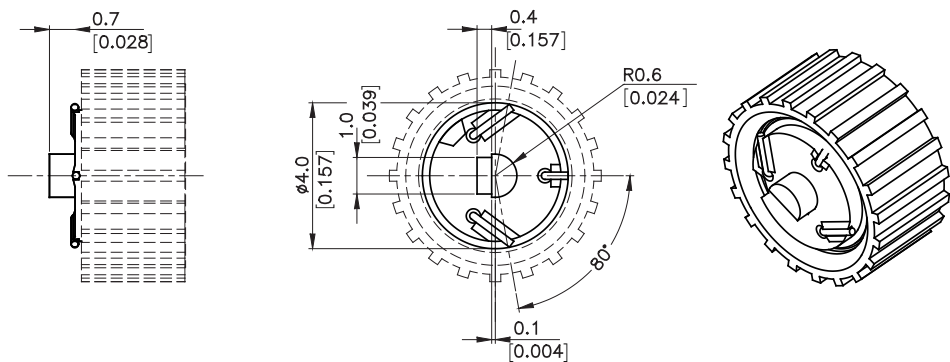


No. 08

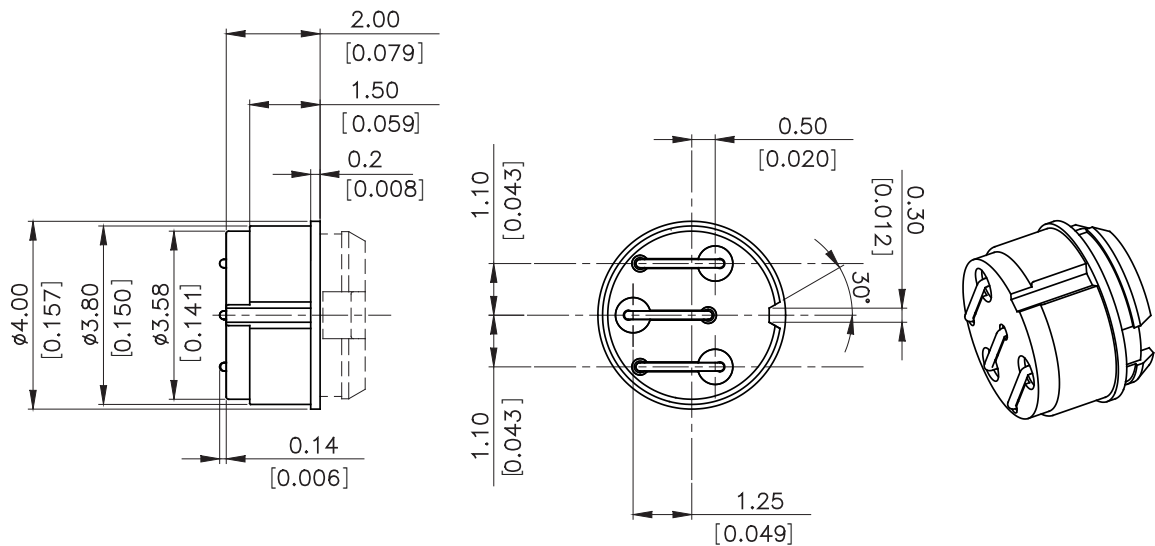


Hole in Base Style No. 08 fits Mounting Screw No. 05

No. 23 - For SMD mounting



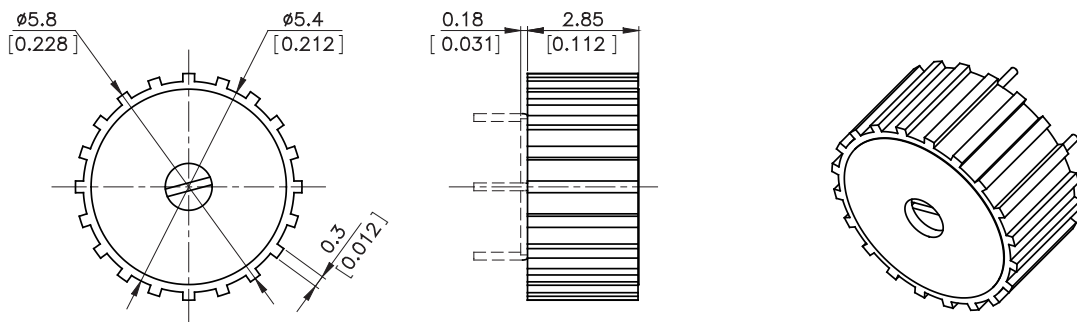
No. 26



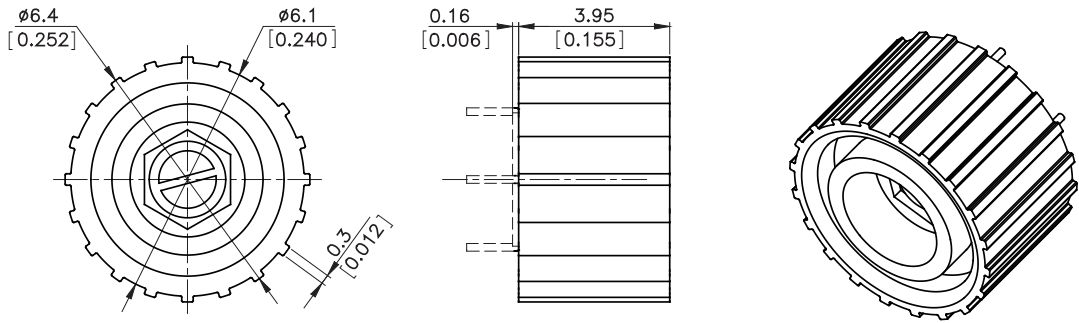
Only PJ 87/88 Cap Styles fit on DCU 193 base No. 26

10. BTE Knob Styles

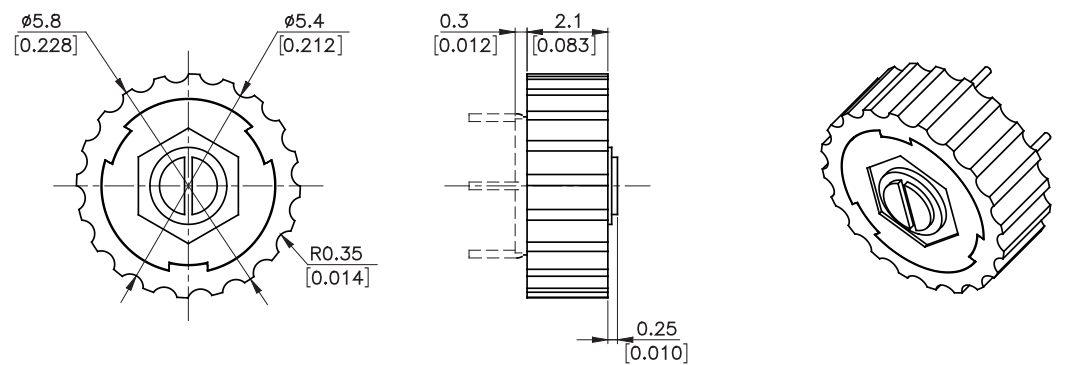
No. 66



No. 67

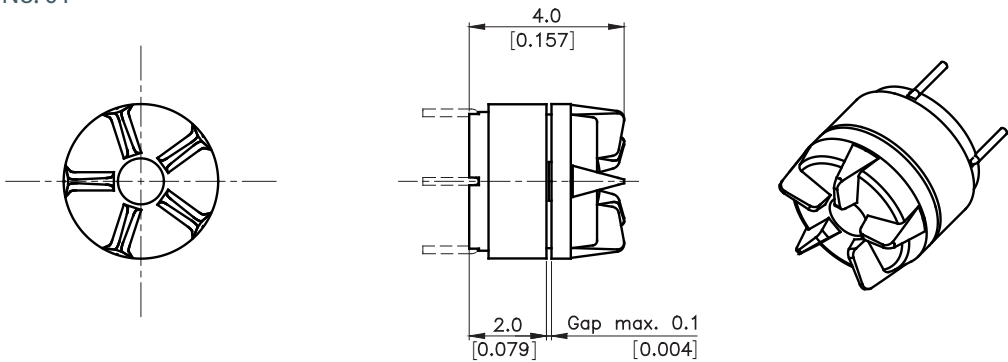


No. 81



11. ITE Knob Styles

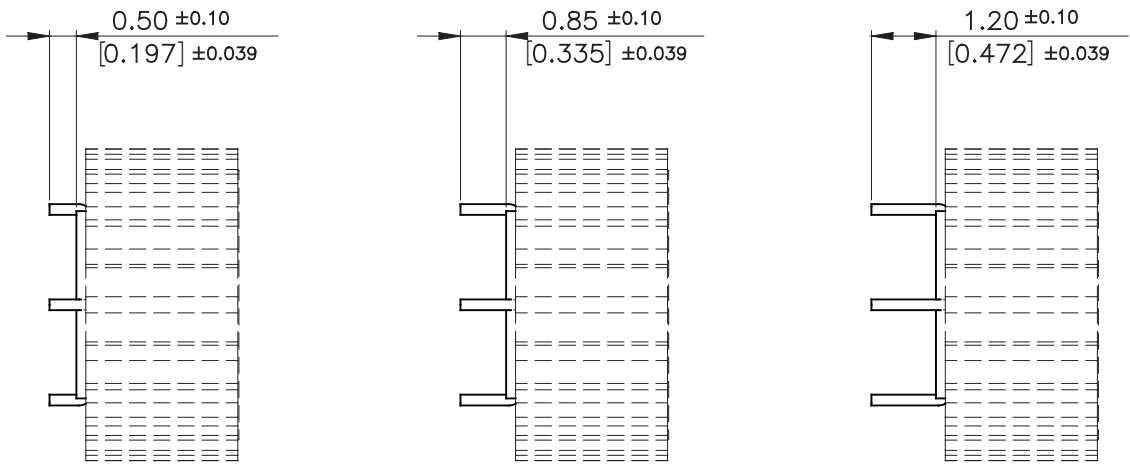
No. 01



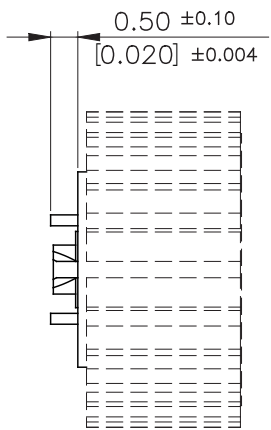
Other PJ 87/88 Knob Styles may also be used. See PJ 87/88 data sheet.

12. Terminal Length

For Terminal Style No. 01

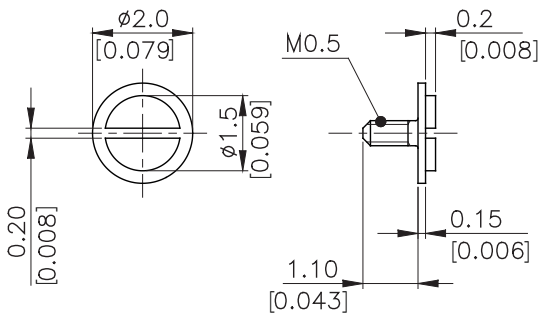


For Terminal Style No. 04



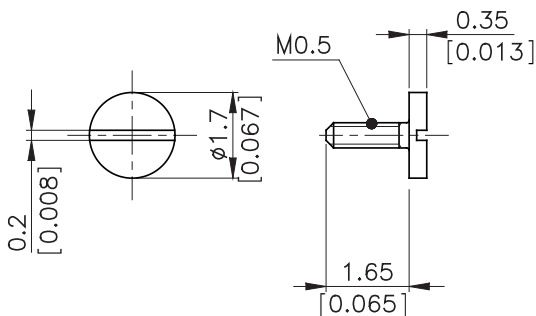
13. Mounting Screw

No. 01



Code No.: 9310-1038804
Screw style 01 fits base no. 04 and 05

No. 05



Code No.: 9310-3008750
Screw style 05 fits base no. 08

14. Knob Plastic Colors

Please refer to the series 100 included in the Sonion 'Plastic Color Assortment' binder

15. Product Specification Form

Name

Company

Customer Part No.

Parameters	Look at page	Enter your choices	Guidelines
Model		DCU 193	
Pulses Nos.	8-10		Please enter 5, 7, 10 or 15. For Base Style No. 26, no. of pulses is 10 or 15. 7 pulses available for knob No. 66 and 67
Base Style			Please enter No. 02, 03, 04, 05, 07, 08, 23 or 26
BTE Knob Style	11		Please enter No. 66, 67 or 81
ITE Knob Style	12		PJ 87/88 knob style selection, for example No. 01
Extended Axle			Please enter 'Yes' or 'No'. Only available for knob style No. 66
Terminal Length	12		Please enter for Terminal Style No. 01: 0.5 mm, 0.85 mm or 1.2 mm. Please enter 1.6 mm for Terminal Style No. 04. N/A for Terminal Style No. 02 and 03
Mounting Screw	13		Screw Style 01 for Base No. 04 or 05 or Screw Style 05 for Base No. 08. Mounting screws must be ordered separately.
Knob Plastic Colors	13		Please refer to the series 100 included in the Sonion 'Plastic Color Assortment' binder