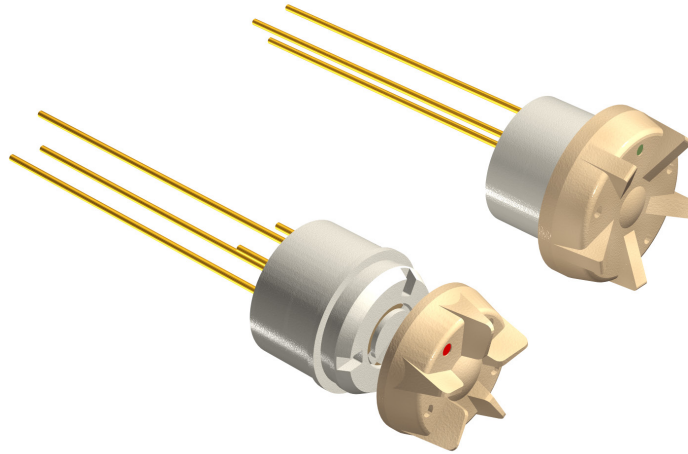
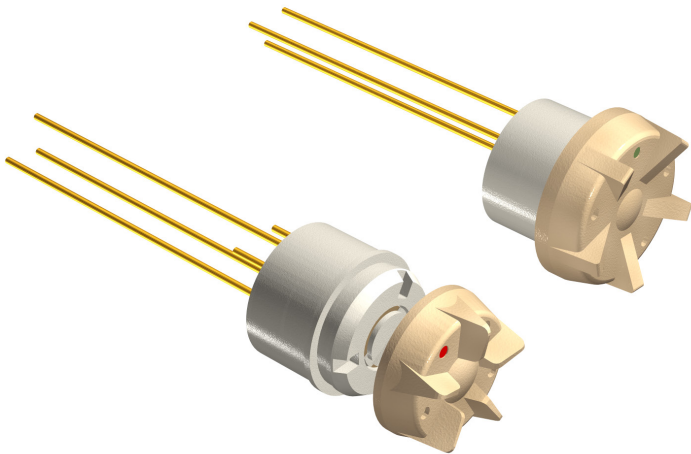




Volume Controls Model PJ 87 & 88



Features

- Snap-on knob system
- Different knob designs available
- Different knob colors available
- Optional color dot coding
- Accurate tapers. Linear, logarithmic, double logarithmic and custom-made
- Customized electrical resistance values and tolerances
- PJ 87 without switch
- PJ 88 with built-in On/Off switch
- PJ 88 CW or CCW switch position

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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
06 / Jan. 02	History Revision added. Terminal dimension corrected from 0.079" to 0.008"
07 / Sep. 02	TABed version removed. Housing style no. 12 removed
08 / Jun. 03	Adaptor Ring No. 5 drawing corrected
09 / May. 05	Resistance curve angle changed from 240° to 230°
10 / Jun. 08	Forces definition drawing added. Storage humidity added. Operational temperature and humidity removed. New data sheet design. New lay-out.
MT1042.A (07/08)	Minimum resistance value on linear tapers increased to 200 Ω.
MT1042.B (01/09)	Housing no. 14 has been removed.
011/JUL-09-2009	No technical updates
012/DEC-09-2009	Knob style 16 color coding possible
013/2014-01-17	Updated design and new RoHS logo directive (2011/65/EU)
014/2015-04-16	Discontinue knobs style 08, 09, 10, 13, 15, 19, 20, 21, 22, 23, 25, 26, 28 and 30
015/2019-07-11	Storage temperature and humidity changed (CR3860)
016/2020-05-20	New drawing knob 29 (CR4140)
017/2020-12-11	New knob extensions added (CR3917)

2. Mechanical Specifications

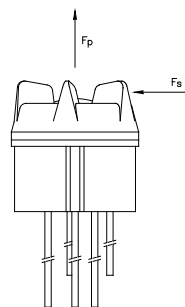
Rotational angle, mechanical	270° ±3°
Resistance curve angle	230°
Switch angle	22° ±3°
End stop torque, initially	Min. 500 cNcm
After environmental exposures	Min. 400 cNcm
Rotational torque, initially	Min. 2 cNcm, max. 10 cNcm, typical 4-8 cNcm
After environmental exposures	Max. 12 cNcm
Switch operating torque On to Off	Min. 6 cNcm, max. 25 cNcm, typical 7-12 cNcm
Switch operating torque Off to On	Min. 8 cNcm, max. 25 cNcm, typical 12-7 cNcm
Terminal retention force	Min. 8 N

Lifetime	
Resistance element	Min. 25,000 cycles
On/Off switch	Min. 15,000 cycles
Bending of terminals	Min. 0.5 mm [0.02"] from housing
Potentiometer terminals	Min. 4 bendings 90°, with 0.25 N load
Switch terminals	Min. 2 bendings 90°, with 0.25 N load

Durability of knob:	
Allowed static axial force to be applied continuously (-Fp)	Max. 5 N
Allowed static axial force to be applied for 20 cycles (-Fp)	Max. 15 N
Allowed torque to be applied continuously (-Fp)	Max. 200 cNcm
Allowed torque to be applied for 20 cycles (-Fp)	Max. 350 cNcm
Pull strength, Fp, initially	Min. 22 N, typical 25 N
After environmental exposures	Min. 18 N
Peel off strength, Fs, initially	Min. 7 N, typical 9 N
After environmental exposures	Min. 5 N

Definition of knob shear and knob pull strength forces:

From top of knob to shear force attack point: 0.75 mm



3. Electrical Specifications

Resistance value	
Linear	200 Ω to 1 M Ω
Logarithmic	500 Ω to 600 k Ω
Double logarithmic	2 k Ω to 500 k Ω
Resistance value tolerance	$\pm 20\%$ (-20% to +30% for values ≤ 1 k Ω)
Resistance taper	See 'Tapers Data Sheet'
Wiper contact resistance	Typ. better than 20 dB rel. R
Contact resistance (On/Off switch)	Max. 150 m Ω
Insulation resistance	Min. 1 M Ω
Potentiometer max. load	10 mW
Continuous current (On/Off switch)	500 mA

4. Material Specifications

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

Potentiometer terminals	AgCu3, gold flash plated
Switch terminals	CuNiZn, gold plated
Other metal parts	BeCu, gold plated
Housing	PA 6.6, glass reinforced
Knob	PA 6.6, glass reinforced
Base	PES
Carbon track base	Glass epoxy composite
Resistance material	Carbon/Silver composite

Lubricant, glue/seal, and paint specifications are proprietary information.

5. Environmental Conditions

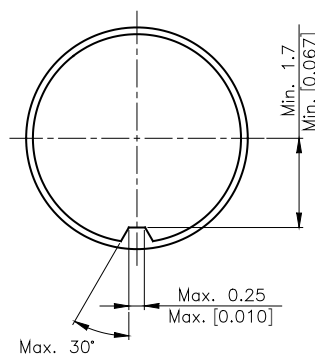
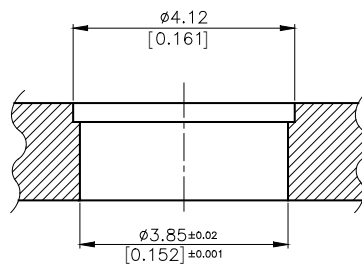
Storage temperature	25°C
Storage humidity	60% RH
Purpose is to protect from high humidity and keep at driest condition as much as possible	

6. Recommended Process Parameters

Gluing	
Types of glue	Cyanoacrylates (non-blooming) , 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 not degrade 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. 0.5 mm [0.02"] from housing To prevent damage to the carbon taper as a result of the soldering process, the knob must be turned either fully CW or CCW, opposite to the switch position. Mechanical stress on soldering terminals must be avoided during soldering.
Cleaning	
Cleaning solvents	Aqua wash (Alpha 2110), Benzine Ultrasonic cleaning must be avoided as it may remove the lubricant inside the component

7. Recommended Dimension of Mounting Hole

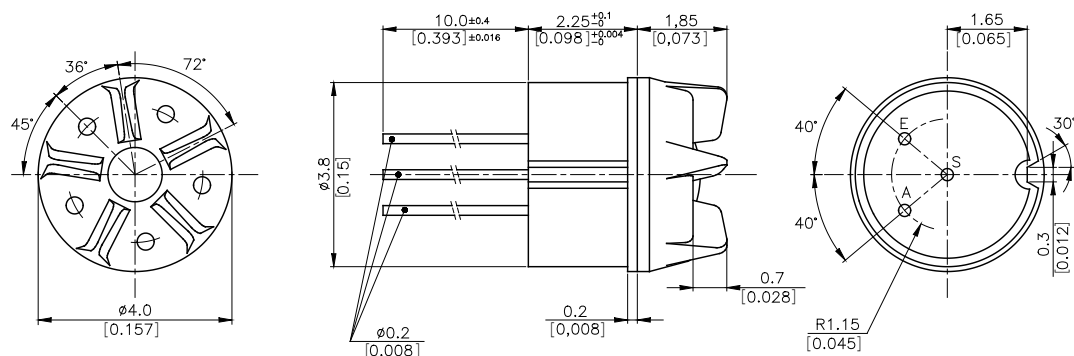
It is recommended that a space of 0.06 mm/[0.002"] is allowed around the knob, as the knob will expand slightly when being mounted onto the knob base. The drawing shows the relevant dimensions for the knob 01.



8. Mechanical Dimensions

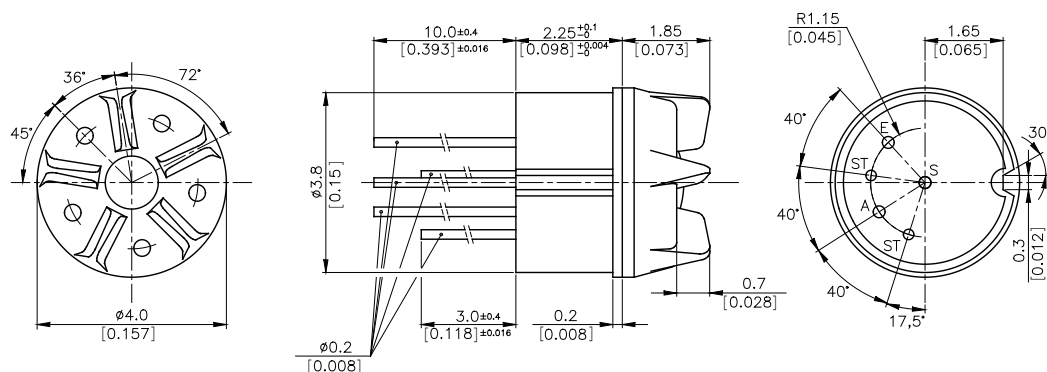
PJ 87

The knob is turned CCW to stop (terminal A). Shown with knob no. 01



PJ 88

The knob is turned CCW to stop (terminal A). Shown with knob no. 01

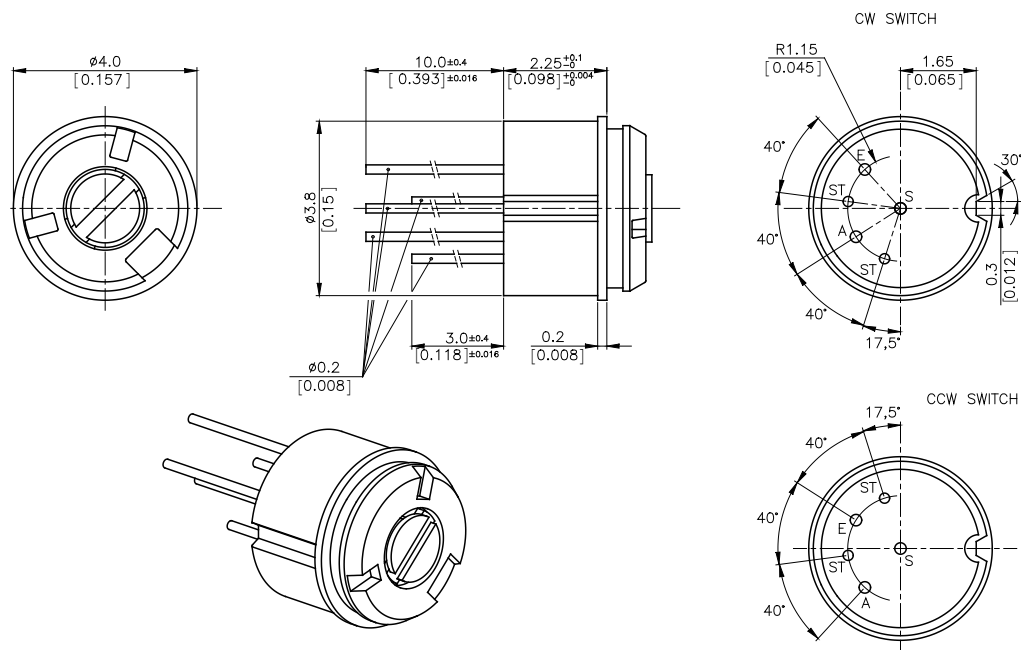


Note:

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.

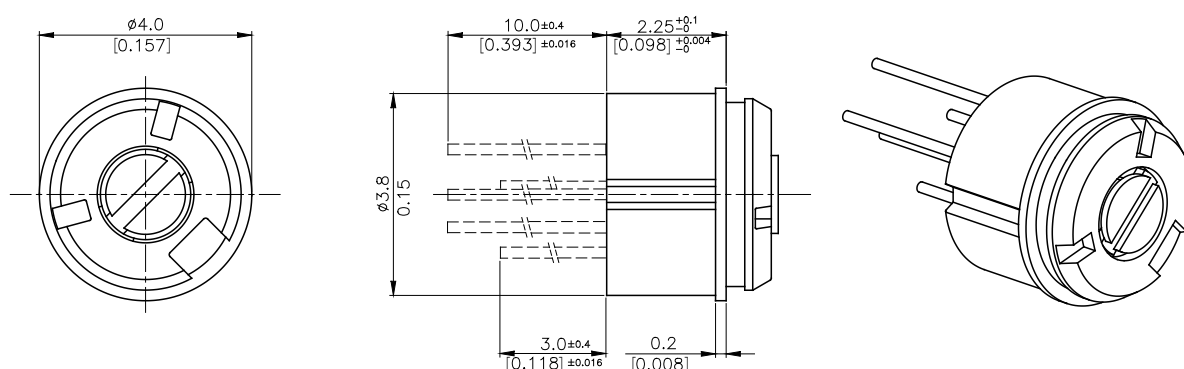
PJ 88 without knob

The knob base is turned CCW to stop (terminal A)



9. Housing Style

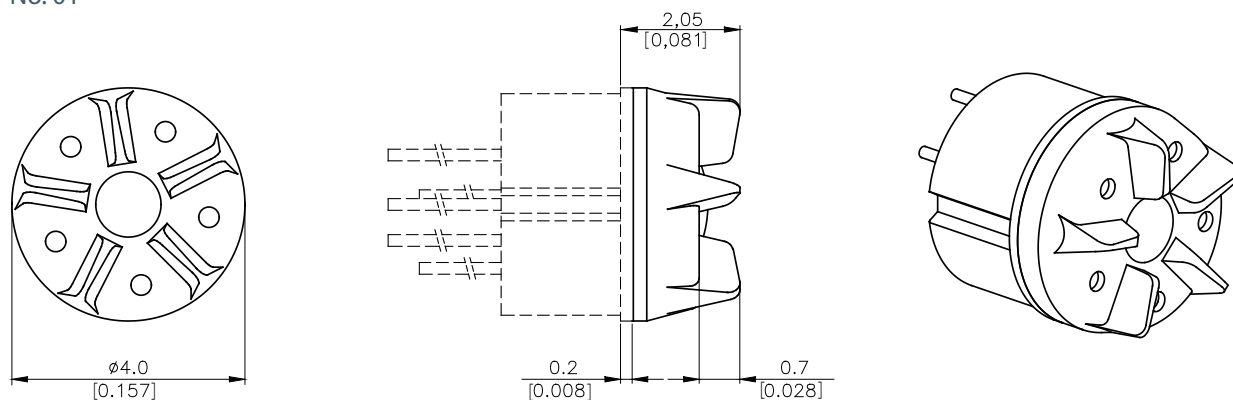
No. 11



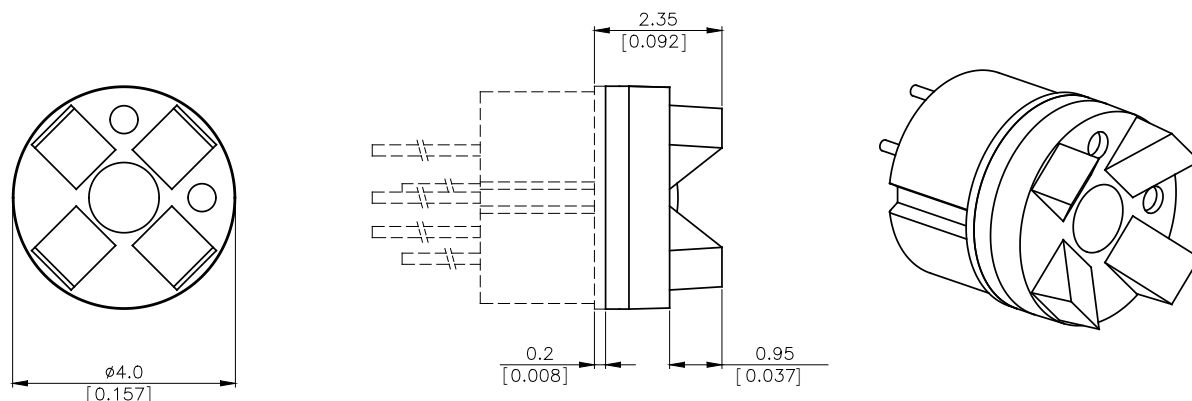
10. Knob Styles

All knobs are shown turned CCW to stop (terminal A)

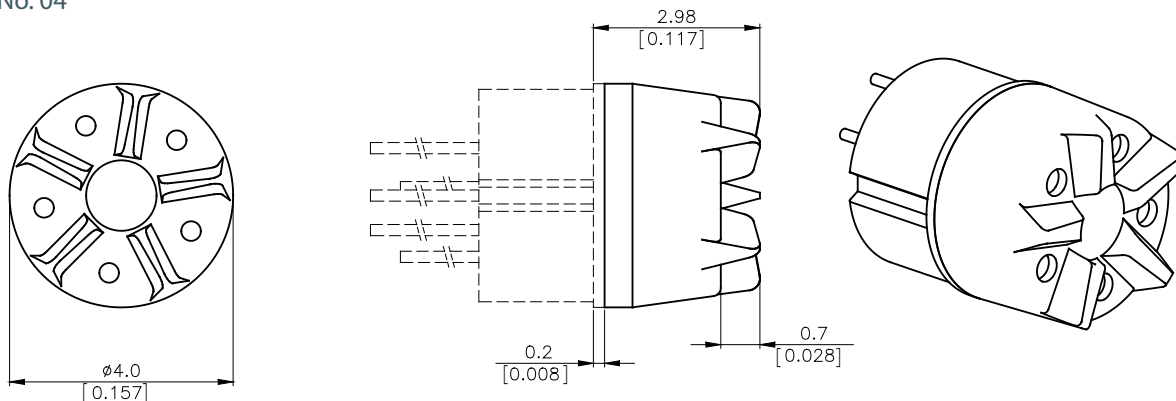
No. 01



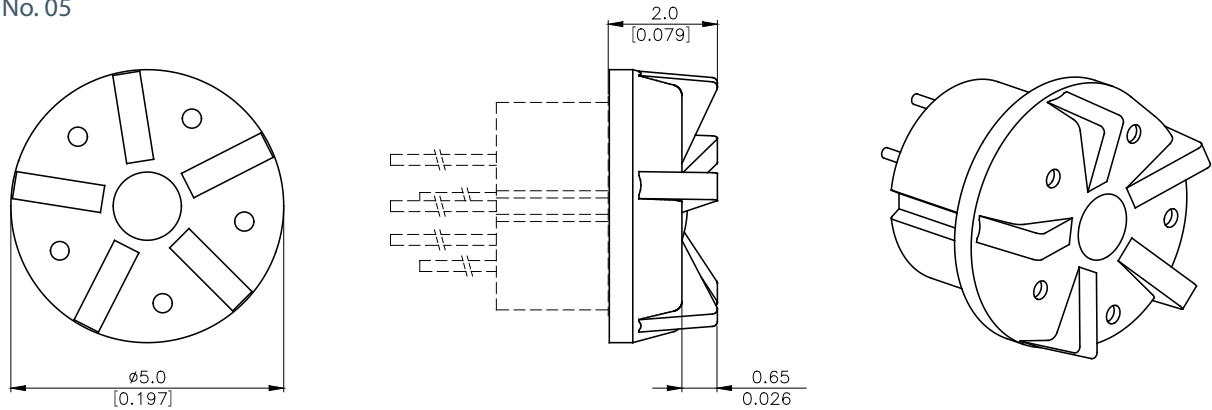
No. 03



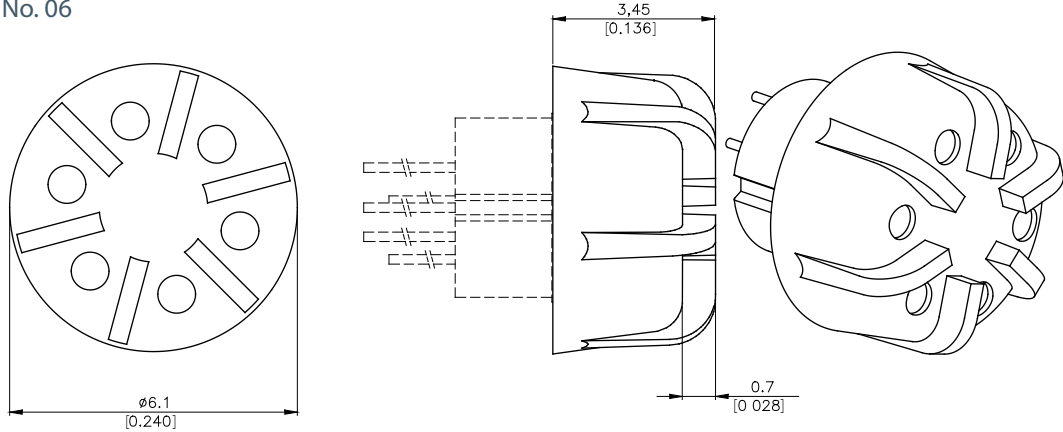
No. 04



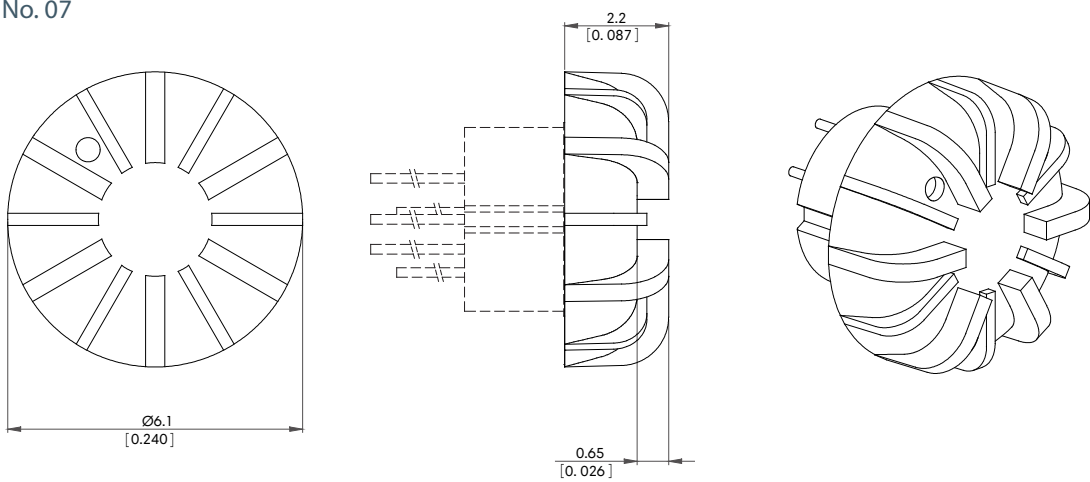
No. 05



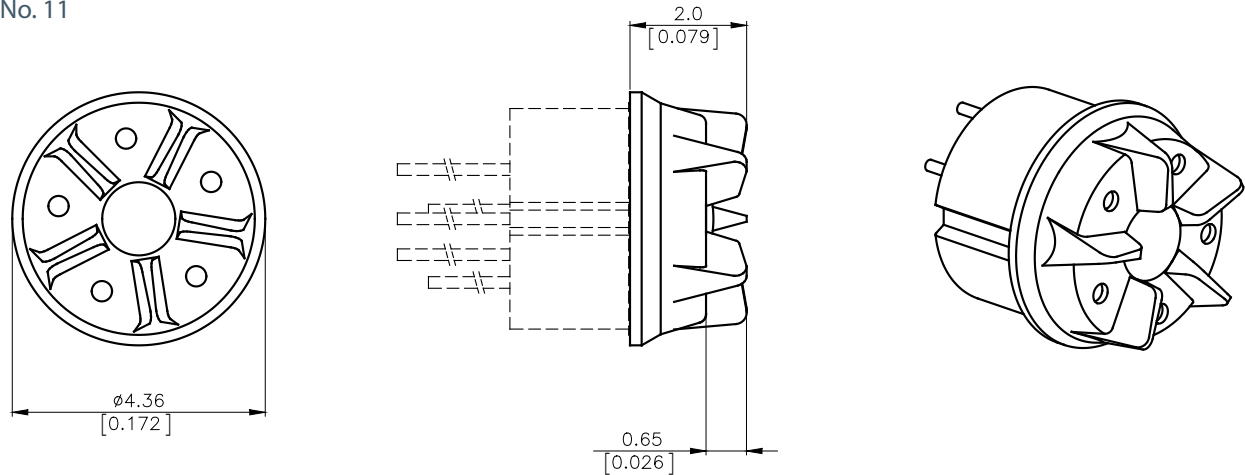
No. 06



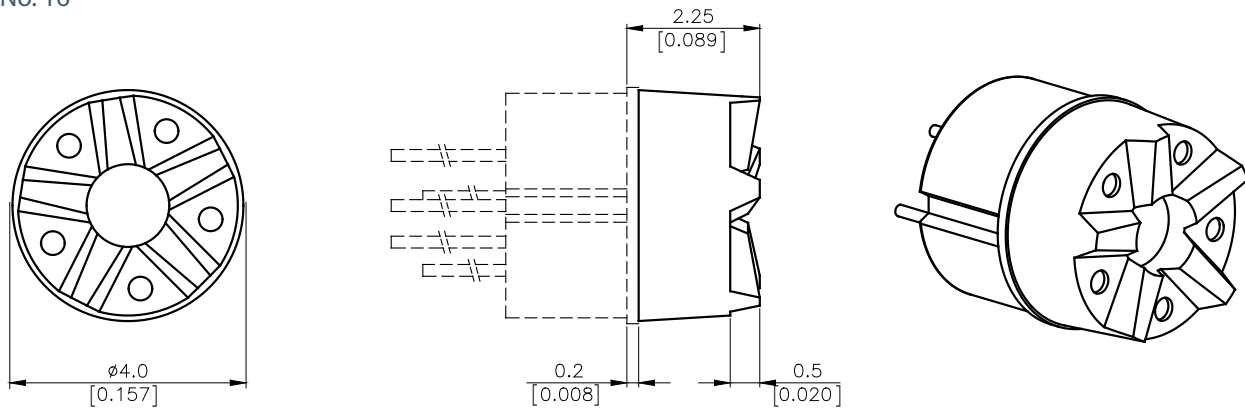
No. 07



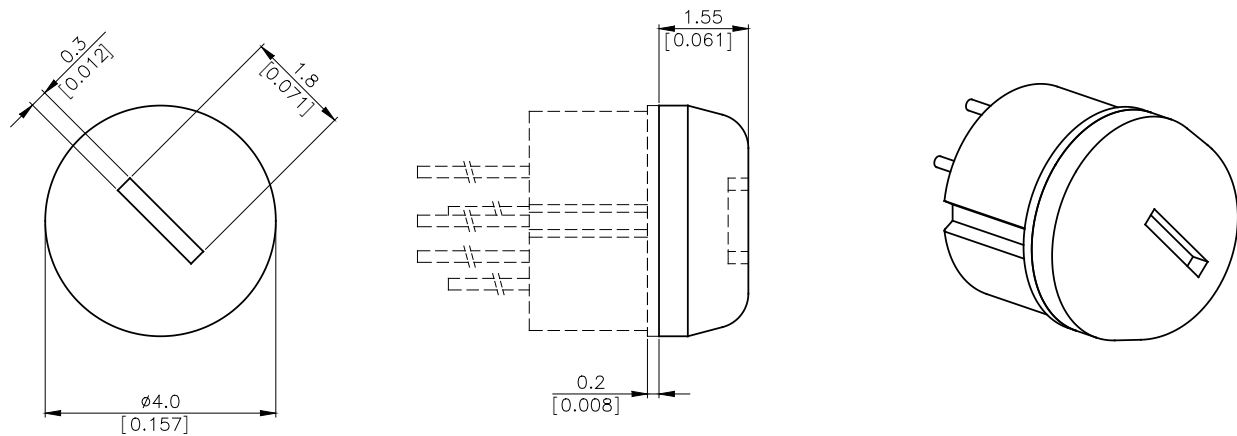
No. 11



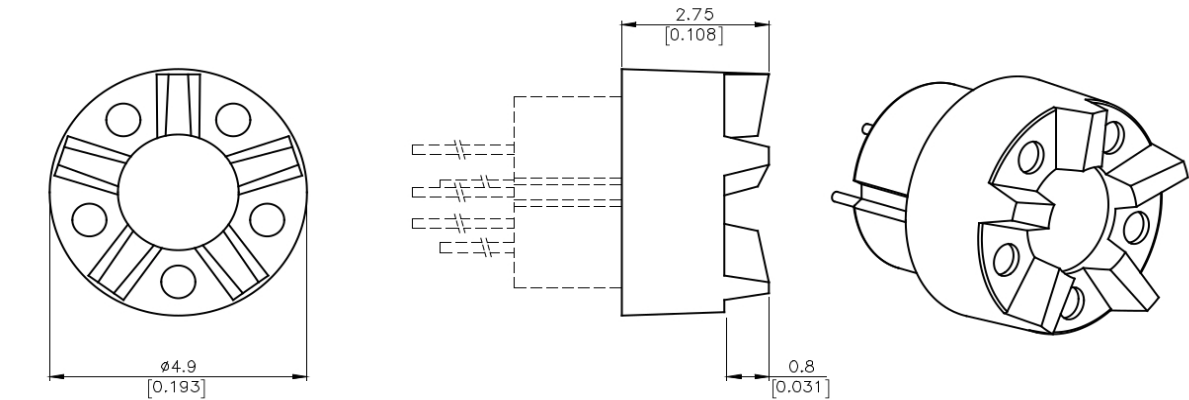
No. 16



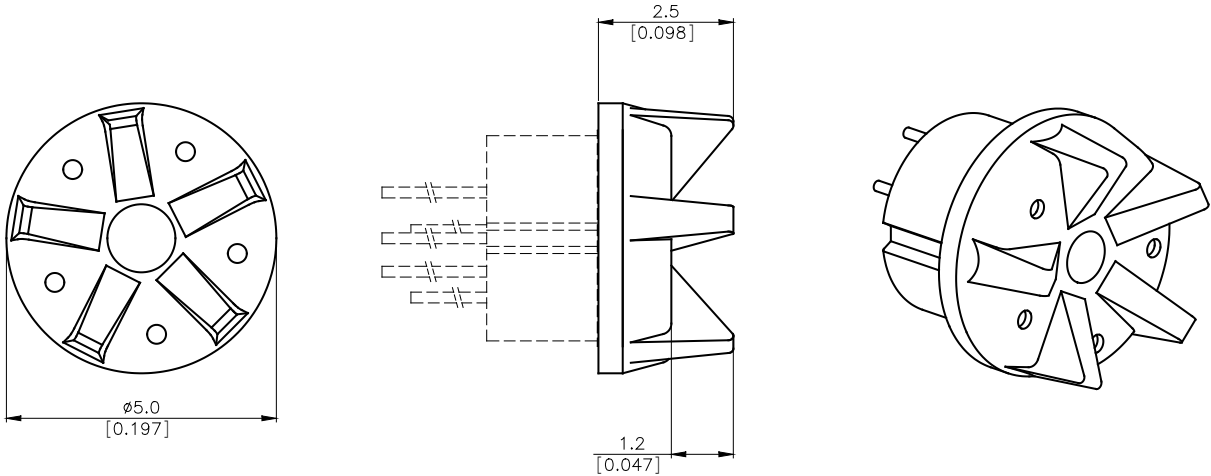
No. 18 (Can only be delivered unmounted, please order separately)



No. 29



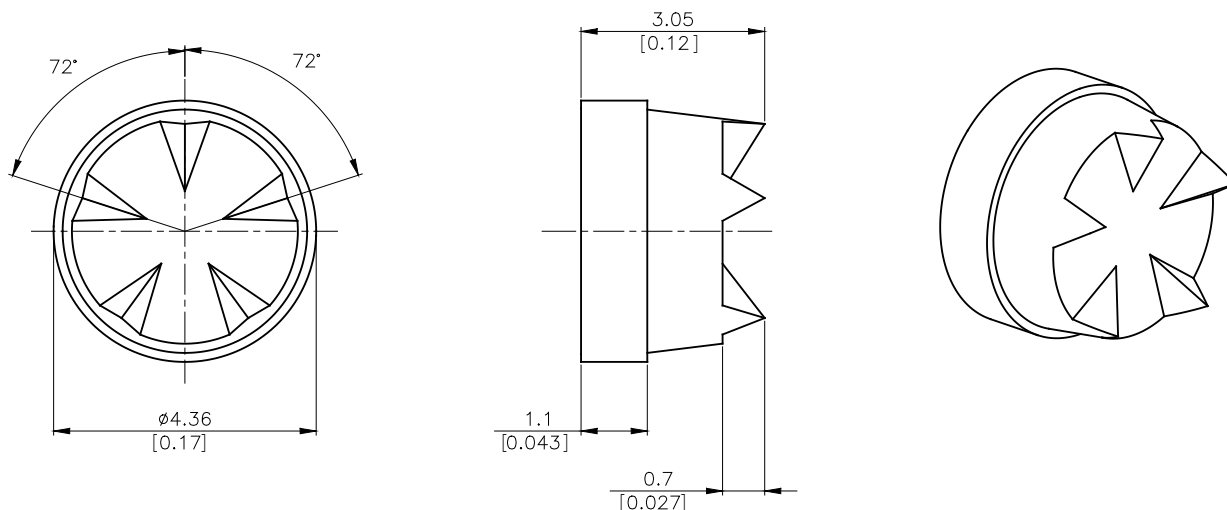
No. 55



11. Knob Extension Styles

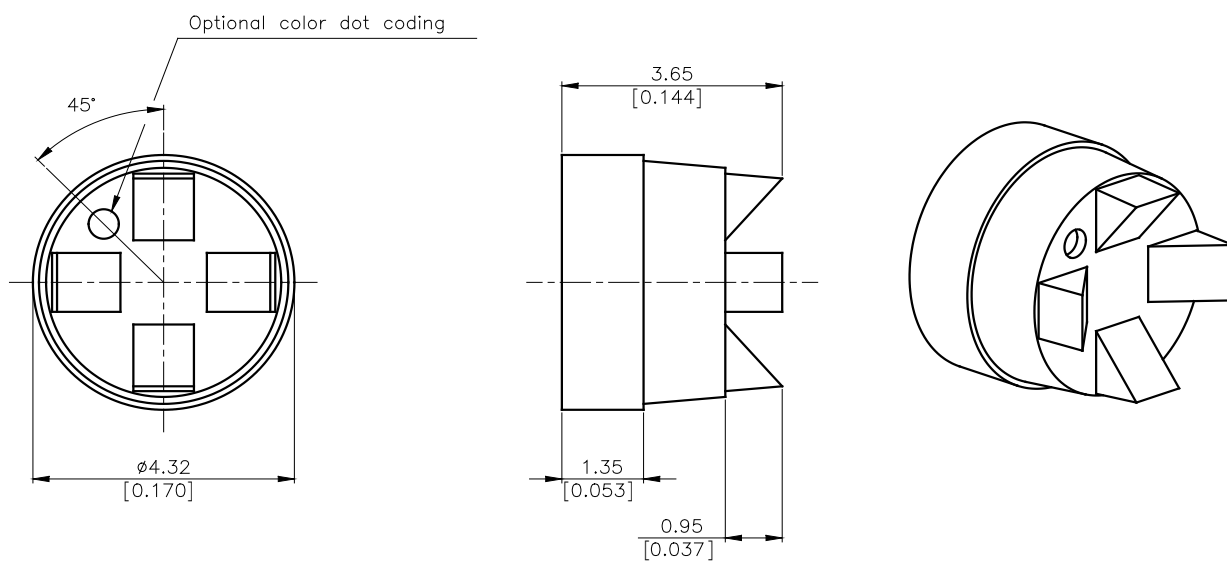
No. 01 to be glued on top of knob 01

The knob extension increases the outer diameter from 4 mm [0.157"] to 4.36 mm [0.172"] and the height increase per knob extension: 1.1 mm [0.043"]



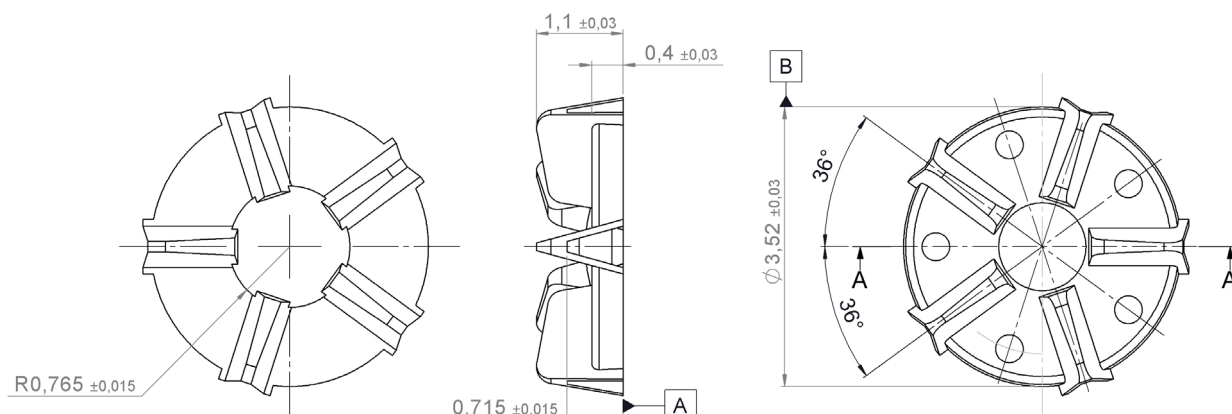
No. 03 to be glued on top of knob 03

The knob extension increases the outer diameter from 4 mm [0.157"] to 4.32 mm [0.170"] and the height from 2.1 mm [0.083"] to 3.55 mm [0.140"]



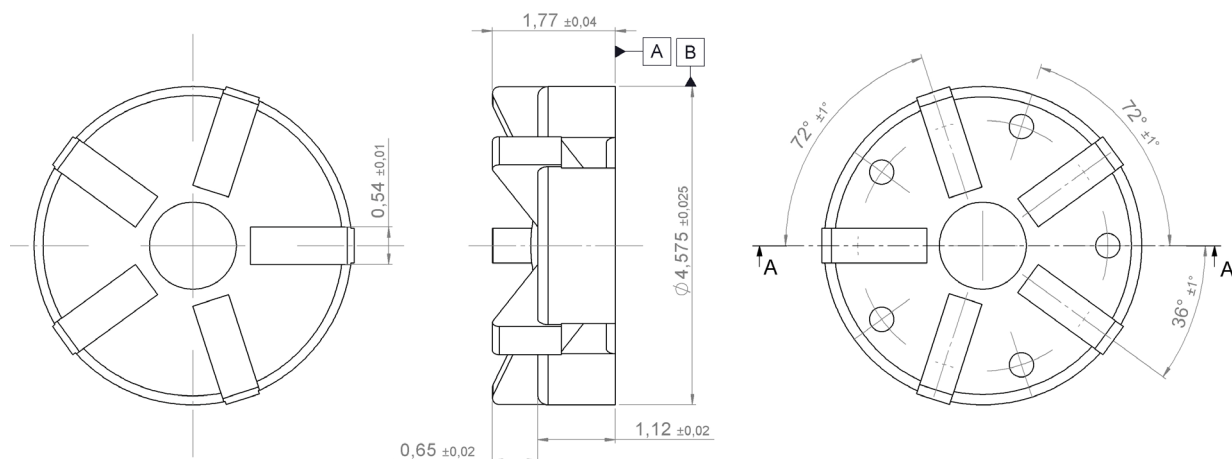
No. 04 to be glued on top of knob

The knob extension increases the outer diameter to 3.52 mm [0.139"]



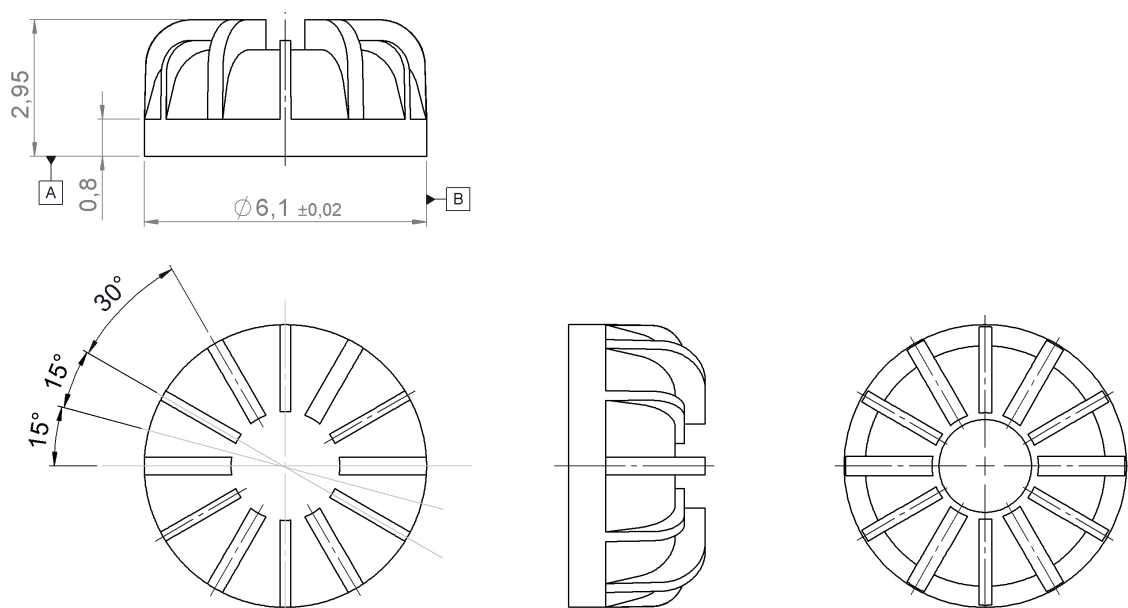
No. 05 to be glued on top of knob

The knob extension increases the outer diameter to 4.575 mm [0.180"]



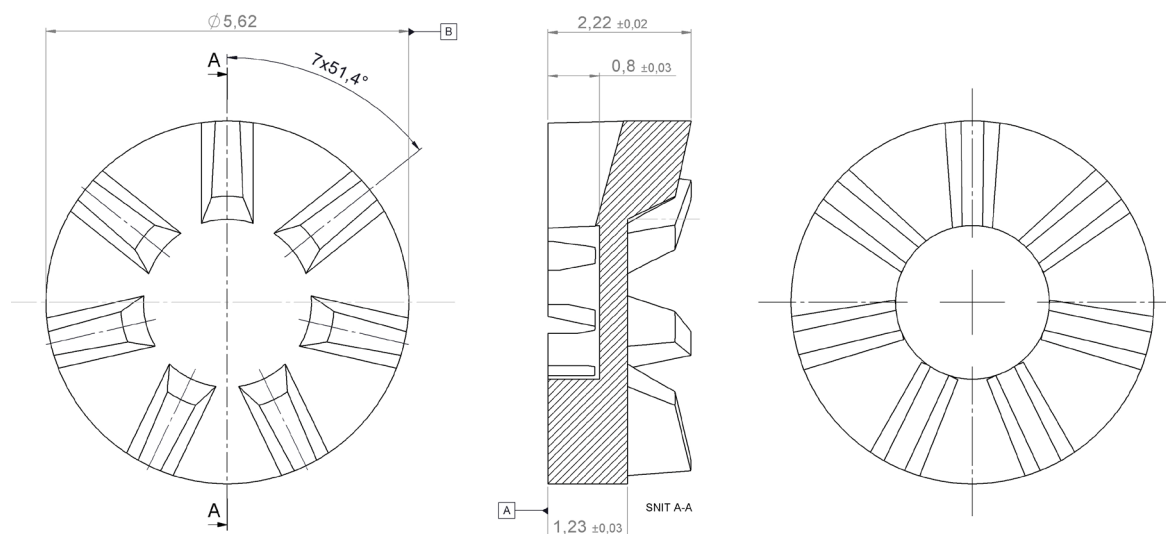
No. 07 to be glued on top of knob 07

The knob extension increases the outer diameter to 6.1 mm [0.240"]



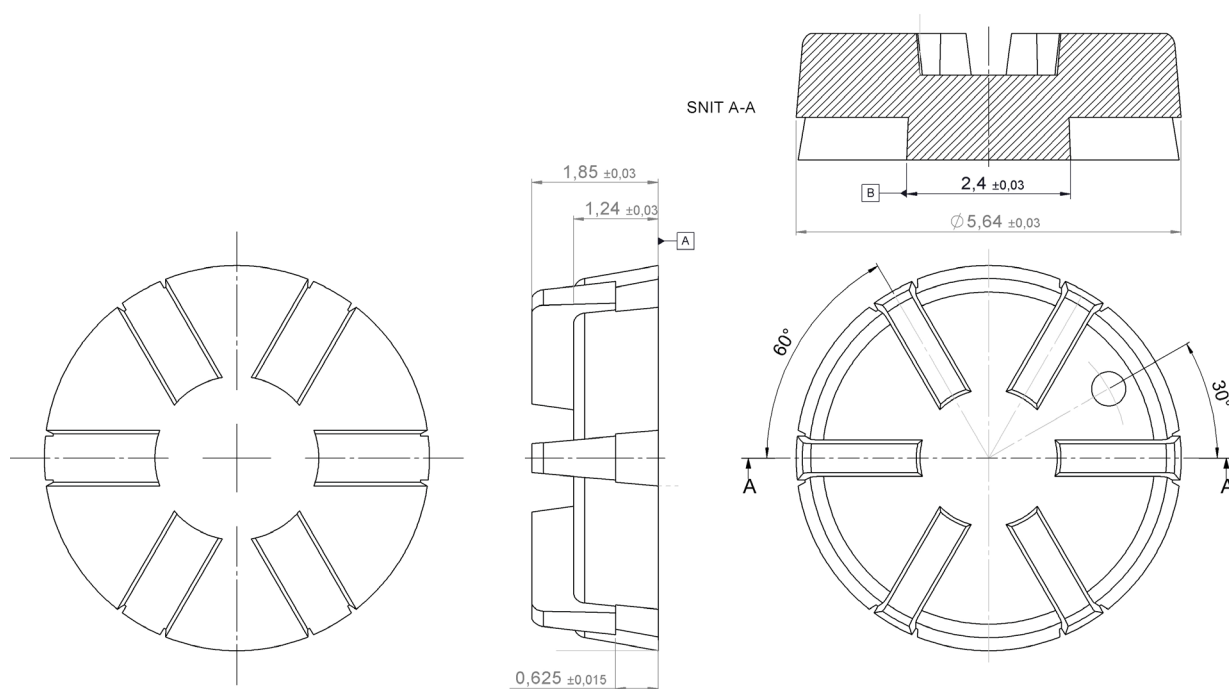
No. 09 to be glued on top of knob

The knob extension increases the outer diameter to 5.62 mm [0.221"]



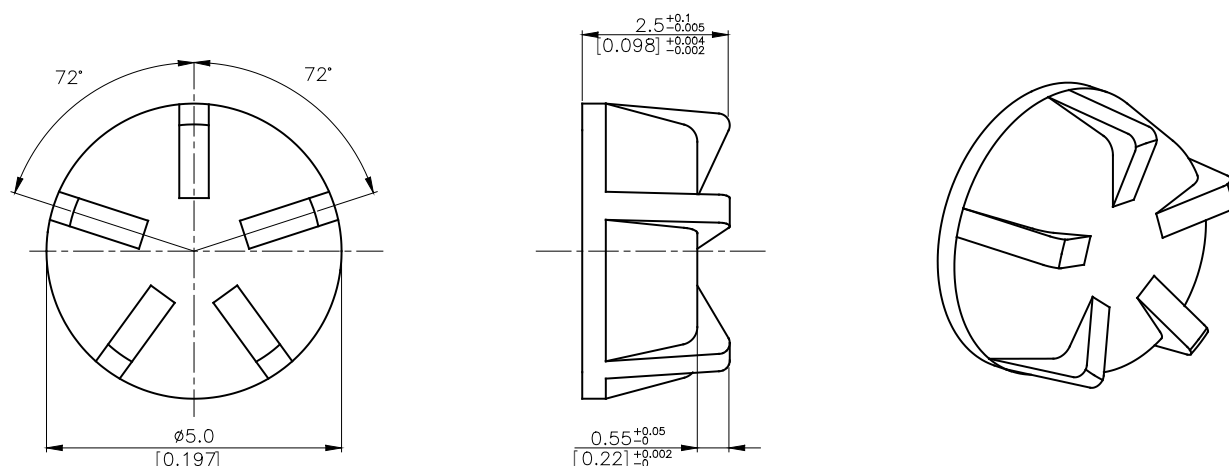
No. 14 to be glued on top of knob

The knob extension increases the outer diameter to 5.64 mm [0.222"]



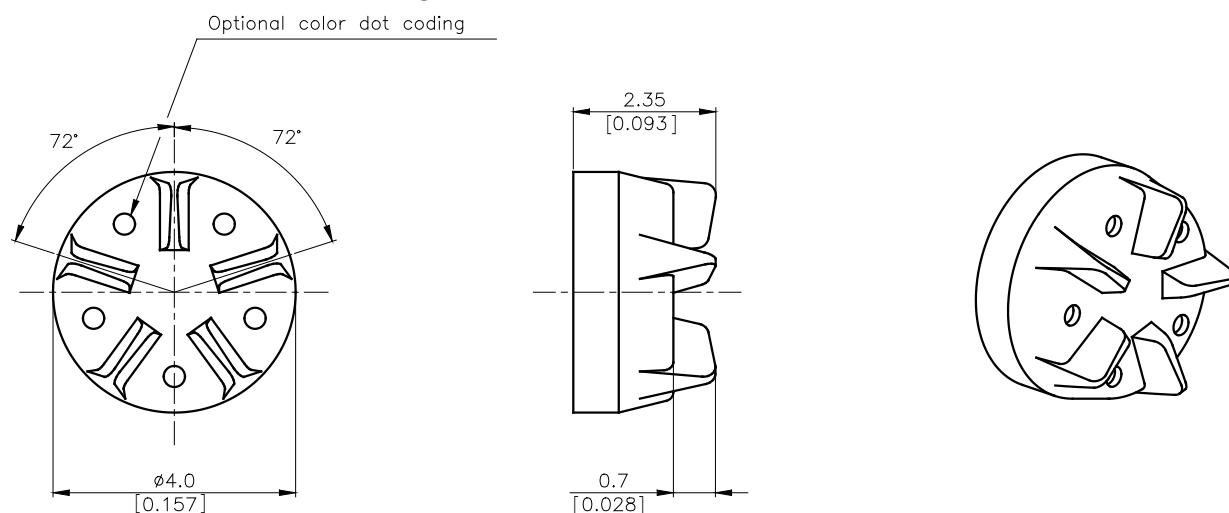
No. 21 to be glued on top of knob 01

The knob extension increases the outer diameter from 4 mm [0.157"] to 5 mm [0.179"] and the height from 2 mm [0.079"] to 2.5 mm [0.098"]



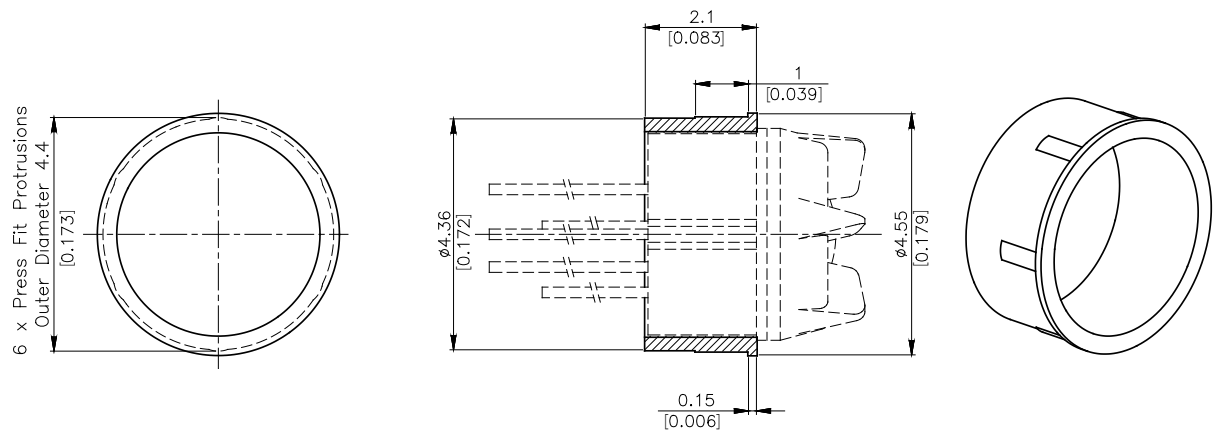
No. 22 to be glued on top of knobs 01 and 11

The knob extension increases the height from 1.85 mm [0.073"] to 2.95 mm [0.116"]

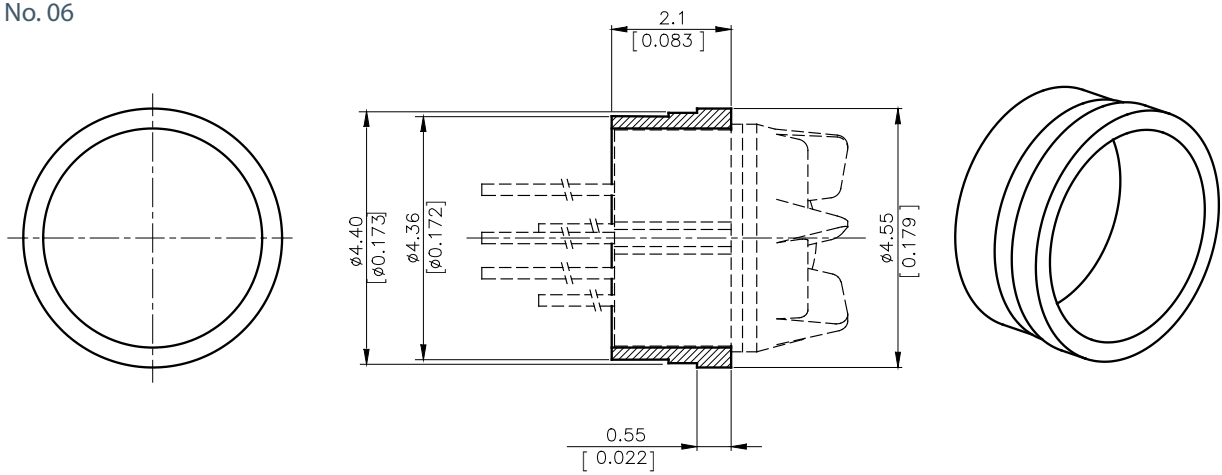


12. Adaptor Ring Styles

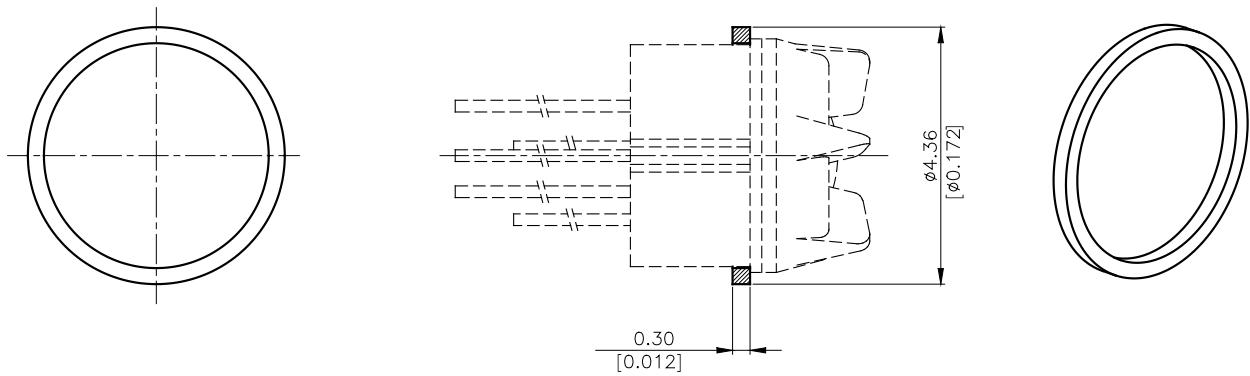
No. 05



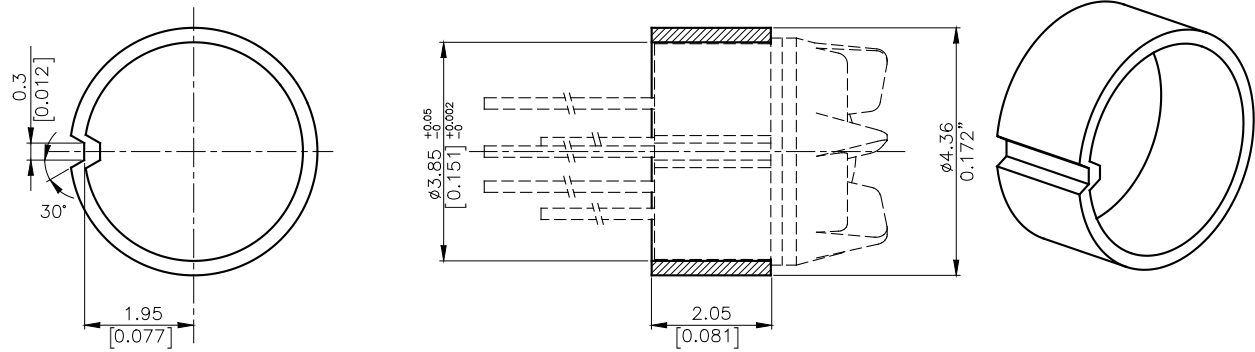
No. 06



No. 25



No. 26



13. Plastic Colors

Please refer to the series 100 included in the Sonion ‘Plastic Color Assortment’ binder.

14. Color Coding

Please see colors for coding included in the Sonion ‘Plastic Color Assortment’ binder.

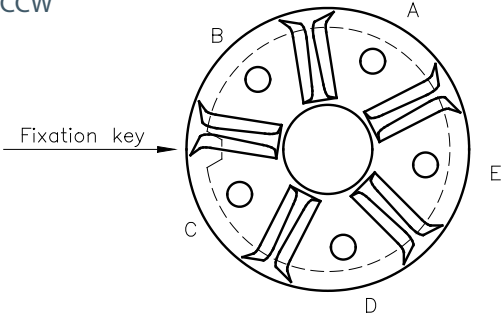
If color coding of a knob extension is desired, please specify the position and color on the knob, on to which the knob extention is to be mounted.

Please note that all knobs are turned CCW to stop (terminal A) or CW to stop (terminal E).

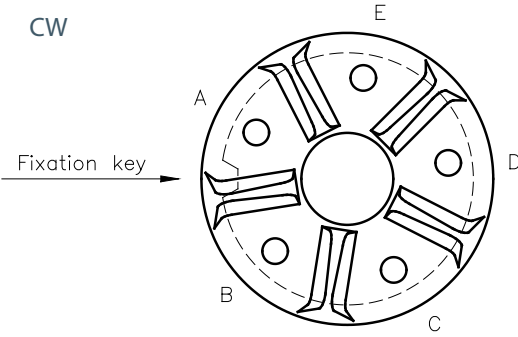
Knob

Nos. 01, 04, 05, 10, 11, 16 & 55

CCW

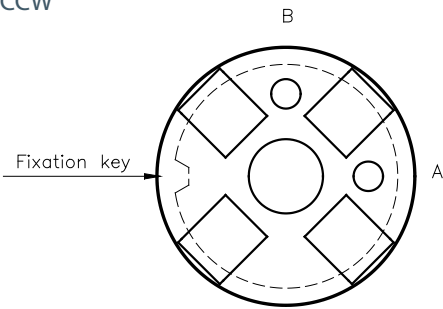


CW

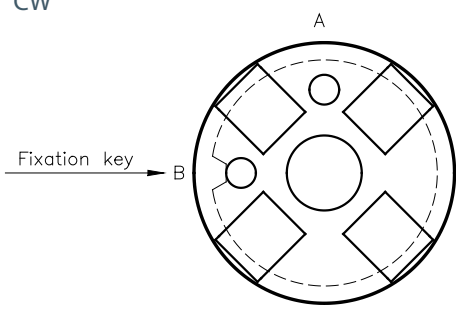


Nos. 03 & 13

CCW

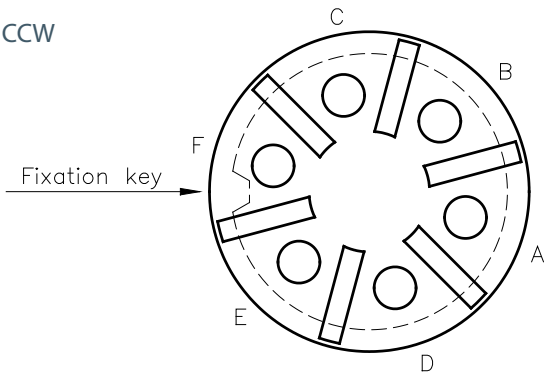


CW

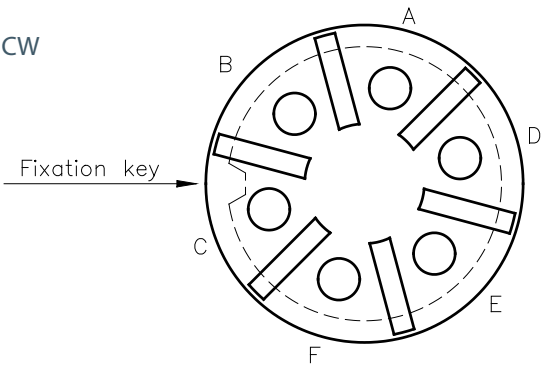


No. 06

CCW

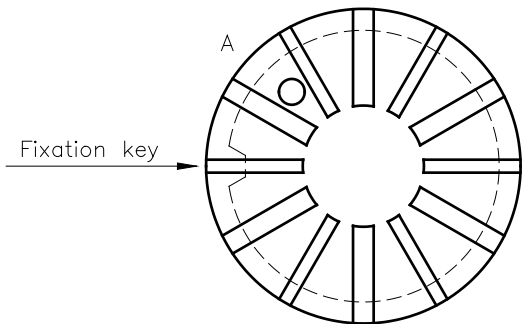


CW

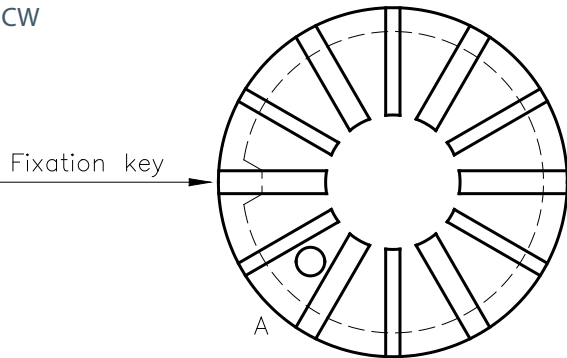


No. 07

CCW

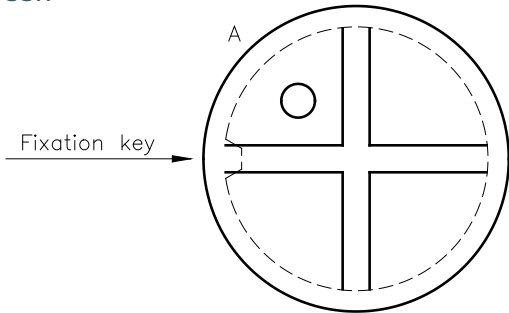


CW

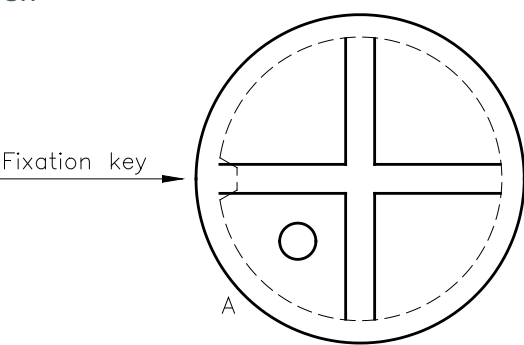


Nos. 21, 22 & 23

CCW

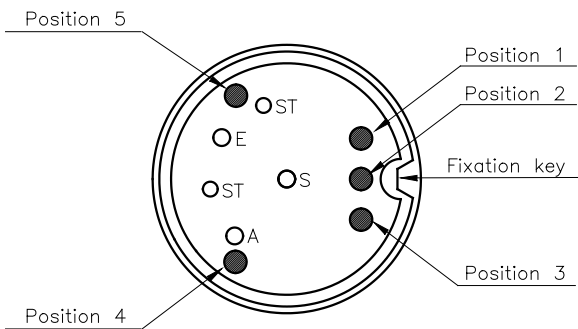


CW

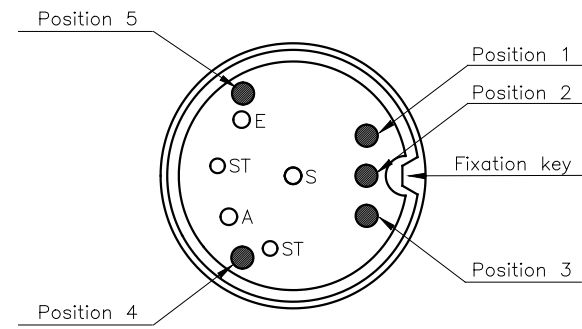


Bottom

CCW switch bottom

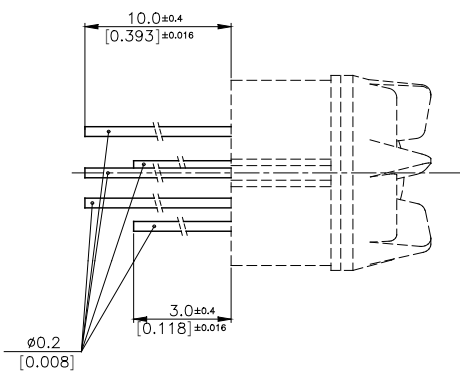


CW switch bottom

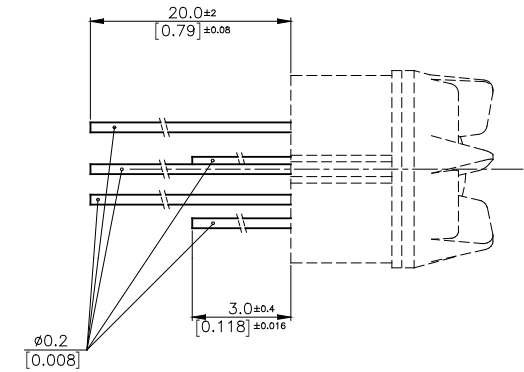


15. Terminal Lengths

10 mm



20 mm



16. Product Specification Form

Name

Company

Customer Part No.

Parameters	Look at Page	Enter your choices	Guidelines
Model	2		PJ 87 CW or CCW PJ 88 CW or CCW For right ear ITE applications, switch position in CCW (counter clockwise) position For left ear ITE applications, switch position in CW (clockwise) position
Housing Styles	9		Please enter housing style no. 11. Only available in Color Code No. 100 Uncolored
Knob Style	10-18		
Knob Extension Styles	18-20		
Adaptor Ring Styles	20-21		
Plastic Colors	22		Please refer to the series 100 included in th Sonion 'Plastic Color Assortment' binder
Color Coding	22-23	A B C D E F	Knob Please refer to colors for coding included in the Sonion 'Plastic Color Assortment' binder
	23	1 2 3 4 5	Bottom Please refer to colors for coding included in the Sonion 'Plastic Color Assortment' binder
Terminal Lenght	23		Please enter 10 mm or 20 mm
Resistance Value			Please see 'Electrical Specifications' and 'Tapers Data Sheet'
Resistance Taper			Please see 'Electrical Specifications' and 'Tapers Data Sheet'