Single-Turn Continuous Rotation Analog Displacement Sensor

FEATURES

- Conductive plastic potentiometer technology, infinite resolution
- Servo mount anodized light alloy housing
- Precious metal contacts
- Stainless steel shaft and bearings
- Applicable standards: NFC 93255, MIL R 39023

QUICK REFERENCE DATA	
Sensor type	ROTATIONAL, conductive plastic
Output type	Output by turrets
Market appliance	Industrial, avionics
Dimensions	1 1/16" (27 mm)

ELECTRICAL SPECIFICATIONS													
PARAMETER													
Theoretical electrical travel (TET)	345° ± 3°												
Theoretical electrical travel (TET) - on request	30°	60°	90°	100°	120°	140°	170°	180°	210°	308°	308°	348°	333° 20’
Useful electrical travel (UET) - on request	30°	44°	70°	90°	120°	140°	170°	100°	210°	140°	180°	342°	300°
Independent linearity standard	± 1 %												
Independent linearity optional	± 0.8 %, ± 0.5 %, ± 0.25 %, ± 0.2 %, ± 0.1 %												
Total resistance (R_n)	4.7 kΩ or 10 kΩ												
Tolerance on R_n	± 20 %												
Output smoothness	≤ 0.1 % (≤ 0.05 % on request)												
Power rating at 70 °C	1.25 W (see “Power Rating Chart”)												
Temperature coefficient	-300 ± 300 ppm/°C												
Wiper current	≤ 1 mA												
Recommended load impedance	≥ 100 R_n for linearity = 1 % ≥ 1000 R_n for linearity ≤ 0.1 %												
Insulation resistance	≥ 1 GΩ at 500 V_{DC} (≥ 10 GΩ at 500 V_{DC} on request)												
Dielectric strength	750 V_{RMS}, 50 Hz, 1 min												

MECHANICAL SPECIFICATIONS	
PARAMETER	
Mechanical rotation	360° continuous
Moment of inertia	≤ 0.4 g cm^2 (for 1 stage), ≤ 0.2 g cm^2 (per additional stage)
Mounting	Standard
Running and starting torque	≤ 12 cN cm (for 1 stage), ≤ 10 cN cm (per additional stage)
Protection class	IP 50
Weight	< 18 g (for 1 stage), < 6 g (per additional stage)

PERFORMANCE	
PARAMETER	
Operating temperature range	-55 °C to +125 °C
Life	25M cycles
Rotation speed (max.)	600 rpm

Note

- Nothing stated herein shall be construed as a guarantee of quality or durability.

For technical questions, contact: mcbprecisionpot@vishay.com

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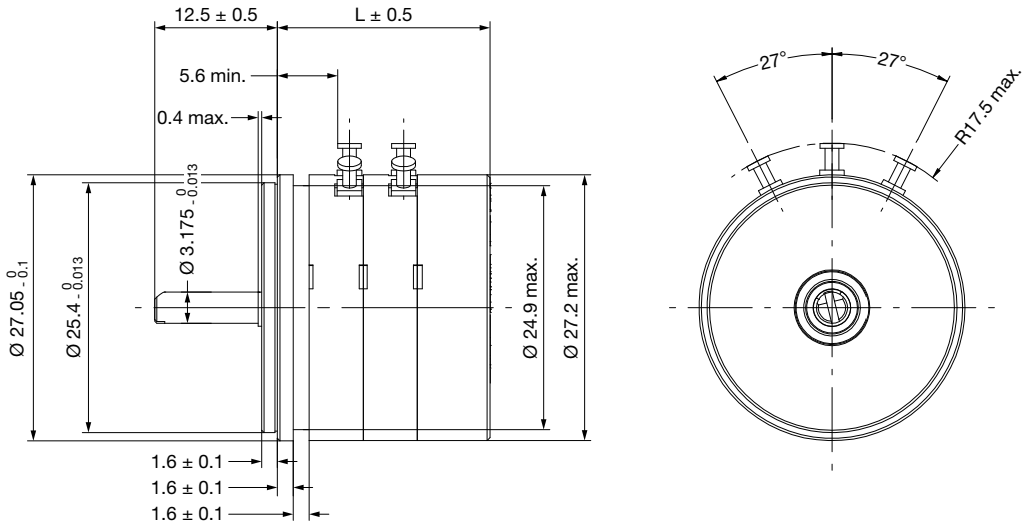
SAP PART NUMBERING GUIDELINES

MODEL	SIZE (mm)	GANG	VALUE	LINEARITY	ANGLE	PACKAGING
POPR	27	1 2 3 4 5 6	472 = 4K7 103 = 10K	A = 1 % B = 0.5 % C = 0.25 % D = 0.1 %	345	B = box

DIMENSIONS in millimeters

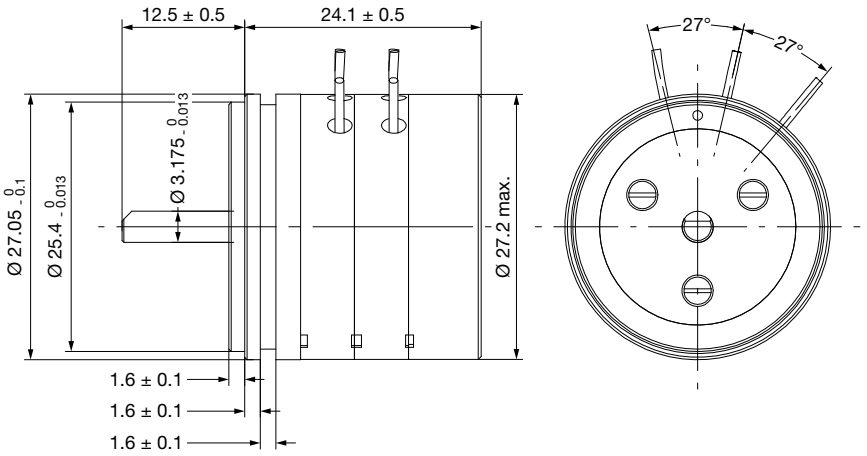


Number of cups	1	2	3	4	5	6
L	16	21.5	27	32.5	38	43.5

DESIGNS ON REQUEST

DIMENSIONS in millimeters

OPTION 1



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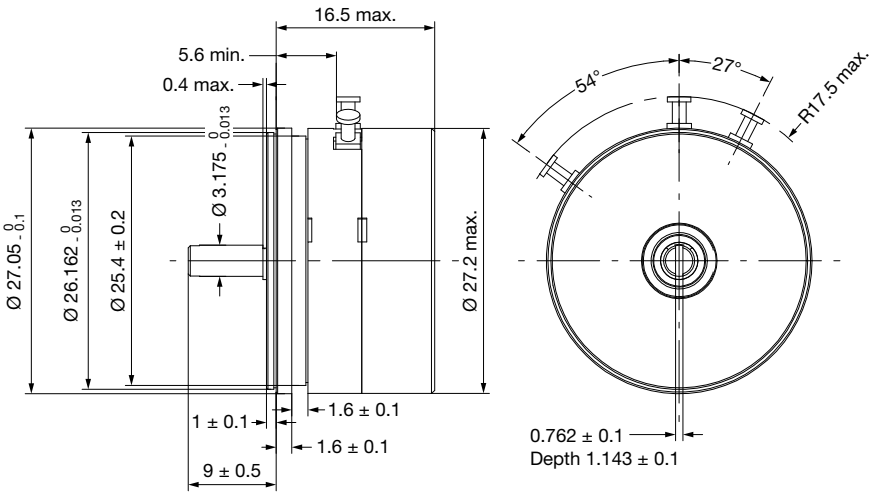
DIMENSIONS in millimeters

OPTION 2



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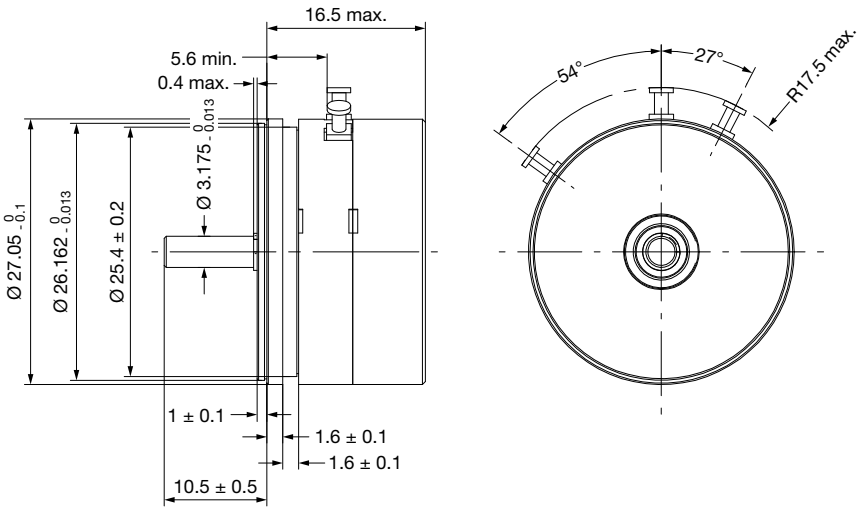

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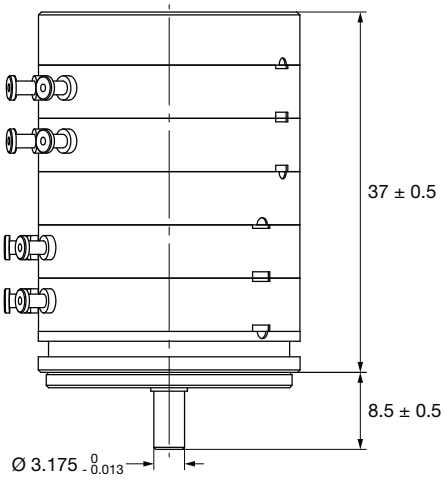
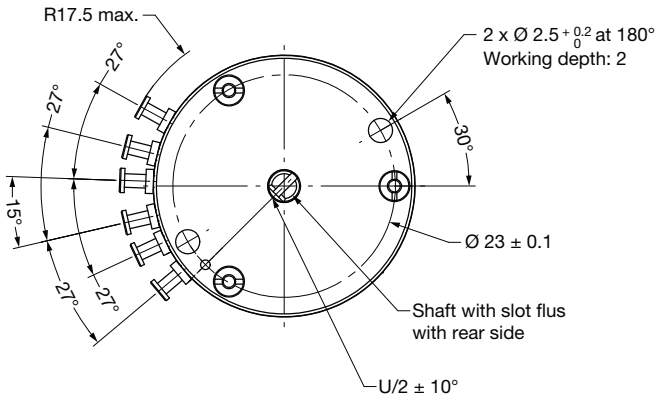
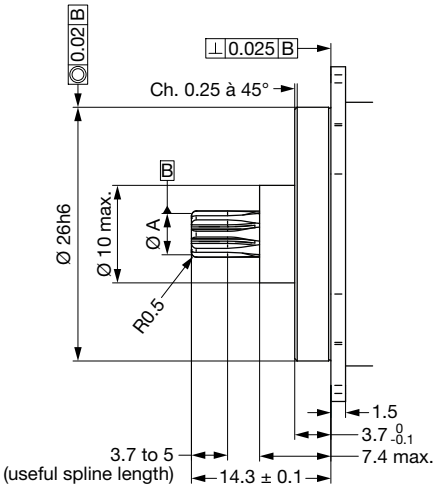
DIMENSIONS in millimeters

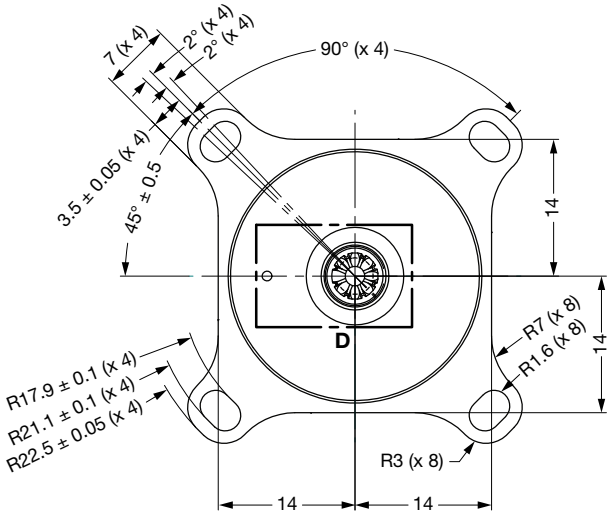
OPTION 4: 4 CUPS WITH INTERMEDIATE HOUSING





OPTION 5: FLANGE 4 EARS AND SHAFT OF COUPLING (EXAMPLE OF CUSTOMIZATION, OTHER VARIANTS ALSO FEASIBLE)



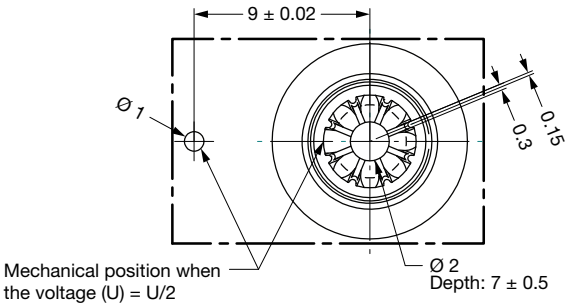


External involute spline data per ANSI B92.1A

Fillet root side fit table 38
Number of teeth: 8 (-1)
Spline pitch: 48/96
Pressure angle: 30°
Base diameter: 3.6661852
Pitch diameter (A): 4.23333
Major diameter: 4.7244 / 4.7752
Form diameter: 3.81
Minor diameter: 2.921 min.
Circular tooth thickness
- Maximum effective: 0.8910
- Minimum actual: 0.8525
- Maximum actual: 0.8694

Minimum measurements over pins: 5.79374 / 5.8166
Pin diameter: 1.016 (ref.)
Fillet radius minimum: 0.1778

Detail D



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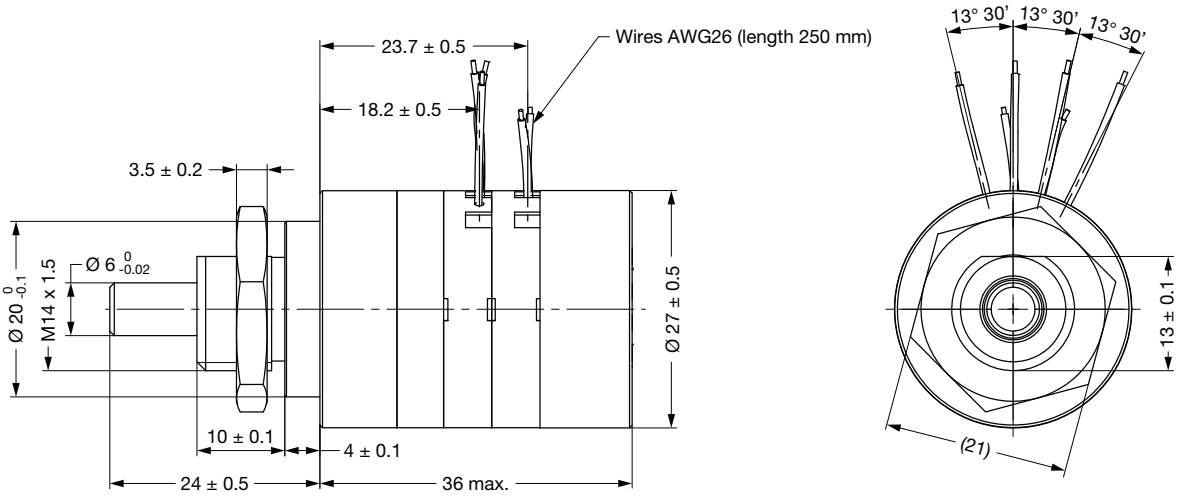
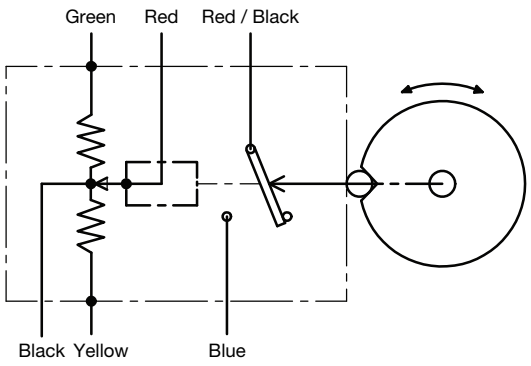
DIMENSIONS in millimeters

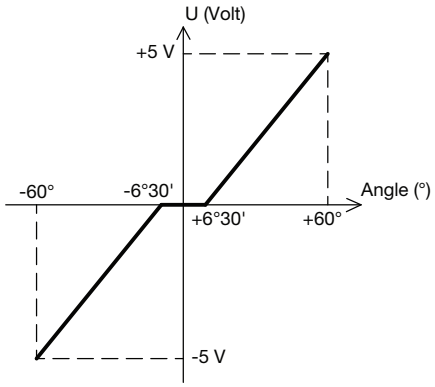
OPTION 6: DOUBLE FUNCTIONS (POTENTIOMETER FUNCTION AND SWITCH) WITH RETURN SPRING



Schematic Diagram



Electrical Function



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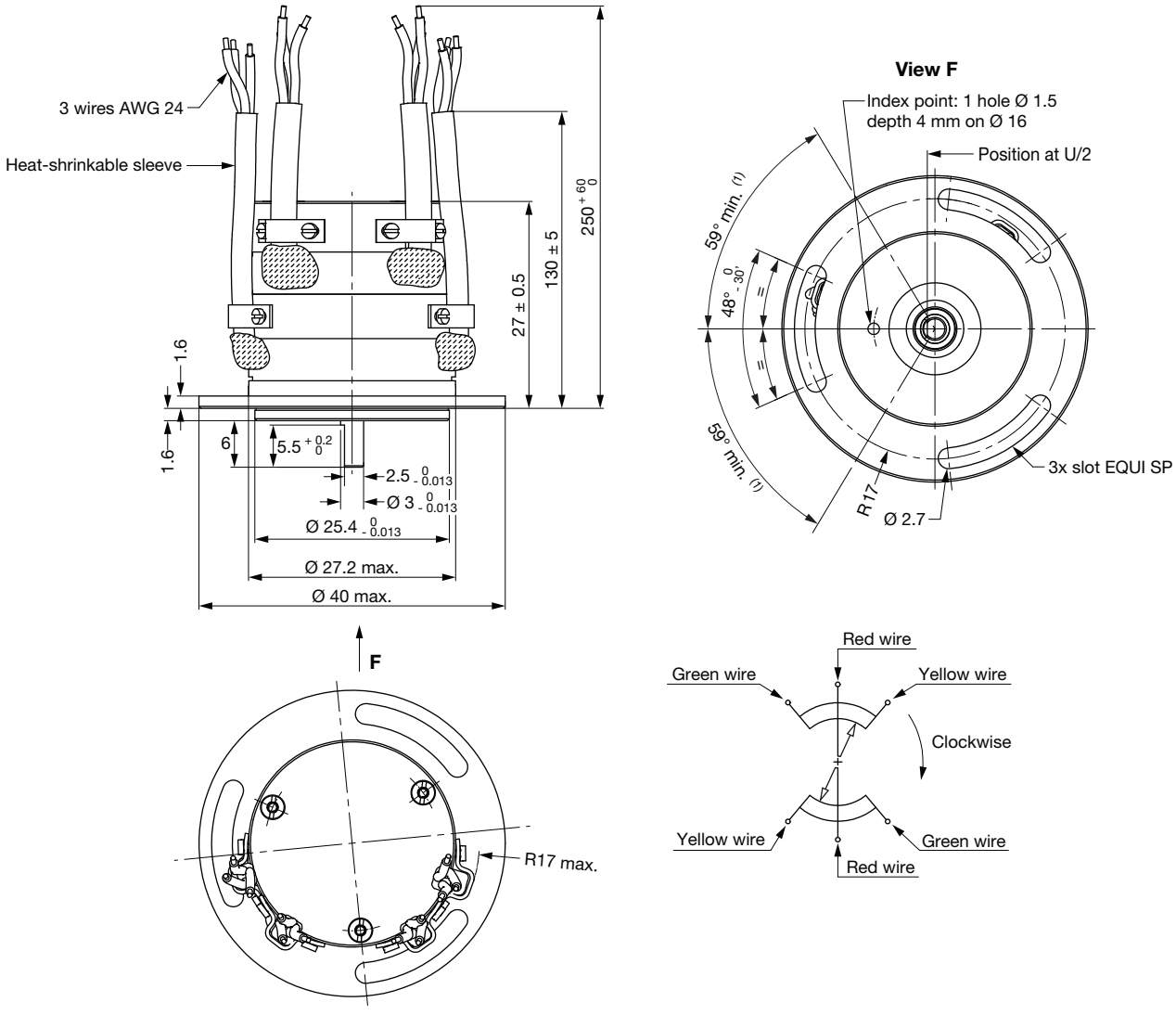
DIMENSIONS in millimeters

OPTION 7: 4 FUNCTIONS (INCLUDING 2 FUNCTIONS/CUP AND FLANGE ALLOWING AN EASY ASSEMBLY ON CUSTOMER DEVICE)



Note

(1) Angle before mechanical stop

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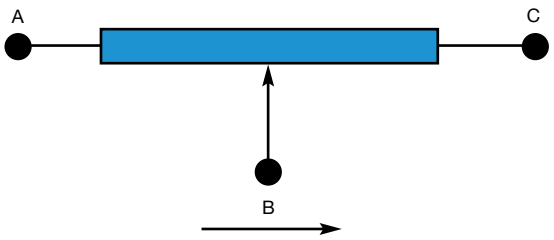
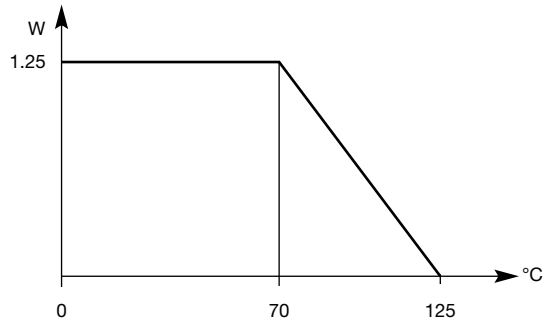
ELECTRICAL DIAGRAM



Clockwise direction viewed from control shaft side

POWER RATING CHART



OPTIONS (on request)

- Other ohmic value: 1.5 kΩ; 2 kΩ; 5 kΩ; 50 kΩ
- Other tolerances on R_n: ± 10 %
- Other linearities: ± 0.065 %
- Other theoretical electrical travel
- Connectors (center tap)
- Through shaft
- Insulating resistance: ≥ 10 GΩ at 500 V_{DC}
- Shaft: without flat surface (without D shape), other specific design feasible (e.g. lamella design)
- Total length (old model with one gang): 14 mm in place of 16 mm
- Type of wiper: 5 strands or 2 or 3 lamellas
- Protection class: IP 65 (front flange)
- Electrical reference: 0.5 U ± 0.1 % U
- Electrical phasing between cups: ± 0.1 % or 0.03 % at U/2
- Mechanical reference: U/2 printing flange / shaft at ± 10° (by printing or machined hole on the flange)
- Intensity accidental = 5 mA
- Function: sine and / or cosine with accuracy ± 1 %
- Flange: with ears in place of synchro mechanical fixation

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