

# 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 <sub>n</sub> )	4.7 kΩ or 10 kΩ													
Tolerance on R <sub>n</sub>	± 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 <sub>n</sub> for linearity = 1 % ≥ 1000 R <sub>n</sub> for linearity ≤ 0.1 %													
Insulation resistance	≥ 1 GΩ at 500 V <sub>DC</sub> (≥ 10 GΩ at 500 V <sub>DC</sub> on request)													
Dielectric strength	750 V <sub>RMS</sub> , 50 Hz, 1 min													

## MECHANICAL SPECIFICATIONS

PARAMETER	
Mechanical rotation	360° continuous
Moment of inertia	≤ 0.4 g cm <sup>2</sup> (for 1 stage), ≤ 0.2 g cm <sup>2</sup> (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

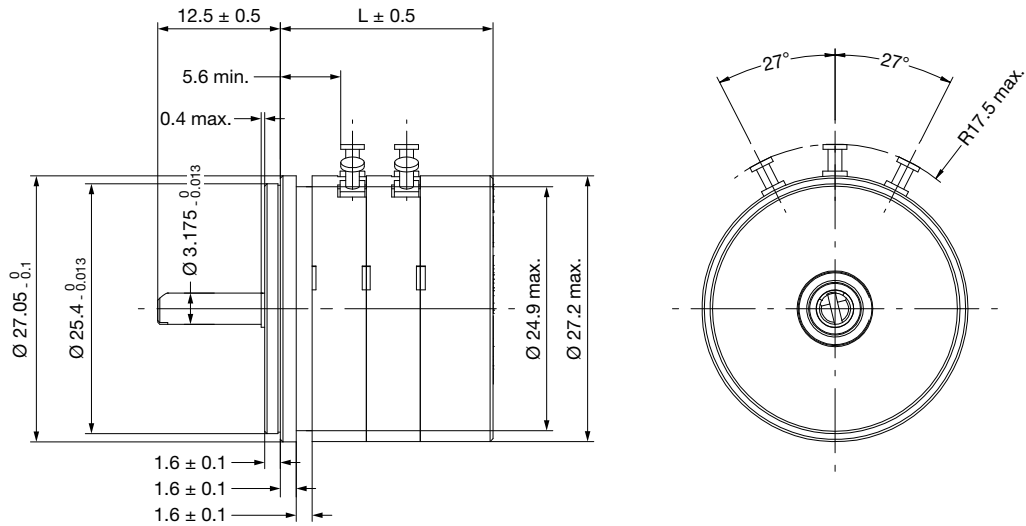
PARAMETER	
Operating temperature range	-55 °C to +125 °C
Life	25M cycles
Rotation speed (max.)	600 rpm

### Note

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

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

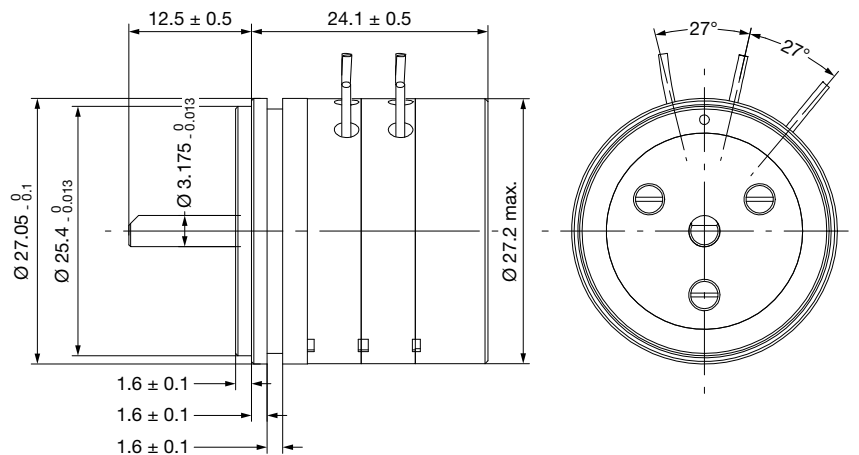
**DIMENSIONS** in millimeters



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

**DESIGNS ON REQUEST**

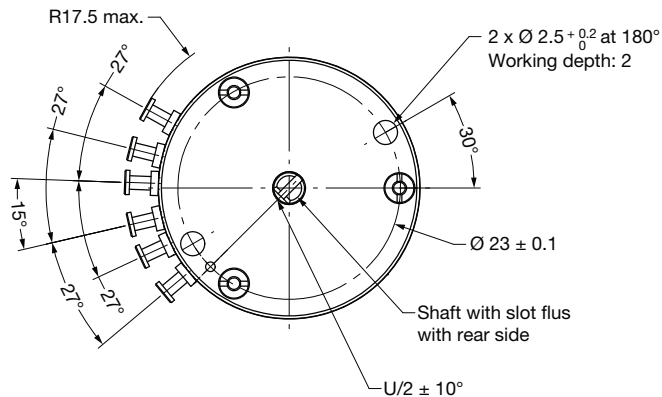
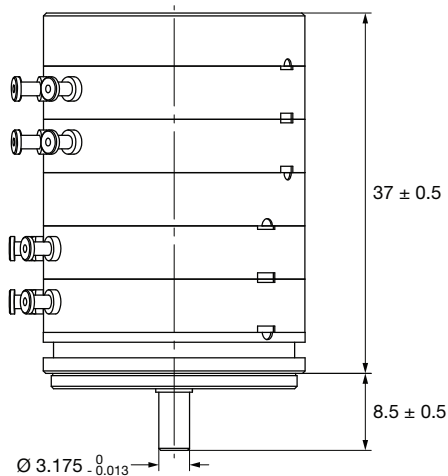
**OPTION 1**



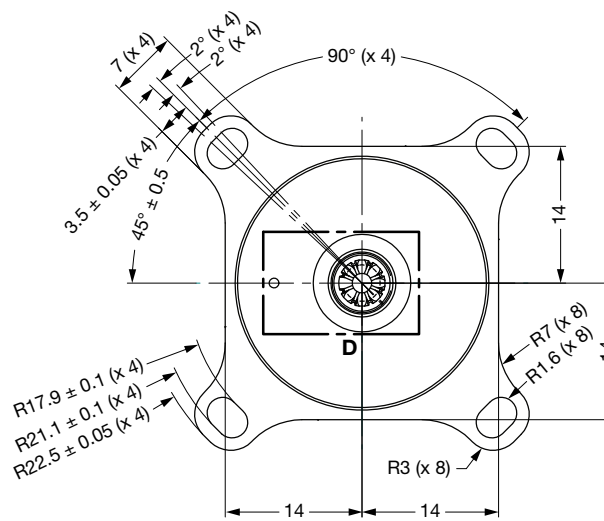
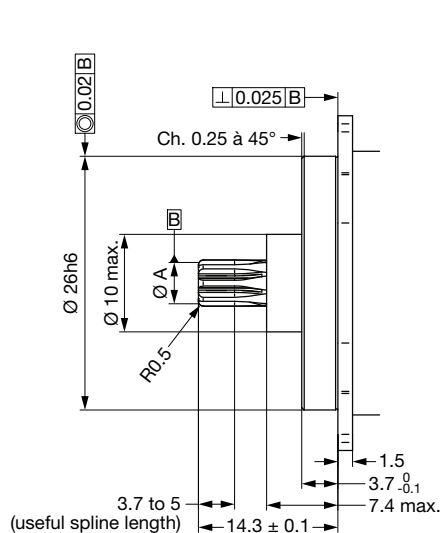


**DIMENSIONS** in millimeters

**OPTION 4: 4 CUPS WITH INTERMEDIATE HOUSING**

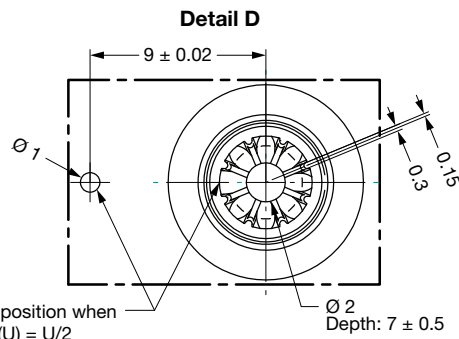


**OPTION 5: SPECIFIC FLANGE AND SHAFT (EXAMPLE OF CUSTOMIZATION, OTHER VARIANTS ALSO FEASIBLE)**



External involute spline data per ANSI B92.1A

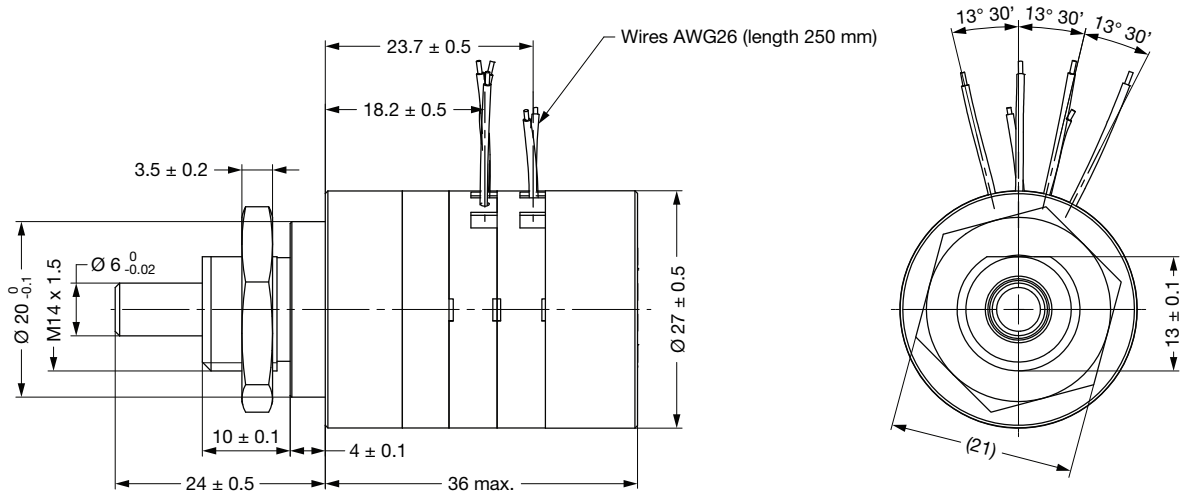
- Fillet root side fit table 38
- Number of teeth: 8 (-1)
- Spline pitch: 48/96
- Pressure angle: 30°
- Base diameter: 3.6661852
- Pitch diameter (A): 4.23333
- Major diameter: 4.7244 / 4.7752
- Form diameter: 3.81
- Minor diameter: 2.921 min.
- Circular tooth thickness
  - Maximum effective: 0.8910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



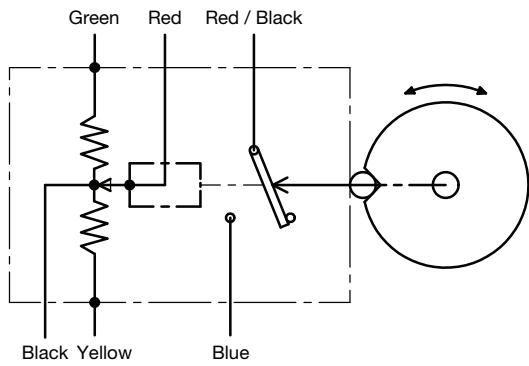
Mechanical position when the voltage (U) = U/2

**DIMENSIONS** in millimeters

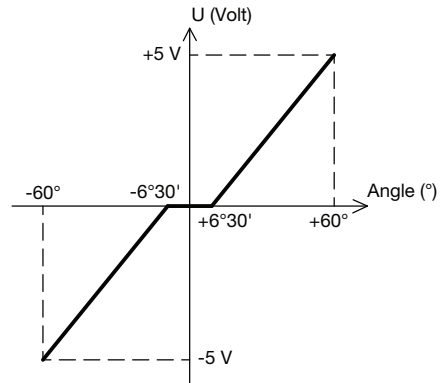
**OPTION 6: DOUBLE FUNCTIONS (POTENTIOMETER FUNCTION AND SWITCH) WITH RETURN SPRING**



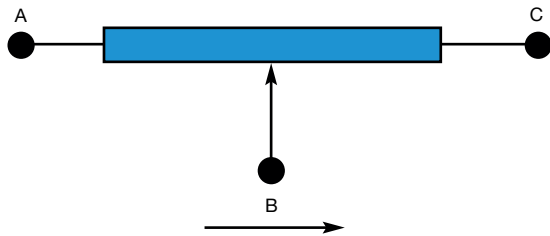
**Schematic Diagram**



**Electrical Function**

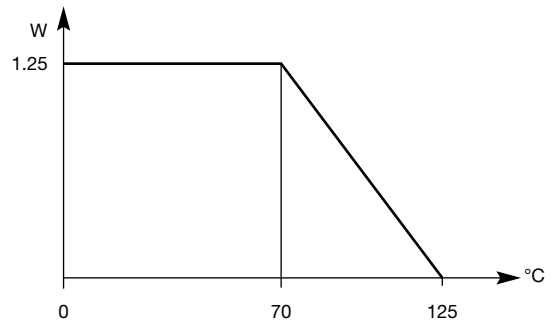


**ELECTRICAL DIAGRAM**



Clockwise direction viewed from control shaft side

**POWER RATING CHART**





**OPTIONS** (on request)

- Other ohmic value: 1.5 k $\Omega$ ; 2 k $\Omega$ ; 5 k $\Omega$ ; 50 k $\Omega$
- Other tolerances on  $R_n$ :  $\pm 10\%$
- Other linearities:  $\pm 0.065\%$
- Other theoretical electrical travel
- Connectors (center tap)
- Through shaft
- Insulating resistance:  $\geq 10\text{ G}\Omega$  at 500 V<sub>DC</sub>
- 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:  $0.5 U \pm 0.1\% U$
- Electrical phasing between cups:  $\pm 0.1\%$  or  $0.03\%$  at  $U/2$
- Mechanical reference:  $U/2$  printing flange / shaft at  $\pm 10^\circ$  (by printing or machined hole on the flange)
- Intensity accidental = 5 mA
- Function: sine and / or cosine with accuracy  $\pm 1\%$
- Flange: with ears in place of synchro mechanical fixation



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