

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.

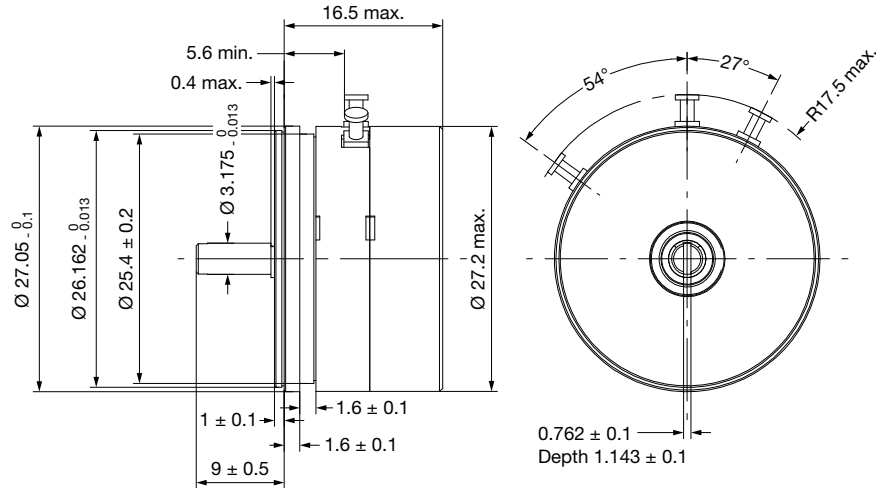
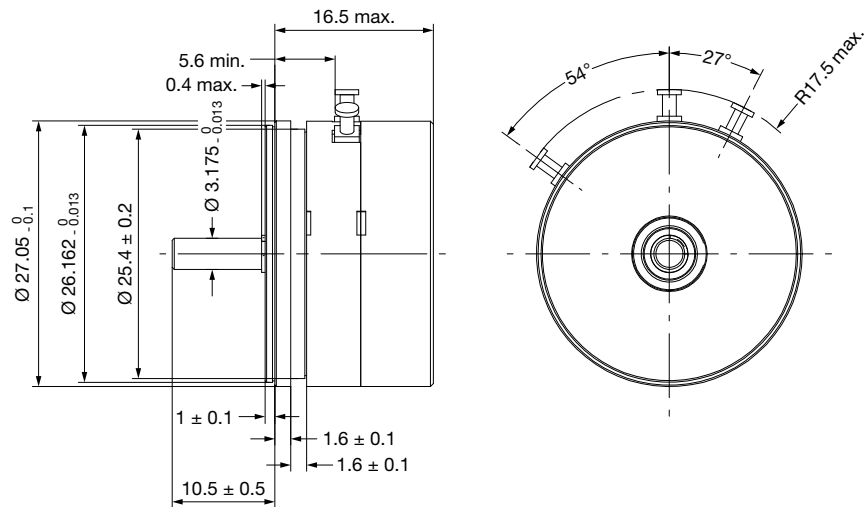
| SAP PART NUMBERING GUIDELINES | | | | | | |
|-------------------------------|-----------|------|-----------|---|-------|-----------|
| MODEL | SIZE (mm) | GANG | VALUE | LINEARITY | ANGLE | PACKAGING |
| POPR | 27 | 1 | 472 = 4K7 | A = 1 % B = 0.5 % C = 0.25 % D = 0.1 % | 345 | B = box |
| | | 2 |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

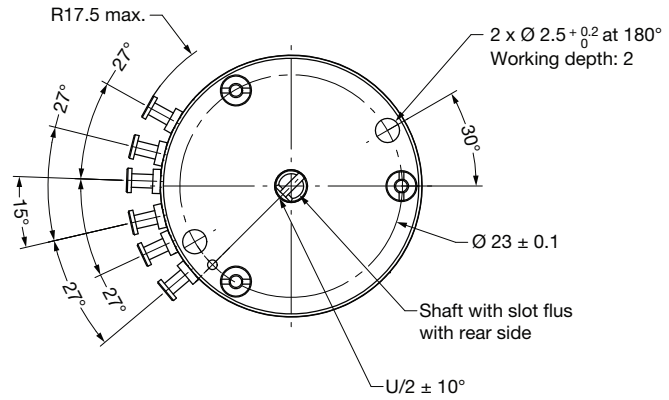
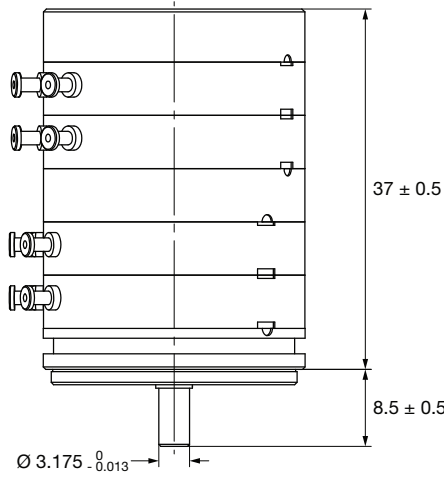
| DIMENSIONS in millimeters | | | | | | |
|---------------------------|--|--|--|--|--|--|
| OPTION 1 | | | | | | |
| | | | | | | |

DIMENSIONS in millimeters

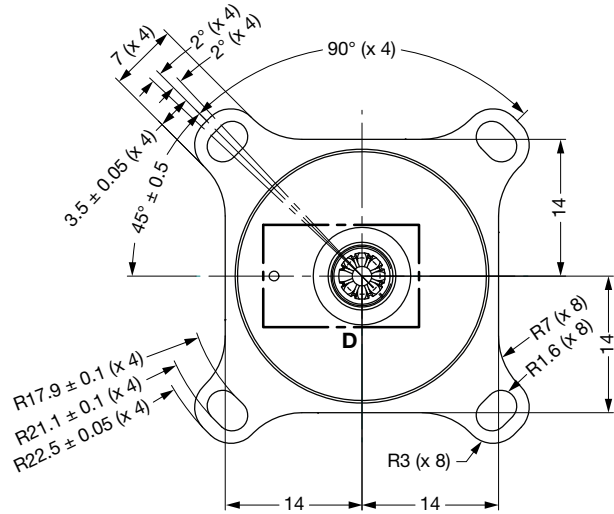
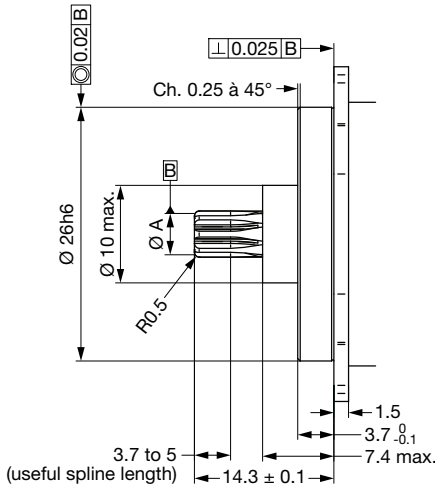
OPTION 2

OPTION 3


DIMENSIONS in millimeters

OPTION 4: 4 CUPS WITH INTERMEDIATE HOUSING



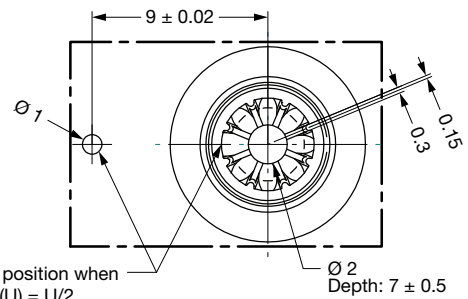
OPTION 5: FLANGE 4 EARS AND SHAFT OF COUPLING (EXAMPLE OF CUSTOMIZATION, OTHER VARIANTS ALSO FEASIBLE)



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

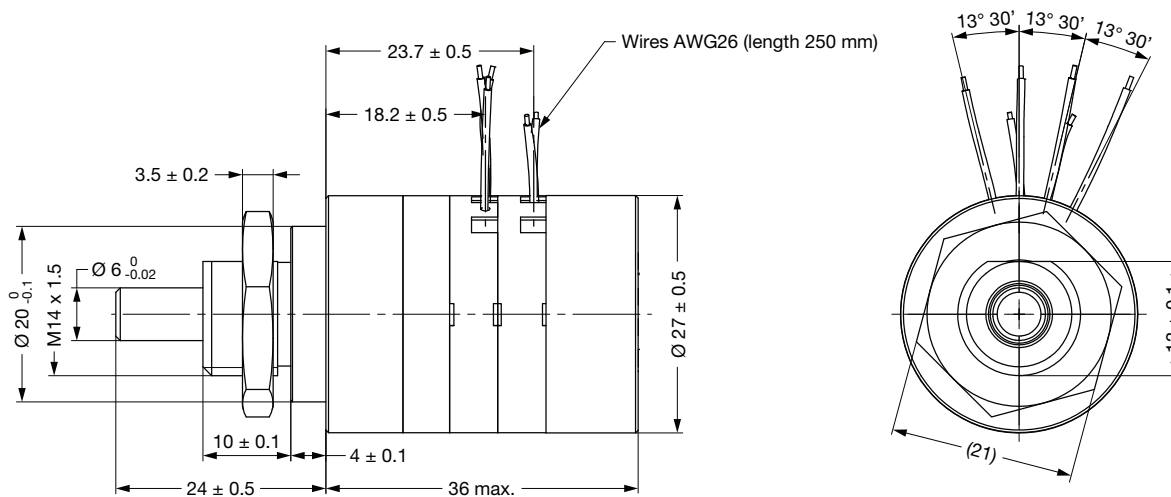
Detail D



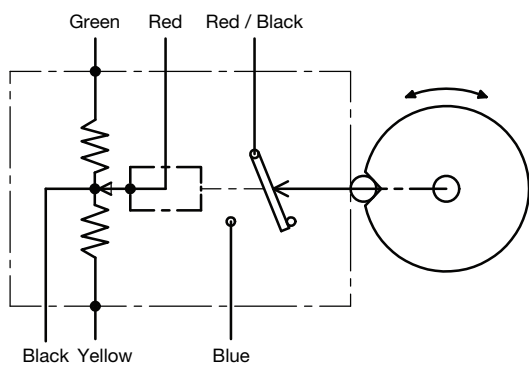
Mechanical position when the voltage (U) = U/2

DIMENSIONS in millimeters

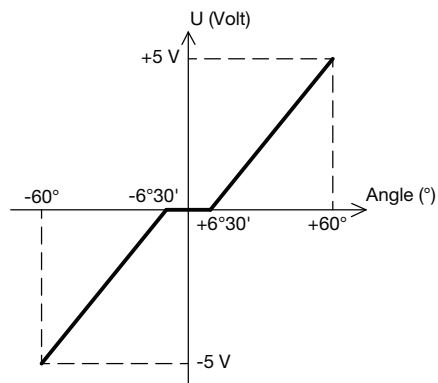
OPTION 6: DOUBLE FUNCTIONS (POTENTIOMETER FUNCTION AND SWITCH) WITH RETURN SPRING



Schematic Diagram

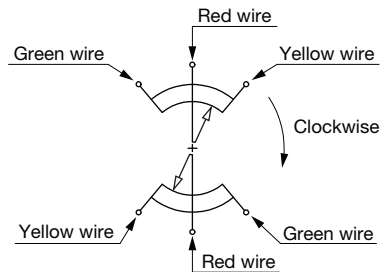
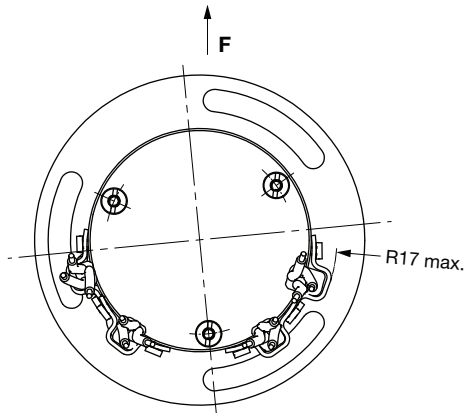
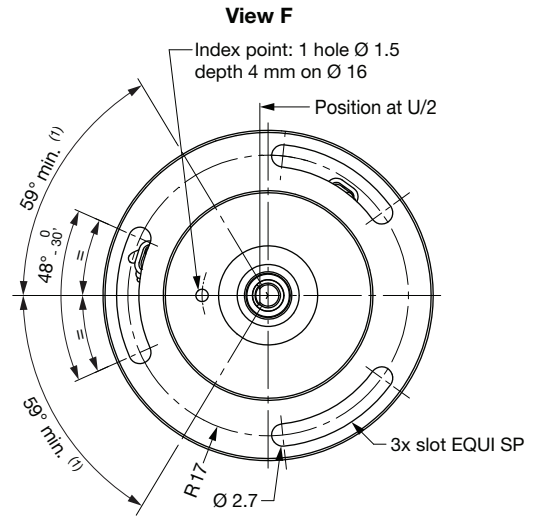
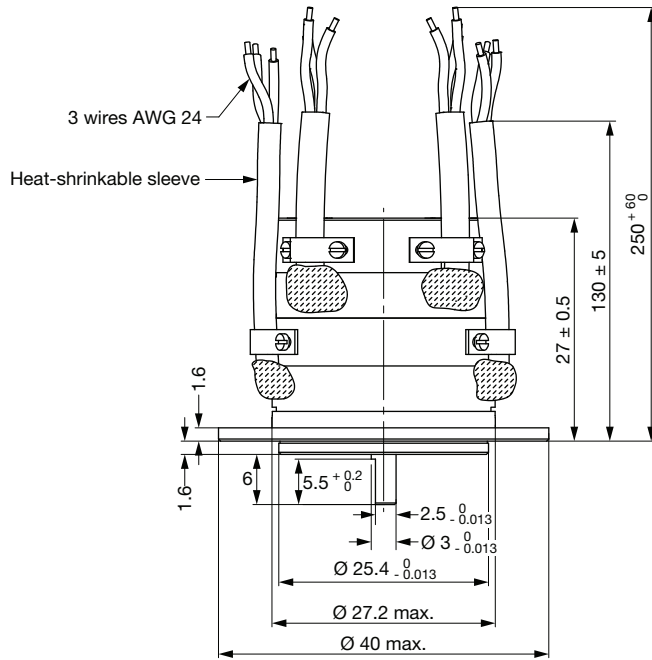


Electrical Function



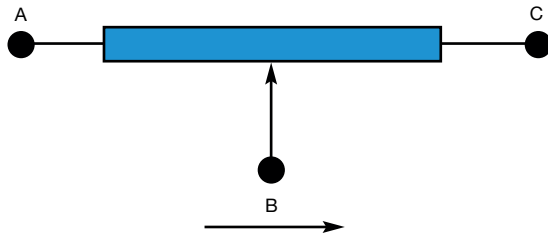
DIMENSIONS in millimeters

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



Note

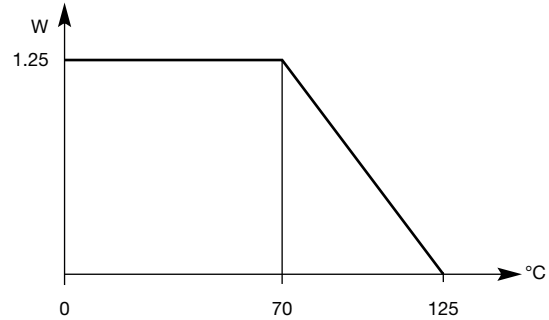
(1) Angle before mechanical stop

ELECTRICAL DIAGRAM


Clockwise direction viewed from control shaft side

OPTIONS (on request)

- Other ohmic value: 1.5 k Ω ; 2 k Ω ; 5 k Ω ; 50 k Ω
- 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_{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: $0.5 U \pm 0.1\% U$
- 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

POWER RATING CHART




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