

# Data Sheet for Precision Potentiometer

Singleturn Wirewound Potentiometer

Series RPS45



The RPS45 servo flange potentiometers are designed for applications where precise wirewound potentiometers with a large electrically effective angle of rotation are required.

- Accurate wirewound potentiometer
- Very high electrically effective angle of rotation  $355^\circ \pm 3^\circ$
- On request with mech. end stop ( $330^\circ$ )
- Multi-ganged up to 7 gangs
- With many options

## Electrical Data

|                                                               |                                                                                               |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Effective electrical angle of rotation 1.)                    | $355^\circ \pm 3^\circ$                                                                       |
| Total resistance 1.)                                          | 10 Ohm..50 kOhm                                                                               |
| Resistance tolerance                                          | $\pm 3\%$ ( $\pm 1\%$ )                                                                       |
| Independent linearity (best straight line) 1.)                | $\pm 0.3\%$ ( $\pm 0.1\%$ )<br>( $\pm 0.2\%$ $R \leq 2k\Omega$ / $\pm 0.1\%$ $R > 2k\Omega$ ) |
| Theoretical resolution 1.)                                    | Depends on resistance value (see table below)                                                 |
| Backlash (Hysteresis) 1.)                                     | $\leq 0.5^\circ$                                                                              |
| Rotational noise (ENR) 1.) (Method C)                         | 100 Ohm                                                                                       |
| Max. / recommended wiper current 1.)                          | 35 mA / 2 $\mu$ A                                                                             |
| Power rating @ $70^\circ\text{C}$ (0W @ $105^\circ\text{C}$ ) | 1 W                                                                                           |
| Insulation Voltage 1.)                                        | 1000 VAC, 1min                                                                                |
| Insulation Resistance 1.)                                     | 1000 MOhm @ 1000 VDC                                                                          |

## Mechanical Data, Environmental Conditions, Miscellaneous

|                                                  |                                                |
|--------------------------------------------------|------------------------------------------------|
| Mechanical angle of rotation                     | $360^\circ$ without stop                       |
| Lifetime (90% el. eff. angle half sine) 2.)      | 1 Mio. rotations                               |
| Max. operational speed                           | 40 rev. / min.                                 |
| Bearing                                          | 2 x ball bearing                               |
| Operational torque @ ambient temperature 1.) 2.) | 4 Nmm                                          |
| Operating temperature range                      | $-20^\circ\text{C}$ up to $+105^\circ\text{C}$ |
| Storage temperature range                        | $-55^\circ\text{C}$ up to $+105^\circ\text{C}$ |
| Protection grade (IEC 60529)                     | IP40                                           |
| Vibration (IEC 68-2-6, Test Fc)                  | 15g 10..2000Hz x 12h                           |
| Shock (IEC 68-2-27, Test Ea)                     | 49g @ 11 ms x 18                               |
| Housing diameter                                 | 41 mm                                          |
| Housing depth                                    | 18 mm                                          |
| Shaft diameter                                   | 6 mm                                           |
| Shaft type                                       | Solid shaft                                    |

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### Mechanical Data, Environmental Conditions, Miscellaneous

|                                      |                            |
|--------------------------------------|----------------------------|
| Max. radial load                     | ≤1 N                       |
| Max. axial load                      | ≤1 N                       |
| Connection type                      | Gold plated soldering lugs |
| Connection position                  | Radial                     |
| Sensor mounting                      | Servo flange               |
| Mass                                 | 55 g                       |
| Fastening parts included in delivery | 3 x servo clamps SFN1      |
| Material shaft                       | Stainless steel            |
| Material housing                     | Metal                      |

1.) According IEC 60393

2.) Determined by climatic conditions according to IEC 68-1, para. 5.3.1 without load collectives

Please note: Max. permissible supply voltage <75 VDC respectively <50 VAC in addition the max. power rating must be observed

### Number of wire turns / resolution

| Resistance value Ohm | 10  | 20  | 50  | 100 | 200 | 500 | 1k  | 2k   | 5k   | 10k  | 20k  | 50k  |
|----------------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
| Number of wire turns | 450 | 550 | 450 | 570 | 720 | 950 | 820 | 1040 | 1430 | 1790 | 2280 | 3100 |

Resolution in degree E.g. R5k =  $360^\circ / 1430 = 0,252^\circ$  per winding resistive wire

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| Order code                               |                                                                             |             |                |  |                 |            |              |               |          |
|------------------------------------------|-----------------------------------------------------------------------------|-------------|----------------|--|-----------------|------------|--------------|---------------|----------|
| Description                              | Selection: <b>standard=black/bold</b> , possible <i>options=grey/italic</i> |             |                |  |                 |            |              |               |          |
| <b>Series</b>                            | <b>RPS45</b>                                                                |             |                |  |                 |            |              |               |          |
| <b>Resistance value / Option Tandem:</b> |                                                                             |             | <i>Tandem*</i> |  |                 |            |              |               |          |
| Option 10 Ohm                            |                                                                             | <i>R10</i>  | <i>/10</i>     |  |                 |            |              |               |          |
| Option 20 Ohm                            |                                                                             | <i>R20</i>  | <i>/20</i>     |  |                 |            |              |               |          |
| Option 50 Ohm                            |                                                                             | <i>R50</i>  | <i>/50</i>     |  |                 |            |              |               |          |
| Option 100 Ohm                           |                                                                             | <i>R100</i> | <i>/100</i>    |  |                 |            |              |               |          |
| Option 200 Ohm                           |                                                                             | <i>R200</i> | <i>/200</i>    |  |                 |            |              |               |          |
| Option 500 Ohm                           |                                                                             | <i>R500</i> | <i>/500</i>    |  |                 |            |              |               |          |
| <b>1 kOhm</b>                            |                                                                             | <b>R1k</b>  | <b>/1K</b>     |  |                 |            |              |               |          |
| Option 2 kOhm                            |                                                                             | <i>R2k</i>  | <i>/2K</i>     |  |                 |            |              |               |          |
| <b>5 kOhm</b>                            |                                                                             | <b>R5k</b>  | <b>/5K</b>     |  |                 |            |              |               |          |
| <b>10 kOhm</b>                           |                                                                             | <b>R10k</b> | <b>/10k</b>    |  |                 |            |              |               |          |
| Option 20 kOhm                           |                                                                             | <i>R20K</i> | <i>/20k</i>    |  |                 |            |              |               |          |
| Option 50 kOhm                           |                                                                             | <i>R50k</i> | <i>/50k</i>    |  |                 |            |              |               |          |
| Option rear shaft:                       |                                                                             |             |                |  |                 |            |              |               |          |
| Standard Ø6.00 x 15 mm                   |                                                                             |             |                |  | <i>RA</i>       |            |              |               |          |
| Shaft length in mm                       |                                                                             |             |                |  | <i>RAxx,xx</i>  |            |              |               |          |
| Shaft diameter in mm (≤6 mm)             |                                                                             |             |                |  | <i>RADMx,xx</i> |            |              |               |          |
| <b>Resistance tolerance:</b>             |                                                                             |             |                |  |                 |            |              |               |          |
| <b>±3%</b>                               |                                                                             |             |                |  |                 | <b>W3%</b> |              |               |          |
| Option ±1%                               |                                                                             |             |                |  |                 | <i>W1%</i> |              |               |          |
| <b>Independent linearity:</b>            |                                                                             |             |                |  |                 |            |              |               |          |
| <b>±0.30%</b>                            |                                                                             |             |                |  |                 |            | <b>L0,3%</b> |               |          |
| Option ±0.2% R ≤ 2kOhm                   |                                                                             |             |                |  |                 |            | <i>L0,2%</i> |               |          |
| Option ±0.1% R > 2kOhm                   |                                                                             |             |                |  |                 |            | <i>L0,1%</i> |               |          |
| Option center tap:                       |                                                                             |             |                |  |                 |            | <i>CT</i>    |               |          |
| <b>Front shaft:</b>                      |                                                                             |             |                |  |                 |            |              |               |          |
| <b>Standard Ø6.00 x 31.5 mm</b>          |                                                                             |             |                |  |                 |            |              | <b>-</b>      |          |
| Option Ø6.35 x 31.5 mm                   |                                                                             |             |                |  |                 |            |              | <i>DM6,35</i> |          |
| Option shaft length in mm                |                                                                             |             |                |  |                 |            |              | <i>Ax,xx</i>  |          |
| Option shaft diameter in mm (≤6.35 mm)   |                                                                             |             |                |  |                 |            |              | <i>DMx,xx</i> |          |
| Option screwdriver slot:                 |                                                                             |             |                |  |                 |            |              |               | <i>B</i> |

\*Housing length +12 mm

**For higher quantities or on-going demand, additional options are available as described below on request**

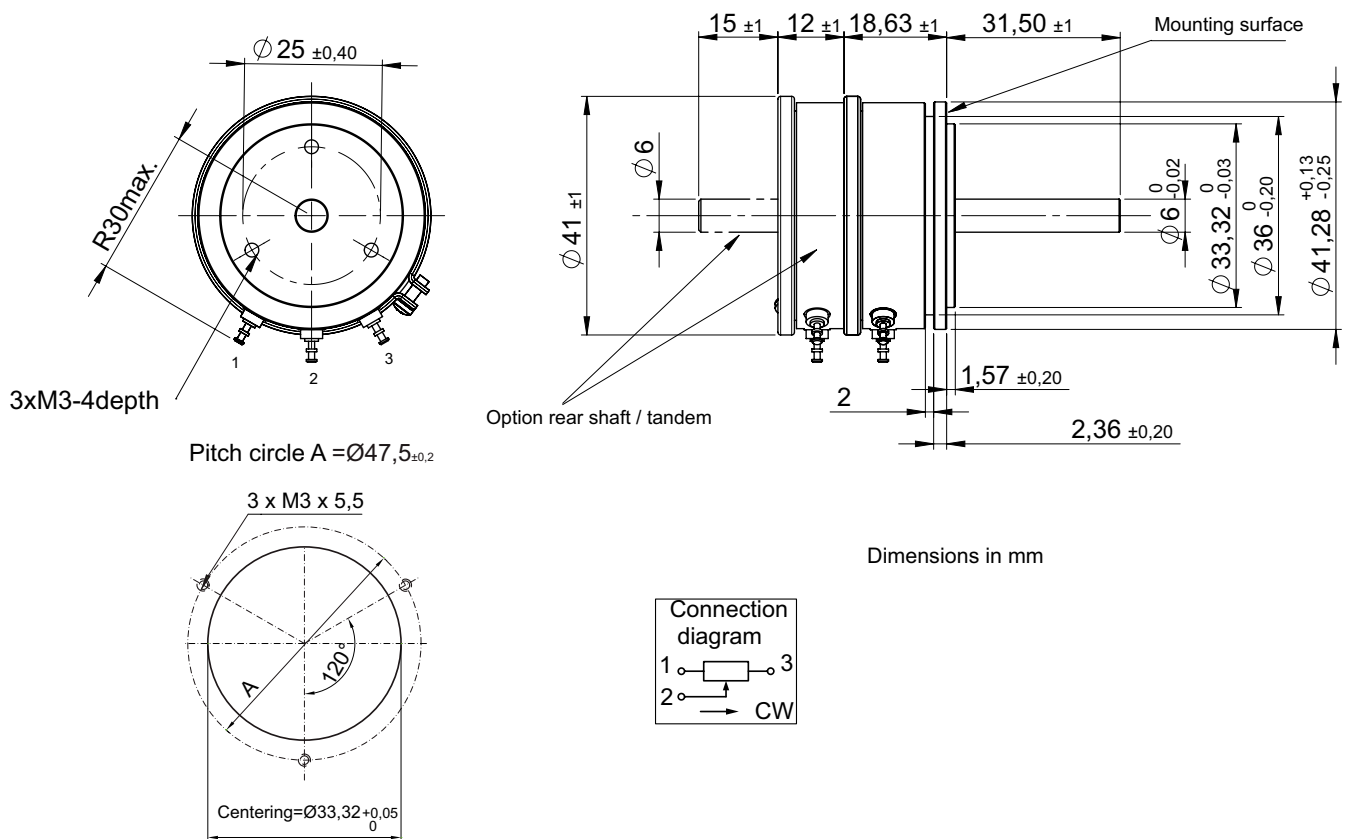
For Example: Multi ganged potentiometers (max. 7) / housing length + 12 mm per gang, more center taps max. 5, with mech. end stop 330° @ 90 Ncm, special electrical and mechanical angles of rotation, and special resistance and linearity tolerances. Furthermore we can mount gear wheels or attach cable assemblies with or without connectors and much more.

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## Drawing



# Data Sheet for Precision Potentiometer

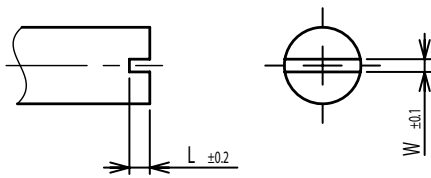


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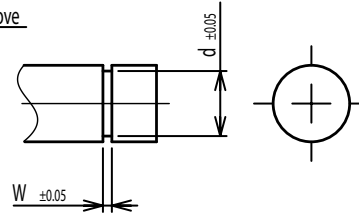
Series RPS45

### On Request: Special machining on shaft

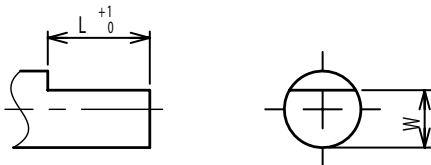
Slot



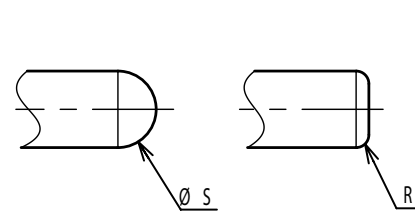
Groove



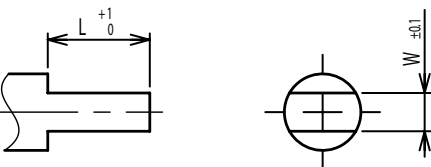
Flat



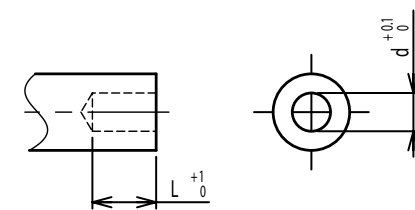
Round top



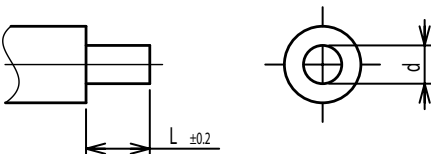
Double side flat



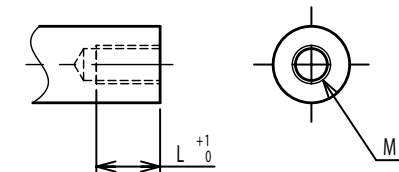
Counterbore hole



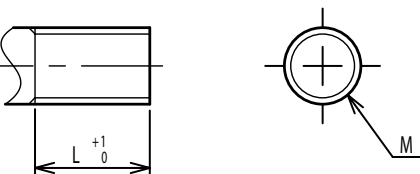
Step



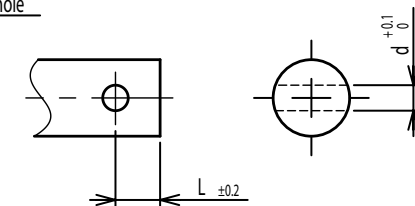
Counterbore screw hole



Screw Thread



Pin hole



Knurled(Parallel)



Screw thread inside hole

