

Data Sheet for Precision Potentiometer

Multiturn Hybrid Potentiometer

Series HH21



The HH21 potentiometers in Ø20 mm housing are suitable for applications where a long life span and very high-resolution multiturn potentiometer with servo flange is important.

- Very high-resolution and long-lasting due to hybrid technology
- Very clean signal - no winding jumps thanks to hybrid technology
- 2 x ball bearing
- Option limit switch

The high resolution precision potentiometers of the HH21 series have a wire wound resistor element which is coated with a conductive plastic layer. This prevents winding jumps and the resolution is almost infinite. The smooth surface of the resistive element gives the hybrid potentiometer a much longer life. The potentiometer is available in 3, 5 or 10-turn versions.

| Electrical Data | 3-turn | 5-turn | 10-turn |
|--|------------|---------------------|----------------|
| Effective electrical angle of rotation 1.) | 1080° ±5° | 1800° ±5° | 3600° ±5° |
| Total resistance 1.) | 1..50 kOhm | 1..50 kOhm | 2..100 kOhm |
| Resistance tolerance | | ±5% | |
| Independent linearity (best straight line) 1.) | ±0.25% | ±0.25% (±0.2%) | ±0.25% (±0.1%) |
| Theoretical resolution 1.) | | Nearly infinite | |
| Backlash (Hysteresis) 1.) | | ≤ 2° | |
| Max. / recommended wiper current 1.) | | 10 µA / 2 µA | |
| Power rating @ 70°C (0W @ 105°C) | 0.75 W | 1 W | 2 W |
| Insulation Voltage 1.) | | 1000 VAC, 1min | |
| Insulation Resistance 1.) | | 100 MOhm @ 1000 VDC | |

| Mechanical Data, Environmental Conditions, Miscellaneous | 3-turn | 5-turn | 10-turn |
|--|--------------------|--------------------------|-------------------|
| Mechanical angle of rotation | 1080° +10° | 1800° +10° | 3600° +10° |
| Lifetime (90% el. eff. angle half sine) 2.) | 2.5 Mio. rotations | 5 Mio. rotations | 10 Mio. rotations |
| Max. operational speed | | 40 rev. / min. | |
| Bearing | | 2 x ball bearing | |
| Operational torque @ ambient temperature 1.) 2.) | | 3 Nmm | |
| End stop torque 1.) 2.) | | 60 Ncm | |
| Operating temperature range | | -55 °C up to +105 °C | |
| Storage temperature range | | -55 °C up to +105 °C | |
| Protection grade (IEC 60529) | | IP40 | |
| Vibration (IEC 68-2-6, Test Fc) | | 15g 10Hz to 2000Hz x 12h | |
| Shock (IEC 68-2-27, Test Ea) | | 49g @ 11 ms x 18 | |
| Housing diameter | | 20 mm | |
| Housing depth | | 24.5 mm | 32 mm |
| Shaft diameter | | 3.00 mm | |
| Shaft type | | Solid shaft | |

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| Mechanical Data, Environmental Conditions, Miscellaneous | 3-turn | 5-turn | 10-turn |
|--|----------------------------|--------|---------|
| Max. radial load | ≤1 N | | |
| Max. axial load | ≤1 N | | |
| Connection type | Gold plated soldering lugs | | |
| Connection position | Radial | | |
| Sensor mounting | Servo flange | | |
| Mass | 20 g | | 25 g |
| Fastening parts included in delivery | 3 x servo clamps SFN2 | | |
| Material shaft | Stainless steel | | |
| Material housing | Plastic | | |

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

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Order code

| Description | Selection: standard=black/bold , possible <i>options=grey/italic</i> | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|
| Series HH17/19 | HH21 | | | | | | | | | |
| Revolutions with stop: | | | | | | | | | | |
| <i>Option 3-turn</i> | | | | | | | | | | |
| <i>Option 5-turn</i> | | | | | | | | | | |
| 10-turn | | | | | | | | | | |
| Slipping clutch: | | | | | | | | | | |
| Without additional mechanics | | | | | | | | | | |
| <i>Option with integr. slipping clutch</i> | | | | | | | | | | |
| Resistance value / Option Tandem: | | | | | | | | | | |
| <i>Option 1 kOhm (only 3 and 5-turn)</i> | | | | | | | | | | |
| <i>Option 2 kOhm</i> | | | | | | | | | | |
| 5 kOhm | | | | | | | | | | |
| 10 kOhm | | | | | | | | | | |
| <i>Option 20 kOhm</i> | | | | | | | | | | |
| <i>Option 50 kOhm</i> | | | | | | | | | | |
| <i>Option 100 kOhm (only 10 Turn)</i> | | | | | | | | | | |
| <i>Option rear shaft:</i> | | | | | | | | | | |
| <i>Standard Ø2 x 10 mm</i> | | | | | | | | | | |
| <i>Shaft length in mm</i> | | | | | | | | | | |
| <i>Shaft diameter in mm (≤3 mm)</i> | | | | | | | | | | |
| Resistance tolerance: | | | | | | | | | | |
| ±5% | | | | | | | | | | |
| Independent linearity: | | | | | | | | | | |
| ±0.25% | | | | | | | | | | |
| <i>Option ±0.10% (10 Turn)</i> | | | | | | | | | | |
| <i>Option ±0.20% (5 Turn)</i> | | | | | | | | | | |
| <i>Option center tap:</i> | | | | | | | | | | |
| | | | | | | | | | | |
| Front shaft: | | | | | | | | | | |
| Standard Ø3.00 x 16.5 mm | | | | | | | | | | |
| <i>Option Ø3.175 x 16.5 mm</i> | | | | | | | | | | |
| <i>Option shaft length in mm</i> | | | | | | | | | | |
| <i>Option shaft diameter in mm (≤3.175 mm)</i> | | | | | | | | | | |
| <i>Option limit switch - on request:</i> | | | | | | | | | | |
| <i>Type CW+CCW ("n"=number Turns)</i> | | | | | | | | | | |
| <i>Type CCW ("n"=number Turns)</i> | | | | | | | | | | |
| <i>Type CW ("n"=number Turns)</i> | | | | | | | | | | |
| | | | | | | | | | | |

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

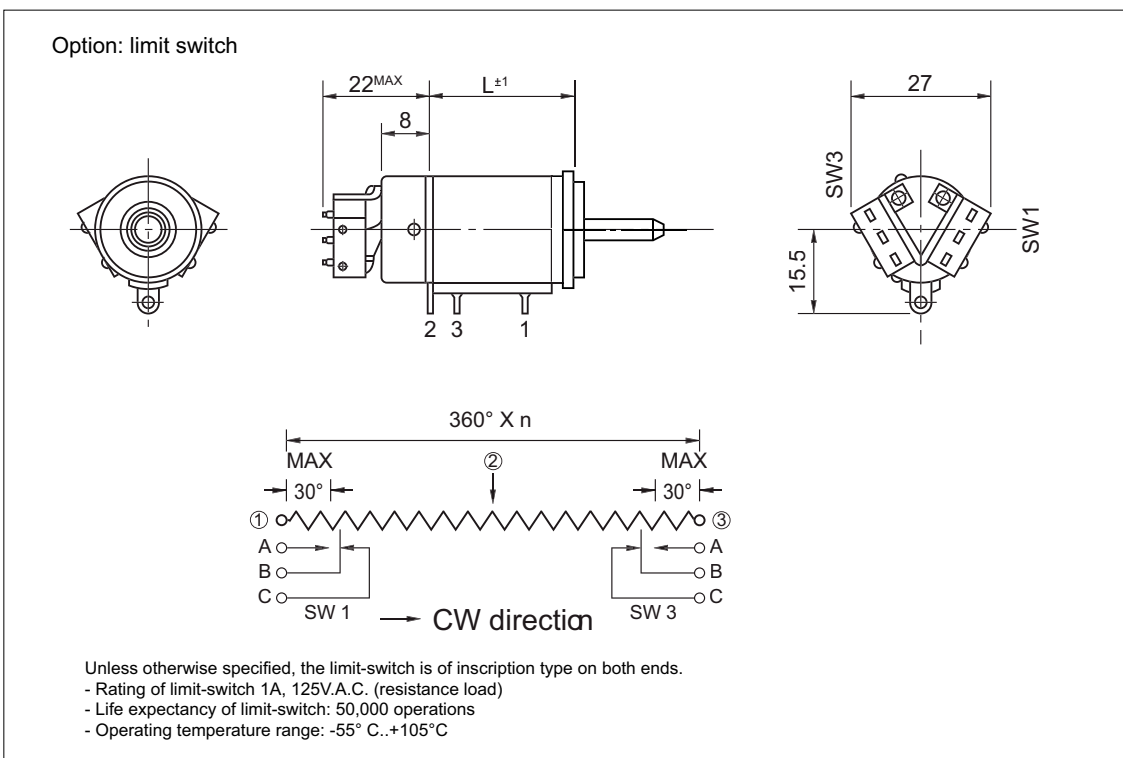
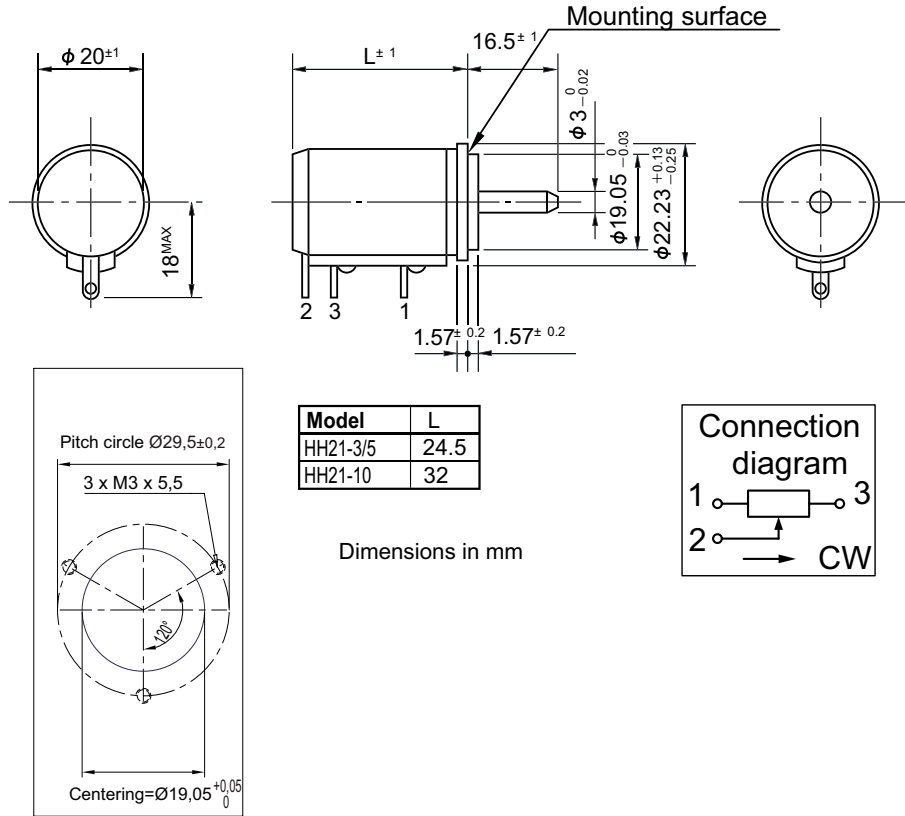
For Example: Multi ganged potentiometers (max. 2), special electrical and mechanical angles of rotation, and special resistance and linearity tolerances. Furthermore we can mount gear wheels or attach cable assemblies with or without connectors and much more.

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Drawing

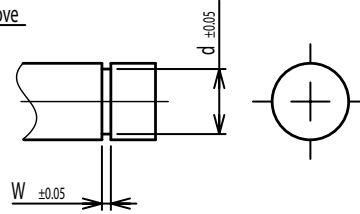


On Request: Special machining on shaft

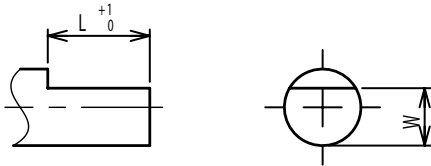
Slot



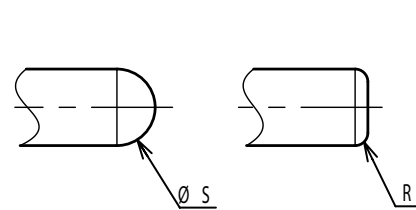
Groove



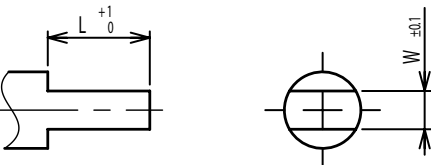
Flat



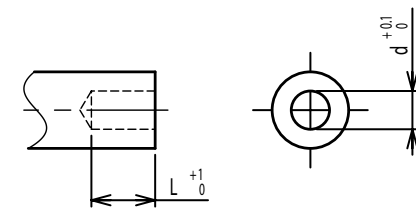
Round top



Double side flat



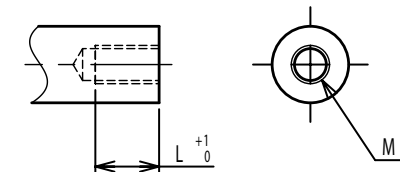
Counterbore hole



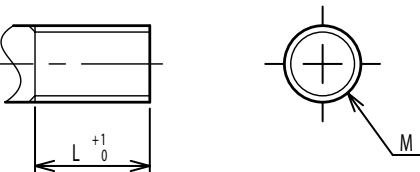
Step



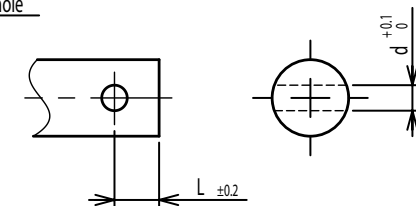
Counterbore screw hole



Screw Thread



Pin hole



Knurled(Parallel)



Screw thread inside hole

