The IGP series multiple-turn geared potentiometer offer an analog voltage output signal that is proportional to the angle, over the specified number of turns. This heavy-duty sensor is designed to measure angular displacement under the most difficult of environmental conditions.

The potentiometer section is based on Novotechnik’s high precision P6500 series, while the mechanism is comprised of precision gears, mounted with stainless steel ball bearings.

The sensor is sealed to IP67 and the single-stage gearing is exceptionally backlash-free. Heavy-duty bearings allow for high axial loading on the shaft, allowing gears, or even chain drives, to be mounted directly to the sensor shaft.

**Description**
- **Case**: varnished aluminium
- **Shaft**: stainless steel
- **Bearings**: stainless ball bearings
- **Reduction gearing**: single-stage low-backlash
- **Resistance element**: conductive plastic
- **Wiper assembly**: precious metal multi-finger wiper
- **Mounting**: any optional orientation
- **Electrical Connections**: 7-pin all-metal plug and socket, freely rotatable, 90° right-angled, protection class IP67, bayonet-type

**Special features**
- **angular range** - 3 turns (~1,080°), 5 turns (~1,800°), or 10 turns (~3,600°)
- **robust construction** - with 10 mm shaft and high allowable loads
- **very good linearity** - 0.1 %
- **excellent repeatability** - 0.002 %
- **very long life** - typically 100 million movements
- **sealed to IP67**

**Schematic**

**Connector pin assignment**

**View on the shaft**
Type designations | IGP-3-P-6501-A502 | IGP-5-P-6501-A502 | IGP-10-P-6501-A502
--- | --- | --- | ---

**Mechanical Data**

Dimensions | see drawing
Mounting | with 4 clamps Z-4-1
Mechanical travel | 360° continuous

Permitted shaft loading (axial and radial)
- static or dynamic force: 300 N
Starting torque | < 10 Nm
Weight | approx. 1300 g
Reduction ratio | 3:1; 5:1; 10:1

**Electrical Data**

Actual electrical travel | 1095 ± 15 1830 ± 20 3800 ± 45 °
Nominal resistance | 5 kΩ
Resistance tolerance | ±20 %
Independent linearity | ±0.1 % (±0.05 on request)
Repeatability | typ. 0.002 %
Max. permissible applied voltage | 42 V
Max. wiper current in case of malfunction | 10 mA
Recommended operating wiper current | < 1 μA
Effective temperature coefficient of the output-to-applied voltage ratio | typ. 5 ppm/K
Insulation resistance (500 VDC) | > 10 MΩ
Dielectric strength (500 VAC, 50 Hz) | < 100 μA

**Environmental Data**

Temperature range | -40...+100 °C
Vibration | 5...2000 Hz
- Amax = 0.75 mm
- amax = 20 g
Shock | 50 g
11 ms

Life | 100 x 10^6 movements
Protection class | IP67 (DIN 400 50 / IEC 529)

**Included in delivery**

- 4 mounting clamps Z-4-1,
- 1 right-angle plug Cannon Nr. CA 08 COM-E16S-1S-B,
- 1 anti-kink sleeve

**Recommended accessories**

- Spring operated backlash free coupling Z-110-G10.
- MAP process control indicator with display.
- MUP/MUK signal conditioners for standardized voltage and current output signals

**Important**

All the values given in this data sheet for linearity, lifetime and temperature coefficient in the voltage dividing mode are quoted for the device operating with the wiper voltage driving on operational amplifier working as a voltage follower, where virtually no load is applied to the wiper (I <= 1 μA)