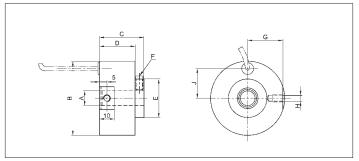


# Hollow-Shaft Conductive Plastic Potentiometric Sensors

## **GL** Series





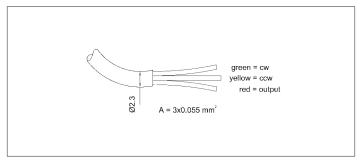
### Special features

- hollow shaft
- drill hole Ø 6 30 mm
- 10 x 10<sup>6</sup> movements
- excellent linearity
- very high resolution better than 0.1°

Novotechnik hollow-shaft precision potentiometer angle sensors are designed for easy installation.

Careful selection of materials and high-quality components ensure a constant and accurate angle measurement throughout the entire service life of the sensor.

Special designs with custom shaft dimensions and angular ranges are available on request.



O H9
inger wiper

## Recommended accessories

MAP process-control indicators and display. MUP signal conditioner for standardized output signals.

#### Important

All values given for this series – including linearity, lifetime, microlinearity, resistance to external disturbances and temperature coefficient in voltage dividing mode – are quoted for the device operating with the wiper voltage driving an operational amplifier working as a voltage follower where virtually no load is applied to the wiper (le ≤ 1 µA).

H M3 M4  J 11.2 20  Mounting 1 socket screw  Mechanical travel continuous 348  Cable 3x0.07 3x0  Permitted shaft loading (axial and radial) static or dynamic force 10  Torque ≤ 0.5 ≤ 1.  Maximum operational speed 230 200  Weight 32 120  Electrical Data  Actual electrical travel 150; 354 140  Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current 1 case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  Amax = 10	Type designations	GL60	GL100	GL200	GL300	
A 6 10 B 31 50 C 17.5 30 D 13 24 E 18 26 M3 M4 B 14.7 23.8 M3 M4 B 14.7 23.8 M3 M4 D 11.2 20 Mounting 1 socket screw Mechanical travel continuous 348 Cable 3x0.07 3x0 Permitted shaft loading (axial and radial) static or dynamic force 10 Forque ≤ 0.5 ≤ 1. Maximum operational speed 230 200 Meight 32 120 Electrical Data Natural electrical travel 150; 354 140 Available resistance values 5; 10 5; 1 Sessistance tolerance ± 20 Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical) Independent linearity ±0.25 Max. permissible applied voltage 42 Recommended operating viper current in case of malfunction 10 Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000 Dielectric strength AC, 50 Hz, 1 min, 1 bar) 1,000 Emperature range -25+75	Mechanical Data					
B 31 50 C 17.5 30 D 13 24 E 18 26 F M3 M4 G 14.7 23.8 H M3 M4 J 11.2 20 Mounting 1 socket screw Mechanical travel continuous 348 Cable 3x0.07 3x0 Permitted shaft loading (axial and radial) static or dynamic force 10 Torque ≤ 0.5 ≤ 1. Maximum operational speed 230 200 Weight 32 120 Electrical Data Actual electrical travel 150; 354 140 Available resistance values 5; 10 5; 1 Resistance tolerance ± 20 Repeatability 0.07; 0.03 (=0.1°) 0.07 Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical) independent linearity ±0.25 Max. permissible applied voltage 42 Recommended operating wiper current in case of malfunction 10 insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000 Dielectric strength AC, 50 Hz, 1 min, 1 bar) 1,000 Environmental Data Temperature range -25+75 Amax = 0.75	Dimensions	see drawing				
C 17.5 30 D 13 24 E 18 26 F M3 M4 G 14.7 23.8 H M3 M4 J 11.2 20 Mounting 1 socket screw Mechanical travel continuous 348 Cable 3x0.07 3x0 Permitted shaft loading (axial and radial) static or dynamic force 10 Torque ≤ 0.5 ≤ 1. Maximum operational speed 230 200 Weight 32 120 Electrical Data Available resistance values 5; 10 5; 1 Resistance tolerance ± 20 Repeatability 0.07; 0.03 (=0.1°) 0.07 Effective temperature coefficient of the output-to-applied voltage ratio independent linearity ±0.25 Max. opermissible applied voltage 42 Recommended operating wiper current in case of malfunction 10 Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000 Derivironmental Data Temperature range -25+75 Amax = 0.75	A	6	10	20	30	mm
DD 13 24 E 18 26 F M3 M4 G 14.7 23.8 H M3 M4 J 11.2 20 Mounting 1 socket screw Mechanical travel continuous 348 Cable 3x0.07 3x0 Permitted shaft loading (axial and radial) static or dynamic force 10 Torque ≤ 0.5 ≤ 1. Maximum operational speed 230 200 Weight 32 120 Electrical Data Actual electrical travel 150; 354 140 Available resistance values 5; 10 5; 1 Resistance tolerance ± 20 Repeatability 0.07; 0.03 (=0.1°) 0.07 Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical) independent linearity ±0.25 Max. permissible applied voltage 42 Recommended operating wiper current ≤ 1 Max. wiper current in case of malfunction 10 Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000 Environmental Data Imperature range -25+75 Jamax = 0.75 Jam	В	31	50	60	74	mm
E	С	17.5	30	31	32	mm
M3 M4  M3 M4  J 11.2 20  Mounting 1 socket screw  Mechanical travel continuous 348  Cable 3x0.07 3x0  Permitted shaft loading (axial and radial) static or dynamic force 10  Torque ≤ 0.5 ≤ 1.  Maximum operational speed 230 200  Weight 32 120  Electrical Data  Actual electrical travel 150; 354 140  Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Environmental Data  Temperature range -25+75  Amax = 0.75 Amax = 10	D	13	24	25	26	mm
Max	E	18	26	36	46	mm
M3 M4  J 11.2 20  Mounting 1 socket screw  Mechanical travel continuous 348  Cable 3x0.07 3x0  Permitted shaft loading (axial and radial) static or dynamic force 10  Torque ≤ 0.5 ≤ 1.  Maximum operational speed 230 200  Weight 32 120  Electrical Data  Actual electrical travel 150; 354 140  Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 10  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Environmental Data  Temperature range -25+75  Jamax = 0.75	F	M3	M4	M4	M4	
Mounting	G	14.7	23.8	28.8	35.8	mm
Mounting         1 socket screw           Mechanical travel         continuous         348           Cable         3x0.07         3x0           Permitted shaft loading (axial and radial)         static or dynamic force         10           Torque         ≤ 0.5         ≤ 1.           Maximum operational speed         230         200           Weight         32         120           Electrical Data         32         140           Actual electrical travel         150; 354         140           Available resistance values         5; 10         5; 1           Resistance tolerance         ± 20         20           Repeatability         0.07; 0.03 (=0.1°)         0.07           Effective temperature coefficient of the output-to-applied voltage ratio         5 (typical)         5 (typical)           Independent linearity         ± 0.25         42         42           Recommended operating wiper current         ≤ 1         4         4           Max. wiper current in case of malfunction         10         10         10           Insulation resistance (500 VDC, 1 bar, 2 s)         ≥ 10,000         2         1,000           Environmental Data         7         25+75         30500         4	Н	M3	M4	M4	M4	
Mechanical travel         continuous         348           Cable         3x0.07         3x0           Permitted shaft loading (axial and radial) static or dynamic force         10           Torque         ≤ 0.5         ≤ 1.           Maximum operational speed         230         200           Weight         32         120           Electrical Data         220         120           Actual electrical travel         150; 354         140           Available resistance values         5; 10         5; 1           Resistance tolerance         ± 20         20           Repeatability         0.07; 0.03 (=0.1°)         0.07           Effective temperature coefficient of the output-to-applied voltage ratio         5 (typical)         5 (typical)           Independent linearity         ± 0.25         42         2           Recommended operating wiper current         ≤ 1         42         2           Recommended operating wiper current in case of malfunction         10         10         10           Insulation resistance (500 VDC, 1 bar, 2 s)         ≥ 10,000         2         2         10,000         2           Environmental Data         Temperature range         -25+75         30500         Amax = 0.75	J	11.2	20	25	31	mm
Cable       3x0.07       3x0         Permitted shaft loading (axial and radial) static or dynamic force       10         Torque       ≤ 0.5       ≤ 1.         Maximum operational speed       230       200         Weight       32       120         Electrical Data       32       140         Available resistance values       5; 10       5; 1         Resistance tolerance       ± 20       20         Repeatability       0.07; 0.03 (=0.1°)       0.07         Effective temperature coefficient of the output-to-applied voltage ratio       5 (typical)       5 (typical)         Independent linearity       ± 0.25       42         Recommended operating wiper current       ≤ 1       42         Recommended operating wiper current in case of malfunction       10       10         Insulation resistance (500 VDC, 1 bar, 2 s)       ≥ 10,000       2         Dielectric strength (AC, 50 Hz, 1 min, 1 bar)       1,000       2         Environmental Data       1       1,000       4         Environmental Data       30500       4       4         Recommended operating wiper current in case of malfunction       10       1       1         Max = 0.750       3       3       3 <td< td=""><td>Mounting</td><td>1 socket screw</td><td></td><td></td><td></td><td></td></td<>	Mounting	1 socket screw				
Permitted shaft loading (axial and radial) static or dynamic force 10  Torque ≤ 0.5 ≤ 1.  Maximum operational speed 230 200  Weight 32 120  Electrical Data  Actual electrical travel 150; 354 140  Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current  10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75 Amax = 10	Mechanical travel	continuous	348	346	348	۰
static or dynamic force 10  Torque	Cable	3x0.07	3x0.14	3x0.14	3x0.14	mm²
Maximum operational speed       230       200         Weight       32       120         Electrical Data		10				N
Weight   32   120	Torque	≤ 0.5	≤ 1.5	≤ 6.0	≤ 6.0	Ncm
Electrical Data  Actual electrical travel 150; 354 140  Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current 1 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  amax = 10	Maximum operational speed	230	200	165	130	RPM
Actual electrical travel 150; 354 140  Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Respeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical) 1  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating 10  Max. wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  Amax = 10	Weight	32	120	178	260	g
Available resistance values 5; 10 5; 1  Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  Amax = 10	Electrical Data					
Resistance tolerance ± 20  Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  amax = 10	Actual electrical travel	150; 354	140; 340	150; 340	340	(±2°)
Repeatability 0.07; 0.03 (=0.1°) 0.07  Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75 amax = 10	Available resistance values	5; 10	5; 10	5; 10	20	kΩ
Effective temperature coefficient of the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  amax = 10	Resistance tolerance	± 20				%
the output-to-applied voltage ratio 5 (typical)  Independent linearity ±0.25  Max. permissible applied voltage 42  Recommended operating  Wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength  (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  amax = 10	Repeatability	0.07; 0.03 (=0.1°)	0.07; 0.03 (=0.1°)	0.07; 0.03 (=0.1°)	0.03 (=0.1°)	%
Max. permissible applied voltage       42         Recommended operating wiper current       ≤ 1         Max. wiper current in case of malfunction       10         Insulation resistance (500 VDC, 1 bar, 2 s)       ≥ 10,000         Dielectric strength (AC, 50 Hz, 1 min, 1 bar)       1,000         Environmental Data       -25+75         Vibration       30500         Amax = 0.75       amax = 10		5 (typical)				ppm/K
Recommended operating wiper current  Max. wiper current in case of malfunction Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar)  Environmental Data  Temperature range  -25+75  Vibration  30500  Amax = 0.75 amax = 10	Independent linearity	±0.25				%
wiper current ≤ 1  Max. wiper current in case of malfunction 10  Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75 amax = 10	Max. permissible applied voltage	42				V
Insulation resistance (500 VDC, 1 bar, 2 s) ≥ 10,000  Dielectric strength (AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  A <sub>max</sub> = 0.75  a <sub>max</sub> = 10		≤ 1				μA
Dielectric strength (AC, 50 Hz, 1 min, 1 bar)  Environmental Data  Temperature range  -25+75  Vibration  30500  Amax = 0.75  amax = 10	Max. wiper current in case of malfunction	10				mA
(AC, 50 Hz, 1 min, 1 bar) 1,000  Environmental Data  Temperature range -25+75  Vibration 30500  Amax = 0.75  amax = 10	Insulation resistance (500 VDC, 1 bar, 2 s)	≥ 10,000				MΩ
Temperature range -25+75  Vibration 30500  Amax = 0.75 amax = 10		1,000				V
Vibration 30500 A <sub>max</sub> = 0.75 a <sub>max</sub> = 10	Environmental Data					
Vibration $ 30500 \\ A_{max} = 0.75 \\ a_{max} = 10 $	Temperature range	-25+75				°C
a <sub>max</sub> = 10						Hz
		$A_{max} = 0.75$				mm
Life 10 million						g
		10 million				movements
Shock (DIN IEC 68 T2-27) 50 7	Shock (DIN IEC 68 T2-27)					g
Protection class (DIN 40050) IP 63	Dustaskias alasa (DINI 40050)					ms

Order designations							
Туре	Art. no.	R in kΩ	electr. angle in °	Туре	Art. no.	R in kΩ	electr. angle in °
GL60 5K0 M150	044000	5	150	GL60 10K0 M354	044001	10	354
GL100 5K0 M150	044002	5	150	GL100 10K0 M340	044003	10	340
GL200 5K0 M150	044004	5	150	GL200 10K0 M340	044005	10	340
				GL300 20K0 M340	044006	20	340