

Rotary Sensor potentiometric Heavy-duty

Series IPX 7900



Special features

- exceptionally durable design for extreme environmental conditions
- salt spray resistant - stainless steel shaft and anodized aluminum housing
- very good linearity - to 0.02%
- repeatability - 0.007°
- sealed to IP69k (w/cable output)
- temperature range -40 to 120°C
- high lifetime >100 million movements, even under high vibration environments
- fully redundant version with 2 separate connections, fulfills SIL3 per IEC61508
- no mechanical rotation limit
- angle ranges 120°, 200° or 350° in one or two channel versions

The IPX7900 was developed for measuring the steering angle in electro-hydraulic steering systems. It offers reliable operation in mobile applications, under extreme environmental conditions.

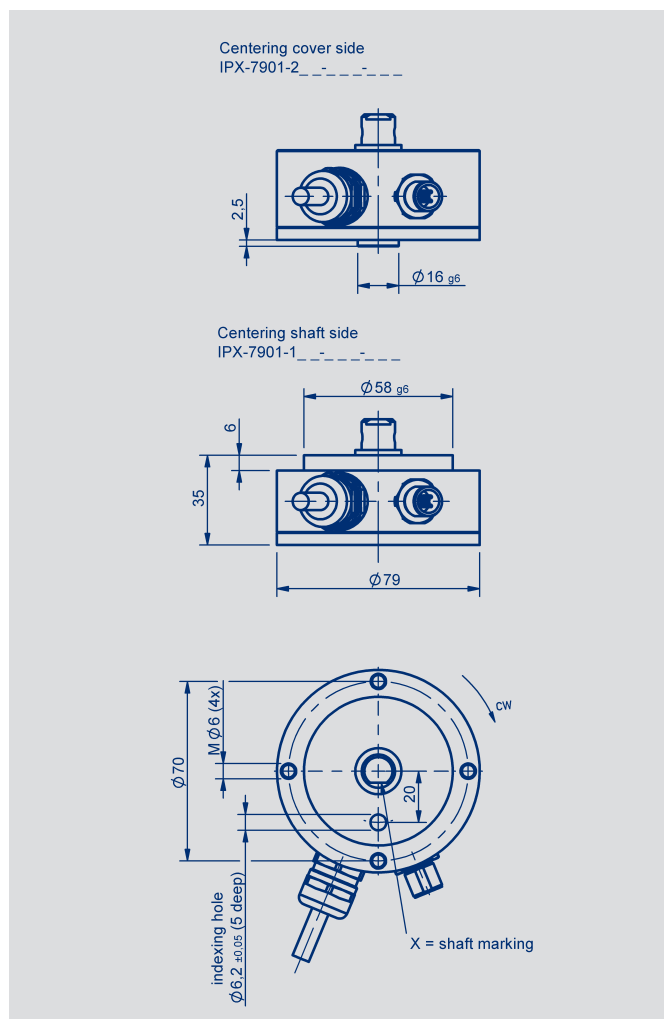
It uses Novotechnik's highly-regarded conductive plastic potentiometer technology, with damped precious metal wiper.

An anodized aluminum housing and a stainless steel shaft with double ball bearing provide an extremely strong housing.

High shaft load specifications allow the use of lever arms (see options) or other couplings.

The housing can be centered by a 58 mm centering diameter on the shaft side or optionally by a 16 mm diameter in the cover.

An optional POM plastic shaft is available for enhanced isolation requirements.

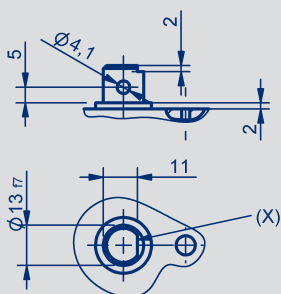


Description

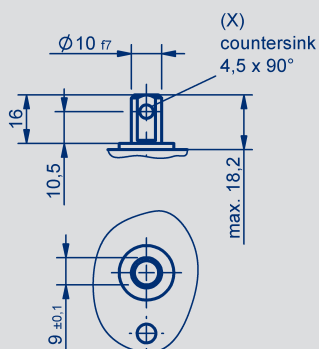
Housing	anodized aluminium; salt spray resistant
Shaft	stainless steel (1.4305)
Bearing	double ball bearings
Resistance element	conductive plastic
Wiper	precious metal multifinger wiper
Electrical connections	cable output with PG screw or M12 plug

Shaft versions

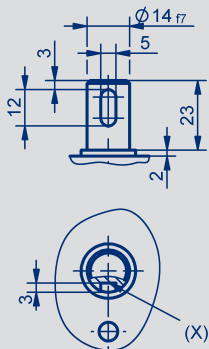
IPX-7901- _ 01- - - - - /
IPX-7901- _ 02- - - - -



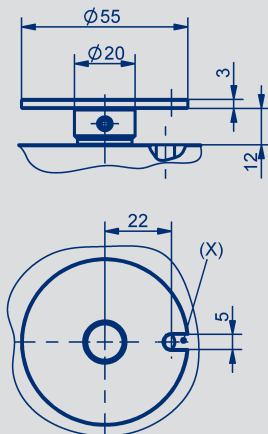
IPX-7901- _ 03- - - - -



IPX-7901- _ 05- - - - -

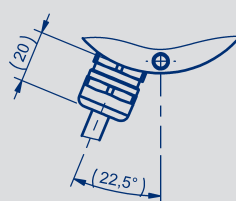


IPX-7901- _ 07- - - - -

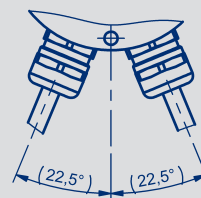


Versions of electrical connections

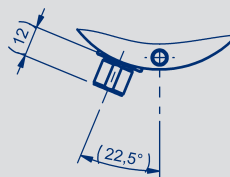
IPX-7901- - - - -202



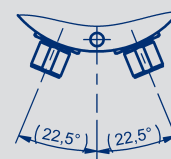
IPX-7901- - - - -402



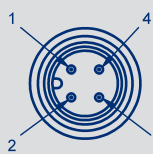
IPX-7901- - - - -101



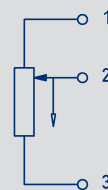
IPX-7901- - - - -103



Connector pin assignment
Pin #4 not connected!



Schematic of connection

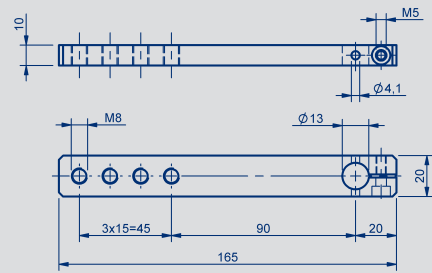


Connection assignment	Connector output		Cable output	
	not redundant Pin-No.	redundant Pin-No.	not redundant Wire marking	redundant Wire marking
Connection 1/1	S1/ 1	S1/ 1	K1/ "1"	K1/ "1"
Connection 1/2	S1/ 2	S1/ 2	K1/ GN/YE	K1/ GN/YE
Connection 1/3	S1/ 3	S1/ 3	K1/ "2"	K1/ "2"
Connection 2/1	-	S2/ 1	-	K2/ "1"
Connection 2/2	-	S2/ 2	-	K2/ GN/YE
Connection 2/3	-	S2/ 3	-	K2/ "2"

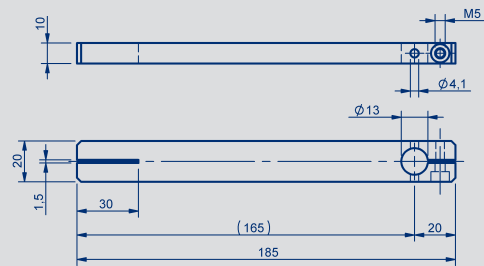
S1 = connector No. 1, S2 = connector No. 2, K1 = cable output No. 1, K2 = cable output No. 2

Electrical Data				
Electrical range	120 ±2	200 ±2	350 ±2	°
Nominal resistance	2	2	5	kΩ
Resistance tolerance	± 15			%
Repeatability	0.002 (0.007°)			%
Temperature coefficient of the output to applied voltage ratio	typ. 10			ppm/K
Independent linearity	< ±0.2	< ±0.1	< ±0.1	%
Max. permissible applied voltage	42			V
Recommended operating wiper current	< 10			μA
Max. allowed wiper current in case of malfunction	10			mA
Insulation resistance (500 VDC, 1 bar, 2 s)	> 100			MΩ
Dielectric strength (50 Hz, 2 s, 1 bar, 500 VAC)	≤ 1000 with POM-shaft ≤ 3000			V RMS V RMS
Mechanical Data				
Dimensions	see drawings			
Mounting	4 screws M6 or M5 (depends on mounting style)			
Mechanical travel	360 continuous			°
Permitted shaft load (static or dynamic force)	300 (axial), 400 (radial)			N
Operating torque max.	4			Ncm
Maximum operational speed	50			RPM
Weight approx.	0.5			kg
Environmental Data				
Operation and storage temperature	-40 ...+120 (M12 plug)			°C
	-40...+100 (cable output)			°C
Vibration	5...2000 Amax = 0.75 amax = 5			Hz mm g
Shock	50 11			g ms
Life time	> 100 x 10 ⁶			movements
Protection class	IP69k (with PG connection) IP67 (M12 plug with fastened connector)			

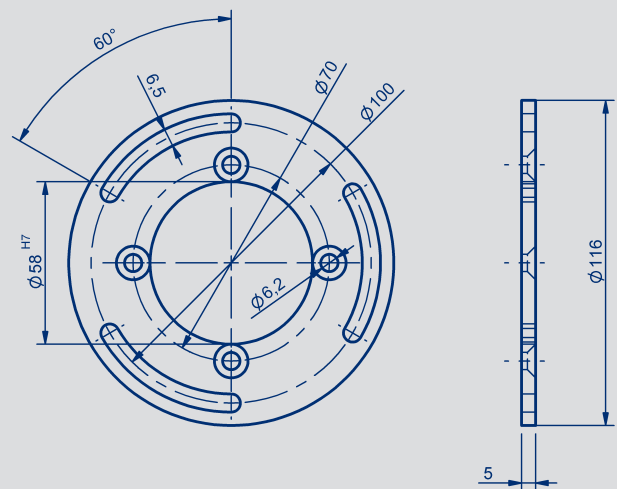
Z-IPX-M01 lever arm 165 x 20 mm



Z-IPX-M11 lever arm 185 x 20 mm



Z-IPX-M31 mounting plate for IPX7900 sensor





Ordering specifications

Electrical range

120: 120°
200: 200°
350: 350°

Electrical type and connections

101: not redundant, 1 x plug M12, 3-pin
103: fully redundant, 2 x plug M12 3-pin
202: not redundant, 1 x cable type "1", 2 m, 3-wire shielded
402: fully redundant, 2 x cable type "1", 2 m, 3-wire shielded

I P X - 7 9 0 1 - 1 0 1 - 1 2 0 - 1 0 1

Product family
IPX

Product series
79: Ø 79 x 35 mm

Shaft

01: Steel D13x12 mm with cross hole D4.1 mm
02: POM D13x12mm with cross hole D4.1 mm
03: Steel D10x16mm with countersink D4.5 x 90°
05: Steel D14x23 mm with longitudinal slot (for parallel key DIN 6885)
07: Steel D13x12 mm with cross hole D4.1 mm, with mounted disc Ø 55 mm for driving pin

Housing centering

1: Centering collar on shaft side
2: Centering collar on top cover side

Housing material

01: Aluminum anodized

Accessories

- Lever arm 165 x 20 mm, Z-IPX-M01, P/N 056501
- Lever arm 185 x 20 mm, Z-IPX-M11, P/N 056502
- Disc Ø 55 mm (mounted ex works, ordering code IPX-7901-__07-__-__)
- Z-IPX-M21, P/N 056503
- Mounting plate Z-IPX-31, P/N 056504

Important

All values given for linearity, lifetime and temperature coefficient are derived with no electrical load on the wiper ($I \leq 1\mu\text{A}$).