novotechnik
Siedle Group

Precision Rotary Sensor potentiometric

Series IPX 7900

Special features

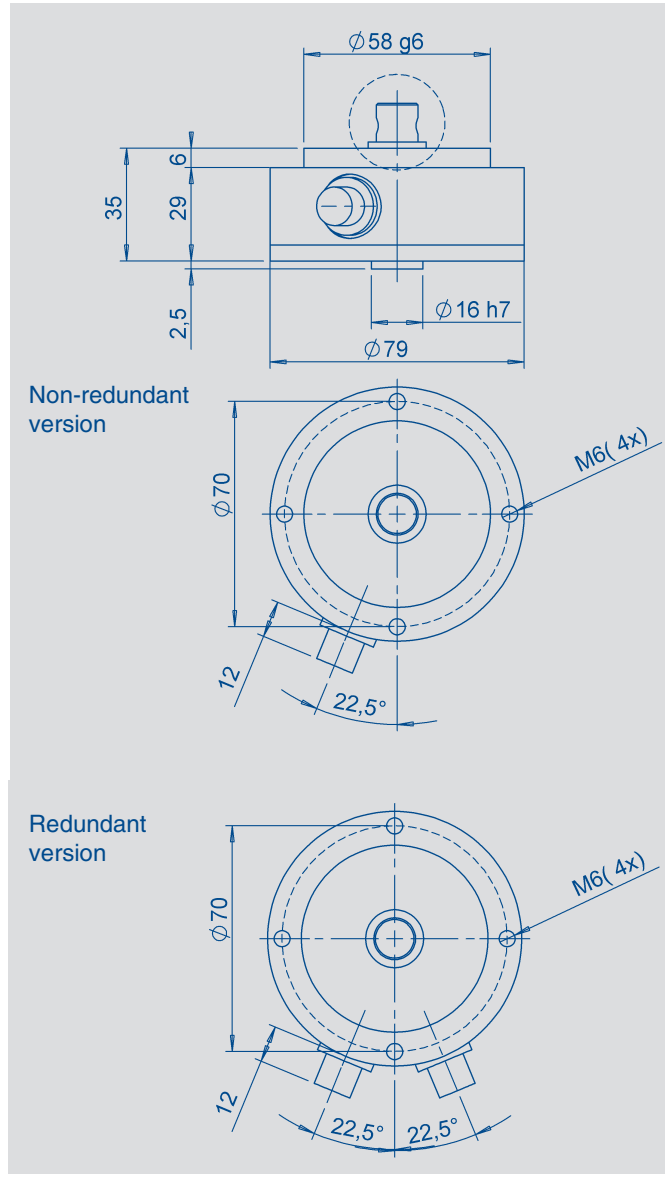
- very durable design for extreme environmental conditions
- absolute potentiometric measuring system
- angle ranges 120°, 200° or 350° in one or two channel versions
- increased corrosion protection by shaft made of stainless steel and anodized aluminium housing; sea water resistant
- very good linearity
- high resolution
- no mechanical rotation limit
- splash water proof
- high temperature resistant
- high life time, >100 Mio. movements, even under high vibration environments
- full redundant version with 2 separate connections, fulfills SIL3 according to IEC61508

This angle sensor was developed for rough operation under extreme environmental conditions in mobile applications.
Equipped with a conductive plastic resistance element and a long term stable multi-finger wiper, the IPX angle sensor is suitable for durable operation even under challenging conditions.

A durable full metal housing, a continuous stainless steel shaft with double ball bearing with large distance as well as an interlocking top cover protect the wiper from outer force effects.
Hermetic sealing and the accuracy and reliability of the absolute angle measurement are further special features of this sensor. The massive but compact design allows the direct connection of the shaft using a strong lever arm or other couplings.

This sensor's main application is the measurement of the steering angle in electro-hydraulic steering systems.

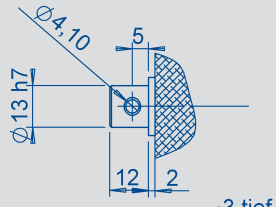
The centering of the housing is provided by a 58g6 mm centering diameter or - if mounted overhead - by a 16h7 mm diameter in the top cover.
A POM shaft can be employed alternatively for enhanced isolation requirements.



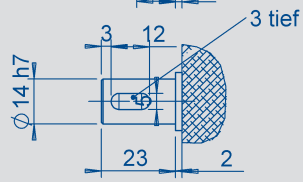
Description	
Size	Ø 79 mm, h 35 mm (without shaft)
Housing	anodized aluminium; salt spray resistant
Shaft	stainless steel (1.4305)
Bearing	double ball bearings with large distance
Resistance element	conductive plastic
Wiper	precious metal multifinger wiper
Electrical connections	cable output with PG screw M12 plug

IPX7900 shaft types

Shaft code 01/02
Hole for split pin
Ø 4 mm DIN 7346

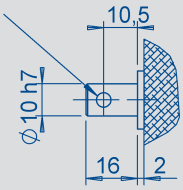


Shaft code 05



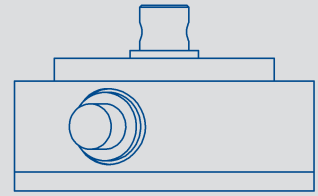
counter sink ⌀4,5x90°

Shaft code 03

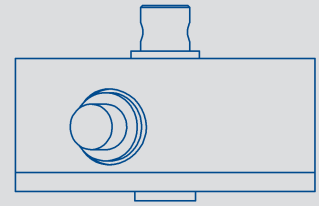


Housing types

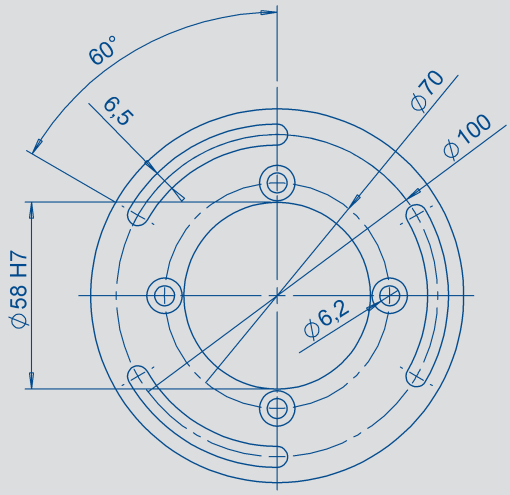
Housing code 01



Housing code 02



Z-IPX-M31 mounting flange for IPX7900 sensor



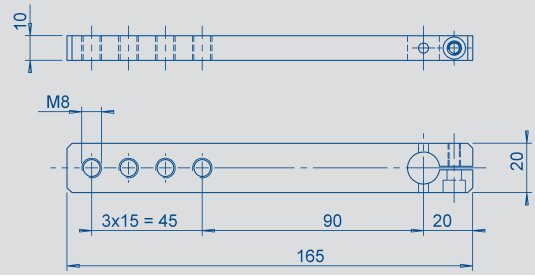
Connector pin assignment

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

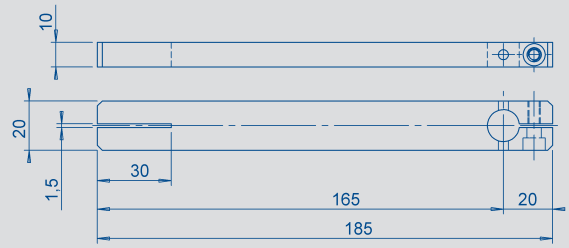
S1 = connector No. 1, S2 = connector No. 2, K1 = cable output No. 1, K2 = cable output No. 2

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. 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 continous			°
Permitted shaft load (static or dynamic force)	300 (axial), 400 (radial)			N
Torque max.	4			Ncm
Maximum operational speed	50			min^{-1}
Weight approx.	0,5			kg
Environmental Data				
Temperature range Operation and storage temperature	-40 ...+120 (M12 plug) -40...+100 (cable output)			°C °C
Vibration	5...2000 A_{max} = 0,75 a_{max} = 5			Hz mm g
Shock	50 11			g ms
Life time	> 100 x 10^6			movem.
Protection class	IP 69k (with PG connection) IP 67 (M12 plug with fastened connector)			

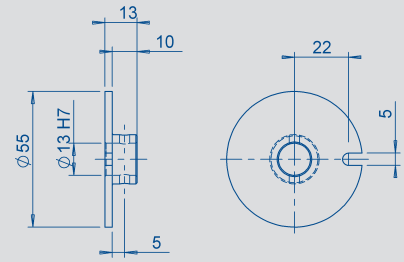
Z-IPX-01 lever arm 165 x 20 mm



Z-IPX-11 lever arm 185 x 20 mm



Z-IPX-M21 disc Ø 55 mm for shaft with adjust pin



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Ordering specifications

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

Product family

Product series
79: Ø 79 x 35mm

Housing material
01: Aluminium anodized

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

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 D14x25 mm with longitudinal slot and spring D4.1 mm

Electrical range
120: 120°
200: 200°
350: 350°

Electr. 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

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 ($I_e \leq 10$ µA).

Accessories

- Lever arm 165 x 20 mm, Z-IPX-01, Art.No. 056501
- Lever arm 185 x 20 mm, Z-IPX-11, Art.No. 056502
- Disc Ø 70 mm Z-IPX-21, Art.No. 056503
- Mounting plate Z-IPX-31, Art.No. 056504