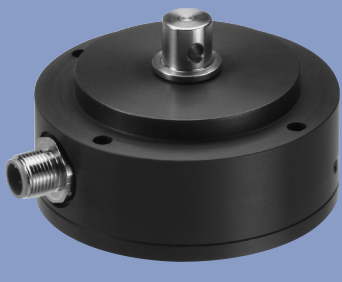


**Precision  
Rotary Sensor  
potentiometric**

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.

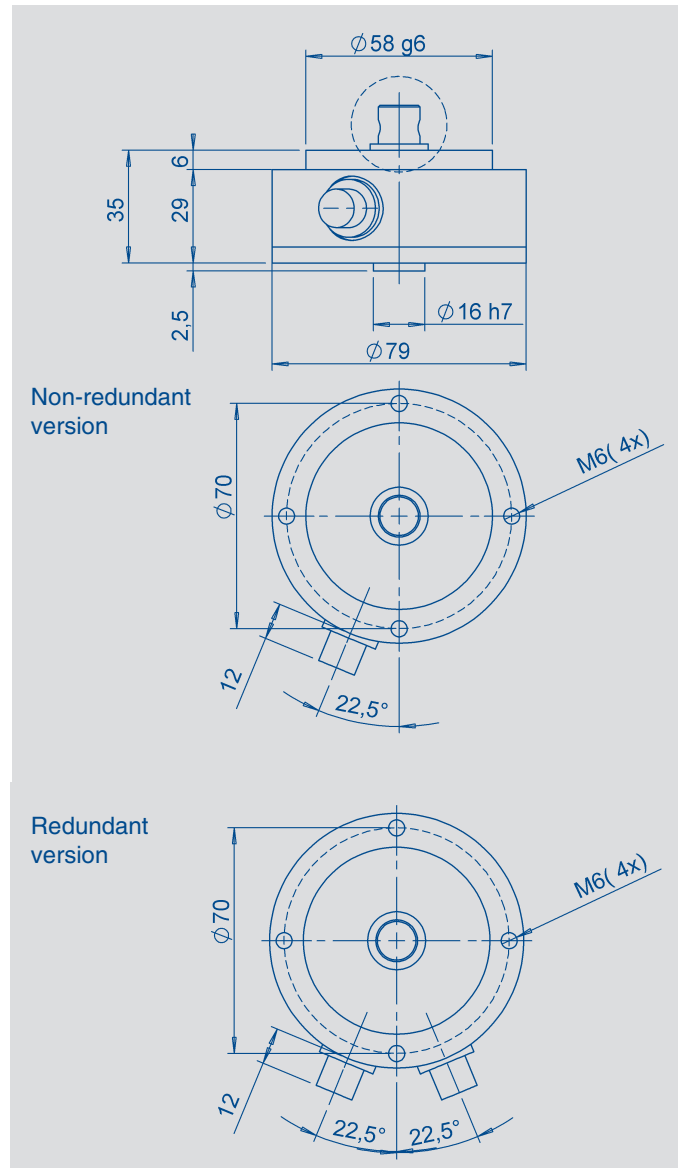
A durable full metal housing, a continuous stainless steel shaft with double ball bearing with large distance as well as an interlocking top cover protect the wiper from outer force effects.

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.

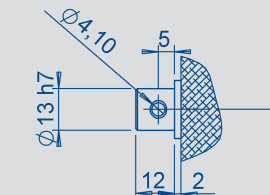


**Description**

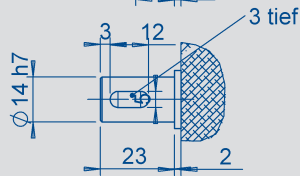
Size	Ø 79 mm, h 35 mm (without shaft)
Housing	anodized aluminium; salt spray resistant
Shaft	stainless steel (1.4305)
Bearing	double ball bearings with large distance
Resistance element	conductive plastic
Wiper	precious metal multifinger wiper
Electrical connections	cable output with PG screw M12 plug

IPX7900 shaft types

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

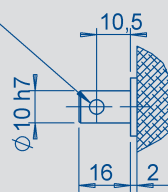


Shaft code 05



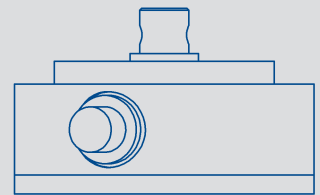
counter sink  $\phi 4,5 \times 90^\circ$

Shaft code 03

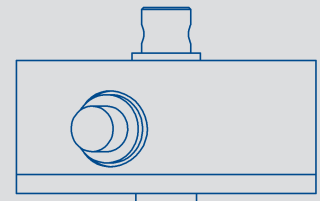


Housing types

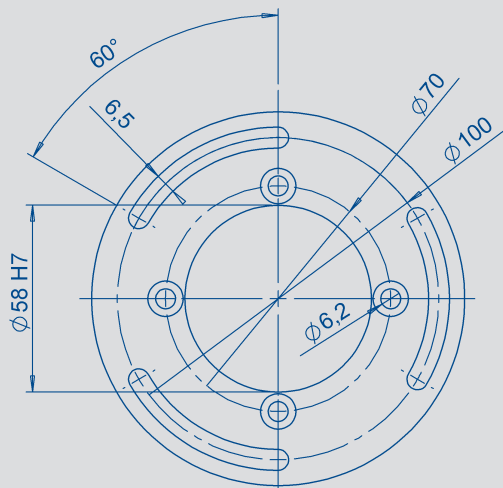
Housing code 01



Housing code 02



Z-IPX-M31 mounting flange for IPX7900 sensor



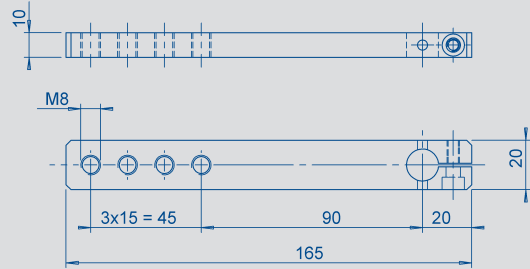
Connector pin assignment

Signal	Connector output		Cable output	
	not redundant Pin-No.	redundant Pin-No.	not redundant Wire marking	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"

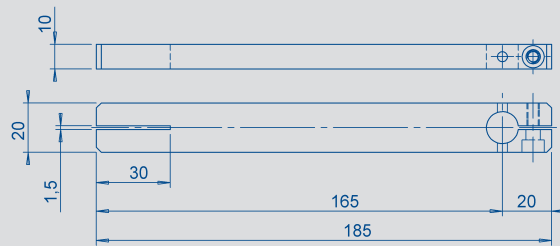
S1 = connector No. 1, S2 = connector No. 2, K1 = cable output No. 1, K2 = cable output No. 2

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			V RMS
	with POM-shaft ≤ 3000			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
Torque max.	4			Ncm
Maximum operational speed	50			min <sup>-1</sup>
Weight approx.	0,5			kg
Environmental Data				
Temperature range				
Operation and storage temperature	-40 ...+120 (M12 plug)		°C	
	-40...+100 (cable output)		°C	
Vibration	5...2000		Hz	
	A <sub>max</sub> = 0,75		mm	
	a <sub>max</sub> = 5		g	
Shock	50		g	
	11		ms	
Life time	> 100 x 10 <sup>6</sup>			movem.
Protection class	IP 69k (with PG connection)			
	IP 67 (M12 plug with fastened connector)			

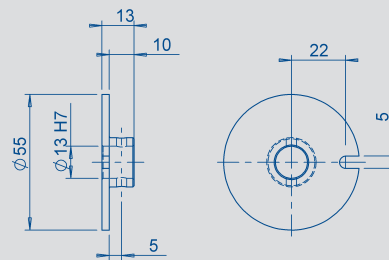
Z-IPX-01 lever arm 165 x 20 mm



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				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°			Electritype 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: fullgndant, 2 x cable type "1", 2 m shielded		
						Housing centering 1: Centering collar on shaft side 2: Centering collar on top cover side									
						Housing material 01: Aluminium anodized									

### Important

### Accessories

All the values given in this data sheet for linearity, temperature coefficient and 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.

- Lever arm 165 x 20 mm, Art.No. 056501
- Lever arm 185 x 20 mm, Art.No. 056502
- Disc Ø 70 mm, Art.No. 056503
- Mounting plate, Art.No. 056504