



## Type SCA115

- Shaft Encoder –  $\varnothing$  115 mm
- Shaft –  $\varnothing$  11 mm
- Resolution up to 12,500 ppr
- IP 66 (IP 65 & IP 67 options)
- “Seawater-proof” 22 micron Anodization
- Built-in Transient Suppression Module

### Electrical Specifications

<b>Code:</b>	Incremental
<b>Resolution:</b>	1 to 12,500 ppr (pulses per revolution)
<b>Supply Voltage:</b>	4.5V - 30V
<b>Current Consumption:</b>	45 mA max. (no load)
<b>Supply Voltage and Output Specifications for various Output Standards:</b>	TTL: $V_{sup} = 5V \pm 10\%$ $V_{high} \geq 4.3V @ I_{out} = -16 mA$ $V_{low} \leq 0.5V @ I_{out} = 16 mA$
	RS422: $V_{sup} = 5V \pm 10\%$ Min. diff. load ( $Z_o$ ): 100 $\Omega$ $V_{diff.} \geq 2.9V @ Z_o = 100 \Omega$ $V_{high} \geq 3.8V @ Z_o = 100 \Omega$ $V_{low} \leq 0.9V @ Z_o = 100 \Omega$
	HTL: $V_{sup} \geq 9V - 30V$ $V_{high} \geq V_{sup} - 1.8V @ I_{out} = -20mA$ $V_{low} \leq 0.8V @ I_{out} = 20 mA$
<b>Output Current:</b>	40 mA max. load per output channel
<b>Frequency Response:</b>	300 kHz max.; 100 kHz with TSM
<b>Output Format:</b>	Two channel (A, B) quadrature with Index (Z) and complementary (A-, B-, Z-) outputs
<b>Phase Sense:</b>	A leads B clockwise (CW) from the shaft end of the encoder
<b>Index:</b>	Gated with Channels A and B high
<b>Accuracy:</b>	+/- 0.8 arc-min.
<b>Output:</b>	OL7272 Line Driver HTL, TTL and RS422 compatible
<b>Electrical Protection:</b>	Output short circuit, reverse polarity (MS output only) and transient surge protected through built-in protection module (see TSM details on website)
<b>Noise Immunity:</b>	Tested to EN61000-6-2 : 2005 (industrial environments) and EN 61000-6-3 : 2007 (residential, commercial, and light-industrial environments) for Electromagnetic compatibility (EMC)

### Mechanical Specifications

<b>Material:</b>	Housing: Aluminum Cap: Aluminum Shaft: Stainless Steel (AISI 303)
<b>Weight:</b>	Encoder: Approx. 925 gr (32.65 oz)
<b>Bearing Life:</b>	> $1.9 \times 10^{10}$ revolutions at rated load
<b>Shaft Speed:</b>	3,000 rpm max. IP 66 (IP 67 option) 4,500 rpm max. (IP 65 option)
<b>Starting Torque:</b>	< 0.1 Nm (14.16 oz-in) at 25° C
<b>Mass Moment of Inertia:</b>	10 gcm <sup>2</sup> ( $3.68 \times 10^{-4}$ oz-in-sec <sup>2</sup> )
<b>Shaft Loads:</b>	Axial 100 N (22.5 lbs) max. Radial 100 N (22.5 lbs) max.

### Environmental Specifications


<b>Operating Temperature:</b>	-40° to +85° C
<b>Storage Temperature:</b>	-40° to +85° C
<b>Shock:</b>	100 G / 11 ms
<b>Vibration:</b>	(10-2000 Hz) / 10 G
<b>Bump:</b>	10 G - 16 ms (1000 x 3 axis)
<b>Humidity:</b>	98 % RH without condensation
<b>Enclosure Rating:</b>	IP 66 / Nema 6 (approx.) IP 67 / Nema 6 (approx.) option IP 65 / Nema 4 (approx.) option 22 micron anodization
<b>Transient Surge</b>	Built-in protection module

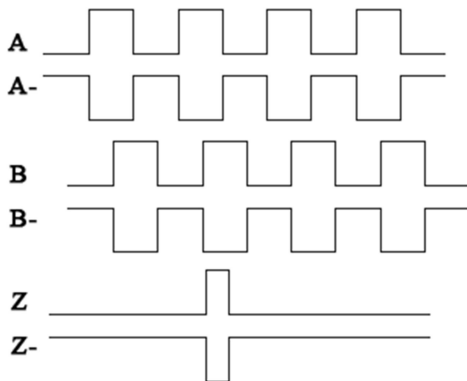
### Connection Options

<b>Cable:</b>	8 leads (0.75 mm <sup>2</sup> , 20 AWG) twisted pairs; shielded
<b>Connectors:</b>	9-lead terminal block (inside cap) M20 cable gland (cable $\varnothing$ 8 – 14 mm)

## Output waveform

## Disk Resolutions (pulses per revolution)

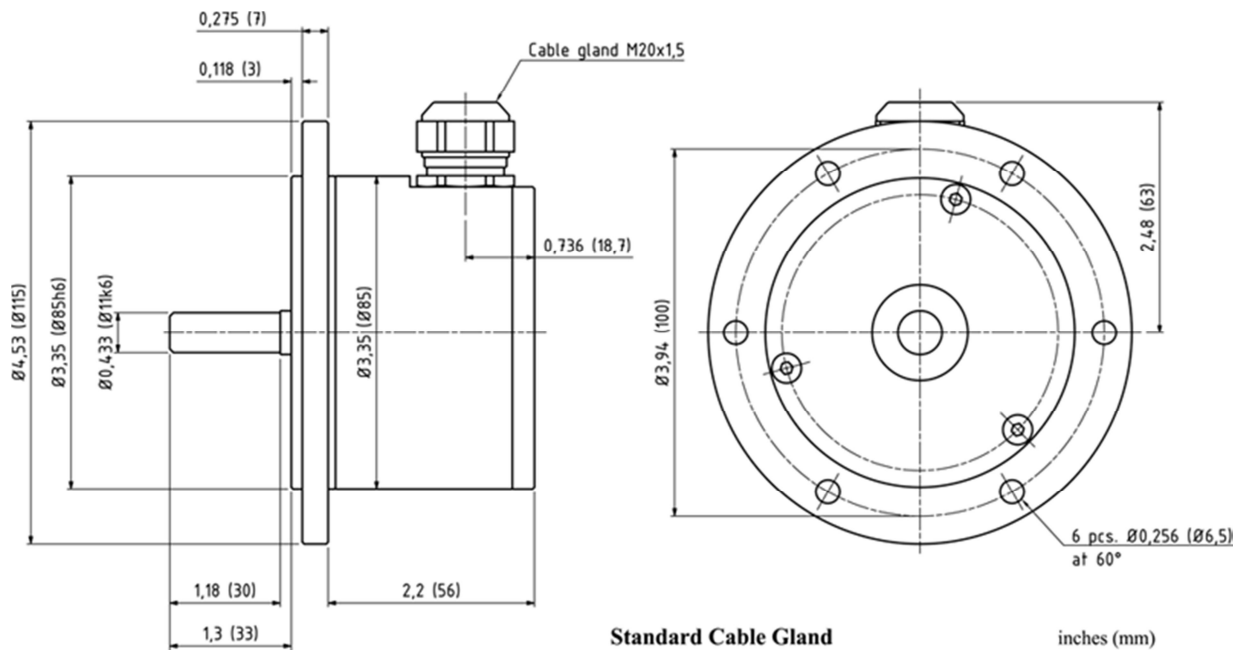
 CW seen from the shaft end



1	32	125	600	2500
2	36	150	635	3072
5	40	180	720	3600
6	50	200	800	4000
8	60	250	1000	4096
10	64	300	1024	5000
15	75	360	1131	9000
16	80	400	1250	10000
20	90	455	1500	12500
25	100	500	2000	
30	120	512	2048	

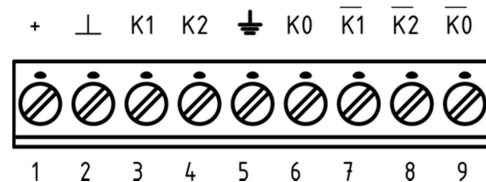
Channel tolerance       $180^\circ \pm 36^\circ$   
 Phase difference tolerance       $90^\circ \pm 18^\circ$   
 Z channel tolerance       $90^\circ \pm 18^\circ$

## Mechanical Dimensions



## Output Terminations

Position	Terminal Block		Cable	
	Standard Output	Differential Output	Differential Output	
	Channel	Channel	Wire Color	
1	Vsup	Vsup	Vsup	Red
2	GND	GND	GND	Blue
3	Ch. A	Ch. A	Ch. A	Pink
4	Ch. B	Ch. B	Ch. B	Green
5	Shield	Shield		
6	Ch. Z	Ch. Z	Ch. Z	White
7	*	Ch. A -	Ch. A-	Gray
8	*	Ch. B -	Ch. B-	Yellow
9	*	Ch. Z -	Ch. Z-	Brown



\* Do not attach any wires to terminal block

GND = Circuit Ground    Shield = Case Ground

## Ordering Code

**Example: SCA115 – 4096 – MS – 11 – 30 – 66 – 00 – CG1**

### Type

<b>SCA115</b>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>										
<b>Pulses per Revolution</b>		<b>Output</b>		<b>Shaft Dia.</b>	-	<b>Shaft Length</b>		<b>IP Rating</b>		<b>Cable Length</b>		<b>Cable Takeout or Cable Gland</b>												
See table								IP 65 <b>65</b> IP 66 <b>66</b> IP 67 <b>67</b>				<table border="1"> <tr> <td colspan="2"><b>Cable</b></td> </tr> <tr> <td>Side (radial) takeout</td> <td><b>S</b></td> </tr> <tr> <td colspan="2"><b>Cable Gland (no cable)</b></td> </tr> <tr> <td>Fits Ø 8 – 11 mm cable</td> <td><b>CG1</b></td> </tr> <tr> <td>Fits Ø11 – 14 mm cable</td> <td><b>CG2</b></td> </tr> </table>			<b>Cable</b>		Side (radial) takeout	<b>S</b>	<b>Cable Gland (no cable)</b>		Fits Ø 8 – 11 mm cable	<b>CG1</b>	Fits Ø11 – 14 mm cable	<b>CG2</b>
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TTL and RS-422	5V only*	<b>MT</b>										<table border="1"> <tr> <td>11 mm x 30 mm</td> <td><b>11</b></td> <td>-</td> <td><b>30</b></td> </tr> </table>			11 mm x 30 mm	<b>11</b>	-	<b>30</b>						
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