

## Type SCA94DD



- Specifically made for measurement of Speed and Position on slow revolving Direct Drive Generators on Wind Turbines
- High Resolution of Speed and Position
- High Update Rate of Speed, typically 10mSec.
- Profibus Interface for easy Integration with existing PLC's
- Rugged Design for Reliable Operation in Harsh Environments
- Built-in Transient Suppression Module

### Description

The **SCA94DD** is a member of the Scancon eCODE Series of high resolution optical semi-absolute encoders. The eCODE encoders are communicating encoders that communicate over a standardized interface and therefore do not need any specialized hardware. All communication is handled by a powerful microprocessor which ensures low latency and short cycle time.

The encoders in this series use a precision interpolating optical system which provides high resolution and accuracy. All data from the interpolating system are processed by the microprocessor insuring that all position and other data is accurate and recent within a few microseconds. Measured values are available over a Profibus interface and also quadrature outputs are present.

The eCODE series implements several programmable functions including resolution and direction of rotation. It also implements diagnostic functions with error and status. Programmable functions can be programmed by the customer or be programmed by Scancon according to the customer's needs.

This version of the eCODE encoder is particularly made to be used in wind power generation on slow rotating direct drive generators. Due to the very high resolution it is able to measure rotor speed and position quickly and with high accuracy.

Also other fields of industry can benefit from the **SCA94DD**'s ability to measure low rotational speed precisely.

## Electrical Specifications – General

<b>Code:</b>	Semi-absolute singleturn.
<b>Internal Resolution:</b>	1,048,576 ( $2^{20}$ ) positions per revolution.
<b>Supply Voltage:</b>	9 V to 30 V.
<b>Current Consumption: (typical without load)</b>	100 mA @ $V_{sup} = 10$ V. 60 mA @ $V_{sup} = 24$ V.
<b>Outputs:</b>	Digital – Quadrature with index.
<b>Interfaces:</b>	Profibus for data interchange. RS485 for set-up.
<b>Electrical Protection:</b>	Output short circuit, reverse polarity 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).

## Electrical Specifications – Digital Outputs

<b>Output:</b>	OL7272 Line Driver. HTL compatible.
<b>Output Specifications</b>	$V_{high} \geq V_{sup} - 1.8$ V @ $I_{out} = -20$ mA $V_{low} \leq 0.8$ V @ $I_{out} = 20$ mA
<b>Output Current:</b>	40 mA max. load per output channel
<b>Output Format:</b>	Two channel (A, B) quadrature with Index (Z) and complementary (A-, B-, Z-) outputs
<b>Phase Sense:</b>	Selectable as clockwise (CW) or counter clockwise (CCW)
<b>Resolution:</b>	Selectable as 1024, 2048, 4096 or 8192 pulses per revolution.
<b>Maximum Frequency:</b>	25 kHz

## Speed Specifications

<b>Maximum Speed:</b>	50 rpm
<b>Resolution:</b>	0.01 rpm
<b>Accuracy:</b>	Depending on sample time. Ex. $\pm 0.05$ rpm sample time = 10 mSec.
<b>Sample Time:</b>	Selectable 1mSec to 100 mSec. (10 to 1000 samples per second). 10 mSec recommended.

## Position Specifications

<b>Resolution:</b>	0.1 degree
<b>Accuracy:</b>	$\pm 0.1$ degree
<b>Measuring Range:</b>	0.0 to 359.9 degree (1 revolution)

## Profibus Specifications

<b>Interface Standard:</b>	DP-V0.
<b>Baud Rate:</b>	All standard baud rates from 9,600 baud to 12 Mbaud.
<b>Address Range:</b>	1 to 125
<b>Termination Resistors:</b>	Built-in – Switchable on/off

## Mechanical Specifications

<b>Material:</b>	Housing: Aluminum Cap: Aluminum Shaft: Stainless Steel (AISI 303)
<b>Weight:</b>	Encoder: approx. 1100 gr. (38.80 oz)
<b>Bearing Life:</b>	$> 1.9 \times 10^{10}$ revolutions at rated load
<b>Starting Torque:</b>	$< 0.1$ Nm (14.16 oz-in) at 25° C
<b>Mass Moment of Inertia:</b>	31 gcm <sup>2</sup> ( $4.39 \times 10^{-4}$ oz-in-sec <sup>2</sup> )
<b>Shaft Loads:</b>	Axial 200 N (45 lbs) max. Radial 400 N (90 lbs) max.

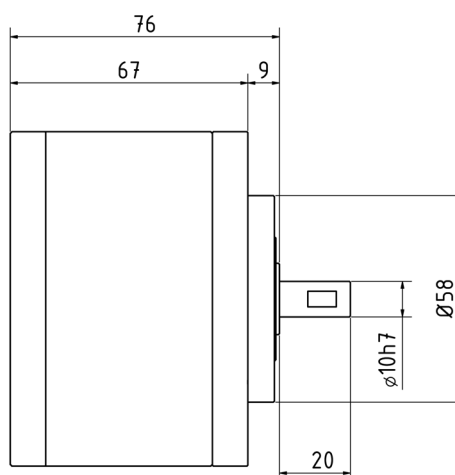
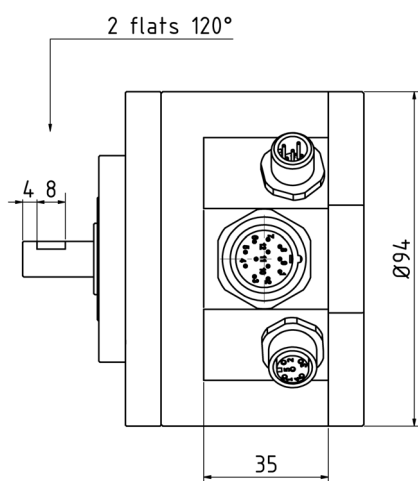
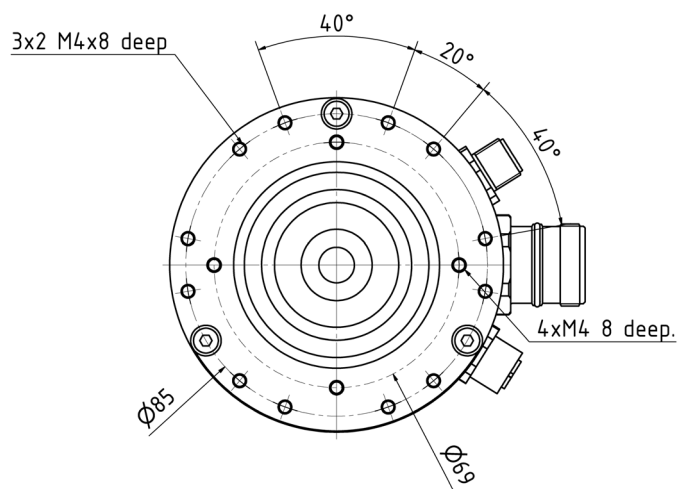
## Environmental Specifications

<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 67 / Nema 6 (approx.)

## Connection

<b>Connectors:</b>	12-pin M23 Male connector 5-pin M12 Male connector 5-pin M12 Female connector
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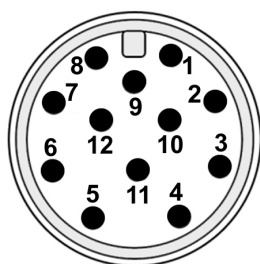
## Mechanical Dimensions



millimeter

## Connections

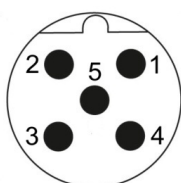
M23 Connector  
Male – 12 pin



Pin no.	Name	Type
1	Ch B Inv.	Output
2	Data +	Bidirectional
3	Ch Z	Output
4	Ch Z Inv.	Output
5	Ch A	Output
6	Ch A Inv.	Output
7	Data -	Bidirectional
8	Ch B	Output
9	N/C	---
10	GND	Common
11	N/C	---
12	Vsup	Supply input

*Connect Cable Shield to mating Connector Housing*

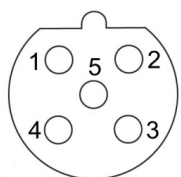
M12 Connector  
Male – 5 pin



Pin no.	Name	Type
1	N/C	---
2	Line A	Bidirectional
3	N/C	---
4	Line B	Bidirectional
5	N/C	---

*Connect Cable Shield to mating Connector Housing*

M12 Connector  
Female – 5 pin



Pin no.	Name	Type
1	N/C	---
2	Line A	Bidirectional
3	N/C	---
4	Line B	Bidirectional
5	N/C	---

*Connect Cable Shield to mating Connector Housing*

## Ordering Code

SCA94DD - 4096 - EP - 10 - 20 - 67 - 00 - CW