



## SCH86BEX Ex-Proof Fiber Optic Encoder

Scancon's SCH86BEX Fiber Optic Encoder is designed for ATEX Zone 1 applications where reliability and size are critical. The Fiber Optic version of the SCH86BEX eliminates signal degradation due to electrical noise issues while providing the same superior qualities found in the standard SCH86BEX encoder.

- Through Hollow Shaft Encoder - Ø 86 mm
- Hollow Shaft: Ø 5/8 inch to Ø 1 inch
- IP 67 (~ Nema 6) Environmental Protection
- Redundant Output Over Two Fibers
- ATEX, IECEx, Russian, North American (ISA/ANSI & CSA standards) Class I Div. 2 and AEx Class 1 Zone 1 certifications



### Technical Specifications

#### Electrical

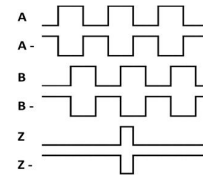
<b>Code:</b>	Incremental
<b>Resolution:</b>	See Table 1
<b>Supply Voltage:</b>	9 V min. to 30 V max.
<b>Current:</b>	110 mA @ Vsup = 15 V 70 mA @ Vsup = 30 V
<b>Output Frequency:</b>	100 kHz max.
<b>Output Format:</b>	Two channels (A, B) in quadrature with Index (Z); and complementary outputs (A-, B-, Z-)
<b>Output Phase Sense:</b>	A leads B clockwise (CW)
<b>Index:</b>	Gated with Channels A and B High; 1/4 cycle
<b>Electrical Protection:</b>	Reverse polarity protected
<b>Noise Immunity:</b>	Tested to EN61000-6-2 : 2005 and EN 61000-6-3 : 2007

#### Mechanical

<b>Material:</b>	Housing: Aluminum Cap: Aluminum Hollow Shaft: Stainless Steel (AISI 303)
<b>Weight:</b>	Aluminum: ~ 1250 gr (44.1 oz) Stainless Steel: ~ 3750 gr (132.3 oz) Cable: 50 gr / meter (1.76 oz / meter)
<b>Bearing Material:</b>	SAE 51200 Chrome Steel ABEC 5
<b>Bearing Life:</b>	> 5.5 x 10 <sup>10</sup> revs. (max. recomm. load; 45° C)
<b>Bearing Life:</b>	458,200 hours (calculated)
<b>Hollow Shaft Load:</b>	200 N (40 lbf) Axial (max. recommended) 200 N (40 lbf) Radial (max. recommended)
<b>Shaft Speed:</b>	3,000 rpm continuous (max.) IP 67
<b>Starting Torque:</b>	< 0.1 Nm (14.16 oz-in) at 25° C
<b>Mass Moment of Inertia:</b>	750 g-cm <sup>2</sup> (10.6 x 10 <sup>-3</sup> oz-in-sec <sup>2</sup> )

#### Output Waveforms

☉ Clockwise seen from the front of the encoder looking away from the motor shaft



Channel tolerance	180 e° +/- 36 e°
Phase difference tolerance	90 e° +/- 18 e°
Z channel tolerance	90 e° +/- 18 e°

#### Optical - Fiber Optic Output

<b>Optical Wavelength:</b>	850 nm (infrared)
<b>Recommended Fiber:</b>	62.5 / 125 µm, multimode
<b>Update Rate:</b>	1.04 million updates per second ~ 0.96 µsec. per update
<b>Transmission Delay:</b>	≤ 3 µsec. Approx. 1 µsec. must be added per 200 meters of optical fiber
<b>Transmission Distance:</b>	1,000 meters 2,000 meters (option)
<b>Compatible Fiber Optic Receiver:</b>	DINJB-RX-INC or equivalent

#### Environmental

<b>Operating Temp.:</b>	-40° to +70° C
<b>Storage Temp.:</b>	-40° to +85° C
<b>Shock:</b>	100 G @ 11 ms
<b>Vibration:</b>	10 G @ 10-2000 Hz
<b>Bump:</b>	10 G @ 16 ms (1000 x 3 axis)
<b>Humidity:</b>	98 % RH without condensation
<b>Enclosure Rating:</b>	IP 65 / Nema 4 (approx.) IP 66 / Nema 6 (approx.) IP 67 / Nema 6 (approx.)

#### Connections

<b>Output Terminations:</b>	Located in the removable End Cap; Terminal Block for Vsup and GND; Fiber Connection Sockets for fiber cables  See Technical Drawings
<b>Cable Outlet:</b>	M20, M25, 1/2 inch NPT, and 3/4 inch Thread Outlet options; Located in the End Cap  Ex suitably certified cable gland required!

### Ordering Code

SCH86BEX -    -    - FO -    - 00 -    - 00 -    - A

1                      2                      3                      4a                      4b                      5                      6                      7                      8

1. **Resolution**  
See Table 1.

Other resolutions may be requested

2. **Composition**  
Aluminum ..... AL  
Stainless Steel (AISI 316) .. SA

3. **Output**  
Fiber Optic ..... FO

4. **Hollow Shaft diameter**    **4a**    **4b**  
5/8 inch ..... 01 - 00  
16 mm ..... 02 - 00  
20 mm ..... 03 - 00  
25 mm ..... 04 - 00  
1 inch ..... 05 - 00

5. **IP Rating**  
IP 65 ..... 65  
IP 66 ..... 66  
IP 67 ..... 67

6. **Cable Length\***  
No Cable (End Cap) ... 00

\* Cable to be provided by customer

7. **End Cap\***  
M20 threaded outlet ..... EC01  
M25 threaded outlet ..... EC02  
3/4 inch NPT outlet ..... EC03  
1/2 inch NPT outlet ..... EC04

\* EX suitably certified cable gland required

8. **Flange**  
A ..... A

Certifications		Mechanical Tolerances (mm)	
<b>ATEX:</b>	Certificate No.: ITS09ATEX16841X II 2 G Ex db IIC T5 Gb II 2 D Ex tb IIIC T100°C Db -40°C < Tamb < +70°C	<b>Hollow Shaft (ISO tolerance):</b> Hollow bore $\phi > 10$ mm to $\leq 18$ mm Hollow bore $\phi > 18$ mm to $\leq 30$ mm	ISO 286-2 ANSI B4.2 G7 (+ 0.006 / + 0.024) G7 (+ 0.007 / + 0.028)
<b>IECEX:</b>	Certificate No.: IECEX ITS13.0025X Ex db IIC T5 Gb Ex tb IIIC T100°C Db -40°C < Tamb < +70°C,	<b>Shaft (recommended ISO tolerance):</b> Shaft $\phi > 10$ mm to $\leq 18$ mm Shaft $\phi > 18$ mm to $\leq 30$ mm	ISO 286-2 ANSI B4.2 h6 (- 0 / - .011) h6 (- 0 / - .013)
<b>North America:</b>	File No: LR 1192 Class I Div. 2, Groups ABCD T5 Class II Div. 2, Groups FG Ex db IIC T5 Gb Class I, Zone 1 AEx db IIC T5 Gb Tamb = -40°C to +70°C V = 4.5 – 30 Vdc; I <sub>max</sub> = 100 mA	<b>Shaft Runout (recommended TIR):</b>	NEMA Std. MG1.4.9.7 + / - 0.05 (0.002 in.)
<b>EAC Ex (Russia):</b>	Certificate No.: EAЭC RU C-DK.AA87.B.00266/19 1 EX db IIC T5 Gb X, Ex tb IIIC T100°C Db X Tamb -40°C to +70°C		
<b>IEC:</b>	This product conforms with IEC/EN 60079-28:2015 Explosive Atmospheres - Part 28: Protection of equipment and transmission systems using optical radiation Scope 1: Exception 3		

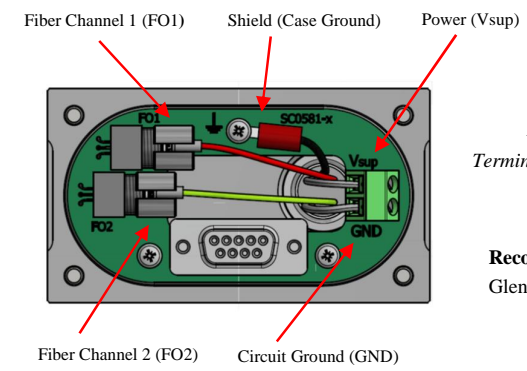
**Table 1. Disk Resolutions (pulses per rev.)**

25	100	1024	2500	3600
32	400	2000	3072	4096
40	800	2048		

Other resolutions may be requested

Certifications may be downloaded from [www.scancon.dk](http://www.scancon.dk)

## Technical Drawings



**Removable End Cap**  
w/ Fiber Connection Sockets and Terminal Block for Power and Circuit Ground

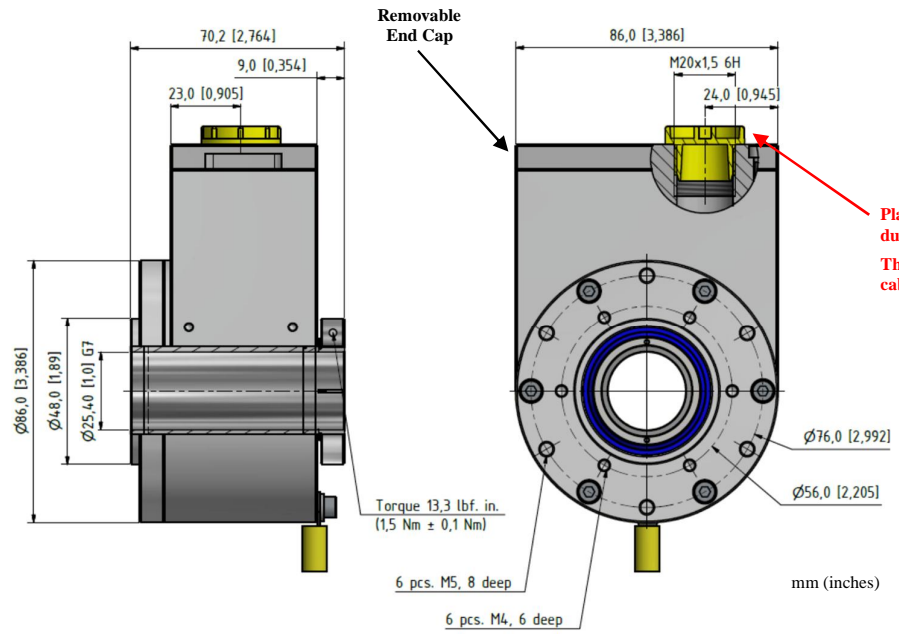
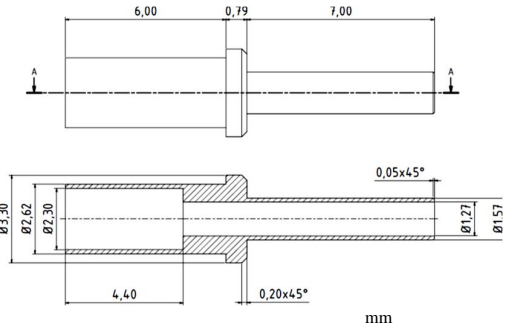
**Recommended Fiber Terminus:**  
Glenair Fiber Optic Jewel Pin Terminus or equivalent

Glenair p/n 181 - 052 - 127

**Terminal Block:**  
Wire conductor range: AWG 26 to 16  
0.14 to 1.5 mm<sup>2</sup>

**Fiber Socket:**  
Fiber: 62.5 / 125  $\mu$ m, multimode

**Cable:** Armoured cable jacket is recommended



Plastic screw plug is for cable outlet protection during shipping and storage.  
This plug must be replaced by an EX d certified cable gland prior to use.