



## Type SCH50B

- Hollow Shaft Encoder -  $\varnothing$  50 mm
- Through Hollow Bore:  $\varnothing$  6 mm to  $\varnothing$  8 mm
- Resolution up to 12.500 ppr
- IP 65 Environmental Protection
- *Formerly named 2RH*

### Electrical Specifications

<b>Code:</b>	Incremental
<b>Resolution:</b>	1 to 12.500 ppr (pulses per revolution)
<b>Supply Voltage:</b>	4,5 Vdc min. to 30 Vdc max. (35 mA max. - no load) **
<b>Output Voltage:</b>	Low: 500 mV max. at 10 mA High: ( $V_{in} - 0,6$ ) at -10 mA ( $V_{in} - 1,3$ ) at -25 mA
<b>Output Current:</b>	30 mA max. load per output channel **
<b>Frequency Response:</b>	300 kHz max. **
<b>Output Format:</b>	Two channel (A, B) quadrature with Index (Z) and optional complementary (A-, B-, Z-) outputs
<b>Phase Sense:</b>	A leads B clockwise (CW) from the mounting end of the encoder
<b>Index:</b>	Gated with Channels A and B high
<b>Accuracy:</b>	+/- 0,8 arc-min.
<b>Outputs:</b>	ASIC Push pull and Differential OL7272 Push-pull and Differential Line Driver 26C31 Differential Line Driver 5V output (with 5V input)
<b>Electrical Protection:</b>	Reverse polarity and output short circuit protected
<b>Noise Immunity:</b>	Tested to EN61000-6-2 : 2005 (industrial environments) Electromagnetic compatibility (EMC) 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 Hollow Shaft: Brass
<b>Weight:</b>	Encoder: ~ 120 gr (4,23 oz) Cable: 60 gr / meter (2,12 oz / meter)
<b>Bearing Life:</b>	> $1,9 \times 10^{10}$ revolutions at rated load
<b>Shaft Speed:</b>	12.000 rpm (max.)
<b>Starting Torque:</b>	< 0,01 Nm (1,42 oz-in) at 25° C
<b>Mass Moment of Inertia:</b>	4,0 gcm <sup>2</sup> ( $5,66 \times 10^{-5}$ oz-in-sec <sup>2</sup> )
<b>Hollow Shaft Loads:</b>	Axial: 20 N (4,5 lbs) max. Radial: 20 N (4,5 lbs) max.

### Environmental Specifications

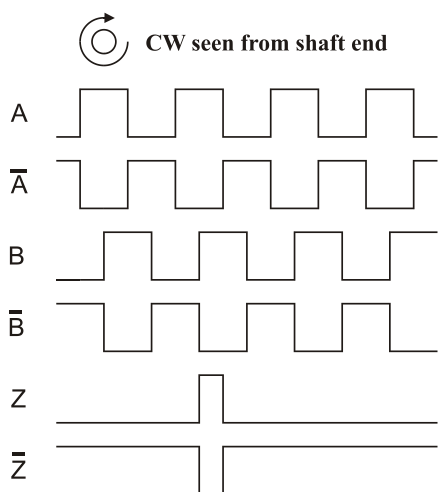
<b>Operating Temp.:</b>	-40° to +85° C
<b>Storage Temp.:</b>	-40° to +85° C
<b>Shock:</b>	100 G / 11 ms
<b>Vibration:</b>	10-2000 Hz / 10 G
<b>Bump:</b>	10 G / 16 ms (1000 x 3 axis)
<b>Humidity:</b>	98 % RH without condensation
<b>IP Rating:</b>	IP 65 / Nema 5 (approx.)

### Connection Options

<b>Cable:</b>	8 leads (0,14 mm <sup>2</sup> , 26 AWG) twisted pairs; shielded
<b>Connector:</b>	5-pin M12 8-pin M12 9-pin M23 12-pin M23

\*\*= It is recommended user not to combine max. Value for all 3 parameters

## Output waveform



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

## Disk Resolutions (Pulses per revolution)

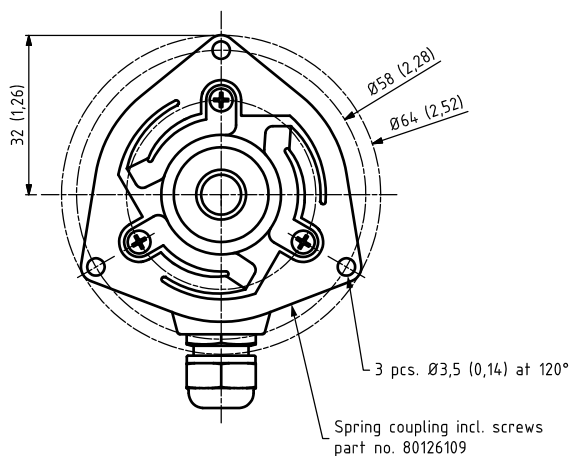
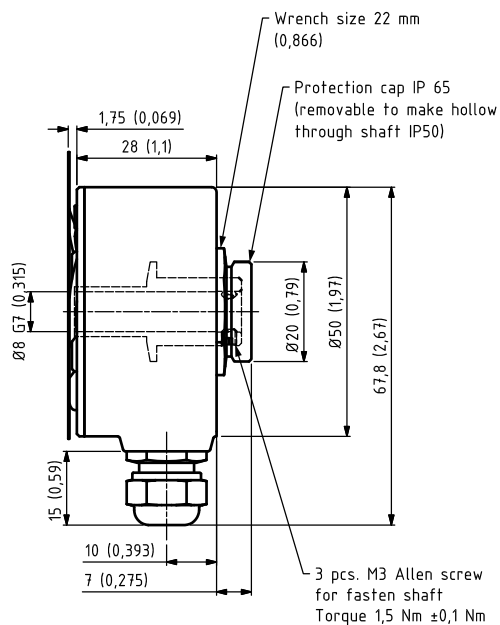
1	32	125	720	3072
2	36	150	800	3600
5	40	180	1000	4000
6	45	200	1024	4096
7	47	250	1131	5000
8	50	256	1200	8192
10	60	300	1250	9000*
12	64	360	1270	10000*
15	70	400	1500	12500*
16	75	455	2000	
18	80	500	2048	
20	90	512	2400	
25	100	600	2500	
30	120	635	3000	

### Other options on request

Pulses per revolution,  
 min. 1 – max. 12.500

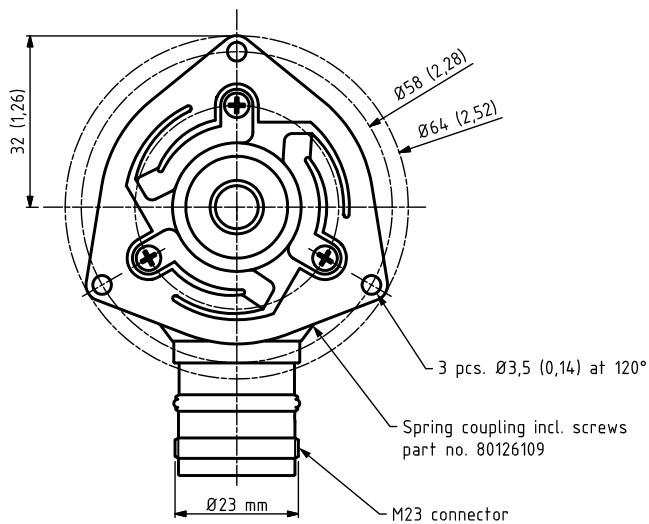
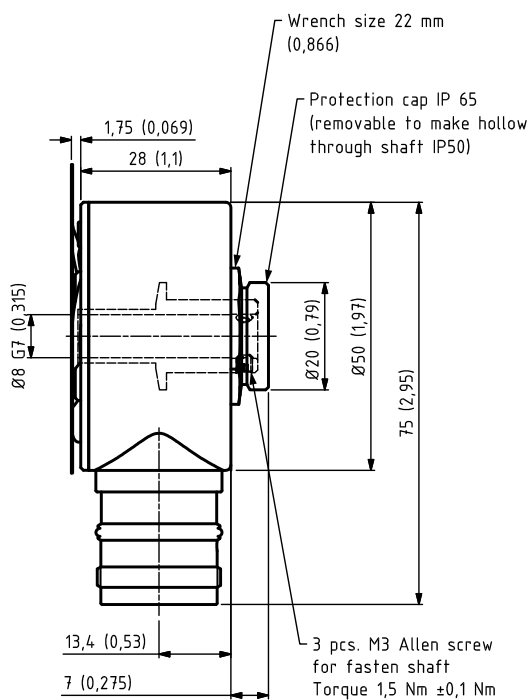
\* Operating temperature:  $-20^\circ\text{C}$  to  $50^\circ\text{C}$

## Mechanical Dimensions



Standard Cable Gland  
 Side (S)

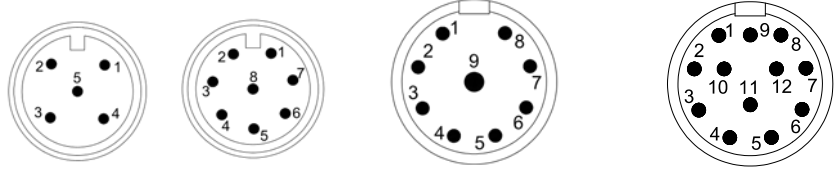
mm (inches)



M23 Connector

mm (inches)

## Output Terminations



Standard Cable			M12 5 - pin		M12 8 - pin		M23 9 - pin		M23 9 - pin		M23 12 - pin		M23 12 - pin	
	Standard Output	Differential Output		Standard Output	Differential Output	Standard Output	Standard Output	Differential Output	Standard Output	Differential Output	Standard Output	Differential Output	Standard Output	Differential Output
Channel	Wire Color		Pin	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel	Channel
A	Pink	Pink	1	Vsup	A	A	A	A	GND	B -				
A -	Gray*	Gray	2	B	Vsup	B	B	B	NC	NC				
B	Green	Green	3	GND	A -	Z	Z	Z	Z	Z				
B -	Yellow*	Yellow	4	A	B	GND	A -	A -	GND	Z -				
Z	White	White	5	Z	B -	GND	B -	B -	A	A				
Z -	Brown*	Brown	6		Z	GND	Z -	Z -	GND	A -				
Vsup	Red	Red	7		GND	Vsup	Vsup	Vsup	NC	NC				
GND	Blue	Blue	8		Z -	GND	GND	GND	B	B				
			9			Shield	Shield	Shield	Shield	Shield				
			10						GND	GND				
			11						NC	NC				
			12						Vsup	Vsup				

*GND = Circuit Ground*

*\* Internally connected as GND*

*GND = Circuit Ground*

*Shield = Case Ground*

## Ordering Code

**Example: SCH50B – 1024 – D – 08 – 34 – 65 – 01 – S – 00 – S1**

<b>SCH50B</b>	-		-		-		-		-		-		-		-	
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<b>Pulses per Revolution</b>	<b>Output</b>	<b>Hollow Shaft Dia.</b>	<b>Hollow Shaft Length</b>	<b>IP Rating</b>	<b>Cable Length</b>	<b>Takeout</b>	<b>Connector</b>	<b>Spring Coupling</b>
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See table

Standard	<b>N</b>
Standard – Open Collector NPN	<b>NON</b>
Standard – Open Collector PNP	<b>NOP</b>
Differential	<b>D</b>
26C31 Line Driver 5V / 5V only	<b>L</b>
OL 7272 Line Driver	<b>M</b>

IP 65	<b>65</b>
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Standard is 1 meter	<b>01</b>
Specify length	<b>XX</b>
No Cable	<b>00</b>

<u>Cable</u>	
Side (radial)	<b>S</b>
<u>Connector</u>	
Side (radial)	<b>S</b>

6 mm x 34 mm	<b>06</b>	-	<b>34</b>
8 mm x 34 mm	<b>08</b>	-	<b>34</b>

M12 5-pin	<b>P5</b>
M12 8-pin	<b>P8</b>
M23 9-pin	<b>C9</b>
M23 12-pin	<b>C12</b>
No Connector	<b>00</b>

1 hole p/n 80146636	<b>S1</b>
1 hole p/n 80141075	<b>S2</b>
3 holes p/n 80126109	<b>S3</b>
1 hole p/n 80140305	<b>S4</b>
No spring coupling	<b>00</b>

See Accessories for drawings

**Other options on request:**  
 Please contact Scancon A/S