



## Type SCA24

- Shaft Encoder -  $\varnothing$  24 mm
- Shaft:  $\varnothing$  2 mm to  $\varnothing$  1/4 inch
- Resolution up to 7500 ppr
- Enclosure IP Rating 64 (IP 50 for IDC connector option)

### Electrical Specifications

<b>Code:</b>	Incremental
<b>Resolution:</b>	1 to 7500 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>	25 mA max. load per output channel **
<b>Frequency Response:</b>	200 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)

\*\* = It is recommended user not to combine max. values for all 3 parameter

### Mechanical Specifications

<b>Material:</b>	Housing: Brass Cap: Electroplated Steel Aluminum (flat cable option) Shaft: Stainless Steel
<b>Weight:</b>	Encoder: ~ 35 gr (1,23 oz) Cable: 50 gr / meter (1,76 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>	< 0,005 Nm (0,708 oz-in) at 25° C
<b>Mass Moment of Inertia:</b>	1,0 gcm <sup>2</sup> ( $1,42 \times 10^{-5}$ oz-in-sec <sup>2</sup> )
<b>Shaft Loads:</b>	Axial: 20 N (4,5 lbs) max. Radial: 20 N (4,5 lbs) max.

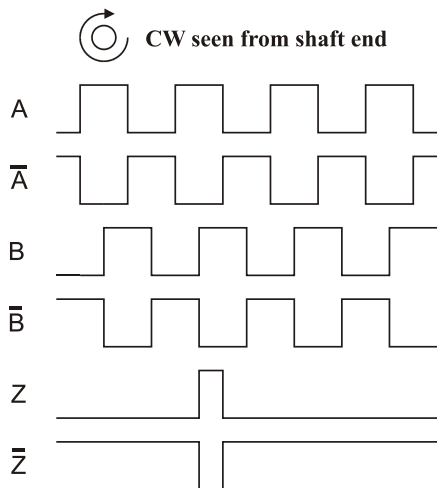
### Environmental Specifications

<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>Enclosure Rating:</b>	IP 64 / Nema 4 (approx.) IP 50 / Nema 5 (approx.) - flat cable

### Connection Options

<b>Cable:</b>	8 leads (0,05 mm <sup>2</sup> , 30 AWG) - Differential 5 leads (0,14 mm <sup>2</sup> , 26 AWG) - Standard twisted pairs; shielded
<b>Flat Cable:</b>	10 lead flat cable with IDC connector

## Output waveform



Channel tolerance       $180\text{ e}^\circ \pm 36\text{ e}^\circ$   
 Phase difference tolerance       $90\text{ e}^\circ \pm 18\text{ e}^\circ$   
 Z channel tolerance       $90\text{ e}^\circ \pm 18\text{ e}^\circ$

## Disk Resolutions (pulses per revolution)

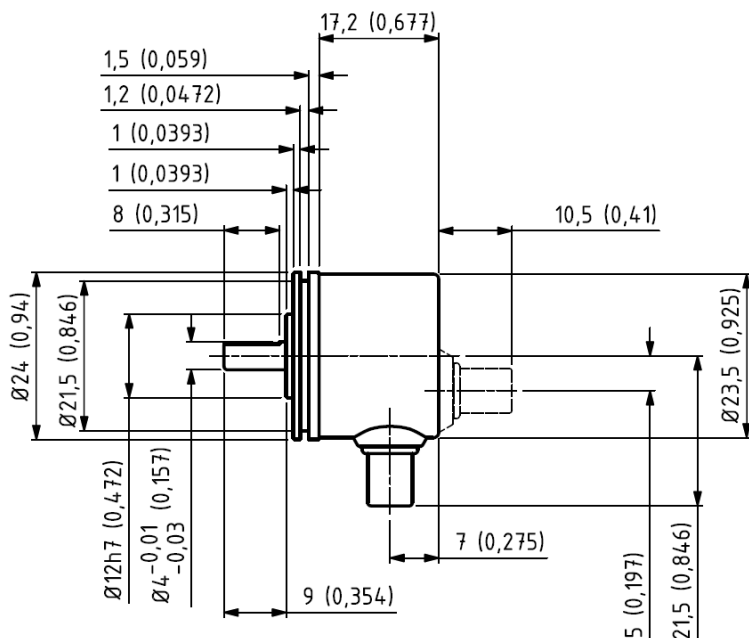
1	36	150	512	3000
4	50	180	600	3600
10	60	200	1000	5000
11	64	250	1024	7500*
12	75	256	1250	
15	90	300	1800	
20	100	360	2000	
25	125	400	2048	
30	128	500	2500	

### Other options on request

Pulses per revolution,  
 min. 1 – max. 7.500

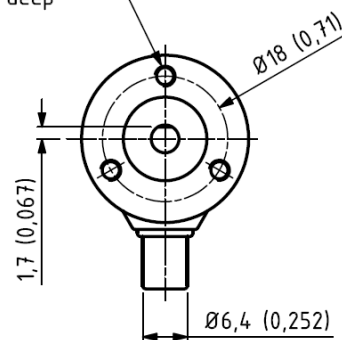
\* Operating temperature:  $-20^\circ\text{C}$  to  $50^\circ\text{C}$

## Mechanical Dimensions



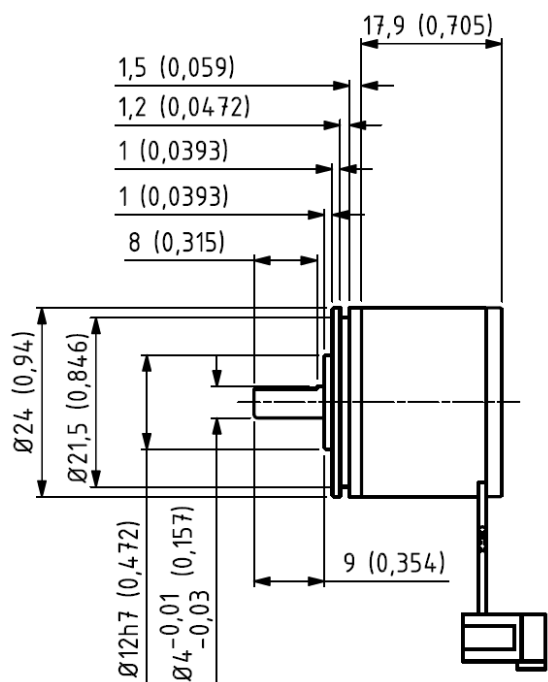
Tolerances according to ISO 2768 f

3 pcs. M3 at  $120^\circ$   
 max. 3,5 deep



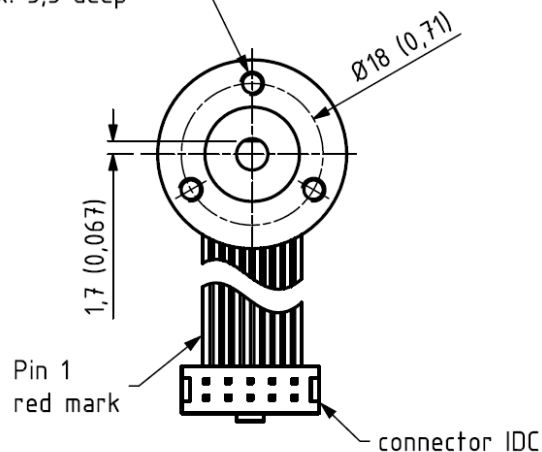
Standard Cable Gland  
 Side (S) or Back (B)

mm (inches)



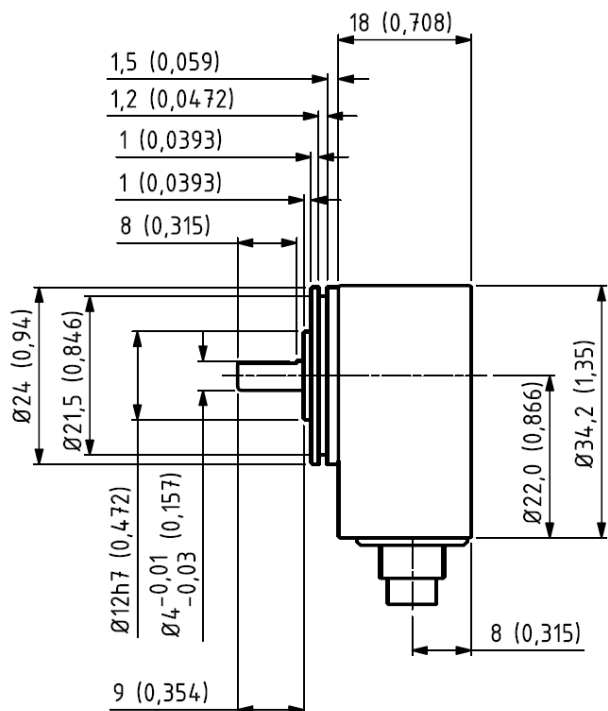
Tolerances according to ISO 2768 f

3 pcs. M3 at 120°  
max. 3,5 deep



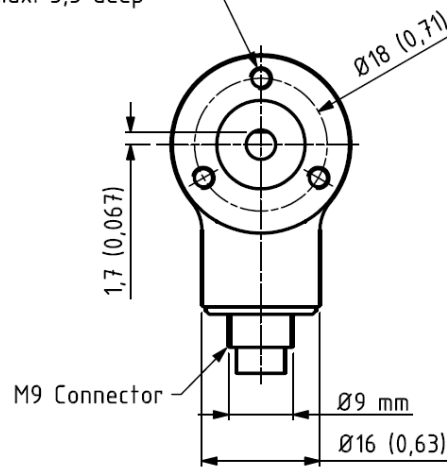
Flat Ribbon Cable with IDC connector

mm (inches)



Tolerances according to ISO 2768 f

3 pcs. M3 at 120°  
max. 3,5 deep



M9 Connector

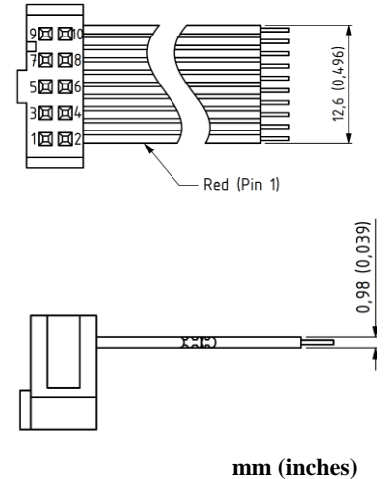
mm (inches)

## Output Terminations

Channel	Standard Cable	
	Standard Output	Differential Output
Channel	Wire Color	
A	Green	Pink
A -	NC	Gray
B	Yellow	Green
B -	NC	Yellow
Z	Gray	White
Z -	NC	Brown
Vsup	Brown	Red
GND	White	Blue

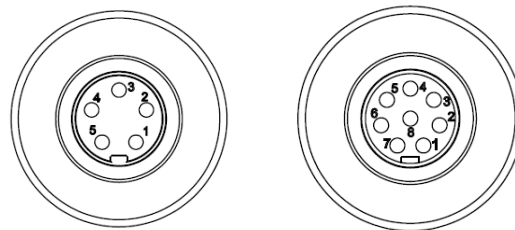
GND = Circuit Ground

Position	Flat Cable w/ IDC Connector	
	Differential Output *	
Position	Channel	
1	NC	
2	Vsup	
3	GND	
4	NC	
5	A	
6	A -	
7	B	
8	B -	
9	Z -	
10	Z	



- IP 50 rating
- CE mark not available
- 0,5 m, 1 m, or 2 m cable length only

\* Hewlett Packard (HP) compatible



Position	M9 5 - pin	M9 8 - pin
	Standard Output	Differential Output
Position	Channel	Channel
1	VDD	VDD
2	GND	GND
3	A	A
4	B	A -
5	Z	B
6		B -
7		Z
8		Z -

## Ordering Code

**Example: SCA24 – 1024 – D – 1/4 – 10F – 64 – 01 – S – 00**

### Type

<b>SCA24</b>	-	-	-	-	-	-	-	-	-																																																				
<b>Pulses per Revolutio</b>		<b>Output</b>	<b>Shaft Dia.</b>	<b>Shaft Length</b>	<b>IP</b>	<b>Cable Length</b>	<b>Cable Takeout</b>	<b>Connector</b>																																																					
See Table					<table border="1"> <tr> <td>IP 50</td> <td>50**</td> </tr> <tr> <td>IP 64</td> <td>64</td> </tr> </table> <p>** = Only flat cable</p>	IP 50	50**	IP 64	64																																																				
IP 50	50**																																																												
IP 64	64																																																												
		<table border="1"> <tr> <td>Standard</td> <td><b>N</b></td> </tr> <tr> <td>Standard – Open Collector NPN</td> <td><b>NON</b></td> </tr> <tr> <td>Standard – Open Collector PNP</td> <td><b>NOP</b></td> </tr> <tr> <td>Differential</td> <td><b>D</b></td> </tr> <tr> <td>26C31 Line Driver 5V / 5V only</td> <td><b>L</b></td> </tr> <tr> <td>OL 7272 Line Driver</td> <td><b>M</b></td> </tr> <tr> <td>Standard - with built-in TSM ***</td> <td><b>T</b></td> </tr> </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>	Standard - with built-in TSM ***	<b>T</b>			<table border="1"> <tr> <td colspan="3"><b>Standard Cable</b></td> </tr> <tr> <td>M9 5-pin</td> <td></td> <td><b>M9/5</b></td> </tr> <tr> <td>M9 8-pin</td> <td></td> <td><b>M9/8</b></td> </tr> <tr> <td>No Connector</td> <td></td> <td><b>00</b></td> </tr> <tr> <td colspan="3"><b>Flat Cable (connector required)</b></td> </tr> <tr> <td>IDC on flat cable</td> <td></td> <td><b>IDC</b></td> </tr> </table>	<b>Standard Cable</b>			M9 5-pin		<b>M9/5</b>	M9 8-pin		<b>M9/8</b>	No Connector		<b>00</b>	<b>Flat Cable (connector required)</b>			IDC on flat cable		<b>IDC</b>																								
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>																																																												
Standard - with built-in TSM ***	<b>T</b>																																																												
<b>Standard Cable</b>																																																													
M9 5-pin		<b>M9/5</b>																																																											
M9 8-pin		<b>M9/8</b>																																																											
No Connector		<b>00</b>																																																											
<b>Flat Cable (connector required)</b>																																																													
IDC on flat cable		<b>IDC</b>																																																											
					<table border="1"> <tr> <td colspan="2"><b>Standard Cable</b></td> </tr> <tr> <td>Standard is 1 meter</td> <td><b>01</b></td> </tr> <tr> <td>Specify length</td> <td><b>XX</b></td> </tr> <tr> <td>No cable</td> <td><b>00</b></td> </tr> <tr> <td colspan="2"><b>Flat Cable w/ IDC</b></td> </tr> <tr> <td>0,5 meter</td> <td><b>0,5</b></td> </tr> <tr> <td>1,0 meter</td> <td><b>01</b></td> </tr> <tr> <td>2,0 meters</td> <td><b>02</b></td> </tr> </table>	<b>Standard Cable</b>		Standard is 1 meter	<b>01</b>	Specify length	<b>XX</b>	No cable	<b>00</b>	<b>Flat Cable w/ IDC</b>		0,5 meter	<b>0,5</b>	1,0 meter	<b>01</b>	2,0 meters	<b>02</b>																																								
<b>Standard Cable</b>																																																													
Standard is 1 meter	<b>01</b>																																																												
Specify length	<b>XX</b>																																																												
No cable	<b>00</b>																																																												
<b>Flat Cable w/ IDC</b>																																																													
0,5 meter	<b>0,5</b>																																																												
1,0 meter	<b>01</b>																																																												
2,0 meters	<b>02</b>																																																												
									<table border="1"> <tr> <td>Side (radial) Standard cable</td> <td><b>S</b></td> </tr> <tr> <td>Side (radial) PUR cable</td> <td><b>PUR</b></td> </tr> <tr> <td>Back (axial)</td> <td><b>B</b></td> </tr> <tr> <td>Side Flat</td> <td><b>SF</b></td> </tr> </table>	Side (radial) Standard cable	<b>S</b>	Side (radial) PUR cable	<b>PUR</b>	Back (axial)	<b>B</b>	Side Flat	<b>SF</b>																																												
Side (radial) Standard cable	<b>S</b>																																																												
Side (radial) PUR cable	<b>PUR</b>																																																												
Back (axial)	<b>B</b>																																																												
Side Flat	<b>SF</b>																																																												
									<table border="1"> <tr> <td>2.0 mm x 13mm</td> <td><b>02</b></td> <td>-</td> <td><b>13</b></td> </tr> <tr> <td>4.0 mm x 5 mm *</td> <td><b>04</b></td> <td>-</td> <td><b>05</b></td> </tr> <tr> <td>4.0 mm x 9 mm *</td> <td><b>04</b></td> <td>-</td> <td><b>09</b></td> </tr> <tr> <td>4.0 mm x 15 mm *</td> <td><b>04</b></td> <td>-</td> <td><b>15</b></td> </tr> <tr> <td>4.0 mm x 20 mm *</td> <td><b>04</b></td> <td>-</td> <td><b>20</b></td> </tr> <tr> <td>4.0 mm x 25 mm *</td> <td><b>04</b></td> <td>-</td> <td><b>25</b></td> </tr> <tr> <td>4.0 mm x 35 mm *</td> <td><b>04</b></td> <td>-</td> <td><b>35</b></td> </tr> <tr> <td>5.0 mm x 10 mm w/ flat only</td> <td><b>05</b></td> <td>-</td> <td><b>10F</b></td> </tr> <tr> <td>6.0 mm x 10 mm</td> <td><b>06</b></td> <td>-</td> <td><b>10</b></td> </tr> <tr> <td>6.0 mm x 14 mm *</td> <td><b>06</b></td> <td>-</td> <td><b>14</b></td> </tr> <tr> <td>1/8 inch x 3/8 inch</td> <td><b>1/8</b></td> <td>-</td> <td><b>3/8</b></td> </tr> <tr> <td>1/4 inch x 10 mm w/ flat only</td> <td><b>1/4</b></td> <td>-</td> <td><b>10F</b></td> </tr> <tr> <td>1/4 inch x 20 mm w/ flat only</td> <td><b>1/4</b></td> <td>-</td> <td><b>20F</b></td> </tr> </table>	2.0 mm x 13mm	<b>02</b>	-	<b>13</b>	4.0 mm x 5 mm *	<b>04</b>	-	<b>05</b>	4.0 mm x 9 mm *	<b>04</b>	-	<b>09</b>	4.0 mm x 15 mm *	<b>04</b>	-	<b>15</b>	4.0 mm x 20 mm *	<b>04</b>	-	<b>20</b>	4.0 mm x 25 mm *	<b>04</b>	-	<b>25</b>	4.0 mm x 35 mm *	<b>04</b>	-	<b>35</b>	5.0 mm x 10 mm w/ flat only	<b>05</b>	-	<b>10F</b>	6.0 mm x 10 mm	<b>06</b>	-	<b>10</b>	6.0 mm x 14 mm *	<b>06</b>	-	<b>14</b>	1/8 inch x 3/8 inch	<b>1/8</b>	-	<b>3/8</b>	1/4 inch x 10 mm w/ flat only	<b>1/4</b>	-	<b>10F</b>	1/4 inch x 20 mm w/ flat only	<b>1/4</b>	-	<b>20F</b>
2.0 mm x 13mm	<b>02</b>	-	<b>13</b>																																																										
4.0 mm x 5 mm *	<b>04</b>	-	<b>05</b>																																																										
4.0 mm x 9 mm *	<b>04</b>	-	<b>09</b>																																																										
4.0 mm x 15 mm *	<b>04</b>	-	<b>15</b>																																																										
4.0 mm x 20 mm *	<b>04</b>	-	<b>20</b>																																																										
4.0 mm x 25 mm *	<b>04</b>	-	<b>25</b>																																																										
4.0 mm x 35 mm *	<b>04</b>	-	<b>35</b>																																																										
5.0 mm x 10 mm w/ flat only	<b>05</b>	-	<b>10F</b>																																																										
6.0 mm x 10 mm	<b>06</b>	-	<b>10</b>																																																										
6.0 mm x 14 mm *	<b>06</b>	-	<b>14</b>																																																										
1/8 inch x 3/8 inch	<b>1/8</b>	-	<b>3/8</b>																																																										
1/4 inch x 10 mm w/ flat only	<b>1/4</b>	-	<b>10F</b>																																																										
1/4 inch x 20 mm w/ flat only	<b>1/4</b>	-	<b>20F</b>																																																										

\* = Available with flat (8mm length)

To order with flat, add "F" to the shaft length.

Example: 1/4 - 10 F

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

\*\*\* Designed specifically for Wind Power applications.

See **SCA24 COC** under *Industries – Wind Power – SCA24* for additional conformity standards testing.

TSM = Transient Suppression Module

Available only as Standard output