

## Type 2RKNA-SSI



- Absolute Encoder - Ø 58 mm
- Shaft - ø ¼ inch to ø 10 mm
- Singleturn or Multiturn
- SSI Interface
- Binary or Gray Code
- Preset of Zero Position
- Choice of Counting Direction
- Enclosure Rating IP 65 or IP 67
- Supply voltage 5V or 9-30 V

### Electrical Specifications

<b>Encoder Type:</b>	Absolute Multiturn
<b>Singleturn Resolution:</b>	13 bits (8192) steps pr. revolution
<b>Number of Revolutions:</b>	12 bits (4096) revolutions 16 bits (65536) revolutions 20 bits (1048576) revolutions 24 bits (16777216) revolutions
<b>Supply Voltage:</b>	5 VDC ±5% or 9-30 VDC
<b>Typical Current Consumption:</b>	30 mA @ V <sub>sup</sub> = 5V 25 mA @ V <sub>sup</sub> = 10V 15 mA @ V <sub>sup</sub> = 24V
<b>Accuracy:</b>	± 0,35°
<b>Interface:</b>	SSI (Synchronous Serial Interface)
<b>Output Code:</b>	Binary or Gray
<b>Electrical Interface:</b>	Differential (RS422) or single ended (TTL)
<b>Clock Frequency:</b>	100 kHz to 2 MHz
<b>Counting Direction:</b>	Increasing clockwise or increasing counter clockwise seen from shaft end of encoder
<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 Shaft: Stainless steel AISI 303
<b>Weight:</b>	Encoder: ~ 190 gr (6,7 oz) Cable: 60 gr / meter (2,12 oz / meter)
<b>Bearing Life:</b>	> 1,9 x 10 <sup>10</sup> revolutions at rated load
<b>Shaft Speed:</b>	4.500 rpm (max. sustained) IP 65 3.000 rpm (max. sustained) IP 66 / IP 67
<b>Starting Torque:</b>	< 0,02 Nm (2,83 oz-in) at 25° C
<b>Mass Moment of Inertia:</b>	6,0 gcm <sup>2</sup> (8,5 x 10 <sup>-5</sup> oz-in-sec <sup>2</sup> )
<b>Shaft Loads:</b>	Axial: 150 N (33,75 lbs) max. Radial: 250 N (56 lbs) max.

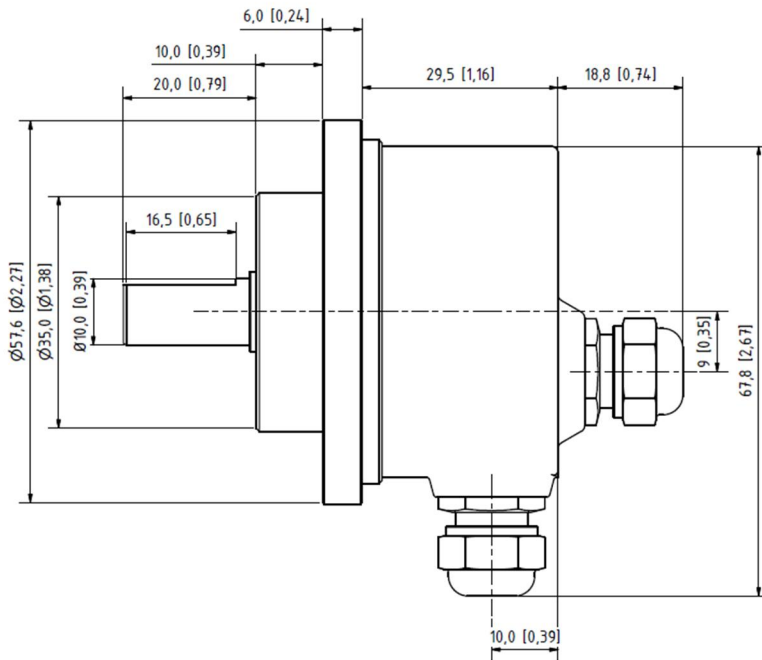
### Environmental Specifications

<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 G @ 10-2000 Hz
<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.) IP 67 / Nema 6 (approx.) option

### Connection Options

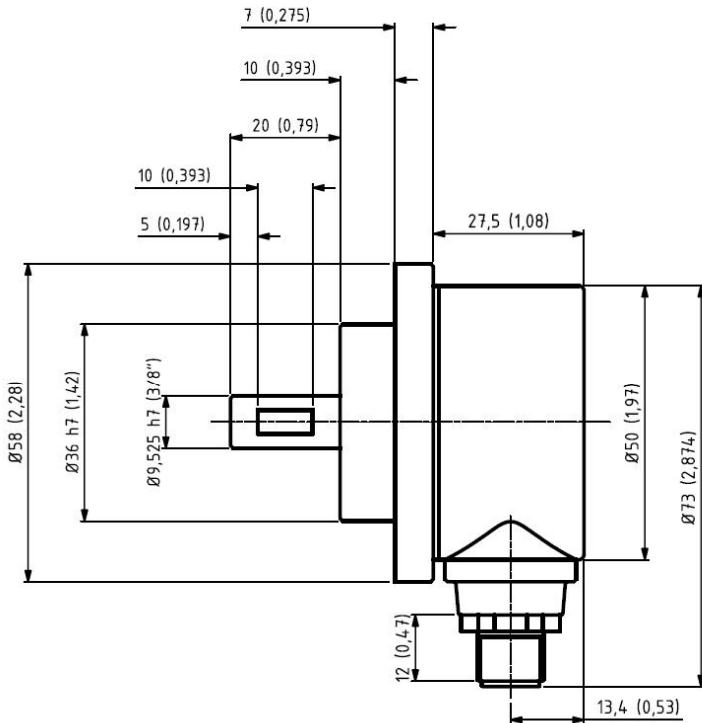
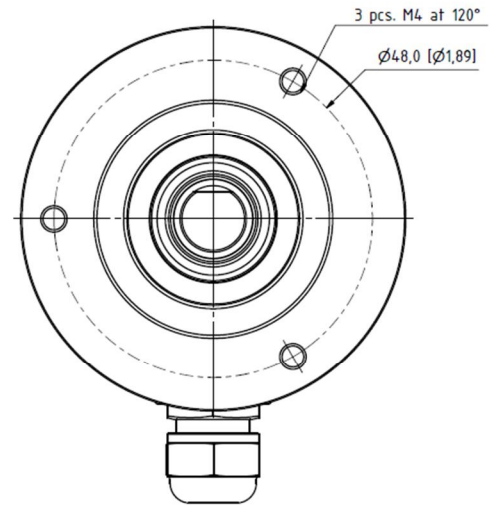
<b>Cable:</b>	8 leads (0,14 mm <sup>2</sup> , 26 AWG) twisted pairs; shielded
<b>Connector:</b>	8-pin M12

## Mechanical Dimensions



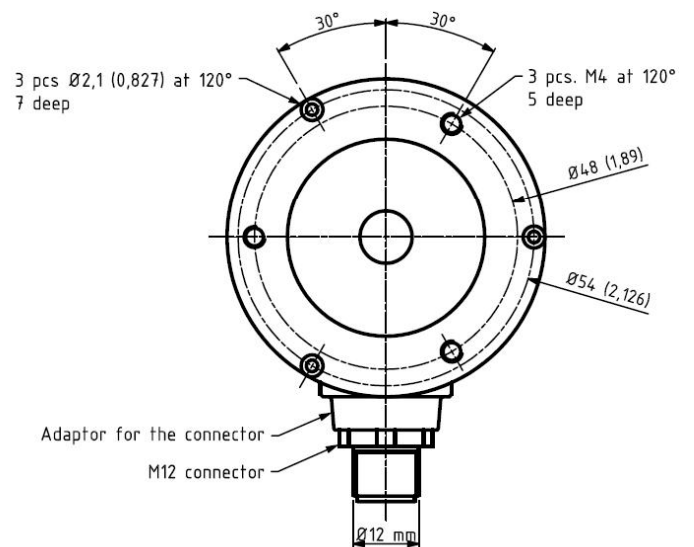
Standard Cable Gland

mm [inches]



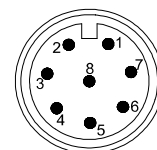
M12 Connector

mm [inches]



## Output Terminations

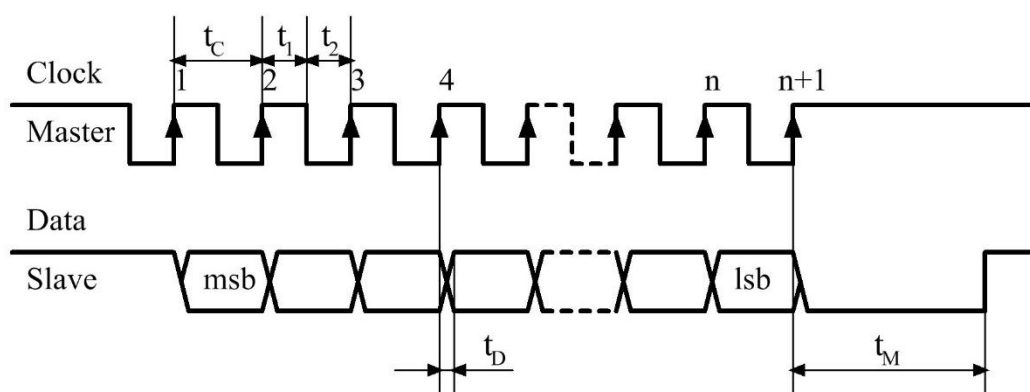
Signal	Cable		M12 Connector	
	Differential Input/output		Differential Input/output	Single Ended Input/output
	Wire Color		Pin Number	
CLK+	Green		3	3
CLK-	Yellow		4	Not Connected
DO+	Gray		5	
DO-	Pink		6	Not Connected
Direction	Red		8	8
Preset	Blue		7	7
Vsup	Brown		2	2
GND	White		1	1



*Shield connected to case ground*

*Shield must be connected to connector housing*

## SSI Interface Timing



msb = Most Significant Bit

lsb = Least Significant Bit

n = Total Number of Bits

$t_c$  = Clock Period = 0,5 to 10  $\mu$ Sec (100kHz to 2 MHz)

$t_1$  = Clock High = 50%  $\pm$ 15% of Clock Period

$t_2$  = Clock Low = 50%  $\pm$ 15% of Clock Period

$t_D$  = Clock to Data Valid = Max. 100 nSec

$t_M$  = Monoflop Time = 20  $\pm$ 3  $\mu$ Sec

## Implementation

During the initial set-up and installation of the encoder, it is possible to set the direction of rotation and preset the encoder to zero.

### Setting of Direction.

The connection designated "Direction" is used to set the direction of rotation. Notice, that the encoder must not be powered when the direction of rotation is set/changed. Notice also, that the encoder will change its position value when the direction of rotation is changed. Direction of rotation is viewed on the shaft end of the encoder.

Voltage Level on Input	Function
High: $V_{sup}$ or $V_{sup}/2 \leq V_{in} \leq V_{sup}$	Encoder Increasing on Counter Clockwise Rotation
Low: Input not connected or $0V \leq V_{in} \leq V_{sup}/2$	Encoder Increasing on Clockwise Rotation

### Preset to Zero

The connection designated "Preset" is used to preset the encoder to zero. Notice, that the encoder must be powered when it is preset to zero.

Voltage Level on Input	Function
High: $V_{sup}$ or $V_{sup}/2 \leq V_{in} \leq V_{sup}$	Encoder Value is set to Zero
Low: Input not connected or $0V \leq V_{in} \leq V_{sup}/2$	Inactive

The encoder will be held at zero as long as the line is high, even though the shaft is turned. The line must be high for at least 100 mSec. for the preset to take effect. The new zero point will be stored permanently in the encoder.

## Ordering Code

Example: 2RKNA-SSI - 1213 - 9 - B - D - 08 - 20 - 65 - 01 - S - 00

<b>2RKNA-SSI</b>	-	-	-	-	-	-	<b>20</b>	-	-	-	-
	<b>Resolution</b>	<b>Supply Voltage</b>	<b>Code</b>	<b>Output</b>	<b>Shaft Dia.</b>	<b>Shaft Length</b>	<b>IP Rating</b>	<b>Cable Length</b>	<b>Cable Takeout</b>	<b>Connector</b>	
<u>Singleturn</u> Resolution 13 bits <b>0013</b> <u>Multiturn</u> Revolutions 12 bits <b>1213</b> Revolutions 16 bits <b>1613</b> Revolutions 20 bits <b>2013</b> Revolutions 24 bits <b>2413</b>			<u>Code</u> Binary <b>B</b> Gray <b>G</b>				IP 65 <b>65</b> IP 67 <b>67</b>	<u>Standard Cable</u> Standard is 1 meter <b>01</b> Specify length <b>XX</b> No Cable <b>00</b>			
	<u>Supply Voltage</u> 5 VDC <b>5</b> 9-30 VDC <b>9</b>		<u>Electrical Interface</u> Differential (RS422) <b>D</b> Single Ended (TTL) <b>S*</b>					<u>Cable</u> Side radial <b>S</b> Back Axial <b>B</b> <u>Connector</u> Side radial <b>S</b> Back Axial <b>B</b>			
						1/4" mm x 20 mm <b>1/4 - 20</b> 8 mm x 20 mm <b>08 - 20</b> 3/8" mm x 20 mm <b>3/8 - 20</b> 10 mm x 20 mm <b>10 - 20</b>			M12 8-pin <b>P8*</b> No Connector <b>00</b>		
											*with connector only
											*Only side (radial) takeout