SCANCON Industrial Encoders

Absolute Encoder

Type 2RMHF SSI

- **Absolute Encoder - Ø 24 mm**
- **Blind Hollow Shaft - ø 3 mm to ø 1/4 inch**
- **Singleturn or Multiturn**
- **SSI Interface**
- **Binary or Gray Code**
- **Preset of Zero Position**
- **Choice of Counting Direction**
- **Enclosure Rating IP 64 or IP 67**

Electrical Specifications

Encoder Type:	Absolute Multiturn
Singleturn Resolution:	13 bits (8192)steps pr. revolution
Number of Revolutions:	12 bits (4096) revolutions 16 bits (65536) revolutions 20 bits (1048576) revolutions 24 bits (16777216) revolutions
Supply Voltage:	5 VDC ±5%
Typical Current Consumption:	30 mA (no load)
Accuracy:	± 0,35°
Interface:	SSI (Synchronous Serial Interface)
Output Code:	Binary or Gray
Electrical Interface:	Differential (RS422)
Clock Frequency:	100 kHz to 2 MHz
Counting Direction:	Increasing clockwise or increasing counter clockwise seen from shaft end of encoder
Electrical Protection:	Reverse polarity and output short circuit protected
Noise Immunity:	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

Material:	Housing: Brass Cap: Electroplated Steel or Aluminum Shaft: Brass
Weight:	Encoder: ~ 55 gr (1,94 oz) Cable: 50 gr / meter (1,76 oz / meter)
Bearing Life:	> 1,9 x 10^{10} revolutions at rated load
Shaft Speed:	12.000 rpm (max.)
Starting Torque:	< 0,005 Nm (0,708 oz-in) at 25° C
Mass Moment of Inertia:	1,05 gcm² (1,49 x 10^{-5} oz-in-sec²)
Shaft Loads:	Axial: 20 N (4,5 lbs) max. Radial: 20 N (4,5 lbs) max.

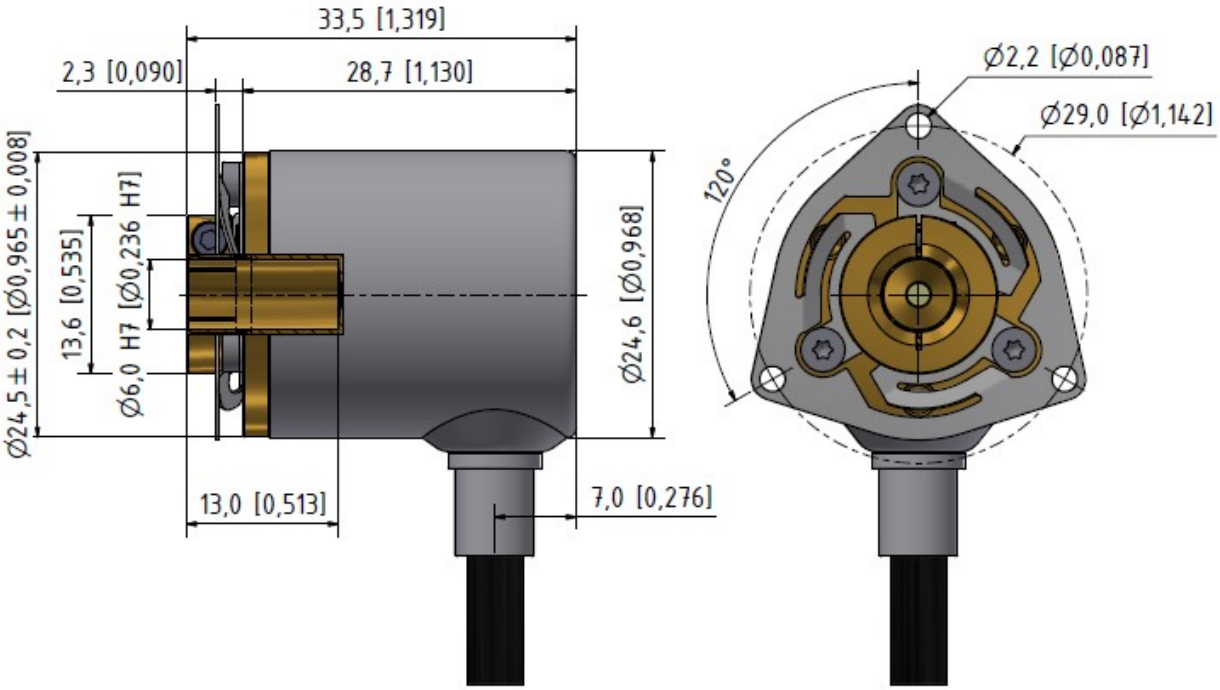
Environmental Specifications

Operating Temp.:	-40° to +85° C
Storage Temp.:	-40° to +85° C
Shock:	100 G @ 11 ms
Vibration:	10 G @ 10-2000 Hz
Bump:	10 G @ 16 ms (1000 x 3 axis)
Humidity:	98 % RH without condensation
Enclosure Rating:	IP 64 / Nema 4 (approx.) IP 67 / Nema 6 (approx.)

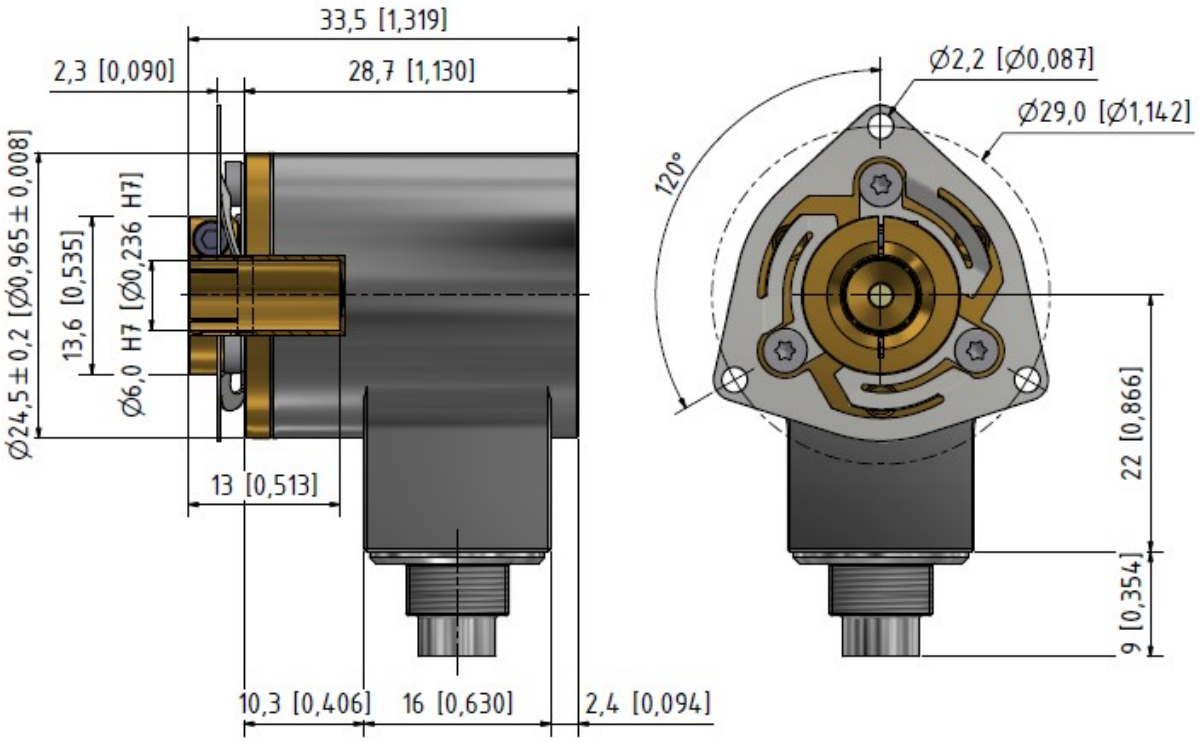
Connection Options

Cable:	8 leads (0,05 mm², 30 AWG) - Twisted pairs shielded
Connector:	8-pin M9 8-pin M12

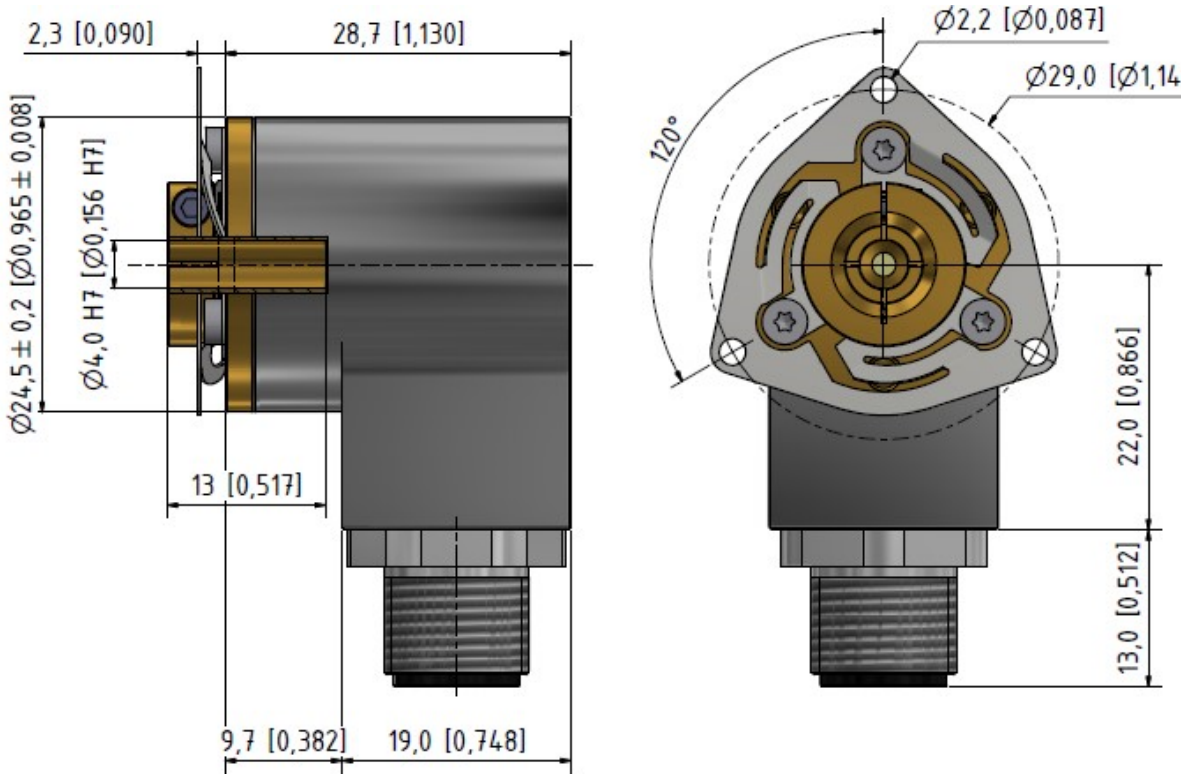
Mechanical Dimensions



Standard Cable Gland *(radial or axial outlet)* mm [inches]



M9 Connector mm [inches]



M12 Connector

mm [inches]

Output Terminations

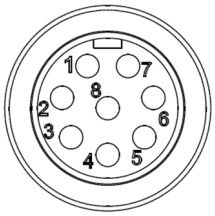
Cable	
Differential Input/output	
Signal	**Wire Color**
CLK+	Green
CLK-	Yellow
DO+	Gray
DO-	Pink
Direction	Red
Preset	Blue
Vsup	Brown
GND	White

Shield connected to case ground

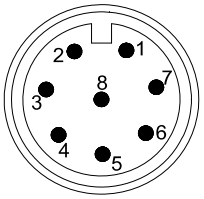
M9 / M12 Connector	
Differential Input/output	
Pin Number	**Signal**
1	GND
2	Vsup
3	CLK+
4	CLK-
5	DO+
6	DO-
7	Preset
8	Direction

Shield must be connected to connector housing

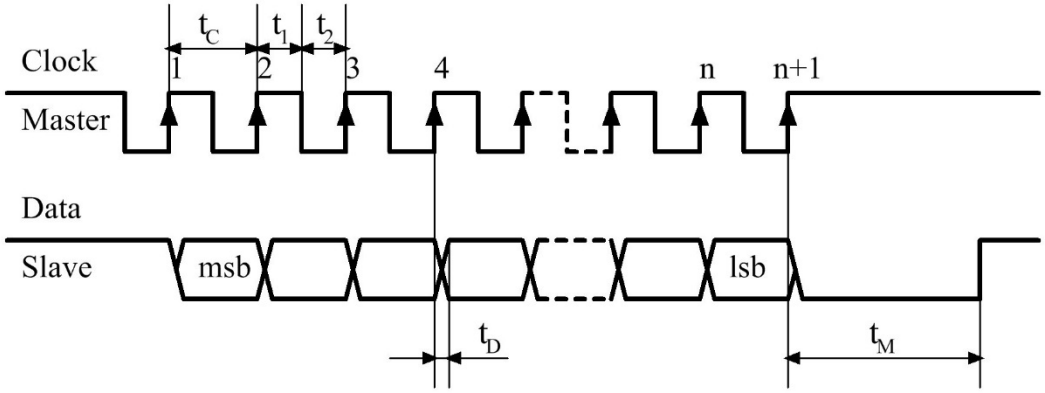
M9 Connector



M12 Connector



SSI Interface Timing



msb = Most Significant Bit
lsb = Least Significant Bit
n = Total Number of bits

t_C	= Clock Period	=	0.5 to 10 µSec (100kHz to 2 MHz)
t_1	= Clock High	=	50% ±15% of Clock Period
t_2	= Clock Low	=	50% ±15% of Clock Period
t_D	= Clock to Data Valid	=	Max. 100 nSec
t_M	= Monoflop Time	=	20 ±3 µSec

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: Input not connected or 3V ≤ Vin ≤ Vsup	Encoder Increasing on Clockwise Rotation
Low: GND or 0V ≤ Vin ≤ 2V	Encoder Increasing on Counter 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: Input not connected or 3V ≤ Vin ≤ Vsup	Inactive
Low: GND or 0V ≤ Vin ≤ 2V	Encoder Value is set to Zero

The encoder will be held at zero as long as the line is low, even though the shaft is turned. The line must be low 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: 2RMHF-1SS – 1213 – B – D – 06 – 13 – 64 – 00 – S – M12 – S3

2RMHF-1SS - [ ] - [ ] - [D] - [ ] - [13] - [ ] - [ ] - [ ] - [ ] - [ ]
1 2 3 4 5 6 7 8 9 10

1. Resolution

Singleturn
Resolution 13 bits …….... **0013**
Multiturn
Revolutions 12 bits …….... **1213**
Revolutions 16 bits …….... **1613**
Revolutions 20 bits …….... **2013**
Revolutions 24 bits …….... **2413**

2. Code

Binary ……..... **B**
Gray …..……..... **G**

3. Electrical Interface

Differential (RS422)…….**D**

4 & 5 Shaft diameter

4.		5.	
3 mm x 13 mm	**03**	**x**	**13**
4 mm x 13 mm	**04**	**x**	**13**
5 mm x 13 mm	**05**	**x**	**13**
6 mm x 13 mm	**06**	**x**	**13**
1/8 in (3,175 mm) x 13 mm	**1/8**	**x**	**13***
3/16 in (4,7625 mm) x 13 mm	**3/16**	**x**	**13***
1/4 in (6,35 mm) x 13 mm	**1/4**	**x**	**13**

**) On request*

6. IP Rating

IP 64 ..... **64**
IP 67 ..... **67**

7. Cable Length

Standard cable is 1m…..…. **01**
Specify length…….....…. **XX**
No cable……..…..…. **00**

8. Cable & Connector Takeout

Side radial……..... **S**
Back axial..... **B***
**Only for encoder with cable*

9. Connector

M9 8-pin **M9***
M12 8-pin **M12***
No Connector..... **00**
**Only side (radial) takeout*

10. Spring Coupling

3 holes p/n 80139791 ..... **S1**
2 holes p/n 80140700 ..... **S2**
2 holes p/n 80149578 ..... **S3**
1 holes p/n 80140482 ..... **S4**
no spring coupling **00**