

## R28i Modular



The **R28i Modular Encoder** provides state-of-the-art performance in a 28mm package which is perfectly suited for a size 11 step motor. The innovative design (patent pending) for centering and gapping makes assembly fast and efficient, saving you money. Our custom OPTO-ASIC sets the standard for resolution and performance. The ability to accommodate up to a 7mm shaft makes this encoder ideal for brush motor and step motor applications.

### Features:

- Line count up to 4000
- 2 data channels in quadrature
- Once around index pulse
- 3.3 or 5 volt capability
- Wide operating temp range
- 500 KHz frequency response
- Push/Pull or Line Driver outputs
- Robust mounting
- No installation tooling required

### Environmental:

<b>Operating Temp</b>	-30° to 110°C
<b>Excursion Limits:</b>	
<b>Storage Temp</b>	-30° to 115°C
<b>Shock</b>	100 G's for 6 mS duration
<b>Vibration</b>	25–2000 Hz @ 20 G's
<b>Humidity</b>	85%/85°C non-condensing
<b>IP Rating</b>	IP40 with closed cover

### Mechanical:

<b>Weight</b>	11.7g
<b>Base Material</b>	Rynite PET530 30% glass filled
<b>Housing Material</b>	Rynite PET530 30% glass filled
<b>Disc Material</b>	Metal 0.05 THK TYP
<b>Hub Material</b>	303 SS
<b>Shaft Max End Play</b>	±0.25mm [0.01"]
<b>Shaft Runout</b>	0.025mm [0.001"] TIR
<b>Mounting Hardware</b>	M2.5 x 0.45

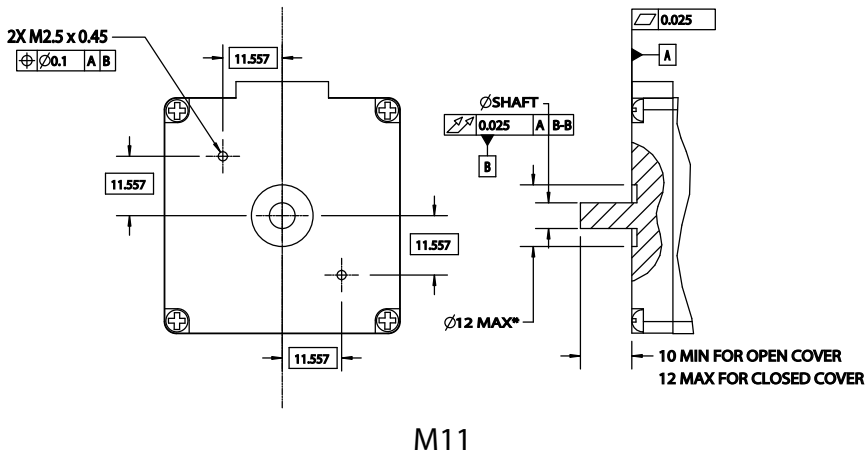
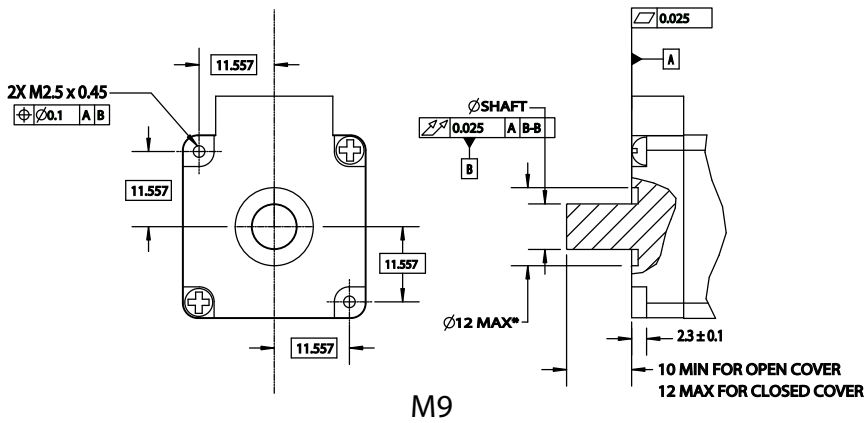
### Electrical:

<b>Signals</b>	Incremental plus once around index pulse
<b>Input Voltage</b>	3.3 VDC ± 10% (LD not available) or 5.0 VDC ± 10% Single Supply
<b>Current</b>	LD = 107 mA Max with 150Ω termination @ 5.5V PP = 47 mA Max with 2KΩ termination @ 5.5V
<b>Output Format</b>	A/B in phase quadrature. INDEX width & location gated with respect to data
<b>Output Type</b>	LD = AM26C31 20 mA Source or Sink Max. (5.0 VDC and 8-pin only) PP = Source or Sink 4 mA Max.
<b>Output Logic Levels</b>	Logic 0 = 0.5 V Max, Logic 1 = 2.5 V Min.
<b>Operating Frequency</b>	To 500 KHz

### Resolution:

<b>Line Count</b>	80,160,200,320,400, 500, 512, 800, 1000, 1024, 1600, 2000, 2048, 3200, 4000
<b>Index Gating</b>	1 = Index Gated with A & B, Index width 90°e ± 45°e 6 = Index Gated with A- & B-, Index width 90°e ± 45°e 7 = Centered on A & B, Index width 270°e ± 45°e 8 = Centered on A- & B-, Index width 270°e ± 45°e

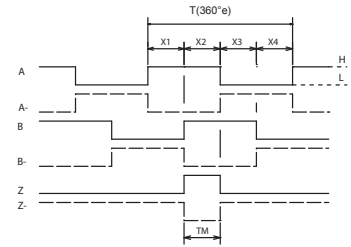
## Mounting Requirements



\*Encoder base requires flat surface

## Phase Quadrature

CCW VIEWING ENCODER TOP  
-1 INDEX SHOWN



$$X1+X2=0.5T\pm 0.2T$$

$$X2+X3=0.5T\pm 0.2T$$

$$X_n \geq 0.125T \quad (n=1, 2, 3, 4)$$

$$T_M=0.25T\pm 0.125T \quad (=X_2)$$

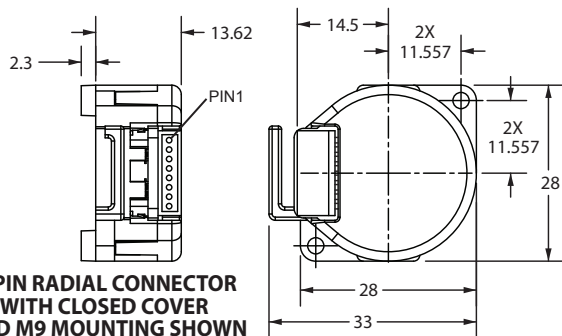
## Hub Size

SPECIFY	HUB SIZE +0.01 -0	SHAFT SIZE +0 -0.013
1/8+	3.178	3.175
3/16+	4.765	4.762
1/4+	6.353	6.350
4mm	4	3.997
5mm	5	4.997
6mm	6	5.997
7mm	7	6.997

## Pin Functions

PIN NO.	FUNCTION		
	8 PIN LD	8 PIN PP	5 PIN PP
1	Z-	NC	+V
2	B-	NC	Z
3	+V	+V	B
4	Z	Z	GND
5	B	B	A
6	GND	GND	
7	A	A	
8	A-	NC	

## Mechanical Dimensions



## Output Format

LD = LINE DRIVER  
PP = PUSH/PULL

## Connector

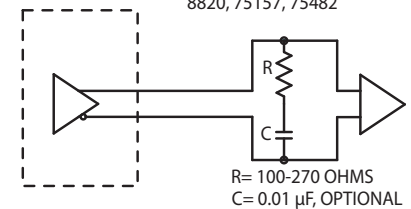
R5 = RADIAL 5 PIN  
R8 = RADIAL 8 PIN

## Closure Option

C = CLOSED COVER  
H = COVER WITH HOLE

## Recommended Termination

ENCODER, LD OUTPUT DIFFERENTIAL LINE RECEIVER  
26LS32, MC3486, DS3486,  
8820, 75157, 75482



TI AM26C31 STANDARD

## Ordering Information

**R28i** - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - **M** \_\_\_\_\_

RESOLUTION See Front Page      HUB SIZE      OUTPUT FORMAT      VOLTAGE See Front Page      GATING See Front Page      CONNECTOR      CLOSURE OPTION      MOUNTING OPTION