

### **Features**

- RoHS compliant\*
- HCMOS, CMOS and TTL compatible
- Compact package size
- High rotational cycle life
- Standard or high force push switch option
- Optional detent



# EM14 - 14 mm Rotary Optical Encoder w/Switch

Electrical Characteristics	
Electrical Output	
Resolution	8 to 64 pulses per revolution (PPF
Supply Voltage (VCC)	5.0 VDC ± 0.25 VD0
,	
Dutput Voltage	
<del>-</del> : : : : :	
	200 ns typic
	167 mW maximur
•	
	90 °e ± 45 °
• • • • • • • • • • • • • • • • • • • •	
	1,000 megohms minimu
. •	
<u> </u>	12 VDC / 20 mA (600 ohms maximum load
Switch Contact Resistance	
<b>Environmental Characteristics</b>	
	-40 °C to +70 °C (-40 °F to +158 °I
torage Temperature Range	55 °C to +125 °C (-67 °F to +257 °I
ibration	15
hock	50
łumidity	MIL-STD-202, Method 103, Condition
-lammability	
P Rating	IP 54
Mechanical Characteristics	
	360 ° Continuou
orque	
•	
	1.2 N-cm (1.7 ozin.) typica
Rotational Life	
Switch Actuation Force	100,000 Cycle
8	
Switch Travel	
Shaft Radial Play	0.005 in. maximul
Shaft Axial Structural Strength	
Nounting Torque	
Materials and Finishes	
erminals	
Soldering Condition	- P P
S .	
Wariaar Goldoning	370 °C (700 °F) max. for 3 second
Waya Saldarina	96.5Sn/3.0Ag/0.5Cu solder with no-clean flu
vvave coluening	260 °C (500 °F) max. for 5 second
	· · · · · · · · · · · · · · · · · · ·
Wash processes	Not recommende
•	
Mounting Hardware	
Aounting Hardware Nut	Black annodized brass, hex (metric)/Nickel-plated brass, hex (SAF
Mounting Hardware Nut Lockwasher	Black annodized brass, hex (metric)/Nickel-plated brass, hex (SAI
Mounting Hardware  Nut  Lockwasher  Marking	

<sup>\*\*</sup>When device is mounted by normal mounting means.

### **Additiional Features**

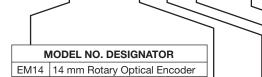
- Splashproof shaft seal
- Recommended for human/machine interface applications (HMI)
- Cable/connector option
- Optional bracket

# EM14 - 14 mm Rotary Optical Encoder w/Switch

C

### **Part Numbering System**

M



0

D

BUSHING DESIGNATOR			
Code Description			
Α	3/8 " D x 3/8 " L Threaded		
С	1/4 " D x 1/4 " L Threaded		
R	10 mm D x 9.5 mm L Threaded		

DETENT OPTION		
Code Description		
0	No Detent	
1	32 Detents (Available for	
	8 or 32 PPR only)	

	ANTI-ROTATION LUG/BRACKET OPTION		
Code Description		Description	
	Α	A/R Lug	
	В	Bracket (No hardware/no cable or	
		connector)	
	D	None	

SHAFT STYLE (See Outline Drawing for Details)			
Code	Description	Available w/ Bushing	
В	1/4 " Dia. Slotted End	Α	
С	1/4 " Dia. Flatted End	Α	
E	1/8 " Dia. Slotted End	С	
R	6 mm Dia. Slotted End	R	
М	6 mm Dia. Flatted End	R	

	SHAFT LENGTH DESIGNATOR		
	Available w/Bushing		
	24 3/4 " 28 7/8 "		A, C
			A, C
	20	20 mm	R, U
	25	25 mm	R, U

SWITCH OPTION		
Code Description		
S	Push Switch (Standard)	
Н	Push Switch (High Force)	
N	No Switch	

0

3

S

RESOLUTION (Pulses Per Revolution)	
Code	Description
08	8 PPR
16	16 PPR
32	32 PPR
64	64 PPR

CABLE/CONNECTOR OPTION			
Code	Description		
0	No Cable/Connector		
1	6 " Cable with Female Connector		
	(0.050 "/1.27 mm pitch centers in-line)		
	and stripped/tinned leads		
2	6 " Cable with Female Connector		
	(0.050 "/1.27 mm pitch centers in-line)		
	on both ends		
3	12 " Cable with Female Connector		
	(0.050 "/1.27 mm pitch centers in-line)		
	and stripped/tinned leads		
4	12 " Cable with Female Connector		
	(0.050 "/1.27 mm pitch centers in-line)		
	on both ends		

TERMINAL CONFIGURATION		
Code Description		
L Axial Multi-Purpose Pin		
R	Radial Multi-Purpose Pin	

#### **Cable and Connector Options:**

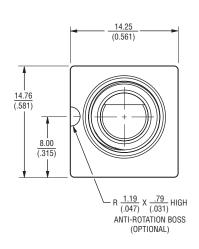
H-190-4 = 6 " Cable with Female Connector (0.050 "/1.27 mm pitch centers in-line) and stripped/tinned leads H-190-1 = 6 " Cable with Female Connector (0.050 "/1.27 mm pitch centers in-line) on both ends

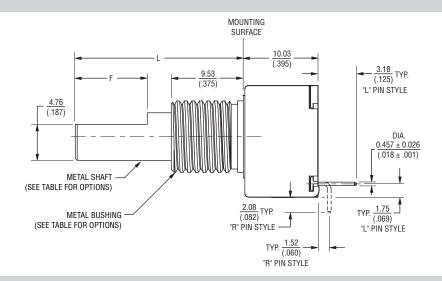
H-190-2 = 12 " Cable with Female Connector (0.050 "/1.27 mm pitch centers in-line) and stripped/tinned leads H-190-3 = 12 " Cable with Female Connector (0.050 "/1.27 mm pitch centers in-line) on both ends

# EM14 - 14 mm Rotary Optical Encoder w/Switch

## BOURNS

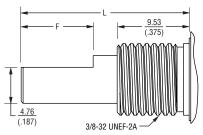
### **Product Dimensions**





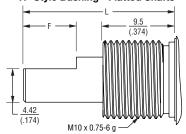
### **Shaft / Flat Length Dimensions**

### "A" Style Bushing - Flatted Shafts



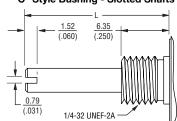
SHAFT DIA.	BUSHING DIA.	SHAFT LENGTH "L"	FLAT LENGTH "F"
6.35	9.52	19.05 (.750)	7.94 (.313)
(.250)	(.375)	22.22 (.875)	9.52 (.375)

"R" Style Bushing - Flatted Shafts



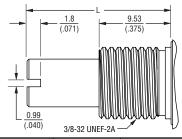
SHAFT DIA.	BUSHING DIA.	SHAFT LENGTH "L"	FLAT LENGTH "F"
6.0	10.0	20.0 (.787)	7.0 (.275)
(.236)	(.394)	<u>25.0</u> (984)	12.0 (472)

#### "C" Style Bushing - Slotted Shafts



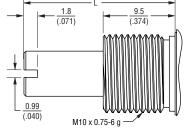
SHAFT DIA.	BUSHING DIA.	SHAFT LENGTH "L"
3.17 (.125)	6.35 (.250)	19.05 (.750)
		<u>22.22</u> (.875)

### "A" Style Bushing - Slotted Shafts



SHAFT DIA.	BUSHING DIA.	SHAFT LENGTH "L"
6.35 (.250)	9.52 (.375)	19.05 (.750)
		22.22 (.875)

### "R" Style Bushing - Slotted Shafts



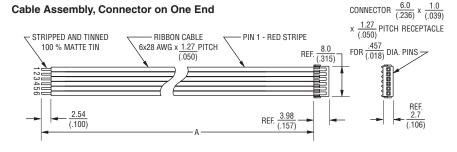
SHAFT DIA.	BUSHING DIA.	SHAFT LENGTH "L"
6.0 (.236)	10.0 (.394)	20.0 (.787)
		25.0 (.984)

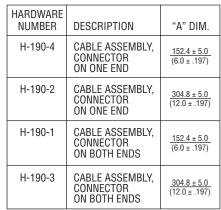
DIMENSIONS:  $\frac{MM}{(INCHES)}$ 

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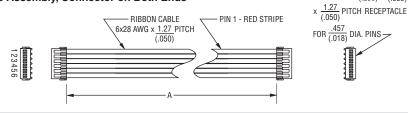
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### **Cable/Connector Options**





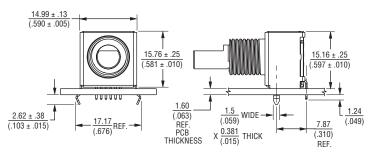
### Cable Assembly, Connector on Both Ends

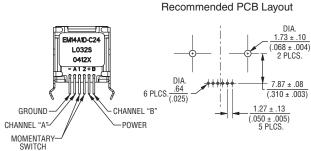


DIMENSIONS:  $\frac{MM}{(INCHES)}$ 

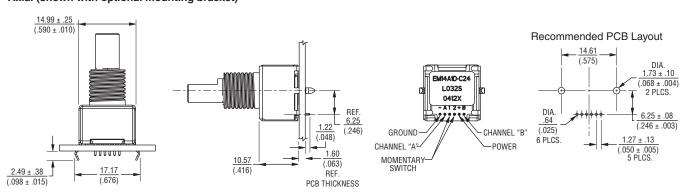
#### **Terminal Configurations**

#### Radial (shown with optional mounting bracket)





### Axial (shown with optional mounting bracket)

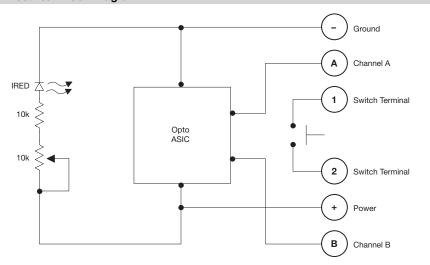


 $2 \times CONNECTOR \frac{6.0}{(.236)} \times \frac{1.0}{(.039)}$ 

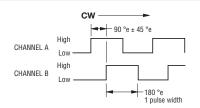
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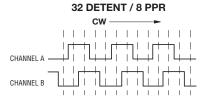
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### **Electrical Block Diagram**

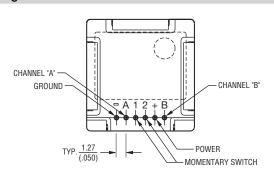


### **Quadrature Output**

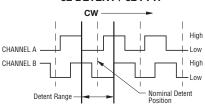




### **Terminal Diagram**



### 32 DETENT / 32 PPR



- Nominal detent position occurs when both Channel A and B are in low states.
- 2. Channel A leads Channel B in CW direction and lags in CCW direction.

## **BOURNS**®

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