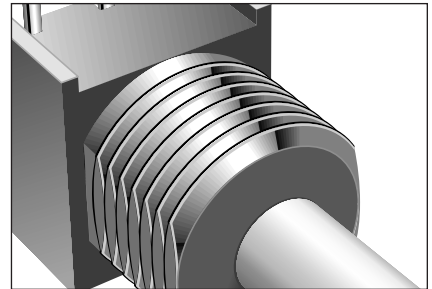
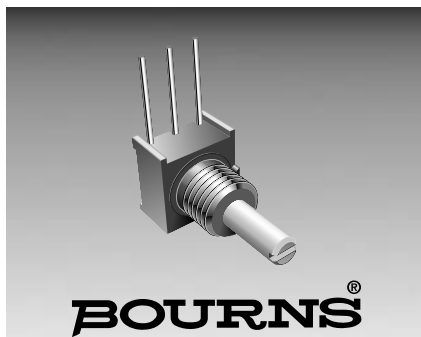


Encoders

BOURNS®

I. Rotary Encoders	
6mm Square	142
9mm Square	138
II. Rotary Optical Encoders	
16mm X 21mm	144
III. Digital Contacting Encoders	
22mm Square	146
IV. Absolute "ACE" Encoder	
22mm Square	149





Features

- Miniature package for design flexibility
- Long operating life
- Conductive plastic element
- Bushing or PC board mount
- Quadrature output

3315 - 9mm Square Sealed Incremental Encoder

Electrical Characteristics

Output.....2-bit gray code,
Channel A leads Channel B
electrically turning clockwise (CW)
Closed Circuit Resistance.....5 ohms
maximum
Contact Rating.....100 milliamp
@ 16 VDC maximum
Insulation Resistance (500 VDC)
.....1,000 megohms minimum
Dielectric Withstanding Voltage
Sea Level900 VAC minimum
Electrical Travel.....Continuous
Contact Bounce (15 RPM)
.....5 milliseconds maximum
RPM (Operating).....120 maximum

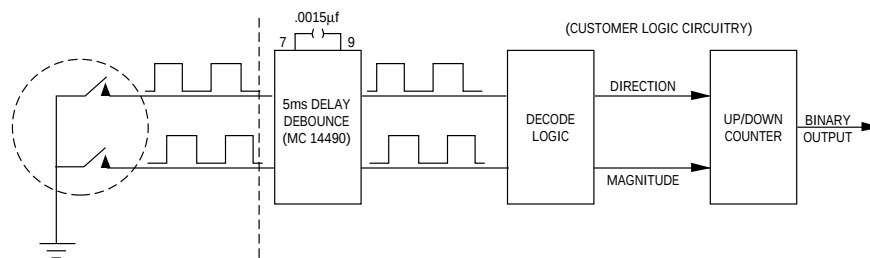
Environmental Characteristics

Temperature Range-55°C to +125°C
Vibration30G
Contact Bounce
.....5.0 millisecond maximum
Shock100G
Contact Bounce
.....5.0 millisecond maximum
Rotational Life100,000 cycles @ 6PPR
25,000 cycles @ 16ppr

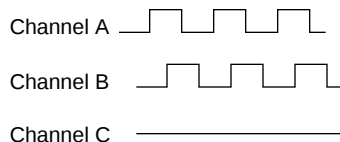
Mechanical Characteristics

Mechanical AngleContinuous
Torque5 oz-in. maximum
MarkingManufacturer's symbol and
model number, product code,
terminal style, date code and
resistance code

Recommended Incremental Control Diagram



Clockwise →



Part Numbering System

3315 Y - 0 0 1 - 006

Model Number Designator
3315 = 9mm Encoder

Terminal Style Designator
C = In-line Straight Terminals Side Exit
R = In-line Terminals Rear Exit
P = 5.08mm x 2.54mm Triangular Pattern Rear Exit
Y = 5.08mm x 5.08mm Triangular Pattern Rear Exit

Shaft End Designator
0 = Shaft End Slotted
1 = Shaft End Flatted

Shaft Length Designator
0 = 12.7mm FMS Long Plastic Shaft
1 = 19.05mm FMS Long Plastic Shaft
(Use with bushing versions only)
2 = 5.59mm FMS (Bushingless version only)

Bushing Designator
1 = 6.35mm x 6.35mm Plastic
2 = 6.35mm x 6.35mm Ni Plated Brass
5 = Bushingless (Board Level)

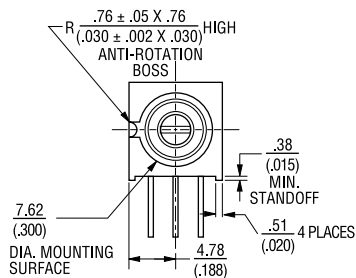
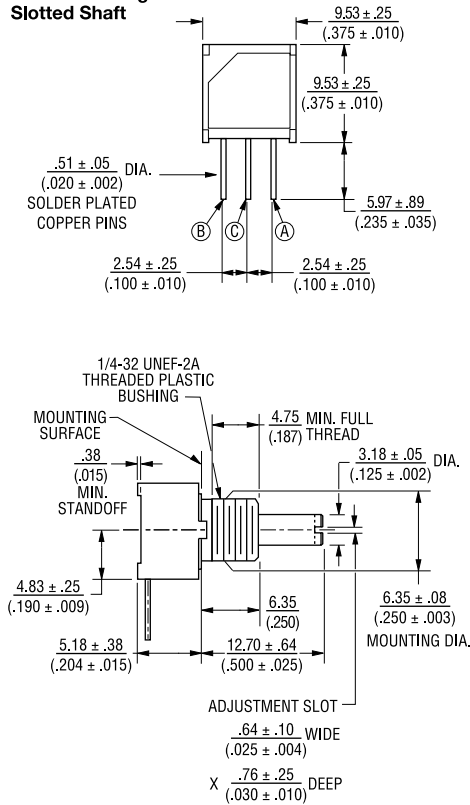
Pulses per Revolution Code
006 = 6 ppr
016 = 16 ppr

3315 - Dimensions and Tolerances

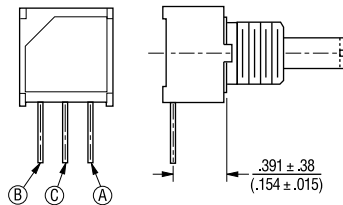
BOURNS®

COMMON DIMENSIONS

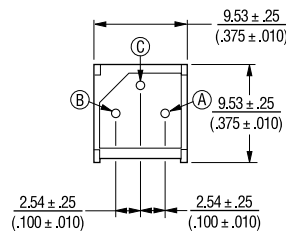
3315-001 Plastic Bushing Slotted Shaft



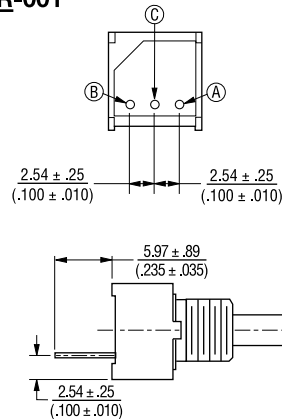
3315C-001



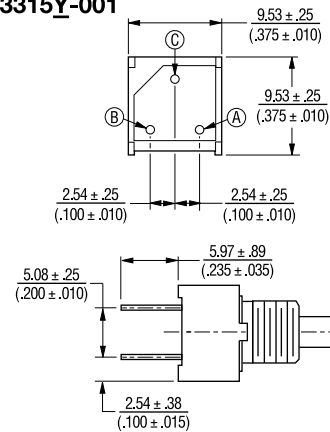
3315P-001



3315R-001

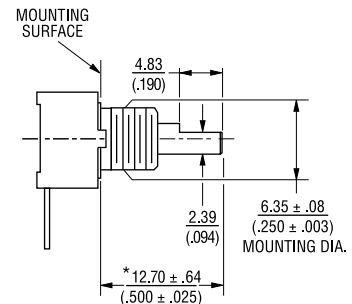


3315Y-001



COMMON DIMENSIONS

3315C-101 Plastic Flatted Shaft

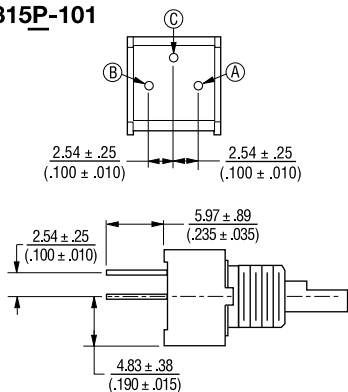


* FMS = From Mounting Surface

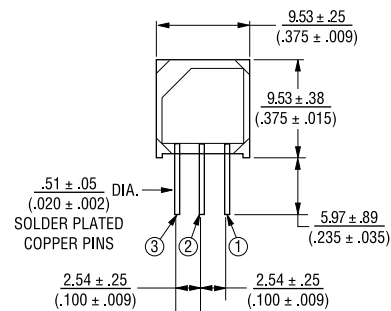
3315 - Dimensions and Tolerances

BOURNS®

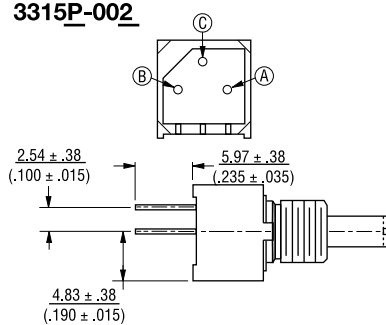
3315P-101



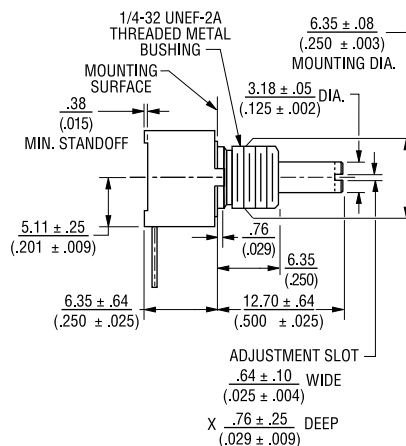
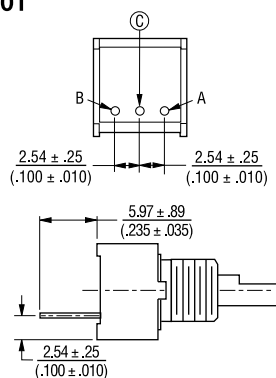
COMMON DIMENSIONS
3315-002
Metal Bushing



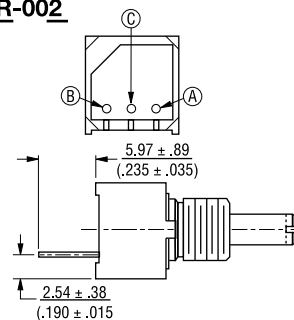
3315P-002



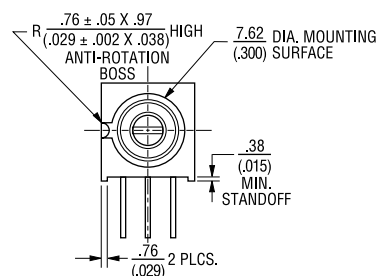
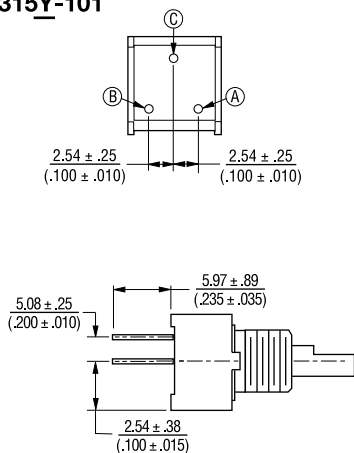
3315R-101



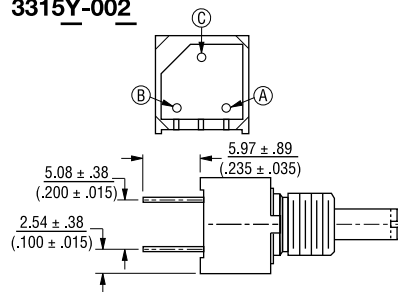
3315R-002



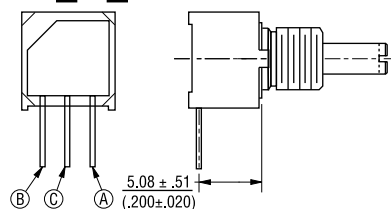
3315Y-101



3315Y-002

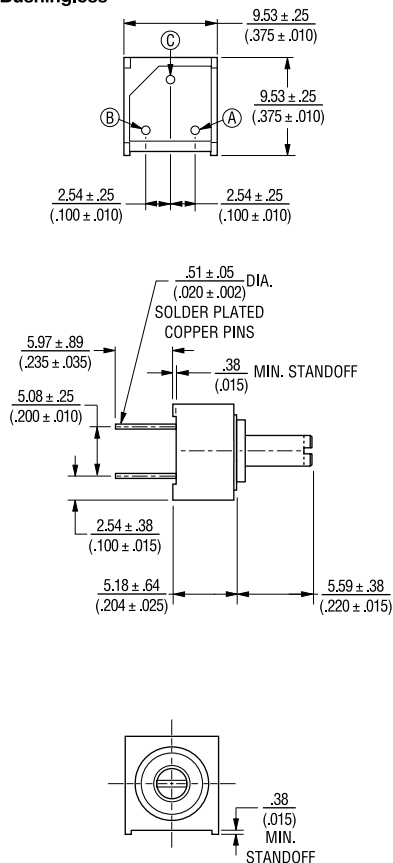
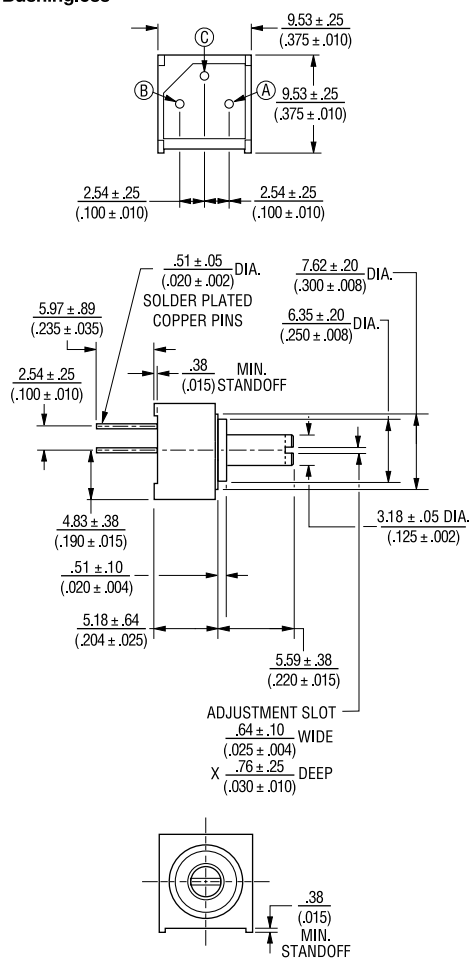


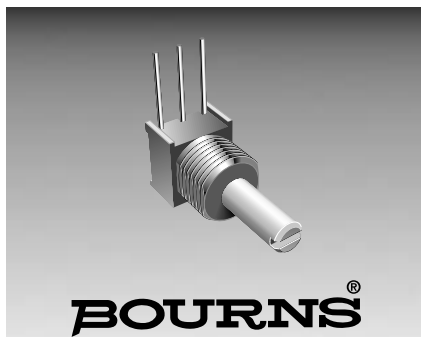
3315C-002



BOURNS®

3315Y-005
Bushingleess





Features

- Miniature package for design flexibility
- Long operating life
- High operating temperature capabilities
- Conductive plastic element
- Bushing or PC board mount
- Quadrature output

3375 - 6mm Square Encoder

Electrical Characteristics

Output2-bit gray code,
Channel A leads Channel B
by electrically turning clockwise (CW)
Closed Circuit Resistance
.....5 ohms maximum
Contact Rating
.....100 milliamp @ 16 VDC maximum
Insulation Resistance (500 VDC)
.....1,000 megohms minimum
Dielectric Withstanding Voltage
Sea Level900 VAC minimum
Electrical TravelContinuous
Contact Bounce (15 RPM)
.....5 milliseconds maximum
RPM (Operating)120 maximum

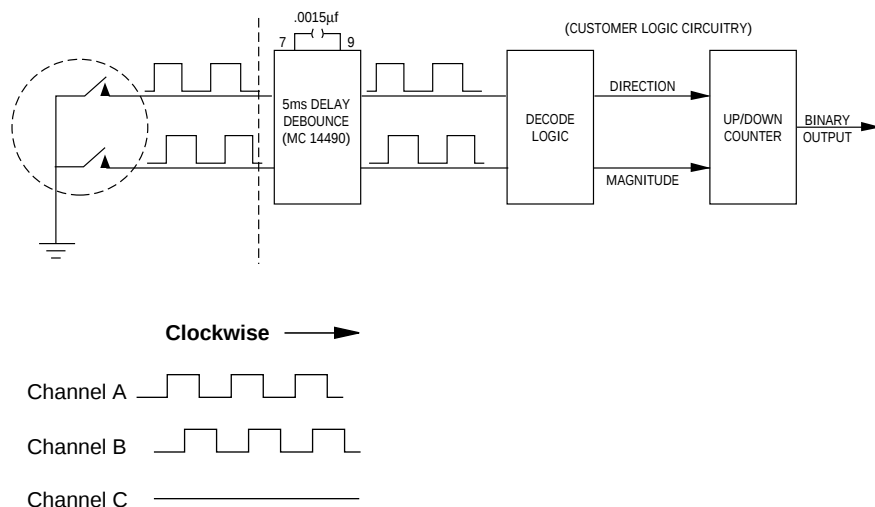
Environmental Characteristics

Temperature Range-55°C to +125°C
Vibration30G
Contact Bounce5 millisecond
maximum
Shock100G
Contact Bounce5 millisecond
maximum
Rotational Life100,000 cycles

Mechanical Characteristics

Mechanical AngleContinuous
Torque5 oz-in. maximum
MarkingManufacturer's symbol and
model number, product code,
terminal style, date code

Recommended Incremental Control Diagram



Part Numbering System

3375 Y - 0 0 1 - 006

Model Number Designator _____
3375 = 6mm Encoder

Terminal Style Designator _____
C = In-line Straight Terminals Side Exit
P = 5.08mm x 2.54mm Triangular Pattern Rear Exit
Y = 5.08mm x 5.08mm Triangular Pattern Rear Exit

Shaft End Designator _____
0 = Shaft End Slotted

Shaft Length Designator _____
0 = 12.7mm FMS Long Plastic Shaft
(Use with bushing versions only)

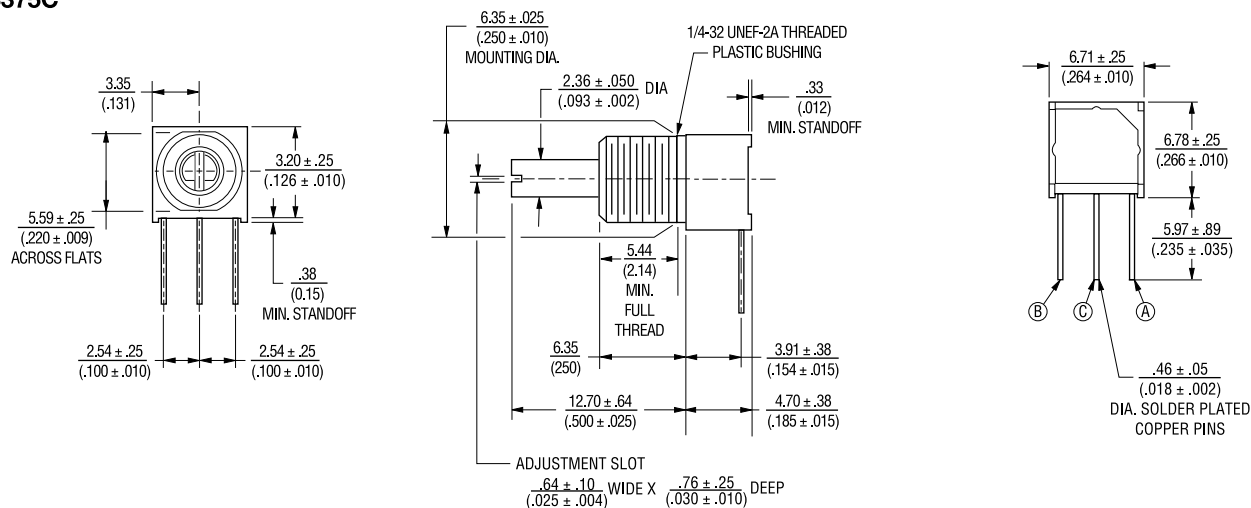
Bushing Designator _____
1 = 6.35mm x 6.35mm Plastic

Pulses per Revolution Code _____
006 = 6 ppr

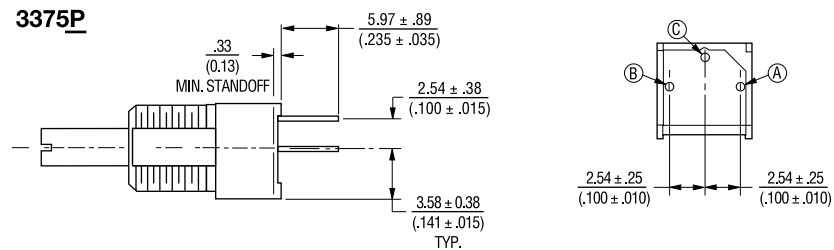
3375 - 6mm Square Encoder

BOURNS®

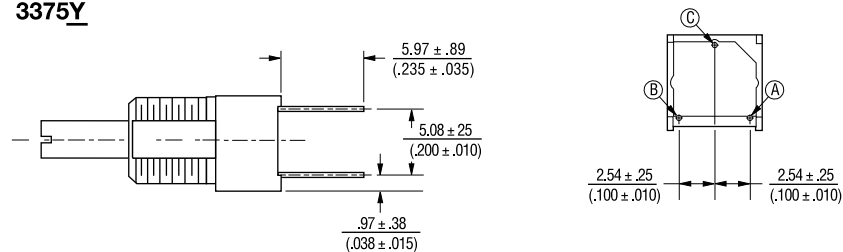
COMMON DIMENSIONS 3375C



3375P



3375Y





Features

- Two channel quadrature output
- Bushing or servo mount
- Square wave signal
- Index channel available
- Small size
- Resolution to 256PPR

- CMOS and TTL compatible
- Long life
- High operating speed

EN - Rotary Optical Encoder

Electrical Characteristics

Output	2-bit gray code, Channel A leads Channel B by 90° (electrical) with clockwise rotation
Supply Voltage	5.0 VDC ± 0.25 VDC*
Supply Current	26 mA maximum
Output Voltage	
Low Output	0.8V maximum
High Output	4V minimum
Output Current	
Low Output	25mA minimum
Insulation Resistance (500 VDC)	1,000 megohms
Rise/Fall Time	200ns (typical)
Shaft RPM (Ball Bearing)	3,000 rpm maximum
Power Consumption	136 mW maximum
Pulse Width (Electrical Degrees, Each Channel)	180° $\pm 45^\circ$ TYP.
Pulse Width (Index Channel)	360° $\pm 90^\circ$
Phase (Electrical Degrees, Channel A to Channel B)	90° $\pm 45^\circ$ TYP.
Index Channel Centered on 1-1 State Combination of A and B Channels	0° $\pm 45^\circ$

*Consult factory for other voltages up to 15 VDC.

Environmental Characteristics

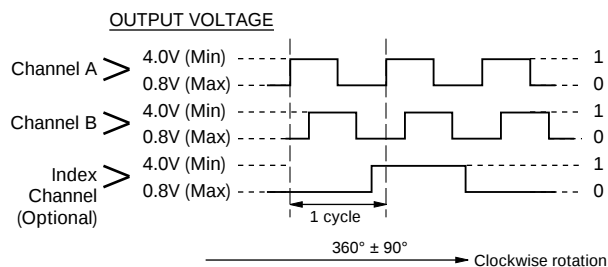
Operating Temperature Range (Standard)	-40°C to +85°C
Vibration	5G
Shock	50G
Humidity	MIL-STD-202, Method 103B, Condition B

Mechanical Characteristics

Torque (Starting and Running)	
A & C Bushings (Spring Loaded for Optimum Feel)	1.5 oz-in. maximum
W, S & T Bushings (Ball Bearing Shaft Support)	0.1 oz-in. maximum
Mechanical Rotation	Continuous
Shaft End Play	0.012" T.I.R. maximum
Shaft Radial Play	0.005" T.I.R. maximum
Rotational Life	
A & C Bushings (300 rpm maximum)**	10,000,000 revolutions
W, S & T Bushings (3,000 rpm maximum)**	200,000,000 revolutions
Weight	0.4 oz.

**For resolutions ≤ 128 quadrature cycles per shaft revolution.

OUTPUT TABLE



STANDARD RESOLUTIONS AVAILABLE

(Full quadrature output cycles per shaft revolution)

25*	125
50*	128
64	200
100	256

For Non-Standard Resolutions—
Consult Factory

* Channel B leads Channel A

ROTARY OPTICAL

The Bourns® EN model is a self-contained rotary optical encoder. It produces a 2-bit quadrature signal which is suitable for digital systems where both magnitude and direction of adjustment must be provided. The EN encoder is ideal for use as a digital panel control or as a position sensing device in applications where long life, reliability, high resolution and precise linearity are critical.

The EN series encoder converts rotary input into electrical signals which can be used by microprocessors without A/D conversion.

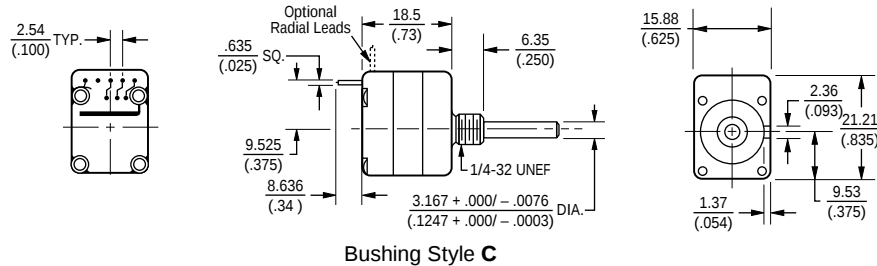
Bourns encoder output signals are square wave digital pulses which do not require debounce circuitry. Both features make it possible to significantly reduce the memory overhead, wiring and wiring interconnects required by other types of control devices.

EN optical encoders offer a useful rotational life of from 10 million to 200 million shaft revolutions, making them ideal for extended service applications. The Bourns encoder is also compact and well suited for situations where the available space is limited.

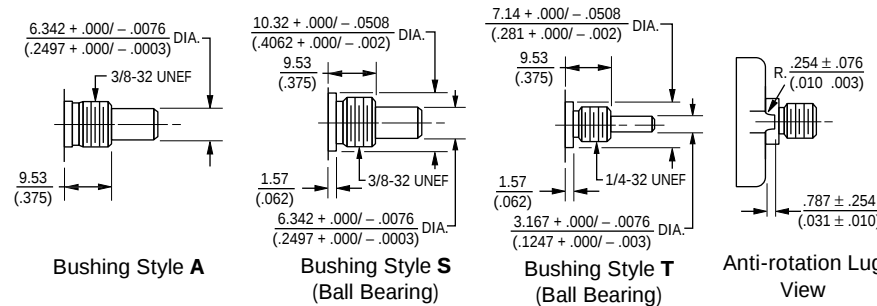
EN - Rotary Optical Encoder

BOURNS®

Dimensional Drawings



Bushing Style C



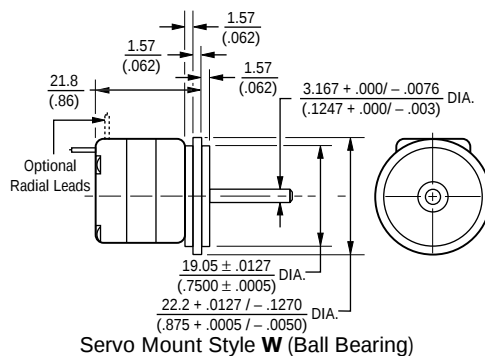
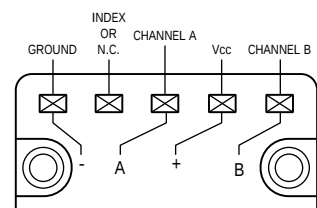
Bushing Style A

Bushing Style S (Ball Bearing)

Bushing Style T (Ball Bearing)

Anti-rotation Lug View

TERMINATION DIAGRAM



Servo Mount Style W (Ball Bearing)

How To Order

BOURNS EN SERIES OPTICAL ENCODER

E N C 1 J D 2 8 L 0 0 1 2 8

ANTI-ROTATION LUG POSITION	
Code	Description
D	None
J	9:00 Position
P	Rear Mounting Bracket

SHAFT LENGTH*	
Code	Description
16	1/2" Long
20	5/8" Long
28	7/8" Long

TERMINAL*** CONFIGURATION	
Code	Description
L	Axial, Multi-Purpose Pin
R	Radial, Multi-Purpose Pin
M	Rear Ribbon Cable with Connector
N	Side Ribbon Cable with Connector
W	Rear Ribbon Cable - No Connector
Y	Side Ribbon Cable - No Connector

RESOLUTION	
Code	Cycles Per Revolution
00025	25
00050	50
00064	64
00100	100
00125	125
00128	128
00200	200
00256	256

SHAFT STYLE		
Code	Description	Use With Bushings (Code)
B	1/4" Dia., Plain End	A, S
D	1/8" Dia., Plain End	C, T, W
C	1/4" Dia., Single Flatted	A, S

BUSHING CONFIGURATION	
Code	Description
A	3/8"D X 3/8"L Threaded
C	1/4"D X 1/4"L Threaded
S	3/8"D X 3/8"L Threaded (Ball Bearing)
T	1/4"D X 3/8"L Threaded (Ball Bearing)
W	Servo Mount 7/8"D (Ball Bearing)

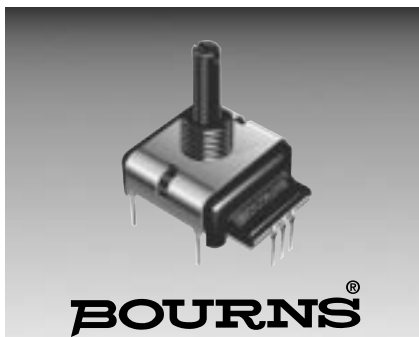
* Shaft length measured from mounting surface.

** 25 and 50ppr is reversed (Channel B leads Channel A)

*** Standard ribbon cable is 10" long
Consult factory for other lengths.

Consult factory for options not shown, including:

- Wire lead or cable options
- Connectors
- Non-standard resolutions
- Special shaft/bushing sizes and features
- Special performance characteristics
- PCB mounting bracket



Features

- Incremental encoder / quadrature output
- Exceptionally long operating life
- High operating temperature capabilities - up to 125°C
- Sturdy construction
- Bushing mount

- Available with PC board mounting bracket (optional)

ECW - Digital Contacting Encoder

Electrical Characteristics

Output	2-bit gray code, Channel A leads Channel B by 90° electrically turning clockwise (CW)
Closed Circuit Resistance	5 ohms maximum
Open Circuit Resistance	100K ohms minimum
Contact Rating	10 milliamp @ 10 VDC or 0.1 watt maximum
Insulation Resistance (500 VDC)	1,000 megohms minimum
Dielectric Withstanding Voltage	MIL-STD-202 Method 301
Sea Level	1,000 VAC minimum
Electrical Travel	Continuous
Contact Bounce (15 RPM)	5 milliseconds maximum
RPM (Operating)	120 maximum

Environmental Characteristics

Storage Temperature Range	-40°C to +140°C
Operating Temperature Range	+1°C to +125°C
Humidity	MIL-STD-202, Method 103B, Condition B
Vibration	15G
Contact Bounce	0.1 millisecond maximum
Shock	50G
Contact Bounce	0.1 millisecond maximum
Rotational Life	200,000 shaft revolutions*

Mechanical Characteristics

Mechanical Angle	Continuous
Weight	Approximately 0.75 oz.
Torque (Detented)	0.75 to 2.25 oz-in.
Mounting Torque	7 in-lbs. maximum
Shaft Side Load (Static)	10 lbs. minimum

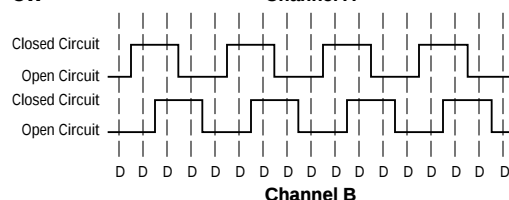
*Applies to EC Option.

QUADRATURE OUTPUT TABLE

This table is intended to show available outputs as currently defined.

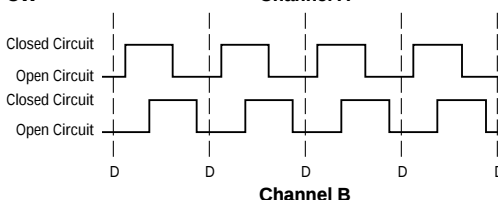
1/4 CYCLE PER DETENT

CW → Channel A

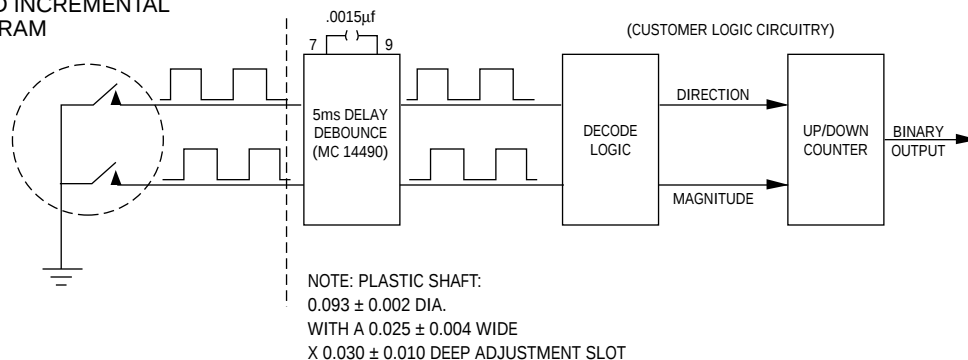


FULL CYCLE PER DETENT (Normally Open in Detent Shown)

CW → Channel A



RECOMMENDED INCREMENTAL CONTROL DIAGRAM



DIGITAL CONTACTING

The Digital Contacting Encoder is commonly referred to by such names as Digital Panel Control, Bit Switch, Gray Switch and Digital Switch. All such names are synonymous with a device whose output is a digital gray code signal, rather than a conventional potentiometric voltage ratio output.

The advantage of the Digital Contacting Encoder is that it permits the direct entry of digitized analog data into a digital circuit without A/D

conversion. The two (2) channel gray coded signal of this incremental encoder allows the user's decoder circuit to sense analog direction of rotation, as well as up-down counter capabilities . . . all without the time and cost required for A/D conversion. This approach can reduce memory overhead, wiring and wiring interconnects, and can provide greater MPU program speed.

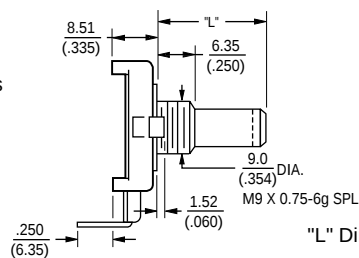
ECW - Digital Contacting Encoder

BOURNS®

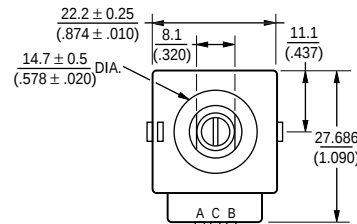
FOR ORDERING INFORMATION, SEE FOLLOWING PAGE.

BUSHING MOUNTED - HOUSING A W style bushing shown.

Shaft lengths "L" for B, C, R and Y styles
24 = .750" (19mm)
36 = 1.125" (28.5mm)

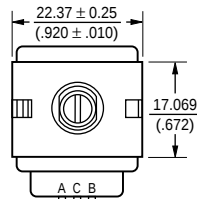
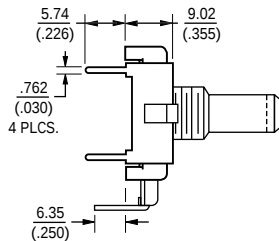


"L" Dim. = 1.125 or .750



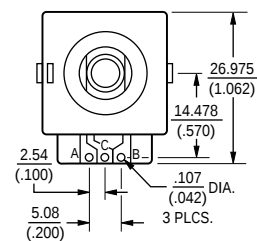
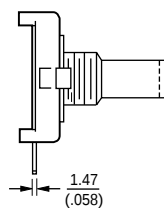
PCB BRACKET MOUNTED - HOUSING B

Dimensions not given are the same as Bushing Mounted.

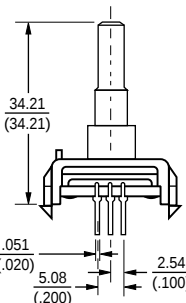
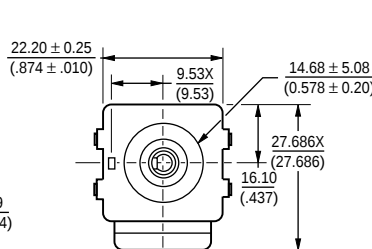
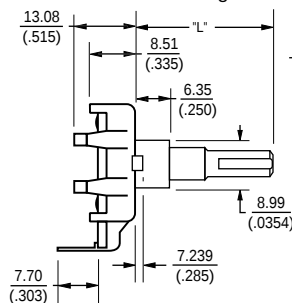


SOLDER HOLES - HOUSING C

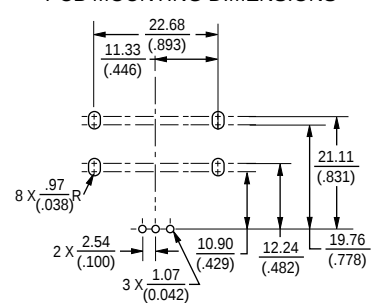
Dimensions not given are the same as Bushing Mounted.



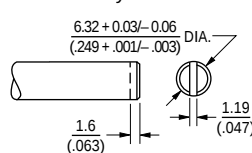
SNAP-IN MOUNT - Housing G



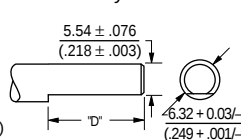
PCB MOUNTING DIMENSIONS



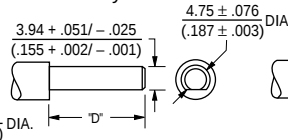
Shaft Style B



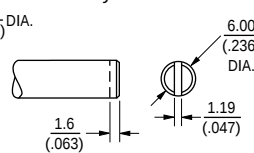
Shaft Style C



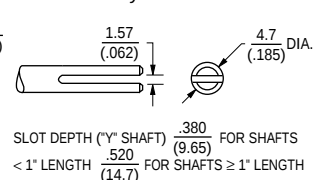
Shaft Style J



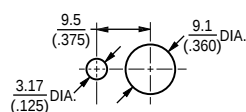
Shaft Style R



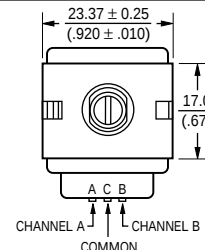
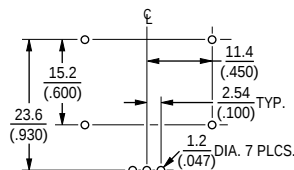
Shaft Style Y



PANEL HOLE DIMENSIONS Bushing Mounted



PCB MOUNTING DIMENSIONS (Housing Styles B and E)



FOR TOLERANCES NOT SHOWN
.XX = ± .010
.XXX = ± .005
SHAFT DIMENSIONS ± 1/32"

ECW - Digital Contacting Encoder - How To Order

BOURNS®

PART NUMBERING SYSTEM

E	C	W	1	J	-	B	2	4	-	B	C	0	0	2	4
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

Code	Rotational Life
C	200,000 Revolutions
L	100,000 Revolutions

BUSHING CONFIGURATION	
Code	Description
W	9mm x 1/4" Length. Threaded M9x0.75
L	9mm x 3/8" Length. Threaded M9x0.75 (Use B shaft only.)
T	9mm x 1/4". No Thread.

SWITCHING CONFIGURATION (In Detent Position)
Applies to performance codes B0012 and C0024 only, use code "0" for all other performance codes.

Code	Description
0	Not Applicable
1	Normally Open
2	Normally Closed

ANTI-ROTATION LUG POSITION	
Code	Description
J	9:00 Position
D	None

SHAFT STYLE (See Outline Drawing for Details)	
Code	Description
B	Plain with Inserted Slot (1/4" Dia.)
C	Single Flatted (1/4" Dia.)
R	Plain with Inserted Slot (6mm Dia.)
Y	Split Shaft Version (.185" Dia.)
J	Flatted Shaft (3/16" Dia.)

PERFORMANCE CODE		
Code	Detents	Cycles/Rev.
E0006		6
E0009		9
E0012	0	12
E0024		24
B0012	12	12
C0006		6
C0024	24	24
D0009	36	9

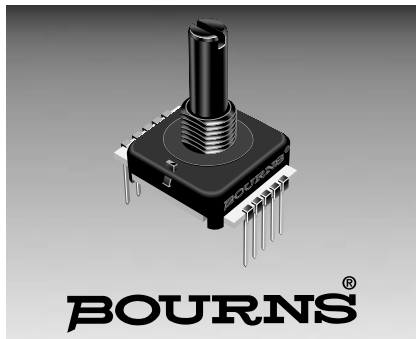
HOUSING TERMINAL CONFIGURATION (X indicates "Equipped With")

Code							
Features	A	B	C	D	E	F	G*
Terminal Cover	X	X			X		X
Terminals	X	X			X		X
Solder Holes			X	X		X	
PCB Bracket		X		X	X	X	
Hardware Included	X		X		X	X	
Snap-In Mount							X

*Bushing code T only.

SHAFT LENGTH (FMS)		
Code	Description	Available Shaft Styles
16	1/2" Length	B
20	5/8" (15.9mm) Length	J
24	3/4" (19mm) Length	B, C, J, Y
28	7/8" (22.2mm) Length	B, C, J, Y
32	1" (25.4mm) Length	B, C, J, Y
36	1-1/8" (28.6mm) Length	B, C, J, Y
Metric		
19	19mm Length	R
22	22mm Length	R
24	24mm Length	R

The sample part number demonstrates the identification code for Bourns contacting encoders.
The part number shown is a commonly used model, typically available from stock.

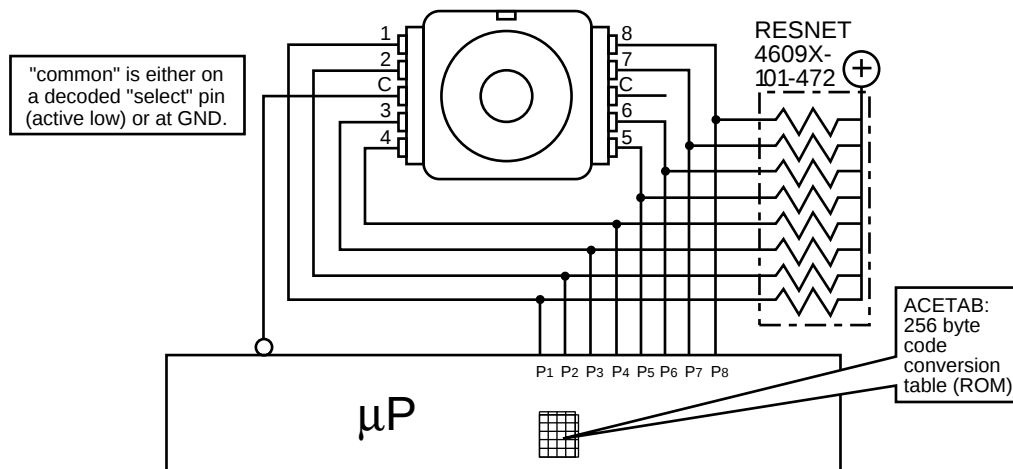


Features

- Absolute encoder / gray code output
- Digital output
- High operating temperature capabilities - up to 125°C
- Sturdy construction
- Bushing mount
- Available with PC board mounting bracket (optional)

EAW - Absolute Contacting Encoder (ACE™)

Recommended Control Diagram for ACE-128



Electrical Characteristics

Output	8-bit gray code with 128 absolute states
Closed Circuit Resistance	5 ohms maximum
Open Circuit Resistance	100K ohms minimum
Contact Rating	10 milliamp @ 10 VDC or 0.1 watt maximum
Insulation Resistance (500 VDC)	1,000 megohms minimum
Dielectric Withstanding Voltage	MIL-STD-202 Method 301
Sea Level	1,000 VAC minimum
Electrical Travel	Continuous
Contact Bounce (60 RPM)	2.7 milliseconds maximum
RPM (Operating)	120 maximum

Environmental Characteristics

Storage Temperature Range	-40°C to +140°C
Operating Temperature Range	-40°C to +125°C
Humidity	MIL-STD-202, Method 103B, Condition B
Vibration	15G
Contact Bounce	0.1 millisecond maximum
Shock	50G
Contact Bounce	0.1 millisecond maximum
Rotational Life	50,000 shaft revolutions minimum*

Mechanical Characteristics

Mechanical Angle	Continuous*
Weight	Approximately 0.50 oz.
Torque	0.75 to 2.50 oz-in.
Mounting Torque	7 in-lbs. maximum
Shaft Side Load (Static)	10 lbs. minimum

* Consult Factory

Until now, the choice of an absolute encoder meant an expensive, and larger-sized product. Through the use of combinatorial mathematics, the gray-code pattern of the Bourns Absolute Contacting Encoder ACE™ is placed on a single track for a very economical, energy-efficient and compact product. Bourns' ACE™ provides an absolute digital output that will also retain its last position in the event of a power failure.

An intelligent alternative to incremental encoders and potentiometers, the Bourns ACE™ is ideally suited for many industrial, automotive, medical and consumer product applications.

EAW - Absolute Contacting Encoder (ACE™)

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Pin Output Code For ACE-128

Bit/Pin correlation: b7 b6 b5 b4 b3 b2 b1 b0 = p8 p7 p6 p5 p4 p3 p2 p1

A binary "1" denotes an "open" switch and a binary "0" denotes a "closed" switch.

Positions 0-127 are seen by a clockwise rotation of the shaft.

Position	p8	p7	p6	p5	p4	p3	p2	p1	Decimal Output
0	0	1	1	1	1	1	1	1	127
1	0	0	1	1	1	1	1	1	63
2	0	0	1	1	1	1	1	0	62
3	0	0	1	1	1	0	1	0	58
4	0	0	1	1	1	0	0	0	56
5	1	0	1	1	1	0	0	0	184
6	1	0	0	1	1	0	0	0	152
7	0	0	0	1	1	0	0	0	24
8	0	0	0	0	1	0	0	0	8
9	0	1	0	0	1	0	0	0	72
10	0	1	0	0	1	0	0	1	73
11	0	1	0	0	1	1	0	1	77
12	0	1	0	0	1	1	1	1	79
13	0	0	0	0	1	1	1	1	15
14	0	0	1	0	1	1	1	1	47
15	1	0	1	0	1	1	1	1	175
16	1	0	1	1	1	1	1	1	191
17	1	0	0	1	1	1	1	1	159
18	0	0	0	1	1	1	1	1	31
19	0	0	0	1	1	1	0	1	29
20	0	0	0	1	1	1	0	0	28
21	0	1	0	1	1	1	0	0	92
22	0	1	0	0	1	1	0	0	76
23	0	0	0	0	1	1	0	0	12
24	0	0	0	0	0	1	0	0	4
25	0	0	1	0	0	1	0	0	36
26	1	0	1	0	0	1	0	0	164
27	1	0	1	0	0	1	1	0	166
28	1	0	1	0	0	1	1	1	167
29	1	0	0	0	0	1	1	1	135
30	1	0	0	1	0	1	1	1	151
31	1	1	0	1	0	1	1	1	215
32	1	1	0	1	1	1	1	1	223
33	1	1	0	0	1	1	1	1	207
34	1	0	0	0	1	1	1	1	143
35	1	0	0	0	1	1	1	0	142
36	0	0	0	0	1	1	1	0	14
37	0	0	1	0	1	1	1	0	46
38	0	0	1	0	0	1	1	0	38
39	0	0	0	0	0	1	1	0	6
40	0	0	0	0	0	0	1	0	2
41	0	0	0	1	0	0	1	0	18
42	0	1	0	1	0	0	1	0	82
43	0	1	0	1	0	0	1	1	83
44	1	1	0	1	0	0	1	1	211
45	1	1	0	0	0	0	1	1	195
46	1	1	0	0	1	0	1	1	203
47	1	1	1	0	1	0	1	1	235
48	1	1	1	0	1	1	1	1	239
49	1	1	1	0	0	1	1	1	231
50	1	1	0	0	0	1	1	1	199
51	0	1	0	0	0	1	1	1	71
52	0	0	0	0	0	1	1	1	7
53	0	0	0	1	0	1	1	1	23
54	0	0	0	1	0	0	1	1	19
55	0	0	0	0	0	0	1	1	3
56	0	0	0	0	0	0	0	1	1
57	0	0	0	0	1	0	0	1	9
58	0	0	1	0	1	0	0	1	41
59	1	0	1	0	1	0	0	1	169
60	1	1	1	0	1	0	0	1	233
61	1	1	1	0	0	0	0	1	225
62	1	1	1	0	0	1	0	1	229
63	1	1	1	1	0	1	0	1	245

Position	p8	p7	p6	p5	p4	p3	p2	p1	Decimal Output
64	1	1	1	1	0	1	1	1	247
65	1	1	1	1	0	0	1	1	243
66	1	1	1	0	0	0	1	1	227
67	1	0	1	0	0	0	1	1	163
68	1	0	0	0	0	0	1	1	131
69	1	0	0	0	1	0	1	1	139
70	1	0	0	0	1	0	0	1	137
71	1	0	0	0	0	0	0	1	129
72	1	0	0	0	0	0	0	0	128
73	1	0	0	0	0	1	0	0	132
74	1	0	0	1	0	1	0	0	148
75	1	1	0	1	0	1	0	0	212
76	1	1	1	1	0	1	0	0	244
77	1	1	1	1	0	0	0	0	240
78	1	1	1	1	0	0	1	0	242
79	1	1	1	1	1	0	1	0	250
80	1	1	1	1	1	0	1	1	251
81	1	1	1	1	1	0	0	1	249
82	1	1	1	1	0	0	0	1	241
83	1	1	0	1	0	0	0	1	209
84	1	1	0	0	0	0	0	1	193
85	1	1	0	0	0	1	0	1	197
86	1	1	0	0	0	1	0	0	196
87	1	1	0	0	0	0	0	0	192
88	0	1	0	0	0	0	0	0	64
89	0	1	0	0	0	0	1	0	66
90	0	1	0	0	1	0	1	0	74
91	0	1	1	0	1	0	1	0	106
92	0	1	1	1	1	0	1	0	122
93	0	1	1	1	1	0	0	0	120
94	0	1	1	1	1	0	0	1	121
95	0	1	1	1	1	1	0	1	125
96	1	1	1	1	1	1	1	0	253
97	1	1	1	1	1	1	0	0	252
98	1	1	1	1	1	0	0	0	248
99	1	1	1	0	1	0	0	0	232
100	1	1	1	0	0	0	0	0	224
101	1	1	1	0	0	0	1	0	226
102	0	1	1	0	0	0	1	0	98
103	0	1	1	0	0	0	0	0	96
104	0	0	1	0	0	0	0	0	32
105	0	0	1	0	0	0	0	1	33
106	0	0	1	0	0	1	0	1	37
107	0	0	1	1	0	1	0	1	53
108	0	0	1	1	1	1	0	1	61
109	0	0	1	1	1	1	0	0	60
110	1	0	1	1	1	1	0	0	188
111	1	0	1	1	1	1	1	0	190
112	1	1	1	1	1	1	1	0	254
113	0	1	1	1	1	1	1	0	126
114	0	1	1	1	1	1	0	0	124
115	0	1	1	1	0	1	0	0	116
116	0	1	1	1	0	0	0	0	112
117	0	1	1	1	0	0	0	1	113
118	0	0	1	1	0	0	0	1	49
119	0	0	1	1	0	0	0	0	48
120	0	0	0	1	0	0	0	0	16
121	1	0	0	1	0	0	0	0	144
122	1	0	0	1	0	0	1	0	146
123	1	0	0	1	1	0	1	0	154
124	1	0	0	1	1	1	1	0	158
125	0	0	0	1	1	1	1	0	30
126	0	1	0	1	1	1	1	0	94
127	0	1	0	1	1	1	1	1	95

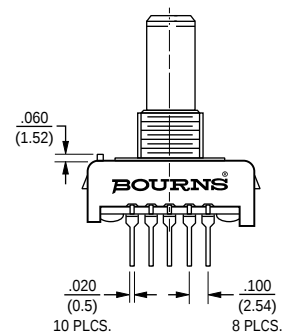
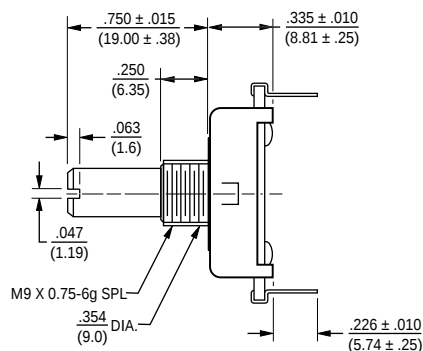
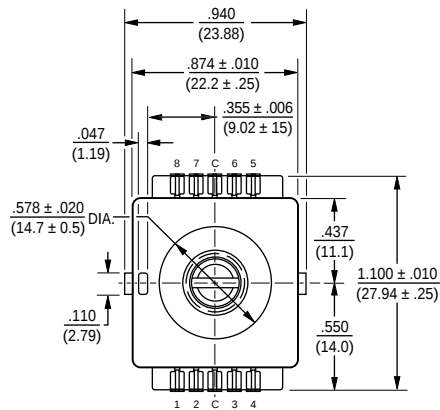
EAW - Absolute Contacting Encoder (ACE™)

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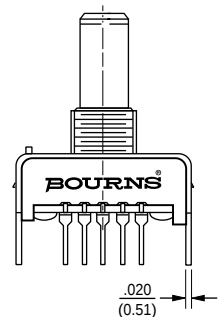
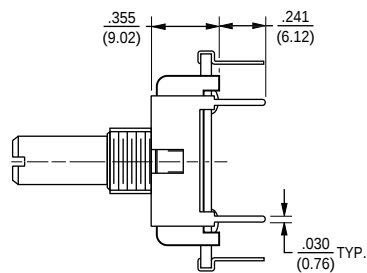
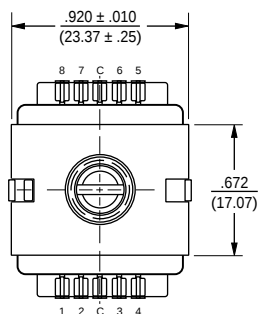
Dimensional Drawings

Dimensional Drawings - For ACE - 128

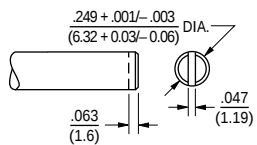
Bushing mounted: Housing A



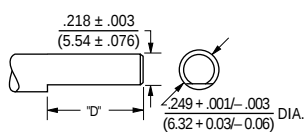
PCB Bracket Mounted: Housing B



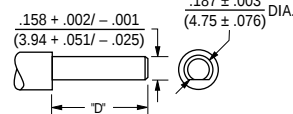
Shaft Style B



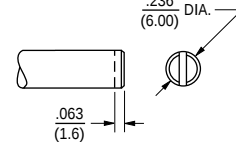
Shaft Style C



Shaft Style J

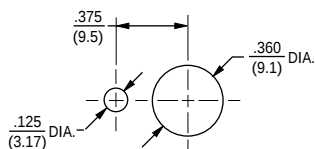


Shaft Style R

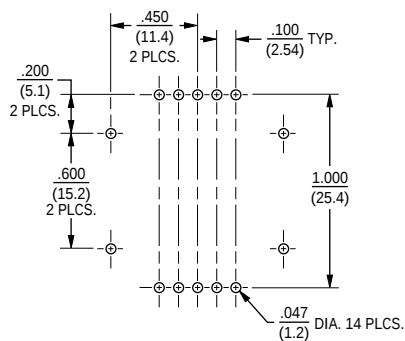


"D" DIMENSION EXTENDS FROM SHAFT END TO BUSHING FACE
"D" = (SHAFT LENGTH, FMS) - (BUSHING LENGTH)

PANEL HOLE DIMENSIONS



PCB BOARD HOLE PATTERN W/PCB BRACKET



EAW - ACE™ Encoder - How To Order

BOURNS®

PART NUMBERING SYSTEM

E	A	W	0	J	-	B	2	4	-	A	E	0	1	2	8
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Code	Rotational Life
A	50,000 Revolutions

BUSHING CONFIGURATION	
Code	Description
W	9mm x 1/4" Length. Threaded M9x0.75
L	9mm x 3/8" Length. Threaded M9x0.75 (Use B shaft only.)

DETENT CONFIGURATION	
Applies to performance codes E0016, E0030 and E0036 only.	
Code	Description
0	Non-Detented
1	Detented

ANTI-ROTATION LUG POSITION	
Code	Description
J	9:00 Position
D	None

SHAFT STYLE (See Outline Drawing for Details)	
Code	Description
B	Plain with Inserted Slot (1/4" Dia.)
C	Single Flatted (1/4" Dia.)
R	Plain with Inserted Slot (6mm Dia.)

PERFORMANCE CODE		
Code	Detents	States/Rev.
E0030*	30	30
E0036*	36	36
E0128	0	128

HOUSING TERMINAL CONFIGURATION (X indicates "Equipped With")			
Code			
Features	A	B	C
Terminals	X	X	X
PCB Bracket		X	X
Hardware Included	X		X

*Bushing code T only.

SHAFT LENGTH (FMS)		
Code	Description	Available Shaft Styles
24	3/4" (19mm) Length	B, C, J
	Metric	
19	19mm Length	R

The sample part number demonstrates the identification code for Bourns contacting encoders.
The part number shown is a commonly used model, typically available from stock.

*Consult factory concerning special inquiries.