

# SERIES ISD37

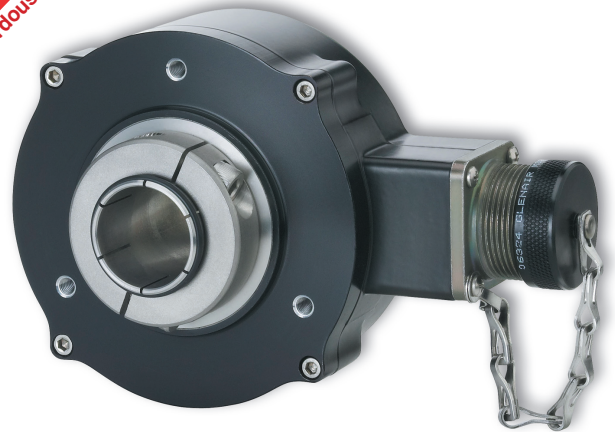
# NorthStar™ brand

## Hazardous Duty Encoder

### Key Features

- Unbreakable Code Disc up to 5000 PPR
- ATEX and CSA Certified for Hazardous Duty Applications
- Dual Isolated Outputs Available for Redundancy
- Anodized Aluminum, Stainless Steel, or Nickel Plated Housing
- IP67 Sealing

HAZ  
Hazardous Duty



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Code:** Incremental, Optical

**Resolution:** Up to 5000 PPR (pulses/revolution)

See Ordering Information

**Format:** Two channel quadrature (AB) with optional Index (Z), and complementary outputs

**Phase Sense:** A leads B for CCW shaft rotation viewing the shaft clamp end of the encoder

**Quadrature Phasing:**

For resolutions 200 to 300 PPR and 1200 PPR and above: 90° ±30° electrical; all other resolutions: 90° ±15°

**Symmetry:**

For resolutions 200-300 PPR and above 1024 PPR: 180° ±25° electrical; all other resolutions: 180° ±18°

**Index:** 150° to 330°, A leads B, CCW (From Clamp End)

**Waveforms:** Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

### ELECTRICAL

**Input Power:** 5VDC, 7-26 VDC

**Outputs:**

7272 Push-Pull: 40mA, sink or source

7272 Differential Line Driver: 40 mA, sink or source

7273 Open Collector: 40mA, sink max

**Frequency Response:** 125 kHz (data & index)

**Noise Immunity:** Tested to EN61326-1

**Electrical Immunity:** Reverse polarity and short circuit protected

**Termination:** MS Connector; M12 Connector; M23 Connector; cable exit w/seal.

**Mating Connector:**

6 Pin MS, Style MS3106A-14S-6S (MCN-N4)

7 Pin MS, Style MS3106A-16S-1S (MCN-N5)

10 Pin MS, Style MS3106A-18-1S (MCN-N6)

10 Pin Bayonet, Style MS3116-F12-10S (MCN-B1)

10 Pin, NEMA4 Style (MCN-N6N4)

12 Pin CW M23 Connector (MCN-C1)

Cable w/ 5 pin M12 Connector (112859-XXXX)

Cable w/ 8 pin M12 Connector (112860-XXXX)

Note: "MS" type mating connectors and pre-built cables are rated NEMA 12. "M12" Cable assemblies are rated IP67

### MECHANICAL

**Bore Diameter:** 1.00", 0.875, 0.750", 0.625", 0.500", 16mm, 15mm, 12mm. Insulated inserts provided for bores under 1 inch (1" bore not electrically isolated for stainless shaft option)

**Mounting Configuration:** Hollow Bore, direct mount over shaft with multiple tether options available

**Bore Runout:** ±0.0005 TIR at midpoint

**Shaft Speed:** 6000 RPM max.

**Min. Shaft Engagement:** 1.60" (Recommended)

**Starting Torque:** 4.5 in-oz. maximum (at ambient)

**Running Torque:** 4.0 in-oz. maximum (at ambient)

**Bearings:** 61806-ZZ

**Housing and Cover:** Hard Anodized Aluminum. Also available in Stainless Steel.

**Shaft Material:** Stainless Steel (Anodized 6061 aluminum for 1" isolated bore option)

**Disc Material:** Mylar

**Weight:** 35 ounces, typical

### ENVIRONMENTAL

**Operating Temperature:** -40 to 80°C

**Storage Temperature:** -40 to 100°C

**Shock:** 400g for 6msec duration

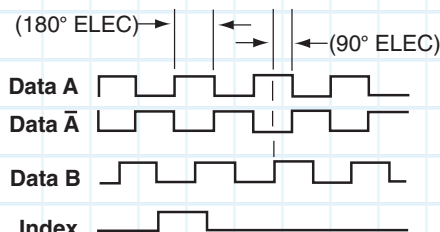
**Vibration:** 5 to 3000Hz @ 20g

**Humidity:** Up to 98% (non-condensing)

**Enclosure Rating:** IP67

### DATA AND INDEX

Not all complements shown  
A̅ shown for reference



Index Width: 150° to 330°  
A leads B, CCW (From Clamp End)

## Ordering Information

To order, complete the model number with code numbers from the table below:

Code 1: Model	Code 2: PPR	Code 3: Shaft	Code 4: Output Format	Code 5: Termination	Code 6: Options	Code 7: Special Option
<b>ISD37</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>

### Ordering Information

<b>ISD37</b> Hazardous Duty Encoder	<b>0015</b>	Electrically isolated: <b>0</b> 6mm <b>1</b> 1/4" <b>2</b> 5/16" <b>3</b> 8mm <b>4</b> 3/8" <b>5</b> 10mm <b>6</b> 12mm <b>7</b> 1/2" <b>8</b> 5/8" <b>9</b> 15mm <b>A</b> 16mm <b>C</b> 19mm <b>D</b> 3/4" <b>E</b> 20mm <b>F</b> 7/8" <b>G</b> 24mm <b>R</b> 1"	<b>A</b> Single Ended ABZ, 7-26V in, 7-26V out push-pull (7272)	<b>0</b> 6 pin connector	<b>0</b> No Options <b>1</b> Slotted Tether <b>2</b> Single Point 4.5" C-Face Tether <b>3</b> Single Point 8.5" C-Face Tether <b>4</b> Dual Isolated Outputs, No Tether <b>5</b> Dual Isolated Outputs, Slotted Tether <b>6</b> Dual Isolated Outputs, 4.5" C-Face Tether <b>7</b> Dual Isolated Outputs, 8.5" C-Face Tether <b>A</b> Swivel Rod Tether <b>C</b> Metric Swivel Rod Tether <b>D</b> Dual Isolated Outputs, Swivel Rod Tether <b>E</b> Dual Isolated Outputs, Metric Swivel Rod Tether	<b>Blank</b> None <b>01</b> Nickel Plated <b>02</b> Stainless Steel
	<b>0032</b> <b>0050</b> <b>0060</b> <b>0100</b> <b>0200</b> <b>0240</b> <b>0250</b> <b>0500</b> <b>0512</b> <b>0600</b> <b>1000</b> <b>1024</b> <b>1200</b> <b>2000</b> <b>2048</b> <b>3072</b> <b>4000</b> <b>4096</b> <b>5000</b>		<b>C</b> Single Ended ABZ, 5V in, 5V out push-pull (7272) <b>D</b> Single Ended ABZ, 7-26V in, 5V out push-pull (7272) <b>E</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector (2222) <b>F</b> Single Ended ABZ, 7-26V in, 7-26V out Open Collector with 1k0hm (2222)	<b>1</b> 7 pin connector <b>2</b> 10 pin connector <b>3</b> 12 pin connector <b>4</b> 10 pin Bayonet connector <b>5</b> 6 pin+mating connector <b>6</b> 7 pin+mating connector <b>7</b> 10 pin+mating connector <b>8</b> 12 pin+mating connector <b>9</b> 10 pin Bayonet+mating connector <b>A</b> .5m (20") cable <b>C</b> 1m (39") cable <b>D</b> 2m (79") cable <b>H</b> 5 pin M12 connector <b>J</b> 8 pin M12 connector <b>K</b> 1.5 ft (18") cable w/ in line 10pin connector <b>M</b> 5 ft (60") cable <b>N</b> 10 ft (120") cable <b>P</b> 1.5 ft (18") Cable with 10-pin Bulkhead Connector <i>Available when Code 6 is 0, 1, 2, 3, A, C</i> <b>T</b> Terminal box w/conduit entry		
		Not electrically isolated: <b>H</b> 1" Non Isolated <b>P</b> 25mm Non Isolated	<i>Options G, H &amp; J not available when Code 5 is H</i> <b>G</b> Differential AB only, 5V in, 5V out (7272) <b>H</b> Differential AB only, 7-26 in, 7-26 out (7272) <b>J</b> Differential AB only, 7-26 in, 5V out (7272)			
			<i>Options K, L, M not available when Code 5 is 0, 1, 5, 6, H</i> <b>K</b> Differential ABZ, 5V in, 5V out (7272) <b>L</b> Differential ABZ, 7-26 in, 7-26 out (7272) <b>M</b> Differential ABZ, 7-26 in, 5V out (7272)			

### Cable Assemblies with MS Connector\*

<b>108594-XXXX</b>	6 Pin MS, Cable Assy. For Use with Single Ended Outputs
<b>108595-XXXX</b>	7 Pin MS, Cable Assy. For Use with Single Ended Outputs
<b>108596-XXXX</b>	7 Pin MS, Cable Assy. For Use with Differential Line Driver w/o Index Outputs
<b>114448-XXXX</b>	10 Pin Bayonet, Cable Assy. For Use with Differential Line Driver with Index Outputs
<b>1400635XXXX</b>	10 Pin MS, Cable Assy. For Use with Differential Line Driver with Index Outputs
<b>109209-XXXX</b>	NEMA4 10 pin MS, Cable Assy. For use with differential line driver with index outputs

### Cable Assemblies with M23 Connector\*

<b>115901-XXXX</b>	12 pin M23, Cable Assy. For Use with Differential Line Driver with Index Outputs, CW
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### Cable Assemblies with M12 Connector\*

<b>112859-XXXX</b>	5 Pin M12, Cable Assy. For Use with Single Ended Outputs
<b>112860-XXXX</b>	8 Pin M12, Cable Assy. For Use with Single Ended Outputs
<b>112860-XXXX</b>	8 Pin M12, Cable Assy. For Use with Differential Line Driver Outputs

\*Note: Standard cable length is 10 feet but may be ordered in any length in 5 foot increments.  
For example, for a 20 foot cable, replace XXXX with -0020.

### Mating Connectors (no cable)

<b>MCN-N4</b>	6 pin, style MS3106A-14S-6S
<b>MCN-N5</b>	7 pin, style MS3106A-16S-1S
<b>MCN-N6</b>	10 pin, style MS3106A-18-1S
<b>MCN-N6N4</b>	10 pin, NEMA4 style
<b>MCN-B1</b>	10 Pin Bayonet, style MS3116-F12-10S
<b>MCN-C1</b>	12 Pin CW M23 Connector

### Accessories

<b>114573-0001</b>	Tether Kit, 4.5" C-Face Single Point with 3/8" Bolt
<b>114574-0001</b>	Tether Kit for Standard AC Motor Fan Covers with T-Bolt
<b>114575-0001</b>	Tether Kit, 8.5" C-Face Single Point with 1/2" Bolt

### The following Cover Kits are not compatible when Code 5 is T

<b>114591-0001</b>	Cover Kit, 56 C-Face
<b>114592-0001</b>	Cover Kit, Fan Cover
<b>114593-0001</b>	Dual Cover Kit, 56 C-Face
<b>114594-0001</b>	Dual Cover Kit, Fan Cover

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## ELECTRICAL CONNECTIONS

### 6, 7 & 10 Pin MS & M23 Connectors and Cables

Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. Models with direct cable exit carry the color coding as shown in the right hand column.

Encoder Function	Cable # 108594-XXXX 6 Pin Single Ended		Cable # 108595-XXXX 7 Pin Single Ended		Cable # 108596-XXXX 7 Pin Dif Line Driver With Out Index		**Cable # 109209-XXXX or 1400635XXXX 10 Pin Dif Line Driver w/ Index		Cable # 114448-XXXX 10 Pin Bayonet		Cable #115901-XXXX 12 Pin (CW)		Cable Exit with Seal
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color	Wire Color
Sig. A	E	BRN	A	BRN	A	BRN	A	BRN	A	BRN	5	BRN	GRN
Sig. B	D	ORG	B	ORG	B	ORG	B	ORG	B	ORG	8	ORN	BLU
Sig. Z*	C	YEL	C	YEL	—	—	C	YEL	C	YEL	3	YEL	ORG
Power +V	B	RED	D	RED	D	RED	D	RED	D	RED	12	RED	RED
Com	A	BLK	F	BLK	F	BLK	F	BLK	F	BLK	10	BLK	BLK
Case	—	—	G	GRN	G	GRN	G	GRN	G	GRN	9	—	WHT
N/C-SLD	F	—	E	—	—	—	E	—	E	—	7	—	—
Sig. $\bar{A}$	—	—	—	—	C	BRN/WHT	H	BRN/WHT	H	BRN/WHT	6	BRN/WHT	VIO
Sig. $\bar{B}$	—	—	—	—	E	ORG/WHT	I	ORG/WHT	I	ORG/WHT	1	ORN/WHT	BRN
Sig. $\bar{Z}^*$	—	—	—	—	—	—	J	YEL/WHT	J	YEL/WHT	4	YEL/WHT	YEL

### 5 & 8 Pin M12 Accessory Cables when Code 5 = H or J

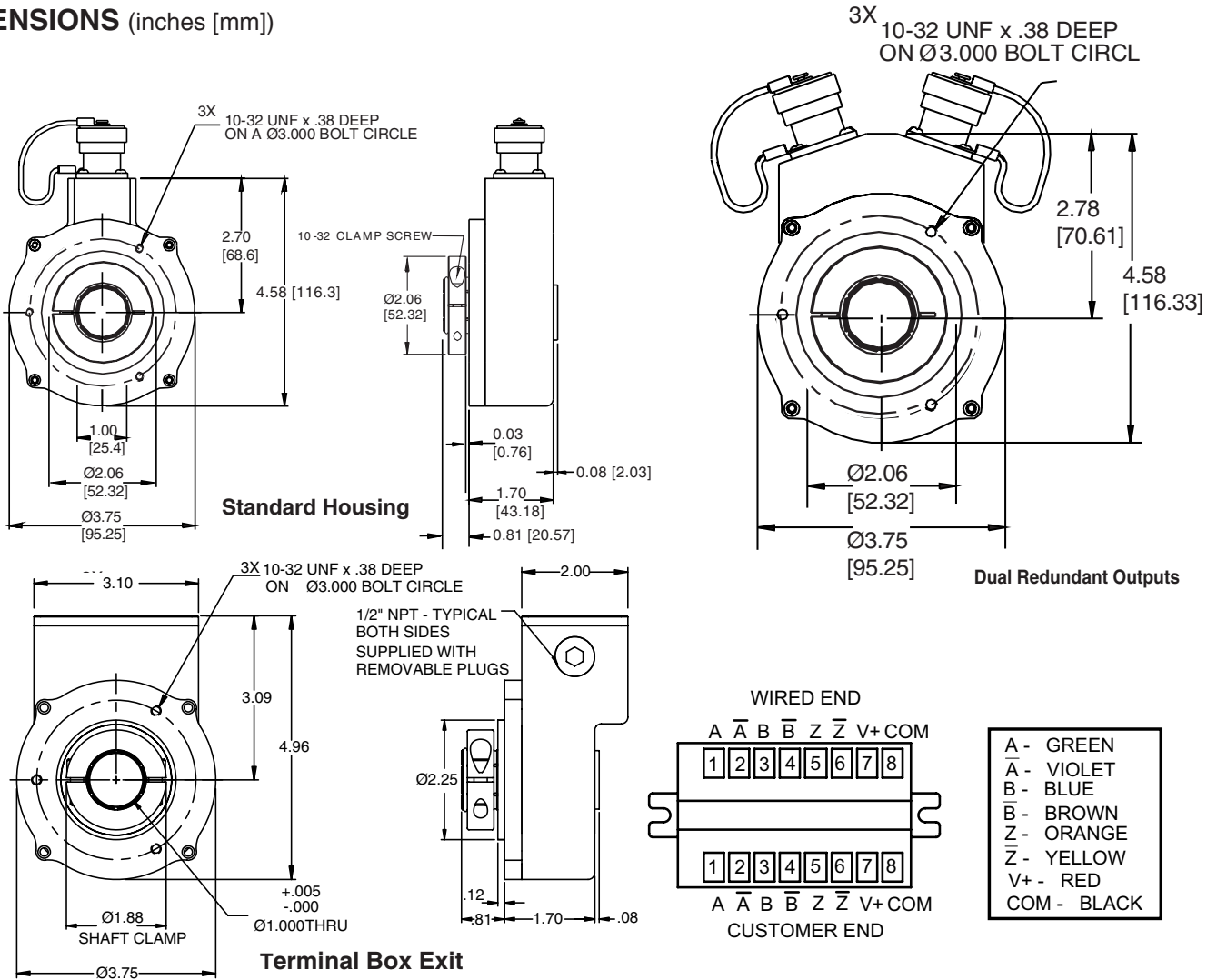
Connector pin numbers and cable assembly wire color information is provided here for reference.

Encoder Function	Cable # 112859-XXXX 5 Pin Single Ended		Cable # 112860-XXXX 8 Pin Single Ended		Cable # 112860-XXXX 8 Pin Differential	
	Pin	Wire Color	Pin	Wire Color	Pin	Wire Color
Sig. A	4	BLK	1	BRN	1	BRN
Sig. B	2	WHT	4	ORG	4	ORG
Sig. Z*	5	GRY	6	YEL	6	YEL
Power +V	1	BRN	2	RED	2	RED
Com	3	BLU	7	BLK	7	BLK
Sig. $\bar{A}$	—	—	—	—	3	BRN/WHT
Sig. $\bar{B}$	—	—	—	—	5	ORG/WHT
Sig. $\bar{Z}^*$	—	—	—	—	8	YEL/WHT

#### NOTES:

- 1) Cable Configuration (Table 1): PVC jacket, 105 °C rated, overall foil shield; 3 twisted pairs 24 AWG (output signals), plus 2 twisted pairs 22 AWG (input power)
- 2) Cable Configuration (Table 2): PVC jacket, 105°C rated, overall foil shield; 24 AWG conductors, minimum
- 3) Standard cable length is 10 feet but may be ordered in any length in 5 foot increments. For example, for a 20 foot cable, replace -XXXX with -0020
- 4) \*Index not provided on all models. See ordering information.
- 5) \*\*For watertight applications, use NEMA4 10 pin cable & connector 109209-XXXX.
- 6) "MS" Type mating connectors and pre-build cables are rated NEMA 12
- 7) "M12" Cable assemblies are rated IP67

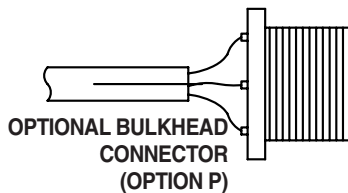
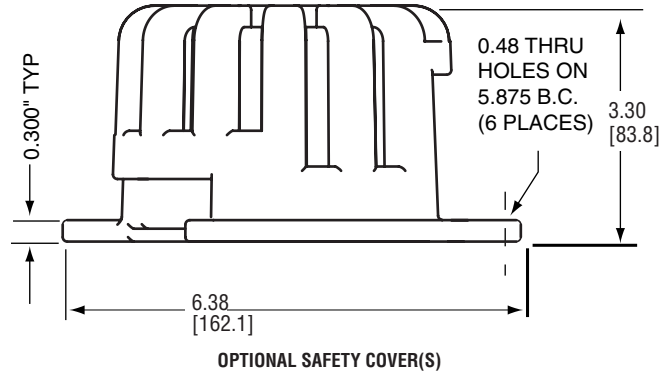
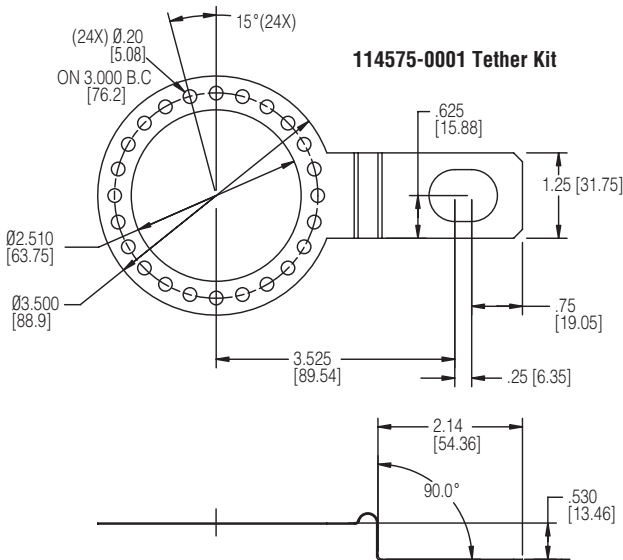
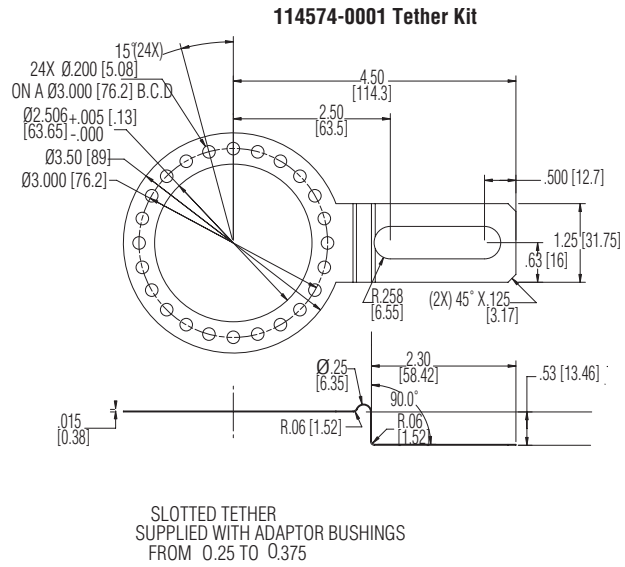
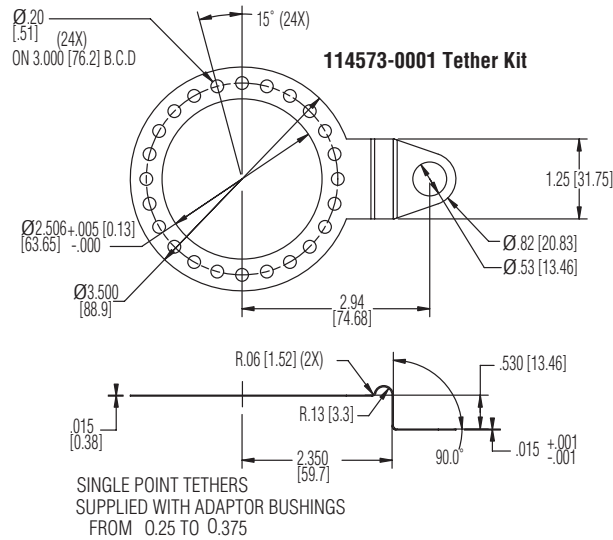
**DIMENSIONS** (inches [mm])



# SERIES ISD37



## DIMENSIONS (inches [mm])



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