E2E2

Proximity Sensor with a Long Screw Length

- Increased tightening strength. Cable protectors provided as a standard feature.
- Increased indicator visibility. A milled section for wrench grip on all models.



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Be sure to read Safety Precautions on page 9.

Ordering Information

Sensors

DC 2-Wire Models

Appearance		Sensing distance	Model Operation mode		
			NO	NC	
Shielded	M12	3 mm	E2E2-X3D1 *	E2E2-X3D2	
	M18	7 mm	E2E2-X7D1 *	E2E2-X7D2	
-	M30	10 mm	E2E2-X10D1 *	E2E2-X10D2	
Unshielded	M12	8 mm	E2E2-X8MD1 *	E2E2-X8MD2	
onshielded ————	M18	14 mm	E2E2-X14MD1 *	E2E2-X14MD2	
	M30	20 mm	E2E2-X20MD1 *	E2E2-X20MD2	

^{*}Models with different frequencies are also available. The model numbers are E2E2-X□D15 (example: E2E2-X3D15).

DC 3-Wire Models

Appearance		Sensing distance	Model Operation mode		
г фрозиции		Continuity and annual	NO	NC	
Shielded	M12	2 mm	E2E2-X2C1	E2E2-X2C2	
	M18	5 mm	E2E2-X5C1	E2E2-X5C2	
	M30	10 mm	E2E2-X10C1	E2E2-X10C2	
Unshielded	M12	5 mm	E2E2-X5MC1	E2E2-X5MC2	
onomeraea M	M18	10 mm	E2E2-X10MC1	E2E2-X10MC2	
	M30	18 mm	E2E2-X18MC1	E2E2-X18MC2	

AC 2-Wire Models

Appearance			Model		
		Sensing distance	Operation mode		
			NO	NC	
Shielded	M12	2 mm	E2E2-X2Y1	E2E2-X2Y2	
	M18	5 mm	E2E2-X5Y1	E2E2-X5Y2	
	M30	10 mm	E2E2-X10Y1	E2E2-X10Y2	
Unshielded	M12	5 mm	E2E2-X5MY1	E2E2-X5MY2	
	M18	10 mm	E2E2-X10MY1	E2E2-X10MY2	
	M30	18 mm	E2E2-X18MY1	E2E2-X18MY2	

Accessories (Order Separately)

Mounting Brackets Protective Covers Sputter Protective Covers

Ratings and Specifications

E2E2-X□D□ DC 2-Wire Models

Item Model E2E2-X3D□ E2E2-X8MD□ E2E2-X7D□ E2E2-X14MD□ E2E2-X10D□ E2 Sensing distance 3 mm±10% 8 mm±10% 7 mm±10% 14 mm±10% 10 mm±10% 20 Set distance *1 0 to 2.4 mm 0 to 6.4 mm 0 to 5.6 mm 0 to 11.2 mm 0 to 8 mm 0 to Differential travel 10% max. of sensing distance Sensing object Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineers page 5.) Standard sensing object Iron, 12 × 12 × 1 mm Iron, 30 × 30 × 1 mm Iro	Unshielded E2E2-X20MD□ 20 mm±10% 0 to 16 mm eering Data on Iron, 54 × 54 × 1 mm				
Sensing distance 3 mm±10% 8 mm±10% 7 mm±10% 14 mm±10% 10 mm±10% 20 Set distance *1 0 to 2.4 mm 0 to 6.4 mm 0 to 5.6 mm 0 to 11.2 mm 0 to 8 mm 0 to Differential travel 10% max. of sensing distance Sensing object Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineers page 5.) Standard sensing object Iron, 12 × 12 × 1 mm Iron, 30 × 30 × 1 mm Iron, 30 × 30 × 1 mm Iron, 30 × 30 × 1 mm Iron, 54	20 mm±10% 0 to 16 mm Pering Data on				
Set distance *10 to 2.4 mm0 to 6.4 mm0 to 5.6 mm0 to 11.2 mm0 to 8 mm0 toDifferential travel10% max. of sensing distanceSensing objectFerrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineer page 5.)Standard sensing objectIron, 12 × 12 × 1 mmIron, 30 × 30 × 1 mmIron, 18 × 18 × 1 mmIron, 30 × 30 × 1 mmIron, 30 × 30 × 1 mm	0 to 16 mm eering Data on Iron,				
Differential travel10% max. of sensing distanceSensing objectFerrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineers page 5.)Standard sensing objectIron, $12 \times 12 \times 1 \text{ mm}$ Iron, $30 \times 30 \times 1 \text{ mm}$ Iron, $18 \times 18 \times 1 \text{ mm}$ Iron, $30 \times 30 \times 1 \text{ mm}$ Iron, $30 \times 30 \times 1 \text{ mm}$ Iron, $30 \times 30 \times 1 \text{ mm}$	eering Data on				
Sensing object Ferrous metal (The sensing distance decreases with non-ferrous metal. Refer to Engineer page 5.) Standard sensing object Iron,	Iron,				
Standard sensing object lron, 12 × 12 × 1 mm lron, 30 × 30 × 1 mm lron, 18 × 18 × 1 mm lron, 30 × 30 × 1 mm lron,	Iron,				
Standard sensing object $12 \times 12 \times 1 \text{ mm}$ $30 \times 30 \times 1 \text{ mm}$ $18 \times 18 \times 1 \text{ mm}$ $30 \times 30 \times 1 \text{ mm}$ $30 \times 30 \times 1 \text{ mm}$ 54	- ,				
Response frequency *2 1 kHz 800 Hz 500 Hz 400 Hz 10					
	100 Hz				
Power supply voltage (operating voltage range) 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.					
Leakage current 0.8 mA max.					
Control output Switching capacity 3 to 100 mA					
Residual voltage 3 V max. (Load current: 100 mA, Cable length: 2 m)					
Indicators D1 Models: Operation indicator (red) and setting indicator (green) D2 Models: Operation indicator (red)					
Operation mode (with sensing object approaching) D1 Models: NO D2 Models: NC Refer to the timing charts under I/O Circuit Diagrams on page 8 for details.	Refer to the timing charts under I/O Circuit Diagrams on page 8 for getails.				
Protection circuits Surge absorber, Load short-circuit protection					
Ambient temperature Operating/Storage: –25 to 70°C (with no icing or condensation)					
Ambient humidity Operating/Storage: 35% to 95% (with no condensation)					
Temperature influence ±10% max. of sensing distance at 23°C in the temperature range of –25 to 70°C					
Voltage influence $\pm 1\%$ max. of sensing distance at rated voltage in the rated voltage $\pm 15\%$ range					
Insulation resistance 50 M Ω min. (at 500 VDC) between current-carrying parts and case					
Dielectric strength 1000 VAC, 50/60 Hz for 1 minute between current-carrying parts and case					
(destruction) 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions					
Shock resistance (destruction) 1,000 m/s² 10 times each in X, Y, and Z directions					
Degree of protection IEC IP67, in-house standard for oil resistance					
Connection method Pre-wired Models (Standard cable length: 2 m)	Pre-wired Models (Standard cable length: 2 m)				
Weight (packed state)Approx. 65 gApprox. 150 gApprox. 210 g					
Case Brass					
Materi- Sensing surface PBT					
als Clamping nuts Nickel-plated brass					
Toothed washer Zinc-plated iron					
Accessories Instruction sheet					

^{*1.} Use the E2E2 within the range in which the setting indicator (green LED) is ON (except D2 Models).
*2. The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.

E2E2-X□C□ DC 3-Wire Models

Size		M ⁻	12	M18		M30	
	Shielding	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item	Model	E2E2-X2C□	E2E2-X5MC□	E2E2-X5C□	E2E2-X10MC	E2E2-X10C	E2E2-X18MC
Sensing of	distance	2 mm±10%	5 mm±10%	5 mm±10%	10 mm±10%	10 mm±10%	18 mm±10%
Set distar	псе	0 to 1.6 mm	0 to 4 mm	0 to 4 mm	0 to 8 mm	0 to 8 mm	0 to 14 mm
Differentia	al travel	10% max. of sen	sing distance	I.			
Sensing of	object	Ferrous metal (T page 5.)	he sensing distan	ce decreases with	n non-ferrous met	al. Refer to <i>Engin</i>	<i>eering Data</i> on
Standard	sensing object	Iron, 12 × 12 × 1 mm	Iron, $15 \times 15 \times 1 \text{ mm}$	Iron, 18 × 18 × 1 mm	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, $30 \times 30 \times 1 \text{ mm}$	Iron, $54 \times 54 \times 1$ mm
Response	e frequency *1	1.5 kHz	400 Hz	600 Hz	200 Hz	400 Hz	100 Hz
	pply voltage (op- oltage range) *2	12 to 24 VDC (10	to 55 VDC), ripp	le (p-p): 10% max	(.		
Leakage o	current	13 mA max.					
Control	Load current	NPN open-collec	tor output, 200 m	A max. (55 VDC r	max.)		
output	Residual voltage	2 V max. (Load o	2 V max. (Load current: 200 mA, Cable length: 2 m)				
Indicators	3	Operation indicator (red)					
Operation (with sense proaching	sing object ap-	C1 Models: NO C2 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 8 for details.				ails.	
Protection	n circuits	Reverse polarity protection, Surge absorber, Load short-circuit protection					
Ambient t	temperature	Operating/Storag	ge: –40 to 85°C (v	vith no icing or co	ndensation)		
Ambient I	humidity	Operating/Storag	ge: 35% to 95% (v	vith no condensat	ion)		
Temperat	ure influence		0		erature range of – erature range of –		
Voltage in	nfluence	±1% max. of sen	sing distance at r	ated voltage in the	e rated voltage ±1	5% range	
Insulation	n resistance	50 M Ω min. (at 5	00 VDC) betweer	current-carrying	parts and case		
Dielectric	strength	1,000 VAC, 50/6	0 Hz for 1 minute	between current	carry parts and ca	ise	
Vibration (destructi	resistance ion)	10 to 55 Hz, 1.5-	mm double ampli	tude for 2 hours e	ach in X, Y, and Z	directions	
Shock res (destructi		1,000 m/s ² 10 tin	nes each in X, Y,	and Z directions			
Degree of	f protection	IEC IP67, in-house standard for oil resistance					
Connection	pre-wired Models (Standard cable length: 2 m) and Connector Models						
Weight (packed state) Approx. 75			orox. 75 g Approx. 160 g Approx. 220 g				
Case Brass							
Materi- Sensing surface PBT							
als	Clamping nuts	Nickel-plated bra	ss				
	Toothed washer	Zinc-plated iron					
Accessor	ies	Instruction sheet					

^{*1.} The response frequency is an average value. Measurement conditions are as follows: standard sensing object, a distance of twice the standard sensing object, and a set distance of half the sensing distance.
*2. A full-wave rectification power supply of 24 VDC ±20% (average value) can be used.

E2E2-X□Y□ AC 2-Wire Models

	Size	M.	12	M18		M30	
	Shielding	Shielded	Unshielded	Shielded	Unshielded	Shielded	Unshielded
Item	Model	E2E2-X2Y□	E2E2-X5MY	E2E2-X5Y□	E2E2-X10MY	E2E2-X10Y	E2E2-X18MY
Sensing distance		2 mm±10%	5 mm±10%	5 mm±10%	10 mm±10%	10 mm±10%	18 mm±10%
Set distar	nce	0 to 1.6 mm	0 to 4 mm	0 to 4 mm	0 to 8 mm	0 to 8 mm	0 to 14 mm
Differentia	al travel	10% max. of sen	sing distance				
Sensing of	bject	Ferrous metal (T page 5.)	he sensing distan	ce decreases with	n non-ferrous met	al. Refer to <i>Engin</i>	eering Data on
Standard	sensing object	Iron, 12 × 12 × 1 mm	Iron, 15 × 15 × 1 mm	Iron, 18 × 18 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 30 × 30 × 1 mm	Iron, 54 × 54 × 1 mm
Response	frequency	25 Hz					
	pply voltage (op- oltage range) *1	24 to 240 VAC (20 to 264 VAC), 50/60 Hz					
Leakage o	current	1.7 mA max.					
Control	Load current *2	5 to 200 mA 5 to 300 mA					
output	Residual voltage	Refer to Enginee	Refer to Engineering Data on page 5.				
Indicators	3	Operation indicator (red)					
Operation (with sense) proaching	sing object ap-	Y1 Models: NO Y2 Models: NC Refer to the timing charts under <i>I/O Circuit Diagrams</i> on page 8 for details.				ails.	
Ambient t	emperature *1, 2	Operating/Storag	ge: -40 to 85°C (v	vith no icing or cor	ndensation)		
Ambient I	numidity	Operating/Storage: 35% to 95% (with no condensation)					
Temperat	ure influence		-	•	erature range of – erature range of –		
Voltage in	nfluence	±1% max. of sen	sing distance at r	ated voltage in the	e rated voltage ±1	5% range	
Insulation	resistance	50 M Ω min. (at 5	00 VDC) betweer	n current-carrying	parts and case		
Dielectric	strength	4,000 VAC, 50/6	0 Hz for 1 minute	between current	carry parts and ca	se	
Vibration (destructi	resistance on)	10 to 55 Hz, 1.5-	mm double ampli	tude for 2 hours e	ach in X, Y, and Z	directions	
Shock res (destructi		1,000 m/s ² 10 tin	nes each in X, Y,	and Z directions			
Degree of	protection	IEC IP67, in-hou	se standard for oi	l resistance			
Connection	on method	Pre-wired Models (Standard cable length: 2 m) and Connector Models					
Weight (p	acked state)	Approx. 65 g Approx. 150 g Approx. 210 g					
	Case	Brass					
Materi- Sensing surface PBT							
als	Clamping nuts	Nickel-plated bra	ss				
	Toothed washer	Zinc-plated iron					
Accessor	ies	Instruction sheet					
*1 \M/bon our	plying 24 VAC to any of	the chave medale m	also auro that the ana	rating ambigat tampa		. OF0C +- OF0C	

^{*1.} When supplying 24 VAC to any of the above models, make sure that the operating ambient temperature range is at least -25°C to 85°C.

*2. When using an M18 or M30 Connector Model at an ambient temperature between 70 and 85°C, make sure that the Sensor has a control output (load current) of 5 to 200 mA max.

I/O Circuit Diagrams

DC 2-Wire Models

Operation mode	Model	Timing Charts	Output circuit
NO	E2E2-X3D1 E2E2-X7D1 E2E2-X10D1 E2E2-X8MD1 E2E2-X14MD1 E2E2-X20MD1	Non-sensing sensing Stable sensing area Sensing Object Sensing Object Sensing Object ON Setting indicator OFF (green) ON Operation OFF indicator (red) ON Control output	Proximity Sensor main circuit
NC	E2E2-X3D2 E2E2-X7D2 E2E2-X10D2 E2E2-X8MD2 E2E2-X14MD2 E2E2-X20MD2	Non-sensing area Sensing object (%) 100 0 Rated sensing distance ON Operation OFF indicator (red) ON Control output	Note: The load can be connected to either the +V or 0 V side.

DC 3-Wire Models

Operation mode	Model	Timing Charts	Output circuit
NO	E2E2-X2C1 E2E2-X5C1 E2E2-X10C1 E2E2-X5MC1 E2E2-X10MC1 E2E2-X18MC1	Sensing object Not present Operation indicator (red) Control output ON OFF ON ON ON ON OFF	Brown 100 Ω Load Proximity Sensor
NC	E2E2-X2C2 E2E2-X5C2 E2E2-X10C2 E2E2-X5MC2 E2E2-X10MC2 E2E2-X18MC2	Sensing object Present Not present Operation indicator (red) Control output OFF ON OFF ON ON OFF	main circuit Blue 0 V

AC 2-Wire Models

Operation mode	Model	Timing Charts	Output circuit
NO	E2E2-X2Y1 E2E2-X5Y1 E2E2-X10Y1 E2E2-X5MY1 E2E2-X10MY1 E2E2-X18MY1	Sensing object Present Not present Operation indicator ON (red) OFF ON Control output OFF	Brown Load Proximity Sensor
NC	E2E2-X2Y2 E2E2-X5Y2 E2E2-X10Y2 E2E2-X5MY2 E2E2-X10MY2 E2E2-X18MY2	Sensing object Present Not present Operation indicator OF (red) OF Control output OF	main direuit

Safety Precautions



This product is not designed or rated for ensuring safety of persons either directly or indirectly.



Do not use it for such purposes.

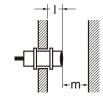
Precautions for Correct Use

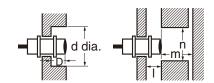
Do not use this product under ambient conditions that exceed the ratings.

Design

Influence of Surrounding Metal

When mounting the Sensor within a metal panel, ensure that the clearances given in the following table are maintained.





(Unit: mm)

Model	Item	M12	M18	M30	
		I	0	0	0
		d	12	18	30
	Shielded	D	0	0	0
		m	8	20	40
DC 2-Wire Models		n	18	27	45
E2E2-X□D□		1	15	22	30
		d	40	70	90
	Unshielded	D	15	22	30
		m	20	40	70
		n	40	70	90
		1	0	0	0
		d	12	18	30
	Shielded	D	0	0	0
DC 3-Wire Models		m	8	20	40
E2E2-X□C□		n	18	27	45
AC 2-Wire Models		I	15	22	30
E2E2-X□Y□		d	40	55	90
	Unshielded	D	15	22	30
		m	20	40	70
		n	36	54	90

Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



Mutual Interference

(Unit: mm)

Model		Item	M12	M18	M30
			30	50	100
	Shielded	Α	(20)	(30)	(50)
	Sillelaea	В	20	35	70
DC 2-Wire Models		Б	(12)	(18)	(35)
E2E2-X□D□	Unshielded	Α	120	200	300
			(60)	(100)	(100)
		В	100	110	200
			(50)	(60)	(100)
DC 3-Wire Models	Shielded	Α	30	50	100
E2E2-X□C□		В	20	35	70
AC 2-Wire Models	Unshielded	Α	120	200	300
E2E2-X□Y□	Orisinelaea	В	100	110	200

Note: Values in parentheses apply to Sensors operating at different frequencies.

Mounting

Tightening Torque

Do not tighten the nut with excessive force.

A washer must be used with the nut.

The following strengths assume washers are being used.



Relationship between Sizes and Models

	Size	Model
	SIZE	
		E2E2-X3D□
	Shielded	E2E2-X2C□
M12		E2E2-X2Y□
IVIIZ		E2E2-X8MD□
	Unshielded	E2E2-X5MC□
		E2E2-X5MY□
		E2E2-X7D□
	Shielded	E2E2-X5C□
M18		E2E2-X5Y□
IVITO		E2E2-X14MD□
	Unshielded	E2E2-X10MC□
		E2E2-X10MY□
		E2E2-X10D□
	Shielded	E2E2-X10C□
M30		E2E2-X10Y□
IVIOU		E2E2-X20MD□
	Unshielded	E2E2-X18MC□
		E2E2-X18MY□

Model	Torque
M12	30 N⋅m
M18	70 N·m
M30	180 N·m

Dimensions (Unit: mm)

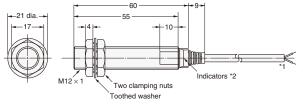
Shielded



Unshielded



E2E2-X3D /E2E2-X2C /E2E2-X2Y

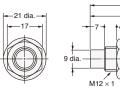


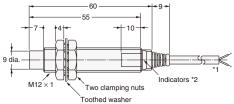
- *1. 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
 - A-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
- The cable can be extended to up to 200 m (Separate metal conduit.)

 *2. D Models: Operation indicator (red) and setting indicator (green),

 C/Y Models: Operation indicator (red)

E2E2-X8MD\(\text{/E2E2-X5MC}\(\text{/E2E2-X5MY}\)

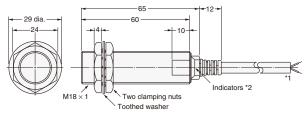




- *1. 4-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
 - 4-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.3 mm², Insulator diameter: 1.3 mm), Standard length: 2 m
- The cable can be extended to up to 200 m (Separate metal conduit.)

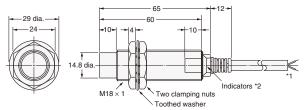
 *2. D Models: Operation indicator (red) and setting indicator (green),
 C/Y Models: Operation indicator (red)

E2E2-X7D | /E2E2-X5C | /E2E2-X5Y |



- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 - 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
 The cable can be extended to up to 200 m (Separate metal conduit.)
- *2. D Models: Operation indicator (red) and setting indicator (green), C/Y Models: Operation indicator (red)

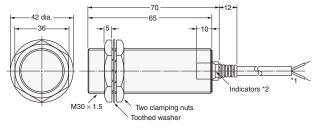
E2E2-X14MD / E2E2-X10MC / E2E2-X10MY



- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard lenoth: 2 m
 - 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
- The cable can be extended to up to 200 m (Separate metal conduit.)

 2. D Models: Operation indicator (red) and setting indicator (green),
 C/Y Models: Operation indicator (red)

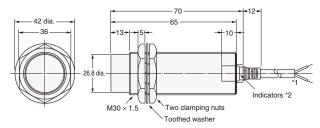
E2E2-X10D / E2E2-X10C / E2E2-X10Y



- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
- 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
- The cable can be extended to up to 200 m (Separate metal conduit.)

 *2. D Models: Operation indicator (red) and setting indicator (green),
 C/Y Models: Operation indicator (red)

E2E2-X20MD / E2E2-X18MC / E2E2-X18MY



- *1. 6-dia. vinyl-insulated round cable with 2 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m 6-dia. vinyl-insulated round cable with 3 conductors
 - 6-dia. vinyl-insulated round cable with 3 conductors (Conductor cross section: 0.5 mm², Insulator diameter: 1.9 mm), Standard length: 2 m
- Standard length: 2 m

 The cable can be extended to up to 200 m (Separate metal conduit.)

 2. D Models: Operation indicator (red) and setting indicator (green),
 C/Y Models: Operation indicator (red)

Mounting Hole Dimensions



Dimension	M12	M18	M30
F (mm)	12.5 ^{+0.5} ₀ dia.	18.5 ^{+0.5} ₀ dia.	30.5 ^{+0.5} ₀ dia.

Note 1. Two clamping nuts and one toothed washer are provided with each Sensors.

2. The model number is laser-marked on the cable section and milled section.

In the interest of product improvement, specifications are subject to change without notice.