



**SEALMASTER**  
PERFORMANCE WITHOUT COMPROMISE™

**ER and ERX-Treme™  
Style Ball Bearings**



the power of  
**EPT**

  
**EMERSON**  
Industrial Automation

**EMERSON. CONSIDER IT SOLVED.**

# SEALMASTER®

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### SEALMASTER®

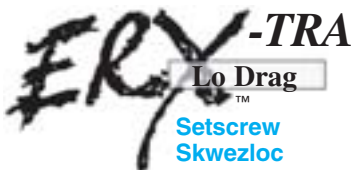
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## ER and ERX™ Style Ball Bearings

In addition to the standard of excellence Gold Line™ ER bearings have, Sealmaster® has expanded its ER style ball bearing product line with ERX-Treme.

Sealmaster now brings you eight ERX-Treme products:

- ERX-Treme Lo Drag Setscrew and Skwezloc
- ERX-Treme X-tra Lo Drag Setscrew and Skwezloc
- ERX-Treme HI Temp Setscrew
- ERX-Treme CRES Setscrew and Skwezloc
- ERX-Treme Re-lube Setscrew

**ERX-Treme Lo Drag** ER style ball bearings seal the bearing chamber with an advanced felt seal that maintains low drag torque requirements while providing a positive barrier to contamination.

X-tra Lo Drag versions are available with oil lubrication for even less rotational torque.

**ERX-Treme CRES** bearings are corrosion resistant setscrew and Skwezloc locking inserts. The concentric locking mechanism of Skwezloc is well suited for stainless steel shafts that are frequently found in corrosive environments. Food grade grease is standard in ERX-Treme CRES bearings.

**ERX-Treme Re-Lube** bearings are the first standard ER style ball bearings that can be re-lubricated without any further modifications to an external housing. ERX-Treme re-lube bearings have lubrication fittings for the same reason that pillow blocks and flange bearings have them; it extends useful bearing life through the use of proper relubrication. Finally, an ER style insert bearing with the same capabilities! This ingenious design incorporates a lubrication fitting on the inner race which allows grease to flow from the lubrication fitting, through a groove in the bore, and into the bearing chamber to try to purge out contaminated or old grease and replenish lubrication.

**ERX-Treme HI Temperature** ER style ball bearings will operate from 30°F to 400°F. ERX HI Temperature bearings utilize Krytox® GPL 226 grease by Dupont® to extend useful bearing life and reduce maintenance requirements.

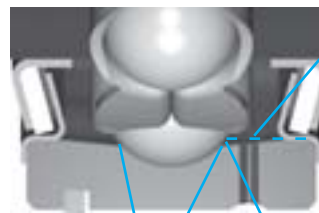
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## ER and ERX-Treme Now Come with Tapered Lands

### Patented Tapered Land Technology



Tapered Lands Design  
Patent No. 5,199,789

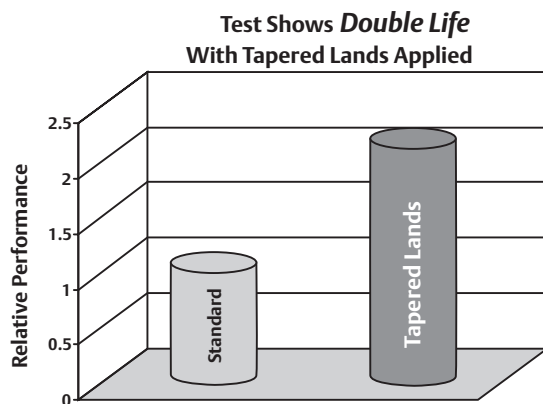


Standard Land Profile  
Tapered Lands  
Grease Circulation

Note: The above illustration is an exaggerated figure to demonstrate the difference of standard vs. Tapered Lands.

The outer land surface in a conventional bearing is parallel to the axis of the inner ring. The Tapered Lands surface is tapered in a radial direction toward the bearing race. This subtle yet crucial design change results in lubrication being redirected back to the raceway. With improved bearing lubrication circulation comes significantly longer bearing service life. This improved circulation and service life comes without any reductions in bearing radial or thrust capacities.

## Life Comparison of Patent Testing



The results of rigorous patent testing show a dramatic service life expectancy difference between bearings with Tapered Lands and bearings with conventional land geometry. The test results to the left illustrate the difference between a standard Sealmaster bearing with no relubrication compared to a Sealmaster bearing using Tapered Lands with no relubrication in a horizontally mounted shaft position.

Performance benefits of Tapered Lands is demonstrated by the results of accelerated life testing shown in the graph above. In this test, standard Sealmaster bearings having a conventional land geometry were compared to Sealmaster bearings incorporating Tapered Lands. The accelerated life test exposes \*non-relubricated bearings to higher loads and speeds that are designed to fail units in less than three months. The results of rigorous patent testing show a dramatic service life expectancy difference as a direct result of the Tapered Lands effect.

\* For bearings that are maintained and relubricated on a regular basis, there is no significant difference in expected life.

## Standard Gold Line “ER” Style Bearings Features and Benefits

Sealmaster has been providing ER style ball bearings for a variety of applications including:

- Ink Rollers
- Plate Cylinders
- Dampening Rollers
- Blanket Cylinders
- Forming Rollers
- Collecting Cylinders
- Calendar Rolls
- Nip Roll
- Live Rolls
- Printing Webs
- Spindles
- Veneers
- Winders
- Bulk Material Handling
- Unit Material Handling
- Agricultural Processing Equipment
- Metal Slitting & Winding
- Plastic Film Transfer
- Packaging Equipment

ER style ball bearings are designed to be pressed into housings which are typically steel plates, conveyor rolls, etc.

Sealmaster ER ball bearings have many of the same features Gold Line mounted units have:

### Wide Outer...

maintains fit up with roll or housing and provides a large grease cavity.

### Wide Inner...

provides better stability on the shaft.

### Zone Hardened Inner Race...

provides a fully hardened ball path while leaving the race extension unhardened, allowing for exceptional control of setscrew fit and hold. Raceways are ground and honed to optimize bearing life and results in quieter operation compared to non-honed raceways.

### Unique Land Riding Metal Retainer...

reduces friction and provides improved grease circulation.

The retainer is designed to “float” on the ground extension (or lands) of the outer ring while spacing the balls precisely for more even load distribution. This decreases wear on both balls and retainer, while increasing stability which is especially important in applications involving vibration, shock loading or high operating speeds.



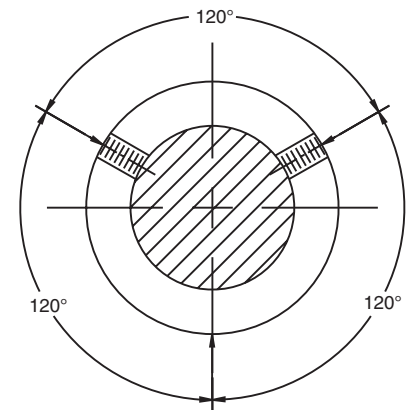
## Standard “ER” Setscrew

Sealmaster setscrews are integrated with Gold Line zone hardened inner races which are post heat treat drilled and tapped to minimize hardening distortion. The soft extended portion of the inner race creates a tightly meshed system and an effective lock.

### Setscrews

Sealmaster setscrews, located 120° apart, provide a balanced 3-point contact. This evenly positioned shaft lock design is particularly important in high speed applications where any eccentricity is magnified. This can especially affect roll applications. The setscrews come standard with precision manufactured threads. They also incorporate a unique diamond faceted point that tightly secures the setscrews to the shaft and resists back-out.

### Balanced 3-Point Contact



### Specially-Designed Diamond Point Setscrews Spaced at 120°...



...deliver superior shaft holding power with less race distortion than any other setscrew design.



*Standard  
“ER”  
Skwezloc*

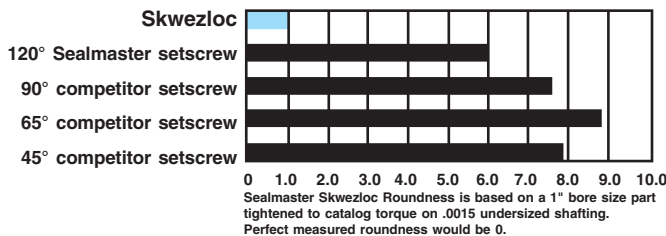
Sealmaster Gold Line ER style ball bearings with Skwezloc locking collars are designed for applications with strict run out requirements. Because the Skwezloc collar centers the shaft in the bore of the bearing, the shaft or roll runs true and saves on equipment maintenance and replacement costs. Skwezloc has demonstrated its proven performance in a number of applications demanding smooth and quiet operation.

### Ball Path Roundness

Sealmaster engineers have measured the relative ball-path roundness of various setscrew bearings and compared them to the roundness of a Sealmaster bearing equipped with Skwezloc. The results and comparisons are illustrated on the bar chart. The differences - all of which can affect bearing operation and life - are dramatic!



### Roundness Comparison



*Standard “ER”*

### METRIC-SKWEZ™

*Available with  
ERX-Treme designs  
as Made to Order (MTO)*

Metric-Skwez “ER” style ball bearings have “hard metric” dimensions with a Skwezloc locking system.

Metric-Skwez “ER” have all metric dimensions for easy installation and replacement on imported machinery or OEM equipment intended for international exportation. Also available in housings – pillow blocks, flanges and take-ups. Request catalog MS-98 for more information.

Sealmaster brand Metric-Skwez “ER” style ball bearings also have all of the standard Gold Line features that have literally made Sealmaster world famous. Additionally, Metric-Skwez “ER” has:

<p><b>Metric Dimensions</b></p>	<p><b>Metric Capscrews</b></p>
<p><b>Distinctive Metric Collar</b></p>	<p><b>Metric Bore</b></p>

## SEALS

### Felt Seal

**Standard for Gold Setscrew and Skwezloc  
Optional for Metric-Skwez**

The patented felt labyrinth seal with rotating flinger directs contamination away from the sealing surfaces. The felt design provides a tight barrier which retains grease and acts as a filter to reduce the ingress of foreign material. The design operates with less drag and heat generation than rubber contact seals.



### Contact Seal

**Standard for Metric-Skwez  
Available from stock: Gold Setscrew and Skwezloc**

The Sealmaster contact seal is recommended where moisture is present. This contact seal is made of a heavy steel shell assembled with a rugged nitrile sealing element. The external steel shell protects the rubber sealing element by deflecting abrasive contamination away. This design gives the Sealmaster contact seal superior wear characteristics. To specify, attach a “C” to the end of the nomenclature:



ER-16C, ER-23TC

# ERX-Treme

## Lo Drag and X-Tra Lo Drag Features and Benefits



**Name** ERX-Treme Lo Drag  
**Suffix** LO  
**Example** ERX-16 LO  
**Locking** Setscrew or Skwezloc  
**Lube** Special Channeling Grease  
**Seal** Lo Drag Felt

The Sealmaster brand ERX Lo Drag ball bearings provide free-running rotation while working to retain grease and maintaining top-notch low drag sealing. The special channeling grease coats and lubricates the internal bearing components providing low friction. The ERX Lo Drag ball bearings utilize the advanced Lo Drag felt seal that provides a positive barrier to contamination.

ERX Lo Drag ball bearings can be specified by attaching the suffix "LO" to standard ERX nomenclature:

*ERX-16 LO, ERX-16T LO*

**Name** ERX-Treme X-Tra Lo Drag  
**Suffix** XLO  
**Example** ERX-16 XLO  
**Locking** Setscrew or Skwezloc  
**Lube** Oil  
**Seal** X-Tra Lo Drag Felt

The Sealmaster brand X-Tra Lo Drag ball bearings maintain top-notch low drag sealing. X-Tra Lo Drag bearings are lubricated with oil to further enhance free rotation. The X-Tra Lo Drag ball bearings utilize the same superior felt seal that provides a positive barrier to contamination. In addition, the X-Tra Lo Drag felt seals are soaked in oil to act as a lubrication reservoir and reduce seal drag.

ERX X-Tra Lo Drag ball bearings can be specified by attaching the suffix "XLO" to standard ERX nomenclature:

*ERX-16 XLO, ERX-16T XLO*

### Lo Drag Size Availability

		1/2	5/8	11/16	3/4	7/8	15/16	1	1 1/8	1 3/16	1 1/4R	1 1/4	1 3/8	1 7/16	1 1/2
Inch	Setscrew	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Skwezloc				x			x	x	x	x	x	x	x	x
Inch	Setscrew	x			x	x	x	x	x	x	x	x	x	x	
	Skwezloc				x		x	x		x			x		
Metric	Setscrew		20	25	30	35	40	45	50						
	Skwezloc	x	x	x	x	x	x	x	x						

### X-Tra Lo Drag Size Availability

		1/2	5/8	11/16	3/4	7/8	15/16	1	1 1/8	1 3/16	1 1/4R	1 1/4	1 3/8	1 7/16	1 1/2
Inch	Setscrew	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Skwezloc				x			x	x	x	x	x	x	x	x
Inch	Setscrew	x	x	x	x		x	x		x	x	x	x	x	
	Skwezloc				x		x	x		x			x		
Metric	Setscrew		20	25	30	35	40	45	50						
	Skwezloc	x	x	x	x	x	x	x	x						

**Applications**

Printing and packaging machinery weave sheets of paper, cardboard, or film through huge webs that are composed of hundreds of rolls. The sheets of material are pulled through the webs where many different processes produce modifications such as printing, cutting, heating, drying, folding, stacking, packing, finishing, etc. The sheets of material typically have a low strength and can be sensitive. If rotational torque is excessive, materials will tear and frequently jam entire machines. ERX-Treme Lo and XLO ball bearings are designed to meet the needs of these low drag applications.

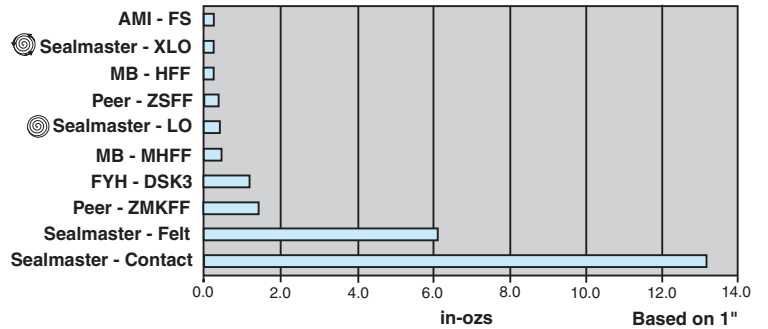


Web Example

**Bearing Rotational Torque**

**Comparison Chart**

	Company	Suffix Option	Seal Type	Lubrication
LO Drag Bearing Options	AMI®	FS	Non-contact	Oil
	Sealmaster	XLO	Low Drag Felt	Oil
	MB®	HFF	Steel Labyrinth	Oil
	Peer®	ZSFF	Steel Labyrinth	Oil
	Sealmaster	LO	Low Drag Felt	Grease
	MB	MHFF	Steel Labyrinth	Grease
	FYH®	DSK3	Non-contact	Oil
	Peer	ZMKFF	Steel Labyrinth	Grease
Standard Bearing Drag (Reference)	Sealmaster	-	Felt	Grease
	Sealmaster	C	Contact	Grease



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**Seals**

**Lo Drag Felt**

The advanced Lo Drag felt labyrinth seal with rotating flinger is designed to direct contamination away from the sealing surface and reduce rotational torque. The Lo Drag felt seal provides an excellent barrier which works to retain grease and acts as a filter to reduce the ingress of debris.

**X-Tra Lo Drag**

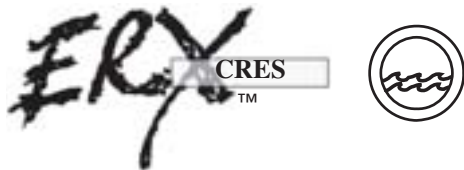
The X-Tra Lo Drag felt labyrinth seal is the same as the Lo Drag felt seal with one difference; it is soaked in oil to act as a lubrication reservoir and lower seal friction.



# ERX-Treme

## CRES

### Features and Benefits



- Name** ERX-Treme CRES
- Suffix** PN
- Example** ERX-PN16 and ERX-PN16T
- Locking** Setscrew and Skwezloc
- Lube** GoldPlex™ FG Grease
- Seal** High Performance Seals (HPS) - See next page

ERX-Treme PN and PN-T bearings offer setscrew and Skwezloc locking mechanisms that reliably clamp to stainless steel shafts which are frequently used in corrosive environments. Each component of the ERX-Treme corrosion resistant bearings is made with a corrosion resistant coating to protect from rusting (see opposing page).

A High Phosphorus Nickel (PN) coating is applied to the races and retaining ring. The collar is coated with a fluoropolymer which is abrasion and corrosion resistant. The collar capscrew is coated with a zinc phosphate protective layer. Stainless steel balls and H1 food grade grease are also standard.

ERX CRES Setscrew and Skwezloc ball bearings can be specified by including the PN description to the standard ERX and ERX-T nomenclature:

[ERX-PN16](#)  
[ERX-PN16T](#)

#### CRES Size Availability

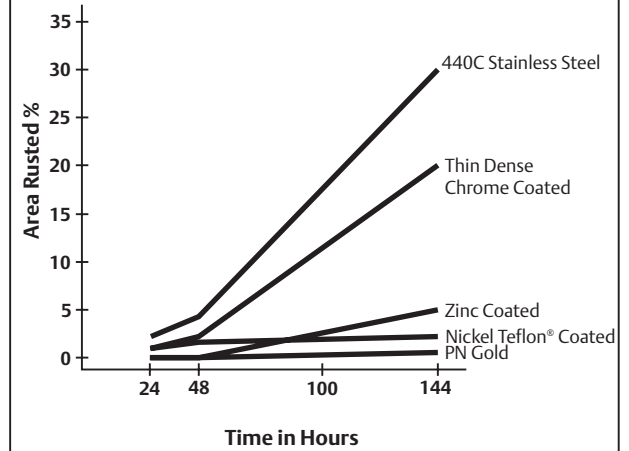
Inch	Setscrew	1/2	5/8	3/4	1	1 1/8	1 3/16	1 1/4R	1 1/4	1 3/8	1 7/16
	Skwezloc	x	x	x	x	x	x	x	x	x	x
Inch	Setscrew	1 1/2	1 11/16	1 3/4	1 15/16	2	2 3/16	2 7/16	2 1/2		
	Skwezloc	x	x	x	x	x	x	x	x		
Metric	Setscrew	20	25	30	35	40					
	Skwezloc	x	x	x		x					



## ERX-Treme CRES Bearings

- High phosphorous, electroless nickel plated 52100 steel races for exceptional corrosion resistance (see chart at right)
- Zone hardened inner races for longer life and quieter operation
- Unique metal land riding retainer allows 360° grease flow around rolling element for improved lubrication circulation.
- Two locking options:
  - ERX CRES Skwezloc Collars feature a fluoropolymer rich surface coat on a molecular binder layer which provides excellent corrosion resistance, abrasion durability, anti-peeling, and non-stick properties.
  - ERX CRES setscrews are manufactured with 300 series stainless steel material. Positioned at 120° apart, the Sealmaster setscrews provide a balanced 3-point contact.

5% Salt Fog Test Results (144 Hours)



## Bearing Salt Fog Results (144 hours)

Tested per ASTM B117, a salt fog test is performed by placing bearing parts in a salt fog chamber. The chamber is filled with a highly corrosive, salt solution and heated to 100°F. After 144 hours, the parts are removed and results are compared. See photos below.



Sealmaster  
High Phosphorus  
Nickel



440C Stainless Steel



Zinc Coated



Thin Dense  
Chrome Coated

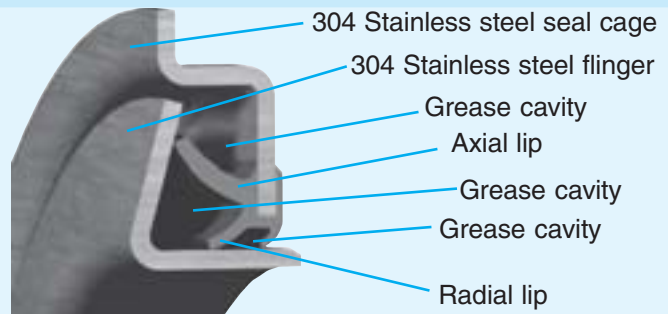


Nickel Teflon Coated

## Seals

### High Performance Seal (HPS)

- Sealmaster HPS seal design provides multi directional sealing for proven performance in contaminated environments.
- 304 stainless steel shell protects from incoming contaminants and provides a wear resistant contact surface for all three seal lips.
- Stainless steel, rotating flinger directs contaminants away from the bearing.
- Highly durable, FKM seal lip material provides chemical resistance and withstands high temperatures.



Sealmaster HPS Seal  
(U.S. Patent Number 6,817,769)



# ERX-Treme

## Re-Lube

## Features and Benefits



- Name** ERX-Treme Re-lube
- Suffix** RL
- Example** ERX-16 RL
- Locking** Setscrew Only
- Lube** Goldplex HP Lithium Complex NLGI #2 Grease
- Seal** Standard Felt

ERX-Treme Re-lube bearings are the first ER style ball bearings that can be relubricated without any further modifications to the external housing.

ERX-Treme Re-lube bearings have lubrication fittings for the same reason that pillow blocks and flange bearings have them; it extends useful bearing life through relubrication. Finally, an ER style insert bearing with the same capabilities! This design can save a lot of time and money; you won't have to provide special methods to relubricate your ER style ball bearings.



**ERX Re-Lube** ball bearings can be specified by attaching the suffix "RL" to standard ERX nomenclature:

*ERX-16 RL*

### Re-lube Size Availability

Inch	Setscrew	1/2	5/8	3/4	7/8	15/16	1	1 1/8	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2
		x	x	x	x	x	x	x	x	x	x	x	x
Inch	Setscrew	1 9/16	1 11/16	1 3/4	1 7/8	1 15/16	2	2 3/16	2 1/4	2 3/8	2 7/16	2 15/16	
		x	x	x	x	x	x	x	x	x	x	x	

## How it Works!



This ingenious design incorporates a lubrication fitting with the inner race which allows grease to flow from the lubrication fitting, through a groove in the bore, and into the bearing chamber to help purge out contaminated or old grease and replenish lubrication levels.

**Caution:** ERX Re-lube bearings are intended to be used on stationary shafting only.

## Seals

### Standard Felt Seals

The patented felt labyrinth seal with rotating flinger is designed to direct contamination away from the sealing surfaces. The felt design creates a tight barrier which provides for grease retention and attenuates the ingress of foreign material. The design operates with less drag and heat generation than rubber contact seals.





# ERX-Treme

## HI-Temperature Features and Benefits

Made with DuPont  
Krytox GPL 226  
Grease



- Name** ERX-Treme HI Temperature
- Suffix** HI (Non-expansion Type)  
HIY (Expansion Type)
- Example** ERX-16 HI and ERX-16 HIY
- Locking** Setscrew Only
- Lube** Krytox GPL 226
- Seal** Nomex® Felt

ERX-Treme HI Temperature ball bearings will operate from 30°F to 400°F. ERX HI Temperature bearings utilize Krytox GPL 226 DuPont high temperature grease to extend useful bearing life and reduce maintenance requirements. The standard brass land riding retainer provides proper ball retention at elevated temperatures (brass has a melting point of 1250°F). Larger internal clearances are designed into the ERX HI Temperature bearings to allow for thermal expansion due to temperature changes.

**ERX HI Temperature** ball bearings can be specified by attaching the suffix "HI" to standard ERX nomenclature:

*ERX-16 HI*

### HI Temp Size Availability

		1/2	5/8	3/4	7/8	15/16	1	1 1/8	1 3/16	1 1/4R	1 1/4	1 3/8	1 7/16	1 1/2	1 9/16	1 11/16
Inch	Setscrew	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Skwezloc			x			x				x			x		

		1 3/4	1 7/8	1 15/16	2	2 3/16	2 1/4	2 3/8	2 7/16	2 1/2	2 11/16	2 15/16	3	3 3/16	3 7/16	3 15/16
Inch	Setscrew	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Skwezloc			x					x							

		20	25	30	35	40
Metric	Setscrew		x		x	
	Skwezloc	x				

### HIY Temp Size Availability

		1/2	5/8	3/4	7/8	15/16	1	1 1/8	1 3/16	1 1/4	1 3/8	1 7/16	1 1/2
Inch	Setscrew			x	x	x	x	x	x	x	x	x	x

		1 9/16	1 11/16	1 3/4	1 7/8	1 15/16	2	2 3/16	2 1/4	2 3/8	2 7/16	2 15/16
Inch	Setscrew	x	x	x	x	x	x	x	x	x	x	

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## Operates 30° F to 400° F

### Optional Expansion Type ERX HIY



An expansion type ERX HI Temperature bearing is available. It uses a half-dog setscrew combined with a lock wire and is recommended for applications that require expansion capability. This may be essential when shafts grow in length due to temperature changes. The single half-dog setscrew has a cylindrical nub that protrudes out of the bottom of the setscrew. The nub is used to mate loosely with a slot milled into the shafting. As the shaft spins, the nub interferes with the slot and positively turns the inner ring. See HIY installation instructions. Note: All expansion bearings must be used in conjunction with a fixed bearing to stabilize the system.

Refer to page 22 for HIY installation instructions. Contact Emerson Power Transmission Application Engineering at (219) 465-2211 for more information about half-dog setscrew and wire installation. ERX HI Temperature Expansion ball bearings can be specified by attaching the suffix "HIY" to standard ERX nomenclature:

*ERX-16 HIY*

### Tests show Krytox can improve life up to 45 times compared with other high temp greases.

Krytox grease has a superior service life and extended life in high temperature environments when compared to other lubricants. It is chemically inert in ultra-severe environments and provides thermal stability and predictable viscosity, even under extreme loads and pressure. Our engineers have found that, compared to other high temperature greases, the thermal stability and lubricity of Krytox can improve a high temperature bearing life 4 to 45 times. Contact Application Engineering for more information.

## Seals

### Nomex Felt

The Nomex felt seal uses the same dependable design as the patented felt labyrinth seal with rotating flinger that works to direct contamination away from the sealing surfaces. The Nomex felt design provides a tight barrier which retains needed grease and attenuates the ingress of foreign material while withstanding higher temperatures. The design operates with less drag and heat generation than rubber contact seals. Nomex, a DuPont brand, is a heat retardant felt-like material that is often used to protect Firemen.



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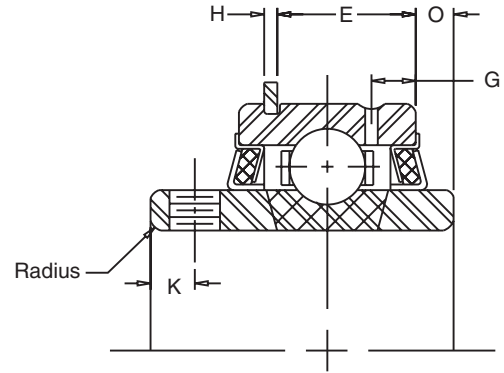
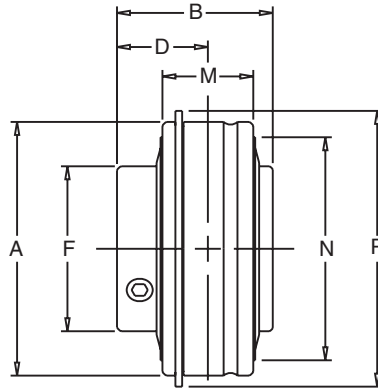
Setscrew Dimensions ..... page 14

HIY Installation Instructions ..... page 22



# SEALMASTER®

## Gold Line Setscrew ER and ERX Bearings



### Setscrew

Shaft Dia.	Standard Description	ERX Description	Dimensions in Millimeters / Inches										Weight in Kilograms / Pounds				Unit Wt.
			A	B	D	E	F	G	H	K	M	N	Rad.	O	P		
1/2 9/16 5/8 11/16 3/4	ER-8 ER-9 ER-10 ER-11 ER-12 ER-204	ERX-8 ERX-10 ERX-11 ERX-12 ERX-204	47mm 1.8504	1 7/32	13/16	31/64	1 3/16	1/8	3/64	3/16	5/8	1 5/8	3/64	3/32	2 3/64	0.56	
7/8 15/16 1	ER-14 ER-15 ER-16 ER-205	ERX-14 ERX-15 ERX-16 ERX-205	52mm 2.0472	1 3/8	55/64	39/64	1 3/8	13/64	3/64	7/32	3/4	1 27/32	1/16	1/8	2 1/4	0.68	
1 1/16 1 1/8 1 3/16 1 1/4R	ER-17 ER-18 ER-19 ER-20R ER-206	ERX-18 ERX-19 ERX-20R ERX-206	62mm 2.4409	1 1/2	7/8	11/16	1 19/32	7/32	1/16	7/32	7/8	2 11/64	1/16	3/16	2 5/8	0.93	
1 1/4 1 5/16 1 3/8 1 7/16	ER-20 ER-21 ER-22 ER-23 ER-207	ERX-20 ERX-22 ERX-23 ERX-207	72mm 2.8346	1 11/16	1	1/2	1 27/32	7/32	1/16	1/4	15/16	2 17/32	5/64	7/32	3 3/64	1.37	
1 1/2 1 9/16	ER-24 ER-25 ER-208	ERX-24 ERX-25 ERX-208	80mm 3.1496	1 15/16	1 3/16	29/32	2 1/16	1/4	1/16	5/16	1 3/32	2 53/64	3/32	13/64	3 23/64	2.00	
1 5/8 1 11/16 1 3/4	ER-26 ER-27 ER-28 ER-209	ERX-26 ERX-27 ERX-28 ERX-209	85mm 3.3465	1 15/16	1 3/16	29/32	2 19/64	1/4	1/16	5/16	1 3/32	3 3/64	3/32	13/64	3 9/16	2.31	
1 13/16 1 7/8 1 15/16 2R	ER-29 ER-30 ER-31 ER-32R ER-210	ERX-30 ERX-31 ERX-30	90mm 3.5433	2 1/32	1 9/32	29/32	2 15/32	19/64	3/32	3/8	1 1/8	3 7/32	7/64	3/16	3 3/4	2.43	
2 2 1/8 2 3/16	ER-32 ER-34 ER-35 ER-211	ERX-32 ERX-34 ERX-35	100mm 3.9370	2 3/16	1 5/16	31/32	2 23/32	19/64	3/32	3/8	1 3/16	3 35/64	1/8	9/32	4 9/64	3.00	
2 1/4 2 3/8 2 7/16	ER-36 ER-38 ER-39 ER-212	ERX-36 ERX-38 ERX-39 ERX-212	110mm 4.3307	2 9/16	1 9/16	1 1/32	2 63/64	19/64	3/32	7/16	1 1/4	3 29/32	1/8	3/8	4 17/32	4.00	
2 1/2 2 11/16	ER-40 ER-43 ER-214	ERX-40 ERX-43	125mm 4.9213	2 3/4	1 11/16	1 7/64	3 7/16	5/16	7/64	7/16	1 3/8	4 7/16	9/64	3/8	5 15/64	5.56	
2 7/8 2 15/16	ER-46 ER-47 ER-215	ERX-47	130mm 5.1181	3 1/16	1 3/4	1 15/64	3 41/64	3/8	7/64	7/16	1 1/2	4 5/8	5/32	9/16	5 7/16	6.37	
3 3 3/16	ER-48 ER-51 ER-216	ERX-48 ERX-51	140mm 5.5118	3 1/4	1 15/16	1 25/64	3 59/64	7/16	7/64	17/32	1 11/16	4 63/64	5/32	15/32	5 13/16	7.85	
3 1/4 3 3/8 3 7/16	ER-52 ER-54 ER-55	ERX-52 ERX-55	150mm 5.9055	3 3/8	2 1/32	1 41/64	4 5/32	7/16	7/64	15/32	1 15/16	5 19/64	13/64	3/8	6 13/64	9.50	
3 15/16 4	ER-63 ER-64	ERX-63	190mm 7.4803	4 5/8	2 11/16	2 5/32	5 11/64	11/16	1/8	3/4	2 1/2	6 43/64	13/64	11/16	7 7/8	22.00	

To specify Setscrew ERX Lo Drag  
Use "LO"  
i.e. ERX-16 LO  
Availability Pg 6  
**ERX-LO**



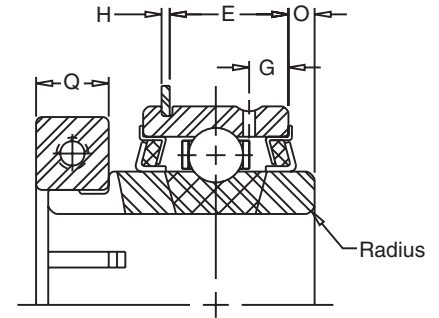
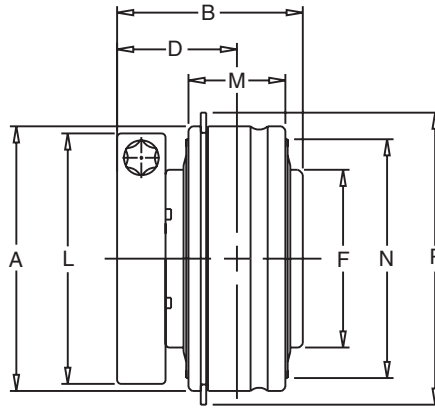
To specify Setscrew X-Tra Lo Drag  
Use "XLO"  
i.e. ERX-16 XLO  
Availability Pg 6  
**ERX-XLO**



To specify Setscrew ERX HI Temp  
Use "HI"  
i.e. ERX-16 HI  
Availability Pg 12  
**ERX-HI**



## Gold Line Skwezloc ER and ERX Bearings



### Skwezloc

Shaft Dia. in	Standard Description	ERX Description	Dimensions in Millimeters / Inches										Weight in Kilograms / Pounds					Unit Wt.
			A	B	D	E	F	G	H	L	M	N	Rad.	O	P	Q		
3/4	ER-12T	ERX-12T	47mm 1.8504	1 9/32	7/8	31/64	1 3/16	1/8	3/64	1 3/4	5/8	1 5/8	3/64	3/32	2 3/64	3/8	0.56	
1	ER-16T	ERX-16T	52mm 2.0472	1 7/16	33/64	39/64	1 15/32	13/64	3/64	1 63/64	3/4	1 27/32	1/16	9/64	2 1/4	3/8	0.68	
1 1/8 1 3/16 1 1/4R	ER-18T ER-19T ER-20RT	ERX-18T ERX-19T ERX-20RT	62mm 2.4409	1 9/16	15/16	11/16	1 19/32	7/32	1/16	2 3/16	7/8	2 11/64	5/64	3/16	2 21/64	3/8	0.93	
1 1/4 1 3/8 1 7/16	ER-20T ER-22T ER-23T	ERX-20T ERX-22T ERX-23T	72mm 2.8346	1 3/4	1 1/16	3/4	1 27/32	7/32	1/16	2 7/16 2 9/16 2 9/16	15/16	2 17/32	5/64	7/32	3 3/64	7/16	1.37	
1 1/2	ER-24T	ERX-24T	80mm 3.1496	2	1 1/4	29/32	2 1/16	1/4	1/16	2 11/16	1 3/32	2 53/64	3/32	13/64	3 23/64	7/16	2.00	
1 11/16 1 3/4	ER-27T ER-28T	ERX-27T ERX-28T	85mm 3.3465	2	1 1/4	29/32	2 19/64	1/4	1/16	2 15/16	1 3/32	3 3/64	3/32	13/64	3 9/16	7/16	2.31	
1 15/16	ER-31T	ERX-31T	90mm 3.5433	2 7/64	1 23/64	29/32	2 15/32	19/64	3/32	3 3/8	1 1/8	3 7/32	7/64	3/16	3 3/4	9/16	2.43	
2 2 3/16	ER-32T ER-35T	ERX-32T ERX-35T	100mm 3.937	2 1/4	1 3/8	31/32	2 23/32	19/64	3/32	3 1/2 3 5/8	1 3/16	3 35/64	1/8	9/32	4 9/64	9/16	3.00	
2 7/16	ER-39T	ERX-39T	110mm 4.3307	2 21/32	1 5/8	1 1/32	2 63/64	19/64	3/32	4 1/8	1 1/4	3 29/32	1/8	3/8	4 17/32	9/16	4.00	

*Available*



#### Only Applicable to Standard Gold Line ER Bearings

Single Lip Contact Seal

Available on all sizes. Recommended where moisture conditions prevail. To specify, add suffix "C" (ER-16C, ER-16TC).

To specify Skwezloc  
ERX Lo Drag  
Use "**LO**"  
i.e. ERX-16T LO  
Availability Pg 6  
**ERX-T LO**



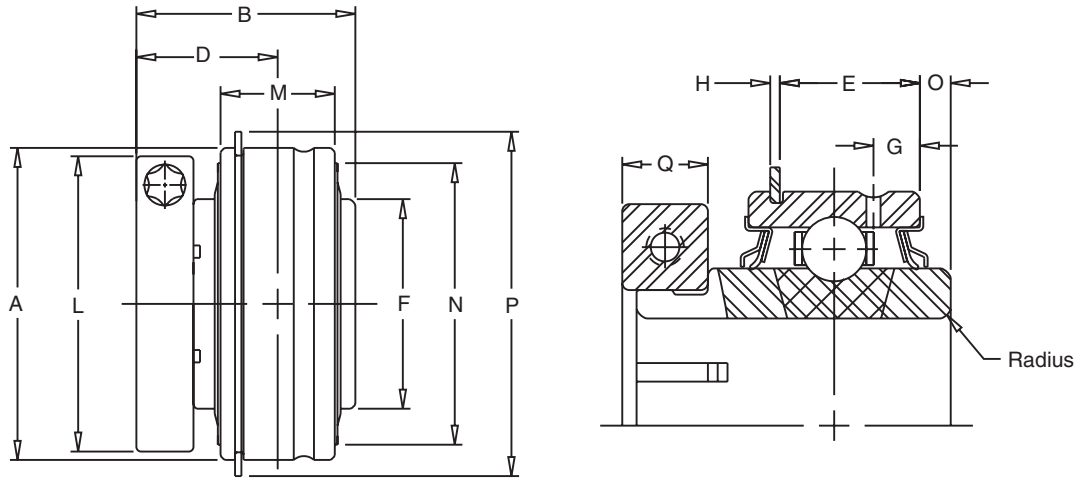
To specify Skwezloc  
X-Tra Lo Drag  
Use "**XLO**"  
i.e. ERX-16T XLO  
Availability Pg 6  
**ERX-T XLO**



To specify Skwezloc  
ERX Corrosion Resistant  
Use "**PN and T**"  
i.e. ERX-PN16T  
Availability Pg 8  
**ERX-PN-T**



# Gold Line Metric-Skwez Bearings



## METRIC-SKWEZ™ ER-TMC

Hard Metric ER Style Extended Inner Ring Bearing Assembly

Contact Seals

Shaft Dia.	Part Description	Dimensions in Millimeters / Inches										Weight in Kilograms / Pounds					Unit Wt.
		A	B	D	E	F	G	H	L	M	N	Rad.	O	P	Q		
20mm	ER-204TMC	47mm	33	20	12	30	4	1	44	16	41	1	5	52	10	0.30	
		1.8504	1 9/32	25/32	31/64	1 3/16	11/64	3/64	1 3/4	5/8	1 5/8	3/64	3/16	2 3/64	3/8	0.56	
25mm	ER-205TMC	52mm	37	22	15	35	5	1	49	19	47	2	5	57	10	0.30	
		2.0472	1 13/32	7/8	39/64	1 3/8	13/64	3/64	1 15/16	3/4	1 27/32	1/16	3/16	2 1/4	3/8	0.68	
30mm	ER-206TMC	62mm	40	24	18	40	6	2	56	2	55	2	5	67	10	0.40	
		2.4409	1 9/16	15/16	11/16	1 19/32	7/32	1/16	2 3/16	1/16	2 11/64	5/64	13/64	2 21/32	3/8	0.93	
35mm	ER-207TMC	72mm	44	27	19	47	6	2	65	24	65	2	6	78	11	0.60	
		2.8346	1 3/4	1 1/16	3/4	1 27/32	7/32	1/16	2 9/16	15/16	2 17/32	5/64	7/32	3 5/64	7/16	1.37	
40mm	ER-208TMC	80mm	51	32	23	52	6	2	68	28	72	2	5	86	11	0.90	
		3.1495	2	1 1/4	29/32	2 1/16	1/4	1/16	2 11/16	1 3/32	2 53/64	3/32	13/64	3 13/32	7/16	2.00	
45mm	ER-209TMC	85mm	51	32	23	58	6	2	75	28	78	2	5	91	11	1.00	
		3.3465	2	1 1/4	29/32	2 19/64	1/4	1/16	2 15/16	1 3/32	3 3/64	3/32	13/64	3 19/32	7/16	2.31	
50mm	ER-210TMC	90mm	53	34	23	63	8	2	86	29	82	3	5	96	14	1.10	
		3.5433	2 3/32	1 11/32	29/32	2 15/32	19/64	3/32	3 3/8	1 1/8	3 7/32	7/64	3/16	3 25/32	9/16	2.43	
55mm	ER-211TMC	100mm	57	35	25	69	8	2	92	30	90	3	7	106	14	1.40	
		3.937	2 1/4	1 3/8	31/32	2 23/32	19/64	3/32	3 5/8	1 3/16	3 35/64	1/8	9/32	4 3/16	9/16	3.00	
60mm	ER-212TMC	110mm	67	41	26	76	8	2	107	32	100	3	10	116	17	1.80	
		4.3307	2 5/8	1 5/8	1 1/32	2 63/64	19/64	3/32	4 1/8	1 1/4	3 29/32	1/8	3/8	4 37/64	11/16	4.00	

Note: ERX-Treme options available on an MTO basis. Please contact Application Engineering at (219) 465-2211 for availability.

*Optional*

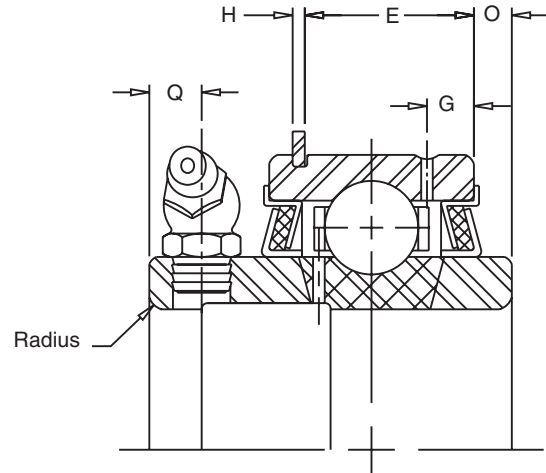
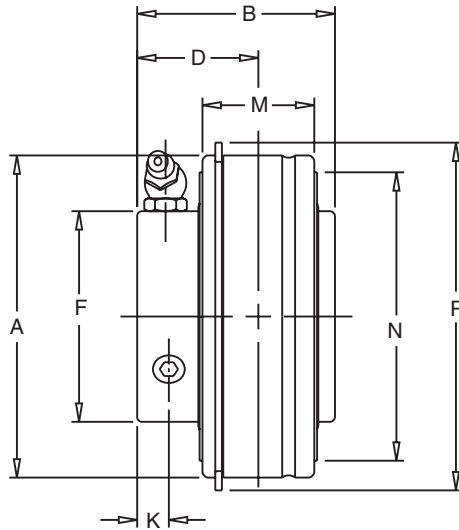


Felt Seals Optional.  
To specify, remove C suffix, as ER-204TM.  
Consult Sealmaster for availability.





## ERX-Treme RL Relube Bearing Assemblies



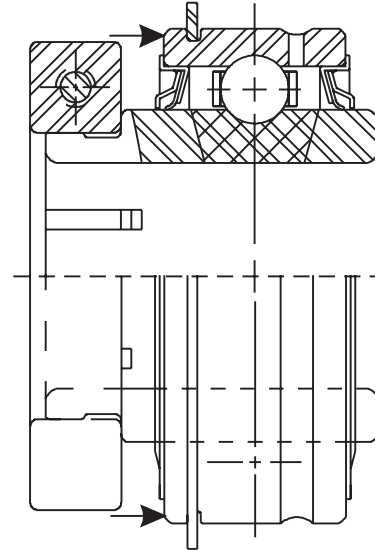
### Setscrew

Shaft Dia. in	Standard Description	ERX Description	Dimensions in Millimeters / Inches										Weight in Kilograms / Pounds					Unit Wt.
			A	B	D	E	F	G	H	K	M	N	Rad.	O	P	Q		
1/2	ER-8	ERX-8 RL	47mm 1.8504	1 1/4	13/16	31/64	1 3/16	1/8	3/64	3/16	5/8	1 5/8	3/64	3/32	2 3/64	3/16	0.56	
5/8	ER-10	ERX-10 RL	52mm 2.0472	1 3/8	7/8	39/64	1 3/8	13/64	3/64	7/32	3/4	1 27/32	1/16	9/64	2 1/4	3/16	368	
3/4	ER-12	ERX-12 RL																
7/8	ER-14	ERX-14 RL																
15/16	ER-15	ERX-15 RL	62mm 2.4409	1 9/16	15/16	11/16	1 19/32	7/32	1/16	7/32	7/8	2 11/64	5/64	3/16	2 5/8	13/64	0.93	
1	ER-16	ERX-16 RL																
1 1/8	ER-18	ERX-18 RL	72mm 2.8346	1 5/8	1	3/4	1 27/32	7/32	1/16	1/4	15/16	2 17/32	5/64	7/32	3 3/64	3/16	1.37	
1 3/8	ER-19	ERX-19 RL																
1 1/4	ER-20	ERX-20 RL	80mm 3.1496	1 15/16	1 3/16	29/32	2 1/16	1/4	1/16	5/16	1 3/32	2 53/64	3/32	13/64	3 23/64	9/32	2	
1 3/8	ER-22	ERX-22 RL																
1 7/16	ER-23	ERX-23 RL																
1 1/2	ER-24	ERX-24 RL	85mm 3.3465	1 15/16	1 3/16	29/32	2 19/64	1/4	1/16	5/16	1 3/32	3 3/64	3/32	13/64	3 35/64	9/32	2.31	
1 9/16	ER-25	ERX-25 RL																
1 11/16	ER-27	ERX-27 RL	90mm 3.5433	2 1/32	1 9/32	29/32	2 15/32	19/64	3/32	3/8	1 1/8	3 7/32	7/64	3/16	3 3/4	5/16	2.43	
1 3/4	ER-28	ERX-28 RL																
1 7/8	ER-30	ERX-30 RL																
1 15/16	ER-31	ERX-31 RL	100mm 3.937	2 3/16	1 5/16	31/32	2 45/64	19/64	3/32	3/8	1 3/16	3 35/64	1/8	9/32	4 9/64	5/16	3	
2	ER-32	ERX-32 RL																
2 3/16	ER-35	ERX-35 RL																
2 1/4	ER-36	ERX-36 RL	110mm 4.3307	2 9/16	1 9/16	1 1/32	2 63/64	19/64	3/32	7/16	1 1/4	3 29/32	1/8	3/8	4 17/32	3/8	4	
2 3/8	ER-38	ERX-38 RL																
2 7/16	ER-39	ERX-39 RL																

## Housing Installation

The ER insert should be pressed into a housing (not provided with the insert). We recommend machining the housing ID to the dimensions called out in the table below. When installing into the housing pressure should be applied only to the face of the **outer ring**. This avoids pushing the inner race into the rolling elements which creates excessive forces and can permanently indent the raceways.

For ER products (other than ERX-Treme Re-lube) if possible, machine a lubrication groove into the housing I.D. Sealmaster recommends drilling a hole into the housing to link the lubrication groove with a fitting or connector to allow for relubrication.



## Shaft Tolerancing

Shaft Size	Recommended Shaft Tolerances	
	Shaft Tolerance (in)	Shaft Tolerance (mm)
1/2 - 1 15/16 in	+0.0000 to -0.0005	
2 - 3 3/16 in	+0.0000 to -0.0010	
3 1/4 - 4 in	+0.0000 to -0.0015	
20 - 50 mm	+0.0000 to -0.0005	+0.0000 to -0.0127
55 - 80 mm	+0.0000 to -0.0010	+0.0000 to -0.0254

## Bore Tolerancing

Bore Size	Bore Tolerances	
	Bore Tolerance (in)	Bore Tolerance (mm)
1/2 - 1 1/4 in.	+0.0006 to -0.0000	
1 3/16 - 2 in.	+0.0007 to -0.0000	
2 1/4 - 3 in.	+0.0008 to -0.0000	
3 3/16 - 4 in.	+0.0009 to -0.0000	
20 - 30 mm	+0.0006 to -0.0000	+0.0152 to -0.0000
35 - 50 mm	+0.0007 to -0.0000	+0.0178 to -0.0000
55 - 75 mm	+0.0008 to -0.0000	+0.0203 to -0.0000
80 mm	+0.0009 to -0.0000	+0.0229 to -0.0000

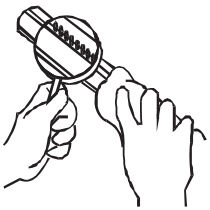

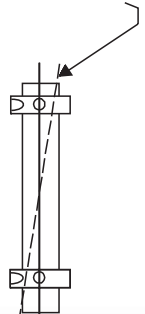
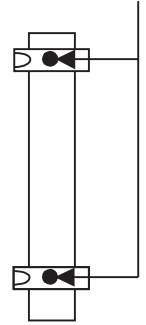
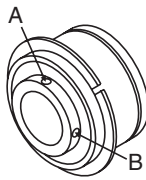
## Recommended Housing I.D.

Cartridge Number	Dimensions in mm / inches									
	O.D. Of Cartridge Diameters		Stationary Housing				Revolving Housing			
	Min.	Max.	Diameter		Theoretical Fit		Diameter		Theoretical Fit	
ER-8 thru	46.9875	47.0002	46.9976	47.0129	0.0025	0.0254	46.9849	47.0002	0.0152	0.0127
ER-12T, ER-204	1.8499	1.8504	1.8503	1.8509	0.0001	0.0010	1.8498	1.8504	0.0006	0.0005
ER-14 thru	51.9836	51.9989	51.9963	52.0090	0.0025	0.0254	51.9836	51.9963	0.0152	0.0127
ER-16T, ER-205	2.0466	2.0472	2.0471	2.0476	0.0001	0.0010	2.0466	2.0471	0.0006	0.0005
ER-17 thru	61.9836	61.9989	61.9963	62.0090	0.0025	0.0254	61.9836	61.9963	0.0152	0.0127
ER-19T, ER-206	2.4403	2.4409	2.4408	2.4413	0.0001	0.0010	2.4403	2.4408	0.0006	0.0005
ER-20 thru	71.9836	71.9988	71.9963	72.0090	0.0025	0.0254	71.9836	71.9963	0.0152	0.0127
ER-23T, ER-207	2.8340	2.8346	2.8345	2.8350	0.0001	0.0010	2.8340	2.8345	0.0006	0.0005
ER-24, ER-24T	79.9846	79.9998	79.9973	80.0100	0.0025	0.0254	79.9846	79.9973	0.0152	0.0127
ER-25, ER-208	3.1490	3.1496	3.1495	3.1500	0.0001	0.0010	3.1490	3.1495	0.0006	0.0005
ER-26 thru	84.9808	85.0011	84.9986	85.0138	0.0025	0.0330	84.9833	84.9986	0.0178	0.0178
ER-28T, ER-209	3.3457	3.3465	3.3464	3.3470	0.0001	0.0013	3.3458	3.3464	0.0007	0.0007
ER-30, ER-31	89.9795	89.9998	89.9973	90.0125	0.0025	0.0330	89.9820	89.9973	0.0178	0.0178
ER-31T, ER-210	3.5425	3.5433	3.5432	3.5438	0.0001	0.0013	3.5426	3.5432	0.0007	0.0007
ER-32 thru	99.9795	99.9998	99.9973	100.0125	0.0025	0.0330	99.9820	99.9973	0.0178	0.0178
ER-35T, ER-211	3.9362	3.9370	3.9369	3.9375	0.0001	0.0013	3.9363	3.9369	0.0007	0.0007
ER-36 thru	109.9795	109.9998	109.9972	110.0125	0.0025	0.0330	109.9820	109.9972	0.0178	0.0178
ER-39T, ER-212	4.3299	4.3307	4.3306	4.3312	0.0001	0.0013	4.3300	4.3306	0.0007	0.0007
ER-40	124.9756	125.0010	124.9959	125.0163	0.0051	0.0406	124.9782	124.9985	0.0229	0.0229
ER-43, ER-214	4.9203	4.9213	4.9211	4.9219	0.0002	0.0016	4.9204	4.9212	0.0009	0.0009
ER-46	129.9743	129.9997	129.9947	130.0150	0.0051	0.0406	129.9769	129.9972	0.0229	0.0229
ER-47, ER-215	5.1171	5.1181	5.1179	5.1187	0.0002	0.0016	5.1172	5.1180	0.0009	0.0009
ER-48	139.9743	139.9997	139.9946	140.0150	0.0051	0.0406	139.9769	139.9972	0.0229	0.0229
ER-51, ER-216	5.5108	5.5118	5.5116	5.5124	0.0002	0.0016	5.5109	5.5117	0.0009	0.0009
ER-52, ER-54	149.9743	149.9997	149.9946	150.0149	0.0051	0.0406	149.9768	149.9972	0.0229	0.0229
ER-55	5.9045	5.9055	5.9053	5.9061	0.0002	0.0016	5.9046	5.9054	0.0009	0.0009
ER-63, ER-64	189.9691	189.9996	189.9945	190.0301	0.0051	0.0610	189.9691	190.0047	0.0305	0.0356
	7.4791	7.4803	7.4801	7.4815	0.0002	0.0024	7.4791	7.4805	0.0012	0.0014

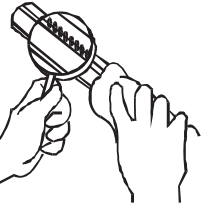

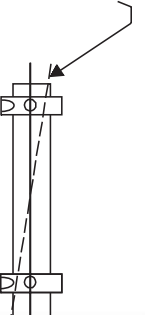
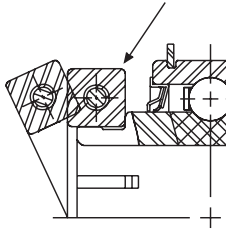

## Shaft Mounting Installation Procedures for Ball Bearings



Note: Setscrew marks on the shaft can be removed by backing out the setscrews and using a flat punch to tap down the set screw burrs on the shaft.

### Setscrew Locking:

<p><b>1 Inspect Shaft</b></p> <ul style="list-style-type: none"> <li>• Clean/remove burrs</li> <li>• Check diameter. See page 18.</li> <li>• Clean mounting surface</li> </ul> 	<p><b>2 Place Bearing On Shaft</b></p> <ul style="list-style-type: none"> <li>• Apply light film of oil on shaft.</li> <li>• Slide, do not hammer, bearing onto shaft.</li> </ul> 	<p><b>3 Check Alignment</b></p> <ul style="list-style-type: none"> <li>• Bearing and shaft must be in alignment.</li> <li>• Rotate shaft to make sure it turns smoothly.</li> </ul> 	<p><b>4 Setscrews Alignment</b></p> <ul style="list-style-type: none"> <li>• Align setscrews on both bearings in line.</li> </ul> 	<p><b>5 Alternate Torquing of Setscrews</b></p> <ul style="list-style-type: none"> <li>• Step 1: Torque setscrew "A" to 1/2 recommended torque.</li> <li>• Step 2: Torque setscrew "B" to full recommended torque.</li> <li>• Step 3: Torque setscrew "A" to full recommended torque. See page 23.</li> </ul> 
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### Skwezloc Locking Collar:

<p><b>1 Inspect Shaft</b></p> <ul style="list-style-type: none"> <li>• Clean/remove burrs</li> <li>• Check diameter. See page 18.</li> <li>• Clean mounting surface</li> </ul> 	<p><b>2 Place Bearing On Shaft</b></p> <ul style="list-style-type: none"> <li>• Slide, do not hammer, bearing onto shaft.</li> </ul> 	<p><b>3 Check Alignment</b></p> <ul style="list-style-type: none"> <li>• Bearing and shaft must be in alignment.</li> <li>• Rotate shaft to make sure it turns smoothly.</li> </ul> 	<p><b>4 Hold Locking Collar Tightly Against Inner Ring Shoulder</b></p> 	<p><b>5 Tighten Capscrew to Recommended Value</b></p>  <p>Capscrew</p>
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	<p><b>⚠ WARNING</b></p> <p>High voltage and rotating parts may cause serious or fatal injury.</p> <p>Turn off power to install or service.</p> <p>Operate with guards in place.</p> <p>Read and follow all instructions.</p>	
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## Relubrication

ER and ERX bearing inserts are shipped with high quality lubricants in the bearing. Periodic relubrication of fresh lubricant will help flush out contaminants, replenish lubrication, and extend useful bearing operating life. The following recommendations detail the type of lubricant and relubrication frequency for each specific ER and ERX design.

## Relubrication Ports of Entry

### *Standard Gold Line ER*

### *ERX Lo Drag and X-Tra Lo Drag*

### *ERX CRES*

### *ERX HI Temperature*

The above units are designed with a relubrication groove in the outer race OD. Relubrication of these bearings requires a passage from a fitting or connector on the machine to the ER lubrication groove.

### *ERX Re-Lube*

ERX Re-lube bearings can be relubricated through the fitting mounted on the inner race extension. This is the only ER bearing in the family that already has a relubrication device built into the bearing. This bearing should only be applied in applications where the shaft and inner ring do not rotate (dead shaft).

### Special Relubrication Instructions for ERX Lo Drag and ERX X-Tra Lo Drag



These bearings are specially designed for applications which require the bearing to rotate with less torque or drag than a standard bearing.

**Note: Addition of lubricant to the bearing will increase bearing drag.**

If relubrication is necessary:

1. Add a very small amount of lubricant.
2. Check bearing rotational torque.  
(be sure that the bearing still rotates freely enough for the application.)



### Recommended Relube Intervals Standard Gold Line ER, ERX-T Lo Drag, ERX Corrosion Resistant, ERX Re-Lube






Speed	Operating Temperature	Cleanliness	Grease Interval
100 rpm	-20° up to 120° F	Clean, Dry	6-12 Months
500 rpm	120° to 150° F	Clean, Dry	2-6 Months
1000 rpm	150° to 210° F	Clean, Dry	2 Weeks to 2 Months
1500 rpm	Over 210° to 250° F	Clean, Dry	Daily to Weekly
1500 to Max. Catalog	-20° to 150° F	Lightly Contaminated, Humid	1 Week to 1 Month
1500 to Max. Catalog	150° to 250° F	Contaminated, Some Moisture	Daily to 2 Weeks
1500 to Max. Catalog	-20° to 250° F	Heavily Contaminated, Wet	Daily to 2 Weeks

Note: Actual performance and specific applications will dictate the required re-lube interval for all ER and ERX bearings.

## Recommended Lubricant Specifications

ERX Lo Drag 		X-Tra Lo Drag 	
Thickener	Sodium Complex	Thickener	NA
NLGI	#3	NLGI	NA
Oil	Petroleum	Oil	Petroleum
Oil Viscosity	285-350 SUS @100° F 60-75 cSt @40° C	Oil Viscosity	120-165 SUS @100° F 25-35 cSt @40° C
Frequency	See Special Inst. Pg 20	Frequency	Daily

ERX Re-Lube and Standard Gold Line 		ERX CRES Food Grade Grease 	
Thickener	Lithium or Lithium Complex	Thickener	Aluminum Complex
NLGI	#2	NLGI	#2
Oil	Petroleum	Oil	Mineral
Oil Viscosity	700-1200 SUS @100 F 150-260 cSt @40 C	Oil Viscosity	1800-2200 SUS @100° F 400-500 cSt @40° C
Frequency	See Page 20	Frequency	See Page 20

ERX HI Temp 		*No substitute - mixing with other lubricants can seriously compromise bearing performance. Contact Sealmaster Engineering for further information.
* Grease	Krytox GPL 226	
Frequency	See Page 20	

Sealmaster Mounted Ball Bearing Relubrication Chart			
Speed	Operating Temperature	Cleanliness	Greasing Intervals
100 rpm	-20°F to 120°F	Clean, Dry	6 -12 Months
500 rpm	120°F to 150°F	Clean, Dry	2 - 6 Months
1000 rpm	150°F to 210°F	Clean, Dry	Weekly to Monthly
1500 rpm	210° to 250°F	Clean, Dry	Daily to Weekly
1500 to Max. Catalog Rating	-20°F to 150°F	Lightly contaminated, Humid	Weekly to Monthly
	150°F - 250°F	Contaminated, Some Moisture	Daily to Weekly
	-20°F to 250°F	Heavily Contaminated, Wet	Daily to Weekly

## ERX Bearing Max. Speeds

Shaft Size	LO	XLO	HI, HIY	PN
1/2	5000	2900	3200	3000
5/8				
11/16				
3/4	5000	2500	2750	2650
7/8				
15/16				
1	4300	2150	2350	2300
1 1/8				
1 3/16				
1 1/4R	3700	1850	2000	2000
1 1/4				
1 5/16				
1 3/8	3300	1650	1800	1750
1 7/16				
1 1/2				
1 9/16	3000	1500	1650	1600
1 5/8				
1 11/16				
1 3/4	2800	1400	1550	1500
1 13/16				
1 7/8				
1 15/16	2500	1250	1400	1350
2R				
2				
2 1/8	2300	1150	1250	1200
2 3/16				
2 1/4				
2 3/8	n/a	n/a	1100	n/a
2 7/16				
2 1/2				
2 11/16	1900	950	1050	n/a
2 7/8				
2 15/16				
3	n/a	n/a	950	n/a
3 3/16				
3 1/4				
3 3/8	n/a	n/a	900	n/a
3 7/16				
3 15/16				
4	n/a	n/a	700	n/a

For standard ER bearings refer to rating tables on pages 24 and 25.

Note: Table assumes that bearings are operating at room temperature. Contact Application Engineering for more information, 219-465-2211.

**Note: Depending on your requirements - you may not have to relubricate ERX-HI temperature bearings.**

Temperature Limitations (F°)	
HI, HIY	200 to 400
LO	-20 to 180
XLO	-20 to 180
RL	-40 to 200
PN	-20 to 200
TMC	-20 to 200

## Optional Expansion Type for HI Temp

Expansion bearings allow for linear shaft expansion or contraction caused by temperature variations. Without this expansion capability, bearings may be subjected to excessive thrust loads and misalignment which could damage the bearing, mounting surfaces, and frameworks.

The ERX-Treme HI Temp bearing can be specified to accommodate shaft expansion. To specify, attach HIY to ERX size: ERX-16 HIY. This will include a half-dog setscrew and wire assembly with the unit. This is strictly an MTO item with approximately 2 week delivery lead time.

**Notes:**

- When using an expansion bearing, always use a fixed bearing as the second support bearing.
- Half-dog setscrew and lock wire bearings are also available for the entire Sealmaster Mounted Ball Bearing Gold Line.
- Half-dog setscrew and lock wire systems are not recommended for high speed or vibration applications. Sealmaster Application Engineering can be contacted for specifics.

A half-dog setscrew and lock wire shaft locking system positively locks the shaft to the inner race while maintaining rotation and allowing for shaft expansion or contraction. The entire system is composed of three main components:

1. Half-dog setscrew - this is a setscrew with a cylindrical nub.
2. Shaft slot - one slot must be machined into the shaft by the user. The half-dog setscrew's nub engages with the shaft slot for a positive lock with the inner race to support rotation.
3. Lock wire - this resides in a groove on the O.D. of the inner race that is in alignment with the slot on the top on the half-dog setscrew. It prevents the half-dog setscrew from backing out.

Only one half-dog setscrew should be used in this arrangement. No other setscrew should be installed. The half-dog setscrew's nub is engaged within the shaft slot, but not tightened into the shaft.

When shafting is heated, it grows longer. This growth in shaft length is particularly problematic when shafts are long and temperature differentials are large.

The difference in linear expansion between the shaft (shaft length between bearing centers) and the bearing mounting structure must be taken in consideration in high temperature applications. For example, in the case where the shaft, bearings and bearing support structure are all in a heated environment, the effect of thermal expansion on the bearings can be insignificant (assuming that all components are made of steel).

The shaft expansion concern arises when the shaft is in a heated environment but the bearings and bearing support structure are not. In this case the slot length in the shaft should be machined so as to accommodate the amount of linear shaft expansion. Calculate the minimum slot length ( $\Delta L$ ) as follows:

$$\Delta L = \alpha \cdot X \cdot \Delta \text{TEMP}_{\text{sys}}$$

where:

- $\Delta L$  = differential linear expansion (inches)
- $\alpha$  = coefficient of thermal expansion (inch/inch/°F)  
 ( $\alpha = 7 \times 10^{-6}$  inch/inch/°F for most carbon steel shafting)  
 ( $\alpha = 1 \times 10^{-5}$  inch/inch/°F for most stainless steel shafting)
- $X$  = length of shaft (inches)
- $\Delta \text{TEMP}_{\text{sys}}$  = operating shaft temperature (°F) - installed shaft temperature (°F)



### Shaft Slot Dimensions

Bore Sizes	Slot Width (C)	Min. Slot Depth (B)	Point Dia. (P)
1/2 to 1/4R	13/64	3/32	5/32
1 1/4 to 1 3/4	9/32	3/32	13/64
1 7/8 to 2 7/16	21/64	1/8	1/4
2 1/2 to 3 7/16	21/64	1/8	19/64
3 15/16 to 4	33/64	3/16	15/32

## Setscrew and Capscrew Information

Standard Duty			Setscrew and Capscrew Information											
Shaft Size	Std. Brg. No.	ERX Brg. No.	Setscrew Locking				ERX-PN Setscrew Locking			Skwezloc Locking				
			Thread	Hex Size	Tighten to (In.-Lbs.)	Tighten to (Ft.-Lbs.)	Thread	Hex Size	Torque PN Gold (In.-Lbs.)	Thread	Bore Size	Tighten to (In.-Lbs.)	Tighten to (Ft.-Lbs.)	* Tighten to N-M
1/2 9/16 5/8 11/16 3/4 20 mm	ER-8 ER-9 ER-10 ER-11 ER-12 ER-204	ERX-8  ERX-10  ERX-12	1/4 - 28	1/8	65 - 85	6 - 7	1/4 - 28	1/8	35 - 45	8 - 32 *M4x16mm	T-25	65 - 70	5 - 6	7 - 8
13/16 7/8 15/16 25 mm 1	ER-13 ER-14 ER-15 ER-205 ER-16	ERX-14 ERX-15 ERX-16	1/4 - 28	1/8	65 - 85	6 - 7	1/4 - 28	1/8	35 - 45	8 - 32 *M4x16mm	T-25	65 - 70	5 - 6	7 - 8
1 1/16 1 1/8 1 3/16 30 mm 1 1/4R	ER-17 ER-18 ER-19 ER-206 ER-20R	ERX-18 ERX-19 ERX-20R	1/4 - 28	1/8	65 - 85	6 - 7	1/4 - 28	1/8	35 - 45	8 - 32 *M4x16mm	T-25	65 - 70	5 - 6	7 - 8
1 1/4 1 5/16 1 3/8 35 mm 1 7/16	ER-20 ER-21 ER-22 ER-207 ER-23	ERX-20 ERX-22 ERX-23	5/16 - 24	5/32	125 - 165	11 - 13	5/16 - 24	5/32	75 - 100	10 - 24 *M5x20mm	T-27	90 - 100	7 - 8	10 - 11
1 1/2 1 9/16 40 mm	ER-24 ER-25 ER-208	ERX-24 ERX-25	5/16 - 24	5/32	125 - 165	11 - 13	5/16	5/32	75 - 100	10 - 24 *M5x20mm	T-27	90 - 100	7 - 8	10 - 11
1 5/8 1 11/16 1 3/4 45 mm	ER-26 ER-27 ER-28 ER-209	ERX-27 ERX-28	5/16 - 24	5/32	125 - 165	11 - 13	5/16 - 24	5/32	75 - 100	10 - 24 *M5x20mm	T-27	90 - 100	7 - 8	10 - 11
1 13/16 1 7/8 1 15/16 50 mm 2R	ER-29 ER-30 ER-31 ER-210 ER-32R	ERX-30 ERX-31 ERX-32R	3/8 - 24	3/16	225 - 300	19 - 25	3/8 - 24	3/16	125 - 145	1/4 - 20 *M6x25mm	T-30	220 - 240	19 - 20	25 - 27
2 2 1/8 55 mm 2 3/16	ER-32 ER-34 ER-211 ER-35	ERX-32 ERX-35	3/8 - 24	3/16	225 - 300	19 - 25	3/8 - 24	3/16	125 - 145	1/4 - 20 *M6x25mm	T-30	220 - 240	19 - 20	25 - 27
2 1/4 2 5/16 60 mm 2 3/8 2 7/16	ER-36 ER-37 ER-212 ER-38 ER-39	ERX-36 ERX-38 ERX-39	3/8 - 24	3/16	225 - 300	19 - 25	3/8 - 24	3/16	125 - 145	1/4 - 20 *M6x25mm	T-45	450 - 495	38 - 41	51 - 56
2 1/2 2 11/16 70 mm	ER-40 ER-43 ER-214	ERX-40 ERX-43	7/16 - 20	7/32	350 - 450	30 - 37	7/16 - 20	7/32	130 - 160	-	-	-	-	-
2 7/8 2 15/16 75 mm	ER-46 ER-47 ER-215	ERX-47	7/16 - 20	7/32	350 - 450	30 - 37	7/16 - 20	7/32	130 - 160	-	-	-	-	-
3 80 mm 3 3/16	ER-48 ER-216 ER-51	ERX-48 ERX-51	7/16 - 20	7/32	350 - 450	30 - 37	7/16 - 20	7/32	130 - 160	-	-	-	-	-
3 1/4 3 3/8 3 7/16	ER-52 ER-54 ER-55		7/16 - 20	7/32	350 - 450	30 - 37	7/16 - 20	7/32	130 - 160	-	-	-	-	-
3 1/2 90 mm	ER-56 ER-218		1/2 - 20	1/4	500 - 650	42 - 54	-	-	-	-	-	-	-	-
3 15/16 4	ER-63 ER-64		5/8 - 18	5/16	1100 - 1400	92 - 117	-	-	-	-	-	-	-	-

\* Applicable to Metric-Skwez only.





# Metric Rating Tables



This chart displays load capacity in newtons for a given L10 life, speed and shaft size. The shaded areas indicate the maximum speed ratings for the optional felt seal only. The values in the table represent loads at ideal conditions with press fit mounting to the shaft. ABMA recommends de-rating slip-fit bearings by dividing load by 1.3. The values in the table represent equivalent radial loads only. For combined radial and thrust load, the equivalent radial load must be calculated before applying the load in the table.

Normal Duty				Revolutions Per Minute (rpm)																
Shaft Size	ERX Description	BDR Newtons	L10 hrs	50	150	500	1000	1750	2000	2500	3000	3500	4500	5000	5500	6000	6500	7500	10000	
20mm	ER-204TM	11614	10000	2903	2592	1735	1377	1143	1093	1015	955	907	834	805	780	758	738	703	639	
			30000	2592	1797	1203	955	792	758	703	662	629	578	558	541	525	512	488	443	
			50000	2186	1516	1015	805	668	639	593	558	530	488	471	456	443	431	411	374	
			100000	1735	1203	805	639	530	507	471	443	421	387	374	362	352	342	327	297	
25mm	ER-205TM	12459	10000	3114	2780	1861	1477	1226	1172	1088	1024	973	895	864	837	813	792	755		
			30000	2780	1928	1290	1024	850	813	755	710	675	620	599	580	564	549	523		
			50000	2345	1626	1088	864	717	686	637	599	569	523	505	489	475	463	441		
			100000	1861	1290	864	686	569	544	505	475	452	415	401	388	377	367	350		
30mm	ER-206TM	19487	10000	4871	4348	2911	2310	1917	1834	1702	1602	1522	1399	1351	1309	1271	1238	1180		
			30000	4348	3015	2018	1602	1329	1271	1180	1111	1055	970	937	908	882	858	818		
			50000	3668	2543	1702	1351	1121	1072	996	937	890	818	790	765	744	724	690		
			100000	2911	2018	1351	1072	890	851	790	744	706	650	627	608	590	575	548		
35mm	ER-207TM	25719	10000	6429	5739	3842	3049	2530	2420	2247	2114	2008	1847	1783	1728	1678	1634			
			30000	5739	3979	2664	2114	1755	1678	1558	1466	1393	1281	1236	1198	1164	1133			
			50000	4841	3356	2247	1783	1480	1415	1314	1236	1175	1080	1043	1010	981	956			
			100000	3842	2664	1783	1415	1175	1123	1043	981	932	857	828	802	779	758			
40mm	ER-208TM	32649	10000	8162	7285	4877	3871	3212	3072	2852	2684	2550	2345	2264	2193					
			30000	7285	5051	3382	2684	2227	2130	1978	1861	1768	1626	1570	1521					
			50000	6145	4261	2852	2264	1879	1797	1668	1570	1491	1371	1324	1282					
			100000	4877	3382	2264	1797	1491	1426	1324	1246	1183	1088	1051	1018					
45mm	ER-209TM	35145	10000	8786	7842	5250	4167	3458	3307	3070	2889	2744	2524	2437						
			30000	7842	5438	3640	2889	2398	2293	2129	2003	1903	1750	1690						
			50000	6615	4586	3070	2437	2022	1934	1795	1690	1605	1476	1425						
			100000	5250	3640	2437	1934	1605	1535	1425	1341	1274	1172	1131						
50mm	ER-210TM	35092	10000	8773	7831	5242	4161	3453	3302	3066	2885	2740	2520	2433						
			30000	7831	5429	3635	2885	2394	2290	2126	2000	1900	1747	1687						
			50000	6605	4579	3066	2433	2019	1931	1793	1687	1603	1474	1423						
			100000	5242	3635	2433	1931	1603	1533	1423	1339	1272	1170	1129						
55mm	ER-211TM	43379	10000	10844	9680	6480	5143	4268	4082	3790	3566	3387	3115							
			30000	9680	6712	4493	3566	2959	2830	2628	2473	2349	2160							
			50000	8164	5661	3790	3008	2496	2387	2216	2085	1981	1822							
			100000	6480	4493	3008	2387	1981	1895	1759	1655	1572	1446							
60mm	ER-212TM	52440	10000	13110	11702	7834	6217	5159	4935	4581	4311	4095								
			30000	11702	8114	5431	4311	3577	3422	3176	2989	2839								
			50000	9870	6843	4581	3636	3017	2886	2679	2521	2395								
			100000	7834	5431	3636	2886	2395	2291	2126	2001	1901								

This table displays load in newtons.

All sales are made on our STANDARD TERMS AND CONDITIONS OF SALE in effect at the time a customer's order is accepted. The current Terms and Conditions are set forth below:

### STANDARD TERMS AND CONDITIONS OF SALE (August 15, 2001)

These Terms and Conditions, the attendant quotation or acknowledgment and all documents incorporated by specific reference therein, will be the complete and exclusive statement of the terms of the agreement governing the sale of goods ("Goods") by **Emerson Power Transmission Corporation** and its divisions and subsidiaries ("Seller") to Customer ("Buyer"). Buyer's acceptance of the Goods will manifest Buyer's assent to these Terms and Conditions. If these Terms and Conditions differ in any way from the terms and conditions of Buyer's order, or other documentation, this document will be construed as a counteroffer and will not be deemed an acceptance of Buyer's terms and conditions which conflict herewith.

1. **PRICES:** Unless otherwise specified in writing by Seller, Seller's price for the goods shall remain in effect for thirty (30) days after the date of Seller's quotation or acknowledgment of Buyer's order for the Goods, whichever occurs first, provided an unconditional, complete authorization for the immediate shipment of the Goods is received and accepted by Seller within such time period. If such authorization is not received by Seller within such thirty (30) day period, Seller shall have the right to change the price for the Good to Seller's price for the Goods at the time of shipment.

2. **TAXES:** Any tax or governmental charge or increase in same hereafter becoming effective increasing the cost to Seller of producing, selling or delivering the Goods or of procuring material used therein, and any tax now in effect or increase in same payable by the Seller because of the manufacture, sale or delivery of the Goods, may at Seller's option, be added to the price.

3. **TERMS OF PAYMENT:** Subject to the approval of Seller's Credit Department, terms are net thirty (30) days from date of Seller's invoice in U.S. currency. If any payment owed to Seller is not paid when due, it shall bear interest, at a rate to be determined by Seller, which shall not exceed the maximum rate permitted by law, from the date on which it is due until it is paid. Seller shall have the right, among other remedies, either to terminate the Agreement or to suspend further performance under this and/or other agreements with Buyer in the event Buyer fails to make any payment when due. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts.

4. **SHIPMENT AND DELIVERY:** Shipments are made F.O.B. Seller's shipping point. Any claims for shortages or damages suffered in transit shall be submitted by the Buyer directly to the carrier. While Seller will use all reasonable commercial efforts to maintain the delivery date acknowledged or quoted by Seller, all shipping dates are approximate. Seller reserves the right to make partial shipments and to segregate "specials" and made-to-order Goods from normal stock Goods. Seller shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions.

5. **QUANTITY:** Buyer agrees to accept overruns of up to ten percent (10%) of the order on "made-to-order" Goods, including parts. Any such additional items shall be priced at the price per item charged for the specific quantity ordered.

6. **LIMITED WARRANTY:** Subject to the limitations of Section 7, Seller warrants that the Goods will be free from defects in material and workmanship under normal use, service and maintenance for a period of one year (unless otherwise specified by Seller in writing) from the date of shipment of the Goods by Seller. **THIS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SELLER WITH RESPECT TO THE GOODS AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE.**

This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, unauthorized modification or alteration, use beyond rated capacity, or improper installation, maintenance or application. To the extent that Buyer or its agents has supplied specifications, information, representation of operating conditions or other data to Seller in the selection or design of the Goods and the preparation of Seller's quotation, and in the event that actual operating conditions or other conditions differ from those represented by Buyer, any warranties or other provisions contained herein which are affected by such conditions shall be null and void. If within thirty (30) days after Buyer's discovery of any warranty defects within the warranty period, Buyer notifies Seller thereof in writing, Seller shall, at its option, repair or replace F.O.B. point of manufacture, or refund the purchase price for that portion of the goods found by Seller to be defective. Failure by Buyer to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of Buyer's claim for such defects. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. Buyer assumes all other responsibility for any loss, damage, or injury to persons or property arising out of, connected with, or resulting from the use of Goods, either alone or in combination with other products/components.

**SECTIONS 6 AND 7 APPLY TO ANY ENTITY OR PERSON WHO MAY BUY, ACQUIRE OR USE SELLER'S GOODS, INCLUDING ANY ENTITY OR PERSON WHO BUYS THE GOODS FROM SELLER'S DISTRIBUTOR AND SUCH ENTITY OR PERSON SHALL BE BOUND BY THE LIMITATIONS THEREIN.**

7. **LIMITATION OF REMEDY AND LIABILITY: THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER (OTHER THAN THE WARRANTY PROVIDED UNDER SECTION 13) SHALL BE LIMITED TO REPAIR, REPLACEMENT OR REFUND OF THE PURCHASE PRICE UNDER SECTION 6. SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. THE TERM "CONSEQUENTIAL DAMAGES" SHALL INCLUDE, BUT NOT BE LIMITED TO, LOSS OF ANTICIPATED PROFITS, LOSS OF USE, LOSS OF REVENUE, COST OF CAPITAL AND DAMAGE OR LOSS OF OTHER PROPERTY OR EQUIPMENT.**

It is expressly understood that any technical advice furnished by Seller with respect to the use of the Goods is given without charge, and Seller assumes no obligation or liability for the advice given, or results obtained, all such advice being given and accepted at Buyer's risk.

**GOODS AND/OR SERVICES SOLD HEREUNDER ARE NOT FOR USE IN ANY NUCLEAR AND RELATED APPLICATIONS.** Buyer accepts goods and/or services with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchaser or users and to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

8. **EXCUSE OF PERFORMANCE:** Seller shall not be liable for delays in performance or for non-performance due to acts of God, acts of Buyer, war, riot, fire, flood, other severe weather, sabotage, or epidemics; strikes or labor disturbances; governmental requests, restrictions, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller's reasonable control. Deliveries may be suspended for an appropriate period of time as a result of the foregoing. If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes addressed in this Section 8, Seller may allocate its available supply of the Goods or such material (without obligation to acquire other supplies of any such Goods or material) among itself and its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom. Deliveries suspended or not made by reason of this section may be canceled by Seller upon notice to Buyer without liability, but the balance of the agreement shall otherwise remain unaffected.

9. **CANCELLATION:** The Buyer may cancel orders only upon written notice and upon payment to Seller of cancellation charges which include, among other things, all costs and expenses incurred and commitments made by the Seller and a reasonable profit thereon.

10. **CHANGES:** Buyer may request changes or additions to the Goods consistent with Seller's specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price and delivery schedule. Seller reserves the right to change designs and specifications for the Goods without prior notice to Buyer, except with respect to Goods being made-to-order for Buyer.

11. **TOOLING:** Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tooling. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interests in, or rights to possession or removal, nor prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

12. **ASSIGNMENT:** Buyer shall not assign its rights or delegate its duties hereunder or any interest therein or any rights hereunder without the prior written consent of the Seller, and any such assignment, without such consent, shall be void.

13. **PATENTS AND COPYRIGHTS:** Subject to Section 7, Seller warrants that the Goods sold, except as are made specifically for Buyer according to Buyer's specifications, do not infringe any valid U.S. patent or copyright in existence as of the date of delivery. This warranty is given upon the condition that Buyer promptly notify Seller of any claim or suit involving Buyer in which such infringement is alleged, and, that Buyer cooperate fully with Seller and permit Seller to control completely the defense or compromise of any such allegation of infringement. Seller's warranty as to use only applies to infringements arising solely out of the inherent operation (i) of such Goods, or (ii) of any combination of Goods in a system designed by Seller. In the event such Goods, singularly or in combination, are held to infringe a U.S. patent or copyright in such suit, and the use of such Goods is enjoined, or in the case of a compromise by Seller, Seller shall have the right, at its option and expense, to procure for Buyer the right to continue using such Goods, or replace them with non-infringing Goods; or modify same to become non-infringing; or grant Buyer a credit for the depreciated value of such Goods and accept return of them.

14. **MISCELLANEOUS:** These terms and conditions set forth the entire understanding and agreement between Seller and Buyer, and supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions of Sale shall be binding upon the Seller unless made in writing and signed on its behalf by an officer of the Seller. No conditions, usage or trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these Terms and Conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification shall be affected by the acceptance of purchase orders or shipping instruction forms containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected by Seller. No waiver by Seller with respect to any breach or default or any right or remedy and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. Seller is not responsible for typographical or clerical errors made in any quotation, orders or publications. All such errors are subject to correction. The validity, performance, and all other matters relating to the interpretation and effect of this contract shall be governed by the law of the state of New York. The United Nations Convention on the International Sale of Goods shall not apply to any transaction hereunder.



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The proper selection and application of power transmission products and components, including the related area of product safety, is the responsibility of the customer. Operating and performance requirements and potential associated issues will vary appreciably depending upon the use and application of such products and components. The scope of the technical and application information included in this publication is necessarily limited. Unusual operating environments and conditions, lubrication requirements, loading supports, and other factors can materially affect the application and operating results of the products and components and the customer should carefully review its requirements. Any technical advice or review furnished by Emerson Power Transmission Corporation and its divisions with respect to the use of products and components is given in good faith and without charge, and Emerson assumes no obligation or liability for the advice given, or results obtained, all such advice and review being given and accepted at customer's risk.

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