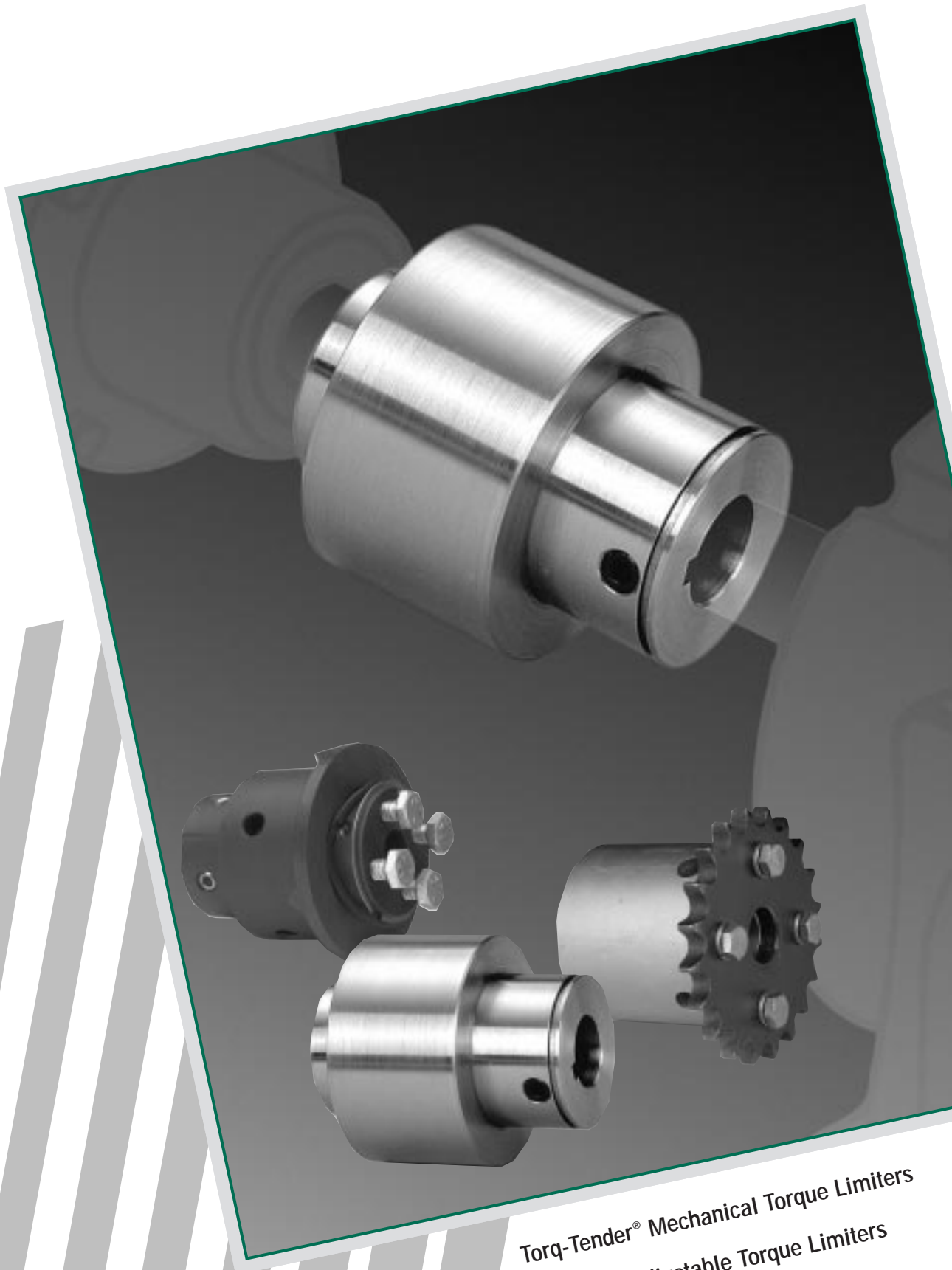


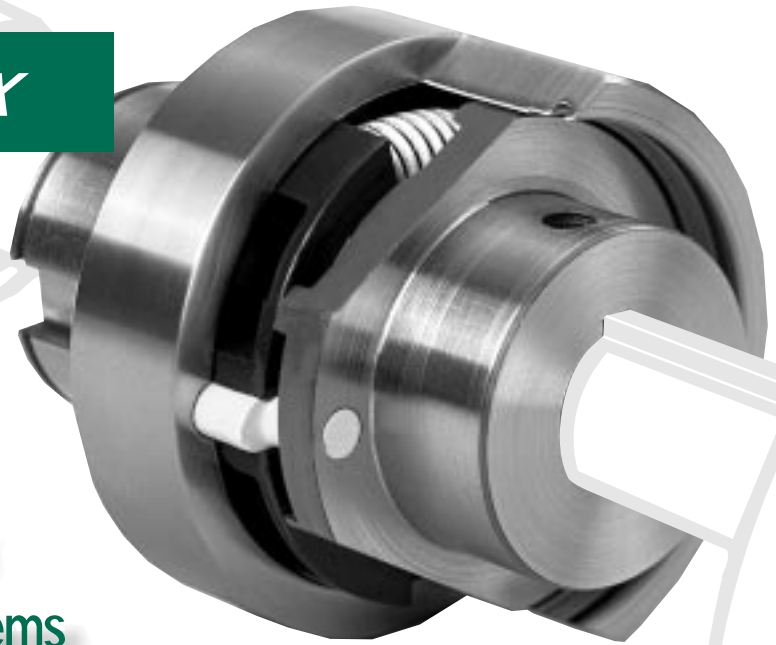
# **////// ZERO-MAX**



**Torq-Tender® Mechanical Torque Limiters**  
**H-TLC Adjustable Torque Limiters**

# /////// ZERO-MAX

## Torq-Tenders... For Accurate Overload Protection In Mechanical Power Transmission Systems



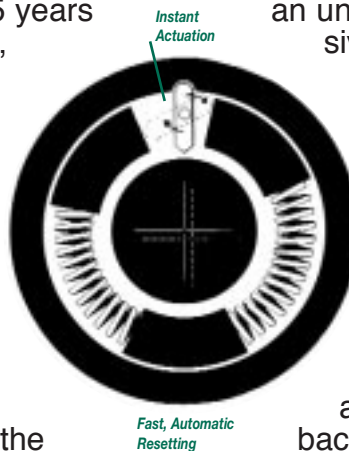
Torq-Tenders are positive drive couplings which provide accurate overload protection in many mechanical power transmission systems. When a jam-up or excess overload occurs, Torq-Tenders disengage motor drives. Their effective, versatile design—proven through 25 years of use—protect your drive train, motor and entire system.

What makes Torq-Tenders so foolproof? Their simple design concept and rugged quality! When load exceeds the rating determined by precision tempered torque springs, the unit's drive key pivots out of a slot to disengage the coupling. Once the overload is removed and speed reduced, the Torq-Tender resets itself automatically.

Steel springs within the unit force metal slides against each side of a hardened cast steel pawl, holding it rigid with one end seated in a detent on the outer drive housing.

During normal machine operation, power transfers into the central assembly through the rigidly held pawl and then rotates the outer drive housing and the driven shaft to which it is connected. If a jam-up or some other malfunction causes an unacceptable load to occur, excessive torque on the pawl overpowers the springs and the pawl rotates out of its detent. Thus, the central assembly is disconnected from the outer drive housing.

Once the overload is removed and speed reduced, the torque springs automatically expand to force the pawl back in its detent. This automatic resetting action engages your drive shaft and puts the entire drive system back into motion at its original angular position. Or, if you prefer, Torq-Tenders are available with precisely located multiple re-engagement points.



**TT1X**  
Page 6 & 7



3 to 60 Inch Lbs.  
Torque Rating

**TT2**  
Page 6 & 7



4 to 140 Inch Lbs.  
Torque Rating

**TT2X**  
Page 6 & 7



18 to 350 Inch Lbs.  
Torque Rating

**TT3**  
Page 6 & 7

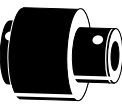


18 to 500 Inch Lbs.  
Torque Rating

**TT3X**  
Page 6 & 7



300 to 1500 Inch Lbs.  
Torque Rating



# Count these important Torq-Tender benefits:

**1 Dependability For Short And Long Term Savings.** Even after repeated overloads, Torq-Tenders continue to operate and protect. Once the overload is removed, Torq-Tenders automatically return to their original setting for continuing overload protection.

**5 Tamper-Resistant Design Has Reset Capability.** Once installed, torque ratings cannot be changed unless springs of a desired new rating are substituted. The change can be made easily and quickly. See page 5 for proper spring selection.

**2 Flexibility Of Application. You Can Install Zero-Max Torq-Tenders Just About Anywhere.** In dusty or oily atmospheres. In high humidity and salt water. They perform dependably for years. Special designs include stainless steel, plated and sealed models for unusual applications and use in most adverse operating conditions.

**3 Installation Is Fast And Easy.** Installs as easily as any simple coupling. Also has the advantage of handling up to 1.5 degrees misalignment and from .005" to .015" parallel misalignment.

**4 Bi-Directional And Uni-Directional Design.** Torq-Tenders have the ability to: (A) Release at the same torque in each direction, (B) Release at a different torque in each direction, or (C) Be a positive drive in either direction.



*Special Designs Available*

**TT4X**  
Page 6 & 7



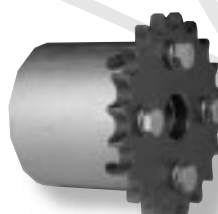
750 to 3000 Inch Lbs.  
Torque Rating

**SS Self Supporting**  
Page 7



Available In All  
Models Up To TT3

**JF-Type Face Mount**  
Page 7



Available In All  
Models

**Actuating Pin/Disc**  
Page 8 & 9



Available In All  
Models

**H-TLC Torque Limiters**  
Page 10 & 11



Two Models  
Available

# How To Select The Correct Torq-Tender

## 1. DETERMINE TORQUE:

Torque is a twisting force that causes rotation and can be theoretically determined with the use of this simple formula:

$$\text{Torque (in. lbs.)} = \frac{63,025 \times \text{HP}}{\text{RPM}}$$

For example, if your motor run speed is 100 RPM and its HP rating is 1.5, then:

$$T \text{ (in. lbs.)} = \frac{63,025 \times 1.5}{100}$$

Your theoretical torque = 945 in. lbs.

A torque rating just below 945 in. lbs. should be selected. However, this is only correct if the drive motor is the component which needs the overload protection. If, for example, there is a reducer in the system with a maximum input of 600 in. lbs. and the torque limiter is to be used as a coupling between the 1.5 HP motor and the reducer, the setting would then be under the 600 in. lbs. rating.

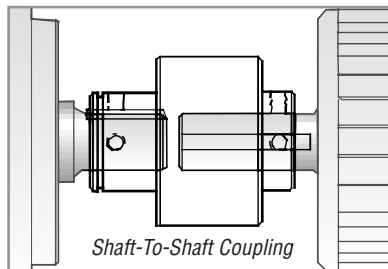
Consideration should also be given to potentially high start up torques in the drive system. Most electric motors have start up torques that exceed normal run torque, which makes it necessary to select a torque as high as possible without exceeding the protection limit.

**(CAUTION: Because of inertia and/or energy in power transfer equipment, torque limiters will not protect against personal injury).**

## 2. SELECT THE TYPE OF TORQ-TENDER:

### A. SHAFT-TO-SHAFT MOUNT - COUPLING TYPE

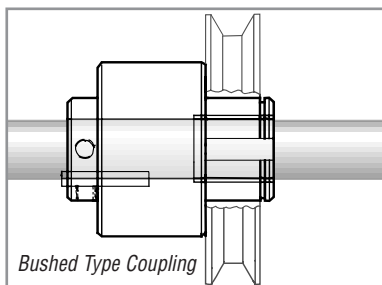
If you require a coupling type model, then the standard Torq-Tender should be used. To order, the size of each bore along with the required torque from the formula above is the only information required. Since Torq-Tenders are bi-directional, the input of the unit is not significant unless the unit is to be equipped with an actuating pin assembly (see page 8).



### B. THROUGH SHAFT MOUNT - BUSHED TYPE

To order, determine torque requirements from the formula above. Also note shaft diameter and length. To use the basic Torq-Tender with the bushing, you will need a shaft to extend through the complete unit. Your drive or driven component (pulley, sprocket, etc.) will be mounted on the long hub. Also, refer to the specific torque and dimensional information.

**(Note: external hub keyways and retaining rings are standard).**

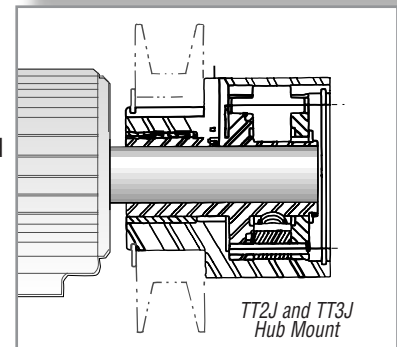
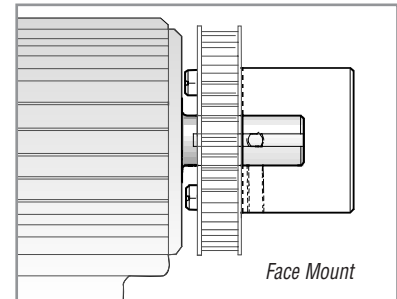


### C. END OF SHAFT MOUNT - INBOARD LOAD TYPE "JF" OR "J".

**(NOTE: Use with timing belt drives, V belt drives, type A or B sprocket).**

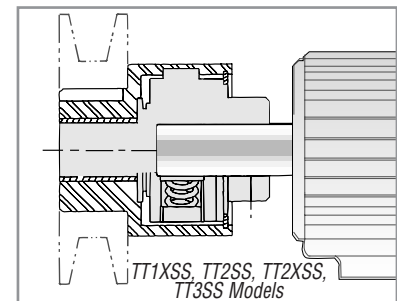
If your shaft is not long enough to extend through the entire length of the unit, the face mounted JF model is designed to

accept your component with minimal shaft length. This model is designed for motor shafts or gear reducer shafts where your sprocket, pulley, etc. is face mounted to the Torq-Tender with four bolts. This model supports itself with minimum overhung load and requires little modification to existing equipment. Offered as an option is the model "J". See page 7 for dimensional information.



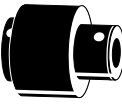
### D. END OF SHAFT MOUNT - OUTBOARD LOAD TYPE "SS"

In some applications your incoming drive shaft is not long enough to extend completely through the unit. There are four Torq-Tender models designed specifically for these situations where the unit must be "self-supporting". The shaded portion shown in the drawing above represents the Torq-Tender's one-piece drive shaft which works with a Bronze Bushing to support the outer housing.



## 3. SELECT SIZE (TT1X, TT2, ETC.) BASED ON SHAFT DIAMETER AND TORQUE REQUIRED. SEE ORDERING INFORMATION ON PAGE 5.





Torq Tender Models	TORQUE RANGE IN LBS.	SHORT HUB C BORE	LONG HUB F BORE	OILITE BUSHING	ACTUATING ASSEMBLY	SHIPPING WEIGHT LBS.
<b>TT1X</b>	3 to 60	1/4 (.250)	1/4 (.250)	Specify	Specify	1/2
		5/16 (.312)	5/16 (.312)			
		3/8 (.375)	3/8 (.375)			
		1/2 (.500)	1/2 (.500)			
<b>TT2</b>	4 to 140	3/8 (.375)	3/8 (.375)	Specify	Specify	1-1/4
		1/2 (.500)	1/2 (.500)			
		5/8 (.625)	5/8 (.625)			
<b>TT2X</b>	18 to 350	1/2 (.500)	1/2 (.500)	Specify	Specify	2-1/4
		5/8 (.625)	5/8 (.625)			
		3/4 (.750)	3/4 (.750)			
<b>TT3</b>	18 to 500	5/8 (.625)	5/8 (.625)	Specify	Specify	3-1/4
		3/4 (.750)	3/4 (.750)			
		7/8 (.875)	7/8 (.875)			
		1 (1.000)	1 (1.000)			
		1-1/8 (1.125)	1-1/8 (1.125)			
<b>TANDEM</b>	240 to 1000	5/8 (.625)	5/8 (.625)	Specify	Specify	5
		3/4 (.750)	3/4 (.750)			
		7/8 (.875)	7/8 (.875)			
		1 (1.000)	1 (1.000)			
		1-1/8 (1.125)	1-1/8 (1.125)			
<b>TT3X</b>	300 to 1500	7/8 (.875)	7/8 (.875)	Specify	Specify	8
		1 (1.000)	1 (1.000)			
		1-1/8 (1.125)	1-1/8 (1.125)			
		1-1/4 (1.250)	1-1/4 (1.250)			
		1-3/8 (1.375)	1-3/8 (1.375)			
<b>TT4X</b>	750 to 3000	1 (1.000)	1 (1.000)	Specify	Actuating Pin is supplied with unit.  Specify Disc option.	15
		1-1/8 (1.125)	1-1/8 (1.125)			
		1-1/4 (1.250)	1-1/4 (1.250)			
		1-3/8 (1.375)	1-3/8 (1.375)			
		1-1/2 (1.500)	1-1/2 (1.500)			
		1-5/8 (1.625)	1-5/8 (1.625)			
1-3/4 (1.750)	1-3/4 (1.750)					

### Inch Bores With Standard Keyways

Bore Size		Keyway
Over	To	
0.437	0.562	0.125 x 0.062
0.562	0.875	0.187 x 0.094
0.875	1.250	0.250 x 0.125
1.250	1.375	0.312 x 0.156
1.375	1.750	0.375 x 0.187

Standard inch keyways are for square keyways. Inch bores are supplied with inch size setscrews. Bores below .500, are supplied with only setscrews and no keyways.

### Metric Bores With Standard Keyways

Bore Size		Keyway
Over	To	
10	12	4 x 1.8
12	17	5 x 2.3
17	22	6 x 2.8
22	30	8 x 3.3
30	38	10 x 3.3
38	44	12 x 3.3
44	50	14 x 3.8

Metric bores are supplied with metric size setscrews.

For selection help, call  
**ZERO-MAX** today: 1-800-533-1731

Spring Color Code	TT-1X	TT-2	TT-2X	TT-3	TT-3X	TT-4X
Garden Green				18		
Gray			18	24		
Slicker Yellow			24			
Purple			28	36		
Copper		4		40		
Light Blue	3	8	40	50		
Gold	5		50	60		
Red	8	12	60	80		
Brown	10	18	90	100	300	750
Silver/Aluminum	12	25	100	120	400	1,000
Black	15	30	120	150	500	1,250
Almond	20	40	135	180	650	1,500
Orange	25	50	150	220	750	1,750
Med. Green	30	60	180	250	850	2,000
Yellow	40	85	200	300	1,000	2,250
Blue	50	100	250	350	1,150	2,500
No Color	60	125	300	420	1,300	2,750
White		140	350	500	1,500	3,000

Note: Dynamic Torque Ratings are shown in above chart. Static Ratings are higher. Call Zero-Max for more information.

### Ordering Torq-Tenders

Include only if needed

Base Model	C Bore	F Bore	Torque Spring Color	Indicate JF or J Model	Indicate SS Model	Indicate Bronze Bushing	Indicate Pin or Disc
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5	6	7	8

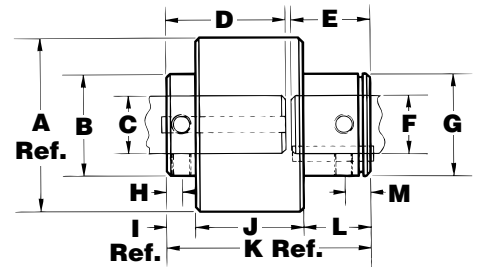
Example

Base Model	C Bore	F Bore	Torque Spring Color	Indicate JF or J Model	Indicate SS Model	Indicate Bronze Bushing	Indicate Pin or Disc
TT1X	.500	<input type="checkbox"/>	5 Gold	<input type="checkbox"/>	Yes	Yes	<input type="checkbox"/>
1	2	3	4	5	6	7	8

## Torq-Tender Shaft-To-Shaft Mount

Torq Tender Models		TT1X	TT2	TT2X	TT3	TT3X	TT4X	TANDEM
A	INCH (MM)	1.562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)	3.625 (92.1)	4.625 (117.5)	3.000 (76.2)
B	INCH (MM)	.875 (22.2)	1.250 (31.7)	1.500 (38.1)	1.750 (44.4)	2.250 (57.1)	3.000 (76.2)	1.750 (44.4)
C*	INCH	.500	.625	.750	1.125	1.500	1.750	1.125
D	INCH (MM)	1.140 (29)	1.540 (39.1)	1.805 (45.8)	2.100 (53.3)	3.080 (78.2)	3.715 (94.4)	3.312 (84.1)
E	INCH (MM)	.630 (16)	.820 (20.8)	1.110 (28.2)	1.330 (33.8)	1.420 (36.1)	1.640 (41.6)	1.312 (33.3)
F	INCH	.500	.625	.750	1.125	1.500	1.750	1.125
G	INCH (MM)	1.000 (25.4)	1.375 (34.9)	1.625 (41.3)	1.750 (44.4)	2.500 (63.5)	3.000 (76.2)	1.750 (44.4)
H	INCH (MM)	.135 (3.4)	.235 (6)	.312 (8)	.312 (8)	.420 (10.7)	.400 (10.2)	.312 (8)
I	INCH (MM)	.205 (5.2)	.365 (9.3)	.455 (11.6)	.470 (11.9)	.555 (14.1)	.590 (15)	.500 (12.7)
J	INCH (MM)	1.000 (25.4)	1.300 (33)	1.500 (38.1)	1.812 (46)	2.750 (69.8)	3.500 (89)	3.035 (77.1)
K	INCH (MM)	1.800 (45.7)	2.420 (61.5)	2.950 (75)	3.470 (88.1)	4.550 (115.6)	5.415 (137.5)	4.710 (119.6)
L	INCH (MM)	.600 (15.2)	.750 (19)	1.000 (25.4)	1.187 (30.1)	1.250 (31.7)	1.330 (33.8)	1.187 (30.1)
M	INCH (MM)	.218 (5.5)	.312 (8)	.312 (8)	.375 (9.5)	.420 (10.7)	.500 (12.7)	.375 (9.5)
N	INCH (MM)	—	—	—	—	—	—	—
O	INCH (MM)	—	—	—	—	—	—	—
P	INCH (MM)	—	—	—	—	—	—	—
Q	INCH (MM)	—	—	—	—	—	—	—

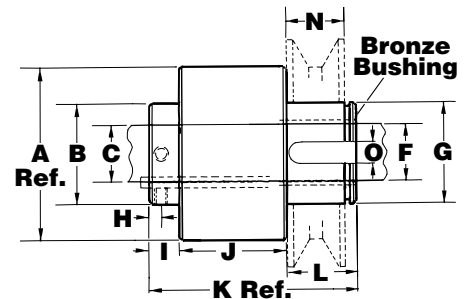
\*Note: Maximum bore shown. See page 5 for other bores available.

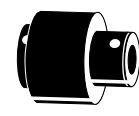


## Torq-Tender Through Shaft Mount–Bushed Type

Torq Tender Models		TT1X	TT2	TT2X	TT3	TT3X	TT4X
A	INCH (MM)	1.562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)	3.625 (92.1)	4.625 (117.5)
B	INCH (MM)	.875 (22.2)	1.250 (31.7)	1.500 (38.1)	1.750 (44.4)	2.250 (57.1)	3.000 (76.2)
C*	INCH	.500	.625	.750	1.125	1.500	1.750
D	INCH (MM)	—	—	—	—	—	—
E	INCH (MM)	—	—	—	—	—	—
F	INCH	.500	.625	.750	1.125	1.500	1.750
G	INCH (MM)	1.000 (25.4)	1.375 (34.9)	1.625 (41.3)	1.750 (44.4)	2.500 (63.5)	3.000 (76.2)
H	INCH (MM)	.135 (3.4)	.235 (6)	.312 (8)	.312 (8)	.420 (10.7)	.400 (10.2)
I	INCH (MM)	.205 (5.2)	.365 (9.3)	.455 (11.6)	.470 (11.9)	.555 (14.1)	.590 (15)
J	INCH (MM)	1.000 (25.4)	1.300 (33)	1.500 (38.1)	1.812 (46)	2.750 (69.8)	3.500 (89)
K	INCH (MM)	1.800 (45.7)	2.420 (61.5)	2.950 (75)	3.470 (88.1)	4.550 (115.6)	5.415 (137.5)
L	INCH (MM)	.600 (15.2)	.750 (19)	1.000 (25.4)	1.187 (30.1)	1.250 (31.7)	1.330 (33.8)
M	INCH (MM)	—	—	—	—	—	—
N	INCH (MM)	.500 (12.7)	.625 (15.9)	.875 (22.2)	1.062 (27)	1.080 (27.4)	1.125 (28.6)
O	INCH (MM)	.250 (6.3)	.312 (8)	.375 (9.5)	.375 (9.5)	.625 (15.9)	.750 (19)
P	INCH (MM)	—	—	—	—	—	—
Q	INCH (MM)	—	—	—	—	—	—

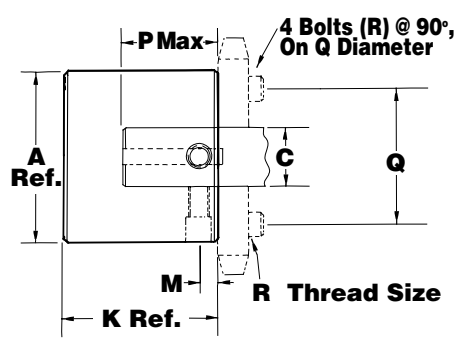
\*Note: Maximum bore shown. See page 5 for other bores available.





# Torq-Tender JF-Type Face Mount

Torq Tender Models		TT1XJF	TT2JF	TT2XJF	TT3JF	TT3XJF	TT4XJF
A	INCH (MM)	1.562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)	3.625 (92.1)	4.625 (117.5)
B	INCH (MM)	—	—	—	—	—	—
C*	INCH	.500	.625	.750	1.125	1.500	1.750
D	INCH (MM)	—	—	—	—	—	—
E	INCH (MM)	—	—	—	—	—	—
F	INCH (MM)	—	—	—	—	—	—
G	INCH (MM)	—	—	—	—	—	—
H	INCH (MM)	—	—	—	—	—	—
I	INCH (MM)	—	—	—	—	—	—
J	INCH (MM)	—	—	—	—	—	—
K	INCH (MM)	1.500 (38.1)	1.875 (47.6)	2.250 (57.1)	2.625 (66.7)	3.550 (90.2)	4.375 (111.1)
L	INCH (MM)	—	—	—	—	—	—
M	INCH (MM)	.187 (4.7)	.282 (7.2)	.325 (8.2)	.312 (8)	.400 (10.2)	.375 (9.5)
N	INCH (MM)	—	—	—	—	—	—
O	INCH (MM)	—	—	—	—	—	—
P	INCH (MM)	.875 (22.2)	1.000 (25.4)	1.500 (38.1)	1.625 (41.3)	2.125 (54)	2.625 (66.7)
Q	INCH (MM)	1.250 (31.7)	1.750 (44.4)	2.000 (50.8)	2.375 (60.3)	3.000 (76.2)	4.00 (101.6)
R	INCH	10-32 X.25DP	10-32 X.37DP	1/4-20 X.62DP	5/16-18 X.50DP	5/16-18 X.62DP	3/8-16 X.75DP



\*Note: Maximum bore shown. See page 5 for other bores available.

# Torq-Tender SS Self Supporting

Torq Tender Models		TT1X	TT2	TT2X	TT3
A	INCH (MM)	1.562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)
B	INCH (MM)	.875 (22.2)	1.250 (31.7)	1.500 (38.1)	1.750 (44.4)
C*	INCH	.500	.625	.750	1.125
D	INCH (MM)	—	—	—	—
E	INCH (MM)	—	—	—	—
F	INCH	—	—	—	—
G	INCH (MM)	1.000 (25.4)	1.375 (34.9)	1.625 (41.3)	1.750 (44.4)
H	INCH (MM)	.135 (3.4)	.235 (6)	.312 (8)	.312 (8)
I	INCH (MM)	.205 (5.2)	.365 (9.3)	.455 (11.6)	.470 (11.9)
J	INCH (MM)	1.000 (25.4)	1.300 (33)	1.500 (38.1)	1.812 (46)
K	INCH (MM)	1.800 (45.7)	2.420 (61.5)	2.950 (75)	3.470 (88.1)
L	INCH (MM)	.600 (15.2)	.750 (19)	1.000 (25.4)	1.187 (30.1)
M	INCH (MM)	—	—	—	—
N	INCH (MM)	.500 (12.7)	.625 (15.9)	.875 (22.2)	1.062 (27)
O	INCH (MM)	.250 (6.3)	.312 (8)	.375 (9.5)	.375 (9.5)
P	INCH (MM)	—	—	—	—

\*Note: Maximum bore shown. See page 5 for other bores available.

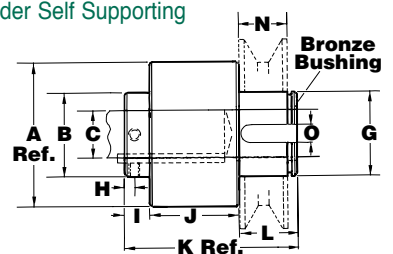
# Torq-Tender J-Type

Torq Tender Models		TT2	TT3
A	INCH (MM)	2.165 (55)	3.00 (76.2)
B	INCH (MM)	—	—
C	INCH	—	—
D	INCH (MM)	—	—
E	INCH (MM)	—	—
F*	INCH	.625	1.125
G	INCH (MM)	1.625 (41.3)	2.250 (57.15)
H	INCH (MM)	—	—
I	INCH (MM)	—	—
J	INCH (MM)	1.360 (34.54)	2.106 (53.49)
K	INCH (MM)	2.110 (53.6)	3.294 (83.7)
L	INCH (MM)	.750 (19)	1.188 (30.2)
M	INCH (MM)	—	—
N	INCH (MM)	.625 (15.9)	1.03 (26.2)
O	INCH (MM)	.375 (9.5)	.500 (12.7)
P	INCH (MM)	—	—

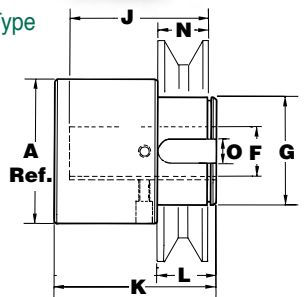
\*Note: Maximum bore shown. See page 5 for other bores available.



Torq-Tender Self Supporting



Torq-Tender J-Type

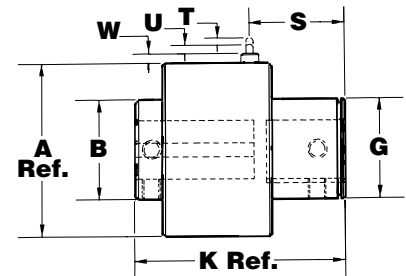


## Torq-Tender Actuating Pin Standard Model\*

## Torq-Tender Actuating Pin Bushing Model\*

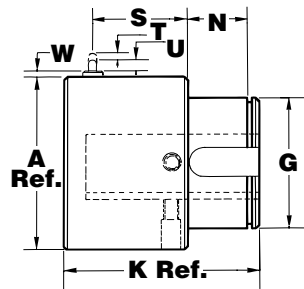


Torq Tender Models		TT1X	TT2	TT2X	TT3	TT3X	TT4X
A	INCH (MM)	1.562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)	3.625 (92.1)	4.625 (117.5)
B	INCH (MM)	.875 (22.2)	1.250 (31.7)	1.500 (38.1)	1.750 (44.4)	2.250 (57.1)	3.000 (76.2)
G	INCH (MM)	1.000 (25.4)	1.375 (34.9)	1.625 (41.3)	1.750 (44.4)	2.500 (63.5)	3.000 (76.2)
K	INCH (MM)	1.800 (45.7)	2.420 (61.5)	2.950 (75)	3.470 (88.1)	4.550 (115.6)	5.415 (137.5)
S	INCH (MM)	.837 (21.5)	1.033 (27)	1.395 (35.4)	1.573 (39.8)	1.791 (45.2)	2.005 (50.9)
T	INCH (MM)	.125 (3.17)	.115 (2.92)	.125 (2.79)	.125 (3.17)	.115 (3.05)	.125 (3.17)
U	INCH (MM)	.198 (4.19)	.150 (3.30)	.130 (3.30)	.125 (2.29)	.120 (3.56)	.125 (3.17)
W	INCH (MM)	.250 (6.35)	.195 (6.35)	.243 (6.35)	.175 (4.75)	.163 (3.17)	.092 (2.54)



## Torq-Tender Actuating Pin J Model\*

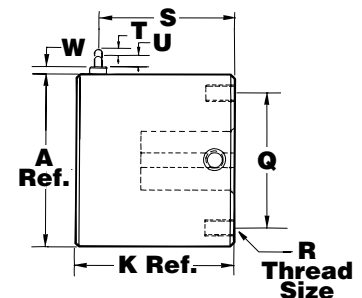
Torq Tender Models		TT2	TT3
A	INCH (MM)	2.165 (55)	3.000 (75.9)
G	INCH (MM)	1.625 (41.3)	2.250 (57.1)
K	INCH (MM)	2.110 (53.6)	3.294 (83.7)
N	INCH (MM)	.625 (15.9)	1.062 (27)
S	INCH (MM)	1.033 (25.9)	1.573 (41.3)
T	INCH (MM)	.115 (2.92)	.125 (3.17)
U	INCH (MM)	.150 (3.30)	.125 (2.28)
W	INCH (MM)	.195 (6.35)	.175 (4.75)



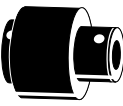
**\*NOTE:** The Actuating Pin Assembly is a simple pin which is forced out radially from the main body when overload occurs. When using this option, it is important to note that the housing (F bore) or external mounting hub end of the unit is the power source or input end. This part of the unit must continue to rotate for the extended pin to contact a customer supplied limit switch for shutdown or warning.

## Torq-Tender Actuating Pin JF Model\*

Torq Tender Models		TT1X	TT2	TT2X	TT3	TT3X	TT4X
A	INCH (MM)	1.562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)	3.625 (92.1)	4.625 (117.5)
K	INCH (MM)	1.500 (38.1)	1.875 (47.6)	2.250 (57.1)	2.625 (66.7)	3.550 (90.2)	4.375 (111.1)
Q	INCH (MM)	1.250 (31.7)	1.750 (44.4)	2.000 (50.8)	2.375 (60.3)	3.000 (76.2)	4.000 (101.6)
R	INCH	10-32 x .25 DP	10-32 x .37 DP	1/4-20 x .62 DP	5/16-16 x .50 DP	5/16-16 x .62 DP	3/8-16 x .75 DP
S	INCH (MM)	.837 (27)	1.033 (34.34)	1.608 (40.84)	1.573 (45.69)	1.791 (68.58)	3.300 (83.82)
T	INCH (MM)	.125 (3.17)	.115 (2.92)	.125 (2.79)	.125 (3.17)	.115 (3.05)	.125 (3.17)
U	INCH (MM)	.198 (4.19)	.150 (3.30)	.130 (3.30)	.125 (2.29)	.120 (3.56)	.140 (3.56)
W	INCH (MM)	.250 (6.35)	.195 (6.35)	.243 (6.35)	.175 (4.75)	.163 (3.17)	.092 (2.54)



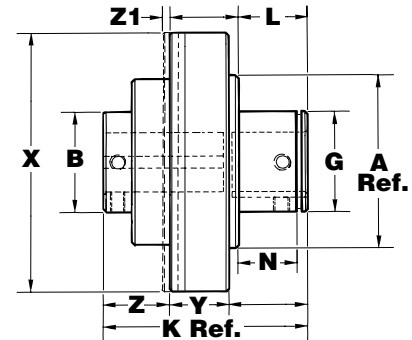




## Torq-Tender Actuating Disc Standard Model Torq-Tender Actuating Disc Bushing Model

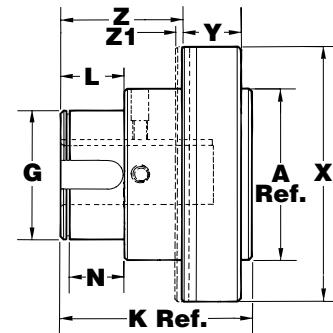


Torq Tender Models	TT1X	TT2	TT2X	TT3	TT3X	TT4X
A	INCH (MM) .1562 (39.7)	2.165 (55)	2.500 (63.5)	3.000 (76.2)	3.625 (92.1)	4.625 (117.5)
B	INCH (MM) .875 (22.2)	1.250 (31.7)	1.500 (38.1)	1.750 (44.4)	2.250 (57.1)	3.000 (76.2)
G	INCH (MM) 1.000 (25.4)	1.375 (34.9)	1.625 (41.3)	1.750 (44.4)	2.500 (63.5)	3.000 (76.2)
K	INCH (MM) 1.800 (45.7)	2.420 (61.5)	2.950 (75)	3.470 (88.1)	4.550 (115.6)	5.415 (137.5)
L	INCH (MM) .600 (15.2)	.750 (19)	1.000 (25.4)	1.187 (30.1)	1.250 (31.7)	1.330 (33.8)
N	INCH (MM) .500 (12.7)	.625 (15.9)	.875 (22.2)	1.062 (27)	1.080 (27.4)	1.125 (28.6)
X	INCH (MM) 2.985 (75.8)	3.485 (88.5)	3.935 (100)	4.480 (113.8)	4.980 (126.5)	6.250 (158.7)
Y	INCH (MM) .970 (24.6)	.970 (24.6)	.970 (24.6)	.970 (24.6)	.970 (24.6)	1.187 (30.1)
Z	INCH (MM) .080 (2)	.498 (12.6)	.740 (18.8)	1.148 (29.1)	1.985 (50.4)	2.516 (63.9)
Z1	INCH (MM) .120 (3)	.120 (3)	.120 (3)	.120 (3)	.120 (3)	.120 (3)



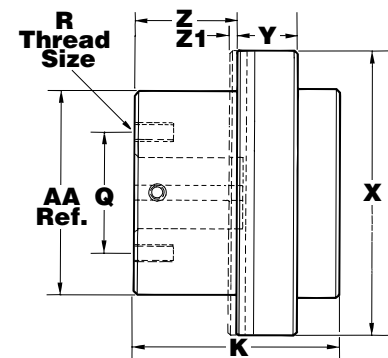
## Torq-Tender Actuating Disc J Model

Torq Tender Models	TT2	TT3
A	INCH (MM) 2.165 (55)	3.000 (75.9)
G	INCH (MM) 1.625 (41.3)	2.250 (57.1)
K	INCH (MM) 2.110 (53.6)	3.294 (83.7)
N	INCH (MM) .625 (15.9)	1.062 (27)
L	INCH (MM) .750 (19)	1.187 (30.2)
X	INCH (MM) 3.485 (88.5)	4.480 (113.8)
Y	INCH (MM) .970 (24.6)	.970 (24.6)
Z	INCH (MM) .921 (23.4)	.870 (22.1)
Z1	INCH (MM) .121 (3.1)	.120 (3)



## Torq-Tender Actuating Disc JF Model

Torq Tender Model	TT1X	TT2	TT2X	TT3	TT3X	TT4X
AA	INCH (MM) 1.530 (38.9)	2.032 (51.6)	2.450 (62.2)	2.895 (73.5)	3.550 (90.2)	4.525 (114.9)
K	INCH (MM) 1.500 (38.1)	1.875 (47.6)	2.250 (57.1)	2.625 (66.7)	3.550 (90.2)	4.375 (111.1)
Q	INCH (MM) 1.250 (31.7)	1.750 (44.4)	2.000 (50.8)	2.375 (60.3)	3.000 (76.2)	4.000 (101.6)
R	INCH 10-32 x .25 DP	10-32 x .37 DP	1/4-20 x .62 DP	5/16-18 x .50 DP	5/16-18 x .62 DP	3/8-16 x .75 DP
X	INCH (MM) 2.980 (75.7)	3.486 (88.5)	3.935 (99.9)	4.480 (113.8)	4.980 (126.5)	6.250 (158.7)
Y	INCH (MM) .970 (24.6)	.970 (24.6)	.970 (24.6)	.970 (24.6)	.970 (24.6)	1.187 (30.1)
Z	INCH (MM) .373 (9.5)	.480 (12.2)	.790 (20.1)	1.083 (27.5)	1.918 (48.7)	1.187 (30.1)
Z1	INCH (MM) .120 (3)	.120 (3)	.120 (3)	.120 (3)	.120 (3.2)	.125 (3.2)



# H-TLC Torque Limiters



## The Intelligent Alternative To Friction-Type Torque Limiters

The unique features in the Zero-Max H-TLC give the designer wider parameters in solving motion control problems.

- 1 H-TLC Is Durable.** In many applications, a torque limiter may wait for months or years before it is required to disengage. All this time, the unit may be subjected to moisture and rust; acids or salts and corrosion; or any number of other pollutants which could seize up the unit and prevent disengagement. However, the H-TLC will never rust because its major components are designed from special polymer materials which are resistant to water, salts, mild acids and most other pollutants. Even in temperatures from -40°F to +180°F, the unit still withstands many corrosive elements and abuse.
- 2 H-TLC Is Dependable.** It works on a spring-loaded convex pin and detent design which reacts to overloads...but not to lubricants. Unlike friction-type designs, you can submerge an H-TLC in oil and still depend on precise disengagement at your design limits.
- 3 H-TLC Is Repeatable.** When a friction-type torque limiter disengages, it generates heat which often alters its disengagement characteristics. It also wears the faces which require the unit be readjusted to counteract a constantly lowered release torque. However, the H-TLC's resilient \*Nylatron GS® and \*\*Delrin® materials don't build up, or retain, the kind of heat unique to friction designs.
- 4 The Torque Setting Is Adjustable.** If operating conditions require periodic changes in torque settings, the H-TLC gives you that ability. Simply adjust the unit's external compression bolts until the desired new setting is reached.

- 5 The H-TLC Will Trigger Automatic Alarm And Shut-Down Systems.** One of the H-TLC's most important special features is its ingeniously simple and inexpensive actuating disc (see page 11). Use this option when your application includes either high-speed overrunning or excessive overrunning in unattended situations. Used in conjunction with a properly installed external limit switch, the actuating disc triggers an automatic warning or power shut-down the instant the H-TLC reaches an overload condition.

Note: \*Nylatron GS® is a registered trademark of Polymer Corp.  
 \*\*Delrin® is a registered trademark of El Dupont Company

### Ordering H-TLC Torque Limiters

Model 1000 Shown With Optional Set Screws.



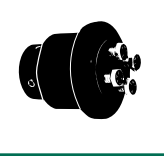
Model 500 Shown With Torque Adjusting Bolts



Base Model	C Bore	F Bore	Spring Color	Include only if needed		
				Actuating Disc	Bronze Bushing	Set Screws
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>

#### Example

Base Model	C Bore	F Bore	Spring Color	Include only if needed		
				Actuating Disc	Bronze Bushing	Set Screws
<b>H-TLC 500</b>	<b>.250</b>	<b>.250</b>	<b>Blue</b>	<b>X</b>	<input type="checkbox"/>	<b>X</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>



## H-TLC Standard Bores and Keyways

Torque Range  
(In. Lbs.)

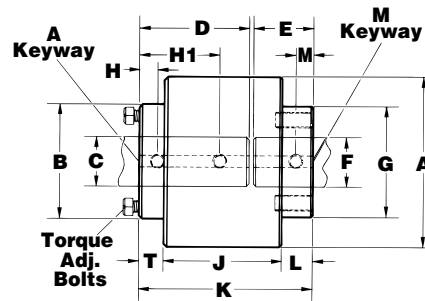
H-TLC Model			500					1000				
Shaft	Bore	C	.250	.375	.500	-	.500	.625	.750	.875	1.000	-
	Keyway	N	None	None	1/8	-	1/8	3/16	3/16	3/16	1/4	-
Housing	Bore	F	.250	.375	.500	.625	.500	.625	.750	.875	1.000	1.125
	Keyway	O	None	None	1/8	3/16	1/8	3/16	3/16	3/16	1/4	1/4

Models	500	1000
Blue	4-60	40-150
Red	40-125	140-350
Gold	100-150	300-500

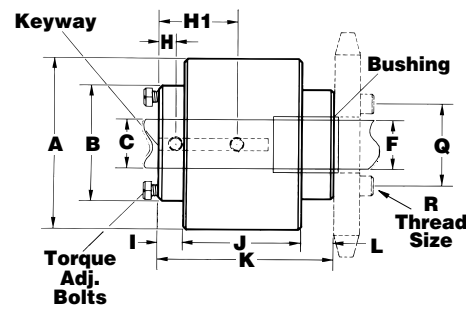
## H-TLC Dimensions

Models		500	1000
A	INCH (MM)	2.00 (50.8)	3.20 (81.3)
B	INCH (MM)	1.49 (37.8)	2.37 (60.2)
D	INCH (MM)	1.625 (41.3)	2.230 (56.6)
E	INCH (MM)	.855 (21.7)	1.210 (30.7)
G	INCH (MM)	1.49 (37.8)	2.22 (56.4)
H	INCH (MM)	.250 (6.3)	.285 (7.2)
H1	INCH (MM)	1.250 (31.7)	1.550 (39.4)
I	INCH (MM)	.563 (14.3)	.520 (13.2)
J	INCH (MM)	1.187 (30.1)	2.300 (58.4)
K	INCH (MM)	2.50 (63.5)	3.45 (87.6)
L	INCH (MM)	.750 (19)	.625 (15.9)
M	INCH (MM)	.375 (9.5)	.400 (10.2)
Q	INCH (MM)	1.125 (28.6)	1.687 (42.8)
R	INCH	1/4-20 x 1/2 DP	5/16-18 x 3/4 DP
X	INCH (MM)	2.53 (64.3)	4.40 (111.8)
Z	INCH (MM)	2.275 (57.8)	3.244 (82.4)
Z1	INCH (MM)	2.125 (54)	3.110 (79)

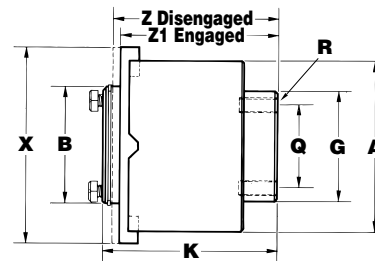
## Standard H-TLC



## H-TLC With Bronze Bushing



## H-TLC With Actuating Disc



# Additional Zero-Max® Motion Control Products



## CD® Couplings

New patented open arm coupling design uses composite material in disc packs.



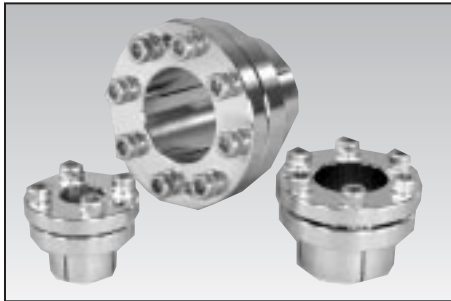
## ServoClass™ Couplings

Zero backlash, torsionally stiff, high misalignment servomotor couplings. 6 sizes, from 8 to 212 inch pound of torque.



## Schmidt Couplings

In-line, Offset and Elastomeric couplings suitable for shaft to shaft applications.



## Posi-Lok® Shaft Bushings

Inch and Metric sizes to 35 mm. Nickel plating offers corrosion protection.



## ETP Shaft Bushings

Hydraulic principle for precise and fast installation. 26 sizes from 3/4" to 4".



## H-TLC Torque Limiters

Corrosion resistant. Bores from .250" to 1.000". Torques from 4 to 500 in. lbs.



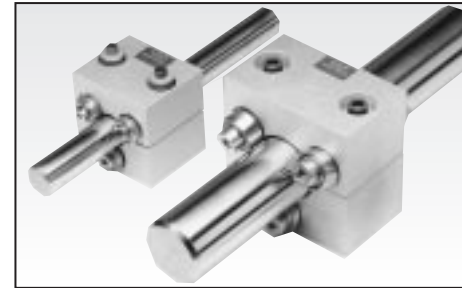
## Crown Right Angle Gear Drives

Two and three way models with 1:1 and 2:1 ratios. Precise spiral bevel gears.



## Zero-Max® Adjustable Speed Drives

Infinitely variable 0 to 400 RPM outputs from constant input speeds to 2000 RPM.



## Roh'lix® Linear Actuators

Convert rotary motion into linear motion. Five models with 3/8" to 2" dia. shafts.

## WARRANTY

Zero-Max, Inc. the manufacturer, warrants that for a period of 12 months from date of shipment it will repair, or at its option, replace any new apparatus which proves defective in material or workmanship, or which does not conform to applicable drawings and specifications approved by the manufacturer. All repairs and replacements shall be F.O.B. factory. All claims must be made in writing to the manufacturer.

In no event and under no circumstances shall manufacturer be liable for (a) damages in shipment; (b) failures or damages due to misuse, abuse, improper installation or abnormal conditions of temperature, dirt, water or corrosives; (c) failures due to operation, intentional or otherwise, above rated capacities, and (d) non-authorized expenses for removal, inspection, transportation, repair or rework. Nor shall manufacturer ever be liable for consequential and incidental damages, or in any amount greater than the purchase price of the apparatus.

Zero Max, Inc. reserves the right to discontinue models or to change specifications at any time without notice. No discontinuance or change shall create any liability on the part of Zero-Max, Inc. in respect to its products in the hands of customers or products on order not incorporating such changes even though delivered after any such change.

This warranty is in LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING (BUT NOT LIMITED TO) ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE TERMS OF THIS WARRANTY CONSTITUTE ALL BUYER'S OR USER'S SOLE AND EXCLUSIVE REMEDY, AND ARE IN LIEU OF ANY RIGHT TO RECOVER FOR NEGLIGENCE, BREACH OF WARRANTY, STRICT TORT LIABILITY OR UPON ANY OTHER THEORY. Any legal proceedings arising out of the sale or use of this apparatus must be commenced within 18 months of the date of purchase.

CAUTION: Rotating equipment must be guarded. Also refer to OSHA specifications and recommendations.

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# ////// ZERO-MAX

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