

# Torque Limiter 400 Series





# Torque Limiter 400 Series

For more than 80 years, Autogard® products have led the industry in overload protection with high-quality products, design innovation and production. Autogard products are manufactured to meet ISO 9001 using the latest machine tools and high-quality materials.

The 400 Series has been designed to meet the need for a high- and low-speed, free-wheeling torque limiter. The 400 Series differs from other ball detent designs by incorporating unique reverse-to-reset using two sets of balls on concentric pitch circles, providing longer life than competitive models. Working like a mechanical “circuit breaker” to protect the weakest member of the drive train, the most effective location for the 400 Series is as close as possible to the component being protected.

In the normal drive condition, torque is transmitted through the drive balls ‘A.’ The inner strut balls ‘B’ are designed to carry no load during this time.

## Disengagement on overload

When an overload condition occurs, the drive balls roll out of their seats forcing the slide plate ‘C’ and drive plate ‘D’ apart. The cage plate ‘E,’ strut balls and drive balls all rotate until the cage plate hits a stop located in the slide plate. At this point the spring pressure has been transferred from the drive balls to the strut balls. The strut balls prevent the drive balls from re-engaging the drive plate. The coupling or driven media attached to adapter ‘G’ is now completely free to rotate. Although the 400 Series has been designed to run freely after disengagement, it is recommended that a shutdown switch is incorporated to avoid wear.

## Re-engagement

Re-engagement occurs when either the driving side is reversed, or the driven side is advanced. Pawl ‘F’ engages the cage plate ‘E’ and rotates it until the drive balls are re-seated. Resetting must be done at low speed to permit the engaging mechanism to function properly in either direction and to prevent potential damage.

The resetting can be done manually or automatically by slowly inching the motor in reverse.



Letters above correspond to paragraphs on the left.

The 400 Series comes standard as a Random Reset style Torque Limiter. This gives the following maximum angles of rotation to re-engage.

Size	Max rotation to reset
1	60°
2	67.5°
3	30°
4	30°
5	30°
6	25.7°

**Single Position Reset (SR) designs are also available and must be specified at the time of ordering. These reset in a constant angular position.**



**Features and Benefits:**

- Proven design with thousands of units successfully in operation
- Accurate torque limitation prevents costly downtime
- Standard designs can accommodate large torque ranges
- Instantaneous disengagement protects equipment from damaging inertias
- Bi-direction protection
- Operates at high or low speeds
- Automatic or manual re-engagement by reversing the unit
- Offered in a large number of styles ensuring the right solution is available for applications such as:
  - Timing and HTD drives
  - Chain and sprocket drives
  - Gear drives
  - Flexible or rigid couplings
  - Flywheel or large gear mounts
- Springs can be inspected and changed without removing the clutch from the drive train

**Selection:**

Data required for torque limiter selection:

- Kilowatt or horsepower (hp) and rpm of the driver
- Shaft details of the driving and driven equipment

(1) Calculate the nominal torque.

$$\text{Torque (lb-in)} = \text{hp} \times 63025 / \text{rpm}$$

Consideration should then be given to start torque or other special circumstances depending on the position chosen in the drive system. Choose a set torque with a suitable margin over nominal. Select the torque limiter which has a higher torque rating.

(2) Check limiting conditions:

- (a) Check hub bore capacity
- (b) Check the torque limiter dimensions such as the overall length and outside diameter

(3) Select and specify the appropriate drive medium or coupling.

All Autogard 400 Series units may be supplied from the factory at a pre-set torque and with the required drive medium assembled to the unit.

**Ordering the 400 Series Torque Limiter**

When ordering, please provide the following designation:  
Type / Size / Feature / S1 bore / S2 bore.

Springs: Choose spring assembly. Refer to Table 3 and 4.  
Specify factor torque setting if desired.

Features: RR – Random Reset (standard)  
SR – Single Position Reset (optional)

S1 Bore & S2 Bore: Please specify metric or imperial  
Standard bore tolerance = H8 + normal fit key

**Example: 402 / 3 / SR / S1 1.500 in**

Refers to a type 402, size 3 torque limiter designed for Single Position Reset.

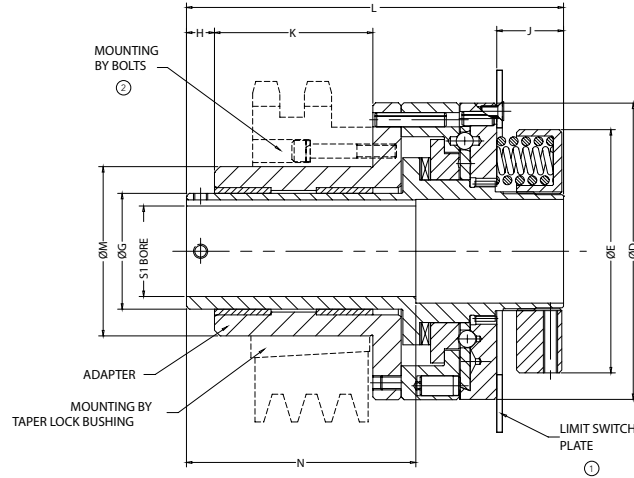
Bore S1 = 1.500 in

Also specify:

- Torque setting or torque range required
- Pulley or sprocket details where required

*The specifications contained within this brochure are correct at the time of going to print. Rexnord is continually reviewing and updating the specifications on its entire Autogard product offering and therefore reserve the right to change any detail.*

# Model 401



- ① See Figure 2 and Table 2 on page 18 for dimensions and movement on disengagement.
- ② Standard mounting holes furnished for a standard price adder. Special mounting holes quote on request. Bolts are not furnished as standard; please specify if required.

Size	Torque ①		Max Speed rpm ②	Weight lb ③	Mass Moment of Inertia MR <sup>2</sup>	
	Min lb-in	Max lb-in			Hub side lb-in <sup>2</sup>	Flange Side lb-in <sup>2</sup>
1	6	250	3600	2.5	1	1
2	80	2000	3600	12	14	14
3	120	6000	3600	25	44	44
4	250	10000	1800	35	79	82
5	700	22500	1800	80	370	310

- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 bores.

**Model 401 incorporates an adapter to facilitate mounting of standard sprocket, sheave, etc., by means of a taper lock bushing or bolting.**

Size	Max Bore S1 in ①	D in	E in	G in ②	H in	J in	K in	L in	M in ③	N in
1	0.625	2.44	2.19	0.984	0.32	0.57	1.00	3.28	1.375	2.00
2	1.125	4.37	3.42	1.575	0.50	1.48	1.75	5.81	2.125	2.62
3	1.625	5.75	4.72	2.165	0.47	1.48	2.00	6.32	2.875	3.50
4	2.000	6.56	5.38	2.559	0.63	1.48	3.50	8.34	3.500	5.00
5	3.000	8.75	7.50	3.937	0.75	2.21	5.00	11.19	5.000	6.25

- ① Bores are furnished with a clearance fit unless otherwise specified.
- ② Tolerance for diameter M is h7.

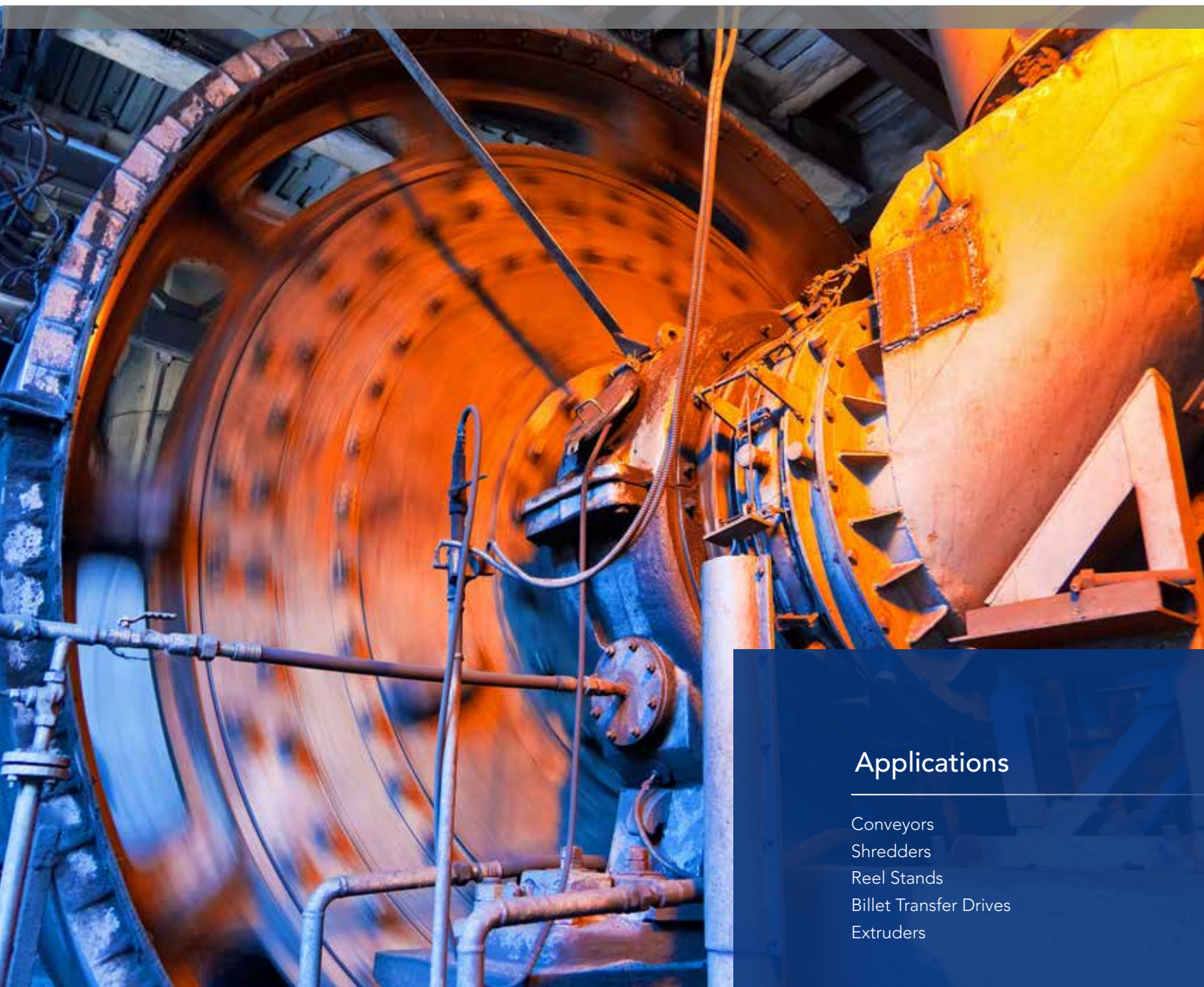
Size	Smallest Sprocket (No. of Teeth - See ①)					Smallest Sheave Diameter in ②
	3/8 in pitch (#35)	1/2 in pitch (#40)	5/8 in pitch (#50)	3/4 in pitch (#60)	1 in pitch (#80)	
1	21	17	14	12	10	2.48
2	28	22	18	16	13	4.41
3	35	28	23	20	16	5.79
4	42	33	27	23	18	6.57
5③	-	43	35	30	23	8.78

- ① B type sprocket recommended. For multiple strand sprockets, consult Rexnord.
- ② This diameter is to the bottom of a v-sheave groove or to the inside diameter of the flange of a timing belt pulley.
- ③ Not available for 3/8 in pitch.

Ⓞ Standard Mounting Hole Patterns (Minimum Diameters - See Ⓞ)					
Size	No. of Bolts	Bolt Size	Max Bolt Depth Adapter in	Bolt Circle Diameter in	Sprocket Bore in
1	6	#8-32	0.25	1.750	1.376/1.378
2	6	#10-24	0.31	2.500	2.126/2.128
3	6	1/4-20	0.38	3.375	2.876/2.878
4	6	5/16-18	0.50	4.125	3.5015/3.5035
5	6	3/8-16	0.62	5.687	5.0015/5.0035

Ⓞ Bolt holes to be equally spaced on bolt circle diameter specified. Care must be taken not to drill into other mounting holes in the adapter.

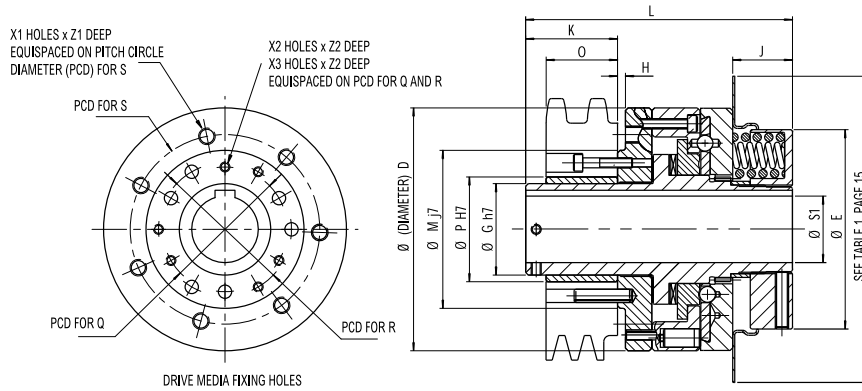
Ⓞ Standard mounting holes furnished for a standard price adder. Special mounting holes quote on request. Bolts are not furnished as standard; please specify if required.



## Applications

Conveyors  
 Shredders  
 Reel Stands  
 Billet Transfer Drives  
 Extruders

# Model 402



Size	Torque ①		Max Speed ②	Weight ③	Mass Moment of Inertia MR <sup>2</sup>	
	Min	Max			Hub Side	Flange Side
	lb-in	lb-in	rpm	lb	lb-in <sup>2</sup>	lb-in <sup>2</sup>
1	6	250	3,600	2.2	1	1
2	80	2,000	3,600	11.4	12	12
3	120	6,000	3,600	22	44	44
4	250	10,000	2,000	33	82	82
5	700	22,500	2,000	80	400	400
6	6,000	50,000	1,800	121	910	910

- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max (S1) bores.

## Model 402 for use with sprockets, pulleys or gears. Supplied complete with bearing and a choice of mounting holes.

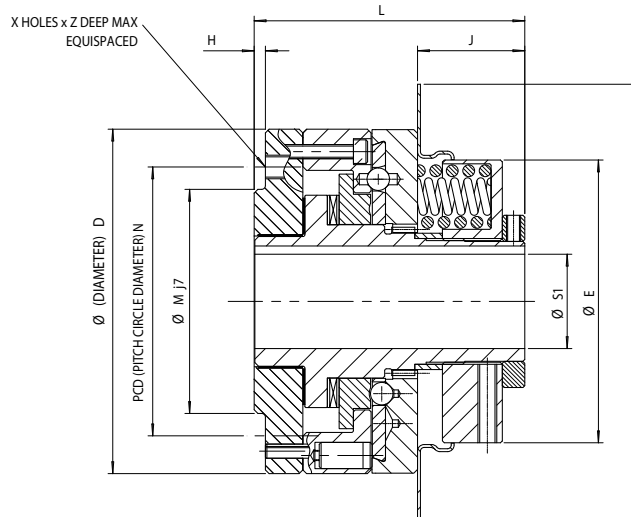
Size	Max Bore S1 in ①	D in	E in	G in	H in ②	K Max in	J in ③	L Max in ④	M in	O Max in	Q in	R in	S in	X1 qty x size	Z1 in	X2 qty x size	X3 in	Z2 in
1 ⑤	0.625	2.44	2.17	0.984	0.00	1.32	0.55	3.27	-	0.98	1.378	1.496	-	-	-	3 x M3	3 x ø4	0.24
2 ⑤	1.125	4.41	3.54	1.575	0.00	2.24	1.46	5.83	-	1.75	2.047	2.402	-	-	-	3 x M4	3 x ø5	0.35
3	1.625	5.75	4.72	2.165	0.19	2.17	1.38	6.30	3.740	1.69	2.953	3.150	4.488	7 x M10	0.59	3 x M6	3 x ø8	0.43
4	2.000	6.61	5.35	2.559	0.19	3.94	1.42	8.35	4.803	3.31	3.346	3.543	5.669	8 x M12	0.59	3 x M8	3 x ø10	0.43
5	3.000	8.74	7.48	3.937	0.25	5.28	2.20	11.18	6.102	4.57	4.724	4.921	7.244	8 x M16	0.91	4 x M8	4 x ø10	0.43
6 ⑥	4.000	10.24	9.25	5.512	-	7.13	0.98	14.80	-	-	-	-	-	-	-	-	-	-

- ① For max bores greater than 1 in, use rectangular parallel keys.
- ② For size 6, the drive medium must be fitted with suitable bearings and fixing. Please specify or consult Rexnord for assistance.
- ③ For size 6, clearance is required for torque adjustment. See Table 1 page 17.
- ④ Hub can be shortened to suit narrower drive media - please specify with order.
- ⑤ Not available for M, S, X1 and Z1.
- ⑥ For H, M, O, P, Q, R, S, X1, Z1, X2, X3 and Z2, please consult Rexnord for assistance.

Size	Smallest Sprocket (No. of teeth — see ①)					Smallest Sheave Diameter in ②
	3/8 in pitch (#35)	1/2 in pitch (#40)	5/8 in pitch (#50)	3/4 in pitch (#60)	1 in pitch (#80)	
1	17	14	12	11	9	1.73
2	24	19	14	13	11	2.52
3	32	25	20	18	14	3.50
4	36	28	23	20	16	3.98
5 ③	-	37	30	26	20	5.35
6 ④	-	-	-	-	-	-

- ① B type sprocket recommended. For multiple sprockets, consult Rexnord.
- ② The diameter quoted is to the bottom of a V pulley groove or the ID of the flange on a timing pulley.
- ③ Not available for 3/8 in pitch.
- ④ Please consult Rexnord for specifications.

# Model 403



Size	Torque ①		Max Speed ②	Weight ③	Mass Moment of Inertia MR <sup>2</sup>	
	Min	Max			Hub Side	Flange Side
	lb-in	lb-in			lb-in <sup>2</sup>	lb-in <sup>2</sup>
1	6	250	3,600	2	1	1
2	80	2,000	3,600	11	14	14
3	120	6,000	3,600	22	44	44
4	250	10,000	2,000	29	79	82
5	700	22,500	2,000	71	370	310
6	6,000	50,000	1,800	104	880	510
7 ④		100,000				
8 ④		220,000				
9 ④		500,000				

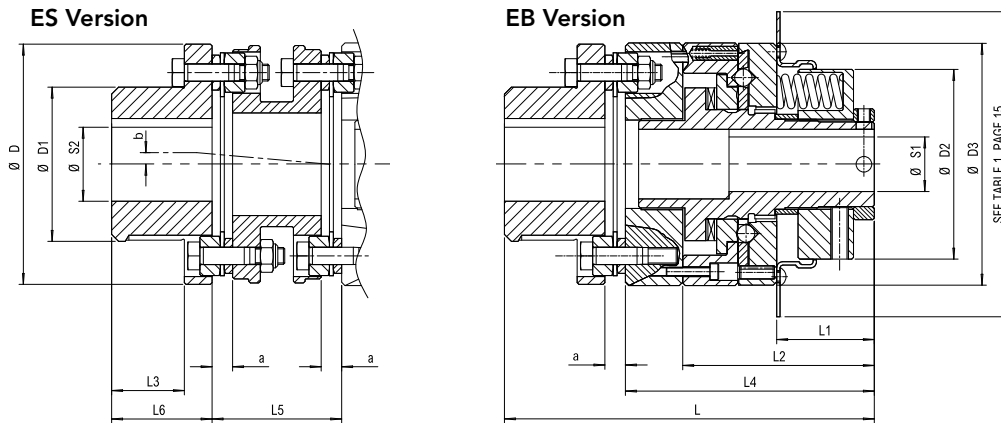
- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 bores.
- ④ Designs may vary for min torque, max speed, weight and mass moment of inertia specifications. Please specify or consult Rexnord for assistance.

## 403 General Purpose Model to accept customer-supplied couplings and drive media.

Size	Max Bore S1 in ①	D in	E in	H in	J in ②	L in	M in	N in	X qty x size	Z in
1	0.625	2.44	2.19	0.06	0.87	2.32	1.189	1.625	5 x M4	0.31
2	1.125	4.37	3.42	0.19	1.77	4.25	2.953	3.622	6 x M8	0.55
3	1.625	5.75	4.72	0.19	1.77	4.49	3.740	4.488	7 x M10	0.59
4	2.000	6.56	5.38	0.19	1.81	4.76	4.803	5.669	8 x M12	0.59
5	3.000	8.75	7.50	0.25	2.72	6.46	6.102	7.244	8 x M16	0.91
6 ③	4.000	10.25	9.25		0.98	8.58				
7 ③	5.000	12.25	11.13		1.02	9.65				
8 ③	6.000	14.63	14.25		1.42	11.81				
9 ③	7.000	18.00	17.75			16.14				

- ① For max bores greater than 1 in, use rectangular parallel keys.
- ② For sizes 6 and above, clearance is required for adjustment.
- ③ Mounting details may vary for H, M, N, X and Z. Please specify or consult Rexnord for assistance.
- ④ Mounting details may vary for H, J, M, N, X and Z. Please specify or consult Rexnord for assistance.

# Model 405



Size	Torque ①		Max Speed rpm ②	Weight lbs ③	Mass Moment of Inertia MR <sup>2</sup>		Max ④ Misalignment $\Delta$ a in	Max ⑤ Parallel Offset b in
	Min lb-in	Max lb-in			S1 side lb-in <sup>2</sup>	S2 side lb-in <sup>2</sup>		
405-1/8HVII	6	250	3,600	3.3	0.7	0.4	0.028	0.016
405-2/35HVII	80	2,000	3,600	16	12	40	0.039	0.020
405-3/150HVII	120	6,000	3,600	35	44	250	0.059	0.024
405-4/150HVII	250	10,000	2,000	44	79	290	0.059	0.024
405-5/480HVII	700	22,500	2,000	110	370	720	0.079	0.031
405-6/880HVII	6,000	50,000	1,800	200	880	2,200	0.098	0.035
405-7 ⑥								
405-8 ⑥								
405-9 ⑥								

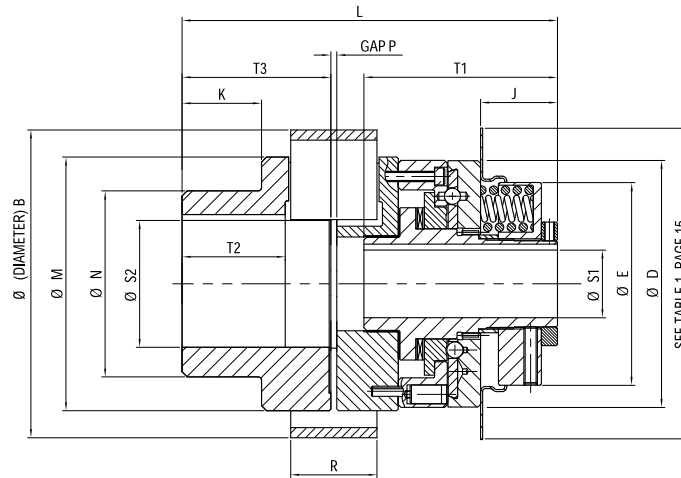
- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 and S2 bores with type EB couplings.
- ④  $\Delta$  a is the max allowable variation in the gap between flanges measured between points around the periphery. This corresponds to 1/2 degree angular misalignment. The total deviation from nominal due to axial and angular must not exceed  $\Delta$  a.
- ⑤ Dimension "b" corresponds to 1/2 degree misalignment per coupling disc pack with minimum spacer length. For longer spacers, consult Rexnord.
- ⑥ Please consult Rexnord for specifications.

## 405 Model includes Autoflex ES to accommodate angular and parallel offset misalignment or Autoflex EB for angular misalignment only.

Size	Max Bore S1 in ①	Max Bore S2 in	a (DBSE) in	D in	D1 in	D2 in	D3 in	L in	L1 in ②	L2 in	L3 in	L4 in	L5 in ③	L6 in
405-1/8HVII	0.625	1.000	0.29	3.15	1.73	2.17	2.44	4.21	0.87	1.89	0.91	2.68	1.89	1.28
405-2/35HVII	1.125	2.000	0.37	4.33	2.76	3.54	4.41	6.65	1.73	3.46	1.30	4.86	2.28	1.81
405-3/150HVII	1.625	3.437	0.35	6.69	4.84	4.72	5.75	8.03	1.77	3.70	2.32	4.72	2.62	2.94
405-4/150HVII	2.000	3.437	0.35	6.69	4.84	5.35	6.61	8.27	1.81	3.94	2.32	5.00	2.62	2.89
405-5/480HVII	3.000	4.187	0.59	9.06	5.91	7.48	8.74	11.18	2.72	5.16	2.95	7.44	4.29	3.74
405-6/880HVII	4.000	5.250	0.65	11.10	7.40	9.25	10.24	14.57	0.98	6.14	3.78	9.21	5.04	4.72
405-7 ⑥														
405-8 ⑥														
405-9 ⑥														

- ① For max bores greater than 1 in, use rectangular parallel keys.
- ② For size 6 and above, clearance is required for adjusting bolt, consult Rexnord.
- ③ L5 dimension is the minimum length. Longer spacers are available, consult Rexnord.
- ④ Please consult Rexnord for specifications.

# Model 406S



Size	Torque ①		Max Speed rpm	Weight ② lbs	Mass Moment of Inertia MR <sup>2</sup>		Max Misalignment Axial in	Max Misalignment Parallel in	Max Misalignment Angular °
	Min lb-in	Max lb-in			S1 side lb-in <sup>2</sup>	S2 side lb-in <sup>2</sup>			
1/A1	6	250	3,600	4.8	0.7	0.4	0.020	0.012	2.0
2/A3	80	2,000	3,600	22.2	12	40	0.028	0.020	2.0
3/A4	120	6,000	3,600	43.4	44	250	0.031	0.028	1.3
4/A5	250	10,000	2,000	78.4	79	290	0.039	0.028	1.3
5/A6	700	22,500	2,000	139.2	370	720	0.039	0.031	1.3
6/A7	6,000	50,000	1,800	226.9	880	2,200	0.039	0.039	1.0
7/ ③									
8/ ③									
9/ ③									

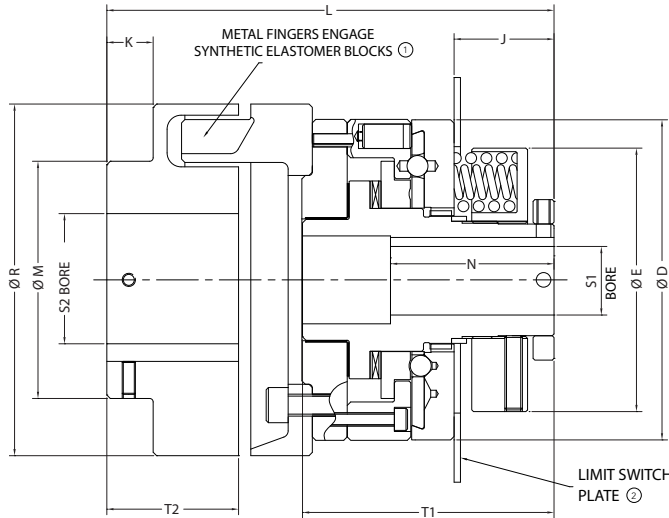
- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 and S2 bores.
- ④ For max bores greater than 1 in, use rectangular parallel keys.
- ⑤ For size 6 and above, clearance is required for adjustment, consult Rexnord.
- ⑥ Please consult Rexnord for assistance on specifications.

**406S Model includes Samiflex® torsionally soft coupling to accommodate angular and parallel offset misalignment.**

Size	Max Bore S1 in ①	Max Bore S2 in ②	B in	D in	E in	J in ③	K in	L in	M in	N in	P (gap)	R in	T1 in	T2 in	T3 in
1/A1④	0.625	1.625	3.27	2.44	2.17	0.87	-	4.57	2.56	2.56	0.06	0.87	2.319	1.339	1.764
2/A3	1.125	2.750	5.67	4.41	3.54	1.77	1.77	7.68	4.57	3.35	0.10	1.65	4.252	2.205	3.024
3/A4	1.625	3.750	7.17	5.75	4.72	1.77	1.85	8.74	5.91	4.33	0.14	2.01	4.504	2.480	3.465
4/A5	2.000	4.500	8.86	6.61	5.35	1.81	2.24	10.20	7.48	5.51	0.14	2.32	4.772	3.031	4.185
5/A6	3.000	4.500	10.43	8.74	7.48	2.72	2.76	12.44	9.17	7.09	0.14	2.64	6.437	3.740	5.051
6/A7	4.000	5.500	12.05	10.24	9.25	0.98	3.46	16.57	10.51	8.07	0.16	2.95	8.563	4.567	6.024

- ① For max bores greater than 1 in, use rectangular parallel keys.
- ② For size 6 and above, clearance is required for adjustment, consult Rexnord.
- ③ Not available for K.
- ④ Please consult Rexnord for assistance on specifications for these sizes.

# Model 406N



- Ⓛ Temperature range of elastomer bushing is -22°F to 176°F (-30°C to 80°C).
- Ⓜ See Figure 2 and Table 2 on page 18 for dimensions and movement on disengagement.

Size	Torque Ⓛ		Max Speed rpm	Weight lbs Ⓛ	Mass Moment of Inertia MR <sup>2</sup>	
	Min lb-in	Max lb-in Ⓜ			S1 side lb-in <sup>2</sup>	S2 side lb-in <sup>2</sup>
1/68	6	250	3,600	4	0.7	0.4
2/125	80	2,000	3,600	19	12	40
3/160	120	6,000	3,600	40	44	250
4/200	250	10,000	1,800	57	79	290
5/250	700	22,500	1,800	135	370	720
6/315	6,000	50,000	1,800	207	880	2200

- Ⓛ Larger sizes are available. For higher torque applications, consult Rexnord.
- Ⓜ See spring selection on page 16 for torque range with specific springs.
- Ⓛ Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- Ⓛ Weights and moments of inertia apply to max S1 and S2 bores.

**406N Model includes a flexible coupling that is torsionally resilient and accommodates angular, parallel and axial misalignment.**

Size	Max Bore S1 in Ⓛ	Max Bore S2 in Ⓛ	D in	E in	J in Ⓜ	K in	L in	M in	N in	R in	T1 in	T2 in
1/68 Ⓨ	0.625	1.000	2.44	2.19	0.88	0.00	3.46	-	2.31	2.68	2.31	0.79
2/125	1.125	2.500	4.37	3.42	1.87	0.75	7.07	3.54	2.62	4.92	4.25	1.97
3/160	1.625	2.750	5.75	4.72	1.87	0.83	8.01	4.25	4.51	6.30	4.51	2.36
4/200	2.000	3.750	6.56	5.38	1.87	1.30	9.14	5.51	4.77	7.87	4.77	3.15
5/250	3.000	4.375	8.75	7.50	2.71	1.57	12.0	6.50	6.44	9.84	6.44	3.94
6/315	4.000	4.875	10.25	9.25	3.19	2.17	14.06	7.87	8.56	12.40	8.56	4.92

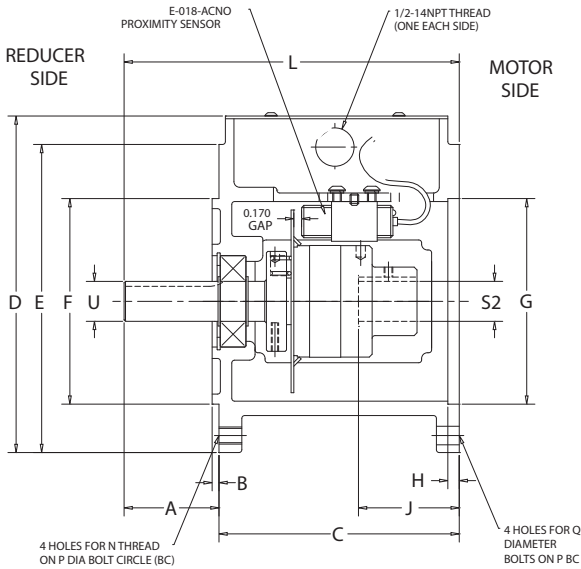
- Ⓛ Bores are furnished for clearance fit unless otherwise specified by customer.
- Ⓜ For size 6 and above, clearance is required for adjustment, consult Rexnord.
- Ⓨ Not available for M.

## Minimum S2 Bore and Maximum Allowable Misalignment

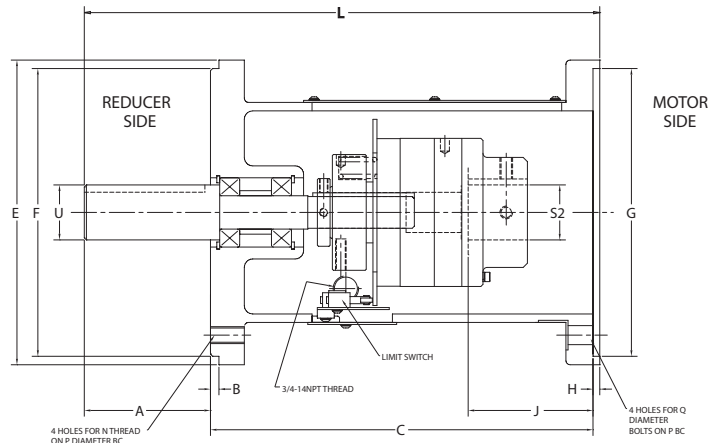
Size	Allowable Misalignment			Gap Between Hub and Adapter in	
	S2 (min) in	Angular Degrees	Parallel in	Min	Max
1	0.39	0.09	0.005	0.08	0.16
2	0.55	0.10	0.008	0.08	0.16
3	0.87	0.10	0.010	0.08	0.25
4	1.10	0.10	0.013	0.08	0.25
5	1.89	0.10	0.017	0.12	0.31
6	2.36	0.10	0.020	0.12	0.31

# Model 408

## 408/1



## 408/2



Model 408 is a double "C" face for use between standard "C" face motor and reducer or mounted only on a "C" face motor.

Size	Motor HP @ 1,800 rpm	For NEMA "C" Face Frame	NEMA Full-load Torque lb-in	Nominal Torque Setting lb-in	Approx Weight lbs	Dimensions in														
						U	S2	L	A	B	C	D	E	F	G	H	J	N	Q	P
1	1/2	56C	18	54	9.5	.624/.623	.625/.626	7.32	2.06	0.15	5.26	7.3	6.6	4.500/4.498	4.501/4.503	0.25	2.15	3/8 - 16	3/8	5.875
	3/4	56C	27	81	9.5	.624/.623	.625/.626	7.32	2.06	0.15	5.26	7.3	6.6	4.500/4.498	4.501/4.503	0.25	2.15	3/8 - 16	3/8	5.875
	1	56C	36	108	9.5	.624/.623	.625/.626	7.32	2.06	0.15	5.26	7.3	6.6	4.500/4.498	4.501/4.503	0.25	2.15	3/8 - 16	3/8	5.875
	1-1/2	140TC	54	162	9.5	.874/.873	.875/.876	7.38	2.12	0.15	5.26	7.28	6.6	4.500/4.498	4.501/4.503	0.25	2.15	3/8 - 16	3/8	5.875
	2	140TC	70	195	9.5	.874/.873	.875/.876	7.38	2.12	0.15	5.26	7.3	6.6	4.500/4.498	4.501/4.503	0.25	2.15	3/8 - 16	3/8	5.875
2	3	182TC	108	297	31	1.124/1.123	1.125/1.126	14.12	2.62	0.25	11.30	-	9.0	8.500/8.497	8.501/8.503	0.20	2.69	1/2 - 13	1/2	7.250
	5	184TC	180	405	31	1.124/1.123	1.125/1.126	14.12	2.62	0.25	11.30	-	9.0	8.500/8.497	8.501/8.503	0.20	2.69	1/2 - 13	1/2	7.250
	7.5	213TC	270	580	31	1.374/1.373	1.375/1.376	14.62	3.12	0.25	11.30	-	9.0	8.500/8.497	8.501/8.503	0.20	3.18	1/2 - 13	1/2	7.250
	10	215TC	360	720	31	1.374/1.373	1.375/1.376	14.62	3.12	0.25	11.30	-	9.0	8.500/8.497	8.501/8.503	0.20	3.18	1/2 - 13	1/2	7.250
	15	254TC	540	1080	31	1.624/1.623	1.625/1.626	15.25	3.75	0.25	11.30	-	9.0	8.500/8.497	8.501/8.503	0.20	3.81	1/2 - 13	1/2	7.250
	20	256TC	720	1440	31	1.624/1.623	1.625/1.626	15.25	3.75	0.25	11.30	-	9.0	8.500/8.497	8.501/8.503	0.20	3.81	1/2 - 13	1/2	7.250

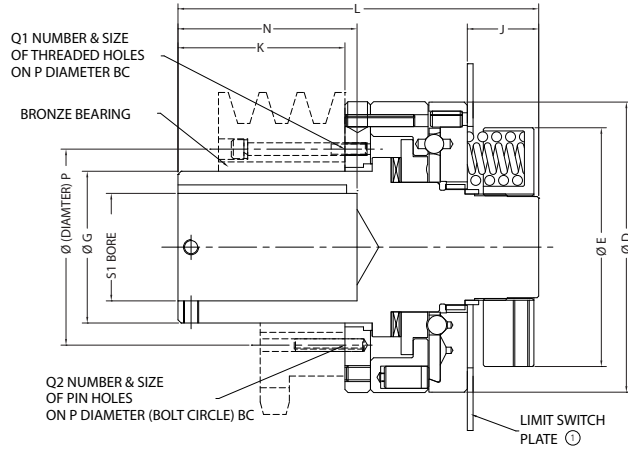
⊙ Nominal torque setting allows for starting torque.

### Additional Notes:

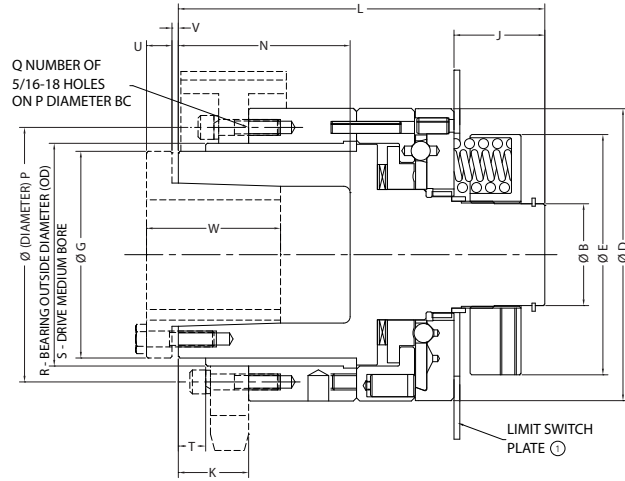
- Random reset only.
- Size 1 incorporates a proximity sensor for shutdown as specified per application.
- Size 2 incorporates a mechanical limit switch for shutdown.
- Accommodates high speed bi-directional operation.
- Easy bolt-on installation.
- Enclosed for protection against normal atmospheric contamination.
- Two wide service openings 180° apart allow for easy torque adjustment or manual resetting.
- Resetting after disengagement is accomplished by reversing the drive side, or rotating the driven side forward, by either joggling the motor or turning by hand.

# Model 409

## SB Version



## QD Version



Ⓢ See Figure 2 and Table 2 on page 18 for dimensions and movement on disengagement.

**Model 409 for use with applications requiring relatively large “blind” bore and light torque setting or for the flexibility of mounting by QD bushing to accommodate different shaft sizes.**

The drive sprocket or sheave will normally be mounted by the factory on both SB and QD type construction. However, customer may mount if desired. See dimensions P, Q, R, S and T in table QD or P, Q1 and Q2 in table SB for mounting data.

Type	Size	Torque Ⓢ		Max Speed rpm Ⓣ	Weight lb	Mass Moment of Inertia MR <sup>2</sup>	
		Min lb-in	Max lb-in			Hub side lb-in <sup>2</sup>	Flange Side lb-in <sup>2</sup>
Type SB	1	6	250	3,600	2.5	1	1
	2	80	2,000	3,600	12	14	14
	3	120	6,000	3,600	25	44	44
	4	250	10,000	1,800	35	79	82
	5	700	22,500	1,800	80	370	310
Type QD	2	80	2,000	3,600	14	14	14
	3	120	6,000	3,600	29	44	44

Ⓢ For higher torque applications, consult Rexnord.

Ⓣ Higher speeds may be allowed under certain conditions. Please consult Rexnord.

## Type SB

Size	Max Bore S1 in	D in	E in	G in	J in	K in	L in	N in	P in	Q1 in Ⓢ	Q2 in Ⓢ
1	1.125	2.44	2.19	1.50	0.57	1.73	3.69	2.00	1.938	Ⓣ #8-32	Ⓢ .187
2	1.625	4.37	3.42	2.25	1.48	2.25	5.81	2.56	3.000	Ⓣ #10-24	Ⓢ .187
3	2.125	5.75	4.72	3.00	1.48	3.31	7.13	3.54	3.875	Ⓣ 1/4-20	Ⓢ .250
4	3.125	6.56	5.38	4.125	1.48	4.94	9.15	5.00	5.000	Ⓣ 5/16-18	Ⓢ .312
5	4.000	8.75	7.50	5.50	2.21	6.47	11.94	6.50	6.500	Ⓣ 3/8-16	Ⓢ .375

Ⓢ Size 1 has all holes (pin and screw) equally spaced. Sizes 2-5 have (6) pin holes 60° apart and (3) screw holes 120° apart spaced 30° between pin holes.

Ⓣ See spring selection Tables 3 and 4 on page 19 for torque range with specific springs.

Ⓢ See Figure 2 and Table 2 on page 18 for dimensions and movement on disengagement.

## Type QD

Size	QD Bushing Style	B in	D in	E in	G in	J in	K in	L in	N in	P in	Q in	R in ⊖	S in ⊕	T in	U in	V in	W in
1	SD	1.52	4.37	3.42	3.19	1.86	1.12	6.00	2.44	3.938	6	3.438	3.439	0.62	0.44	0.12	1.81
2	SK	2.00	5.75	4.72	4.06	1.86	1.38	7.21	3.38	5.000	6	4.375	4.376	0.75	0.50	0.12	1.88

⊖ Tolerance is -.001 in.

⊕ Tolerance is +.002 in.

Bushing	Stock Bore in	Keyseat in
SD	5/8, 11/16, 3/4, 13/16, 7/8	3/16x3/32
	15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4	1/4x1/8
	1 5/16, 1 3/8 ⊖	5/16x5/32
	1 7/16, 1 1/2 ⊖, 1 9/16, 1 5/8, 1 11/16	3/8x3/16
	1 3/4	3/8x1/8
	1 13/16	1/2x1/8
	1 7/8, 1 5/16	1/2x1/16
SK	2	No Keyseat
	15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4	1/4x1/8
	1 5/16, 1 3/8 ⊖	5/16x5/32
	1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 11/16, 1 3/4	3/8x3/16
	1 13/16, 1 7/8, 1 15/16, 2 ⊖, 2 1/16, 2 1/8	1/2x1/4
	2 3/16, 2 1/4	1/2x1/8
	2 5/16, 2 1/8, 2 7/16, 2 1/2	5/8x1/16
2 9/16, 2 5/8	No Keyseat	

⊖ Optional keyseat available. Check bushing catalog.



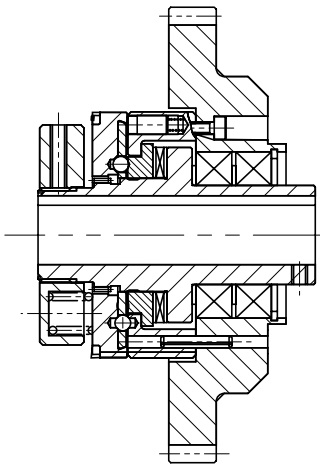
## Industries

Mining  
Printing  
Paper Converting  
Food and Beverage  
Pharmaceutical  
Chemical Processing  
General Industrial  
(coatings, resins, plastics and fibers)

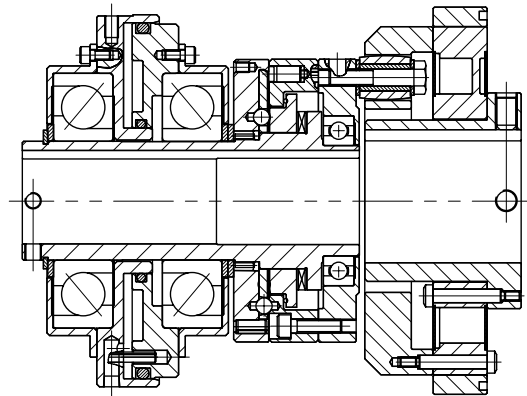


## Additional Models and Special Designs

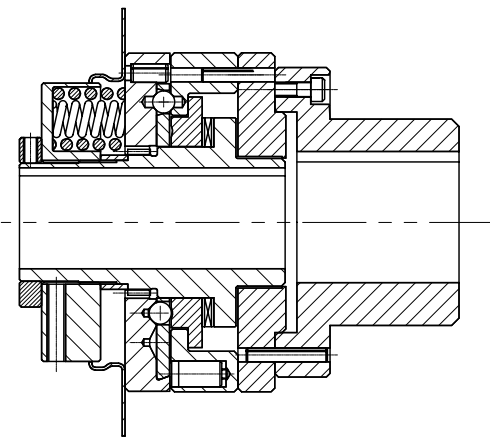
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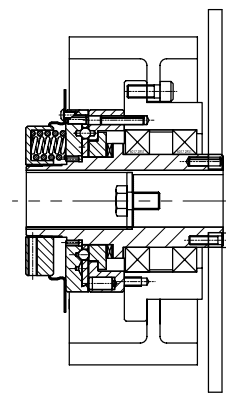
**Model 402**  
Comes with a custom gear



**Model 403**  
Air actuated and comes with a flexible coupling  
and a Monitorq torque monitoring system



**Model 404**  
A rigid coupling style used when the attached  
unit is self aligning



**Model 409**  
Comes with large pulley and brake

# Torque Limiter Accessories

## Standard Springs

The torque carrying capacity of the 400 Series Torque Limiter can be varied by the position of the adjusting nut and the number and configuration of the springs supplied.

Coil springs are offered on sizes 1 to 5 and can vary in the number and length to provide an optimum range of torque settings. The larger size torque limiters utilize disc spring stacks

which can be varied in thickness to provide a range of torque settings. The actual torque setting of a unit is directly related to the gap 'Y' — refer to Table 1. Consult Rexnord for details on quantities and configurations for the spring assemblies offered on each size.

Table 1

Size	1	2	3	4	5	6	7	8	9
Min Gap 'Y'	.075	.20	.20	.20	.40	1.05	1.15	2.05	3.23
Clearance <sup>Ⓢ</sup>	-	-	-	-	-	3/8	1/2	1	1 1/2

<sup>Ⓢ</sup> Not available for size 1 through 5.

## Torque Adjustment

The 400 Series Torque Limiter can be shipped from the factory with the torque setting specified at the time of the order or furnished unset for adjustment at the time of installation. It should be noted that in the event that the torque ranges are not specified, Rexnord will supply the torque limiter with a spring arrangement to provide the maximum rating for the size ordered.

Sizes 1 to 5 are furnished with a calibration spacer that prevents adjustment beyond the maximum torque rating of the unit. If factory setting is required, a spacer can be furnished to prevent adjustment to a higher value than that set at the factory. Standard units are not supplied with the spacer, which must be requested at the time the order is placed. The spacer must be removed to allow tightening of the adjustment nut to achieve a higher torque value. On sizes 6 and larger, positioning spacers are provided to prevent torque adjustment. If removed to make an adjustment, they must be replaced to assure proper operation.

In some cases the exact torque setting requirements are difficult to calculate with a reasonable degree of accuracy; therefore, the recommended installation procedure would be to try to start the drive with a low torque setting, progressively tightening the adjusting nut until the unit will start and drive the mechanism without disengaging under normal conditions. Before attempting to turn the adjusting nut, ensure that the locking set screw is loosened and for sizes 6 and above, the locking key is removed. Replace keys and tighten setscrew after final adjustment.

**Caution: Do not tighten the adjusting nut so that the springs are compressed beyond their minimum operating length** (Min gap "Y" size, Table 1), or the springs will not allow sufficient movement of the slide plate to let the balls leave their seats during an overload. Damage to the machinery or to the Autogard Torque Limiter will result. It is important that our product is used in the correct manner and that adjustments and setting in relation to a particular function follow recommended procedures.

# Torque Limiter Engineering Information

## Covers

Covers are not usually required for reasonably clean factory installations. For protection against moderately dusty or dirty environments, the Autogard unit can be furnished with a dust resistant cover as shown in Figure 1 and Table 1. The dust cover incorporates a limit switch plate as shown.

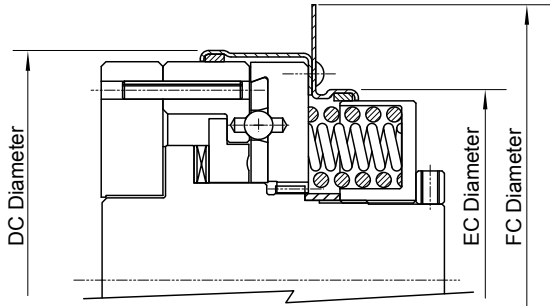


Figure 1

## Limit Switch Plates

The Autogard 400 Series is designed to run freely upon disengagement. However, it is still critical to shut down the drive immediately when disengagement occurs to avoid premature wear of the torque limiter. The recommended method of shutting down the drive is through the use of a customer supplied mechanical limit switch or proximity sensor shown in Figure 2 using the dimensions in Table 2. However, it is preferable to use the slide plate movement on disengagement to operate a limit switch, which switches off the main drive and/or sounds an alarm.

The limit switch may be operated by a limit switch operating plate fitted to the slide plate or by the cover. In some circumstances a limit switch may be operated directly by the slide plate.

Figure 2 and Table 2 give details of the limit switch plate and the movement on disengagement.

Table 1

Size	Dimensions			Material
	DC	EC	FC	
1	2.9	2.5	3.25	Steel
2	4.7	3.7	5.5	Steel
3	6.1	5.1	7.25	Steel
4	6.9	5.7	8.00	Steel
5	9.1	7.8	11.0	Steel

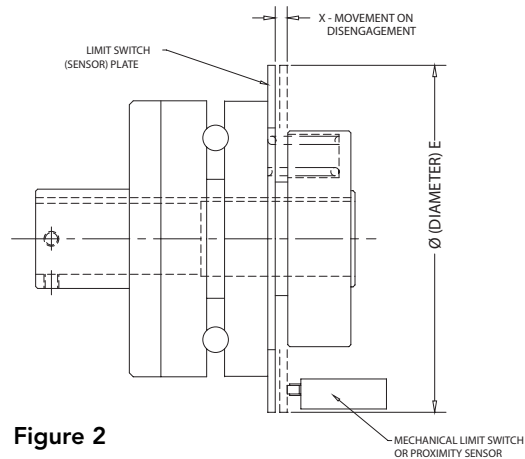


Figure 2

Table 2

Size	1	2	3	4	5	6
X	.059	.112	.137	.137	.173	.210
E	4.33	5.50	7.25	8.00	11.00	12.00

## Protective Finish

The standard protective finish applied to Autogard Torque Limiters is manganese phosphate plus oil dip. This treatment provides a high level of protection with good corrosion resistance and is suitable for most environments. Other finishes can be applied for situations where exceptional environments necessitate high levels of protection — consult Rexnord.

## Maintenance

The Autogard 400 Series Torque Limiter normally uses needle thrust bearings and self-lubricating journal bearings. Both needle bearings and drive balls are packed with grease at assembly. The frequency of maintenance will depend on the operating environment and number of trips, but once every 2,000 operating hours should be adequate in most applications. The amount of maintenance required is dependent upon the operating conditions and should be maintained at least as frequently as the adjacent drive components. In adverse conditions, consult Rexnord.

## General Safety

Autogard Torque Limiters are reliable units, built to high standards of workmanship. Similar to all mechanical devices, each application must be considered on its own merits with reference to safety (i.e., lifting equipment, explosive conditions, etc). As rotating components, adequate guarding must be provided, in accordance with local codes. The intended use of torque limiters is for the protection of industrial machinery and should not be regarded as human safety devices. Rexnord staff is always available to discuss particular applications.

# Torque Limiter Engineering Information

## Spring Selections:

The full range of torque for each unit, sizes 1 through 5 is achieved by a number of positions in which coil springs are located. Calculate theoretical running torque at a chosen location using the following formula:

$$\text{Torque (lb-in)} = \frac{\text{hp} \times 63,025}{\text{RPM}}$$

For these sizes, select the proper spring assembly so that the desired tripping torque will be close to the max torque of the spring assembly. For lower torque settings, choose light-duty springs as shown in Table 4.

**Table 3: Standard Spring Selection**

Size	Standard Torque Adjustment Springs				Minimum Allowable Gap (Y)		Clearance (CA)	
	Spring Assembly		Torque Range		in	mm	in	mm
	Quantity	Positions	lb-in	Nm				
1	8	Outer	100-250	11.3-28.2	0.075	1.9	None Required	
	6	Outer	75-188	8.5-21.2	0.075	1.9		
	4	Outer	50-125	5.6-14.1	0.075	1.9		
	2	Outer	25-63	2.8-7.1	0.075	1.9		
2	8	Outer	400-2,000	45.2-226	0.20	5.1	None Required	
	6	Outer	300-1,500	33.9-169	0.20	5.1		
	4	Outer	200-1,000	22.6-113	0.20	5.1		
3	6	Inner & Outer	1,700-6,000	192-678	0.20	5.1	None Required	
	6	Outer	1,200-3,200	136-362	0.20	5.1		
	4	Outer	800-2,100	98.4-237	0.20	5.1		
	3	Outer	600-1,600	68-181	0.20	5.1		
4	8	Inner & Outer	2,500-10,000	282-1,130	0.20	5.1	None Required	
	8	Outer	2,000-6,800	226-768	0.20	5.1		
	6	Outer	1,500-5,100	169-576	0.20	5.1		
	4	Outer	1,000-3,400	113-384	0.20	5.1		
5	8	Inner & Outer	8,000-22,500	904-2,540	0.40	10.2	None Required	
	8	Outer	6,000-17,000	678-1,921	0.40	10.2		
	6	Outer	4,500-12,750	508-1,440	0.40	10.2		
	4	Outer	3,000-8,500	339-960	0.40	10.2		
6	8	Spring Stacks	12,000-50,000	1,356-5,650	1.05	26.7	3/8	9.5
	6	Spring Stacks	9,000-37,500	1,017-4,237	1.05	26.7		
	4	Spring Stacks	6,000-25,000	678-2,825	1.05	26.7		
7	12	Spring Stacks	45,000-100,000	5,085-11,300	1.15	29.2	1/2	12.7
	8	Spring Stacks	30,000-66,000	3,390-7,458	1.15	29.2		
	6	Spring Stacks	23,000-50,000	2,599-5,650	1.15	29.2		
	4	Spring Stacks	15,000-33,000	1,695-3,729	1.15	29.2		
8	12	Spring Stacks	90,000-220,000	10,170-24,860	2.05	52.1	1	25.4
	8	Spring Stacks	60,000-146,000	6,780-16,500	2.05	52.1		
	6	Spring Stacks	45,000-110,000	5,085-12,430	2.05	52.1		
	4	Spring Stacks	30,000-73,000	3,390-8,249	2.05	52.1		
9	12	Spring Stacks	200,000-500,000	22,600-56,500	3.23	82.0	1 1/2	38.1
	8	Spring Stacks	130,000-330,000	14,690-37,290	3.23	82.0		
	6	Spring Stacks	100,000-250,000	11,300-28,250	3.23	82.0		
	4	Spring Stacks	65,000-170,000	7,345-19,210	3.23	82.0		

**Table 4: Light-duty Spring Selection**

Size	Spring #	Qty	Torque		Minimum Allowable Gap (Y)	
			lb-in	Nm	in	mm
1	4112003	6	6-12	.68-1.4	0.075	1.9
		8	9-19	1.0-2.1		
	4112002	4	12-25	1.4-2.8		
		6	18-45	2.0-5.1		
2	4212002	8	24-60	2.7-6.8	0.20	5.1
		4	80-250	9.0-28		
	4212002	6	120-375	14-42		
		8	160-500	18-56		
3	4312001	3	120-325	14-37	0.20	5.1
		4	180-488	20-55		
		6	240-650	27-73		
4	4312001	4	250-500	28-56	0.20	5.1
		6	375-750	42-85		
		8	500-1,000	56-113		
5	4512002	4	700-1,400	79-158	0.25	6.4
		6	1,050-2,100	119-237		
		8	1,400-2,800	158-316		

## Other Autogard Products

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Autogard Torque Limiter 200 Series



Autogard Torque Limiter 320 Series



Autogard Torque Limiter 600 Series



Autogard Torque Limiter 820 Series



Autogard Torque Limiter WT Series

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To learn more about the Autogard Torque Limiter offering and how it can provide you with high-quality overload protection, go to [www.rexnord.com](http://www.rexnord.com), where you'll find:

- Product information
- Brochures
- Manuals

866-REXNORD (toll-free within the U.S.) or 414-643-2366 (Outside the U.S.)

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866-REXNORD/866-739-6673 (Within the U.S.)  
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## Why Choose Rexnord?

When it comes to providing highly engineered products that improve productivity and efficiency for industrial applications worldwide, Rexnord is the most reliable in the industry. Commitment to customer satisfaction and superior value extend across every business function.

### Delivering Lowest Total Cost of Ownership

The highest quality products are designed to help prevent equipment downtime and increase productivity and dependable operation.

### Valuable Expertise

An extensive product offering is accompanied by global sales specialists, customer service and maintenance support teams, available anytime.

### Solutions to Enhance Ease of Doing Business

Commitment to operational excellence ensures the right products at the right place at the right time.

# REXNORD

## Rexnord Company Overview

Rexnord is a growth-oriented, multi-platform industrial company with leading market shares and highly trusted brands that serve a diverse array of global end markets.

## Process & Motion Control

The Rexnord Process & Motion Control platform designs, manufactures, markets and services specified, highly engineered mechanical components used within complex systems where our customers' reliability requirements and the cost of failure or downtime are extremely high.

## Water Management

The Rexnord Water Management platform designs, procures, manufactures and markets products that provide and enhance water quality, safety, flow control and conservation.