



AUTOGARD® 400 SERIES TORQUE LIMITER

OVERVIEW BROCHURE — IMPERIAL



Autogard® 400 Series Torque Limiter

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 a unique reverse-to-reset function 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.

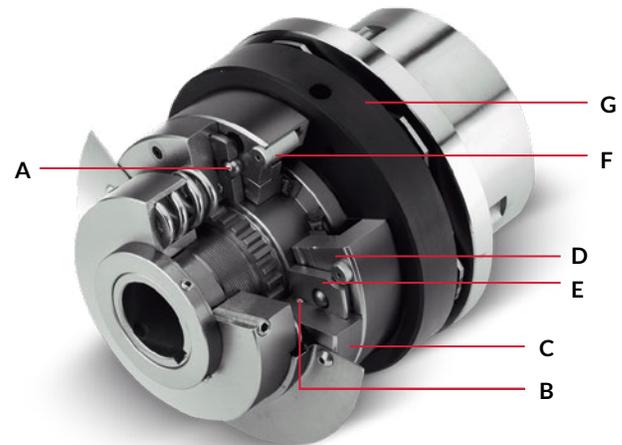
DISENGAGEMENT ON OVERLOAD

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 4**.
Specify factory 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 = H7 + 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

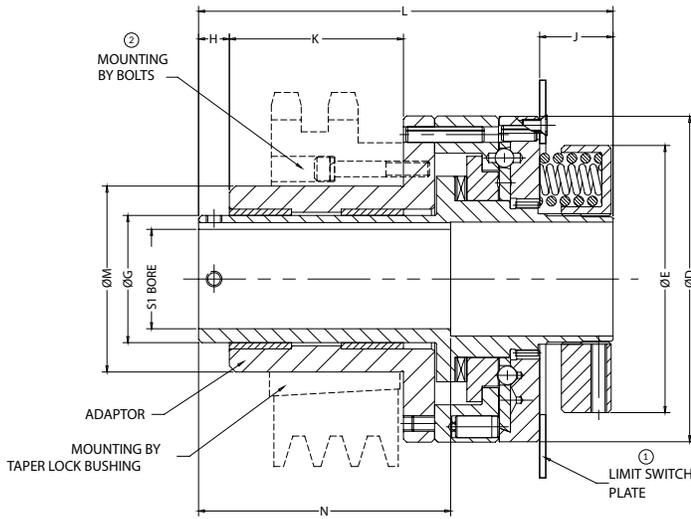
Also specify:

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

The specifications contained within this brochure are correct at the time of publishing. Regal 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

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



① See Figure 2 and Table 3 on page 14 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 ²	
	Min lb-in	Max lb-in			Hub side lb-in ²	Flange Side lb-in ²
1	25	250	3,600	2.5	1	1
2	180	2,000	3,600	12	14	14
3	500	6,000	3,600	25	44	44
4	660	10,000	1,800	35	79	82
5	2,000	22,500	1,800	80	370	310

① For higher torque applications, consult Regal Rexnord™.

② Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord.

③ Weights and moments of inertia apply to max S1 bores.

Size	Max Bore S1 in ①	D in	E in	G in ②	H in	J in	K in	L in	M in ②	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
5 ③	-	43	35	30	23	8.78

① B type sprocket recommended. For multiple strand sprockets, consult Regal 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.

① Standard Mounting Hole Patterns (Minimum Diameters – See ②)					
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

① 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.

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.

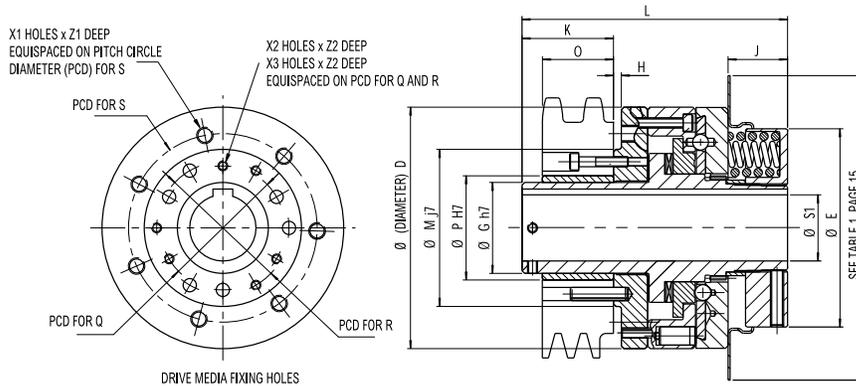


Applications

Conveyors
 Shredders
 Reel Stands
 Billet Transfer Drives
 Extruders

Model 402

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



Size	Torque ①		Max Speed ②	Weight ③	Mass Moment of Inertia MR ²	
	Min	Max			Hub Side	Flange Side
	lb-in	lb-in	rpm	lb	lb-in ²	lb-in ²
1	25	250	3,600	2.2	1	1
2	180	2,000	3,600	11.4	12	12
3	500	6,000	3,600	22	44	44
4	660	10,000	2,000	33	82	82
5	2,000	22,500	2,000	80	400	400
6	9,750	50,000	1,800	121	910	910

① For higher torque applications, consult Regal Rexnord™.

② Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord.

③ Weights and moments of inertia apply to max (S1) bores.

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 ⑤	-	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 Regal Rexnord for assistance.

③ For size 6, clearance is required for torque adjustment. See Table 1 on page 13.

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 Regal 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 Regal Rexnord.

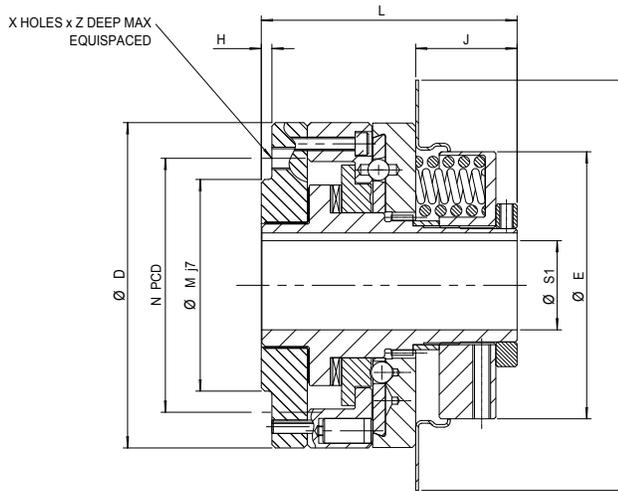
② The diameter quoted is to the bottom of a V pulley groove or the ID of the flange on a timing pulley.

③ Not available for 3/8 in pitch.

④ Please consult Regal Rexnord for specifications.

Model 403

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



Size	Torque ①		Max Speed ②	Weight ③	Mass Moment of Inertia MR ²	
	Min	Max			Hub Side	Flange Side
	lb-in	lb-in	rpm	lb	lb-in ²	lb-in ²
1	25	250	3,600	2	1	1
2	180	2,000	3,600	11	14	14
3	500	6,000	3,600	22	44	44
4	660	10,000	2,000	29	79	82
5	2,000	22,500	2,000	71	370	310
6	9,750	50,000	1,800	104	880	510
7 ④	-	100,000	-	-	-	-
8 ④	-	220,000	-	-	-	-

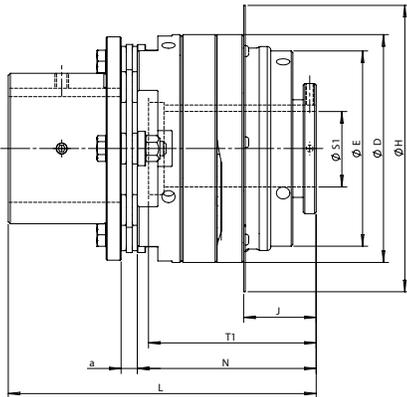
- ① For higher torque applications, consult Regal Rexnord™.
- ② Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord.
- ③ Weights and moments of inertia apply to max S1 bores.
- ④ Designs may vary for min torque, max speed, weight and mass moment of inertia specifications.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

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	-	-	-	-

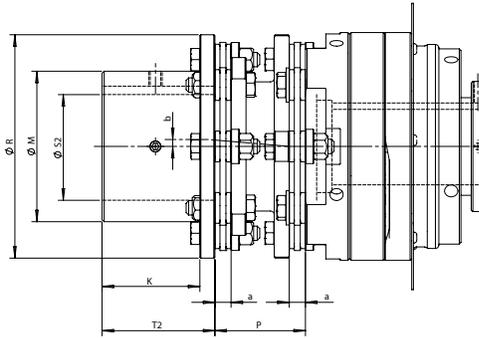
- ① For max bores greater than 1 in, use rectangular parallel keys.
- ② For sizes 6 and above, clearance is required for adjustment.
- ③ Mounting details may vary for H, M, N, X and Z. Please specify or consult Regal Rexnord for assistance.

Model 405

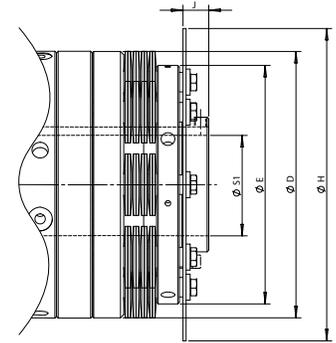
405 Model includes Thomas® XTSR52 to accommodate angular and parallel offset misalignment or Thomas XTSRS for angular misalignment only.



405 XTSRS



405 XTSR52



405 XTSR52, Sizes 6-8

Size	Torque ①		Max Speed rpm ②	Weight lbs ③	Mass Moment of Inertia MR ²		Max Axial Misalignment per disc pack ± in ④	Max Angular Misalignment per disc pack degrees ④	Max ⑤ Parallel Offset b in
	Min lb-in	Max lb-in			S1 side lb-in ²	S2 side lb-in ²			
405-2/XTSR	25	2,000	3,600	13.4	13.7	17.1	0.03	0.50	0.01
405-3/XTSR	500	6,000	3,600	27.8	44.4	64.9	0.03	0.33	0.01
405-4/XTSR	660	10,000	2,000	34.6	75.2	99.1	0.03	0.33	0.01
405-5/XTSR	2,000	22,500	2,000	91.5	372.5	498.9	0.04	0.33	0.02
405-6/XTSR	9,750	50,000	1,800	160.5	902.1	1,387.4	0.05	0.33	0.02
405-7/XTSR	13,500	100,000	1,500	264.6	2,371.5	3,095.9	0.06	0.33	0.02
405-8/XTSR	45,000	220,000	1,000	504.6	6,673.7	8,843.6	0.07	0.33	0.03

① For higher torque applications, consult Regal Rexnord™.

② Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord.

③ Weights and moments of inertia apply to max S1 and S2 bores with type XTSRS couplings.

④ The sum of percentages of permissible axial and angular misalignment present must not exceed 100%.

⑤ For size 2, dimension 'b' corresponds to 1/2° misalignment per coupling disc pack with minimum spacer length. For sizes 3 to 8, dimension 'b' corresponds to 1/3° misalignment per coupling disc pack with minimum spacer length. For longer spacers, consult Regal Rexnord. Parallel offset is not permissible for type XTSRS couplings.

Size	Max Bore S1 in ①	Max Bore S2 in	a in	D in	E in	H in	J in ②	K in	L in	M in	N in	P in ③	R in	T1 in	T2 in
405-2/XTSR	1.125	2.00	0.37	4.36	3.42	5.50	1.77	1.71	6.61	2.83	4.27	1.84	4.25	4.25	1.97
405-3/XTSR	1.625	2.50	0.41	5.74	4.72	7.25	1.80	2.81	8.37	3.63	4.77	2.26	5.51	4.51	3.19
405-4/XTSR	2.00	2.50	0.41	6.55	5.37	8.00	1.85	2.81	8.62	3.63	5.02	2.26	5.51	4.77	3.19
405-5/XTSR	3.00	4.00	0.62	8.75	7.50	11.00	2.79	3.76	11.82	5.78	6.87	3.48	8.58	6.44	4.33
405-6/XTSR	4.00	4.75	0.73	10.35	9.17	12.00	0.99	4.22	14.61	7.03	8.97	4.26	10.39	8.56	4.92
405-7/XTSR	5.00	5.75	0.81	12.48	11.13	15.25	1.12	5.07	16.36	8.41	9.65	4.82	12.32	9.65	5.91
405-8/XTSR	6.00	7.13	0.99	15.14	14.25	19.00	1.42	6.19	20.64	10.35	12.37	5.96	15.55	11.81	7.28

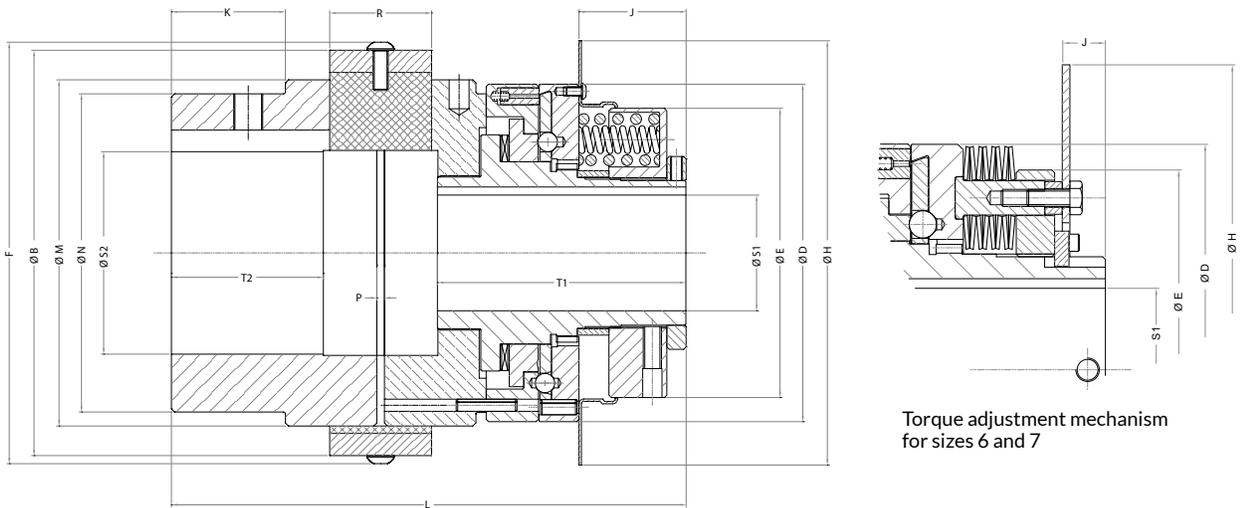
① For max bores greater than 1 inch, use rectangular parallel keys.

② For size 6 and above, clearance is required for adjusting bolt, consult Regal Rexnord.

③ P dimension is the minimum length. Longer spacers are available, consult Regal Rexnord.

Model 406W

406W Model includes Wrapflex® torsionally soft coupling to accommodate angular and parallel offset misalignment.



For the "R" dimension information please see Wrapflex catalogue (491-110)

Size	Torque		Max. ① Speed rpm	Max. Misalignment Axial ±in	Max. Misalignment Parallel in	Max. Misalignment Angular degrees	Weight ② lbs	Mass Moment of Inertia MR ² ②	
	Min. lb-in	Max. lb-in						S1 Side lb-in ²	S2 Side lb-in ²
1/5R	6	250	3,600	0.008	0.04	1.00	5	0.7	0.4
2/30R	80	2,000	3,600	0.008	0.08	1.00	22	12	40
3/40R	120	6,000	3,600	0.019	0.08	1.00	43	44	250
4/50R	250	10,000	2,000	0.019	0.08	1.00	78	79	290
5/60R	700	22,500	2,000	0.020	0.08	1.00	140	370	720
6/70R	6,000	50,000	1,800	0.019	0.08	1.00	230	880	2,200
7/80R	23,000	100,000	1,800	0.025	0.08	1.00	395	1,800	4,500

① Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord™.

② Weights and Mass Moments of Inertia apply to maximum S1 and S2 bores.

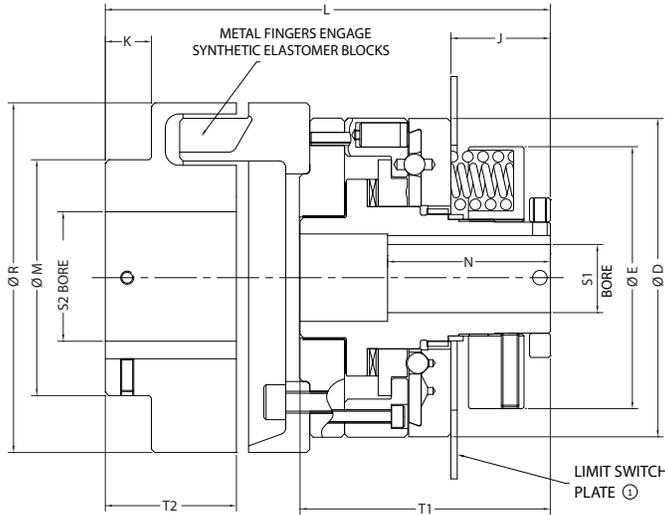
Size ②	Max. Bore ① S1 in	Max. Bore ① S2 in	B in	D in	E in	F in	H in	J in	K in	L in	M in	N in	P in	T1 in	T2 in
1/5R	0.625	1.625	3.01	3.15	2.19	3.16	4.33	0.87	0.79	4.17	2.52	2.36	0.08	2.31	0.98
2/30R	1.125	2.875	5.77	4.36	3.42	6.01	5.50	1.77	1.81	8.01	4.65	4.13	0.08	4.25	2.24
3/40R	1.625	3.375	7.17	5.75	4.72	7.48	7.25	1.77	2.13	9.095	5.91	5.12	0.19	4.51	2.60
4/50R	2.000	4.125	9.09	6.55	5.38	9.41	8.00	1.81	2.32	10.24	7.48	7.01	0.19	4.77	2.99
5/60R	3.000	5.250	10.51	8.75	7.50	10.94	11.00	2.72	2.95	13.33	8.98	8.25	0.20	6.44	3.94
6/70R	4.000	6.125	12.20	10.35	9.25	12.64	12.00	0.98	3.54	15.50	10.63	9.88	0.19	7.46	4.72
7/80R	5.000	7.250	14.57	12.48	11.13	15.00	15.25	1.10	4.02	18.00	12.91	10.63	0.25	8.63	5.51

① Standard bore tolerances = H8 + standard key fit.

② For size 6 and above, clearance is required for adjustment. Please consult Regal Rexnord.

Model 406N

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



See Figure 2 and Table 3 on page 14 for dimensions and movement on disengagement

Size	Torque ①		Max Speed rpm ③	Weight lbs ④	Mass Moment of Inertia MR ²		Max Axial Misalignment inch	Max Parallel Misalignment inch	Max Angular Misalignment degrees
	Min lb-in	Max lb-in ②			S1 side lb-in ²	S2 side lb-in ²			
1/68	25	250	3,600	4	0.7	0.4	0.39	0.005	0.09
2/125	180	2,000	3,600	19	12	40	0.55	0.008	0.10
3/160	500	6,000	3,600	40	44	250	0.87	0.010	0.10
4/200	660	10,000	1,800	57	79	290	1.10	0.013	0.10
5/250	2,000	22,500	1,800	135	370	720	1.89	0.017	0.10
6/315	9,750	50,000	1,800	207	880	2200	2.36	0.020	0.10
7/440 ⑤	13,500	100,000	-	-	-	-	-	-	-
8/560 ⑤	45,000	220,000	-	-	-	-	-	-	-

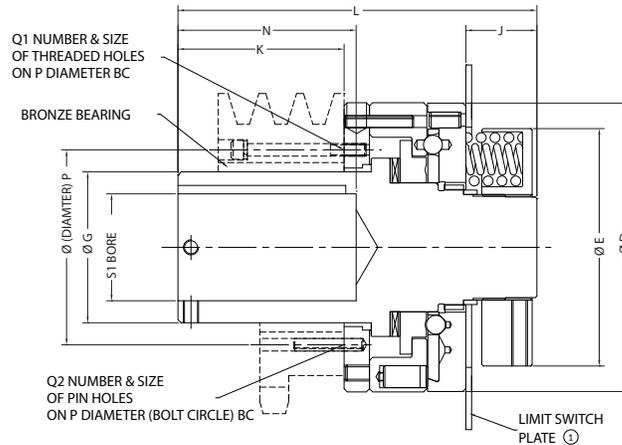
- ① Larger sizes are available. For higher torque applications, consult Regal Rexnord™.
- ② See spring selection on page 13 for torque range with specific springs.
- ③ Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord.
- ④ Weights and moments of inertia apply to max S1 and S2 bores.
- ⑤ Please consult Regal Rexnord for assistance on specifications for these sizes.

Size	Max Bore S1 in ①	Bore S2 ①		D in	E in	J in ②	K in	L in	M in	N in	R in	T1 in	T2 in	Gap Between Hub and Adapter in	
		Min in	Max in											Min	Max
1/68 ③	0.625	-	1.000	2.44	2.19	0.88	0.00	3.46	-	2.31	2.68	2.31	0.79	0.08	0.16
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	0.08	0.16
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	0.08	0.25
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	0.08	0.25
5/250	3.000	1.875	4.375	8.75	7.50	2.71	1.57	12.0	6.50	6.44	9.84	6.44	3.94	0.12	0.31
6/315 ③	4.000	3.625	4.875	10.25	9.25	3.19	2.17	14.06	7.87	8.56	12.40	8.56	4.92	0.12	0.31
7/440 ④	5.000	4.75	6.25	-	-	-	-	-	-	-	-	-	-	-	-
8/560 ④	6.000	4.75	7.875	-	-	-	-	-	-	-	-	-	-	-	-

- ① Bores are furnished for clearance fit unless otherwise specified by customer.
- ② For size 6 and above, clearance is required for adjustment, consult Regal Rexnord.
- ③ Smaller bores may be available under certain conditions. Please consult Regal Rexnord.
- ④ Please consult Regal Rexnord for assistance on specifications for these sizes.

Model 409SB

Model 409 is for use with applications requiring relatively large “blind” bore and light torque setting. The drive sprocket or pulley will normally be mounted by the factory. However, customer may mount if desired.



① See Figure 2 and Table 3 on page 14 for dimensions and movement on disengagement.

Size	Torque ①		Max Speed rpm ②	Weight lb	Mass Moment of Inertia MR ²	
	Min lb-in	Max lb-in			Hub side lb-in ²	Flange Side lb-in ²
1	25	250	3,600	2.5	1	1
2	180	2,000	3,600	12	14	14
3	500	6,000	3,600	25	44	44
4	660	10,000	1,800	35	79	82
5	2,000	22,500	1,800	80	370	310

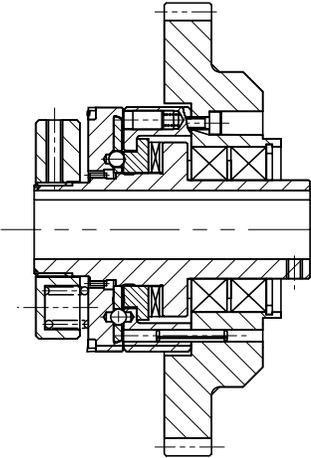
① For higher torque applications, consult Regal Rexnord™.

② Higher speeds may be allowed under certain conditions. Please consult Regal Rexnord.

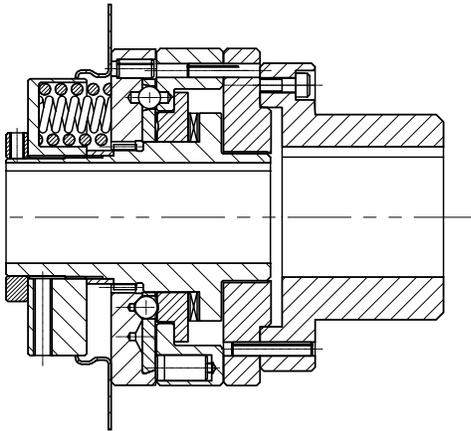
Size	Max Bore S1 in	D in	E in	G in	J in	K in	L in	N in	P in	Q1 in ①	Q2 in ①
1	1.125	2.44	2.19	1.50	0.57	1.73	3.69	2.00	1.938	#8-32	.187
2	1.625	4.37	3.42	2.25	1.48	2.25	5.81	2.56	3.000	#10-24	.187
3	2.125	5.75	4.72	3.00	1.48	3.31	7.13	3.54	3.875	1/4-20	.250
4	3.125	6.56	5.38	4.125	1.48	4.94	9.15	5.00	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

① 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.

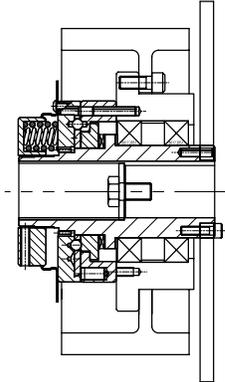
Additional Models and Special Designs



Special Design
Complete with a custom gear



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



Special Design
Complete with large pulley and brake



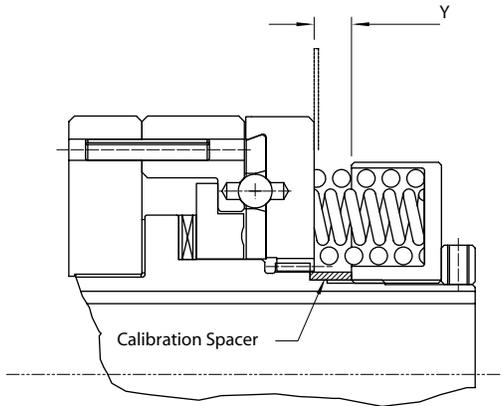
Torque Limiter Accessories

STANDARD SPRINGS

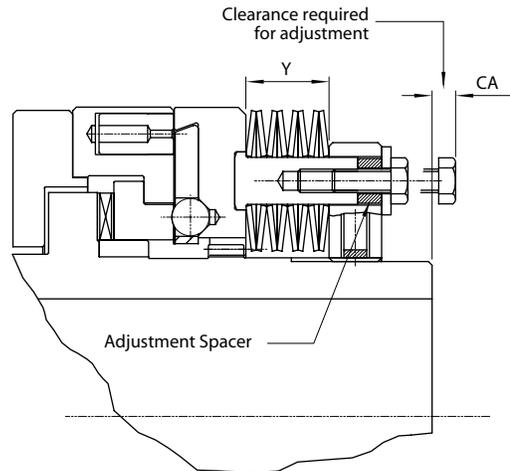
The torque carrying capacity of the 400 Series Torque Limiter can be varied by the position of the adjusting nut and the number and configuration of the springs supplied.

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 Regal Rexnord™ for details on quantities and configurations for the spring assemblies offered on each size.



Gap Size 1-5



Gap Size 6+

Table 1

Size	1	2	3	4	5	6	7	8
Min Gap 'Y'	.075	.20	.20	.20	.40	1.05	1.15	2.05
Clearance ①	-	-	-	-	-	3/8	1/2	1

① 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, Regal 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 2**. The dust cover incorporates a limit switch plate as shown.

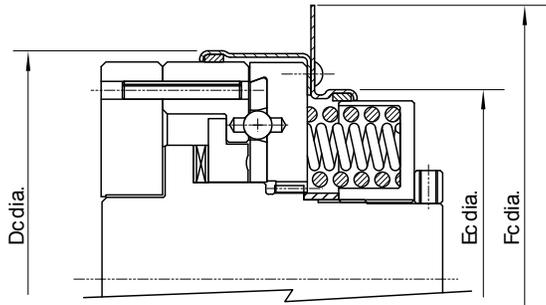


Figure 1

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 3**. 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 3** give details of the limit switch plate and the movement on disengagement.

Table 2

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

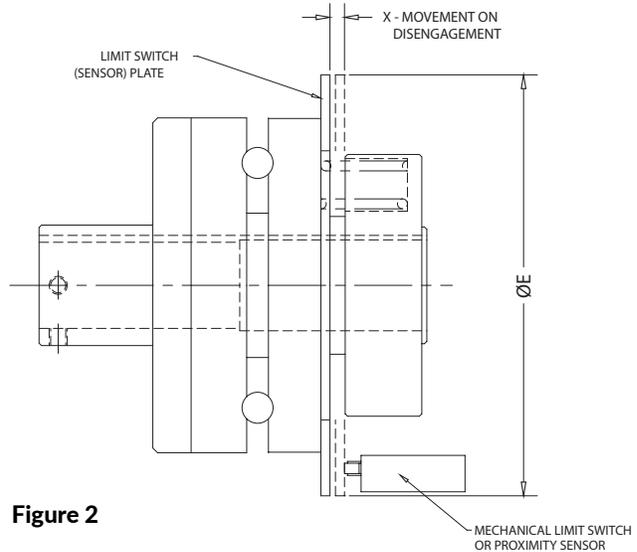


Figure 2

Table 3

Size	1	2	3	4	5	6
X	.059	.112	.137	.137	.173	.210

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 Regal 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 Regal 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. Regal Rexnord staff is always available to discuss particular applications.

Torque Limiter Engineering Information

SPRING SELECTIONS:

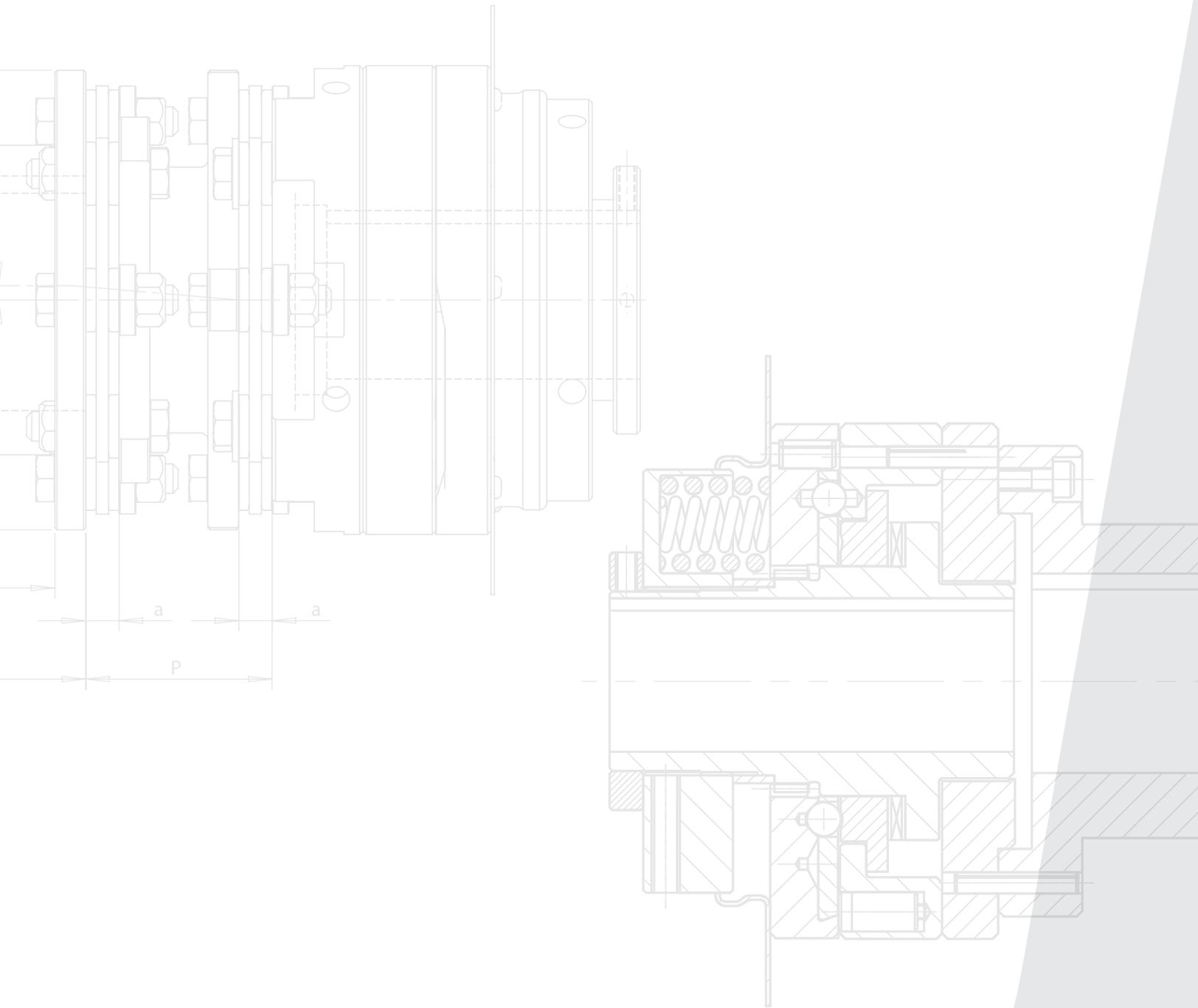
The full range of torque for each unit, sizes 1 to 5 is achieved by a number of positions in which coil springs are located. Calculate theoretical running torque at a chosen location using the following formula:

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

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.

Table 4 – Standard Spring Selection

Size	Standard Torque Adjustment Springs				Minimum Allowable Gap (Y)		Clearance (CA)	
	Spring Assembly		Torque Range		in	mm	in	mm
	Quan.	Positions	in-lb	Nm				
1	8	Outer	130 - 250	15 - 28	0.075	1.9	None Required	
	6	Outer	100 - 190	11 - 21	0.075	1.9		
	4	Outer	50 - 120	6 - 14	0.075	1.9		
	2	Outer	25 - 63	3 - 7	0.075	1.9		
2	8	Outer	700 - 2,000	80 - 220	0.20	5.1	None Required	
	6	Outer	500 - 1,500	60 - 170	0.20	5.1		
	4	Outer	300 - 1,000	40 - 115	0.20	5.1		
	2	Outer	180 - 550	20 - 60	0.20	5.1		
3	6	Inner & Outer	2,200 - 6,000	250 - 678	0.20	5.1	None Required	
	6	Outer	1,400 - 4,000	160 - 450	0.20	5.1		
	4	Outer	1,000 - 2,700	110 - 300	0.20	5.1		
	2	Outer	500 - 1,300	60 - 150	0.20	5.1		
4	8	Inner & Outer	4,800 - 10,000	500 - 1,130	0.20	5.1	None Required	
	8	Outer	3,100 - 6,700	350 - 750	0.20	5.1		
	6	Outer	2,300 - 5,000	260 - 560	0.20	5.1		
	4	Outer	1,400 - 3,300	160 - 375	0.20	5.1		
	2	Outer	660 - 1,700	75 - 190	0.20	5.1		
5	8	Inner & Outer	10,600 - 22,500	1,200 - 2,540	0.40	10.2	None Required	
	8	Outer	8,000 - 17,000	900 - 2,000	0.40	10.2		
	6	Outer	6,000 - 13,000	680 - 1,500	0.40	10.2		
	4	Outer	4,000 - 8,500	450 - 1,000	0.40	10.2		
	2	Outer	2,000 - 4,500	225 - 500	0.40	10.2		
6	8	Spring Stacks	20,000 - 50,000	2,250 - 5,650	1.05	26.7	3/8	9.5
	6	Spring Stacks	15,000 - 37,500	1,700 - 4,250	1.05	26.7		
	4	Spring Stacks	9,750 - 25,000	1,100 - 2,800	1.05	26.7		
7	12	Spring Stacks	40,000 - 100,000	4,500 - 11,300	1.15	29.2	1/2	12.7
	8	Spring Stacks	26,500 - 66,000	3,000 - 7,500	1.15	29.2		
	6	Spring Stacks	20,000 - 50,000	2,250 - 5,650	1.15	29.2		
	4	Spring Stacks	13,500 - 33,000	1,500 - 3,800	1.15	29.2		
8	12	Spring Stacks	90,000 - 220,000	10,000 - 24,860	2.05	52.1	1	25.4
	8	Spring Stacks	60,000 - 146,000	7,000 - 18,645	2.05	52.1		
	6	Spring Stacks	45,000 - 110,000	5,000 - 12,430	2.05	52.1		



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