



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 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 “fuse” 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 as 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.

$$\text{Torque (Nm)} = \text{Kw} \times 9550 / \text{rpm}$$

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:

- Check hub bore capacity
- 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 40mm

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

Bore S1 = 40 mm

Also specify:

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

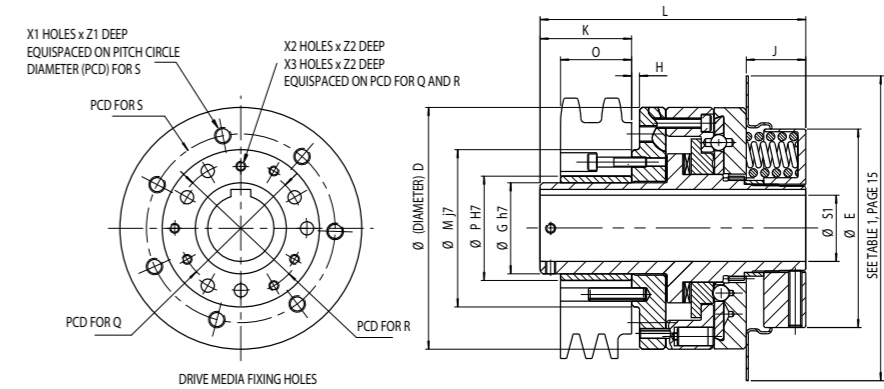
The specifications contained within this brochure are correct at the time of going to print. Rexnord is continually reviewing and updating the specifications on its entire Autogard product offering and therefore reserve the right to change any detail.



Applications

Conveyors
 Shredders
 Real Stands
 Billet Transfer Drives
 Extruders

Model 402



Size	Torque ①		Max Speed ②	Weight ③	Mass Moment of Inertia ④	
	Min Nm	Max Nm			Hub Side Kgm ²	Flange Side Kgm ²
1	3	28	3600	1.0	0.0002	0.0002
2	20	226	3600	5.2	0.0036	0.0041
3	60	678	3600	10.1	0.013	0.013
4	75	1130	2000	14.8	0.024	0.024
5	225	2540	2000	36.4	0.118	0.090
6	1100	5650	1800	55	0.266	0.170

- 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.

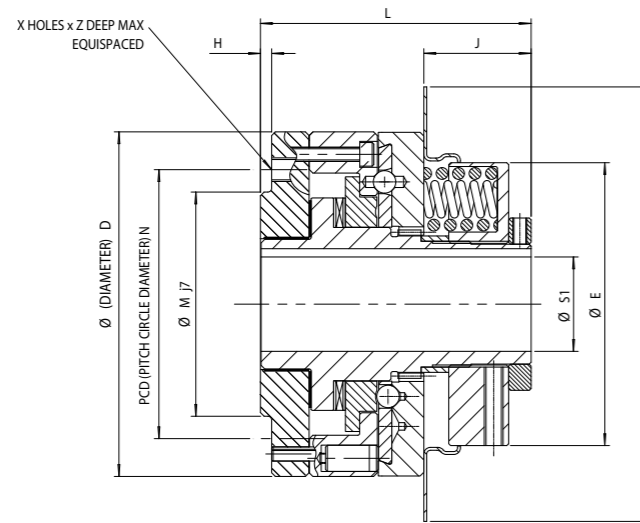
Size	Max Bore S1 mm ①	D mm	E mm	G mm	H mm ②	K Max mm	J mm ③	L Max mm ④	M mm	O Max mm	P mm	Q mm	R mm	S mm	X1 mm	Z1 mm	X2 mm	X3 mm	Z2 mm
1	16	62	55	25	-	33.5	14	83	-	25	30	35	38	-	-	-	3 x M3	3 x ø4	6
2	28	112	90	40	-	57	37	148	-	44.5	46	52	61	-	-	-	3 x M4	3 x ø5	9
3	40	146	120	55	4.76	55	35	160	95	43	63	75	80	114	7 x M10	15	3 x M6	3 x ø8	11
4	50	168	136	65	4.76	100	36	212	122	84	72	85	90	144	8 x M12	15	3 x M8	3 x ø10	11
5	75	222	190	100	6.35	134	56	284	155	116	107.95	120	125	184	8 x M16	23	4 x M8	4 x ø10	11
6 ⑤	100	260	235	140 ⑥	-	181	25	376	-	-	-	-	-	-	-	-	-	-	-

- ① For max bores greater than 25mm, 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 13.
- ④ Hub can be shortened to suit narrower drive media - please specify with order.
- ⑤ h6 tolerance.

Size	Smallest Sprocket (No. of teeth — see ①)					Smallest Diameter mm ②
	3/8" pitch	1/2" pitch	5/8" pitch	3/4" pitch	1" pitch	
1	19	15	13	-	-	46
2	27	21	17	15	12	70
3	34	27	22	19	15	92
4	-	30	24	21	17	104
5	-	38	31	27	21	139
6 ③	-	-	-	-	-	-

- 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 Please consult Rexnord for specifications.

Model 403



Size	Torque ①		Max Speed ②	Weight ③	Mass Moment of Inertia MR ²	
	Min	Max			Hub Side	Flange Side
	Nm	Nm				
1	3	28	3600	0.9	0.0002	0.0002
2	20	226	3600	5.0	0.0035	0.0041
3	60	678	3600	9.8	0.0130	0.0130
4	75	1130	2000	13	0.0230	0.0240
5	225	2540	2000	32	0.1080	0.0900
6	1100	5650	1800	47	0.2580	0.1500
7 ④	15000	11300				
8 ④	3500	24860				
9 ④	8000	56500				

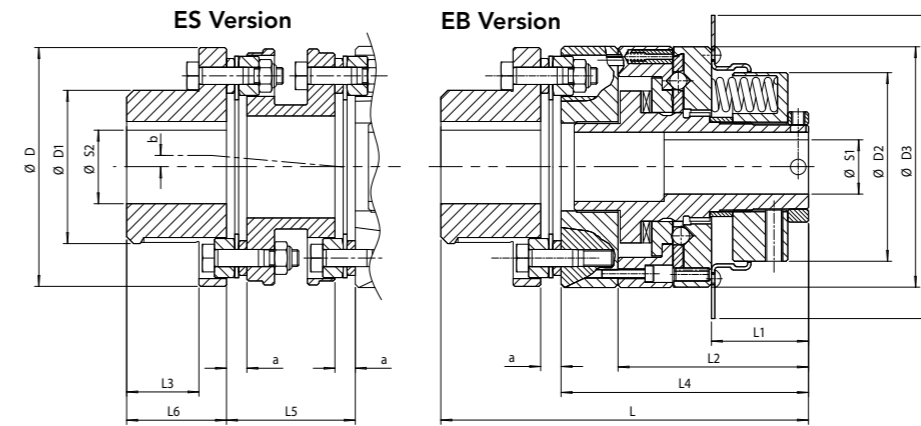
- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 bores.
- ④ Designs may vary for min torque, max speed, weight and mass moment of inertia specifications. Please specify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

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

Size	Max Bore S1 mm ①	D mm	E mm	H mm	J mm ②	L mm	M mm	N mm	X qty x size	Z mm
1	16	62	55	1.59	22	59	30.2	41.275	5 x M4	8
2	28	112	90	4.76	45	108	75	92	6 x M8	14
3	40	146	120	4.76	45	114	95	114	7 x M10	15
4	50	168	136	4.76	46	121	122	144	8 x M12	15
5	75	222	190	6.35	69	164	155	184	8 x M16	23
6 ③	100	260	235		25	218				
7 ③	127	311	283		26	245				
8 ③	152	385	362		36	300				
9 ③	178	457	451			410				

- ① For max bores greater than 25mm, 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



Atex Compliance Available

Size	Torque ①		Max Speed rpm ②	Weight kg ③	Mass Moment of Inertia		Max ④ Misalignment Δ a mm	Max ④ Parallel Offset b mm
	Min Nm	Max Nm			S1 side kgm ²	S2 side kgm ²		
405-1/8HVII	3	28	3600	1.5	0.0002	0.0012	0.7	0.4
405-2/35HVII	20	226	3600	7.1	0.0035	0.0116	1.0	0.5
405-3/150HVII	60	678	3600	16	0.013	0.073	1.5	0.6
405-4/150HVII	75	1130	2000	20	0.023	0.086	1.5	0.6
405-5/480HVII	225	2540	2000	50	0.108	0.211	2.0	0.8
405-6/880HVII	1100	5650	1800	91	0.258	0.649	2.5	0.9
405-7 ④	15000	11300						
405-8 ④	3500	24860						
405-9 ④	8000	56500						

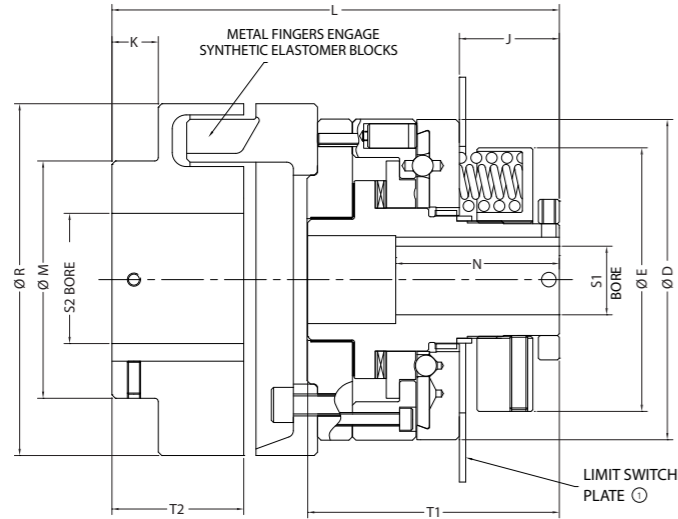
- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 and S2 bores with type EB couplings.
- ④ Δ a is the max allowable variation in the gap between flanges measured between 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 Δ 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 mm ①	Max Bore S2 mm	a (DBSE) mm	D mm	D1 mm	D2 mm	D3 mm	L mm	L1 mm ②	L2 mm	L3 mm	L4 mm	L5 mm ③	L6 mm
405-1/8HVII	16	30	7.4	80	44	55	62	107	22	48	23	68	48	32.5
405-2/35HVII	28	50	9.4	110	70	90	112	169	44	88	33	123.4	58	46
405-3/150HVII	40	90	8.9	170	123	120	146	204	45	94	59	120	66.5	74.6
405-4/150HVII	50	90	8.9	170	123	136	168	210	46	100	59	127	66.5	73.5
405-5/480HVII	75	110	15	230	150	190	222	284	69	131	75	189	109	95
405-6/880HVII	100	137	16.5	282	188	235	260	370	25	156	96	234	128	120
405-7 ④														
405-8 ④														
405-9 ④														

- ① For max bores greater than 25mm, 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 406N



Atex Compliance Available

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

Size	Torque ①		Max Speed rpm	Weight kg	Mass Moment of Inertia		Max Axial Misalignment mm	Max Parallel Misalignment mm	Max Angular Misalignment degrees
	Min Nm	Max Nm			S1 side kgm²	S2 side kgm²			
1/68	3	28	3600	1.4	0.0002	0.0005	3	0.11	0.1
2/125	20	226	3600	9.8	0.0035	0.0136	3	0.21	0.1
3/160	60	678	3000	16.4	0.0126	0.0343	4	0.27	0.1
4/200	75	1130	2000	27.2	0.0230	0.091	4	0.34	0.1
5/250	225	2540	2000	54	0.1080	0.2781	5	0.42	0.1
6/315	1100	5650	1800	92	0.2581	0.7203	5	0.52	0.1
7 ②	15000	11300							
8 ③	3500	24860							
9 ④	8000	56500							

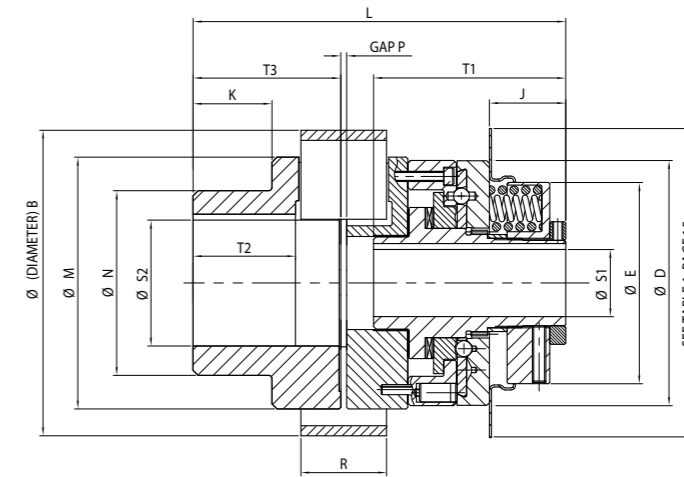
- ① Larger sizes are available. For higher torque applications, consult Rexnord.
- ② See spring selection on page 15 for torque range with specific springs.
- ③ Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ④ Weights and moments of inertia apply to max S1 and S2 bores.
- ⑤ Please consult Rexnord for assistance on specifications for these sizes.

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

Size	Max Bore S1 mm ①	Bore S2		D mm	E mm	J mm ②	K mm	L mm	M mm	N mm	R mm	T1 mm	T2 mm	Gap between hub & adapter	
		Min mm ③	Max mm ④											Min mm	Max mm
		1/68	16												
2/125	28	-	55	112	90	44	19	179	90	67	125	108	50	2	4
3/160	40	-	65	146	120	45	21	204	108	115	160	114	60	2	6
4/200	50	-	85	168	136	46	33	232	140	121	200	121	80	2	6
5/250	75	46	100	222	190	69	40	305	165	164	250	164	100	3	8
6/315	100	90 ⑤	120	260	235	79	55	357	200	217	315	218	125	3	8
7 ⑥															
8 ⑦															
9 ⑧															

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

Model 406S



Atex Compliance Available

Size	Torque ①		Max Speed rpm	Weight kg	Mass Moment of Inertia		Max Axial Misalignment mm	Max Parallel Misalignment mm	Max Angular Misalignment degrees
	Min Nm	Max Nm			S1 side kgm²	S2 side kgm²			
1/A1	3	28	3600	2.2	0.0002	0.0011	0.5	0.3	2.0
2/A3	20	226	3600	10.1	0.0035	0.0181	0.7	0.5	2.0
3/A4	60	678	3600	19.7	0.013	0.069	0.8	0.7	1.3
4/A5	75	1130	2000	35.6	0.023	0.198	1.0	0.7	1.3
5/A6	225	2540	2000	63.2	0.108	0.427	1.0	0.8	1.3
6/A7	1100	5650	1800	103	0.258	0.818	1.0	1.0	1.0
7 ②	15000	11300							
8 ③	3500	24860							
9 ④	8000	56500							

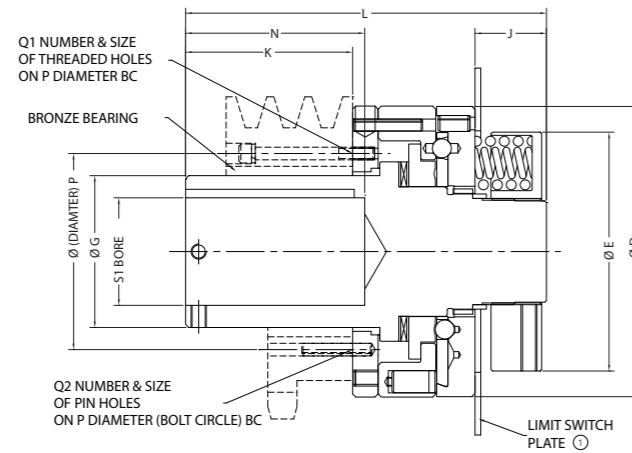
- ① For higher torque applications, consult Rexnord.
- ② Higher speeds may be allowed under certain conditions. Please consult Rexnord.
- ③ Weights and moments of inertia apply to max S1 and S2 bores.
- ④ Larger S2 bores are available for sizes 2,3 and 4 using a large boss, "B" style hub - consult Rexnord for details.
- ⑤ Please consult Rexnord for assistance on specifications for these sizes.

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

Size	Max Bore S1 mm ①	Max Bore S2 mm ②	B mm	D mm	E mm	J mm ③	K mm	L mm	M mm	N mm	P (gap)	R mm	T1 mm	T2 mm	T3 mm
2/A3	28	54	144	112	90	45	45	195	116	85	2.5	42	108.0	56.0	76.8
3/A4	40	70	182	146	120	45	47	222	150	110	3.5	51	114.4	63.0	88.0
4/A5	50	85	225	168	136	46	57	259	190	140	3.5	59	121.2	77.0	106.3
5/A6	75	114	265	222	190	69	70	316	233	180	3.5	67	163.5	95.0	128.3
6/A7	100	140	306	260	235	25	88	421	267	205	4.0	75	217.5	116.0	153.0
7 ④															
8 ⑤															
9 ⑥															

- ① For max bores greater than 25mm, use rectangular parallel keys.
- ② Larger S2 bores are available for sizes 2,3 and 4 using a large boss, "B" style hub - consult Rexnord for details.
- ③ For size 6 and above, clearance is required for adjustment, consult Rexnord.
- ④ Please consult Rexnord for assistance on specifications for these sizes.

Model 409 SB



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. See dimensions P, Q, R, S and T in table QD or P, Q1 and Q2 in table SB for mounting data.

Size	Torque ①		Max Speed ② rpm	Weight Kg	Mass Moment of Inertia	
	Min Nm	Max Nm			Hub side Kgm ²	Flange Side Kgm ²
1	3	28	3,600	5.5	0.0003	0.0003
2	20	226	3,600	26.5	0.0040	0.0040
3	60	678	3,600	55.1	0.0130	0.0130
4	75	1130	1,800	77.2	0.0230	0.0240
5	225	2540	1,800	176.4	0.1083	0.0907

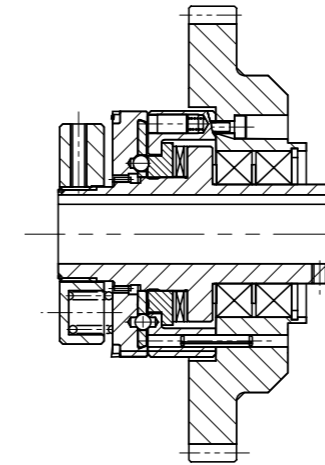
① For higher torque applications, consult Rexnord.

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

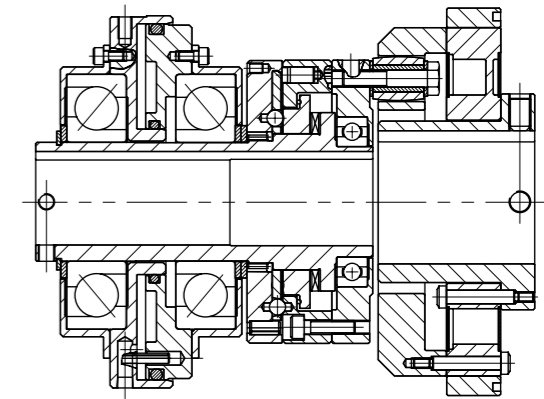
Size	Max Bore S1 mm	D mm	E mm	G mm	J mm	K mm	L mm	N mm	P mm	Q1 ① mm	Q2 ② mm
1	29	62	56	38	14	44	94	51	49	8 - 32	0.187
2	41	111	87	57	38	57	148	65	76	10 - 24	0.187
3	54	146	120	76	38	84	181	90	98	1/4 - 20	0.250
4	79	167	137	105	38	125	232	127	127	5/16 - 18	0.312
5	102	222	191	140	56	164	303	165	165	3/8 - 16	0.375

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.

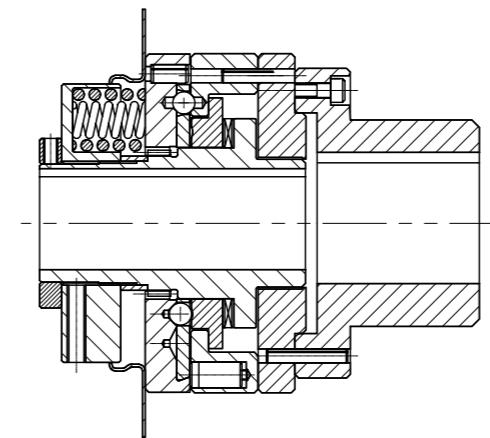
Additional Models and Special Designs



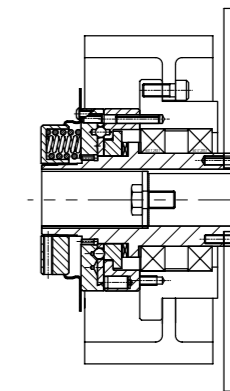
Special design complete with a custom gear



Special design that is 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

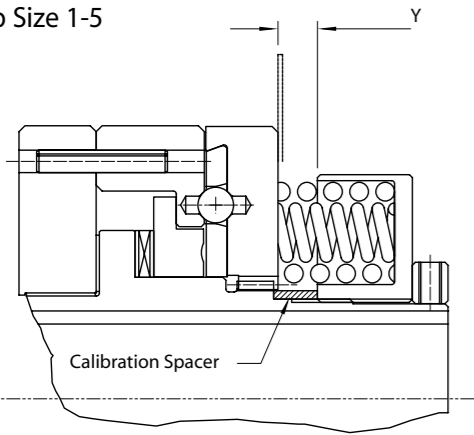


Special design complete with large pulley and brake

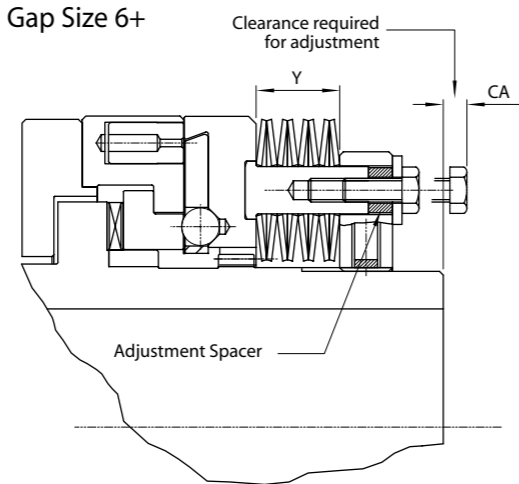


Torque Limiter Accessories

Gap Size 1-5



Gap Size 6+



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' mm	1.9	5.1	5.1	5.1	10.2	26.7	29.2	52.1	82.0
Clearance \odot mm	-	-	-	-	-	9.5	12.7	25.4	38.1

\odot 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.

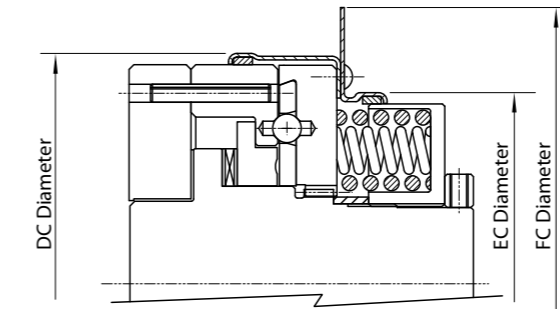


Figure 1

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.

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.

Table 1

Size	Dimensions			Material
	DC mm	EC mm	FC mm	
1	74	64	83	steel
2	120	94	140	steel
3	155	130	184	steel
4	175	145	203	steel
5	230	198	279	steel

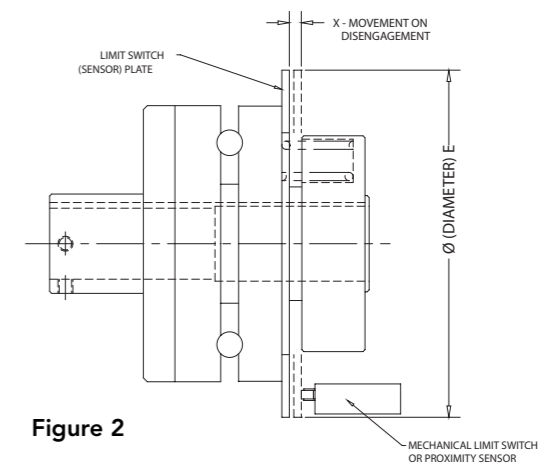


Figure 2

Table 2

Size	1	2	3	4	5	6
X mm	1.5	2.84	3.48	3.48	4.39	5.33
E mm	110	140	184	203	279	305

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.

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 are 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:

$$\text{Torque (Nm)} = \frac{Kw \times 9550}{\text{rpm}}$$

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		
	12	Spring Stacks	45,000-100,000	5,085-11,300	1.15	29.2		
7	8	Spring Stacks	30,000-66,000	3,390-7,458	1.15	29.2	1/2	12.7
	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		
	12	Spring Stacks	90,000-220,000	10,170-24,860	2.05	52.1		
8	8	Spring Stacks	60,000-146,000	6,780-16,500	2.05	52.1	1	25.4
	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		
	12	Spring Stacks	200,000-500,000	22,600-56,500	3.23	82.0		
9	8	Spring Stacks	130,000-330,000	14,690-37,290	3.23	82.0	1 1/2	38.1
	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	4	24-60	2.7-6.8	0.20	5.1
		6	80-250	9.0-28		
	4312001	4	120-375	14-42		
		6	160-500	18-56		
3	4312001	3	120-325	14-37	0.20	5.1
		4	180-488	20-55		
	4312001	4	240-650	27-73		
		6	250-500	28-56		
4	4312001	4	375-750	42-85	0.20	5.1
		6	500-1,000	56-113		
	4512002	4	700-1,400	79-158		
		6	1,050-2,100	119-237		
5	4512002	6	1,400-2,800	158-316	0.25	6.4

Other Autogard Products



Autogard Torque Limiter 200 Series



Autogard Torque Limiter 320 Series



Autogard Torque Limiter 600 Series



Autogard Torque Limiter 820 Series



Autogard WT Series

Any questions? Please contact us.

Morskate Aandrijvingen BV
Oosterveldsingel 47A
7558 PJ Hengelo (Ov)
The Netherlands

NL
T +31 (0)74 - 760 11 11
info@morskateaanrijvingen.nl
www.morskateaanrijvingen.nl

DE
T +49 692 - 222 34 95
info@morskateantriebstechnik.de
www.morskateantriebstechnik.de

EN
T +31 (0)74 - 760 11 11
info@morskatedrivetechnology.com
www.morskatedrivetechnology.com