

Autogard Torque Limiter 320 Series





Torque Limiter 320 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.

Acting like a mechanical “fuse” to protect the weakest member of the drive train, the most effective location for Autogard Torque Limiters is as close as possible to the component being protected. The 320 Series has been designed to meet the need for a compact and reliable safety clutch. The optimized design provides a robust, backlash-free clutch that will protect equipment from the damaging effects caused by overloading a drive train. The SR Reset features a timed automatic re-engagement as a standard.

Disengagement on Overload

In the normal drive condition, torque is transmitted through drive balls ‘A’ that are located in holes in flange ‘B’ and detents in drive plate ‘C’. The drive balls are held in the detents under pressure from springs ‘D’. When the driven machine either jams or an overload occurs which is greater than the torque setting, the balls roll out of their seats.

Re-engagement — SR Reset

Re-engagement is automatic once the overload is removed. Ball detents are positioned in a scattered pattern so that the balls must return to their original position before they can reset. Re-engagement will occur within one revolution in either direction. Immediate shutdown is required to prevent wear of the detents.

Figure 1



Letters above correspond to paragraphs on the left and below.

320 Series Applications

Conveyor Drives
Coal Feeder Conveyor
Packaging Equipment



Features and Benefits:

- Accurate torque limitation prevents costly downtime caused by overloads
- Compact design reduces weight and inertia on the equipment
- Bi-directional operation
- The standard design can accommodate larger torque ranges than many other models currently available
- Backlash-free operation
- One revolution synchronous re-engagement as standard
- Springs can be inspected and changed without removing the clutch from the drive train
- Coil springs allow one standard design to accommodate the full torque range as opposed to regressive disc springs that can only accommodate a narrow torque band
- Bore options with conventional bore and key or cone clamp sleeve for keyless connection

Selection:

Data required for torque limiter selection:

- Application details for service factors
- Kilowatt (kW) 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:

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

(3) Select and specify the appropriate drive medium.

All 320 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 320 Series Torque Limiter

When ordering, please provide the following designation:

Model and Size / Type / Reset / S1

Standard bore tolerance = H7 + normal fit key

Example: 320-2 / 2 / SR / 35

Refers to a 320 Series, Size 2, Type 2 torque limiter designed for Single Position Reset

S2 Bore = 35 mm

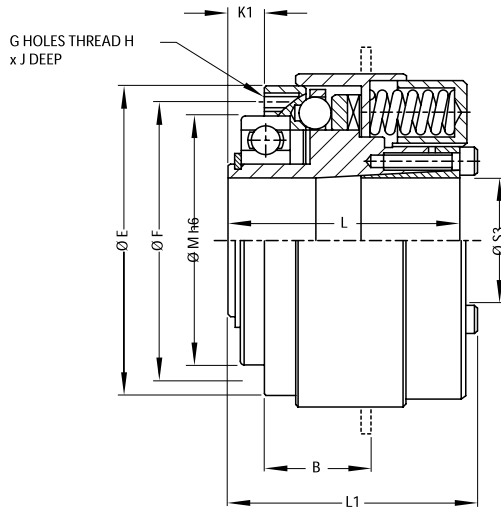
Also specify setting torque and/or pulley or sprocket if required.

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.

320 Series SR Standard Hub

For use with sprockets, pulleys or gears. Type 1 contains keyless bore clamp bushing. Type 2 accommodates a parallel bore and key.

Type 1 - Figure 2



Type 2 - Figure 3

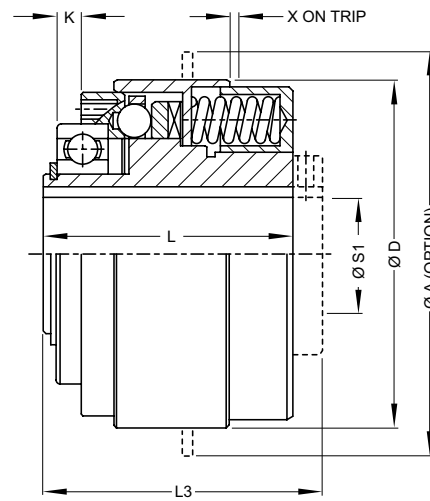


Table 1

Size	Torque ①		Max. Speed rpm	Weight ② Kg	Mass Moment of Inertia MR ² ②	
	Min.	Max.			Hub Side	Flange Side
	Nm	Nm			Kg-m ²	Kg-m ²
01	3	50	300	1.00	0.0004	0.0001
0	5	100	300	1.91	0.0009	0.0005
1	10	200	300	2.89	0.0019	0.0010
2	20	400	300	4.47	0.0044	0.0020
3	35	700	300	7.41	0.0094	0.0040
4	75	1,500	300	12.95	0.0257	0.0109

① See page 17, Table 21, for spring and torque ranges with specific springs.

② Weights and inertia values are for unbored units.

Table 2

Size	Bore (S3) Clamped Collar ②		Bore (S1) Keyed Hub ② ③	A	B	D	E	F	G	H	J	K	K1	L	L1	L3	M ①	X
	Min.	Max.																
	mm	mm	mm															
01	10	20	20	80	21	68	63.6	56	8	M4	6	5	8	47	50	52	47	1.2
0	15	28	23	100	28	84	78.7	71	8	M5	8	7	11	60	65	68	62	1.6
1	22	35	32	116	33	100	93.6	85	8	M6	10	7	12	71	77	80	75	1.7
2	32	45	40	140	38	120	111	100	8	M6	12.7	8	12	84	90	95	90	2.2
3	35	55	50	160	42	132	127	116	8	M8	12.7	8	16	95	101	105	100	2.4
4	42	65	58	190	49	166	157	144	8	M10	18	8	16	110	118	122	115	2.8

① Bores are furnished for clearance fit unless otherwise specified by customer. Consult Rexnord.

② Rectangular keys must be used for maximum bore diameters.

③ The drive medium must be bored to suit dimension M. Clutches may be ordered complete with drive medium (v-belt pulleys, timing pulleys, etc).

Table 3

Size	Smallest Sprocket (No. of teeth)					Smallest Pulley Diameter [⊙]
	3/8" Pitch	1/2" Pitch	5/8" Pitch	3/4" Pitch	1" Pitch	mm
01	24	19	16	14	11	60
0	29	23	19	16	13	76
1	34	27	22	19	15	91
2	40	31	25	22	17	106
3	-	35	29	24	19	124
4	-	-	35	29	23	154

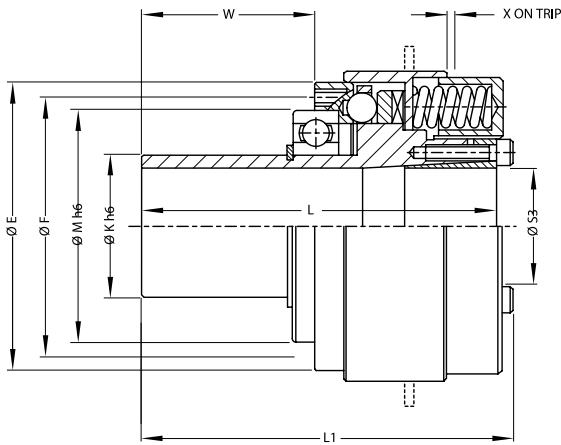
⊙ The pulley diameter quoted is to the bottom of the V-pulley groove or the inside diameter for the flange of the timing pulley.



320 Series SR Long Projecting Hub

For use with sprockets, pulleys or gears. Type 3 contains a keyless bore clamp bushing. Type 4 accommodates a parallel bore and key.

Type 3 - Figure 4



Type 4 - Figure 5

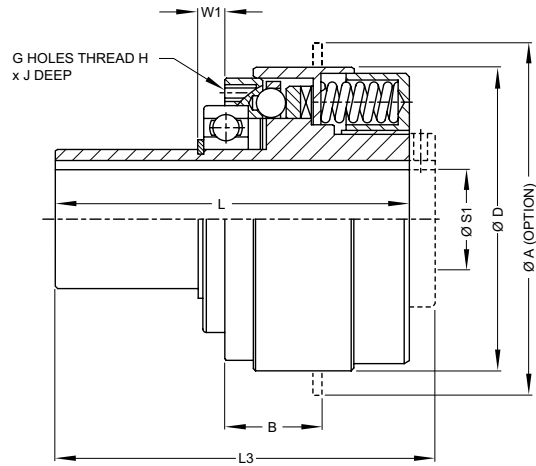


Table 4

Size	Torque ①		Max. Speed rpm	Weight ② Kg	Mass Moment of Inertia MR ² ②	
	Min.	Max.			Hub Side	Flange Side
	Nm	Nm			Kg-m ²	Kg-m ²
01	3	50	300	1.16	0.0004	0.0002
0	5	100	300	2.28	0.0010	0.0006
1	10	200	300	3.50	0.0020	0.0012
2	20	400	300	5.64	0.0048	0.0025
3	35	700	300	9.05	0.0103	0.0048
4	75	1,500	300	15.83	0.0277	0.0129

① See page 17, Table 21, for spring and torque ranges with specific springs.

② Weights and inertia values are for unbored units.

Table 5

Size	Bore (S3) Clamped Collar		Bore (S1) Keyed Hub ② ③	A	B	D	E	F	G	H	J	K ①	L	L1	L3	M	W	W1	X
	Min.	Max.																	
	mm	mm	mm																
01	10	20	20	80	21	68	63.6	56	8	M4	6	30	72	75	77	47	33	6.5	1.2
0	15	28	24	100	22	84	78.7	71	8	M5	8	40	93	97	101	62	43	8.5	1.6
1	22	35	32	116	33	100	93.6	85	8	M6	10	45	115	120	123	75	55	8.8	1.7
2	32	45	40	140	38	120	111	100	8	M6	12.7	55	139	145	150	90	67	10.6	2.2
3	35	55	50	160	42	132	127	116	8	M8	12.7	65	152	158	162	100	73	10.5	2.4
4	42	65	58	190	49	166	157	144	8	M10	18	75	185	193	197	115	91	10.5	2.8

① Bores are furnished for clearance fit unless otherwise specified by customer. Consult Rexnord.

② Rectangular keys must be used for maximum bore diameters.

③ The drive medium must be bored to suit dimension K and supported with suitable bearing. Clutches may be ordered complete with drive medium (v-belt pulleys, timing pulleys, etc).

Table 6

Size	Smallest Sprocket (No. of teeth)					Smallest Pulley Diameter [Ⓞ]
	3/8" Pitch	1/2" Pitch	5/8" Pitch	3/4" Pitch	1" Pitch	mm
01	18	15	12	11	9	45
0	20	16	13	11	9	55
1	24	19	16	13	11	70
2	28	22	18	16	12	85
3	-	26	21	18	14	100
4	-	-	23	20	16	110

Ⓞ The pulley diameter quoted is to the bottom of the V-pulley groove or the inside diameter for the flange of the timing pulley.



Torque Setting

The full torque capabilities of the 320 Series will depend on the number of springs fitted. A full complement of springs gives the catalog maximum values. See Table 21 below.

Table 7: Spring Selection 320 Series — SR

Size No. of Springs	01		0		1		2		3		4	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm
2	3	12	10	17	10	30	20	70	35	100	75	250
4	5	25	10	35	20	60	40	140	70	225	150	500
8	10	50	20	70	40	120	80	260	140	450	300	1,000
12	-	-	30	100	60	200	120	400	200	700	450	1,500

Drive Shutdown on Disengagement — 320 Series SR

The 320 Series SR torque limiter is designed to run at speeds up to 300 rpm, but the service life is determined by the number of rotations after disengagement. No wear occurs while the torque limiter is engaged. The life of the unit when running tripped depends on the torque setting, the running speed, and the time it takes to stop the drive after an overload occurs. Situations where a drive is allowed to coast to a stop or where the drive runs continuously with the torque limiter disengaging, are to be avoided. Longer life may also be achieved at lower torque settings.

Protective Finish

The standard phosphate and oil finish provides a high level of corrosion resistance. Units can be supplied with a suitable alternative finish for special machinery requirements, or for adverse environmental conditions. Please consult Rexnord to discuss any special requirements.

Maintenance and General Safety Information

Maintenance

The 320 Series uses sealed-for-life deep groove ball bearings. Other working surfaces are lightly greased on assembly. Under reasonably clean conditions the unit will operate with a minimum of maintenance and re-lubrication. It is recommended that the torque setting is checked and reset as part of routine maintenance or after any sustained period of disengaged running. The frequency of maintenance is dependent on many operating factors, but in adverse conditions, please 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. Contact Rexnord to discuss particular applications.



320 Series Industries

Lumber — Wood Products

Energy

Printing and Packaging

Paper Converting

Chemical

Pharmaceuticals



Other Autogard Products



Autogard 200 Series Torque Limiter



Autogard 400 Series Torque Limiter



Autogard 600 Series Torque Limiter



Autogard 820 Series Torque Limiter



Autogard XG Series Torque Limiter



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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.