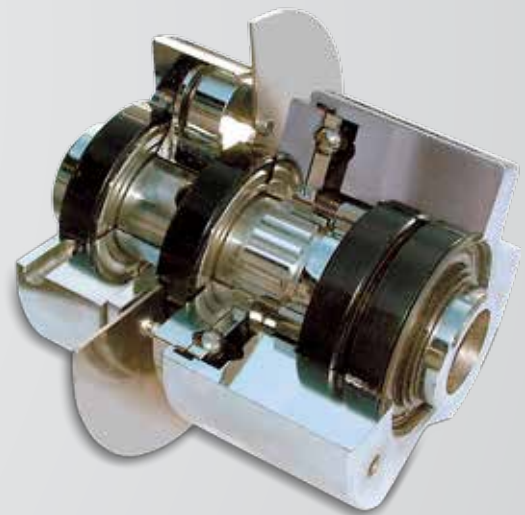


# Torque Limiter 600 Series





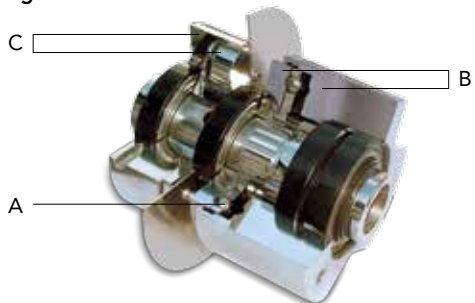
# Torque Limiter 600 Series

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 “circuit breaker” 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 600 Series Airjustor is a pneumatically controlled torque limiter and disengagement clutch that is adjustable in motion. It provides the ultimate in equipment protection with the addition of ON-OFF clutch control at a single cost.

The 600 Series Airjustor transmits torque from the drive to driven equipment through hardened chromium-steel balls ‘A’. Conical detents in opposing hardened tool-steel plates ‘B’ hold these balls under pressure. One detent plate connects to the drive and the other to the driven equipment. A pneumatic piston-cylinder assembly ‘C’, mounted on permanently lubricated sealed ball bearings (or optional shielded bearings) supplies the pressure on the detent plates. Mounting the piston-cylinder assembly on bearings allows it to be stationary relative to the air supply line regardless of the drive configuration, and assures a long, maintenance-free life.

Figure 1



Letters correspond to paragraph above.

## Adjusting the Overload Torque Setting

The 600 Series Airjustor carries a load in direct proportion to the air supply pressure. A pressure regulator set within the 20–80 PSI operating range controls the magnitude of the overload set point. Use of a dual regulator system with a timer allows for a high-torque set point to overcome starting inertia while automatically dropping to a lower, more sensitive setting after the driven equipment has accelerated

to normal running speed. This principle of dual set points can be generalized by use of a controller to accommodate any number of torque settings.

## Disengagement on Overload

When the torque setting is exceeded, the balls roll out of their seating in the detents and force the plates apart against the air pressure. This action releases the damaging inertia load by allowing the driving and driven halves of the 600 Series Airjustor to rotate freely with respect to one another through another pair of ball bearings. At this point, the air must be exhausted from the cylinder or the drive must be shut down to prevent damage to the torque limiter.

## Clutching

The 600 Series Airjustor can act as a disengaging clutch by exhausting the air from the cylinder. This will force disengagement. With no air pressure in the cylinder, internal springs force the plates apart so that the balls do not contact the driving and driven members at the same time. Now the driving and driven halves of the 600 Series Airjustor rotate freely relative to one another through a pair of ball bearings.

## Re-engagement

To re-engage after overload or clutching, simply reapply air pressure to the cylinder. Re-engagement must be accomplished at low speed or by stopping the motor and reapplying air pressure before starting. Before the drive balls reset completely, the 600 Series Airjustor will transmit a residual torque (typically about 10 percent of the disengagement torque) thus the driven machine must maintain a minimum resistance for the clutch to fully re-engage. Depending on the specification, the 600 Series Airjustor will reset in random position (AC) or single position (ACT). The single position reset unit will always maintain the same angular relation between input and output when fully engaged (every one or two revolutions depending on operational mode).



### Features and Benefits:

- Sensitive and accurate torque limitation with complete disengagement
- Can transmit a higher starting torque to accelerate the machine, and then drop to a lower running torque once the drive is up to speed for increased sensitivity
- Pneumatic control for adjustment of torque setting while running
- Can be used as a clutch to support machine cleaning and maintenance
- Air pressure regulation which can be adjusted while running either manually or automatically using a control system
- Rolling disengagement with no skidding for accuracy, reliability and long life
- Synchronous re-engagement possible at very low speeds
- Greased-for-life sealed ball bearings for long life
- Wide range of mounting configurations ensures the right solution for any problem:
  - Timing, HTD and V-Belt drives
  - Chain and sprocket drives
  - Gear drives
  - Flexible or rigid couplings

### Selection:

Data required for torque limiter selection:

- Application details for service factors
- Kilowatt (kW) 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 number of pistons (see page 8, Table 8).

(4) Select and specify the appropriate drive medium or coupling if applicable.

(5) Determine shaft retention:

- (a) Model 602 is standard with set screws or optional with a clamping collar mounting arrangement on the drive media end.
- (b) Both Models 605 and 606 are standard with set screws or optional with clamping collar on the S1 side and set screws only on the S2 side.
- (c) Special retention methods are also available, please consult Rexnord.

### Ordering the 600 Series Airjustor Torque Limiter

When ordering, please provide the following designation  
Model and Size / Type / Number of Pistons / S1 Bore /  
S2 Bore

Standard bore tolerance = H8 + normal fit key / shaft retention

### Example: 606-2 / AC / 8 / S1-1.000 / S2-2.125 / set screws

Refers to a Model 606, Size 2, Automatic Random Reset,  
8 pistons

S1 Bore = 1 in S2 Bore = 2.125 in

Mounting with set screws

# Model 602

Figure 2

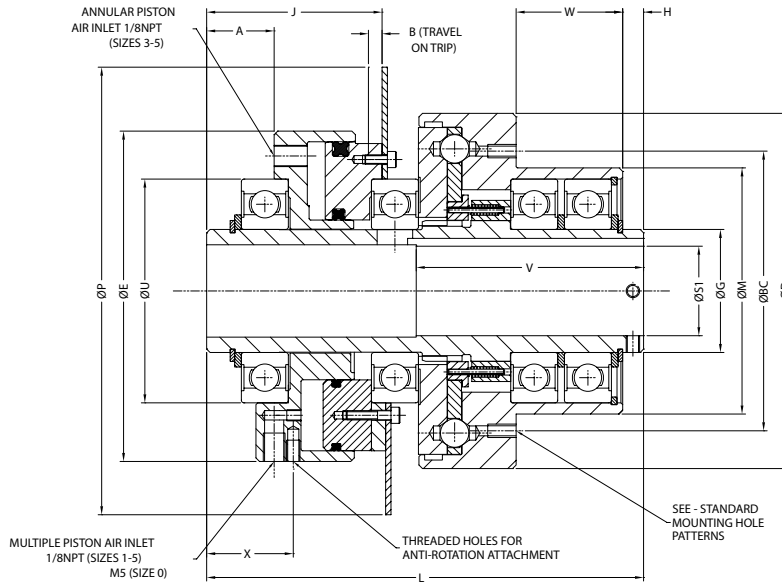


Table 1

Size	Max. Torque lb-in <sup>①</sup> <sup>②</sup>	Max. Speed <sup>③</sup>		Weight lb	Mass Moment of Inertia MR <sup>2</sup> lb-in <sup>2</sup>
		Type AC rpm	Type ACT rpm		
0	250	200	500	4	3
1	1,000	200	500	12	10
2	3,000	200	500	23	27
3 MP	3,000	200	500	36	82
3 AP	6,000	200	500	36	82
4 MP	5,000	200	500	61	219
4 AP	10,000	200	500	61	219
5 MP	11,250	200	500	149	854
5 AP	22,500	200	500	161	1,029

① Maximum torque is based on 80 PSI air pressure.

② Refer to page 8, Table 8. After calculating torque, select correct number of pistons for torque range required.

③ Higher speeds may be allowed under certain conditions. Consult Rexnord.

Table 2

Model 602 incorporates an adaptor to facilitate mounting of a standard sprocket, sheave, etc.

Size	S1 Max.	A	B	D	E	G	H	J	L	M	P	U	V	W	X
	<sup>①</sup>	in	in	in	in	in	in	in	in	in	in	in	in	in	in
0	0.625	0.68	0.09	2.75	2.56	0.984	0.312	1.70	4.560	2.062	3.75	1.851	2.25	0.87	1.20
1	1.000	0.64	0.16	4.00	3.88	1.378	0.312	2.20	5.750	2.750	5.50	2.441	3.00	1.37	1.57
2	1.375	0.66	0.24	5.25	5.07	1.772	0.393	2.71	6.500	3.375	7.00	2.952	3.50	1.50	0.98
3 MP	1.625	0.87	0.24	6.25	6.00	2.165	0.393	3.15	7.680	4.375	8.00	3.937	4.25	1.87	1.25
3 AP	1.625	1.19	0.24	6.25	5.62	2.165	0.393	3.10	7.680	4.375	8.00	3.937	4.25	1.87	1.44
4 MP	2.125	1.35	0.30	7.25	6.25	2.756	0.472	3.20	9.250	5.500	8.75	4.921	5.25	2.25	2.09
4 AP	2.125	1.66	0.30	7.25	6.62	2.756	0.472	3.53	9.250	5.500	8.75	4.921	5.25	2.25	1.84
5 MP	3.250	1.32	0.33	10.04	9.00	4.134	0.590	5.33	12.200	7.125	12.00	6.299	6.25	3.12	2.94
5 AP	3.250	1.71	0.33	10.04	9.65	4.134	0.590	5.05	12.200	8.250	12.00	7.480	6.25	3.12	2.09

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

② Tolerance for diameter M is h7.

Table 3

Size	Standard Mounting Hole Patterns			
	No. of Bolts	Bolt Size	Drive Medium Bore in	Bolt Circle Diameter in
0	6	#8-32	2.063 / 2.065	2.375
1	6	#10-24	2.751 / 2.753	3.125
2	6	1/4-20	3.376 / 3.378	3.875
3	6	5/16-18	4.376 / 4.378	5.000
4	8	5/16-18	5.501 / 5.503	6.125
5 MP	8	3/8-16	7.126 / 7.128	7.875
5 AP	8	3/8-16	8.251 / 8.253	9.000



## 600 Series Applications

Printing Presses  
Bottling/Filling Lines  
Labeling Machines  
Conveyors  
Plate Mill Levelers  
Paper Rolling Machines

# Model 605

Figure 3, EB

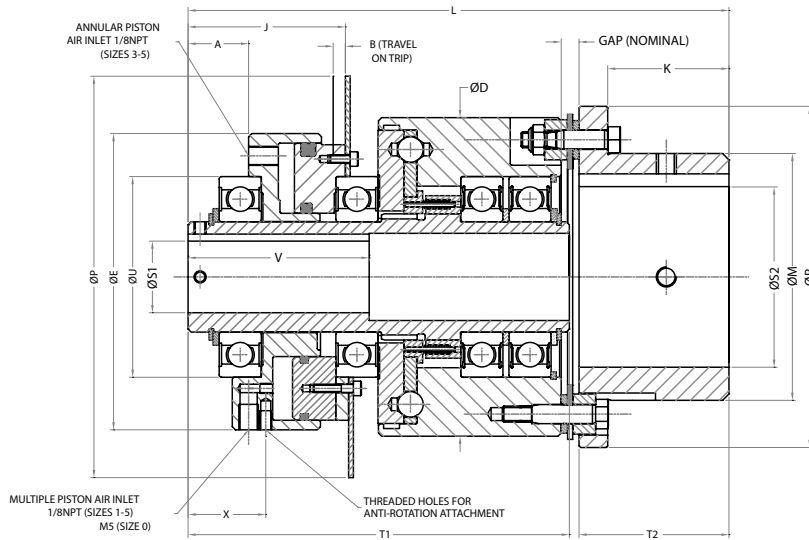


Figure 4, ES

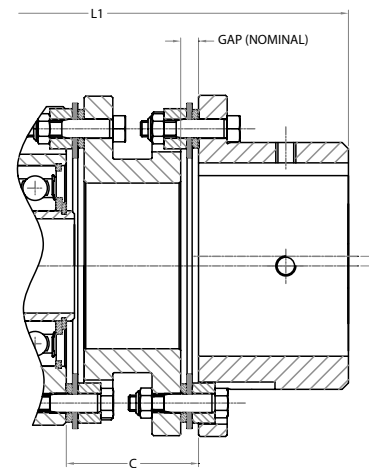


Table 4

Size	Max. Torque lb-in ① ②	Max. Speed ③		Weight lb ④	Mass Moment of Inertia MR <sup>2</sup> lb-in <sup>2</sup> ⑤	Max. Coupling Misalignments		
		Type AC rpm	Type ACT rpm			Axial in	Angular degree	Parallel in ⑥
0/8HVII	250	200	500	7	5	0.012	0.5	0.024
1/35HVII	1,000	200	500	19	27	0.020	0.5	0.028
2/70HVII	3,000	200	500	35	65	0.024	0.5	0.028
3 MP/150HVII	3,000	200	500	60	202	0.031	0.5	0.031
3 AP/150HVII	6,000	200	500	60	202	0.031	0.5	0.031
4 MP/150HVII	5,000	200	500	89	379	0.031	0.5	0.031
4 AP/150HVII	10,000	200	500	89	379	0.031	0.5	0.031
5 MP/480HVII	11,250	200	500	194	2,057	0.031	0.5	0.031
5 AP/480HVII	22,500	200	500	240	2,033	0.039	0.5	0.051

① Maximum torque is based on 80 PSI air pressure.

② Refer to page 8, Table 8. After calculating torque, select correct number of pistons for torque range required.

③ Higher speeds may be allowed under certain conditions. Consult Rexnord.

④ Weights and moment of inertia apply to maximum (S1 and S2) bores for the EB version.

⑤ Parallel offset misalignment applies only to ES-HV11 spacer couplings and is based on minimum DBSE.

Table 5

Model 605 includes the Autoflex EB-HVII torsionally rigid metal membrane coupling for angular misalignment. The Autoflex ES-HVII can be supplied upon request and accommodates angular and parallel offset misalignment.

Size	S1 Max. ①	S2 Max. ①	A	B	C Min. ②	D	E	J	K	L	L1 Min.	M	P	R	T1	T2	U	V	X	Nominal Gap
	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in	in
0/8HVII	0.625	1.000	0.68	0.09	1.89	2.75	2.56	1.70	0.91	6.59	8.19	1.72	3.75	3.15	4.56	1.28	1.85	2.25	1.20	0.29
1/35HVII	1.000	2.000	0.64	0.16	2.28	4.00	3.88	2.20	1.30	7.57	9.48	2.78	5.50	4.33	5.60	1.81	2.44	3.00	1.57	0.37
2/70HVII	1.375	2.562	0.66	0.24	2.28	5.25	5.07	2.71	1.77	8.86	10.77	3.58	7.00	5.24	6.43	2.26	2.95	3.50	0.98	0.37
3 MP/150HVII	1.625	3.437	0.87	0.24	2.52	6.25	6.00	3.15	2.36	10.56	12.73	4.84	8.00	6.69	7.48	2.94	3.94	3.75	1.68	0.35
3 AP/150HVII	1.625	3.437	1.19	0.24	2.52	6.25	5.62	3.10	2.36	10.56	12.73	4.84	8.00	6.69	7.48	2.94	3.94	3.75	1.44	0.35
4 MP/150HVII	2.125	3.437	1.35	0.30	2.52	7.25	6.25	3.20	2.36	13.04	15.21	4.84	8.75	6.69	9.28	2.94	4.92	5.25	2.09	0.35
4 AP/150HVII	2.125	3.437	1.66	0.30	2.52	7.25	6.62	3.53	2.36	13.04	15.21	4.84	8.75	6.69	9.28	2.94	4.92	5.25	1.84	0.35
5 MP/480HVII	3.250	4.187	1.32	0.33	4.29	10.04	9.00	5.33	2.95	15.94	19.64	5.91	12.00	9.06	12.00	3.74	6.30	6.25	2.94	0.59
5 AP/480HVII	3.250	4.187	1.71	0.33	4.29	10.04	9.65	5.05	2.95	17.88	19.64	5.91	12.00	9.06	12.00	3.74	7.48	6.25	2.09	0.59

① Bores are furnished for clearance fit unless otherwise specified by customer. Rectangular keys must be used for maximum bore diameters.

② C min. dimension is a minimum value. Longer spacers available upon request. Consult Rexnord.

# Model 606

Figure 5

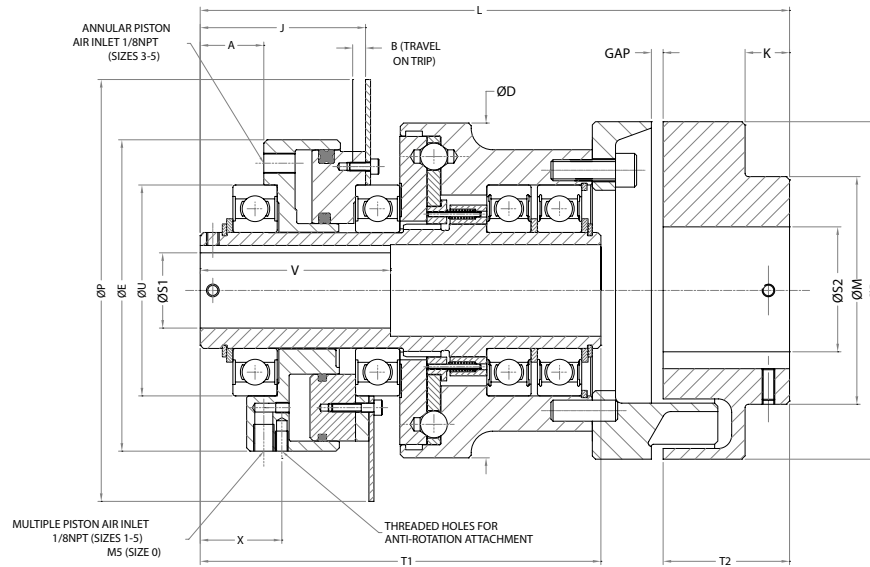


Table 6

Size	Max. Torque lb-in ① ②	Max. Speed ③		Weight lb	Mass Moment of Inertia MR <sup>2</sup> lb-in <sup>2</sup> ④	Coupling Misalignments			Gap Between Hub and Adaptor	
		Type AC	Type ACT			Min. S2 Bore in	Angular degrees	Parallel in	Min. in	Max. in
		rpm	rpm							
0/68	250	200	500	6	4	0.39	0.09	0.005	0.08	0.16
1/110	1,000	200	500	22	31	0.55	0.09	0.007	0.08	0.16
2/125	3,000	200	500	34	65	0.55	0.10	0.008	0.08	0.16
3 MP/160	3,000	200	500	55	174	0.87	0.10	0.010	0.08	0.25
3 AP/160	6,000	200	500	55	174	0.87	0.10	0.010	0.08	0.25
4 MP/200	5,000	200	500	246	513	1.10	0.10	0.013	0.08	0.25
4 AP/200	10,000	200	500	246	513	1.10	0.10	0.013	0.08	0.25
5 MP/250	11,250	200	500	246	2,238	1.89	0.10	0.017	0.12	0.31
5 AP/250	22,500	200	500	246	2,214	1.89	0.10	0.017	0.12	0.31

① Maximum torque is based on 80 PSI air pressure.

② Refer to page 8, Table 8. After calculating torque, select correct number of pistons for torque range required.

③ Higher speeds may be allowed under certain conditions. Consult Rexnord.

Table 7

Model 606 includes a rubber element coupling that is torsionally resilient and accommodates angular, parallel and axial misalignment.

Size	S1	S2	A	B	D	E	J	K	L	M	P	R	T1	T2	U	V	X
	Max.	Max.															
	in	in															
0/68	0.625	1.000	0.68	0.09	2.75	2.56	1.70	0.00	5.50	2.68	3.75	2.68	4.56	0.79	1.851	2.25	1.20
1/110	1.000	2.000	0.64	0.16	4.00	3.88	2.20	0.53	7.95	3.03	5.50	4.33	5.60	1.57	2.441	3.00	1.57
2/125	1.375	2.500	0.66	0.24	5.25	5.07	2.71	0.75	9.25	3.56	7.00	4.92	6.43	1.96	2.952	3.50	0.98
3 MP/160	1.625	2.750	0.87	0.24	6.25	6.00	3.15	0.843	11.12	3.75	8.00	6.30	7.48	2.36	3.937	3.75	1.25
3 AP/160	1.625	2.750	1.19	0.24	6.25	5.62	3.10	0.843	11.12	3.75	8.00	6.30	7.48	2.36	3.937	3.75	1.44
4 MP/200	2.125	3.750	1.35	0.30	7.25	6.25	3.20	1.31	13.38	5.50	8.75	7.88	9.25	3.15	4.921	5.25	2.09
4 AP/200	2.125	3.750	1.66	0.30	7.25	6.62	3.53	1.31	13.38	5.50	8.75	7.88	9.25	3.15	4.921	5.25	1.84
5 MP/250	3.250	4.375	1.32	0.33	10.04	9.00	5.33	1.57	17.63	6.50	12.00	9.84	12.00	3.94	6.299	6.25	2.94
5 AP/250	3.250	4.375	1.71	0.33	10.04	9.65	5.05	1.57	17.63	6.50	12.00	9.84	12.00	3.94	7.480	6.25	2.09

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

# Engineering Information

## Air Requirements

The 600 Series Airjustor requires regulated dry plant air (no lubrication) within a pressure range of 20 to 80 PSI. The 600 Series Airjustor operates on air pressure — the volume of air (CFM) is negligible and will not affect plant demand.

## Protective Finish

The standard protective finish applied to the 600 Series Airjustor 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.

**Table 8: Piston Selection**

Size	Max. Bore in	No. of Pistons	Torque Range lb-in
0	0.625	4	31–125
		8	62–250
1	1.000	4	125–500
		8	250–1,000
2	1.375	4	375–1,500
		8	750–3,000
3	1.625	3	375–1,500
		6	750–3,000
		One Annular	1,500–6,000
4	2.125	4	625–2,500
		8	1,250–5,000
5	3.250	One Annular	2,500–10,000
		4	1,406–5,622
		8	2,812–11,250
		One Annular	5,625–22,500

Note: Maximum torque is based on 80 PSI air pressure. Minimum torque is 25 percent of maximum torque for any given piston combination assuming air supply is at 20 PSI.

# Maintenance and General Safety Information

## Maintenance

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.





## 600 Series Industries

Printing and Packaging  
Paper Converting  
Food and Beverage  
Pharmaceutical  
Material Handling  
Steel Processing



micatoc

CONCEPT

CE

## Other Autogard Products

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Autogard Torque Limiter 200 Series



Autogard Torque Limiter 320 Series



Autogard Torque Limiter 400 Series



Autogard Torque Limiter 820 Series



Autogard Torque Limiter WT Series

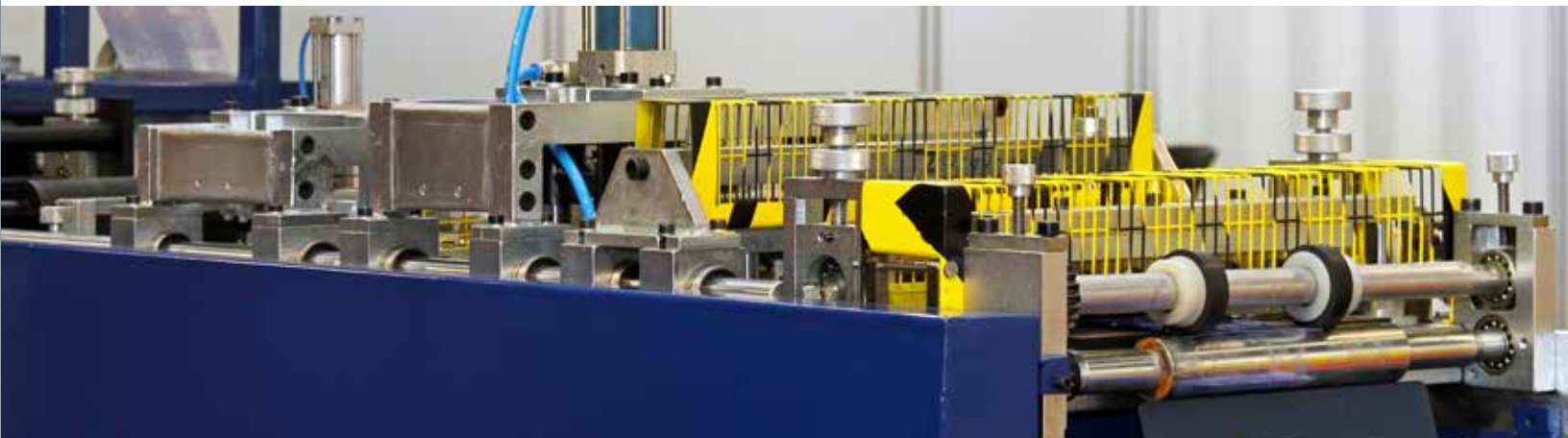
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To learn more about the Autogard Torque Limiter offering and how it can provide you with high-quality overload protection, go to [www.rexnord.com](http://www.rexnord.com), where you'll find:

- Product information
- Brochures
- Manuals

**866-REXNORD/866-739-6673 (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.)  
414-643-2366 (Outside the U.S.)  
[www.rexnord.com](http://www.rexnord.com)

## 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.