

# Autogard Torque Limiter 820 Series





# Autogard Torque Limiter 820 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.

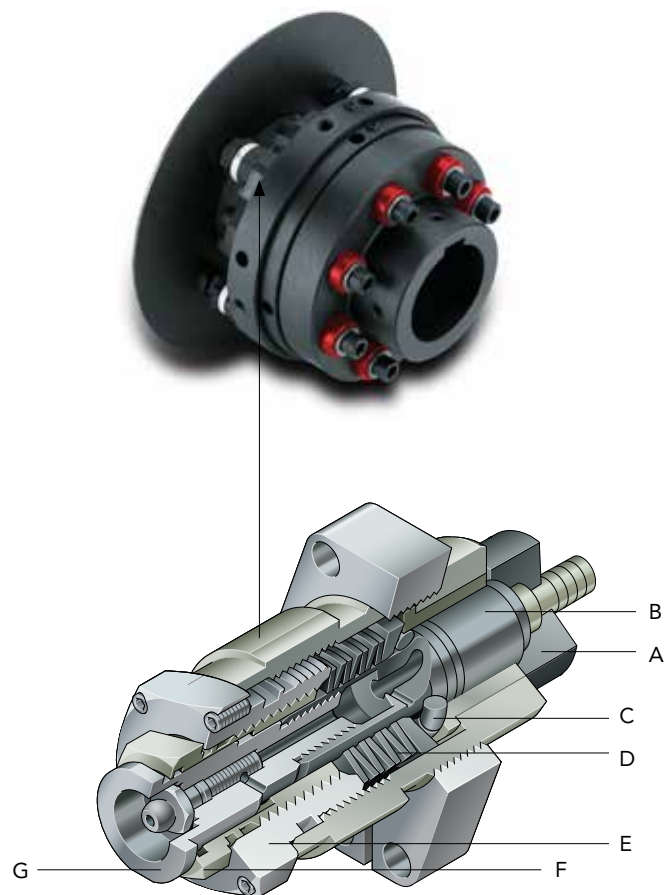
Acting like a mechanical “circuit breaker” to protect the weakest member of the drive train, the most effective location for Autogard Torque Limiters is as close as possible to the component being protected. The 820 Series has been designed using a modular principle to meet the emerging need for a high-torque, high- and low-speed torque limiter. The trip torque setting can be set to virtually any value depending upon the radius at which the modules are located, the number of modules used and module load setting.

## Disengagement on overload

A hardened seat ‘A’ is built into one half of the torque limiter. The module unit is then located into the opposing flange in a way that the torque is transmitted between the plunger ‘B’ and the hardened seat. This produces an end thrust in the plunger in proportion to the applied torque. This force is resisted by a ring of segments ‘C’ trapped between a flat surface and a conical washer loaded by disc springs ‘D.’ When the axial force reaches a level greater than the reaction force through the spring mechanism, the plunger will retract forcing the segments up the plunger slope and allowing the plunger to disengage from the hardened seat. The torque limiter is now allowed to run free. The modular torque limiter may incorporate an optional limit switch plate that moves on trip and can operate a switch to stop the device.

## Re-engagement

Resetting is accomplished by simply aligning the two halves, positioning the plunger over the hardened seat, and tapping the reset pin ‘G’ with a soft hammer. A remote reset version is also available. If required, the trip torque is externally adjusted and is achieved by turning the adjustment nut ‘E’ to increase or decrease the spring pressure.



Letters above correspond to paragraphs on the left.



### Features and Benefits:

- Accommodates high-torque application with high or low speeds
- Accurate and consistent torque setting ensuring reliable and repeatable torque overload protection
- Instant and complete disengagement of the driving and driven inertias ensuring optimum protection
- Trip torque can be adjusted easily without removing modules from the torque limiter
- Vernier scales are provided on each module allowing for accurate setting of the modules
- In the event of an overload, standard limit switches or proximity sensors can provide automatic motor shutdown
- Modules can be quickly and easily reset — manual or automatic resets available
- Manual disengagement allows for the unit to be disconnected for maintenance purposes
- Integral grease fitting allows for periodic lubrication of the unit without removing it from the drive line
- Wide range of mounting configurations ensures the right solution for any problem
- Drop-out center section allows the torque limiter to be removed from the drive line without moving the equipment

### Selection:

Data required for torque limiter selection:

- Application details for service factors
- 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 820 Series units may be supplied from the factory at a pre-set torque and with the required drive medium assembled to the unit.

## 820 Series Industries

Mining  
Energy  
Steel  
Paper

### Ordering the 820 Series Torque Limiter

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

Standard bore tolerance = H8 + normal fit key

#### Example: 820-3L / 2 / S1-4000 / S2-5125

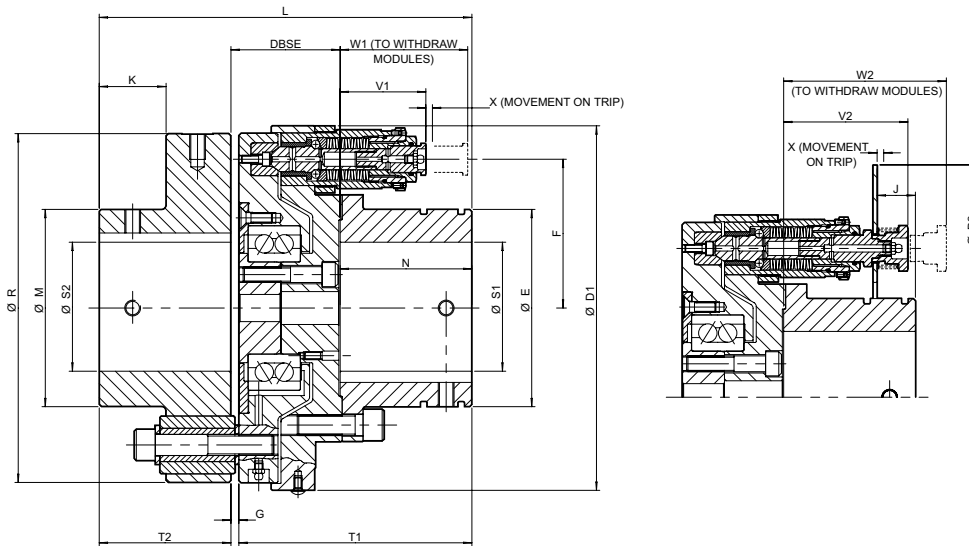
Refers to a model 820, size 3L, Type 2 torque limiter

Bore S1 = 4 in      Bore S2 = 5.125 in

Also specify setting torque if required.

# Type 1

Type 1 Model includes a pin and bush elastic coupling.



Size ⊙ ⊙	Modules (Size-Qty)	Torque		Coupling Torque		Max Speed	Mass ⊙	Mass Moment of Inertia MR <sup>2</sup> ⊙	Max Axial Misalignment	Max Parallel Misalignment
		Min	Max	Nominal	Peak					
		lb-in	lb-in	lb-in	lb-in	rpm	lb	lb-in <sup>2</sup>	in	in
1L	1L-4	3,275	13,011	18,764	37,527	3,800	73	461	+/- .12	.005
1H	1H-4	6,505	26,021	18,764	37,527	3,800	74	465	+/- .12	.005
2L	2L-3	7,612	30,535	56,114	112,228	2,400	167	1,855	+/- .12	.005
2H	2H-3	15,268	61,070	56,114	112,228	2,400	168	1,876	+/- .12	.005
3L	2L-4	12,391	50,007	85,410	170,819	2,150	273	4,340	+/- .14	.005
3H	2H-4	25,003	100,013	85,410	170,819	2,150	276	4,374	+/- .14	.005
4L	3L-4	26,995	107,979	159,933	319,866	1,800	538	12,711	+/- .14	.005
4H	3H-4	53,990	215,958	159,933	319,866	1,800	542	12,916	+/- .14	.005
5L	4L-3	57,884	231,447	309,776	619,553	1,800 ⊙	1,041	43,054	+/- .14	.005
5H	4H-3	115,724	462,894	309,776	619,553	1,800 ⊙	1,049	43,738	+/- .14	.005
6	5-3	531,045	1,062,090	Designed to customer specification. Consult Rexnord.						

⊙ Max angular misalignment 0.25°.

⊙ Balancing optional.

⊙ Consult Rexnord if limit switch plate is required at speeds above 1,400 rpm.

⊙ Mass and inertia values calculated for units with solid hubs without limit switch plate.



Size	S1 (max) in	S2 (max) in	DBSE in	D1 in	D2 in	E in	F in	G in	J in	K in	L in	M in	N in	R in	T1 in	T2 in	V1 in	V2 in	W1 in	W2 in	X in
1L	3.15	3.31	2.49	8.35	11.34	4.53	3.37	0.24	1.28	1.79	8.78	4.67	3.15	7.68	5.39	3.15	1.98	2.79	3.01	3.66	0.15
1H	3.15	3.31	2.49	8.35	11.34	4.53	3.37	0.24	0.89	1.79	8.78	4.67	3.15	7.68	5.39	3.15	2.38	3.18	3.40	4.06	0.15
2L	3.94	4.50	3.27	10.91	13.90	5.91	4.45	0.24	1.70	2.00	11.14	6.40	3.94	10.43	6.97	3.94	2.01	3.17	3.34	4.33	0.20
2H	3.94	4.50	3.27	10.91	13.90	5.91	4.45	0.24	1.15	2.00	11.14	6.40	3.94	10.43	6.97	3.94	2.56	3.72	3.89	4.88	0.20
3L	4.72	5.12	3.68	12.95	15.94	7.09	5.47	0.28	2.48	2.36	13.11	7.42	4.72	12.36	8.11	4.72	2.01	3.17	3.34	4.33	0.20
3H	4.72	5.12	3.68	12.95	15.94	7.09	5.47	0.28	1.93	2.36	13.11	7.42	4.72	12.36	8.11	4.72	2.56	3.72	3.89	4.88	0.20
4L	5.91	6.75	4.52	16.10	19.09	9.06	6.54	0.28	2.76	3.54	16.34	9.76	5.91	14.76	10.16	5.91	2.99	4.31	4.96	5.16	0.24
4H	5.91	6.75	4.52	16.10	19.09	9.06	6.54	0.28	1.81	3.54	16.34	9.76	5.91	14.76	10.16	5.91	3.94	5.25	5.91	6.10	0.24
5L	7.09	8.00	5.31	21.65	24.65	11.02	8.70	0.28	2.25	4.72	19.49	12.20	7.09	18.50	12.13	7.09	4.68	6.00	7.32	7.56	0.31
5H	7.09	8.00	5.31	21.65	24.65	11.02	8.70	0.28	0.99	4.72	19.49	12.20	7.09	18.50	12.13	7.09	5.94	7.26	8.58	8.82	0.31
6	9.00	9.00	Designed to customer specification. Consult Rexnord.																		

## 820 Series Type 1 Pin Coupling Selection Method

When selecting a 820 Series, Type 1, please confirm the coupling is suitable for the continuous torque, taking into account the duty in which the unit will be used.

(A) Determine the nominal torque: Torque (lb-in) = Horsepower (hp) x 63025/rpm

(B) Select the appropriate service factor  $f_D$  as shown in Table 1.

(C) From Table 2 select the factor for the frequency of starts per hour ( $f_s$ ).

(D) Determine selection torque: Selection Torque (lb-in) = nominal torque x  $f_D$  x  $f_s$

(E) Check to ensure that the coupling's nominal torque rating exceeds the selection torque. If not, select the next larger torque limiter that meets this criteria.

**Table 1: Pin coupling service factor ( $f_D$ ) for 820 Series Type 1 only.**

Driven Machinery Characteristics				
Prime Mover (Drive input)	Duration Service (Hours/Day)	Steady Load	Medium Impulsive	Highly Impulsive
Electric Air, Hydraulic Motors, Steam Turbines (Steady Input)	Intermittent 3 hrs/day max	0.90	1.00	1.50
	3-10	1.00	1.25	1.75
	Over 10	1.25	1.50	2.00
Multi-cylinder I.C. Engine (Medium Impulsive Input)	Intermittent 3 hrs/day max	1.00	1.25	1.75
	3-10	1.25	1.50	2.00
	Over 10	1.50	1.75	2.25
Single-cylinder I.C. Engine (Highly Impulsive Input)	Intermittent 3 hrs/day max	1.25	1.50	2.00
	3-10	1.50	1.75	2.25
	Over 10	1.75	2.00	2.50

**Table 2: Pin coupling service Factor ( $f_s$ ) for 820 Series Type 1 only.**

Number of Starts per Hour	0-1	1-30	30-60	60+
Factor	1.00	1.20	1.30	1.50

### Notes:

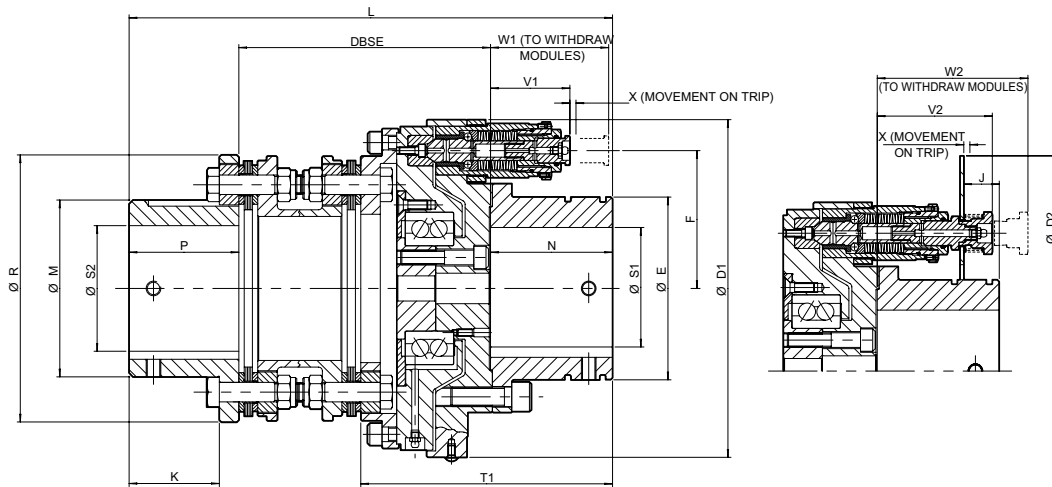
Service factors are for reference only.

For applications with excessive vibration, contact Rexnord.

Rotating equipment must be provided with suitable guarding, or injury may result.

# Type 3

Type 3 Model accepts torsionally rigid disc coupling.



Size ①	Modules (Size-Qty)	Torque		Coupling		Mass	Mass Moment of Inertia MR <sup>2</sup> ③	Max Axial Misalignment	Max Parallel Offset
		Min lb-in	Max lb-in	Max Continuous Torque lb-in	Max speed rpm				
1L	1L-4	3,275	13,011	29,207	3,800	104	731	0.070	0.030
1H	1H-4	6,505	26,021	29,207	3,800	105	738	0.070	0.030
2L	2L-3	7,612	30,535	61,955	2,400	202	2,313	0.090	0.035
2H	2H-3	15,268	61,070	61,955	2,400	203	2,334	0.090	0.035
3L	2L-4	12,391	50,007	115,060	2,150	375	6,390	0.114	0.043
3H	2H-4	25,003	100,013	115,060	2,150	377	6,424	0.114	0.043
4L	3L-4	26,995	107,979	221,269	1,800	668	14,659	0.239	0.029
4H	3H-4	53,990	215,958	221,269	1,800	675	14,898	0.239	0.029
5L	4L-3	57,884	231,447	432,624	1,800	1084	47,838	0.311	0.031
5H	4H-3	115,724	462,894	432,624	1,800	1093	48,521	0.311	0.031
6	4H-4	419,525	839,051	640,794					
7	5-3	696,996	1,393,992	1,031,997					
8	5-3	1,062,090	2,124,179	1,770,149					

Designed to customer specification. Consult Rexnord.

- ① Max angular misalignment 1/2° per flexing pack sizes 1 to 3, 1/3° per flexring pack for unit sizes 4 and 5.
- ② Consult Rexnord if limit switch plate is required at speeds above 1,400 rpm.
- ③ Mass and inertia values calculated for units with solid hubs, minimum DBSE and without limit switch plate.

Size	S1 (max) in	S2 (max) in	S2 Pilot in	DBSE ② in	D1 in	D2 in	E in	F in	J in	K in	L ② in	M in	N in	P in	R in	T1 in	V1 in	V2 in	W1 in	W2 in	X in
1L	3.15	3.86	1.00	7.06	8.35	11.34	4.53	3.37	1.28	2.83	13.75	5.28	3.15	3.54	8.07	6.30	1.98	2.79	3.01	3.63	0.15
1H	3.15	3.86	1.00	7.06	8.35	11.34	4.53	3.37	0.89	2.83	13.75	5.28	3.15	3.54	8.07	6.30	2.38	3.18	3.40	4.06	0.15
2L	3.94	4.84	1.97	8.46	10.91	13.90	5.91	4.45	1.70	3.50	16.74	6.65	3.94	4.33	10.12	7.73	2.01	3.17	3.34	4.33	0.20
2H	3.94	4.84	1.97	8.46	10.91	13.90	5.91	4.45	1.15	3.50	16.74	6.65	3.94	4.33	10.12	7.73	2.56	3.72	3.89	4.88	0.20
3L	4.72	6.30	2.00	9.92	12.95	15.94	7.09	5.47	2.48	4.09	19.76	8.58	4.72	5.12	12.80	8.95	2.01	3.17	3.34	4.33	0.20
3H	4.72	6.30	2.00	9.92	12.95	15.94	7.09	5.47	1.93	4.09	19.76	8.58	4.72	5.12	12.80	8.95	2.56	3.72	3.89	4.88	0.20
4L	5.91	5.67	0.98	11.97	16.10	19.09	9.06	6.54	2.76	3.94	23.00	7.91	5.91	5.12	12.20	12.13	2.99	4.31	4.92	5.16	0.24
4H	5.91	5.67	0.98	11.97	16.10	19.09	9.06	6.54	1.81	3.94	23.00	7.91	5.91	5.12	12.20	12.13	3.94	5.25	9.84	6.10	0.24
5L	7.09	7.40	1.38	14.00	21.65	24.65	11.02	8.70	2.25	5.75	27.98	10.35	7.09	6.89	15.47	14.34	4.68	6.00	7.32	7.56	0.31
5H	7.09	7.40	1.38	14.00	21.65	24.65	11.02	8.70	0.99	5.75	27.98	10.35	7.09	6.89	15.47	14.34	5.94	7.26	8.58	8.82	0.31
6	9.06	8.78																			0.31
7	9.84	10.16																			0.47
8	11.81	12.01																			0.47

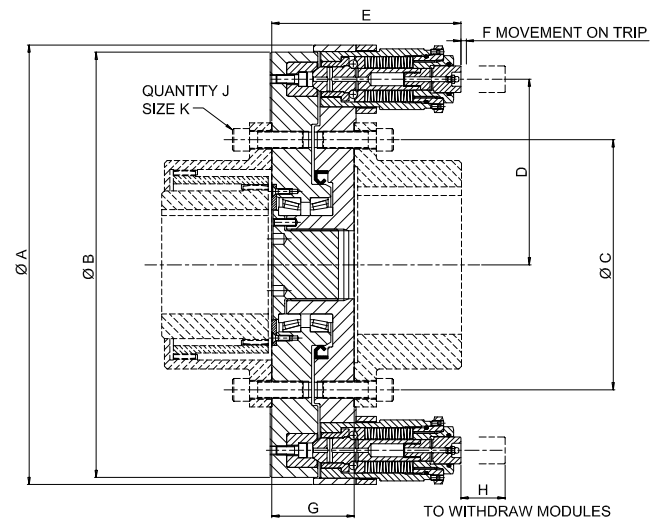
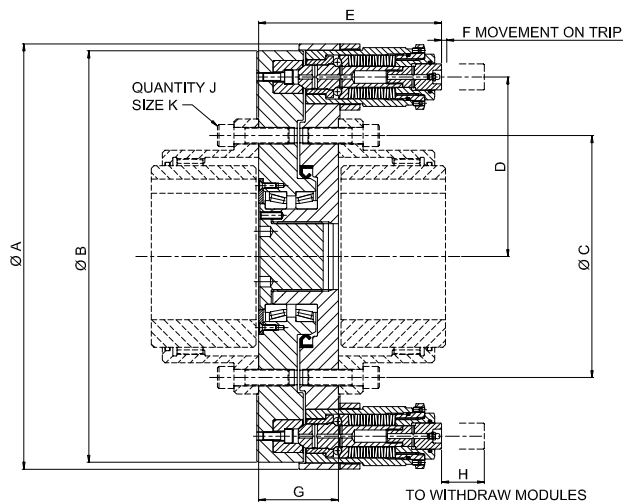
Designed to customer specification. Consult Rexnord.

- ① Larger bore available, consult Rexnord.
- ② Values for minimum DBSE shown, longer spacers available upon request.

# Type 4 and Type 5

Type 4 designed to accept standard full flex AGMA gear couplings.

Type 5 designed to accept standard double engagement half flex AGMA gear couplings.



Size	Modules (Size-Qty)	Torque				Mass ②	Mass Moment of Inertia MR <sup>2</sup> ②
		Min	Max	Max speed Type 4 ①	Max speed Type 5 ①		
		lb-in	lb-in	rpm	lbs		
2.5	2H-4	24,782	96,473	1,900	3,000	121	2,119
3.0	2H-4	26,552	106,209	1,700	2,700	139	2,802
3.5	2H-6	45,139	180,555	1,500	2,400	185	6,731
4.0	3H-4	65,496	260,212	1,200	2,000	337	14,386
4.5	3H-6	104,439	417,755	1,200	1,800	390	19,033
5.0	3H-8	153,118	611,587	1,200	1,800	481	27,541
5.5	4H-4	188,521	754,084	1,000	1,500	791	61,438
6.0	4H-6	299,155	1,195,736	900	1,400	906	78,625
7.0	4H-6	335,443	1,341,773	900	1,300	1,089	114,709
8.0 to 11.0	↓	↓	↓	Designed to customer specification. Consult Rexnord.			
12.0	5-10	3,319,030	6,638,060				

① Balancing may allow up to 50 percent increase in speeds shown. Please consult Rexnord.

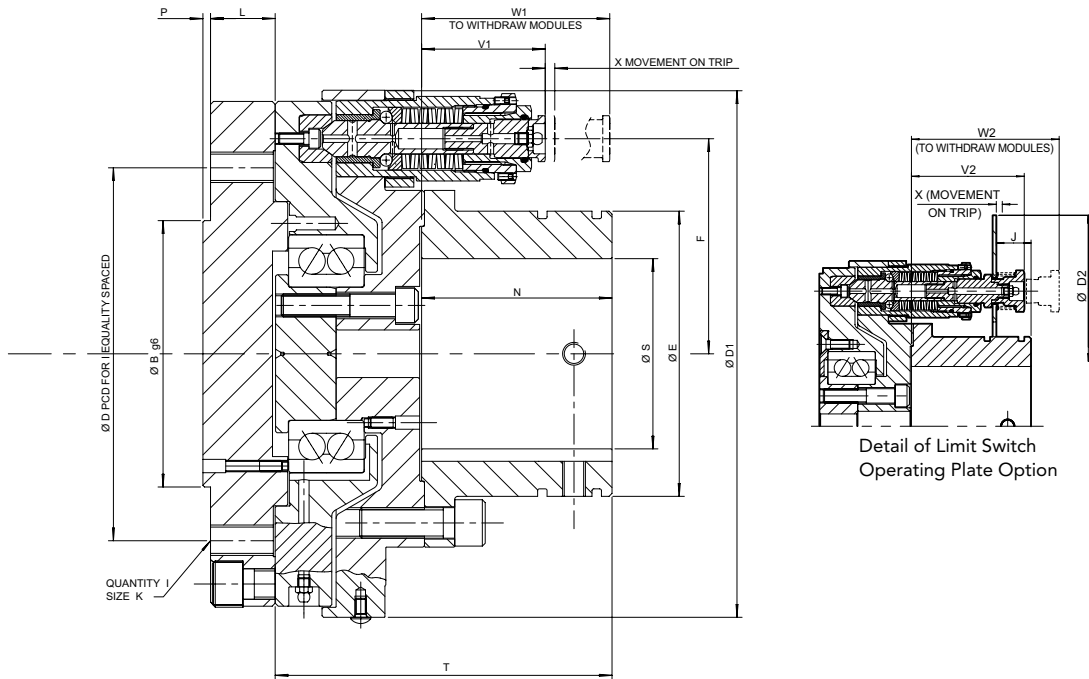
② Mass and moment of inertia values excluding gear coupling.

Size	AGMA Gear Coupling Size ①	A	B	C	D	E	F	G	H	J	K
		in	in	in	in	in	in	in	in	in	in
2.5	2.5	12.52	12.05	7.13	5.26	6.50	0.20	4.17	1.34	0.24	0.63
3.0	3.0	13.58	13.11	8.13	5.79	6.50	0.20	4.17	1.34	0.31	0.63
3.5	3.5	15.16	14.69	9.50	6.57	6.50	0.20	4.41	1.34	0.31	0.75
4.0	4.0	18.74	18.15	11.00	7.87	8.19	0.24	4.41	1.97	0.31	0.75
4.5	4.5	19.84	19.21	12.00	8.43	8.43	0.24	4.41	1.97	0.39	0.75
5.0	5.0	21.50	20.87	13.50	9.25	8.54	0.24	4.61	1.97	0.31	0.88
5.5	5.5	25.51	24.09	14.50	10.62	11.50	0.31	5.79	2.68	0.55	0.88
6.0	6.0	26.69	25.31	15.75	11.22	11.50	0.31	5.79	2.68	0.55	0.88
7.0	7.0	29.45	28.03	18.25	12.60	11.50	0.31	5.79	2.68	0.63	1.00
8.0 to 11.0	8.0 to 11.0	Designed to customer specification. Consult Rexnord.									
12.0	12.0										

① The 820 Type 4 Torque Limiter can be supplied with or without the gear coupling. Please advise at time of order.

# Type 6

## Type 6 Model to accept a cardan shaft flange.



Size	Torque		Flange size in	Max Speed rpm	Mass <sup>①</sup> lb	Max Angular Misalignment degrees	Max Axial Load lbF	Max radial Load lbF	Mass Moment of <sup>①</sup> kgm <sup>2</sup>
	Min lb-in	Max Nm							
2H	15,268	61,070	7.09	1800	134	5	6,295	44,962	1,709
			8.86	1800	134	5	6,295	44,962	1,709
3H	25,003	100,013	8.86	1800	219	5	8,992	139,382	3,964
			11.22	1800	219	5	8,992	139,382	3,964
4H	53,990	215,958	11.22	1800	444	5	13,151	242,794	12,165
			12.40	1800	444	5	13,151	242,794	12,165
5H	115,724	462,894	13.78	1800 <sup>②</sup>	712	5	21,582	550,782	38,033
			15.35	1800 <sup>②</sup>	712	5	21,582	550,782	38,033

① Mass and inertia values calculated for units with solid hubs and without limit switch plate

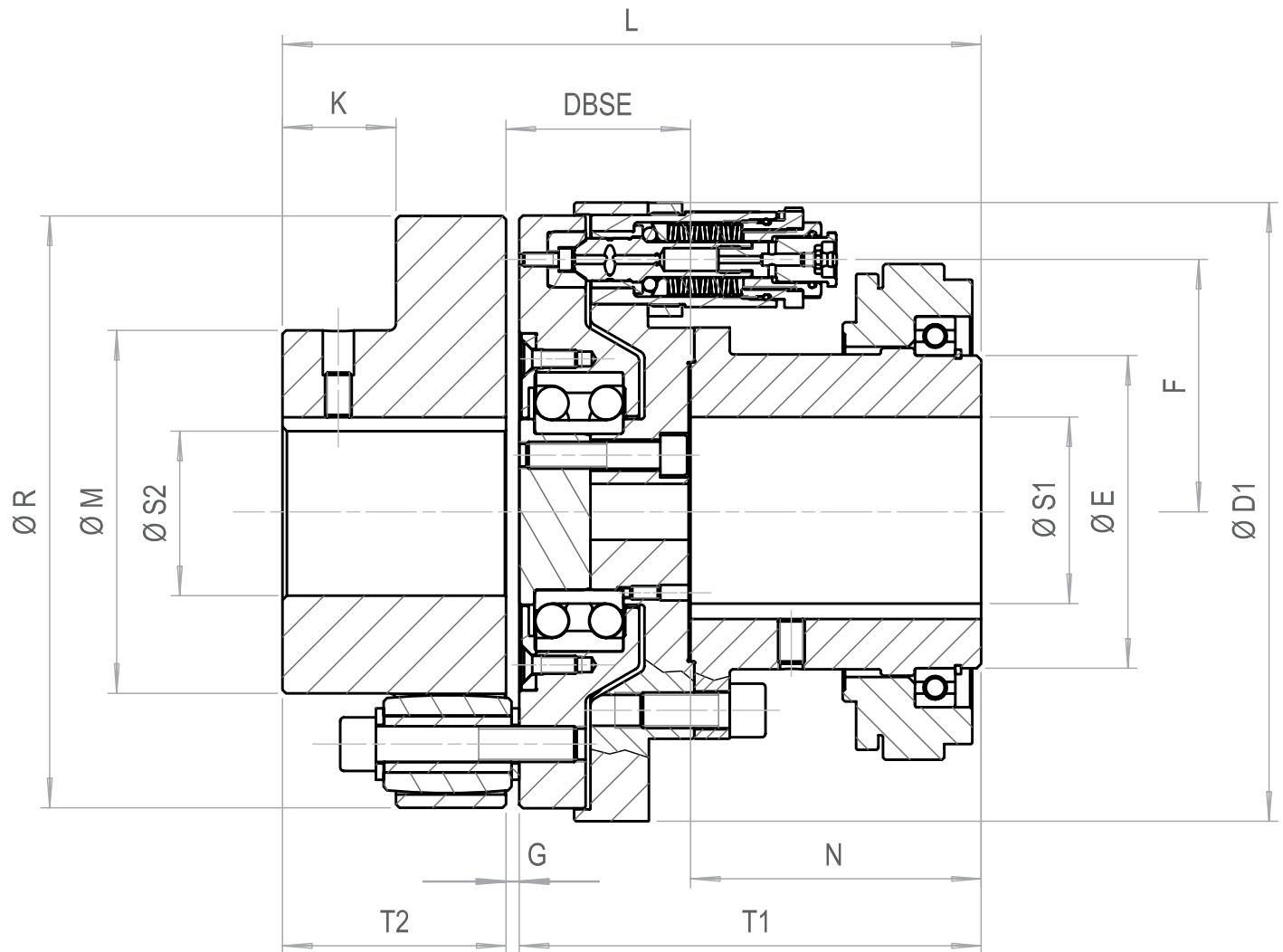
② 1800 rpm without the switch plate otherwise 1400rpm

Size	Flange size mm	B mm	D PCD mm	D1 in	D2 in	E in	F in	I	J in	K	L in	N in	P in	Max S in	T in	V1 in	V2 in	W1 in	W2 in	X in
2H	180	110	155.5	10.91	13.90	5.91	4.45	8	1.15	M14	1.30	3.94	0.12	3.94	6.97	2.56	3.72	3.89	4.88	0.20
	225	140	196.0	10.91	13.90	5.91	4.45	8	1.15	M16	1.30	3.94	0.20	3.94	6.97	2.56	3.72	3.89	4.88	0.20
3H	225	140	196.0	12.95	15.94	7.09	5.47	8	1.93	M16	1.57	4.72	0.20	4.72	8.11	2.56	3.72	3.89	4.88	0.20
	285	175	245.0	12.95	15.94	7.09	5.47	8	1.93	M20	1.57	4.72	0.24	4.72	8.11	2.56	3.72	3.89	4.88	0.20
4H	285	175	245.0	16.10	19.09	9.06	6.54	8	1.81	M20	1.73	5.91	0.24	5.91	10.16	3.94	5.25	5.91	6.10	0.24
	315	175	280.0	16.10	19.09	9.06	6.54	8	1.81	M22	1.73	5.91	0.24	5.91	10.16	3.94	5.25	5.91	6.10	0.24
5H	350	220	310.0	21.65	24.65	11.02	8.70	10	0.99	M22	⊙	7.09	0.28	7.09	12.13	5.94	7.26	8.58	8.82	0.31
	390	250	345.0	21.65	24.65	11.02	8.70	10	0.99	M24	⊙	7.09	0.28	7.09	12.13	5.94	7.26	8.58	8.82	0.31

⊙ No adaptor required



# Autogard 820 Series Remote Reset



Size	Torque		Max. speed rpm	S1 (max) in	S2 (max) in	DBSE in	D1 in	E in	F in	G in	K in	L in	M in	N in	R in	T1 in	T2 in	Mass lb	Mass moment of Inertia MR <sup>2</sup> lb-in <sup>2</sup>
	Min	Max																	
	lb-in	lb-in																	
820-2H	7,612	61,070	2,400	3.50	4.50	3.27	10.91	5.51	4.45	0.24	2.00	12.32	6.40	5.12	10.43	8.15	3.94	190	1,859
820-3H	12,391	100,013	2,150	4.25	5.12	3.68	12.95	6.69	5.47	0.28	2.36	14.13	7.42	5.75	12.36	9.13	4.72	322	4,408
820-4H	26,995	215,958	1,800	5.50	6.75	4.52	16.10	8.66	6.54	0.28	3.54	17.83	9.76	7.40	14.76	11.65	5.91	608	13,088

To control the reset of the Autogard Torque Limiter a pneumatic supply with a pressure range of 0.4 to 0.8 MPa (60-120 Psi) is required.



# Maintenance and General Safety Information

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## Maintenance

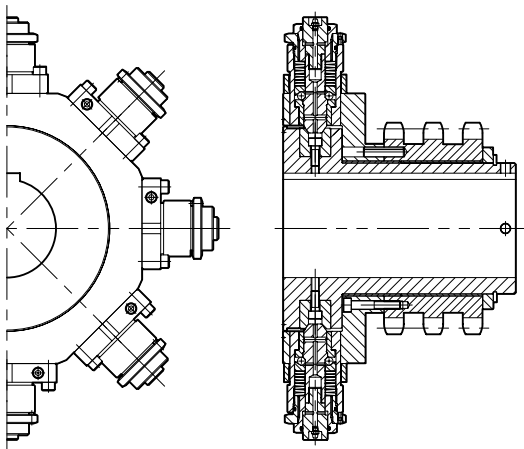
The frequency of maintenance will depend on the operating environment and number of trips, but once every three months should be adequate in most applications. The amount of maintenance required is dependent upon the operating conditions and should be maintained at least as frequently as the adjacent drive components. In adverse conditions, consult Rexnord.

## General Safety

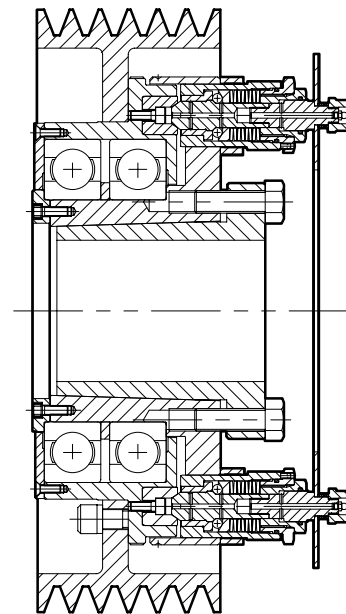
Autogard Torque Limiters are reliable units, built to high standards of workmanship. Similar to all mechanical devices, each application must be considered on its own merits with reference to safety (i.e., lifting equipment, explosive conditions, etc). As rotating components, adequate guarding must be 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.

## Special Designs

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**Radial Module with Triplex Sprocket**  
Designed for tight axial space constraints



**Standard 820 Module**  
Designed for v-belt pulley applications



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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.