Shock Guard TGZ Series

Features

TGZ Series can be used as a simple layout release type protection device or an ON-OFF clutch.

Release type

After tripping due to overload, the input side freely rotates. Even a high-speed shaft can be operated worry-free.

Resetting by external force

After the Shock Guard has been stopped, remove the cause of overload. Then give load to the axial direction manually or with external force.

ON-OFF function

The rotation (ON) or shut-off (OFF) functions are available arbitrarily. They can be used as an accurate mechanical type ON-OFF clutch.

Easy torque adjustment

Just by turning the adjustment nut,
trip torque can be easily set.

Easy to see torque indicator

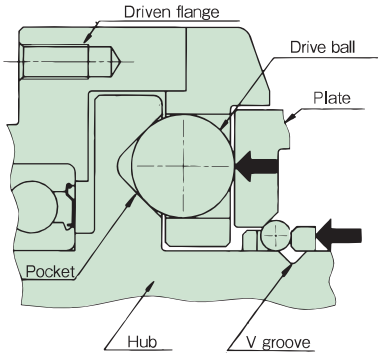
By using the revolution indicator and angle indicator, set torque can be monitored at any time.

One position type

This uniquely assembled torque transmission element ball and pocket configuration only engages in one position.

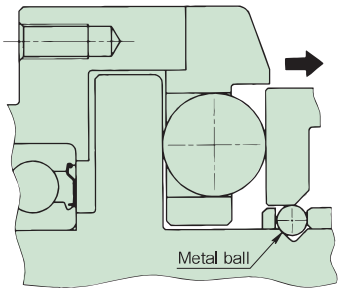
Operating Principles

During normal operation (engagement)



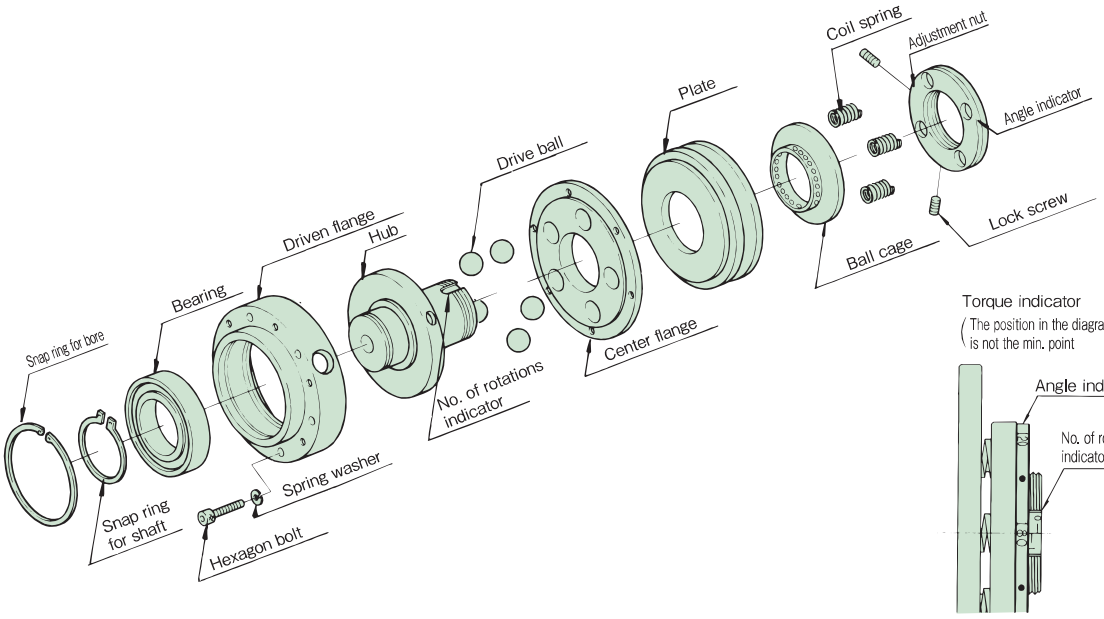
Torque transmission is made by a drive ball which is pressurized and retained at the hub pocket and the driven flange.
The non-symmetric arrangement of the balls and pockets allows only one engagement position per one rotation, and there is no phase shift after tripping.

During overload (trip)



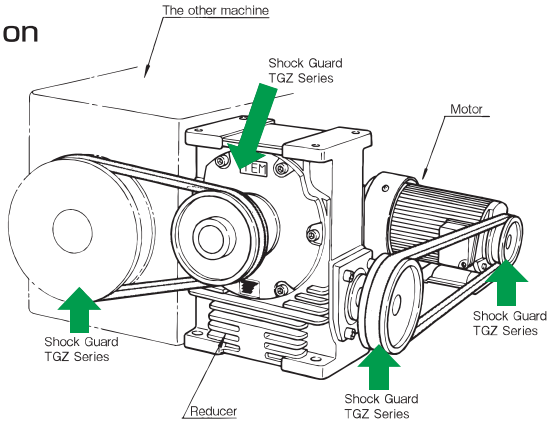
When overloading (when OFF), a drive ball instantly pops out of its pocket, and the plate and a steel ball simultaneously move to the adjustment nut side.
A drive ball comes completely out of its pocket and a steel ball enters the hub outer circumference V-groove, and the pressure from the springs is not transferred to the plate. Therefore, a drive ball freely rotates without returning to the pocket.

Construction



Applications classified by use

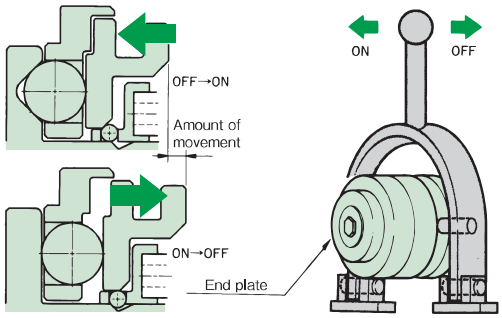
1. Overload protection



As demonstrated in the diagram on the left, the TGZ Series can be installed with any motor shaft, reducer (variator) or other machines. When considering the layout, make sure to leave sufficient space to adjust torque and for resetting procedures. After removing the cause of overload, do not reset the machine while it is running.

⚠If the Shock Guard is reset during rotation, the machine will suddenly run.

2. ON-OFF clutch



By using manual or mechanical external force (pneumatic, hydraulic, etc.), the plate can be moved, cutting off the input rotation (OFF) or transmitting it (ON). The necessary axial load for turning the machine ON or OFF is written in the table below.

Necessary shaft direction load when ON-OFF

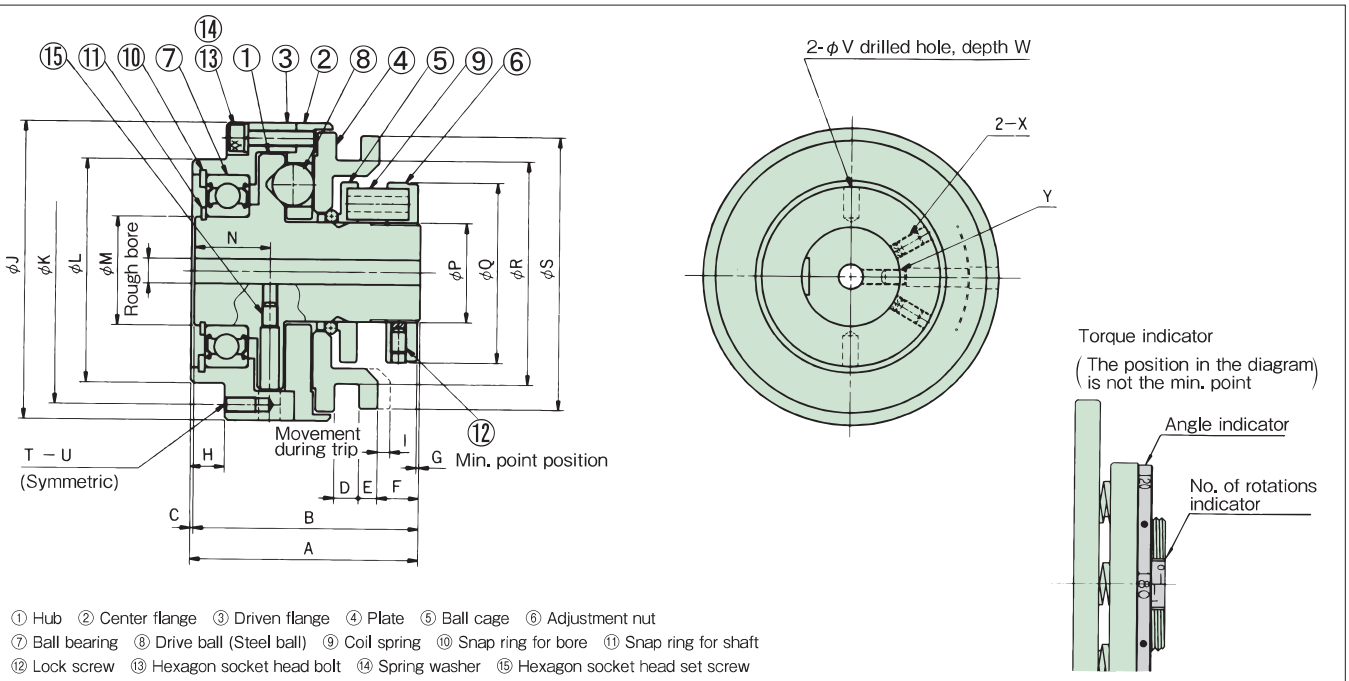
Actuation / Model No.	OFF → ON N {kgf}	ON → OFF N {kgf}	Amount of movement mm
TGZ20-L	49 { 5}	245 { 25}	4.1
TGZ20-M	88 { 9}	431 { 44}	
TGZ20-H	176 {18}	862 { 88}	
TGZ30-L	98 {10}	470 { 48}	4.7
TGZ30-M	235 {24}	1176 {120}	
TGZ30-H	470 {48}	2352 {240}	

Actuation / Model No.	OFF → ON N {kgf}	ON → OFF N {kgf}	Amount of movement mm
TGZ40-L	157 { 16}	774 { 79}	5.9
TGZ40-M	421 { 43}	2087 {213}	
TGZ40-H	833 { 85}	4155 {424}	
TGZ50-L	451 { 46}	2269 {231}	7
TGZ50-M	902 { 92}	4518 {461}	
TGZ50-H	1382 {141}	6919 {706}	

Axial load fluctuates depending on the number of actuations and usage conditions. Set the load with margin.

Transmissible Capacity/Dimensions

Shock Guard (TGZ Series)



① Hub ② Center flange ③ Driven flange ④ Plate ⑤ Ball cage ⑥ Adjustment nut
⑦ Ball bearing ⑧ Drive ball (Steel ball) ⑨ Coil spring ⑩ Snap ring for bore ⑪ Snap ring for shaft
⑫ Lock screw ⑬ Hexagon socket head bolt ⑭ Spring washer ⑮ Hexagon socket head set screw

* Adjustment nut for fixing the lock screw (1) is included with the Shock Guard. After setting appropriate torque, tighten with the following torque to avoid interference with the pocket of hub. Lock screw size: M5···3.8N·m{38.7kgf·cm} M8···16N·m{163kgf·cm}

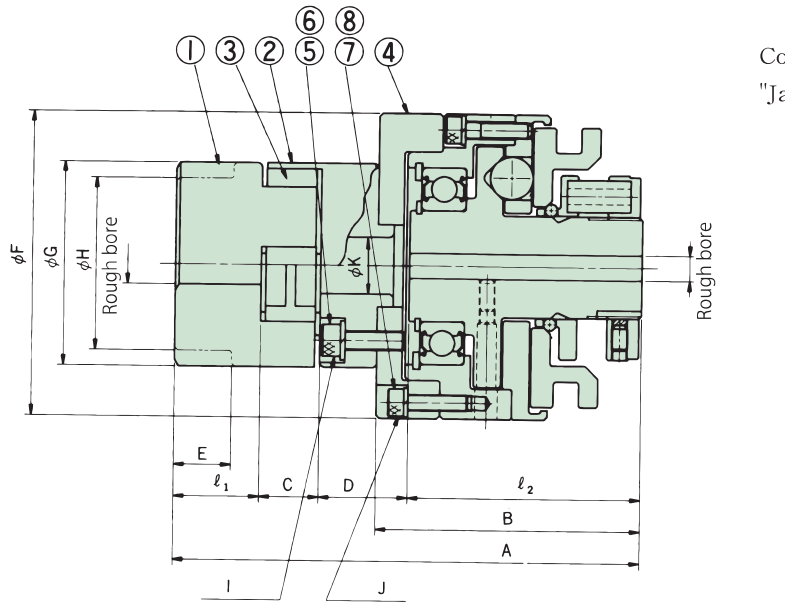
Unit : mm

Shock Guard Model No.	Set torque range N·m	Max. rpm r/min	Coil spring color X the number	Rough bore diamter	Min. bore diameter	Max. bore diameter	A	B	C	D	E	F	G min. point position	H	I amount of movement during trip	J	K PCD
TGZ20-L	2.4 to 8.3	1800	Yellow×3	8	10	20	74	73	1	8	6	13.5	0.8	11	4.1	96	86
TGZ20-M	4.1 to 16		Blue ×3														
TGZ20-H	8.2 to 31		Blue ×6														
TGZ30-L	5.9 to 21	1800	Yellow×4	12	14	30	83.5	82	1.5	8	6	14.5	1.1	11.5	4.7	118	106
TGZ30-M	20 to 52		Red ×4														
TGZ30-H	39 to 108		Red ×8														
TGZ40-L	25 to 93	1800	Blue ×5	17	19	40	101	100	1	9	8	20	1.1	14	5.9	152	139
TGZ40-M	44 to 127		Red ×5														
TGZ40-H	88 to 245		Red ×10														
TGZ50-L	63 to 157	1800	Red ×5	22	24	50	114.5	112	2.5	10	9	20.2	1.2	16	7	178	162
TGZ50-M	127 to 304		Red ×10														
TGZ50-H	245 to 451		Green×10														

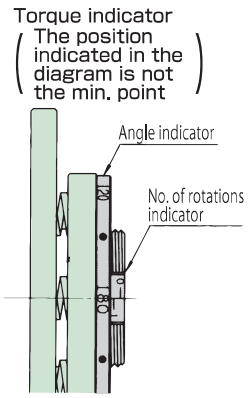
Shock Guard Model No.	L h7	M	N	P	Q	R	S	T	U screw diameter X length	V	W	X screw size X length	Y screw size X length	* Mass kg	* Moment of inertia × 10^{-2}kg·m²
TGZ20-L	72	35	24.5	32	57	70	88	4	M5 × 10	5	10	M5 × 10	M5 × 10	2.57	0.273
TGZ20-M															
TGZ20-H															
TGZ30-L	87	45	27.5	45	75	88	108	4	M6 × 12	6	10	M5 × 10	M6 × 10	4.17	0.695
TGZ30-M															
TGZ30-H															
TGZ40-L	114	65	32.5	65	103	119	141	6	M6 × 12	8	14	M8 × 10	M8 × 10	8.71	2.40
TGZ40-M															
TGZ40-H															
TGZ50-L	133	75	37	75	113	138	166	6	M8 × 16	9	14	M8 × 10	M8 × 10	13.7	5.30
TGZ50-M															
TGZ50-H															

*1. All products are stock items.
2. Mass and moment of inertia are based on the bores' maximum diameters.

Coupling type



Combined with TSUBAKI
"Jaw Flex Coupling L Series"



① Coupling hub A ② Coupling hub B ③ Insert ④ Adapter
⑤ Hexagon socket head bolt ⑥ Spring washer ⑦ Hexagon socket head bolt ⑧ Spring washer

Unit : mm

Shock Guard Model No.	Set torque range N·m	Max. rpm r/min	Shock Guard			Coupling			A	B	C	D	ℓ 1	ℓ 2	E
			Rough bore diamter	Min. bore diameter	Max. bore diameter	Rough bore diamter	Min. bore diameter	Max. bore diameter							
TGZ20-LC	2.4 to 8.3	1800	8	10	20	12.7	16	35	146	83	18.8	27.2	27	73	—
TGZ20-MC	4.1 to 16														
TGZ20-HC	8.2 to 31														
TGZ30-LC	5.9 to 21	1800	12	14	30	18.0	21	47	180	93.5	22.6	32.5	42.9	82	—
TGZ30-MC	20 to 52														
TGZ30-HC	39 to 108														
TGZ40-LC	25 to 93	1800	17	19	40	19.1	22	58	213	111	26.1	32.9	54	100	34.9
TGZ40-MC	44 to 127														
TGZ40-HC	88 to 245														
TGZ50-LC	63 to 157	1800	22	24	50	19.1	22	63	242	127.5	26.1	40.4	63.5	112	34.9
TGZ50-MC	127 to 304														
TGZ50-HC	245 to 451														

Shock Guard Model No.	F	G	H	I No. of pieces-screw size X length	J No. of pieces-screw size X length	* Mass kg	* Moment of inertia × 10^{-2}kg·m^2	Model No. of coupling used	K	Allowable angular misalignment (deg.)	Allowable parallel misalignment	Allowable shaft direction displacement
TGZ20-LC	96	64.3	—	3-M6 × 20	4-M5 × 22	4.34	0.44	L099-H	27	0.5	0.38	± 0.5
TGZ20-MC												
TGZ20-HC												
TGZ30-LC	118	84.1	—	6-M6 × 22	4-M6 × 22	7.77	1.22	L110-H	40	0.5	0.38	± 0.7
TGZ30-MC												
TGZ30-HC												
TGZ40-LC	152	114.3	101.6	6-M6 × 25	6-M6 × 25	15.4	4.05	L190-H	54	0.5	0.38	± 1.0
TGZ40-MC												
TGZ40-HC												
TGZ50-LC	178	127	107.9	6-M8 × 25	6-M8 × 25	23.2	8.63	L225-H	60	0.5	0.38	± 1.0
TGZ50-MC												
TGZ50-HC												

*1. All products are stock items.
2. Mass and moment of inertia are based on the bores' maximum diameters.

Handling

1. Bore finishing (Shock Guard)

(1) Before finishing

The Shock Guard TGZ Series is shipped set at the minimum point (minimum torque value). Once received, confirm that the revolution indicator and angle indicator are set at zero.

(2) Disassembly

Loosen the setscrews, remove the adjustment nut and take out the coil springs, ball cage, plate and balls. Next, take out the shaft snap ring, and remove the bearing and driven flange. When disassembling, take care not to lose the ball B at s ball cage. Make sure the Shock Guard parts do not become dusty or dirty.

(3) Chucking

Chuck the hub flange's outside diameter and center the hub portion.

(4) Machining

① Keyway specifications

Table 1 shows the maximum bore diameters for keyway specifications.

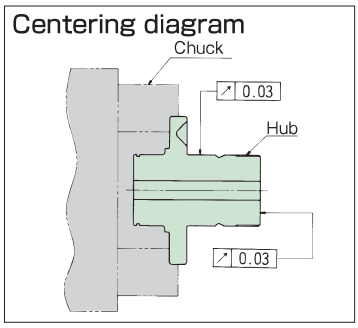
Table 1

Model No.	Max. bore diameter	Applicable standard
TGZ20	ϕ 20	parallel key
TGZ30	ϕ 30	
TGZ40	ϕ 40	New JIS Old JIS
TGZ50	ϕ 50	

② Centering

Chuck the hub flange's outer edge and center the hub as shown in the figure on the right.

Centering diagram



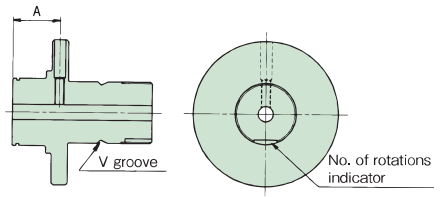
③ Machining

The keyway should be machined directly below the setscrew tap at the hub flange section as shown below.

Table 2

Model No.	A
TGZ20	24.5
TGZ30	27.5
TGZ40	32.5
TGZ50	37.0

Set screw position



(5) Reassembly

After bore finishing is completed and when reassembling the Shock Guard, make sure to coat the drive balls, steel balls, pockets, and the V-groove with grease.

2. Bore finishing (Coupling type)

(1) Machining

① Keyway specifications

Table 3 shows the maximum bore diameters on the coupling side. For the maximum bore diameters of the Shock Guard hub, refer to Table 1.

② Centering

Chuck the coupling hub's outer edge and center the hub as shown in the below diagram. For the recommended positions of the coupling hub setscrew, refer to Table 4 (Length F).

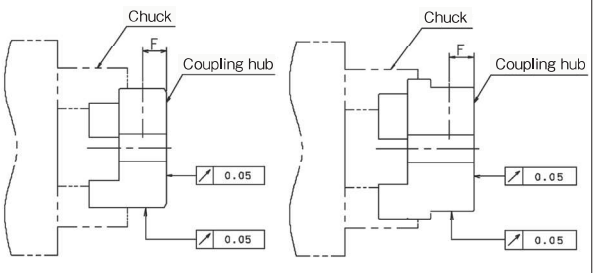
Table 3

Model No.	Max. bore diameter	Applicable standard
TGZ20	ϕ 35	Parallel key
TGZ30	ϕ 47	
TGZ40	ϕ 58	New JIS Old JIS
TGZ50	ϕ 63	

Table 4

Model No.	Coupling model No.	Length F
TGZ20-C	L099-H	13.5
TGZ30-C	L110-H	20.5
TGZ40-C	L190-H	25.5
TGZ50-C	L225-H	25.5

Bore finishing diagram



L099,L110
(TGZ20-C,TGZ30-C)

L190,L225
(TGZ40-C,TGZ50-C)

3. Trip Torque setting

(1) Shock Guard TGZs are all shipped with torque set at the minimum point (min. torque value). Confirm that the angle indicator and the No. of rotations indicator are set at zero. The No. of rotations indicator can be read at the end face of the adjustment nut. Refer to page 73 for more information.

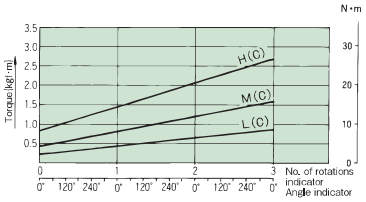
(2) From the "Tightening Amount-Torque Correlation Chart", find the adjustment nut tightening angle equivalent to the predetermined trip torque and tighten them. Set at 60° toward the determined tightening value, then install to the machine and conduct a trip test. Gradually tighten and set at optimum trip torque.

(3) After setting torque, screw the lock screw to the adjustment nut. Refer to page 32 for lock screw tightening torque and precautions.

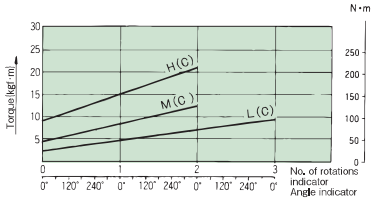
(4) Do not turn the adjustment nut (bolt) more than the torque indicator's maximum value. Doing so will put it in a locked position, and there will be no leeway for the disk spring to bend.

* Each product's trip torque does not always correspond with the value listed in the "Tightening Amount - Torque Correlation Chart", so use these values only as a rough guide.

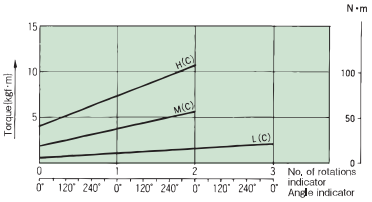
TGZ 20(C)



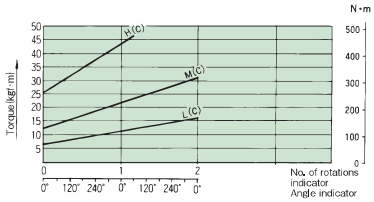
TGZ 40(C)



TGZ 30(C)

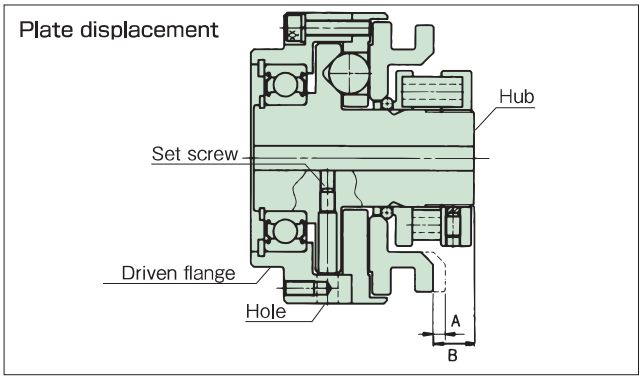


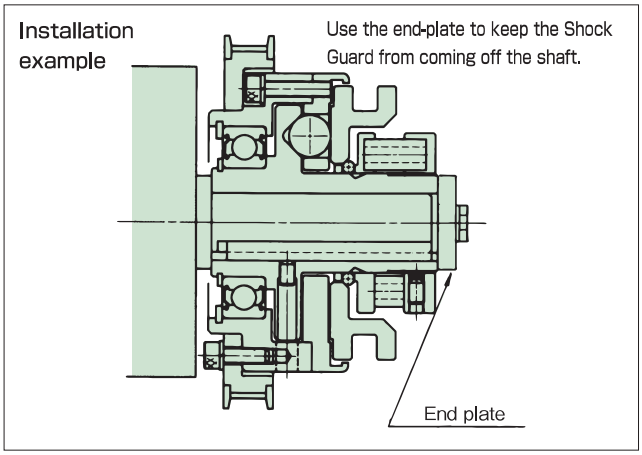
TGZ 50(C)



4. Resetting

Match up one hole of the driven flange with the hub side's setscrew position. (This position is the pocket and drive ball's correct phase.)





Next, apply axial load to the plate to reset (refer to the following table). To determine whether the Shock Guard has completely reset, verify it using the measurements of the table below (displacement A).

Model No.	Axial load N {kgf}	Amount of displacement A mm	B mm
TGZ20-L	49 {5}	4.1	13.5
TGZ20-M	88 {9}		
TGZ20-H	176 {18}		
TGZ30-L	98 {10}	4.7	14.5
TGZ30-M	235 {24}		
TGZ30-H	470 {48}		
TGZ40-L	157 {16}	5.9	20.0
TGZ40-M	421 {43}		
TGZ40-H	833 {85}		
TGZ50-L	451 {46}	7.0	18.2
TGZ50-M	902 {92}		
TGZ50-H	1382 {141}		

Maintenance

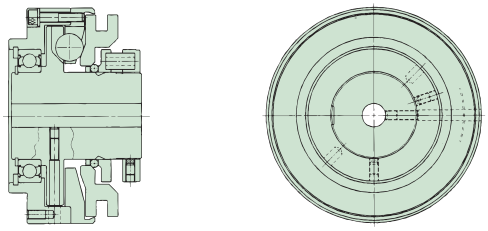
Grease the drive ball and ball cage either once per year or every thousand trips.

Special Specifications

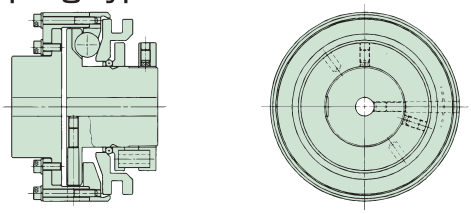
TGXZ Series

Non-backlash and complete release type. With its high-speed specifications (up to 1800r/min), it is ideal for when instant stop is not possible. Please contact TEM for more information.

■ TGXZ Series only



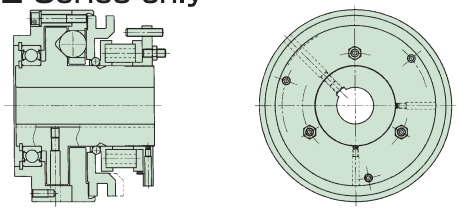
■ Coupling type



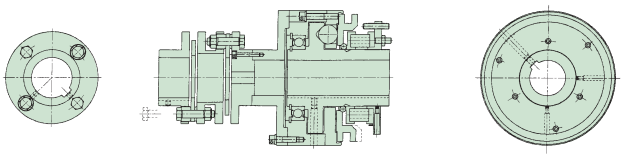
TGZ Large Series

For the application of setting torque 451N・m and above, please contact TEM for more information.

■ TGXZ Series only



■ Coupling type



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