Innovation in Motion
TSUBAKI

INSTALLATION MANUAL

SHOCK GUARD TGM（-C）Series

Safety Guide and Warranty

WARNING **Death or serious injury may result from product misuse due to not following the instructions.**

"Mechanical type Safety and Control devices"

- Begin inspection and maintenance after verifying that no load or rotational force is being applied to the equipment.
- Check the operation of the device periodically so that it can be sure to function properly when overload occurs.

"Electrical type Safety and Control devices"

- When carrying out an operation test or making a periodic inspection, make sure to verify that it functions properly as a protection device.
- Follow the instruction manual when carrying out megger testing because most electrical devices have certain requirements for megger testing.
- Check the operation of the device periodically so that it can be sure to function properly when overloaded occurs.

"Common"

- Comply with the 2-1-1 General Standard of "Ordinance on Labor Safety and Hygiene".
- When performing maintenance or inspections:
  1) Wear proper work clothes and protective equipment (safety devices, gloves, shoes, etc.). To avoid an accident, make sure to perform maintenance and inspections in an appropriate environment.
  2) Make sure the power is switched off, and the machine has stopped completely before carrying out maintenance and inspections. Take the necessary measures to ensure the power is not turned back on.
  3) Follow the instruction manual.
  4) Wire according to the technical standards of Electrical Installation and company regulations. Take note of the cautions in this manual which explain installation direction, clearance and environmental conditions. Make sure to ground the device to prevent electrical shock and to improve noise resistance.
- When using with lifting equipment, install a suitable protection device for safety purposes, otherwise an accident resulting in death, serious injury or damage to the equipment may occur due to a falling accident.

CAUTION **Minor or moderate injury, as well as damage to the product may result from product misuse due to not following the instructions.**

"Mechanical type Safety and Control devices"

- The strength of the equipment should be designed to withstand the load or rotational force when the device is activated due to overload.
- Wear damage may occur depending on the number and frequency of activations. Following the manual, check the functions and operations periodically. If something is not functioning properly, contact the distributor for repair.

"Electrical type Safety and Control devices"

- Consumable parts (tantalum electrolytic capacitors, relays, etc.) are built-in the products. Using the manual, periodically check the functions and operation of the device. If it is not functioning properly, contact the distributor for repair.
- Do not use the device in a corrosive gas environment. Sulphidizing gases (SO_2, H_2S) can especially corrode the copper and copper alloy used on PCBs and parts, and cause a malfunction.

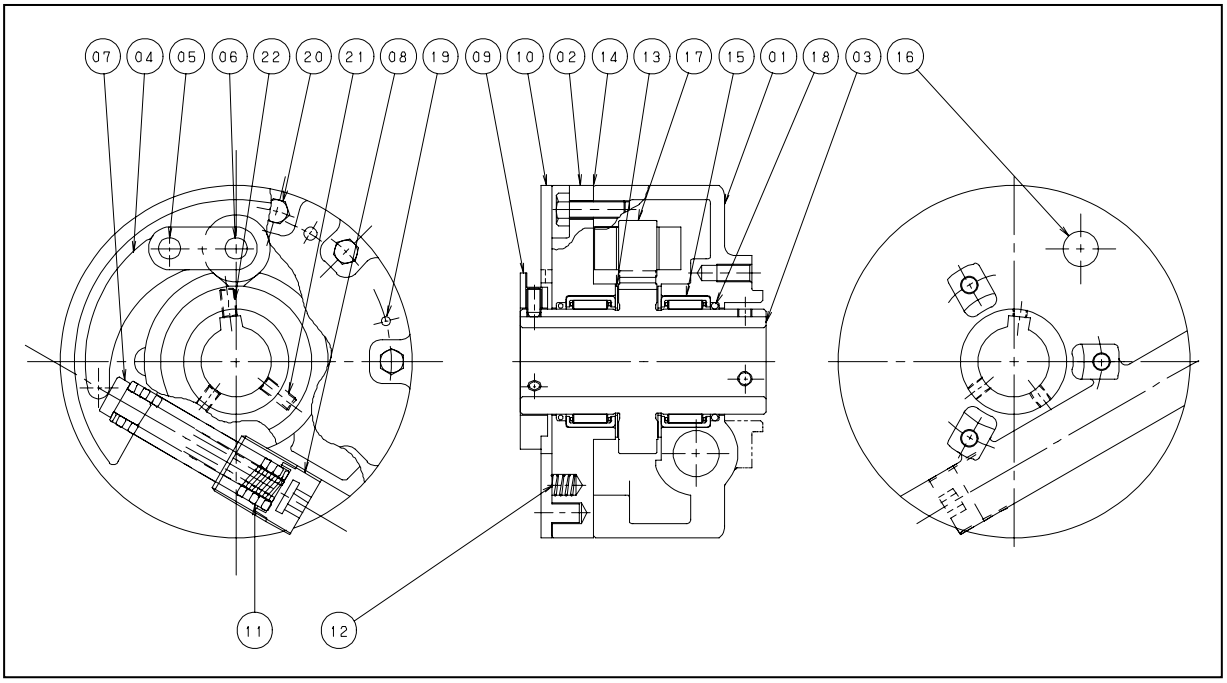
"Common"

- Read the instruction manual carefully, and use the product properly. In case the instruction manual is not available, request one from the distributor where you purchased the product, or our sales office with the product name and model number.
- Deliver this instruction manual to the final customer who uses the TSUBAKIMOTO CHAIN product.

Thank you for purchasing a Shock Guard TGM series. Make sure the unit delivered matches your order and no shortages exist in the parts provided. Any such shortages or other delivery errors must immediately be reported to your distributor. This manual should be considered an essential part of the Shock Guard TGM series and remain with the coupling when redistributed.

To ensure safety, read all instructions thoroughly before installing or working on the equipment.

1. CONSTRUCTION



PART NO.	NAME OF PART	PART NO.	NAME OF PART
01	Case	12	Coil spring B
02	Cover	13	Thrust washer
03	Cam shaft	14	Gasket
04	Lever	15	Bearing A
05	Fulcrum pin	16	Bearing B
06	Roller pin	17	Cam follower
07	Spring seat	18	Seal
08	Adjusting screw	19	Spring pin
09	Cam actuation plate	20	Hexagonal bolt
10	LS detecting plate	21	Hexagonal set screw
11	Coil spring A	22	Hexagonal set screw

Table 1

2. INSTALLATION

2－1． Installation to the axis

A Bore diameter tolerance of h6 or h7 for installing the Shock Guard to the shaft is recommended. Use a JIS 1301-1996（New JIS standards）parallel key. Allow some clearance between the top of the key and keyway.

When installing the cam actuating plate to the shaft, tighten bolts in three places.（For the key, 1 place; for the shaft, 2 places）

When mounting the Shock Guard to the end face of the shaft, depending on the installation method, the cam actuating plate set screws cannot be used. In this case use the tap holes on the mounting seat side.

Set screws for these tap holes are not included, so use bolts with a length that fits the bore diameter. (Table 2)　Take care to ensure that the head of the set screws do not come out from the outer diameter of the camshaft.

If the head of the screws come out, they will interfere with the inner diameter and lateral side of the mounting seats when the Shock Guard trips.

If during operation there is a chance vibration will cause the screws to loosen, apply Loctite 242 or an equivalent for anti-loosening.

Model No.	Bore size	Set screw size	
		For the key, 1 place	For the shaft, 2 place
TGM3 TGM6	10~12	M4×8	M4×10
	13~14	M4×6	M4×8
TGM20	14~16	M4×10	M4×12
	17~20	M4×8	M4×10
TGM60	20~22	M5×16	M5×20
	22~28	M5×12	M5×16
	29~30	M5×12	M5×12
TGM200	28~30	M6×25	M6×30
	31~40	M6×20	M6×25
	41~50	M6×16	M6×20
TGM400 TGM800	38~45	M8×25	M8×30
	46~55	M8×20	M8×25
	56~60	M8×16	M8×20

Table 2

2－2．Installation of drive member

By utilizing 3 mounting seats, tighten the bolts with the torque shown in Table 3 to install the sprockets, pulleys, gears and couplings to the housing.(Fig.1)

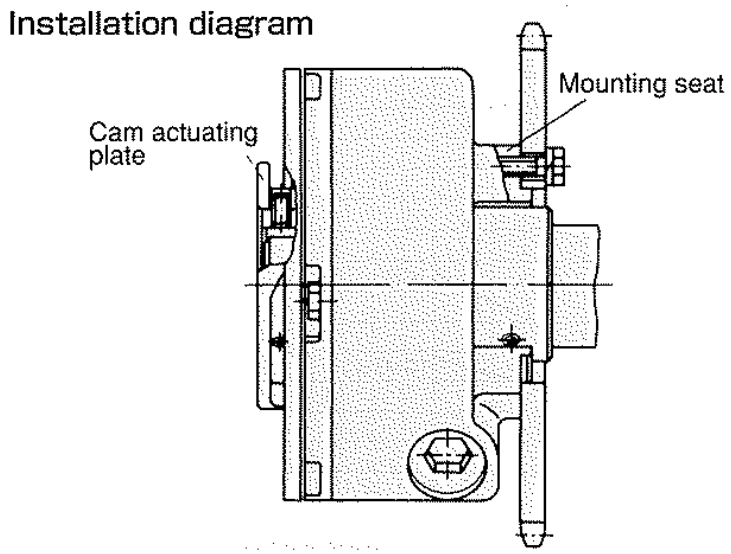


Fig.1

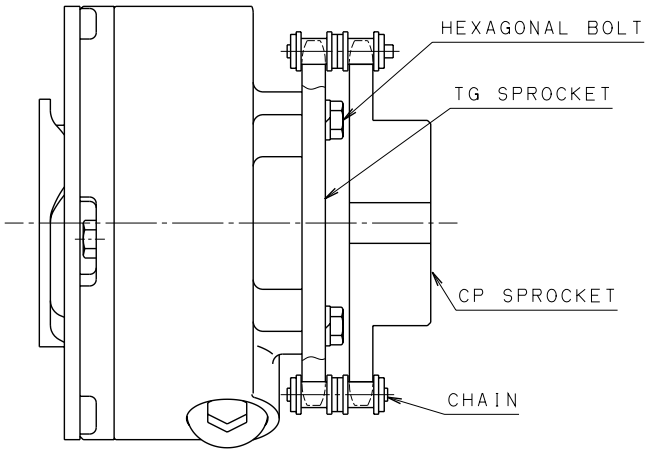
2－3．Installation bolts

The screw-in length of the mounting seat installation bolts and their tightening torque recommended values are listed on Table 3. As well, use JIS B1001 2 class and higher class prepared holes for installation bolts.

Model No.	Bolt screw-in length (mm)	Bolt tightening torque N・m{kgf・m}	Prepared hole diameter for installation bolt (mm)
TGM3 TGM6	6～7	2.0～2.9{0.2～0.3}	4.5
TGM20	8～9	3.9～5.9{0.4～0.6}	5.5
TGM60	9～11	6.9～11{0.7～1.1}	6.6
TGM200	15～17	34～51{3.5～5.2}	11.0
TGM400 TGM800	18～25	59～89{6.0～9.1}	14.0

Table 3

3. INSTALLING THE COUPLING



Model No.	Angular α (deg)	Dimension C (mm)	Parallel ε (mm)
TGM3-C TGM-6C TGM-20C	0.5	5.8	0.19
TGM-60C	0.5	7.4	0.25
TGM-200C	0.5	11.6	0.38
TGM-400C TGM-800C	0.5	15.3	0.50

Table 4

3－1. Align the two sprockets within the tolerance given in Table.

Angular misalignment

Keep the same C dimension in Table 4 (distance between the side face of sprockets) for the circumference, and install it within the allowable angular misalignment α = 0.5°. (Fig. 3 and 4)

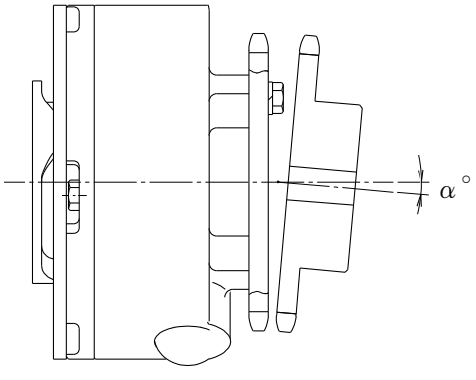


Fig.3

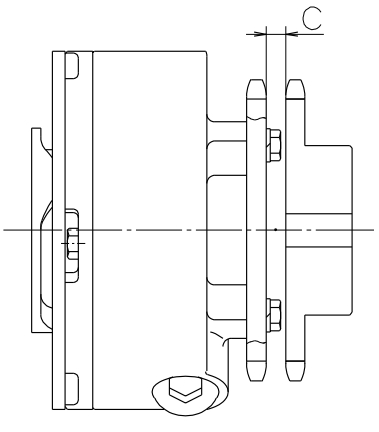


Fig.4

Parallel misalignment

Align with the straight edge at the bottom of coupling teeth.

Allowable parallel misalignment is within ε.

(Fig. 5)

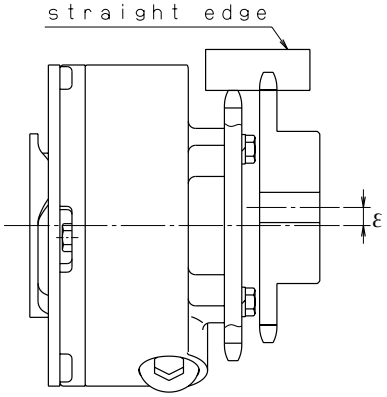


Fig.5

3－2. Winding the roller chain and insert the joint link after completion of sprockets alignment, wind roller chain, insert the joint link then fix with the clip. Space shown in table 5 is necessary to insert the joint link.(Fig.6)

(mm)

Model No.	Dimension H
TGM3-C TGM-6C	9
TGM-20C	7
TGM-60C	17
TGM-200C	26
TGM-400C TGM-800C	38

Table 5

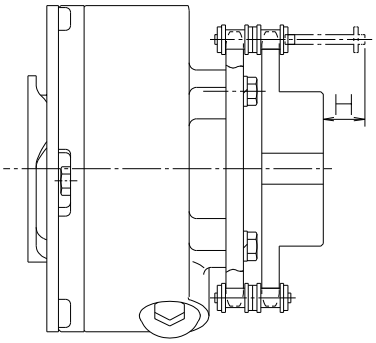


Fig.6

3－3. TG sprocket for TGM3, TGM6 and TGM20 are with hub (one side) sprocket. Pay special attention to the direction when installing TG sprocket so that the hub side is the seat side.(Fig.7)

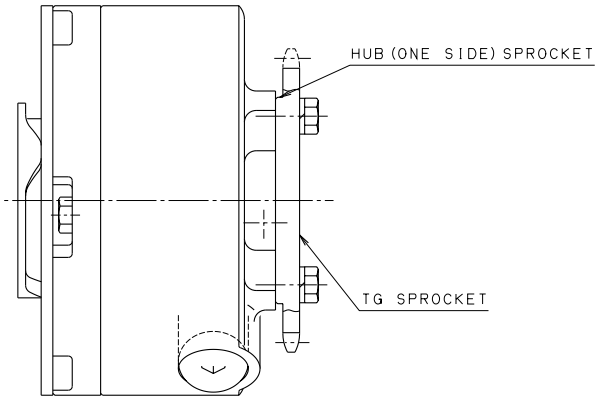
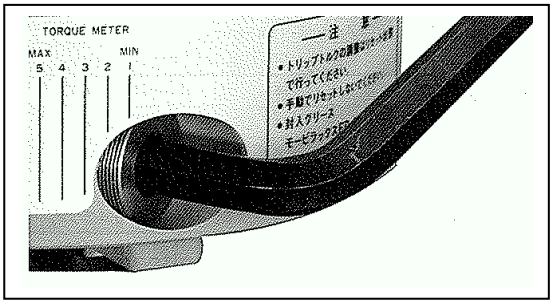


Fig.7

4. TORQUE SETTING

By simply turning the adjusting screw with a hexagonal Allen wrench, precise torque can be set.

① The minimum torque value is set for shipment. The top surface of the adjustable screw is adjusted to the minimum torque (torque indicator 1) printed on the nameplate. This is the base tightening quantity.



② Before setting the torque, apply Loctite 242 or an equivalent adhesive to the exposed surface of the adjustable screw's thread portion. After setting torque, it becomes anti-loosing.

③ From the "Tightening Amount-Torque Correlation Chart", find the adjusting screw tightening angle equivalent to the predetermined trip torque. Set at 60°toward the determined tightening value, then install to the machine and conduct a trip torque. 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.(Table 6 and Fig.8)

④ Do not set torque lower than the minimum torque（torque indicator 1 on the nameplate）. If it is necessary to use a torque level lower than the minimum, use a weak spring type.

⑤ Do not turn the adjusting screw when the Shock Guard is in a tripped state.

⑥ Torque setting before shipment is available.

Model No.	min.torque N・m{kgf・m}	Amount of torque variation per one(1)rotation N・m{kgf・m}	Total number of rotations
TGM3	1.5{0.15}	0.28{0.029}	8
TGM6	2.5{0.26}	0.48{0.049}	8
TGM20	6.4{0.65}	1.02{0.10}	13
TGM60	20{2.0}	4.90{0.5}	10
TGM200	68{6.9}	9.80{1.0}	16
TGM400	225{23}	20.6{2.1}	11
TGM800	451{46}	41.2{4.2}	11

Table 6

Set torque = min. torque + (amount of torque variation per one(1)rotation × total number of rotations of the adjustable screw

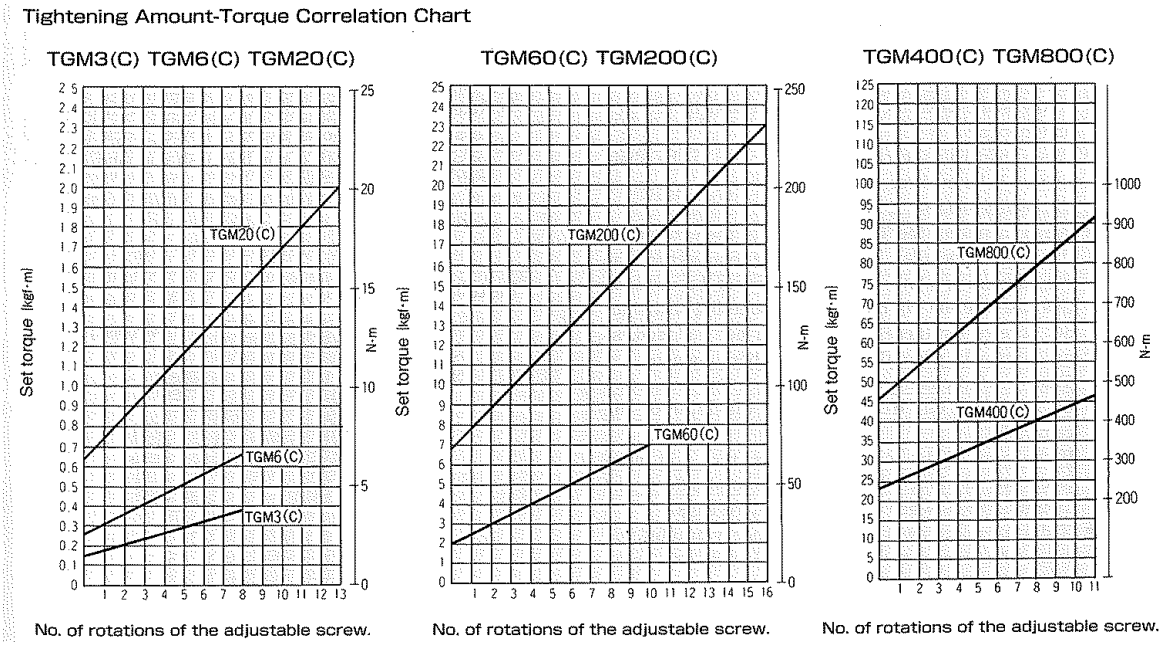


Fig.8

5. OVERLOAD DETECTION

Using the limit switch, overload can be detected easily.

If the Shock Guard trips due to overload, the cam follower will disengage from the pocket and the camshaft and main unit (case) will idle. At the same time, the LS detecting plate slides in the axial direction.

The limit switch detects this movement, shuts the power off and sets off an alarm. Whether the stopping side is on the camshaft side or the main unit case side, overload can be detected. For every one trip, the LS detecting plate slides three times.

① Table 7 shows LS detecting plate movement and force during trip. Choose a limit switch from chart 5 that meets the "movement until operation" and its "necessary amount of force".

② Fig.9 are limit switch installation examples.

③ Connect the limit switch's "b contact" parallel to the start button's contact.

④ Fig.10 shows an example of a typical circuit. TSUBAKIMOTO CHAIN recommends using a built-in holding circuit.

Model No.	Amount of movement (mm)	Force when moving N{gf}
TGM3 TGM6 TGM20	4	3.9{400}
TGM60	6	3.9{400}
TGM200	6	5.4{550}
TGM400 TGM800	8	5.9{600}

Table 7

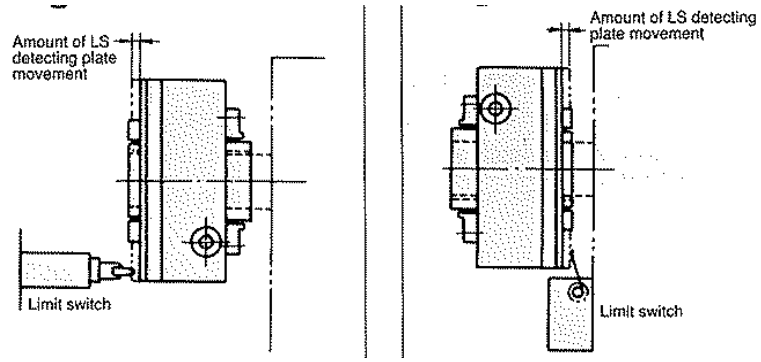


Fig.9

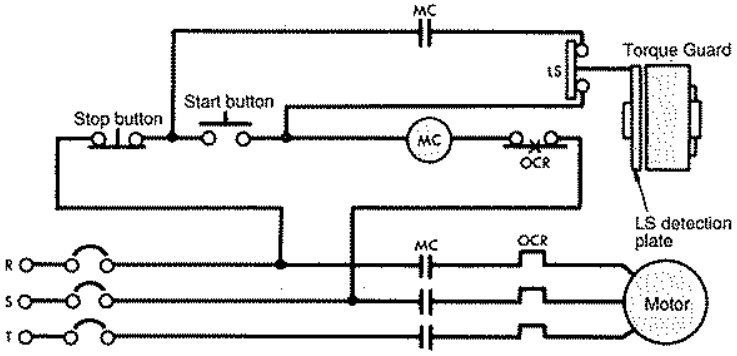


Fig.10

6. RESETTING

As it is an automatic reset system, just re-starting the drive side can automatically reset it.

① When the Shock Guard trips due to overload, stop the rotation and remove the cause of the overload.

② When resetting, reset（re-engage）with input rpm at less than 50r/min or by inching the motor. To avoid injury, do not reset the Shock Guard by hand.

③ A distinct clicking sound is made when the cam follower settles in its pocket.

7. GREASE

① Shock Guard

Shock Guard TGM Series are packed in high quality grease before shipment, so they can used as is. Under normal conditions greasing is not necessary.

Grease used:

Mobil
Mobilux EP2

② Coupling

Apply the lubricant such as molybdenum disulfide to the chain and top of the sprocket teeth periodically（every 2000 hours）.

Warranty

TSUBAKIMOTO CHAIN CO.: hereinafter referred to as “Seller”
Customer: hereinafter referred to as “Buyer”
Goods sold or supplied by Seller to Buyer: hereinafter referred to as “Goods”

1. Warranty period without charge

18 months effective the date of shipment or 12 months effective the first use of Goods, including installation of Goods to Buyer’s equipment or machines - whichever comes first.

2. Warranty coverage

Should any damage or problem with the Goods arise within the warranty period, given that the Goods were operated and maintained under instructions provided in the manual, Seller would repair and replace at no charge once the Goods are returned to Seller. The following are excluded from the warranty.

1) Any costs related to removing Goods from the Buyer’s equipment or machines to repair or replace parts.
2) Costs to transport Buyer’s equipment or machines to the Buyer’s repair shop.
3) Costs to reimburse any profit loss due to any repair or damage and consequential losses caused by the Buyer.

3. Warranty with charge

Seller will charge any investigation and repair of Goods caused by:

1) Improper installation by failing to follow the instruction manual.
2)Insufficient maintenance or improper operation by the Buyer.
3) Incorrect installation of Goods to other equipment or machines.
4) Any modifications or alterations of Goods by the Buyer.
5) Any repair by engineers other than the Seller or those designated by the Seller.
6) Operation in an inappropriate environment not specified in the manual.
7) Force Majeure or forces beyond the Seller’s control such as natural disasters and injustice done by a third party.
8) Secondary damage or problem incurred by the Buyer’s equipment or machines.
9) Defected parts supplied, or specified by the Buyer.
10) Incorrect wiring or parameter setting by the Buyer.
11) The end of life cycle of the Goods under normal usage.
12) Loss or damage not liable to the Seller.

4. Dispatch Service

Service to dispatch a Seller’s engineer to investigate, adjust or trial test Seller’s Goods is at the Buyer’s expense.

5. Disclaimer

1) In our constant efforts to improve, TSUBAKIMOTO CHAIN may change the contents of this document without notice.

2) Considerable effort has been made to ensure that the contents of this document are free from errors. However, TSUBAKIMOTO CHAIN makes no warranties with respect to the accuracy of information described herein. In the mean time, we would appreciate comments or reports on any inaccuracies or omissions found in this document to help us make timely amendments as necessary. Your cooperation is greatly appreciated.

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