INSTALLATION MANUAL

AXIAL GARD

TGA65

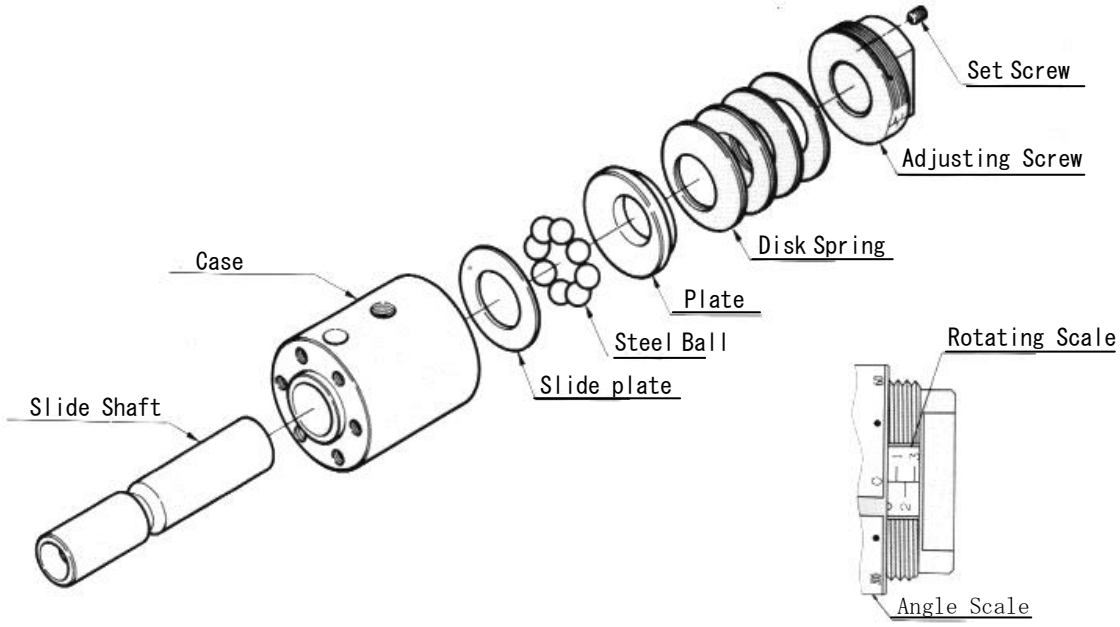
TGA150

TGA250

TGA350

TSUBAKIMOTO CHAIN

1. CONSTRUCTION



2. INSTALLATION

2-1 INSTALLING TO THE MACHINE

Before installing the AXIAL GARD to the machine, completely wipe off any dust or dirt from the slide shaft, the spigot facing of the case and taps.

2-2 Next, connect the slide shaft and the case tap portion. TSUBAKIMOTO CHAIN recommends an adhesive for metals be applied to the tap portion or the bolt outer diameter to prevent any loosening. (Loctite 262 recommended)

2-3 Make sure not to fix both the AXIAL GARD slide shaft side and the case side when installing the AXIAL GARD. The AXIAL GARD has no coupling function, so if it is installed too rigidly it will not properly function, potentially causing a malfunction or machine damage.

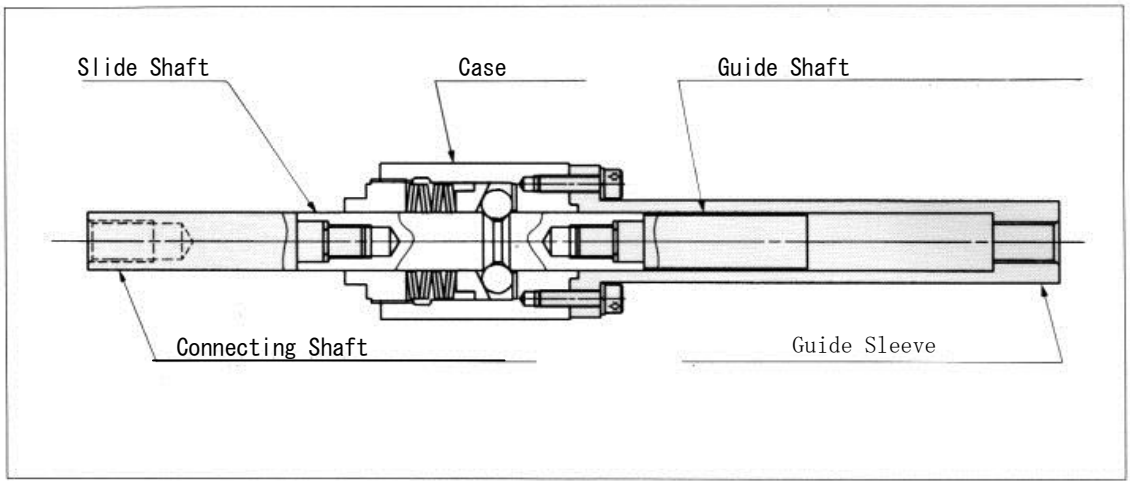
2-4 When the guide sleeve and guide shaft are connected to the AXIAL GARD there is a possibility that the inner diameter of the guide sleeve and the outer diameter of the guide shaft end face may interfere. Just in case, apply grease to the portion on the diagram below. (Refer to the maintenance section about grease brands.)

2-5 When the AXIAL GARD is installed vertically, (lengthwise direction) grease may

leak through the gap between the slide shaft and case or the adjustable screw. To avoid any problems, apply the grease once a year or every 100 times tripping.

CAUTION

Do not use the AXIAL GARD if there is a possibility that a falling accident of the drive or load side may occur when tripping. Such an accident may lead to serious injury or machine damage.



2-6 OVERLOAD DETECTION

When using the AXIAL GARD, make sure to combine it with the sensor mechanism to ensure that overload can be properly detected. (Refer to overload detection information)

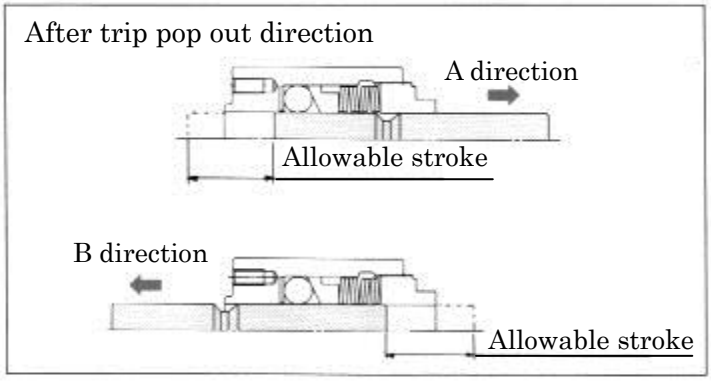
CAUTION

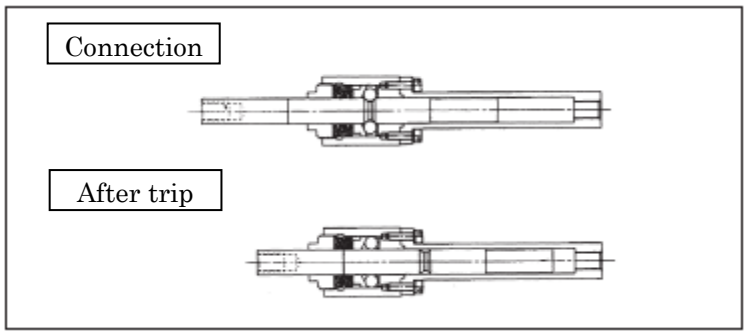
2-7 AXIAL GARD ALLOWABLE STROKE (AXIAL GARD unit only)

If the AXIAL GARD exceeds the stroke limits from the table below, the slide shaft will come out. In this case, the ball will fall out and the AXIAL GARD's functions will be lost. If after tripping the stroke is more than what is listed in the below table, connect the connecting and guide shafts.

(mm)

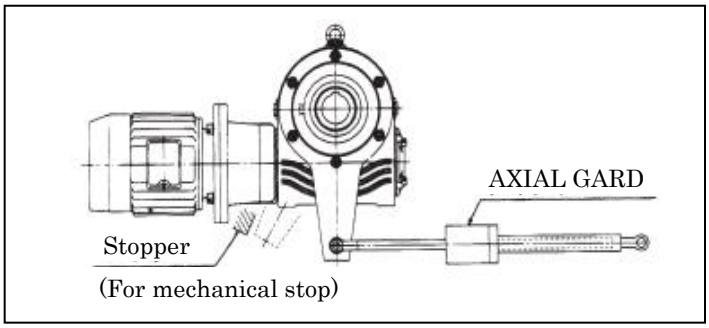
Model No.	TGA65	TGA150	TGA250	TGA350
A direction allowable stroke	14	20	30	38
B direction allowable stroke	14	22	24	26





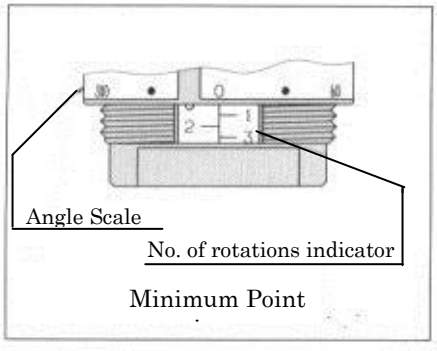
2-8 When installing at shaft-mounted reducer tie rod

This is an example of the application being used for shaft-mounted reducer torque arm as an overload protection device. Load direction is rotational direction, and the reducer rotates when tripping. Because of the reducer rotation, after the sensor detects overload and stops the motor, it stops mechanically at a certain position. For possible applications and model numbers, contact TSUBAKIMOTO CHAIN.



3. HOW TO SET THE TRIP LOAD

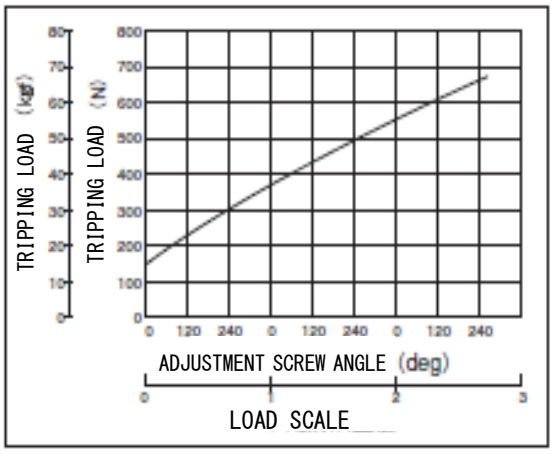
3-1 All AXIAL GUAD are shipped with the load set at the minimum point (min. load). Confirm that the number of rotations indicator and angle indicator are set at “0”.



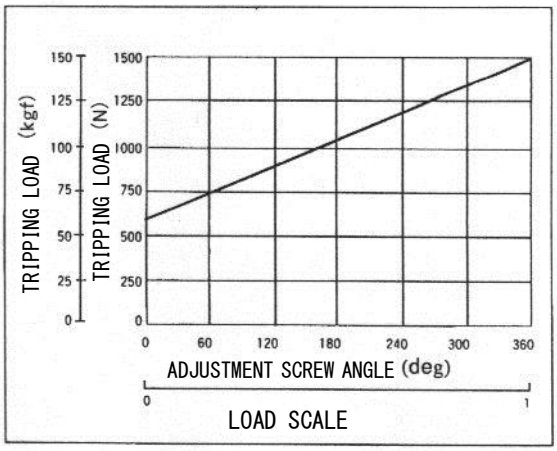
The No. of rotations indicator displays how many times the adjustable screw has rotated from the minimum load. If the end face of case is between 0 and 1, it indicates less than 1 rotation (less than 360°). As well, the angle indicator indicates how many degrees the adjustable screw has turned. The degree amount is indicated by the No. of rotations indicator indicator’s centerline. The total of the adjustable screw’s number of rotations (1 rotation=360°) and angle indicator is the rotation angle of adjustable screw.
(Example)
If the No. of rotations indicator is between 0 and 1, and the angle indicator shows 180° , the adjustable screw is turned to 180° position from minimum torque.

Loosen the hexagon socket head set screw to prevent loosing of adjustable screw.

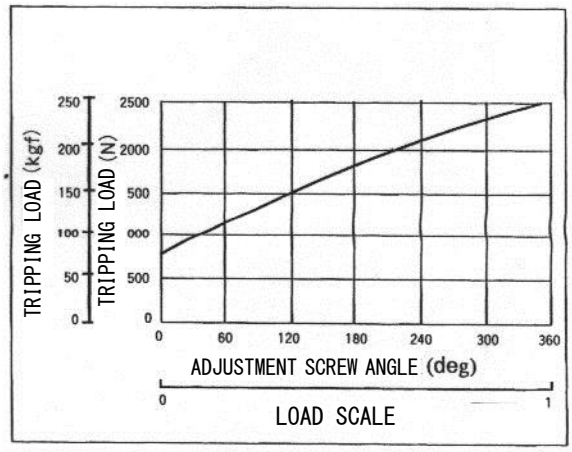
3-2 From the information in the “Tightening Amount - Load Correlation Chart”, find the tightening angle of an equivalent adjustable screw for the predetermined trip load. Tighten to 60° less than the predetermined angle. Next, carry out a load trip test. Gradually tighten to optimal trip load and test.



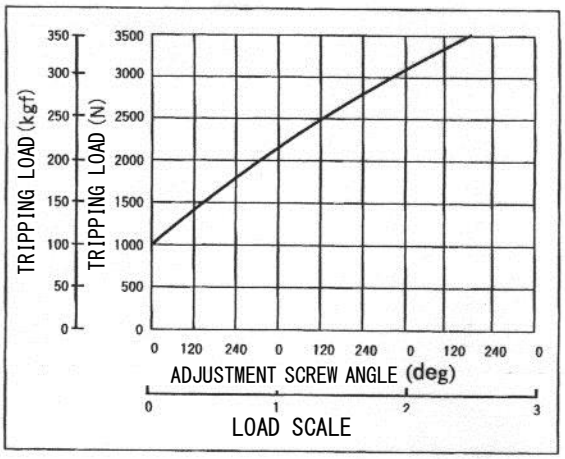
TGA—65



TGA—150

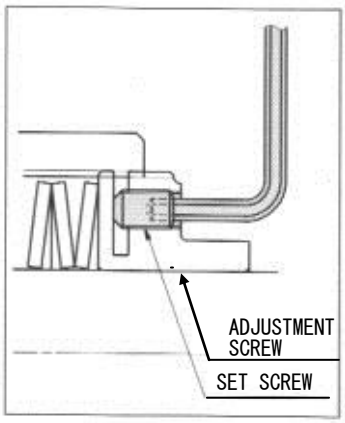


TGA—250

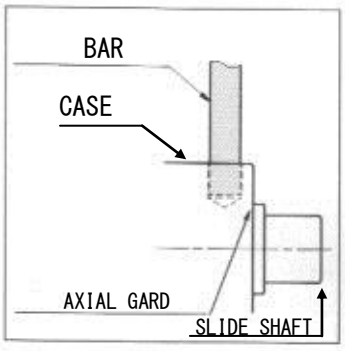


TGA—350

3-3 When the load has been set, tighten the hexagon socket head set screw portion, and verify that the set screw to prevent loosing of adjustable screw portion, and verify that the set screw is locked.



3-4 When turning the adjustable screw, to prevent the AXIAL GUAD from turning together with the adjustable screw, insert the bar into the drilled hole at the outer diameter of the cover.



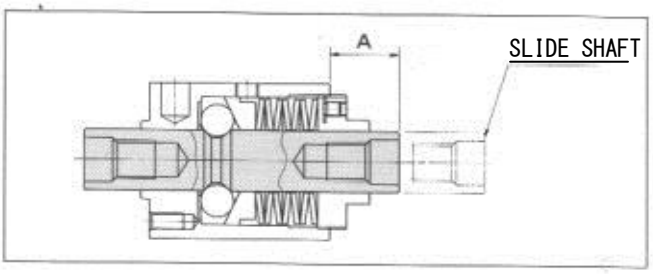
4. RESET

4-1 Before resetting, stop the machine and remove the cause of overload.

4-2 It is reset automatically when restarting the drive side (motor) to reverse load direction of trip direction. Turn the input (motor) using low rpm or inching. The axial load that is necessary for resetting is listed in the chart on the below.

Model	Resetting Load	A
TGA65	83N {8.5kgf}	11mm
TGA150	196N {20kgf}	19mm
TGA250	343N {35kgf}	22mm
TGA350	490N {50kgf}	24mm

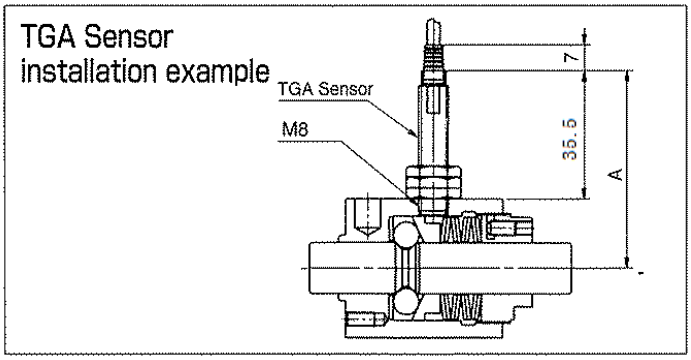
4-3 When the AXIAL GUAD resets, it makes a distinct “click” sound. To check whether the AXIAL GUAD has reset, refer to dimension A in the diagram on the below.



4-4 When resetting, the slide shaft or cover rapidly moves in the axial direction, causing mechanical shock. Therefore, do not reset by hand or directly touch the AXIAL GUAD.

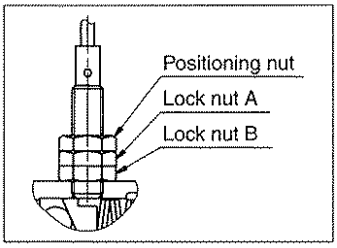
5. Overload detection

5-1 When using the AXIAL GUAD make sure to use the TGA sensor to detect trip during overload.



Unit : mm

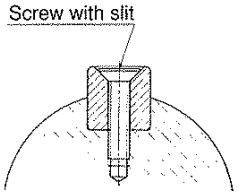
Model No.	A	Thread depth
TGA65	52	4.5
TGA150	54.5	
TGA250	58	
TGA350	63.5	



Fix the TGA Sensor to the case by screwing it into the tap holes. After fixing the sensor to the case, screw on lock nut A last to make it lock in place (double nut).
(The positioning nut is glued with an adhesive, so do not forcibly rotate it.)

When using the TGA Sensor it is necessary to stop the slide shaft side and case side rotation. As in the diagram below, stop rotation by putting the slide key between the guide sleeve and the guide shaft. For other methods, contact TSUBAKIMOTO CHAIN for more information.

Reference drawing



Like the diagram on the left, fix the slide key to the shaft with a slotted head countersunk screw (JISB1101). Screw sizes are listed below.

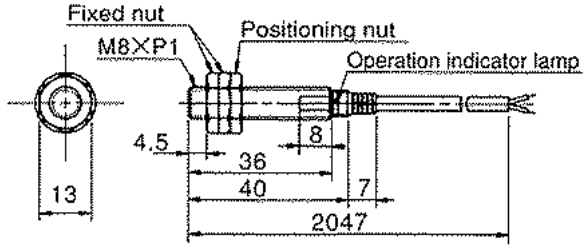
Model No.	Screw size
TGA65	M1.6
TGA150	M2
TGA250	M2
TGA350	M3

■TGA Sensor Specifications

		AC type	DC type
Model No.		TGA－S8	TGA－S8D
Power supply voltage	Rating	AC24～240V	DC12～24V
	Possible use range	AC20～264V(50/60Hz)	DC10～30V
Current consumption		Less than 1.7mA(at AC200V)	Less than 13mA
Control output (open, close capacity)		5～100mA	Max. 200mA
Indicator lamp		Operation indicator	
Ambient operating temperature		－5～＋70℃ (no condensation)	
Ambient operating humidity		35～95%RH	
Output form		NC (Output open/close condition when not detecting sensor plate)	
Operation form		—	NPN
Insulation resistance		More than 500M (at DC50V mega) Charge portion - Case	
Mass		Approx. 45g (with 2m cord)	
Residual voltage		Refer to characteristic data	Less than 2.0V (Load current 200mA, 2m cord length)

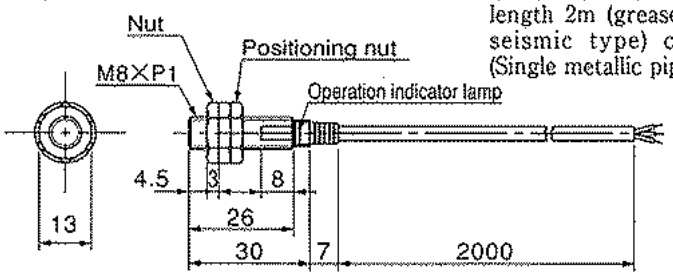
■Measurement Diagram

•AC type TGA-S8



＊Plastic insulation circle type cord φ4 (60/φ0.08) 2 cores, standard length 2m (grease resistant, anti-seismic type) cord extension (Single metallic piping) max. 200m

•TGA-S8D



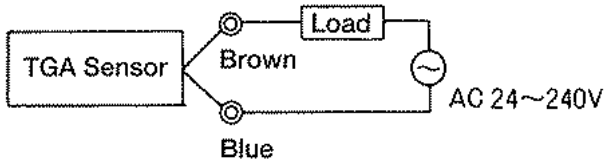
＊Plastic insulation circle type cord φ4 (60/φ0.08) 3 cores, standard length 2m (grease resistant, anti-seismic type) cord extension (Single metallic piping) max. 200m

■TGA Sensor handling

Refrain from striking, swinging or putting excessive force on the detecting portion.

AC type TGA-S8

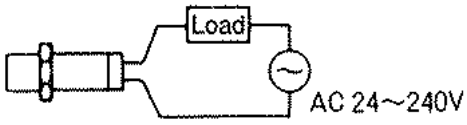
■Circuit diagram



Not necessary to consider TGA Sensor's polarity (brown, blue)

■Precautions for wiring

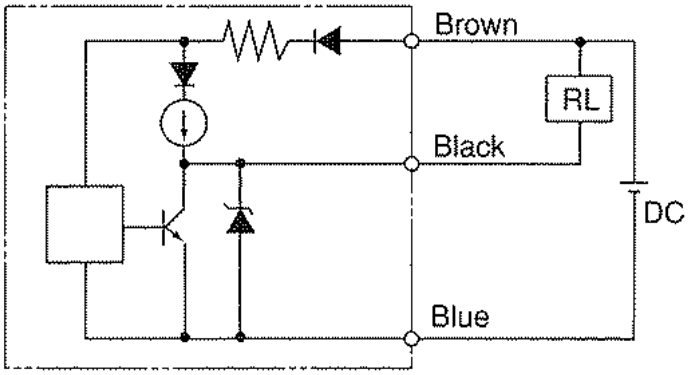
- Make sure to connect the load at first, then turn on the power. If the power is turned on without connecting the load, it will be damaged.



- In order to prevent malfunction or damage due to surge or noise, insert the TGA sensor code in a individual piping when it runs close to the power cable.

DC type TGA-S8D

■Circuit diagram



■About choosing load and wiring

•Connecting to the power source

Make sure to connect to the power source through load. A direct connection will break the elements inside.

•Metal piping

In order to prevent malfunction or damage, insert the proximity switch code inside a metal pipe when it runs close to the power cable.

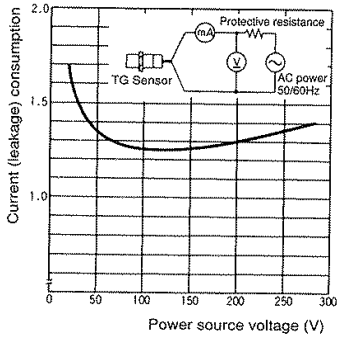
•Surge protection

In the case where the TGA Sensor is near a device that generates a large surge (motor, welding machine, etc.), the TG Sensor contains a surge absorption circuit, but also insert a varistor to the source.

•The effect of current consumption (leakage)

Even when the TGA Sensor is OFF a small amount of current continues to flow to keep the circuit running. (Refer to the "Current Consumption (leakage) Graph".) Because of this, a small voltage occurs in the load that can sometimes lead to reset malfunction. Therefore, confirm that the voltage of the load is less than the reset voltage before use. As well, if using the relay as load, depending on the construction of the relay, a resonance may occur due to the current leaks when the sensor is OFF.

Current (leakage) Consumption Characteristics



•When power voltage is low

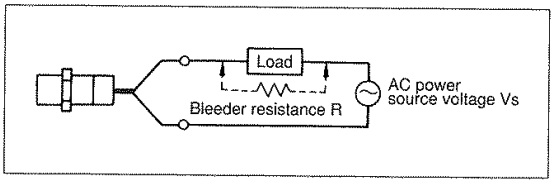
When power source voltage is lower than AC48V and load current is less than 10mA, the output residual voltage when the TGA Sensor is ON becomes large. When it is OFF, the residual voltage of load becomes large. (Refer to "Residual Voltage Characteristics of Load".) Take caution when using the load such as a relay operated by voltage.

•When load current is small

When load current is smaller than 5mA, residual voltage of load becomes large in the TGA Sensor. (Refer to "Residual Voltage Characteristics of Load".) In this case, connect the breeder resistance with load parallel, apply load current at more than 5mA, and set the residual voltage less than return voltage of load. Calculate the breeder resistance and allowable power using the following calculations . TSUBAKIMOTO CHAIN recommends to use 20kΩ at AC100V and more than 1.5W(3W),and 39kΩ at AC200V and more than 3W(5W) for safe. (If heat generation becomes a problem, use the Wattage shown in ( ).)

$$R \leqq \frac{Vs}{5-i}\ (k\Omega) \qquad P \geqq \frac{Vs^2}{5-i}\ (mW)$$

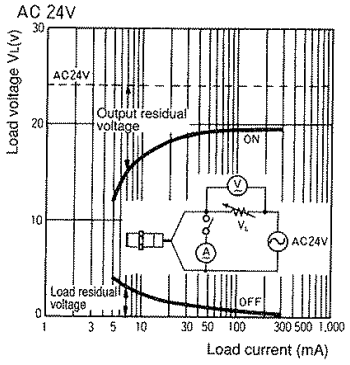
P : Wattage of breeder resistance
i : Current applied to the load (mA)

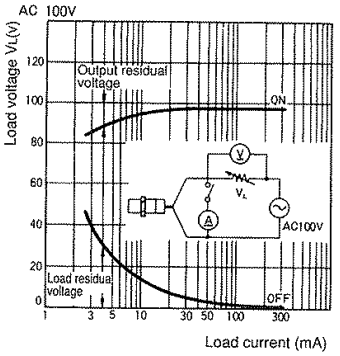


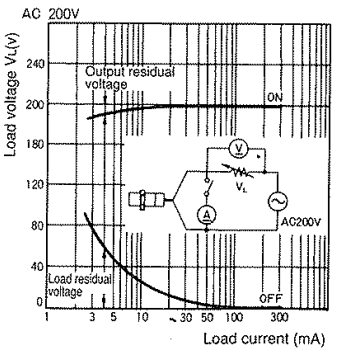
•Load with large inrush current

As for the load with large inrush current (1.8A and above) such as a lamp or motor, the opening and closing element can be deteriorated or be broken. In this case, use along with a relay.

Residual Voltage Characteristics







6. MAINTENANCE

AXIAL GARD is shipped after applying the grease but apply the grease listed below once a year or every 100 times trippings.

KYODO OIL	SUMITOMO LUBRICANT	DOW CORNING	STT
Hanyo Grease HD	Low Temp Grease	Molykote 44MA Grease	SOLVEST 832

PROCEDURE FOR MAINTENANCE

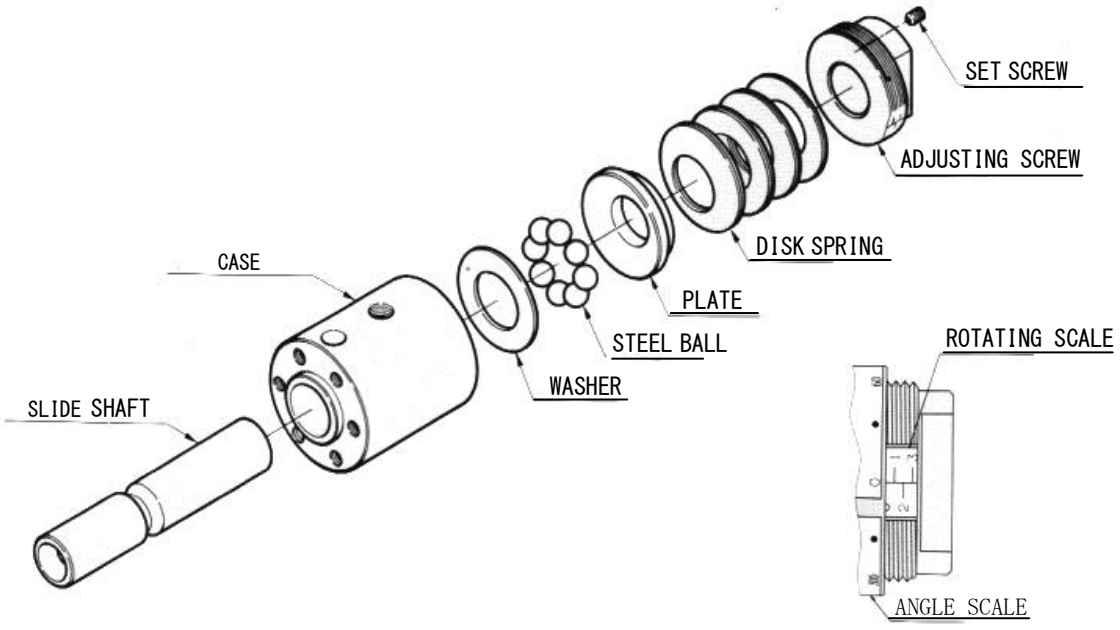
6-1 DISMANTLE

Loosen “SET SCREW” and remove “ADJUSTMENT SCREW” , “DISC SPRING” , “PLATE” ,”STEEL BALL” and “SLIDE SHAFT” in order.

After flashing old grease from all parts , apply grease enough to “WASHER” , “STEEL BALL” , “SLIDE SHAFT” and “PLATE”.

6-2 Re-assembling

After assembling “SLIDE SHAFT” , “WASHER” , “STEEL BALL” ,”PLATE” and ”DISC SPRING” to the “CASE” in order , tighten “ADJUSTMENT SCREW” and tighten “SET SCREW”.



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 machine - 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 according to the instructions provided in the manual, Seller will repair and replace at no charge once the Goods are returned to the Seller.
   This warranty does not include the following:
   1) Any costs related to removal of Goods from the Buyer’s equipment or machine to repair or replace parts.
   2) Cost 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 machine.
   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 injustices done by a third party.
   8) Secondary damage or problem incurred by the Buyer’s equipment or machine.
   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 make changes to this document or the product described herein, without notice.
   2) Considerable effort has been made to ensure that the contents of this document are free from technical inaccuracies and errors. However, any such inaccuracies or errors reported will be gladly examined and amended as necessary.

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