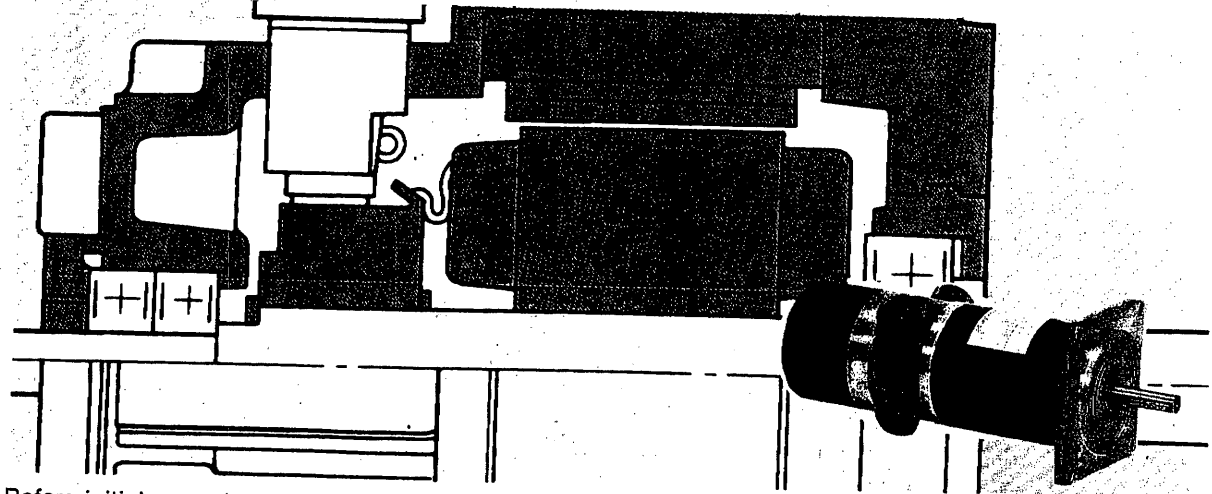


MINERTIA MOTORS RM SERIES

EXCELLENT PERFORMANCE/SIZE RATIO IN A SMALL PACKAGE

TYPE UGRMEM-□□□□



Before initial operation, read these instructions thoroughly, and retain for future reference.



When properly installed, operated and maintained, this motor will provide a lifetime of optimum operation. It is mandatory that the person who operates, inspects, and maintains this motor thoroughly read and understand this manual.

CONSTRUCTION

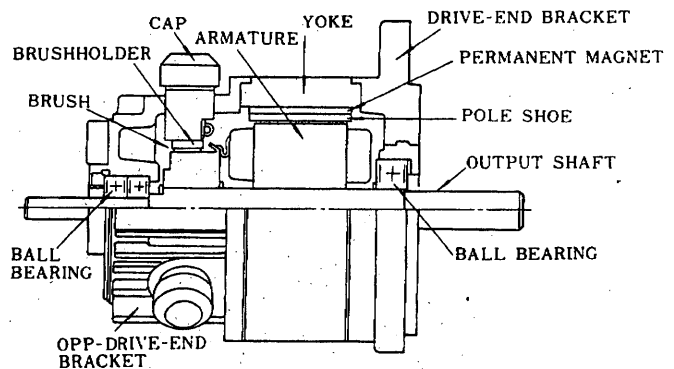
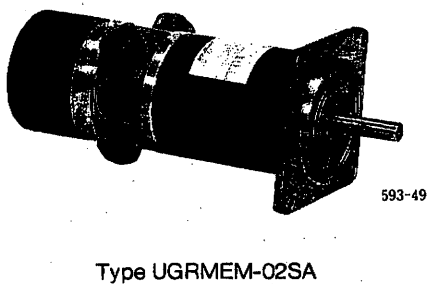


Fig. 2 Construction of Minertia Motor RM Series

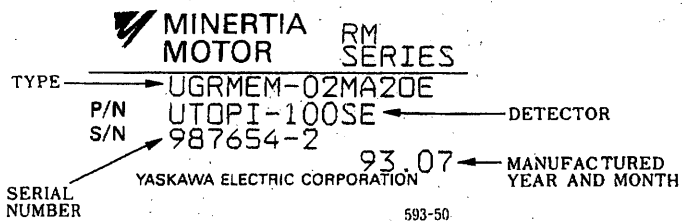


Fig. 1 Nameplate Detail

RECEIVING

This motor has been put through extensive tests at the factory before shipping. After unpacking, however, check and see the following.

- The nameplate ratings meet your requirements (Fig. 1).
- No damage while in transit.
- Bolts and screws are not loose.

If any part of the motor is damaged or lost, notify Yaskawa representative giving full details and nameplate data as soon as possible.

RATINGS AND SPECIFICATIONS

Time Rating: Continuous

Insulation: Class B

(For types UGRMEM-40S, 40 M, Class F)

Enclosure: Totally-enclosed self-cooled type

Ambient Temperature: -10°C to $+40^{\circ}\text{C}$

Vibration: $15\ \mu\text{m}$ or below

Finish in Munsell Notation: N 1.5

Excitation: Permanent magnet

Mountings: Flange-mounted type

Drive Method: Direct drive

STORAGE

If a motor is not to be installed immediately, it must be stored in a clean, dry place below 40°C and protected from high humidity, corrosive gases and liquids, dust and vibration. It is recommended that the motor be covered with a vinyl sheet, using silica gel for moisture absorption. When in storage for an extended period, or during prolonged shut-down, hand-rotate the output shaft every three months to prevent binding due to corrosion.

INSTALLATION

Minertia Motors are flange-mounted type and can be installed either horizontally or vertically. When installing the motor, follow carefully the procedures given below. Incorrect installation and/or improper environment may damage the motor or cause accidents.

BEFORE MOUNTING

Remove anticorrosive paint on shaft extension with paint thinner before connecting the motor to the driven machine.

LOCATION

Use the motor under the following conditions.

- Indoors and protected from the corrosive liquids
- Free from corrosive and/or explosive gases or vapors
- Ambient temperature -10 to $+40^{\circ}\text{C}$
- Free from dust and moisture
- Easily accessible for inspection and cleaning

If Minertia Motors are to be used where spraying or splashing of water or oil can be expected, protect the Minertia Motors with a cover or other shielding device. If only slight splashing or spraying is expected, apply liquid gasket on the joints of components and heads of screws.

When protection from splashing or spraying is specified in the purchase order, the treatment will be accomplished at the factory prior to shipment.

COUPLING TO LOAD

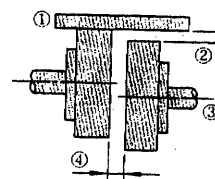
True alignment of motor and driven machine is essential to prevent vibration, short bearing and coupling life, or shaft and bearing failures.

Use flexible coupling with direct drive. The alignment should be made in accordance with Fig. 4.

Allowable Tolerances on Offset and Angular Misalignment

Tolerances in mm	
Offset Tolerance	Angular Tolerance
0.025	0.05

Note: Where a dial indicator is used for correcting offset misalignment, the offset tolerance should be half the difference of the dial indicator readings.

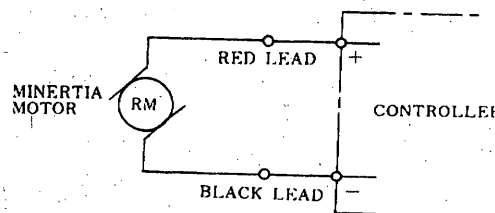


- ① Straightedge
- ② Measure the gap between the straightedge and coupling halves at four equidistant points of the coupling. The each reading should not exceed 0.05 mm.
- ③ Align the shafts.
- ④ Measure the gap between the coupling faces at four equidistant points around the coupling rim with thickness gage. The maximum variation between any two readings should not exceed 0.05 mm.

Fig. 4 Alignment of Coupling

WIRING

Minertia Motor RM Series must be connected with the controller as shown below.



The direction of the rotation of the output shaft should be counterclockwise (CCW) when viewed from the drive end, when the red lead connected to \oplus pole of the power source and black lead to \ominus .

TEST RUN

Before run, check the items given below and correct any deficiency.

INSPECTION BEFORE TEST RUN

Before test run, make sure of the following.

- All fastening bolts and screws are tight.
- Output shaft mounted securely.
- Wiring is correct.
- Fuse is proper type. (Select a fuse matching the rated current stated on the nameplate.)
- Type RHP overcurrent relay is the proper type.

INSPECTION DURING TEST RUN

The following items should be checked during the test run.

- Unusual vibration
- Abnormal noise
- Excessive temperature rise

If any malfunction occurs during test run, check the cause, following Table 3 and take appropriate corrective action.

NOTE

During test run, thermal overload relay type RH-35 may trip because of insufficient warm-up of the driven machine. Whenever the relay trips, make a thorough check.

OPERATION

Before and during operation, check the following items :

- Be sure to remove any obstacles from periphery of equipment before operation.
- Be sure to prevent access to equipment by unauthorized personnel during operation.

MAINTENANCE

To insure a lifetime of optimum operation, it is necessary to periodically inspect and maintain brushes, commutator, bearings and other parts.

Table 1 shows the inspection schedule for Minertia Motor RM Series.

CAUTION

Never disassemble the Minertia Motor under any circumstances. Since Minertia Motor incorporates powerful permanent magnets, the performance might be degraded if disassembled.

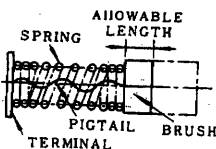
Table 1 Inspection Schedule

Inspection Item	Schedule					What to do
	Daily	Monthly	Yearly	Motor Running	Motor at Rest	
Noise	<input type="radio"/>			<input type="radio"/>		If unusual noise is heard, contact your Yaskawa representative.
Vibration	<input type="radio"/>			<input type="radio"/>		Feel by hand. If excessive, motor must be rebuilt.
Loose Connection		<input type="radio"/>			<input type="radio"/>	If loose, tighten connection.
Parts contaminated with Dust or Oil		<input type="radio"/>			<input type="radio"/>	Clean dirty parts.
Brush Wear		<input type="radio"/>			<input type="radio"/>	Measure the remaining brush length. When the remaining length has reached allowable length limit, replace brush. (See Table 2.)
Coupling to Load			<input type="radio"/>		<input type="radio"/>	Check for motor alignment and coupling balance, following "Coupling to Load." If misaligned, correct by realignment.
Damage to Leads and Terminals			<input type="radio"/>		<input type="radio"/>	Replace damaged parts.
Vertical Slide of Brush in Brushholder			<input type="radio"/>		<input type="radio"/>	If vertical slide of brush in brushholder is not smooth, clean brushholder.
Damage to Brush Section			<input type="radio"/>		<input type="radio"/>	Replace damaged brush.
Load Current			<input type="radio"/>	<input type="radio"/>		Measure load current with an AC ammeter. If load current is less than the rating, contact your Yaskawa representative.

BRUSHES

Brushes and contact pressure have been selected for the most appropriate type and value for the motor. No re-adjustment is required. Brush wear depends upon the period of use and should be replaced when the remaining brush length has reached allowable length limit. It is advisable to replace the brush every 4000 hours. Detail of brush is shown in Table 2.

Table 2 Brush Size Dimensions in mm

Motor Type UGRMEM-	Thick- ness	Width	Length	Allow- able Length	Remarks
01SAK	2.5	4	10	4	
02SA2 02MA2	3	7	15	7	
04SA2 04MA2	3	7	15	7	
08SA2 08MB2	4	8	18	7	
40SA2 40MA2	5	10	22	7	

Inspection and Replacement of Brushes

CAUTION

- Before inspecting brushes, disconnect power source from the motor to avoid electric shock.
- Never permit oil on the brush.

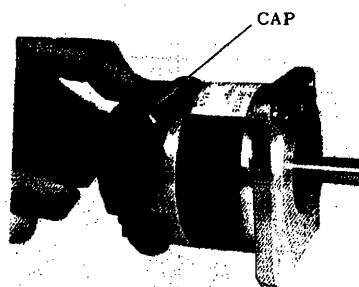
The inspection of brushes can be easily made by manually removing brush terminal after removing the cap. See Fig. 3 (a) and (b). Replace the brushes if they are defective, as listed below. When replacing the brushes, select new ones according to Table 2.

- Wear has reached allowable limit.
- Damaged or cracked.
- Contaminated with oil or water.
- Pigtails are discolored or corroded.
- Pigtail fastener is loose.

When inserting the brush, be sure to put it into place for commutator protection.

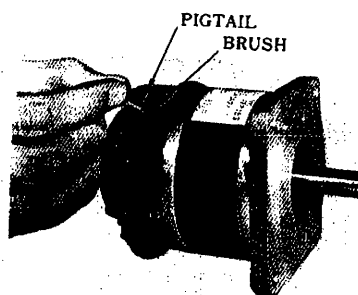
After replacing the brushes, fit new brushes to commutator surface as follows :

1. Drive the motor for approximately 30 seconds in both forward and reverse with no load. Repeat at least 5 times.
2. After the above test drive, remove the inspection window bushing. Blow off brush dust and other dirt with clean, dry compressed air through the inspection window. See Fig. 3 (c).



(a) Removing Cap

583-263



(b) Removing Brush

583-264



(c) Removing Carbon Particles by Compressed Air

583-265

Fig. 3 Brush Inspection

TROUBLESHOOTING GUIDE

Troubleshooting guide for Minertia Motor RM Series is shown in Table 3.

WARNING

Remedies in should be practiced after turning off the power.

Table 3 Troubleshooting Guide for Minertia Motor RM Series

Trouble	Cause	What to Do
Motor does not start.	Voltage below rated	Measure voltage across red and black leads of motor with tester and correct to rated value.
	Contactors defective	Repair or replace.
	Loose connection	Tighten connection.
	Defective wiring	Correct.
	Fuse blown	Replace.
	Relay open	Reset.
	Overload	Reduce load or use a larger motor.
	Motor defective	Measure voltage across red and black leads of motor. When correct, inspect brushes or replace motor. When incorrect, check and repair controller.
	Controller defective	
Fuse is blown.	Improper fuse	Change fuse.
	Motor defective	Disconnect motor from controller. If fuse is not blown, inspect brushes or replace motor. If blown, check wiring and controller.
	Wiring or controller defective	
Relay operates and then motor stops.	Improper setting of relay	Correct.
	Overload	Reduce load or use a larger motor.
	Motor defective	If relay opens with no load, replace motor.
Unstable operation	Worn or damaged brush	Replace.
	Controller defective	Repair.
	Wrong connection	Inspect and correct connection across red and black leads of motor and T.G.
Motor overheats.	Excessive ambient temperature	Reduce below 40°C.
	Motor dirty	Clean motor surface.
	Overload	Reduce load or use a larger motor.
Unusual noise	Motor loosely mounted	Tighten foundation bolts.
	Motor misaligned	Realign.
	Coupling out of balance	Balance coupling.
	Noisy bearing	Check alignment, loading of bearing, lubrication and contact manufacturer's agent.
	Vibration of driven machine	Contact the machine manufacturer.
	Brush worn and damaged	Replace.
	Detector defective	Contact your Yaskawa representative.

REFERENCE**Overload Protection**

For overload protection of Minertia Motors, Yaskawa Type RHP thermal quick actuating overload relays are recommended. Type RHP relays are optional and are available upon request.

When using relay Type RHP, observe the following precautions. (See Fig. 5.)

- (1) Never disassemble the thermal relay.
- (2) If the heater element is damaged, replace the thermal relay.
- (3) Since the operating current has been preset at the factory before shipment, readjustment is not required.
- (4) Thermal relay can be reset both automatically and manually. For resetting the relay automatically, fix the reset button in depressed position by inserting the slider into a groove of the reset button.

- For manual resetting, the relay is reset by depressing the button and holding for more than 3 minutes after it is tripped.
- For automatic resetting, the relay is automatically reset within 3 minutes after it is tripped.

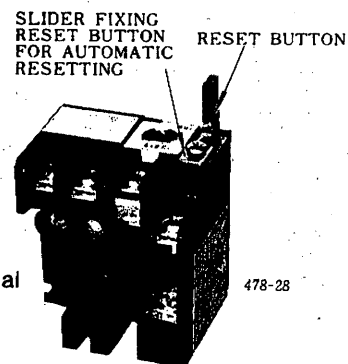


Fig. 5 Type RHP Thermal Overload Relay

478-28

ASSISTANCE OR INQUIRY

Your Minertia Motor will serve you life-time operation with correct maintenance conducted in compliance with these Instructions.

In case of malfunction, you want to know the corrective actions to take, or if our annual inspection service is desired, notify your Yaskawa representative including the information listed below.

- (1) Type*
- (2) Serial Number*
- (3) Year and Month Manufactured*
- (4) Detector Type*
- (5) Application or Use

In case of malfunction, describe the circumstances in as much detail as possible.

* These are stated on the Nameplate attached to the Minertia Motor.

MINERTIA MOTORS RM SERIES

EXCELLENT PERFORMANCE/SIZE RATIO IN A SMALL PACKAGE

TYPE UGRMEM-□□□□

TOKYO OFFICE Ohtemachi Bldg, 1-6-1 Ohtemachi, Chiyoda-ku, Tokyo, 100 Japan
Phone (03) 3284-9111 Telex YASKAWA J33530 Fax (03) 3284-9034

SEOUL OFFICE 8th Floor Seoul Center Bldg, 91-1, Sogong-Dong, Chung-ku, Seoul, Korea 100-070
Phone (02) 776-7844 Fax (02) 753-2639

TAIPEI OFFICE Shen Hsiang Tang Sung Chiang Building 10F 146 Sung Chiang Road, Taipei, Taiwan
Phone (02) 563-0010, -7732 Fax (02) 567-4677

YASKAWA ELECTRIC AMERICA, INC.

Chicago-Corporate Headquarters 2942 MacArthur Blvd. Northbrook, IL 60062-2028, U.S.A.
Phone (708) 291-2340 Fax (708) 498-2430

Chicago-Technical Center 3160 MacArthur Blvd. Northbrook, IL 60062-1917, U.S.A.
Phone (708) 291-0411 Fax (708) 291-1018

MOTOMAN INC.

805 Liberty Lane West Carrollton, OH 45449, U.S.A.
Phone (513) 847-6200 Fax (513) 847-6277

YASKAWA ELECTRIC EUROPE GmbH

Niederhöchstädter Straße 73, 61476 Kronberg-Oberhöchstädt, Germany
Phone (06173) 9380 Telex 415660 YASE D Fax (06173) 68421

YASKAWA ELÉTRICO DO BRASIL COMÉRCIO LTDA.

Rua Conde Do Pinhal 8-5°, Andar Sala 51 CEP 01501-São Paulo-SP, Brasil
Phone (011) 35-1911 Fax (011) 37-7375

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.

Head Office : CPF Bldg, 79 Robinson Road # 13-05, Singapore 0106, SINGAPORE

Phone 221-7530 Telex (87) 24890 YASKAWA RS Fax 224-5854

Service Center : 221 Henderson Road, # 07-20 Henderson Building Singapore 0315, SINGAPORE

Phone 276-7407 Fax 276-7406

YATEC ENGINEERING CORPORATION

Shen Hsiang Tang Sung Chiang Building 10F 146 Sung Chiang Road, Taipei, Taiwan

Phone (02) 563-0010 Fax (02) 567-4677



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YASKAWA ELECTRIC CORPORATION