



TOE-C 247-2B
INSTRUCTIONS

Hi-Cup Motors™

CUP-ARMATURE, DC SERVOMOTORS

Read thoroughly this manual before starting and keep it for future reference.

Type UGHMED-□□ AA
Type UGHMED-□□ GG

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 reads and understands this manual.

RECEIVING

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

- Its nameplate ratings meet your requirements.
- It has sustained no damage while in transit.
- The output shaft should be hand-rotated freely. However, the brake-mounted motor does not rotate as it is shipped with the shaft locked.
- Fastening bolts and screws are not loose.

If any part of the motor is damaged or lost, immediately notify us giving full details and nameplate data.

INSTALLATION

Hi-Cup Motor can be installed either horizontally or vertically.

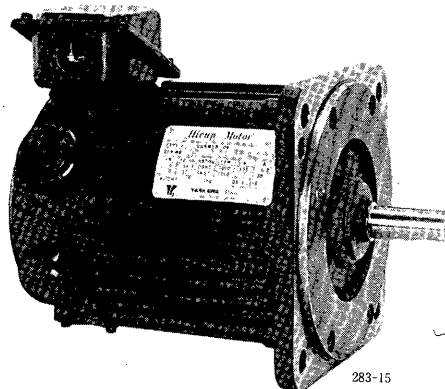
BEFORE MOUNTING

Wash out anticorrosive paint on shaft extension and flange surface with thinner before connecting the motor to the driven machine. See Fig. 1.

LOCATION

Use the motor under the following conditions.

- Indoors
- Free from corrosive and/or explosive gases or liquids
- Ambient temperature -10 to +40°C
- Clean and dry
- Accessible for inspection and cleaning



Totally Enclosed Flange-Mounted
Type UGHMED-06AA2

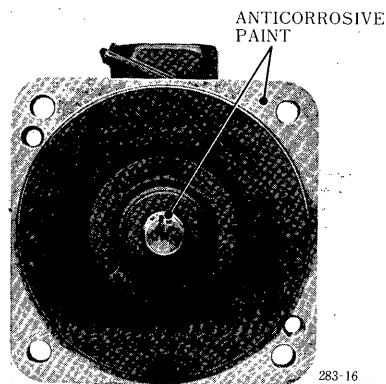


Fig. 1 Anticorrosive
Paint to be Removed

COUPLING TO LOAD

Tolerance of shaft extension diameter is 0 to +0.025 mm, and flange rabbet diameter, 0 to -0.040 for 180 mm diameter and 0 to -0.046 for 200 to 250 mm diameter. The motor can be directly mounted on the driven machine with less alignment work, if the mated surface is worked within the same tolerance limits with the motor.

ALLOWABLE LOAD TO BEARINGS

Avoid both thrust and radial loads to the motor shaft. Should it be unavoidable, never exceed the values in Table 1.

Table 1 Allowable Load to Bearings

Motor Type		Allowable Thrust Load* (kg)	Allowable Equivalent Radial Load† (kg)
A Series	UGHMED-06AA □	56	140
	UGHMED-12AA □	38	210
	UGHMED-20AA □	78	210
	UGHMED-30AA □	58	240
G Series	UGHMED-03GG □	50	100
	UGHMED-06GG □	35	100
	UGHMED-12GG □	85	210
	UGHMED-20GG □	85	210
	UGHMED-30GG □	65	210

* At rated speed and rated torque.

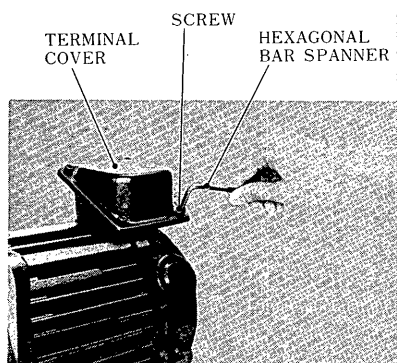
† Radial load insuring the specified bearing life during continuous operation at rated speed.

WIRING

Wire Hi-Cup Motor as follows.

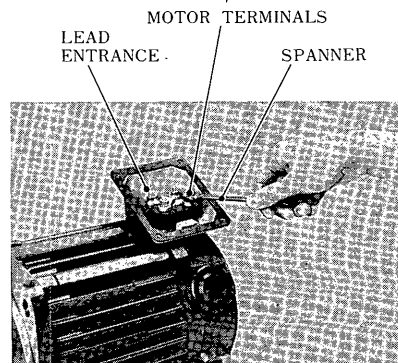
1. Remove 4-mounting screws with a hexagonal bar spanner to take off the terminal box cover. See Fig. 2.
2. Run the power leads through lead entrance into the terminal box.
3. Attach pressure terminals to the leads, and connect them securely to the motor terminals (A and B). See Fig. 3.
4. Remount the terminal box cover by fastening with mounting screws.

When viewed from the drive end, the motor rotates counterclockwise and motor terminal A is the plus pole.



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Fig. 2 Removal of Terminal Box Cover



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Fig. 3 With Terminal Box Cover Removed

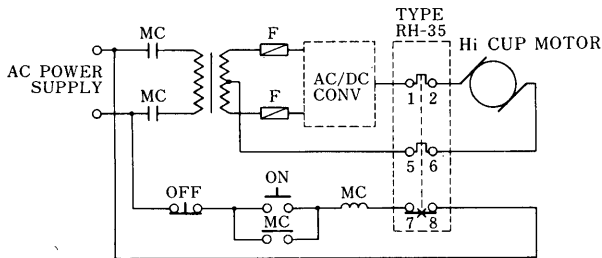
OVERLOAD PROTECTION

Use the thermal overload relay type RH-35 for overload protection of Hi-Cup Motor. Refer to Figs. 4 and 5 and Table 2. When using type RH-35, check the following.

- Never disassemble the thermal relay.
- If the heater element is damaged, replace the thermal relay with a new one.
- Since operating current of the relay is adjusted at the factory, no readjustment is necessary.
- 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.



Note: Thermal overload relay type RH-35 must not be connected to AC terminals of amplifier or rectifier.

Fig. 4 Connection Diagram of Thermal Overload Relay Type RH-35

Table 2 Selection of Thermal Overload Relays, Type RH-35

Motor Type UGHMED-	Thermal Overload Relay, Type RH-	Nominal Current (A)
A Series	06AA □	35/6.2HV
	12AA □	35/10.5HV
	20AA □	35/17HV
	30AA □	35/23.5HV
B Series	03GG □	35/7.8HV
	06GG □	35/6.2HV
	12GG □	35/10.5HV
	20GG □	35/16HV
	30GG □	35/21HV

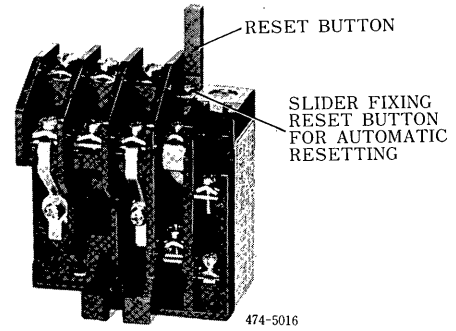


Fig. 5 Thermal Overload Relay, Type RH-35

TEST RUN

INSPECTION BEFORE TEST RUN

Before test run, check the following. Correct any deficiency.

- Bolts and nuts are not loose.
- Wiring is correct.
- Oil-seal is not damaged, if used.

INSPECTION DURING TEST RUN

The following items should be checked during the test run.

- Unusual vibration
- Abnormal noise
- Excessive temperature rise

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

MAINTENANCE

Essentially, maintenance of Hi-Cup Motor centers about brushes in user's side.

The inspection schedule for the motor is shown in Table 3.

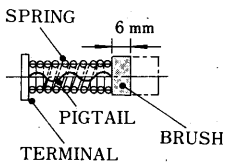
Table 3 Inspection Schedule for Hi-Cup Motors

Inspection Item	Frequency	Inspection Operation
Vibration	Daily	Feel manually.
Noise	Daily	Aurally.
Exterior and Cleaning	As required	Clean with dry cloth or compressed air.
Brush and Commutator	Every 5000 hours	See BRUSHES and COMMUTATOR described below.
Insulation Resistance	Annually	Make sure that it is more than 1 MΩ by measuring with a 500 V megger after disconnecting the motor from the controller.
Oil Seal	Every 5000 hours	See OIL SEAL AND O RING REPLACEMENT .
Total Inspection	Every 20,000 hours or 5 years whichever is sooner	Consult the company.

BRUSHES

Table 4 shows brush size, quantity and length limit. Brush life depends on motor application and operating condition. In general, inspect the brush every 5000 hours of motor operating time.

Table 4 Brush Size, Quantity and Length Limit

Motor Type	Size (mm)	Q'ty	Allowable Length Limit
UGHMED-06AA	6x12.5x22	4	6 mm (min.) (Initial length is 22 mm.) 
UGHMED-12AA	6x12.5x22	4	
UGHMED-20AA	6x12.5x22	4	
UGHMED-30AA	6x12.5x22	6	
UGHMED-03GG	6x12.5x22	4	
UGHMED-06GG	6x12.5x22	4	
UGHMED-12GG	6x12.5x22	4	
UGHMED-20GG	6x12.5x22	4	
UGHMED-30GG	6x12.5x22	6	

Note: It is recommended that the brush be replaced with new one at approximately 10 mm of brush length.

Inspection and Replacement of Brushes

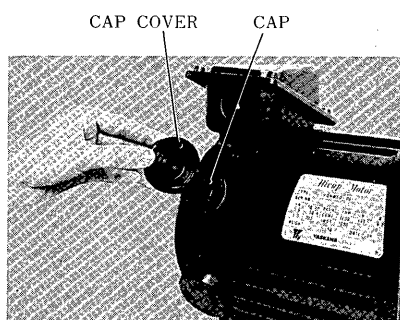
Caution

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

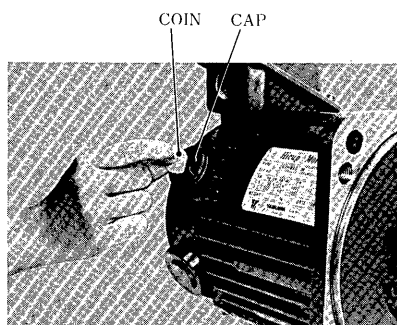
The inspection of brushes can be easily made by manually removing brush terminal after removing the cap cover and cap. See Fig. 6. Replace the brushes with new ones if they are defective, as listed below. When replacing the brushes, select new ones according to Table 4.

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

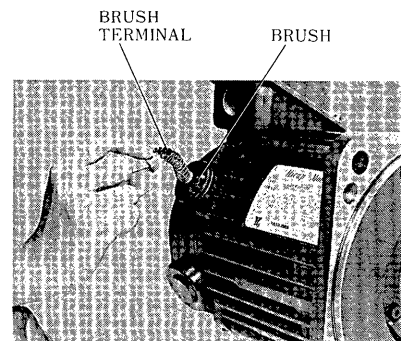
Where inserting the brush, be sure to put it into place for commutator protection. Refer to Fig. 8.



1. Remove Cap Cover.



2. Remove Cap.



3. Remove Brush.

Fig. 6 Inspection of Brushes

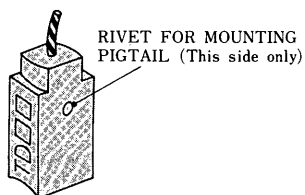


Fig. 7 Inserting-Direction Mark (Rivet) for Brush

After Replacing Brushes

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

1. Drive the motor for approximately 10 seconds in both forward and reverse with no load. Repeat at least 5 times.
2. After the above test drive, remove the inspection window cover at lower position of the motor. Blow off brush dust and other dirt with clean, dry compressed air through the inspection window. See Fig. 8.

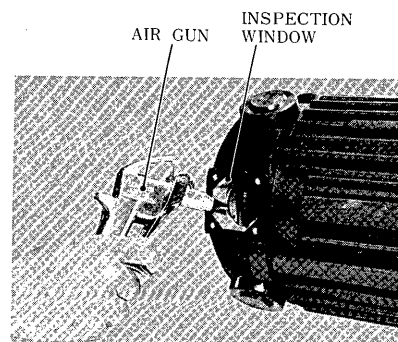


Fig. 8 Removal of Carbon Particles by Compressed Air

COMMUTATOR

If the commutator surface is brown and glossy, it is in good condition. If the surface appears blackened and/or dirty, contact the company for repairing or replacing.

OIL SEAL AND O RING REPLACEMENT

If the bearing is provided with oil seal and O ring, the oil seal should be lubricated with turbine oil or hydraulic oil. Do not use oil with extreme-pressure heavy-duty film-strength additive for the bearing. Long-period operation without oiling will result in seizure and abnormal wear of oil seal. Table 5 shows the selection of oil seal and O ring.

Life of oil seal is approximately 5,000 operating hours, and O ring, 10,000 operating hours.

Replacing procedures for oil seal and O ring is as follows. Refer to Fig. 9.

1. Take off bearing cover by removing the cover fastening screws.
2. Remove oil seal from bearing cover.
3. If the fitting of new oil seal is too tight, grind the shaft and polish it with fine sand paper so that surface roughness will be 1.6 micron, rms, or below.
4. Apply Three Bond No. 1104 (made by Three Bond Co., Ltd., Japan) to the outer face of oil seal, and mount it into bearing cover. Replace O ring with new one at the same time if it defective.
5. Apply Three Bond No. 1104 to joint surface of bearing cover and mount the cover to the motor.

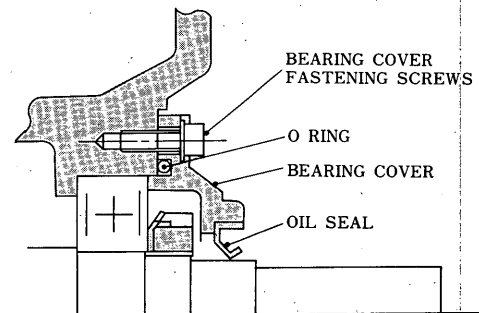


Fig. 9 Construction of Bearing Section with Oil Seal and O Ring

Table 5 Motor Type, Oil Seal and O Ring

Motor Type	Oil Seal Type	O Ring Type
UGHMED-06AA	SBX2-26428	AG65
UGHMED-12AA	SBX2-36507	AG80
UGHMED-20AA	SBX2-36507	AG80
UGHMED-30AA	SBX2-40608	AG85
UGHMED-03GG	SBX2-22388	AG55
UGHMED-06GG	SBX2-22388	AG55
UGHMED-12GG	SBX2-36507	AS80
UGHMED-20GG	SBX2-36507	AS80
UGHMED-30GG	SBX2-36507	AS80

BEARINGS

Hi-Cup Motor employs shielded ball bearings. Shielded ball bearings can not be lubricated. Therefore, it is necessary to replace the bearings with new ones packed with lithium base grease every approximately 20,000 operating hours. Contact the company.

MOUNTING OF AUXILIARY EQUIPMENT

Tapped holes for mounting auxiliary equipment are on the opposite-drive-end bracket. See Fig. 10. When mounting auxiliary equipment, remove the opposite-drive-end bracket cover to use tapped holes.

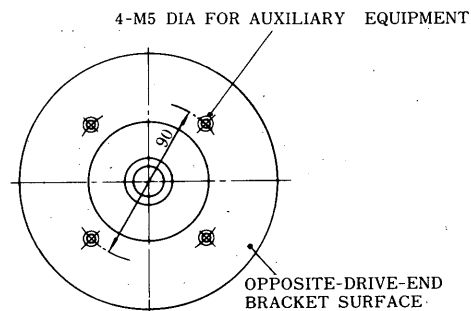


Fig. 10 Mounting Holes

TROUBLESHOOTING GUIDE

Table 6 Troubleshooting Guide for Hi-Cup Motor

Trouble	Cause	What to do
Motor does not start.	Voltage below rated.	Measure voltage and correct to rated value.
	Contactor 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 terminals A and B. When correct, inspect brushes or replace motor. When incorrect, check and repair controller.
	Controller defective.	Measure voltage across terminals A and B. When correct, inspect brushes or replace motor. When incorrect, check and repair controller.
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.	Disconnect motor from controller. If fuse is not blown, inspect brushes or replace motor. If blown, check wiring and controller.
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 terminals A and B, and 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 the company.

Remedies in 7272 should be practiced after turning off the power.



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