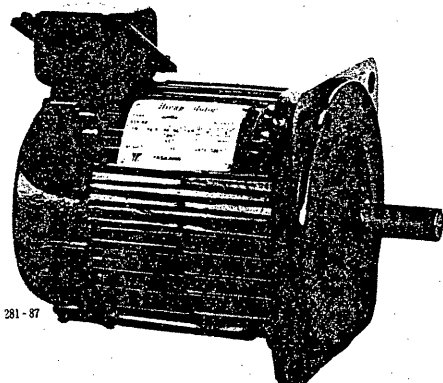


# Hi-Cup™ Motors

TOTALLY-ENCLOSED SELF/FAN-COOLED

0.25 - 6.0kW  
TYPE UGHMED- AA, - GG; UGHMFD- AA

The Hi-Cup Motor is a smooth core armature type DC Servomotor consisting of a unique hollow, cup-shaped armature and permanent magnets of salient magnetic pole construction. The motor is especially designed for direct servo drive at low running speeds (rated speed: 1000 rpm). To meet users' application needs, Hi-Cup Motor is available with two types of output shafts (straight and taper) and A series and G series options.



TYPE UGHMED-06AA2

## RATINGS AND SPECIFICATIONS

- Time Rating: - Continuous
- Insulation: Class F
- Enclosure: Type UGHMED-06AA to 44AA, -03GG to 30GG—  
Totally-enclosed self-cooled (corresponding to IP44)  
Type UGHMFD-60AA—  
Totally-enclosed fan-cooled (corresponding to IP44)
- Ambient Temperature: -10°C to +40°C
- Vibration: 15 μ or below
- Finish in Munsel Notation: N1.5 (7.5 BG4/1.5 for type UGHMED-44AA2)
- Excitation: Permanent magnet
- Mounting: Flange-mounted type
- Drive Method: Direct drive
- Accessory: Thermal overload relay type RH-35/□ HV

Table 1 Ratings and Specifications

Item	Motor Type	A Series						G Series				
		UGHMED -06AA2	UGHMED -12AA2	UGHMED -20AA2	UGHMED -30AA2	UGHMED -44AA2	UGHMFD -60AA2	UGHMED -03GG	UGHMED -06GG†	UGHMED -12GG2	UGHMED -20GG2	UGHMED -30GG2
Rated Output*	kW	0.5	1.2	2.0	3.0	4.4	6.0	0.25	0.51	1.2	1.8	2.88
Rated Torque*	kg.cm	58.4	117	195	292	428	584	24	50	117	175	280
Rated Speed*	rpm	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated Armature Voltage*	V	133	143	145	150	206	214	55	113	143	135	160
Rated Armature Current*	A	6.2	10.6	16.6	23.3	24.7	33.6	7.8	6.5	10.6	16.2	21.0
Power Rate*	kW/sec	4.49	9.81	12.5	16.6	15.5	28.8	2.72	7.27	9.81	12.6	20.6
Torque/Inertia*	rad/sec <sup>2</sup>	784	854	654	579	369	503	1159	1484	854	732	753
Acceleration Constant*	msec	133	122	159	180	284	208	90	70	122	143	139
Instantaneous Max. Torque*	kg.cm	292	584	975	1606	1498	1498	120	250	585	375	1400
Instantaneous Max. Armature Current*	A	30	53	82	128	86.5	86.5	38	32	53	80	105
Instantaneous Max. Speed*	rpm	2000	2000	2000	1800	1200	1200	2500	2000	2000	2000	1800
Armature Inertia (GD2/4)	kg.cm <sup>2</sup>	73	134	292	494	1138	1138	20.3	33	134	234	365
Armature Resistance	Ω	4.0	1.96	1.0	0.6	0.72	0.72	2.0	3.7	1.96	1.0	0.84
Armature Inductance	mH	5.6	4.2	3.8	2.9	4.4	4.4	1.0	3.9	4.2	3.0	2.9
Voltage Constant	mV/rpm	104	120	128	136	190	190	34.5	84	120	118	142
Torque Constant	kg.cm/A	10.1	11.7	12.5	13.2	18.5	18.5	3.36	8.17	11.7	11.5	13.8
Friction Torque	kg.cm	0.8	0.95	1.04	1.57	2.6	2.6	0.67	0.67	0.95	0.95	1.57
Viscous Damping Coefficient	g.cm/rpm	0.49	0.78	1.41	2.24	4.1	4.1	0.15	0.29	0.78	1.17	1.75
Inertia Time Constant	msec	29.7	20	19.6	17.6	25	25	37.5	19	20	18.5	16.7
Inductive Time Constant	msec	1.55	2.14	3.8	4.83	6.1	6.1	0.5	1.05	2.14	3.0	3.45

\* Values of asterisked ratings are the ones obtained at armature winding temperature of 100°C, and others at armature winding temperature of 20°C.

† Provided with a taper output shaft, the others a straight output shaft.

Notes:

1. Values of rated torque and armature current are obtained in the operation from DC power supply, such as battery, at ambient temperature 40°C and below.
2. Instantaneous values of max. torque and max. armature current mean the allowable conduction time at armature current shown in Fig. 2 Starting and Overload Characteristics.

# ELECTRIC CHARACTERISTICS

## TORQUE-SPEED CHARACTERISTICS

Torque-speed characteristics shown in Fig. 1 are based on armature voltage and armature current maintained constant at an armature winding temperature of 100°C. The motor torque and speed can be obtained by the following formulas.

$$T = K_T \times (I_a - I_{ot})$$

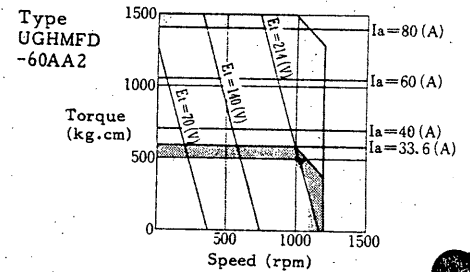
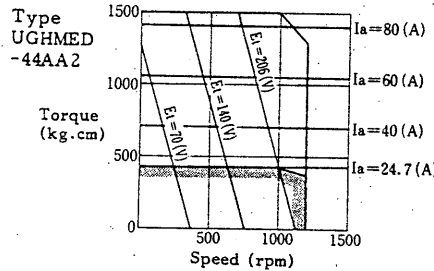
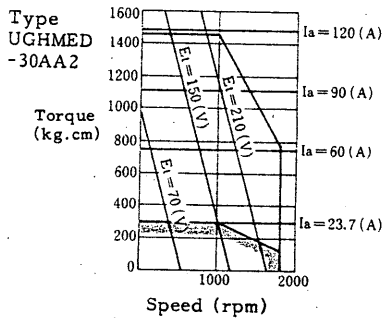
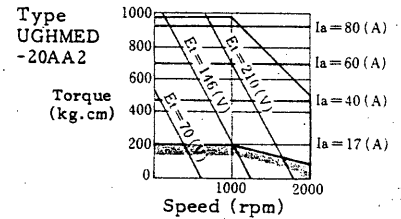
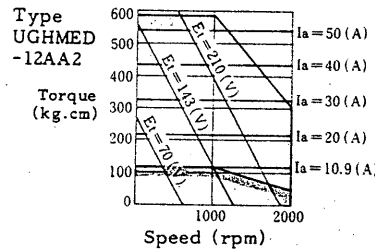
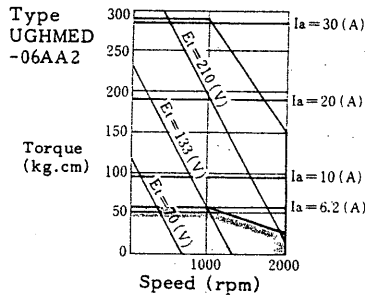
$$n = \frac{E_t - (R_{at} \cdot I_a + V_{Br})}{K_E} \times 103$$

$I_{ot}$  and  $R_{at}$  are calculated as follows.

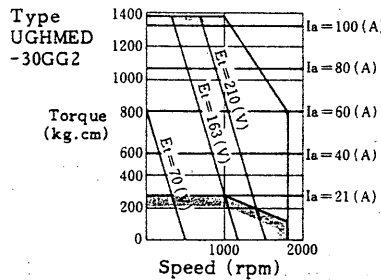
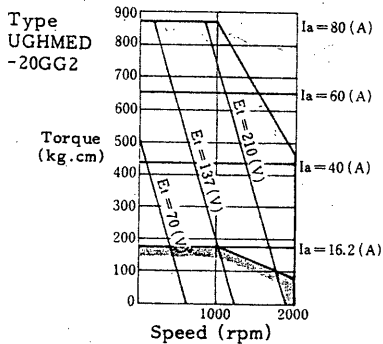
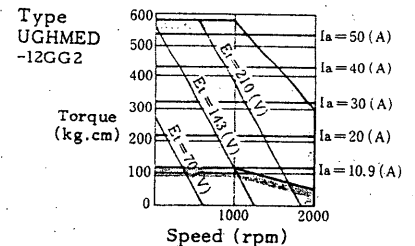
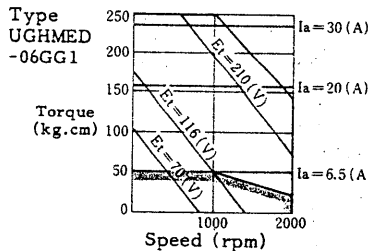
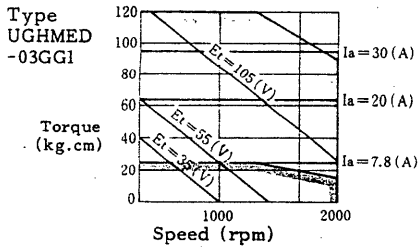
$$I_{ot} = \frac{T_f + F_d(20^\circ) \times 10^{-3} \times \frac{255}{(235 + t)} \times n}{K_T}$$

$$R_{at} = \frac{(235 + t)}{255} \times R_a(20^\circ)$$

### Hi-Cup Motor A Series



### Hi-Cup Motor G Series



- T: Torque (kg.cm)
- $K_T$ : Torque constant (kg.cm/A)
- $I_a$ : Armature current (A)
- $I_{ot}$ : No-load current (A) at  $t^\circ\text{C}$  of armature winding
- n: Speed (rpm)
- $E_t$ : Armature voltage (V)
- $R_{at}$ : Armature resistance at  $t^\circ\text{C}$  of armature winding
- $R_a$ : Armature resistance at  $20^\circ\text{C}$  of armature winding
- $V_{Br}$ : Brush drop voltage (V), approx. 1-2 V
- $K_E$ : Induced voltage constant (mV/rpm)
- $T_f$ : Friction torque (kg.cm)
- $F_d$ : Viscous damping coefficient (g.cm/rpm)
- t: Armature temperature ( $^\circ\text{C}$ )

Instantaneous rating range  
Continuous rating range

Fig. 1 Torque-Speed Characteristics

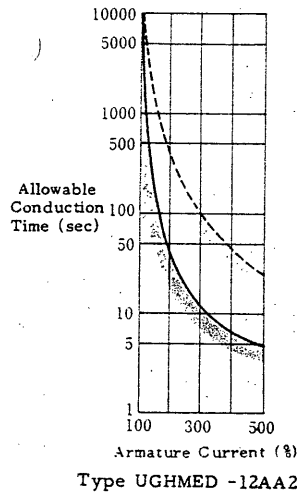
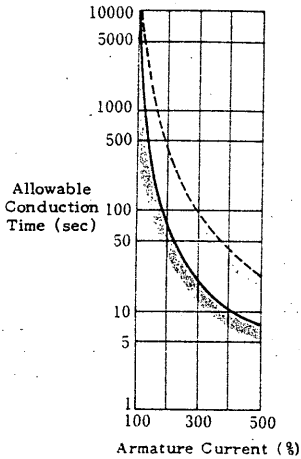
## STARTING AND OVERLOAD CHARACTERISTICS

Fig. 2 shows the allowable conduction time of armature current at starting and overload operation. This should be known before operation to avoid the damage to armature insulation due to overheat.

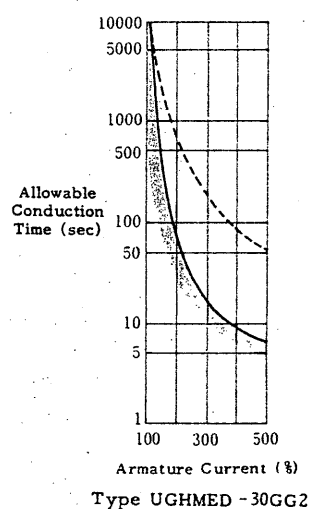
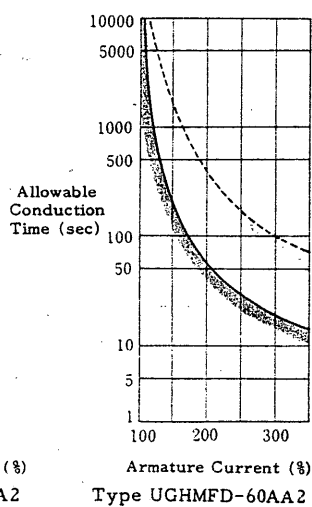
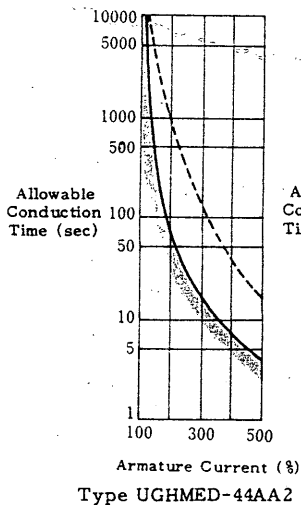
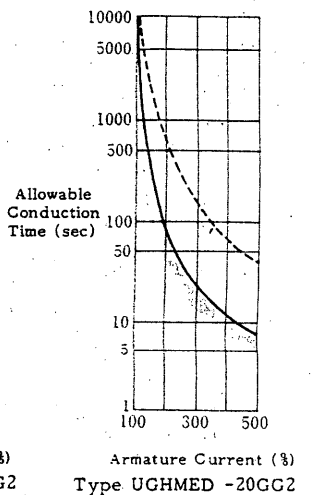
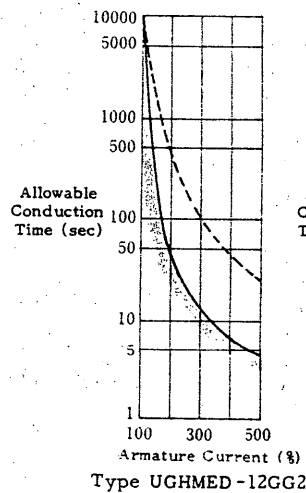
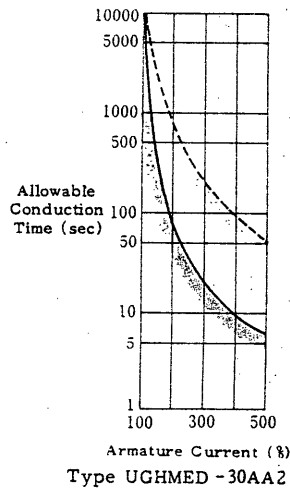
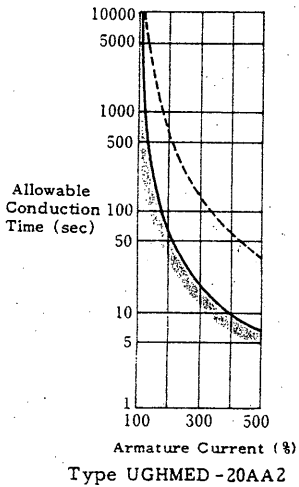
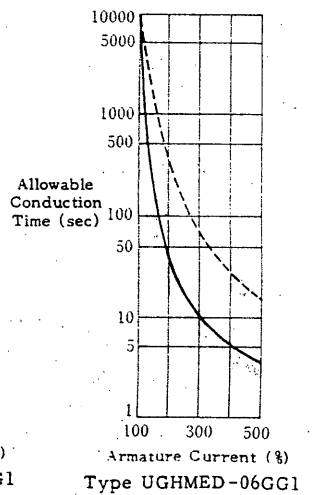
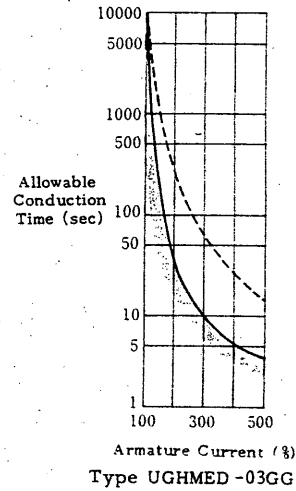
Cold-state curves are obtained at starting operation when armature temperature is equal to ambient temperature.

Hot-state curves are obtained when armature temperature is saturated at the rated operation.

### Hi-Cup Motor A Series



### Hi-Cup Motor G Series



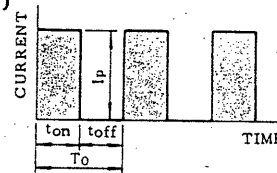
--- : Cold Condition  
 — : Hot Condition

Fig. 2 Starting and Overload Characteristics (Cold and Hot-State Curves)

# ELECTRIC CHARACTERISTICS (CONT'D)

## DUTY-CYCLE LOAD CHARACTERISTICS

As shown in Fig. 3, current conduction time ON TIME ( $t_{on}$ ) is limited at duty-cycle operation. Refer to the examples 1 and 2.

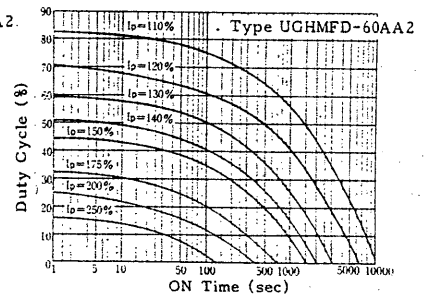
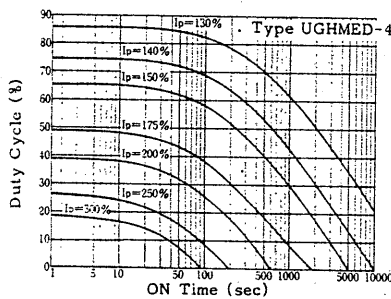
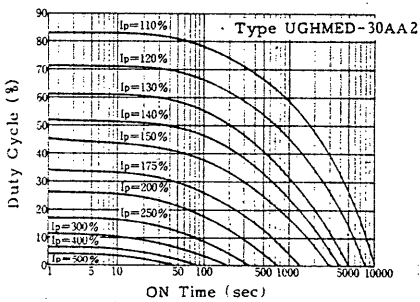
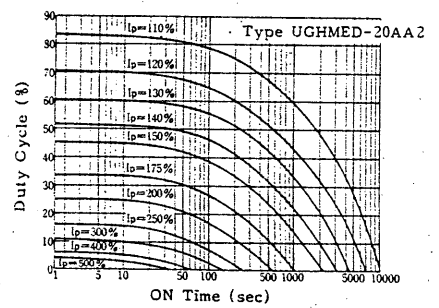
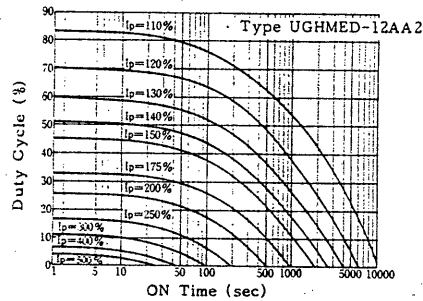
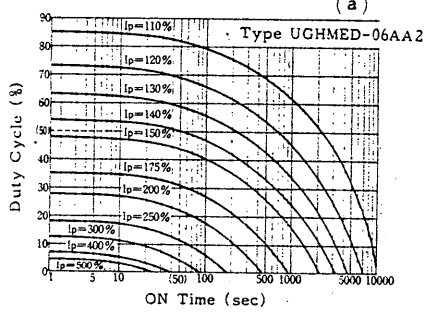


Duty cycle  $\alpha$   

$$= \frac{t_{on}}{T_o} \times 100(\%)$$
 Where  $I_p$ :  
 Peak load current ratio (%)  
 $t_{on}$ : ON TIME  
 $t_{off}$ : OFF TIME  
 $T_o$ : One cycle time

Fig. 3 Duty-cycle Operation with No Rated Load

### Hi-Cup Motor A Series



### Hi-Cup Motor G Series

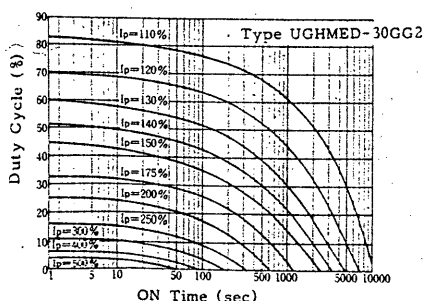
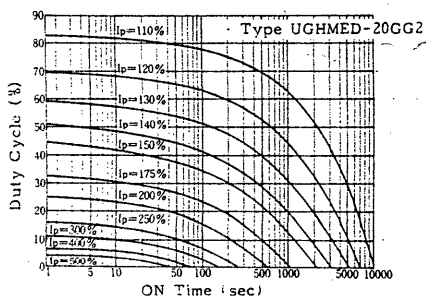
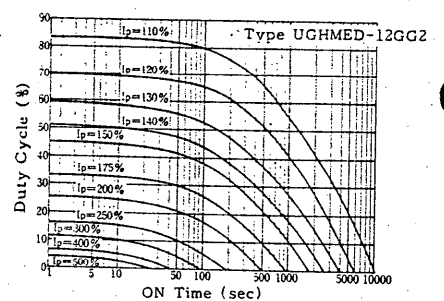
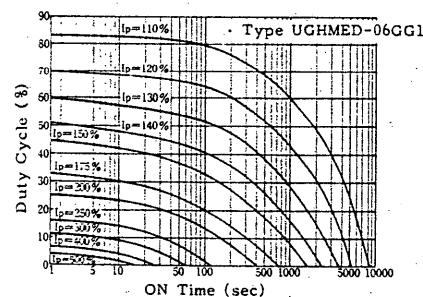
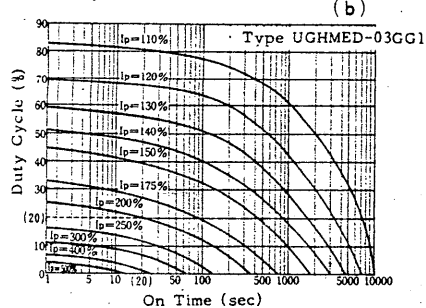


Fig. 4 Duty-cycle Load Characteristics

**Example 1**

Dotted line in Fig. 4 (a) shows that maximum ON TIME ( $t_{on}$ ) is 50 sec. when peak load current ratio ( $I_p$ ) is 140% and duty-cycle ( $\alpha$ ) is 50%.

**Example 2**

Dotted line in Fig. 4 (b) shows that duty cycle is 20% when ON TIME is 20 sec. and  $I_p$  is 200%. Consequently the required OFF TIME ( $t_{off}$ ) can be obtained from the equation below.

$$t_{off} = \left( \frac{100}{\alpha} - 1 \right) \times t_{on}$$

$$= \left( \frac{100}{20} - 1 \right) \times 20 = 80 \text{ sec.}$$

As explained above, when any two of three duty-cycle load characteristics elements (ON TIME, duty-cycle, peak load current ratio) are given, the other must be obtained from the graph. As for the value of  $I_p$ , the waveform factor should be always considered.

Fig. 5 shows duty-cycle load characteristics under the peak load and the load for 20 to 80% of rated torque. If this type of the duty-cycle operation is used, contact the company.

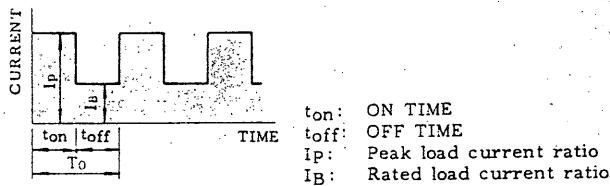


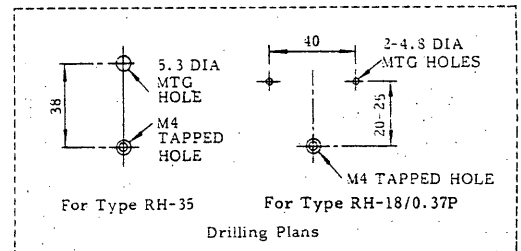
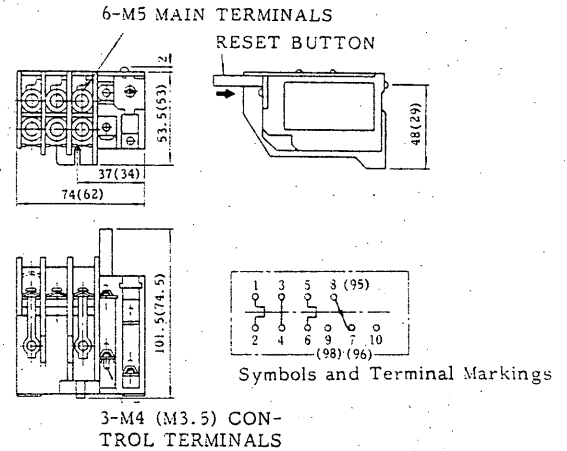
Fig. 5 Duty-cycle Operation with Rated Load

**OVERLOAD PROTECTION**

It is recommended that the motor be provided with Yaskawa thermal overload relay type RH-35 for overload protection. Refer to Table 2, Figs. 6 and 7. For Hi-Cup motor with a cooling fan, thermal overload relay type RH-18/0.37P (nominal current 0.37A) is required for a fan motor.

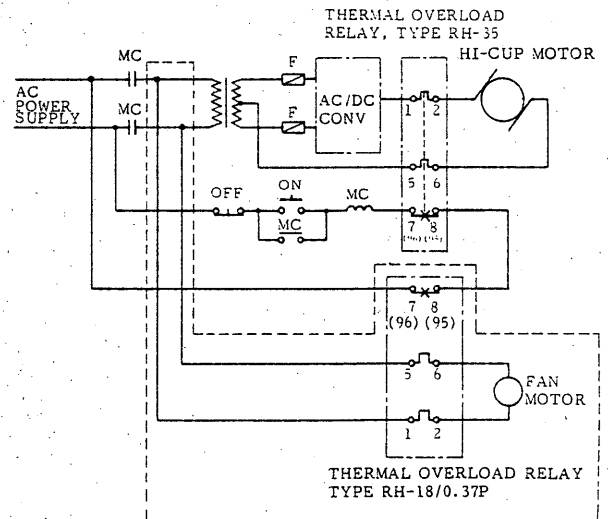
Table 2 Selection of Thermal Overload Relay for Hi-Cup Motor

Motor Type	Thermal Overload Relay Type	Nominal Current (A)	
A Series	UGHMED-06 AA2	RH-35/6.2HV	6.2
	UGHMED-12 AA2	RH-35/10.5HV	10.5
	UGHMED-20 AA2	RH-35/17HV	17
	UGHMED-30 AA2	RH-35/23.5HV	23.5
	UGHMED-44 AA2	RH-35/24.5HV	24.5
	UGHMFD-60 AA2 (with a cooling fan)	RH-35/33HV RH-18/0.37P	33 0.37
G Series	UGHMED-03 GG1	RH-35/7.3HV	7.8
	UGHMED-06 GG1	RH-35/6.2HV	6.2
	UGHMED-12 GG2	RH-35/10.5HV	10.5
	UGHMED-20 GG2	RH-35/16HV	16
	UGHMED-30 GG2	RH-35/21HV	21



Note: Dimensions and terminal markings in parentheses are for type RH-18/0.37P

Fig. 6 Dimensions of Thermal Overload Relays Type RH-35 and RH-18/0.37P



Note: Hi-Cup motor with a cooling fan (6.0 kW) requires wiring in dashed lines.

Fig. 7 Connection Diagram of Thermal Overload Relays, Type RH-35 and RH-18/0.37P

# MECHANICAL CHARACTERISTICS

## BEARINGS AND ALLOWABLE LOAD

Table 3 shows bearing types and allowable load according to the motor.

Table 3 Bearings and Allowable Load

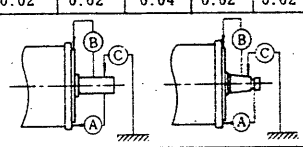
Motor Type	Bearing No.		Allowable Thrust Load (kg)	Allowable Equivalent Radial Load (kg)
	Drive End	Opp. Drive End		
A Series	UGHMED-06 AA 2	6206 ZZ 6204 ZZ	65	140
	UGHMED-12 AA 2	6208 ZZ 6204 ZZ	85	210
	UGHMED-20 AA 2	6208 ZZ 6204 ZZ	85	210
	UGHMED-30 AA 2	6209 ZZ 6206 ZZ	85	240
	UGHMED-44 AA 2	6210 ZZ 6206 ZZ	85	250
	UGHMFD-60 AA 2	6210 ZZ 6206 ZZ	85	250
G Series	UGHMED-03 GG 1	6205 ZZ 6003 ZZ	50	100
	UGHMED-06 GG 1	6205 ZZ 6003 ZZ	35	110
	UGHMED-12 GG 2	6208 ZZ 6204 ZZ	85	210
	UGHMED-20 GG 2	6208 ZZ 6204 ZZ	85	210
	UGHMED-30 GG 2	6208 ZZ 6206 ZZ	65	210

Notes:

1. Bearings are packed with lithium base grease for high temperature use.
2. Allowable thrust load is obtained from operation of the motor at rated speed and rated torque.
3. Allowable equivalent radial load is maximum radial load insuring the specified bearing life during continuous operation at rated speed.

## MECHANICAL SPECIFICATION

Table 4 Mechanical Specifications

Motor Type UGHMED-	Accuracy (mm)				
	A Series			G Series	
	06AA2 12AA2	20AA2 30AA2	44AA2 60AA2	03GG1 06GG1	12GG2 20GG2 30GG2
Flange surface perpendicular to shaft	0.04	0.045	0.06	0.04	0.045
Flange diameter concentric to shaft	0.02	0.022	0.03	0.02	0.02
Shaft run out	0.02	0.02	0.04	0.02	0.02
Reference diagram					

## COMMUTATOR BRUSH

Table 5 shows commutator brush according to motor type. Commutator brush life depends on type of service. In general, the brush wears approximately 0.5 to 1 mm per 1000 operation hours.

Compared with other DC motors, Hi-Cup Motor features better commutating ability and requires less maintenance. However, in adverse environmental conditions—high humidity, existence of reducing gas like ammonia, oxidizing gas like chlorine gas and surfurous acid gas—commutation sparks become a little larger. Vibration due to misalignment will also result in commutation failure.

Table 5 Application of Commutator Brush

Hi-Cup Motor Type	Brush Size (mm)	Qty	Remarks
A Series	UGHMED-06 AA 2	6 X 12.5 X 22	4
	UGHMED-12 AA 2	6 X 12.5 X 22	4
	UGHMED-20 AA 2	6 X 12.5 X 22	4
	UGHMED-30 AA 2	6 X 12.5 X 22	6
	UGHMED-44 AA 2	8 X 12.5 X 22	6
	UGHMFD-60 AA 2	8 X 12.5 X 22	6
G Series	UGHMED-03 GG 1	6 X 12.5 X 22	4
	UGHMED-06 GG 1	6 X 12.5 X 22	4
	UGHMED-12 GG 2	6 X 12.5 X 22	4
	UGHMED-20 GG 2	6 X 12.5 X 22	4
	UGHMED-30 GG 2	6 X 12.5 X 22	6

Length limit of brush: 6 mm  
(Initial length: 22 mm)

## INSTALLATION

### LOCATION

Use the motor under the following conditions.

- Indoors
- Ambient temperature -10 to +40°C
- Clean and dry
- Accessible for inspection and cleaning

### (ADVICE ON LOCATION)

Where a standard Hi-Cup motor is used in a place where water and oil drops prevail, provide a cover with the motor to protect from the liquids. Oil or water on a commutator affects good commutation.

The motor with an oil seal and an O ring is also available on request. See Table 6 and Fig. 8.

Keep in mind that the motor cannot be operated in the locations where corrosive liquids like chemicals and brine, flammable gases or corrosive gases such as chlorine gas, hydrogen gas, and oxygen gas, inert gas prevail.

Table 6 Hi-Cup Motor Type, Oil Seal and O Ring

Hi-Cup Motor Type	Oil Seal Type	O Ring Type
A Series	UGHMED-06 AA 2	SBX 2-26428 AG 55
	UGHMED-12 AA 2	SBX 2-36507 AG 65
	UGHMED-20 AA 2	SBX 2-36507 AG 80
	UGHMED-30 AA 2	SBX 2-40608 AG 85
	UGHMED-44 AA 2	SBX 2-45609 AG 90
	UGHMFD-60 AA 2	SBX 2-45609 AG 90
G Series	UGHMED-03 GG 1	SBX 2-22388 AG 55
	UGHMED-06 GG 1	SBX 2-22388 AG 55
	UGHMED-12 GG 2	SBX 2-36507 S 80
	UGHMED-20 GG 2	SBX 2-36507 S 80
	UGHMED-30 GG 2	SBX 2-36507 S 80

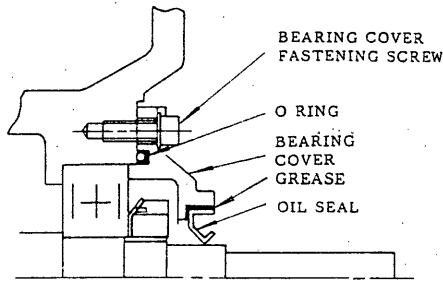


Fig. 8 Construction of Bearing Section with Oil Seal and O Ring

### COEFFICIENT DEPENDING ON AMBIENT TEMPERATURE

When an ambient temperature is 40°C and over, operate the motor at less than a rated output. The output can be obtained by the following formula.

$$\text{Rated Output} \times \text{Coefficient depending on Ambient Temperature}$$

$$= \text{Output to be Used}$$

Ambient Temperature	Coefficient
50°C	0.9
60°C	0.8
70°C	0.7

## HI-CUP MOTORS WITH TACHOMETERS AND MAGNETIC BRAKES

Hi-Cup motors form an ideal combination with a DC tachometer for speed control, an optical tachometer for position control, or a magnetic brake.

Table 7 shows a combination of Hi-Cup motors, tachometers and magnetic brakes.

Table 7 Combination of Hi-Cup Motors, Tachometers and Magnetic Brakes

Hi-Cup Motor Type	Magnetic Brake Type	Detectors		
		DC Tachometer Generator Type	Feedback Unit Type	Optical Tachometer Type
A Series	UGHMED-06AA2	UGTGIM-7LVH	TFUE-02 □ C7	UTOPE-02 □ CL
	UGHMED-12AA2		TFUE-03 □ C7	UTOPE-03 □ CL
	UGHMED-20AA2		TFUE-30 □ C7	UTOPE-30 □ CL
	UGHMED-30AA2		TFUE-04 □ C7	UTOPE-04 □ CL
	UGHMED-44AA2		TFUE-40 □ C7	UTOPE-40 □ CL
	UGHMFD-60AA2		TFUE-05 □ C7	UTOPE-05 □ CL
G Series	UGHMED-03GG1	UGTGIM-7LVH	TFUE-07 □ C7	UTOPE-07 □ CL
	UGHMED-06GG1		TFUE-08 □ C7	UTOPE-08 □ CL
	UGHMED-12GG2		TFUE-10 □ C7	UTOPE-10 □ CL
	UGHMED-20GG2		TFUE-15 □ C7	UTOPE-15 □ CL
	UGHMED-30GG2		TFUE-18 □ C7	UTOPE-18 □ CL
	UGHMED-30GG2		TFUE-20 □ C7	UTOPE-20 □ CL
	UGHMED-30GG2		TFUE-25 □ C7	UTOPE-25 □ CL
	UGHMED-30GG2		TFUE-30 □ C7	UTOPE-30 □ CL

Note: Controllers for magnetic brakes are also available on request. See Fig. 9.

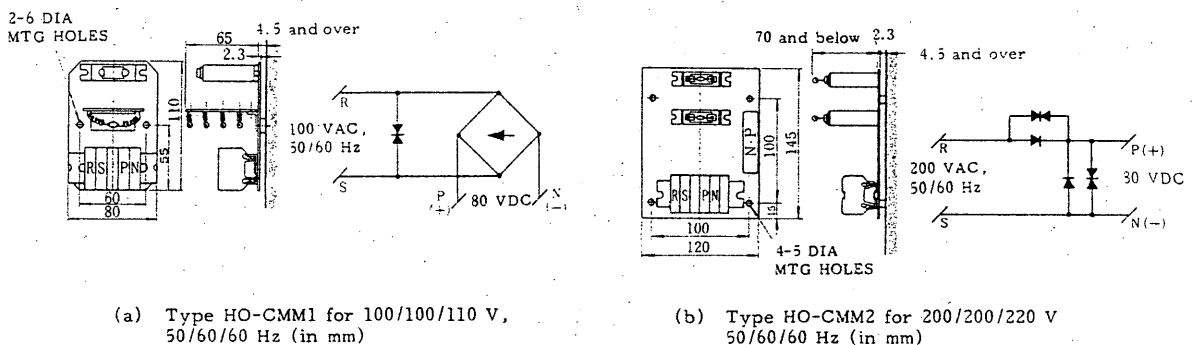
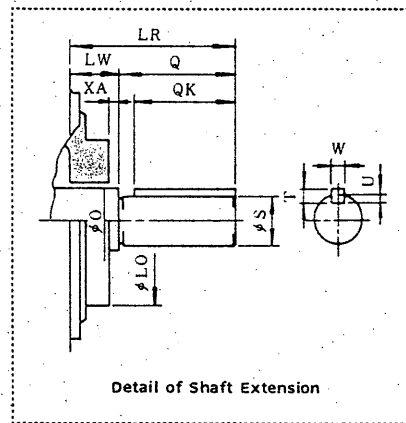
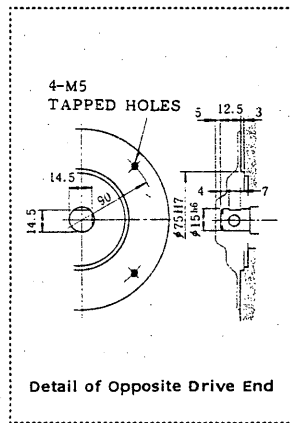
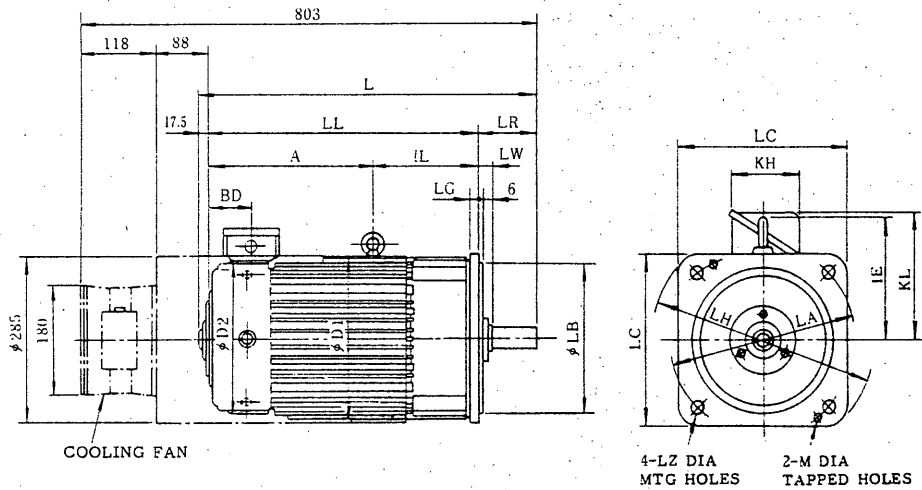


Fig. 9 Controllers for Magnetic Brakes

# DIMENSIONS in mm

## HI-CUP MOTOR A SERIES



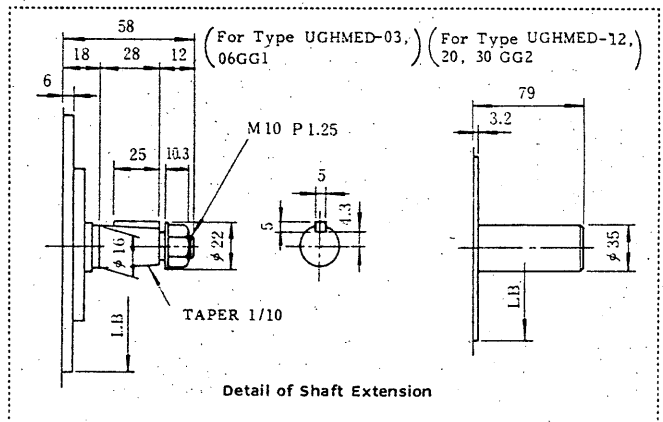
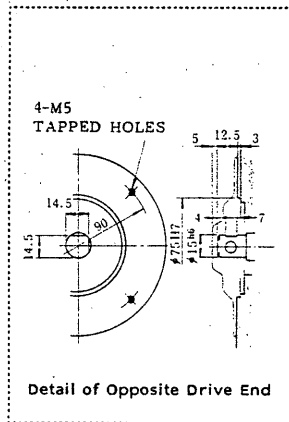
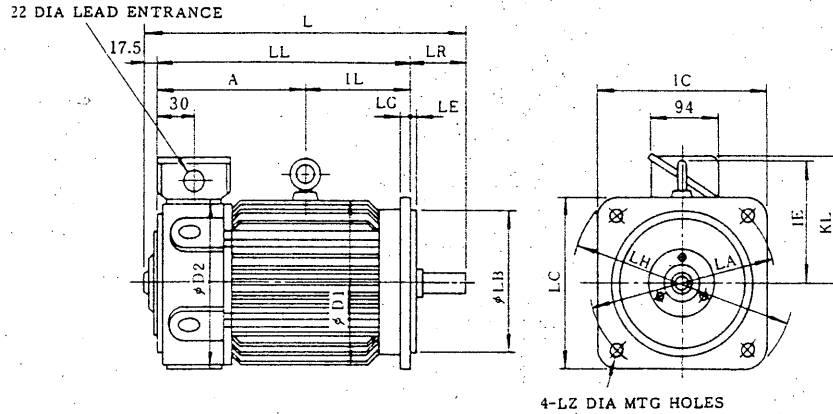
Motor Type	A	BD	D1	D2	IE	IL	KH	KL	L	LL	Flange							
											LA	LB	LC	LG	LW	LZ	M	LH
UGHMED-06 AA 2 *	—	30	173	180	—	—	94	132	295.5	208	215	180 <sup>0</sup> <sub>-0.040</sub>	190	13	20	14	12	250
UGHMED-12 AA 2	149	30	187	194	130	100	94	137	336.5	249	215	180 <sup>0</sup> <sub>-0.040</sub>	190	13	20	14	12	250
UGHMED-20 AA 2	177	30	199	208	137	131	94	141	405.5	308	235	200 <sup>0</sup> <sub>-0.046</sub>	210	15	18	14	12	270
UGHMED-30 AA 2	212	30	208	214	141	172	94	163	481.5	384	265	230 <sup>0</sup> <sub>-0.046</sub>	240	15	18	14	12	300
UGHMED-44 AA 2	295	79	275	268	175	192	94	176	614.5	487	300	250 <sup>0</sup> <sub>-0.046</sub>	280	20	20	18	16	342
UGHMFD-60 AA 2	295	79	275	268	175	192	94	176	803	487	300	250 <sup>0</sup> <sub>-0.046</sub>	280	20	20	18	16	342

Motor Type	Shaft Extension					Key					Approx. Weight (kg)
	LO	O	Q	S	LR	XA	W	T	QK	U	
UGHMED-06 AA 2 *	50	26	50	22 <sup>0</sup> <sub>-0.013</sub>	70	8	7	7	45	4	21
UGHMED-12 AA 2	65	36	50	22 <sup>0</sup> <sub>-0.013</sub>	70	5.5	7	7	45	4	27
UGHMED-20 AA 2	65	36	62	35 <sup>0</sup> <sub>-0.016</sub>	80	3.5	8	8	45	4.5	38
UGHMED-30 AA 2	70	40	62	35 <sup>0</sup> <sub>-0.016</sub>	80	4	10	8	45	4.5	56
UGHMED-44 AA 2	70	45	90	42 <sup>0</sup> <sub>-0.016</sub>	110	5	10	9	60	4.5	99
UGHMFD-60 AA 2	70	45	90	42 <sup>0</sup> <sub>-0.016</sub>	110	5	10	8	60	4.5	113

\* Not provided with an eyebolt.



# HI-CUP MOTOR G SERIES



Motor Type	A	D1	D2	IE	IL	KI	L	LL	Flange						Approx. Weight (kg)	
									LA	LB	LC	LE	LG	LZ		LH
UGHMED-03 GG1 *	—	153	166	—	—	125	254.5	179	145	110 <sup>0</sup> <sub>-0.035</sub>	132	6	12	9	165	12
UGHMED-06 GG1 *	—	153	166	—	—	125	295.5	220	145	110 <sup>0</sup> <sub>-0.035</sub>	132	6	12	9	165	15
UGHMED-12 GG2	149	187	194	130	104	137	349.5	253	200	114.3 <sup>0</sup> <sub>-0.025</sub>	175	3.2	18	13.5	230	27
UGHMED-20 GG2	185	187	194	132	138	137	419.5	323	200	114.3 <sup>0</sup> <sub>-0.025</sub>	180	3.2	18	13.5	230	35
UGHMED-30 GG2	226	194	204	134	183	161	505.5	409	200	114.3 <sup>0</sup> <sub>-0.025</sub>	180	3.2	18	13.5	230	47

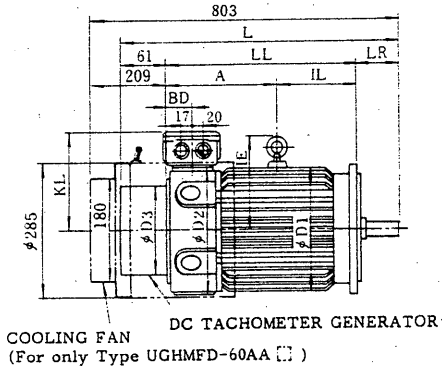
\* Not provided with an eyebolt.

UGHMED-37GG20F IS SAME SIZE AS 30GG2 BUT ALSO HAS FAN IN BACK THUS MAKING IT ONLY LONGER.

# DIMENSIONS in mm (CONT'D)

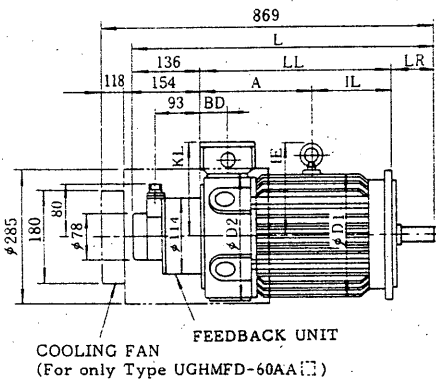
## HI-CUP MOTOR WITH AUXILIARY EQUIPMENT

### Hi-Cup Motor with DC Tachometer Generator



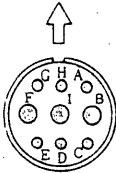
Motor Type	A	BD	D1	D2	D3	IE	IL	KL	L	LL	LR	Approx. Weight (kg)
UGHMED-06AA2O6	—	27	173	180	152	—	—	144	336	205	70	24
UGHMED-12AA2O6	146	27	187	194	152	130	100	149	377	246	70	30
UGHMED-20AA2O6	174	27	199	208	152	137	131	153	446	305	80	41
UGHMED-30AA2O6	209	27	208	214	152	141	172	175	522	381	80	59
UGHMED-44AA2O6	292	76	275	268	152	175	192	176	655	484	110	102
UGHMFD-60AA2O6	292	76	275	268	152	175	192	176	655	484	110	116
UGHMED-03GG1O6	—	27	153	166	120	—	—	137	295	176	58	15
UGHMED-06GG1O6	—	27	153	166	120	—	—	137	336	217	58	18
UGHMED-12GG2O6	146	27	187	194	152	130	104	149	390	250	79	30
UGHMED-20GG2O6	182	27	187	194	152	132	138	149	460	320	79	38
UGHMED-30GG2O6	223	27	194	204	152	134	183	173	546	406	79	50

### Hi-Cup Motor with Feedback Unit



Motor Type	A	BD	D1	D2	IE	IL	KL	L	LL	LR	Approx. Weight (kg)
UGHMED-06AA2OF	—	30	173	180	—	—	132	414	208	70	24
UGHMED-12AA2OF	149	30	187	194	130	100	137	455	249	70	30
UGHMED-20AA2OF	177	30	199	208	137	131	141	524	308	80	41
UGHMED-30AA2OF	212	30	208	214	141	173	163	600	384	80	59
UGHMED-44AA2OF	295	79	275	268	175	192	176	733	487	110	102
UGHMFD-60AA2OF	295	79	275	268	175	192	176	733	487	110	116
UGHMED-03GG1OF	—	30	153	166	—	—	125	373	179	58	15
UGHMED-06GG1OF	—	30	153	166	—	—	125	414	220	58	18
UGHMED-12GG2OF	149	30	187	194	130	104	137	468	253	79	30
UGHMED-20GG2OF	185	30	187	194	132	138	137	538	323	79	38
UGHMED-30GG2OF	226	30	194	204	134	183	161	624	409	79	50

Opposite Drive End



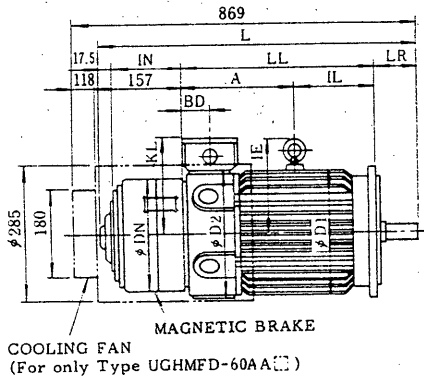
Terminals

- A: Channel A Output
- B: Channel B Output
- C: Origin Pulse Output
- D: Common
- E: +12 VDC Input
- F: Ground

- G: Tach-Gen Output ⊕
- H: Tach-Gen Input ⊖
- I: Spare

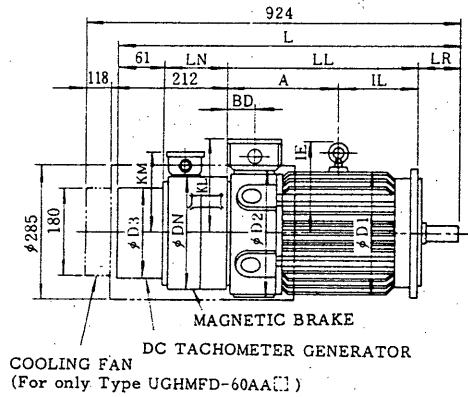
Feedback Unit Terminals

### Hi-Cup Motor with Magnetic Brake



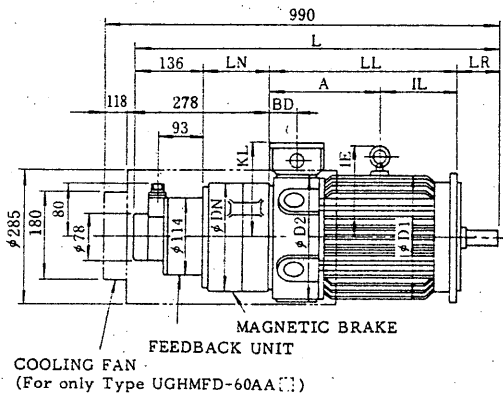
Motor Type	A	BD	D1	D2	DN	IE	IL	KL	L	LL	LN	LR	Approx. Weight (kg)
UGHMED-06AA2O8	—	27	173	180	152	—	—	132	393.5	205	101	70	30
UGHMED-12AA2O8	146	27	187	194	178	130	100	137	441.5	246	108	70	40
UGHMED-20AA2O8	174	27	199	208	178	137	131	141	510.5	305	108	80	51
UGHMED-30AA2O8	209	27	208	214	202	141	172	163	602.5	381	124	80	74
UGHMED-44AA2O8	292	76	275	268	202	175	192	176	735.5	484	124	110	117
UGHMFD-60AA2O8	292	76	275	268	202	175	192	176	735.5	484	124	110	131
UGHMED-03GG1O8	—	27	153	166	152	—	—	125	352.5	176	101	58	18
UGHMED-06GG1O8	—	27	153	166	152	—	—	125	393.5	217	101	58	24
UGHMED-12GG2O8	146	27	187	194	178	130	104	137	454.5	250	108	79	40
UGHMED-20GG2O8	182	27	187	194	178	132	138	137	524.5	320	108	79	48
UGHMED-30GG2O8	223	27	194	204	202	134	183	161	626.5	406	124	79	65

### Hi-Cup Motor with Magnetic Brake and DC Tachometer Generator



Motor Type	A	BD	D1	D2	D3	DN	IE	IL	KL	KM	L	LL	LN	LR	Approx. Weight (kg)
UGHMED-06AA2OW	—	27	173	180	152	152	—	—	132	120	434	205	98	70	33
UGHMED-12AA2OW	146	27	187	194	152	178	130	100	137	133	482	246	105	70	43
UGHMED-20AA2OW	174	27	199	208	152	178	137	131	141	133	551	305	105	80	54
UGHMED-30AA2OW	209	27	208	214	152	202	141	172	163	145	643	381	121	80	77
UGHMED-44AA2OW	292	76	275	268	152	202	175	192	176	145	776	484	121	110	120
UGHMFD-60AA2OW	292	76	275	268	152	202	175	192	176	145	776	484	121	110	134
UGHMED-03GG1OW	—	27	153	166	152	152	—	—	125	120	393	176	98	58	21
UGHMED-06GG1OW	—	27	153	166	152	152	—	—	125	120	434	217	98	58	27
UGHMED-12GG1OW	146	27	187	194	152	178	130	104	137	133	495	250	105	79	43
UGHMED-20GG1OW	182	27	187	194	152	178	132	138	137	133	565	320	105	79	51
UGHMED-30GG1OW	223	27	194	204	152	202	134	183	161	145	667	406	121	79	68

### Hi-Cup Motor with Magnetic Brake and Feedback Unit



Motor Type	A	BD	D1	D2	DN	IE	IL	KL	L	LL	LN	LR	Approx. Weight (kg)
UGHMED-06AA2OZ	—	27	173	180	152	—	—	132	512	205	101	70	33
UGHMED-12AA2OZ	146	27	187	194	178	130	100	137	560	246	108	70	43
UGHMED-20AA2OZ	174	27	199	208	178	137	131	141	629	305	108	80	54
UGHMED-30AA2OZ	209	27	208	214	202	141	172	163	721	381	124	80	77
UGHMED-44AA2OZ	292	76	275	268	202	175	192	176	854	484	124	110	120
UGHMFD-60AA2OZ	292	76	275	268	202	175	192	176	854	484	124	110	134
UGHMED-03GG1OZ	—	27	153	166	152	—	—	125	447	176	101	58	21
UGHMED-06GG1OZ	—	27	153	166	152	—	—	125	512	217	101	58	27
UGHMED-12GG2OZ	146	27	187	194	178	130	104	137	573	250	108	79	43
UGHMED-20GG2OZ	182	27	187	194	178	132	138	137	643	320	108	79	51
UGHMED-30GG2OZ	223	27	194	204	202	134	183	161	745	406	124	79	68