GEAR MOTOR
TA and TE Series
CB GEAR MOTOR

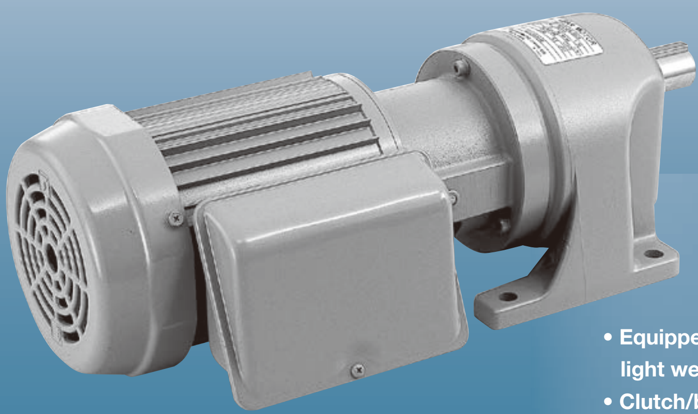
0.1 kW to 2.2 kW

CONTENTS

GEAR MOTOR TA and TE Series
CB GEAR MOTOR Features

Gear Motor TA/TE Series and CB Gear Motor Features

Clutch/brake equipped



0.75 kW to 2.2 kW
Compatible with highly efficient Top Runner motors
Premium efficiency: IE3 class

Ideal for high-frequency operation.
Higher grade than previous models.

- Equipped with TA and TE Series reducer for compactness, light weight, and low noise
- Clutch/brake-equipped model boasts superb usability and long life

1 Compact

Direct connection of the clutch/brake between the motor and reducer achieves a more compact gear motor, meaning less mounting space is needed. Compared to installing a combination of units, mounting and centering time is dramatically shortened.

2 Balance

An optimal balance of torque between clutch and brake matches the motor capacity and load conditions. And reliable movement of the clutch/brake and reducer contribute to greater durability.

3 Higher grade

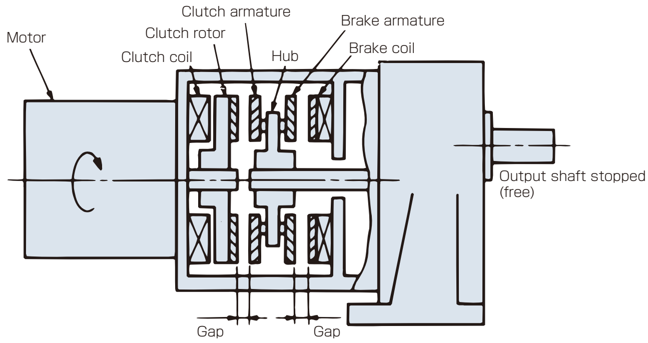
The clutch/brake's unique design and efficient housing structure ensure frictional heat is dispersed rapidly to outside. This makes possible high-frequency starting and stopping. By combining it with the TA Series reducer, which is known for its low noise and durability, users get high reliability. And an extensive lineup —0.1 kW to 2.2 kW and reduction ratios from 1/5 to 1/200—means that users can choose the exact model that matches their machinery's needs.

4 Easy maintenance

The clutch/brake adjusts automatically thanks to the automatic gap device. This means that movement remains precise even after long hours of operation, and it eliminates the need for gap adjustment, even when the friction plate is worn. The reducer uses the grease encapsulating method, which means long periods of use without replacement.

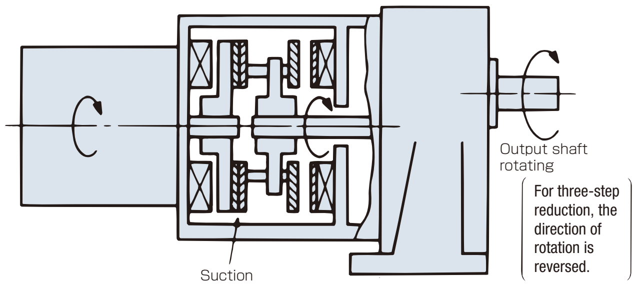
Operating Principle

1. Stopping



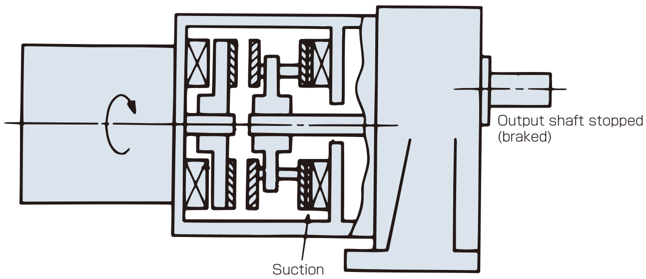
Motor: ON or OFF
Clutch: OFF
Brake: OFF

2. Clutching



Motor: ON
Clutch: ON
Brake: OFF

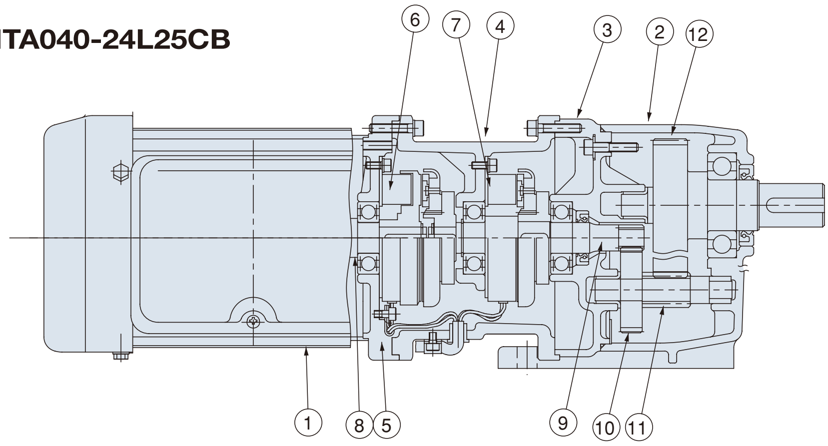
3. Braking



Motor: ON
Clutch: OFF
Brake: ON

Structure

GMTA040-24L25CB



1 . Motor
2 . L case
3 . M bracket
4 . Housing
5 . Motor flange
6 . Clutch
7 . Brake
8 . Motor shaft
9 . Pinion with input shaft
10. 1st stage wheel
11. Pinion with 2nd shaft
12. Wheel with output shaft

Nomenclature

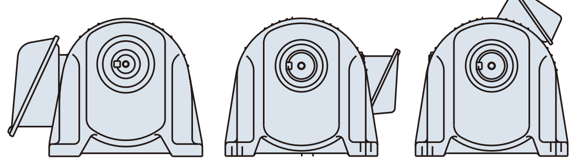
GMTA010-28L200CB□□□□

① GMTA ② 010 - ③ 28 ④ L ⑤ 200 ⑥ CB ⑦ □□ ⑧ □□

① Product series name	GMTA	Motorized type
	GMTE	Top Runner motor type
② Motor capacity (example)	010	Three-phase 0.1 kW
③ Frame number (example)	28	Frame number 28 (Note 1)
④ Mounting type	L	Foot mount
	U	Face mount
	F	Flange mount
⑤ Reduction ratio (example)	200	1/200
⑥ Specification code	CB	Clutch/brake type
⑦ Option code (Order of priority)	1. Z	Inverter motor type (0.1 kW–0.4 kW only)
	2. V	400V class
	3. V2	380V 60Hz
	4. V3	415V 50Hz
	5. V4	460V 60Hz
⑧ Option code B Former supplementary code	P2	Terminal box position 180° swing (0.1 kW–0.4 kW)
	P5	Terminal box position 120° swing (0.75 kW–2.2 kW)
	C0	Paint color: Light gray (Munsell N7.5)
	C1	Paint color: Light silver metallic
	C2	Paint color: Ivory white
	C3	Paint color: Dark silver metallic

Note 1: Refer to the specification chart and outline dimension diagram for the frame number.

Terminal Box Position Codes



Note: On the 0.75 kW, 1/5–1/25 foot mount types, the motor protrudes from the mounting surface in the P5 position.

Model Lineup

Foot mount type

	5	10	15	20	25	30	40	50	60	75	100	120	165	200
0.1kW	18L					24L					28L			
0.2kW	18L					24L					28L			
0.4kW	24L					28L					38L			
0.75kW	28L					38L					42L			
1.5kW	42L						50L				63L			
2.2kW	42L						50L				63L			

Face mount type, flange mount type

	5	10	15	20	25	30	40	50	60	75	100	120	165	200
0.1kW	18U					24U					28U			
0.2kW	18U					24U					28U			
0.4kW	24U					28U					38U			
0.75kW	28U					38U					42F			
1.5kW	42U						50F				63F			
2.2kW	42F						50F				63F			

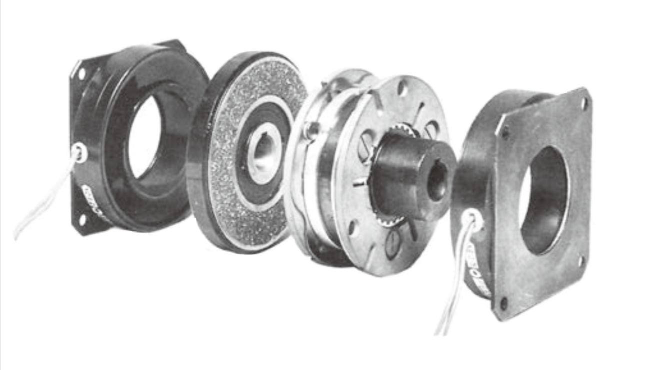
Specifications

Motor	Output	Three-phase: 0.1, 0.2, 0.4, 0.75, 1.5, 2.2 kW
	Power supply	200/200/220 V 50/60/60 Hz
	Number of poles	4
	Protection	0.1 kW: Totally enclosed type (IP44), 0.2 kW–2.2 kW: Totally enclosed external fan type (IP44)
	Cooling	0.1 kW: Self-cooled type (IC410), 0.2 kW–2.2 kW: Self-managed type (IC411)
	Startup	–
	Rating	S1 (Continuous)
	Insulation	0.1 kW–0.4 kW: 120(E), 0.75 kW–2.2 kW: 155(F)
Reducer	Reduction ratio	1/5 to 1/200
	Reduction method	Circumscribed gear method (helical gear/spur gear)
	Lubrication	Grease
	Start end keyway	New JIS key (JIS B1301-1976): Output shaft key attached
	Output shaft end	Tapped
Ambient conditions	Installation place	Indoor not exposed to dust or water
	Temperature	0℃ to 40℃
	Humidity	Less than 85% (non condensing)
	Altitude	Elevations below 1000 m
	Atmosphere	Free from corrosive gases, explosive gases, and steam
	Mounting direction	No limitations on mounting angles: horizontal, vertical, or inclined
Paint color		Munsell 2.5G 6/3

Note: The protective construction for CB gear motor is IP12.

Clutch/Brake Specifications

Type	Dry single-plate friction
Actuation method	Excitation
Rated voltage	DC 24 V
Insulation	130(B)
Protection	Open
Gap adjustment	Automatic gap control system
Lining	No asbestos



Power Supply Box

The following power supply boxes and control unit for the clutch/brake are available. Make the selection according to your operating conditions. The control unit is of the non-contact type, making it suitable for high frequency on-off switching.

Power Supply Box List

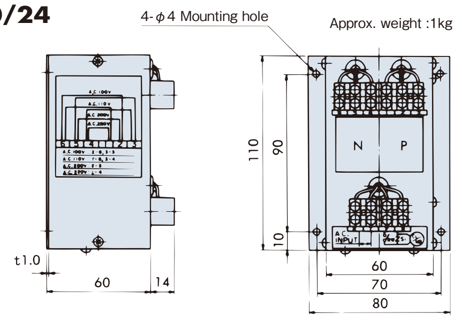
Model	Model number	Capacity W	Recommended CB gear motor	Varistor for discharge circuit	Function	Specifications
DMP type power supply box	DMP-10/24	10	GMTA010 GMTA100 GMTA020 GMTA200 GMTA040	Z15D151	Rectifying only	 Input voltage: 100/100/110 V AC, 200/200/220 V AC Output voltage: 24 V DC Rating: Continuous Paint color: Munsell 7.5BG 6/1.5
	DMP-20/24A	20	GMTE075 GMTE150 GMTE220	Z15D151		
TMP type control unit	TMP-40D	40	All models	Unnecessary	Rectifying and brake torque adjusting	

(The varistor accompanies the CB gear motor.)

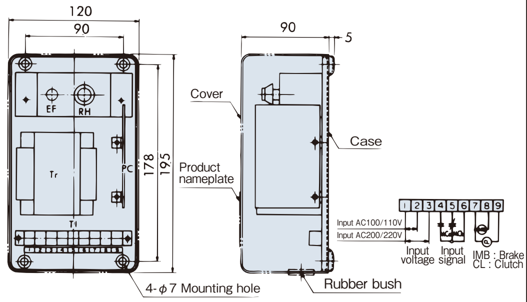
DMP-10/24

4-ϕ4 Mounting hole

Approx. weight :1kg



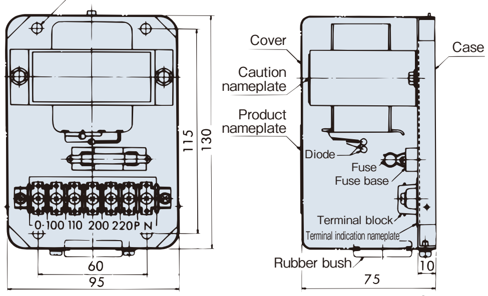
TMP-40D



Approx. weight : 2.2kg

DMP-20/24A

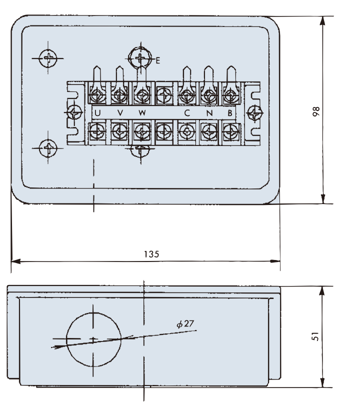
4-ϕ5.8 Mounting hole



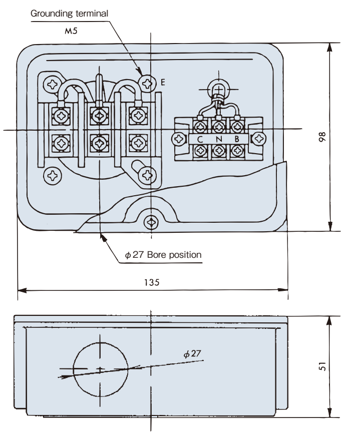
Approx. weight : 1.2kg

Structure of Terminal Box

Three-phase 0.1 kW to 0.75 kW



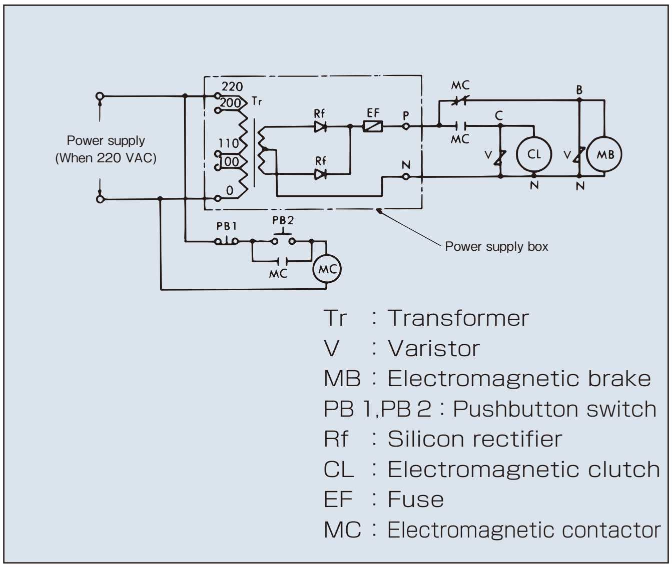
Three-phase 1.5 kW to 2.2 kW

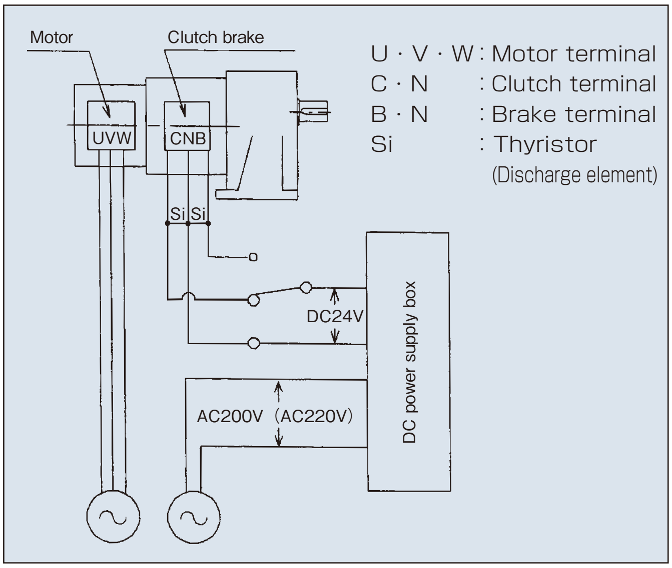


CB Gear Motor Wiring

The operating voltage of the clutch/brake is 24 V DC. Therefore, use the DC power supply box that converts commercial AC power to the specified 24 V DC and connect it as shown in the figures below.

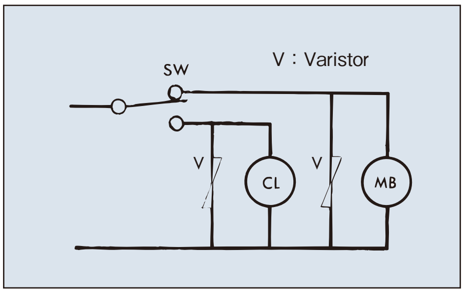
1. Example of circuit using standard power supply box (DMP type)





2. Discharge circuit

When performing switching on the DC side using the standard (DMP type), provide a discharge circuit using the varistor accompanying the CB gear motor in order to protect the switch and to prevent a dielectric breakdown of the clutch/brake. When using the standard control unit (TMP type), because a discharge circuit is included, the above procedure is not necessary.

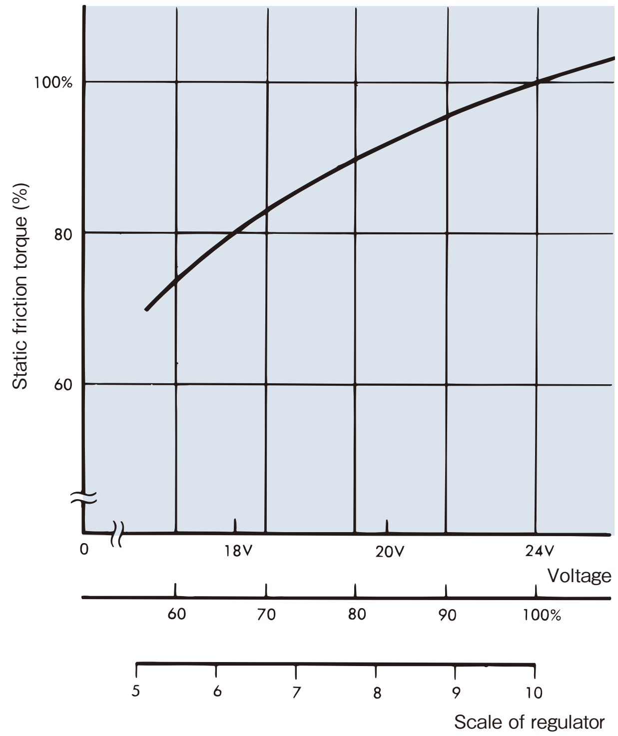


3. Power capacity

The power capacity for the electromagnetic clutch/brake should be 130% or more of the power consumption of the clutch/brake. When using two or more CB gear motors, it should be 130% or more of the total capacity.

4. Brake torque adjusting function

For the TMP-type control unit, a brake torque-adjusting resistor is built into the circuit. The brake torque can be adjusted as shown in the figure to the right by reducing the voltage with this resistor. The lower limit of the voltage adjustment is about 70%. If the voltage is reduced too much, insufficient pull-in of the armature will result. The scale of the control unit should be regarded as a guideline. To determine the precise value, measure the terminal voltage.



5. Special control circuit

If fast actuation of the clutch/brake is required, increase the voltage applied to the clutch/brake above the rated voltage; this will shorten the armature pull-in time and the torque rise time. Using this method will cause the clutch/brake unit to heat up. In addition, if the GD^2 of the load is 0.5 or more than that of the motor, there will be a greater impact on starting. Care should therefore be taken when using this method.

Precautions for Use

● Do not use for constantly maintaining loads

Because the brake of the CB gear motor exerts a braking effect through excitation, it is unsuitable for use in equipment such as hoisting machines that must always maintain loads.

● Ask for totally enclosed types

Because the clutch/brake part is an open type, the standard product cannot be used outdoors where it is exposed to water or indoors where it is exposed to large amounts of dust or oil mist. If you require a totally enclosed clutch/brake, please contact Tsubaki.

● Handling variable voltage and double voltage

Motors can be made to handle variable voltage and double voltage at time of purchase or through rewinding. However, for the power supply box for a clutch/brake, because it is for 100/200 V AC, a 100 V instrumentation power supply should be used.

● Operation by inverter

When operating using an inverter, the motor's RPM during clutch/brake coupling and control should be 1,800 r/min (60 Hz) or lower. If the motor's RPM is higher than 1,800 r/min during coupling and control, the gear and shaft may become damaged due to abnormal abrasion of the clutch/brake's lining and impact load of the clutch/brake.

● Explosion-proof type

There are no explosion-proof clutch/brakes. Consider using other intermittent mechanisms such as indexing drives.

Specifications of Motor and Clutch/Brake

Table 1. Moment of inertia of motor and clutch/brake

Motor output	Moment of inertia of motor		Model number of clutch/brake		Moment of inertia of clutch/brake	
	I_M	GD_M^2			I_C	GD_C^2
	kg·m²	{kgf·m²}	Clutch	Brake	kg·m²	{kgf·m²}
0.1kW	0.64×10^{-3}	2.54×10^{-3}	NC/NB-0.15/0.1-AG-002		1.21×10^{-4}	{4.83×10^{-4}}
0.2kW	0.74×10^{-3}	2.96×10^{-3}	NC/NB-0.3/0.2-AG-002		1.21×10^{-4}	{4.83×10^{-4}}
0.4kW	0.90×10^{-3}	3.59×10^{-3}	NC-0.6AG-064	NB-0.4AG-002	2.16×10^{-4}	{8.63×10^{-4}}
0.75kW	1.37×10^{-3}	5.48×10^{-3}	NC-1.2AG-081	NB-0.75AG-002	0.62×10^{-3}	{2.46×10^{-3}}
1.5kW	3.41×10^{-3}	13.6×10^{-3}	NC-2.5AG-062	NB-1.5AG-002	1.94×10^{-3}	{7.74×10^{-3}}
2.2kW	4.79×10^{-3}	19.2×10^{-3}	NC-2.5AG-062	NB-2.2AG-002	1.94×10^{-3}	{7.74×10^{-3}}

Table 2. Armature pull-in time

	Armature pull-in time (S)	Model number of power supply box
NC/NB-0.15/0.1	0.010 0.015 0.005	DMP TMP EMP
NC/NB-0.3/0.2	0.010 0.015 0.005	DMP TMP EMP
NC/NB-0.6/0.4	0.015 0.023 0.008	DMP TMP EMP
NC/NB-1.2/0.75	0.020 0.030 0.010	DMP TMP EMP

	Armature pull-in time (S)	Model number of power supply box
NC/NB-2.5/1.5	0.030 0.045 0.015	DMP TMP EMP
NC/NB-2.5/2.2	0.035 0.053 0.018	DMP TMP EMP

EMP has special specifications for double excitation.

Table 3. Specifications of clutch/brake

Motor output	Classification	Model number of clutch/brake	Static friction torque		Dynamic friction torque		Power consumption	Allowable work E_O		Total work E_T	
			N·m	{kgf·m}	N·m	{kgf·m}	(W)	J/min	{kgf·m/min}	J	{kgf·m}
0.1kW/100W	Clutch	NC/NB-0.15/0.1-AG-002	1.47	{0.15}	0.88	{0.09}	4	1960	{ 200}	25.5×10^7	{2.6×10^7}
	Brake		0.98	{0.1 }	0.59	{0.06}	3	1764	{ 180}		
0.2kW/200W	Clutch	NC/NB-0.3/0.2-AG-002	2.94	{0.3 }	1.76	{0.18}	5	1960	{ 200}	25.5×10^7	{2.6×10^7}
	Brake		1.96	{0.2 }	1.18	{0.12}	4	1764	{ 180}		
0.4kW	Clutch	NC-0.6AG-064	5.88	{0.6 }	3.53	{0.36}	8	2744	{ 280}	39.2×10^7	{4.0×10^7}
	Brake	NB-0.4AG-002	3.92	{0.4 }	2.35	{0.24}	7	2450	{ 250}		
0.75kW	Clutch	NC-1.2AG-081	11.8	{1.2 }	6.86	{0.70}	11	4410	{ 450}	61.7×10^7	{6.3×10^7}
	Brake	NB-0.75AG-002	7.35	{0.75}	4.41	{0.45}	8	3969	{ 405}		
1.5kW	Clutch	NC-2.5AG-062	24.5	{2.5 }	14.7	{1.5 }	17	6860	{ 700}	90.2×10^7	{9.2×10^7}
	Brake	NB-1.5AG-002	14.7	{1.5 }	8.82	{0.9 }	12	6174	{ 630}		
2.2kW	Clutch	NC-2.5AG-062	24.5	{2.5 }	14.7	{1.5 }	17	6860	{ 700}	90.2×10^7	{9.2×10^7}
	Brake	NB-2.2AG-002	21.6	{2.2 }	12.7	{1.3 }	16	6174	{ 630}		

Selection

1. Selecting Procedure

- When making a selection based on the torque and revolution, select a model number according to the gear motor. The allowable inertia ratio, clutch/brake clutching work, and life span are described here.

1. Conditions
(1) Output shaft revolution speed n_L and frequency Hz
(2) Load torque on motor shaft T_ℓ
(3) Load on motor shaft GD^2_ℓ (moment of inertia)
(4) GD^2_M of motor
(5) Starting frequency per minute N (Maximum frequency: 60 times/min.)
(6) Method of coupling to load

2. Selection of model
(1) Calculate the corrected inertia ratio (U).

$$U=\frac{GD^2_\ell\times U_F}{GD^2_M}$$

Correction coefficient according to coupling method: (U_F)

Method of coupling to load	U_F
Direct coupling, etc. that causes no shake	1.0
Chain transmission, etc. that causes shake	1.5

(2) Make sure that the corrected inertia ratio (U) of the motor to be used does not exceed the allowable inertia ratio (U_{max}).
Note: If it exceeds the allowable inertia ratio, please contact us.

Allowable inertia ratio: (U_{max})

Reduction ratio	U_{max}
1/30 or lower	1.0
1/40 to 1/50	0.5
1/60 to 1/75	0.3
1/100 to 1/200	0.2

(3) While referring to the clutch/brake selection diagram on page 169, select a suitable motor capacity to allow for the load torque on the motor shaft and GD^2 on the motor shaft.
(For N = 25, refer to the diagram for N = 30.)
When a precise selection is necessary, determine it using the basic formula on page 170.

3. Determination of life span Calculate the clutching work per time E_ℓ using the formula shown in Section 3 on page 170.
From this E_r and the total work E_T of the clutch/brake (shown on page 167), calculate the total clutching count (Z).

$$Z=\frac{E_T}{E_\ell}$$

To calculate the life span in units of days, use the following formula.

$$Z_d=\frac{Z}{N\times 60\times N_h}$$

Z_d : Life span in units of days
N : Starting count per minute
N_h : Average operating time per day

2. Example of Selection

SI units

1. Conditions
(1) Output shaft revolution speed n_L = 50 r/min (50 Hz)
(2) Load torque on motor shaft T_r = 1.764 N · m
(3) Moment of inertia on motor shaft
I_ℓ = 0.001 kg · m² (Load being coupled directly)
(4) Moment of inertia of load of motor I_M = 0.00119 kg · m²
(5) Starting frequency N = 15 times/min

2. Selection of model

$$U=\frac{I_\ell\times U_F}{I_M}=\frac{0.001\times 1.0}{0.00119}=0.84$$

- Because the output shaft revolution speed is 50 r/min, the reduction ratio is 1/30 according to the specification chart (page 171) and therefore the allowable inertia ratio is 1.0, which means there is no problem with the corrected inertia ratio U.
- Because the starting frequency per minute is 15 times/min., refer to the diagram for N=20 times/min. The point of intersection of the above-shown T_ℓ and I_ℓ in this diagram indicates that the proper motor capacity is 0.4 kW. As a result, the model number that should be selected is GMTA040-28L30CB.

3. Determination of life span
(Perform the following calculation while referring to page 170.)

$$E_r=\frac{\Sigma I\times n^2}{182.5}\times\frac{T_d}{(T_d-T_r)}$$
$$=\frac{1.216\times 10^{-3}\times 1500^2}{182.5}\times\frac{3.53}{(3.53-1.76)}$$
$$=29.9\text{J}$$

$\Sigma I = 2.16\times 10^{-4} + 1.0\times 10^{-3}$
$= 1.216\times 10^{-3}\text{kg}\cdot\text{m}^2$
$n = 1500\text{r/min}$
$T_d = 3.53\text{N}\cdot\text{m}$
$T_\ell = 1.76\text{N}\cdot\text{m}$

$E_T = 3.92\times 10^8\text{J}$

$$Z=\frac{3.92\times 10^8}{29.9}=13.1\times 10^6\text{ times}$$

Gravitational units

1. Conditions
(1) Output shaft revolution speed n_L = 50 r/min (50 Hz)
(2) Load torque on motor shaft T_ℓ = 0.18 kgf · m
(3) Load on motor shaft GD^2_ℓ = 0.004 kgf · m²
(Load being coupled directly)
(4) GD^2_M of motor = 0.00476 kgf · m²
(5) Starting frequency N = 15 times/min

2. Selection of model

$$U=\frac{GD^2_\ell\times U_F}{GD^2_M}=\frac{0.004\times 1.0}{0.0476}=0.84$$

- Because the output shaft revolution count is 50 r/min, the reduction ratio is 1/30 according to the specification chart (page 171) and therefore the allowable inertia ratio is 1.0, which means there is no problem with the corrected inertia ratio U.
- Because the starting frequency per minute is 15 times/min., refer to the graph for N=20 times/min. The point of intersection of the above-shown T^ℓ and GD^2_ℓ in this diagram indicates that the proper motor capacity is 0.4 kW. As a result, the model number that should be selected is GMTA040-28L30CB.

3. Determination of life span
(Perform the following calculation while referring to page 170.)

$$E_r=\frac{\Sigma GD^2\times n^2}{7160}\times\frac{T_d}{(T_d-T_\ell)}$$
$$=\frac{4.86\times 10^{-3}\times 1500^2}{7160}\times\frac{0.36}{(0.36-0.18)}$$
$$=3.05\text{kgf}\cdot\text{m}$$

$\Sigma GD^2 = 8.63\times 10^{-4} + 4.0\times 10^{-3}$
$= 4.86\times 10^{-3}\text{kgf}\cdot\text{m}^2$
$n = 1500\text{r/min}$
$T_d = 0.36\text{kgf}\cdot\text{m}$
$T_\ell = 0.18\text{kgf}\cdot\text{m}$

$E_T = 4.0\times 10^7\text{kgf}\cdot\text{m}$

$$Z=\frac{4.0\times 10^7}{3.05}=13.1\times 10^6\text{ times}$$

3. Clutch/Brake Selection Diagram

SI units

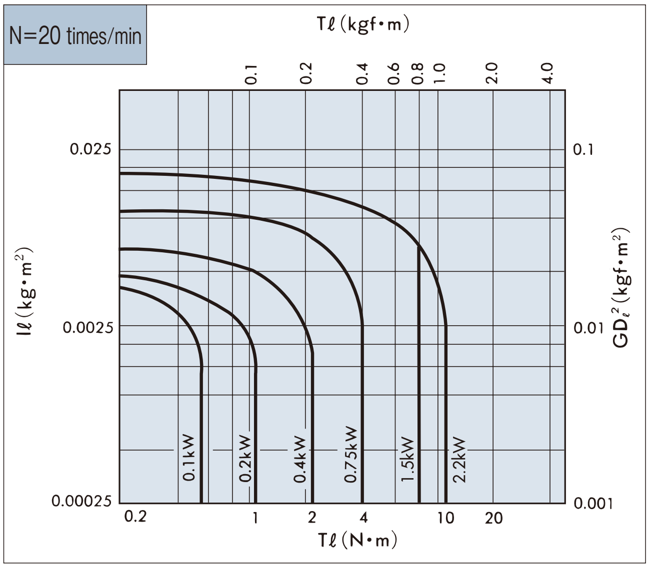
$T_\ell = \frac{T_L}{R}$ $I_\ell = \frac{I_L}{R^2}$

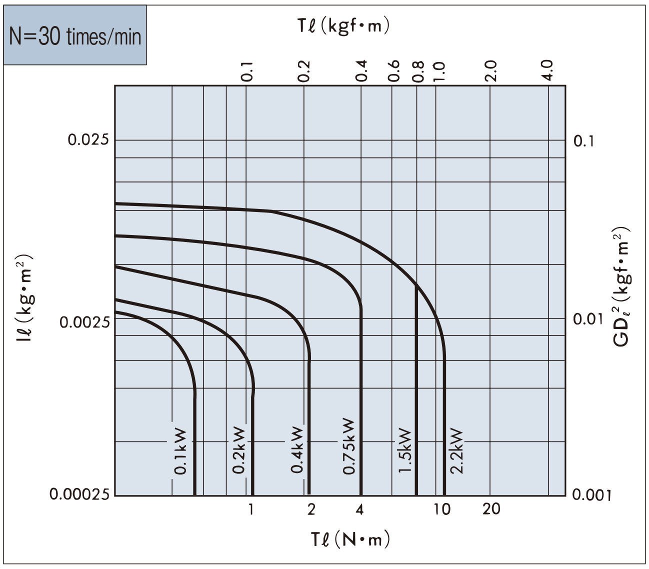
T_ℓ : Load torque on motor shaft (N · m)
T_L : Load torque on output shaft (N · m)
I_ℓ : Moment of inertia of load on motor shaft (kg · m²)
I_L : Moment of inertia of load on output shaft (kg · m²)
R : Reduction ratio

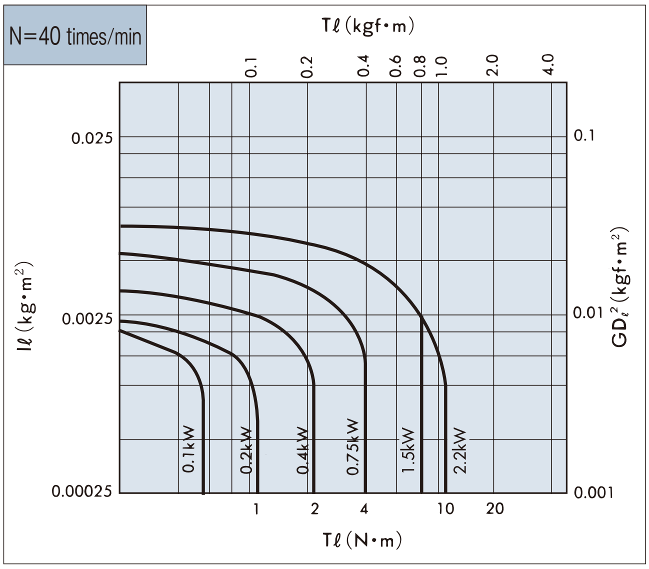
Gravitational units

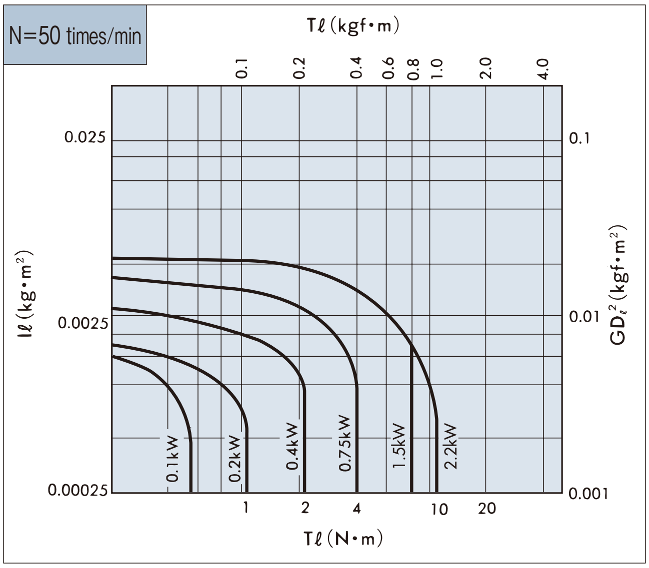
$T_\ell = \frac{T_L}{R}$ $GD_\ell^2 = \frac{GD_L^2}{R^2}$

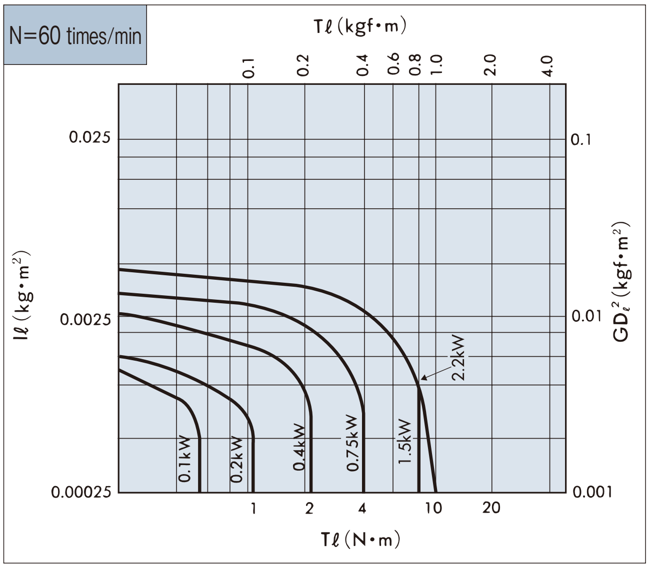
T_ℓ : Load torque on motor shaft (kgf · m)
T_L : Load torque on output shaft (kgf · m)
GD_ℓ^2 : Load on motor shaft GD^2 (kgf · m²)
GD_L^2 : Load on output shaft GD^2 (kgf · m²)
R : Reduction ratio











4. Basic Formula for Selection

SI units

1. Torque, revolution speed, and power

$$T_L = 9550 \frac{P}{n_L}$$

T_L: Torque on output shaft N · m
P : Power kW
n_L : Output shaft revolution speed r/min

2. Conversion to motor shaft

(1) T_ℓ: Load torque on motor shaft N · m

$$T_r = \frac{T_L}{i}$$

T_L : Torque on output shaft N · m
i : Reduction rate

(2) I_ℓ: Moment of inertia on motor shaft kg · m²

$$I_\ell = \frac{I_L}{i^2}$$

I_L : Moment of inertia on output shaft kg · m²

3. Clutching (braking) work

(1) E_ℓ : Clutching (braking) work per time J

$$E_\ell = \frac{\Sigma I x n_\ell^2}{182.5} \times \frac{T_d}{(T_d \pm T_\ell)}$$

$$\Sigma I = I_C + I_\ell$$

I_ℓ: Moment of inertia on motor shaft
I_C: Moment of inertia of clutch/brake (Page 167, Table 1)

n_ℓ: Motor shaft revolution speed r/min
T_d : Dynamic friction torque of clutch/brake N · m (Page 167, Table 3)
$+$: Positive torque at the time of braking
$-$: Negative torque at the time of clutching and braking

(2) E_N: Clutching (braking) work per minute J

$$E_N = E_\ell \times N$$

N: Starting frequency (time/min)

$$E_N \leqq E_o$$

E_o: Allowable work J/min (Page 167, Table 3)

4. Clutching (braking) time

t_b: Clutching (braking) time s

$$t_b = \frac{\Sigma I}{9.55} \times \frac{n_\ell}{(T_d \pm T_\ell)}$$

$+$: Positive torque at the time of braking
$-$: Negative torque at the time of clutching and braking

5. Response time

t_a: Armature pull-in time s (Page 167, Table 2)

6. Calculation of braking distance

$$S = \left(t_a + \frac{1}{2} t_b\right) \times V$$

S : Braking distance mm
V : Speed (conveyor speed, etc.) mm/s

7. Stopping accuracy

Precise determination of the stopping accuracy is difficult because it is affected by voltage, temperature, alteration through use, operating time, etc. However, if the following variations are assumed:

a. Load torque variation: ±20%
b. Breaking torque variation: ±20%
c. Time lag variation: ±0.01s

The variation from the calculated breaking distance is about ±30%.

Stopping accuracy δ = S x 0.6or S x ±0.3

For example, when the calculated braking distance S is 10 mm, the stopping accuracy is 6 mm (10±3 mm).

Gravitational units

1. Torque, revolution speed, and power

$$T_L = 974 \frac{P}{n_L}$$

T_L: Torque on output shaft kgf · m
P : Power kW
n_L : Output shaft revolution speed r/min

2. Conversion to motor shaft

(1) T_ℓ: Load torque on motor shaft kgf · m

$$T_\ell = \frac{T_L}{i}$$

T_L: Torque on output shaft kgf · m
i : Reduction rate

(2) GD_ℓ^2: Load on motor shaft GD² kgf · m²

$$GD_\ell^2 = \frac{GD_L^2}{i^2}$$

GD_L^2: Load on output shaft GD² kgf · m²

3. Clutching (braking) work

(1) E_ℓ: Clutching (braking) work per time kgf · m

$$E_\ell = \frac{\Sigma GD^2 \times n_\ell^2}{7160} \times \frac{T_d}{(T_d \pm T_\ell)}$$

$$\Sigma GD^2 = GD_C^2 + GD_\ell^2$$

GD_ℓ^2: Load on motor shaft GD²
GD_C^2: GD² of clutch/brake (Page 167, Table 1)

n_ℓ: Motor shaft revolution speed r/min
T_d : Dynamic friction torque of clutch/brake kgf · m (Page 167, Table 3)
$+$: Positive torque at the time of braking
$-$: Negative torque at the time of clutching and braking

(2) E_N: Clutching (braking) work per minute kgf · m/min

$$E_N = E_\ell \times N$$

N: Starting frequency (time/min)

$$E_N \leqq E_o$$

E_o: Allowable work kgf · m/min (Page 167, Table 3)

4. Clutching (braking) time

t_b: Clutching (braking) time s

$$t_b = \frac{\Sigma GD^2}{375} \times \frac{n_\ell}{(T_d \pm T_\ell)}$$

$+$: Positive torque at the time of braking
$-$: Negative torque at the time of clutching and braking

5. Response time

t_a: Armature pull-in time s (Page 167, Table 2)

6. Calculation of braking distance

$$S = \left(t_a + \frac{1}{2} t_b\right) \times V$$

S : Braking distance mm
V : Speed (conveyor speed, etc.) mm/s

7. Stopping accuracy

Precise determination of the stopping accuracy is difficult because it is affected by voltage, temperature, alteration through use, operating time, etc. However, if the following variations are assumed:

a. Load torque variation: ±20%
b. Breaking torque variation: ±20%
c. Time lag variation: ±0.01s

The variation from the calculated breaking distance is about ±30%.

Stopping accuracy δ = S x 0.6or S x ±0.3

For example, when the calculated braking distance S is 10 mm, the stopping accuracy is 6 mm (10±3 mm).

Specification Chart

Model number		Motor output kW	Frame number	Nominal reduction ratio	Number of reduction steps	Output shaft revolution r/min		Allowable output shaft torque				Allowable output shaft O.H.L.		Page and drawing number of outline dimensions	
								N·m	{kgf·m}	N·m	{kgf·m}			Three-phase	
						50Hz	60Hz	50Hz		60Hz		N	{kgf}	Foot mount	Flange mount
GMTA010	5CB	0.1	18	1/5	2	300	360	2.8	{0.29}	2.4	{0.24}	274	{ 28}	173-1	173-5
	10CB			1/10		150	180	5.7	{0.58}	4.8	{0.49}	431	{ 44}	173-2	173-6
	15CB			1/15		100	120	8.6	{0.88}	7.2	{0.73}	568	{ 58}		
	20CB			1/20		75	90	11.8	{ 1.2}	9.5	{0.97}	686	{ 70}		
	25CB			1/25		60	72	14.7	{ 1.5}	11.8	{ 1.2}	804	{ 82}		
	30CB		24	1/30		50	60	17.6	{ 1.8}	14.7	{ 1.5}	902	{ 92}	173-3	173-7
	40CB			1/40		37.5	45	22.5	{ 2.3}	19.6	{ 2.0}	1098	{112}		
	50CB			1/50	3	30	36	28.4	{ 2.9}	23.5	{ 2.4}	1264	{129}		
	60CB			1/60		25	30	34.3	{ 3.5}	28.4	{ 2.9}	1431	{146}		
	75CB			1/75		20	24	43.1	{ 4.4}	36.3	{ 3.7}	1666	{170}		
	100CB		28	1/100		15	18	56.8	{ 5.8}	48.0	{ 4.9}	2009	{205}	173-4	173-8
	120CB			1/120		12.5	15	68.6	{ 7.0}	56.8	{ 5.8}	2274	{232}		
	165CB			1/165		9.1	10.9	94.1	{ 9.6}	78.4	{ 8.0}	2813	{287}		
	200CB			1/200		7.5	9	115	{11.7}	95.1	{ 9.7}	3195	{326}		
GMTA020	5CB	0.2	18	1/5	2	300	360	5.7	{0.58}	4.7	{0.48}	431	{ 44}	174-1	174-5
	10CB			1/10		150	180	11.8	{ 1.2}	9.5	{0.97}	686	{ 70}	174-2	174-6
	15CB			1/15		100	120	17.6	{ 1.8}	14.7	{ 1.5}	902	{ 92}		
	20CB			1/20		75	90	22.5	{ 2.3}	19.6	{ 2.0}	1098	{112}		
	25CB			1/25		60	72	28.4	{ 2.9}	23.5	{ 2.4}	1264	{129}		
	30CB		24	1/30		50	60	34.3	{ 3.5}	28.4	{ 2.9}	1431	{146}	174-3	174-7
	40CB			1/40		37.5	45	46.1	{ 4.7}	38.2	{ 3.9}	1735	{177}		
	50CB			1/50	3	30	36	56.8	{ 5.8}	48.0	{ 4.9}	2009	{205}		
	60CB			1/60		25	30	68.6	{ 7.0}	56.8	{ 5.8}	2274	{232}		
	75CB			1/75		20	24	86.2	{ 8.8}	71.5	{ 7.3}	2636	{269}		
	100CB		28	1/100		15	18	115	{11.7}	95.1	{ 9.7}	3195	{326}	174-4	174-8
	120CB			1/120		12.5	15	137	{14.0}	115	{11.7}	3606	{368}		
	165CB			1/165		9.1	10.9	189	{19.3}	158	{16.1}	4459	{455}		
	200CB			1/200		7.5	9	218	{22.2}	181	{18.5}	4822	{492}		
GMTA040	5CB	0.4	24	1/5	2	300	360	12.1	{1.23}	10.0	{1.02}	686	{ 70}	175-1	175-4
	10CB			1/10		150	180	24.5	{ 2.5}	20.6	{ 2.1}	1098	{112}		
	15CB			1/15		100	120	36.3	{ 3.7}	30.4	{ 3.1}	1431	{146}		
	20CB			1/20		75	90	48.0	{ 4.9}	40.2	{ 4.1}	1735	{177}		
	25CB			1/25		60	72	60.8	{ 6.2}	50.0	{ 5.1}	2009	{205}		
	30CB		28	1/30		50	60	72.5	{ 7.4}	60.8	{ 6.2}	2274	{232}	175-2	175-5
	40CB			1/40	3	37.5	45	94.1	{ 9.6}	78.4	{ 8.0}	2754	{281}		
	50CB			1/50		30	36	118	{12.0}	98.0	{10.0}	3195	{326}		
	60CB			1/60		25	30	140	{14.3}	118	{12.0}	3606	{368}		
	75CB			1/75		20	24	175	{17.9}	146	{14.9}	4185	{427}		
	100CB		38	1/100		15	18	234	{23.9}	195	{19.9}	5076	{518}	175-3	175-6
	120CB			1/120		12.5	15	281	{28.7}	234	{23.9}	5733	{585}		
	165CB			1/165		9.1	10.9	364	{37.1}	303	{30.9}	6664	{680}		
	200CB			1/200		7.5	9	389	{39.7}	324	{33.1}	6684	{682}		

Note 1: The nominal reduction ratio is shown as the reduction ratio.
Note 2: The output shaft revolution rate is calculated by dividing the motor synchronous revolution rate by the nominal reduction ratio.
For actual reduction ratio, refer to the specification chart for the inline reducer type on pages 51-52.
For the 0.1 kW devices. because the 0.2 kW reducer is used. refer to the actual reduction ratio for 0.2 kW.

Model number		Motor output kW	Frame number	Nominal reduction ratio	Number of reduction steps	Output shaft revolution r/min		Allowable output shaft torque				Allowable output shaft O.H.L.		Page and drawing number of outline dimensions	
								50Hz		60Hz					
						50Hz	60Hz	N·m	{kgf·m}	N·m	{kgf·m}	N	{kgf}	Foot mount	Flange mount
GMTE075	5CB	0.75	28	1/5	2	300	360	22.6	{ 2.31}	18.8	{ 1.92}	1049	{ 107}	176-1	176-4
	10CB			1/10		150	180	45.1	{ 4.6}	38.2	{ 3.9}	1666	{ 170}		
	15CB			1/15		100	120	67.6	{ 6.9}	56.8	{ 5.8}	2176	{ 222}		
	20CB			1/20		75	90	91.1	{ 9.3}	75.5	{ 7.7}	2636	{ 269}		
	25CB			1/25		60	72	114	{ 11.6}	94.1	{ 9.6}	3058	{ 312}		
	30CB		38	1/30		50	60	136	{ 13.9}	114	{ 11.6}	3459	{ 353}	176-2	176-5
	40CB			1/40	3	37.5	45	175	{ 17.9}	146	{ 14.9}	4185	{ 427}		
	50CB			1/50		30	36	220	{ 22.4}	183	{ 18.7}	4861	{ 496}		
	60CB			1/60		25	30	264	{ 26.9}	220	{ 22.4}	5488	{ 560}		
	75CB			1/75		20	24	300	{ 30.6}	250	{ 25.5}	5792	{ 591}		
	100CB		42	1/100		15	18	439	{ 44.8}	369	{ 37.7}	7301	{ 745}	176-3	176-6
	120CB			1/120		12.5	15	527	{ 53.8}	439	{ 44.8}	8242	{ 841}		
	165CB			1/165		9.1	10.9	724	{ 73.9}	604	{ 61.6}	9800	{1000}		
	200CB			1/200		7.5	9	735	{ 75.0}	613	{ 62.5}	9800	{1000}		
GMTE150	5CB	1.5	42	1/5	2	300	360	45.3	{ 4.62}	37.7	{ 3.85}	1666	{ 170}	177-1	177-4
	10CB			1/10		150	180	91.1	{ 9.3}	75.5	{ 7.7}	2548	{ 260}		
	15CB			1/15		100	120	136	{ 13.9}	114	{ 11.6}	3342	{ 341}		
	20CB			1/20		75	90	181	{ 18.5}	151	{ 15.4}	4047	{ 413}		
	25CB			1/25		60	72	226	{ 23.1}	189	{ 19.3}	4694	{ 479}		
	30CB			1/30		50	60	272	{ 27.8}	226	{ 23.1}	5302	{ 541}		
	40CB		50	1/40	3	37.5	45	351	{ 35.8}	293	{ 29.9}	6292	{ 642}	177-2	177-5
	50CB			1/50		30	36	439	{ 44.8}	366	{ 37.3}	7301	{ 745}		
	60CB			1/60		25	30	527	{ 53.8}	439	{ 44.8}	8242	{ 841}		
	75CB			1/75		20	24	659	{ 67.2}	549	{ 56.0}	9565	{ 976}		
	100CB		63	1/100		15	18	878	{ 89.6}	732	{ 74.7}	11584	{1182}	177-3	177-6
	120CB			1/120		12.5	15	1054	{107.5}	878	{ 89.6}	13073	{1334}		
	165CB			1/165		9.1	10.9	1449	{147.9}	1207	{123.2}	13230	{1350}		
	200CB			1/200		7.5	9	※1470	※{150.0}	※1225	※{125.0}	13230	{1350}		
GMTE220	5CB	2.2	42	1/5	2	300	360	66.6	{ 6.8}	55.9	{ 5.7}	2078	{ 212}	178-1	178-4
	10CB			1/10		150	180	133	{ 13.6}	111	{ 11.3}	3293	{ 336}		
	15CB			1/15		100	120	200	{ 20.4}	167	{ 17.0}	4312	{ 440}		
	20CB			1/20		75	90	266	{ 27.1}	221	{ 22.6}	5223	{ 533}		
	25CB			1/25		60	72	332	{ 33.9}	277	{ 28.3}	6066	{ 619}		
	30CB			1/30		50	60	399	{ 40.7}	332	{ 33.9}	6850	{ 699}		
	40CB		50	1/40	3	37.5	45	515	{ 52.6}	429	{ 43.8}	8114	{ 828}	178-2	178-5
	50CB			1/50		30	36	644	{ 65.7}	537	{ 54.8}	9418	{ 961}		
	60CB			1/60		25	30	773	{ 78.9}	644	{ 65.7}	10633	{1085}		
	75CB			1/75		20	24	966	{ 98.6}	805	{ 82.1}	12338	{1259}		
	100CB		63	1/100		15	18	1288	{131.4}	1073	{109.5}	14955	{1526}	178-3	178-6
	120CB			1/120		12.5	15	1545	{157.7}	1288	{131.4}	16885	{1723}		
	165CB			1/165		9.1	10.9	2126	{216.9}	1771	{180.7}	17640	{1800}		
	200CB			1/200		7.5	9	※2156	※{220.0}	※1796	※{183.3}	17640	{1800}		

Note 1: The nominal reduction ratio is shown as the reduction ratio.
Note 2: The output shaft revolution rate is calculated by dividing the motor synchronous revolution rate by the nominal reduction ratio.
For actual reduction ratio, refer to the specification chart for the inline reducer type on pages 51-52.
For the 1.5 kW devices, because the 2.2 kW reducer is used, refer to the actual reduction ratio for 2.2 kW.
Note 3: The models marked with ※ are ones for which torque is limited.

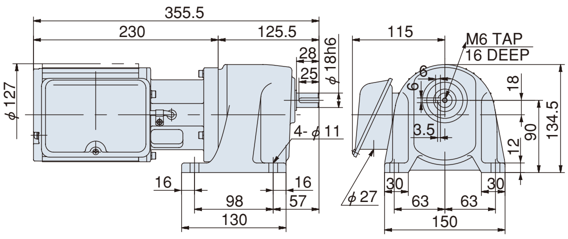
GEAR MOTOR, CB GEAR MOTOR

Outline Dimensions

Three-phase 0.1 kW — Foot mount

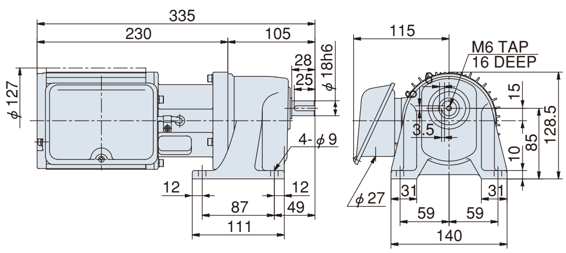
GMTA010-18L5CB — 1

Reduction ratio : 5	Approx. weight : 9.1kg



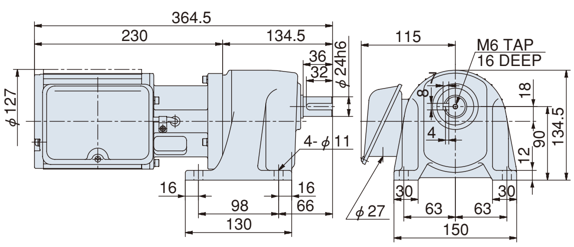
GMTA010-18L10~25CB — 2

Reduction ratio : 10, 15, 20, 25	Approx. weight : 7.9kg



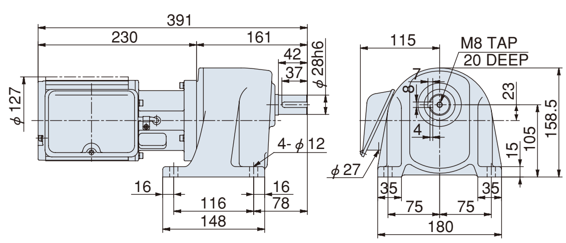
GMTA010-24L30~75CB — 3

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 9.3kg



GMTA010-28L100~200CB — 4

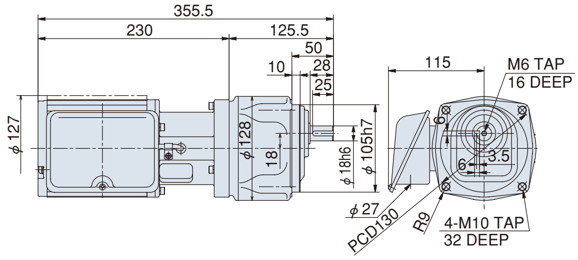
Reduction ratio : 100, 120, 165, 200	Approx. weight : 11.7kg



Three-phase 0.1 kW — Face mount

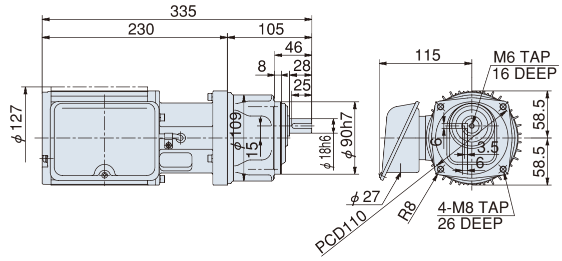
GMTA010-18U5CB — 5

Reduction ratio : 5	Approx. weight : 9.1kg



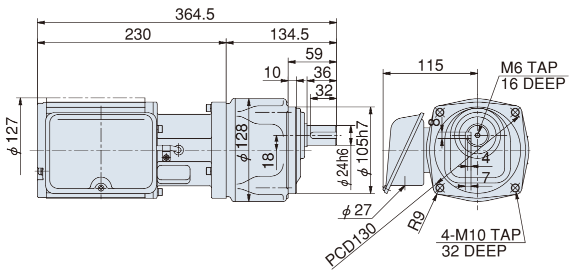
GMTA010-18U10~25CB — 6

Reduction ratio : 10, 15, 20, 25	Approx. weight : 7.7kg



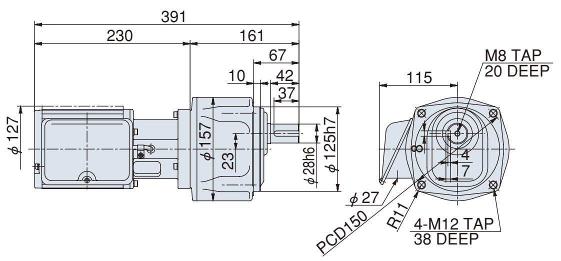
GMTA010-24U30~75CB — 7

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 9.1kg



GMTA010-28U100~200CB — 8

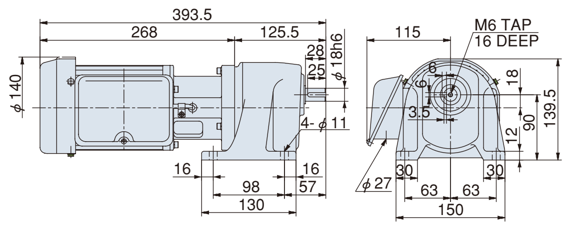
Reduction ratio : 100, 120, 165, 200	Approx. weight : 11.5kg



Three-phase 0.2 kW | Foot mount

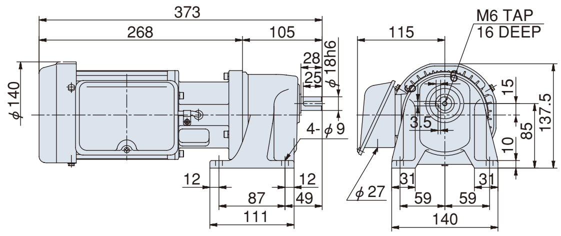
GMTA020-18L5CB 1

Reduction ratio : 5	Approx. weight : 9.0kg



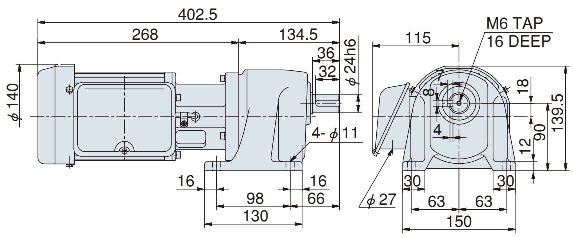
GMTA020-18L10~25CB 2

Reduction ratio : 10, 15, 20, 25	Approx. weight : 7.8kg



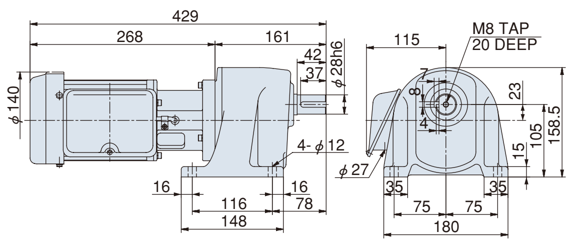
GMTA020-24L30~75CB 3

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 9.2kg



GMTA020-28L100~200CB 4

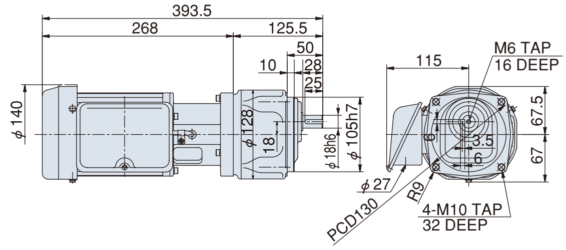
Reduction ratio : 100, 120, 165, 200	Approx. weight : 11.8kg



Three-phase 0.2 kW | Face mount

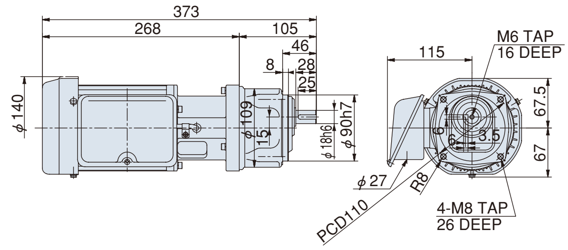
GMTA020-18U5CB 5

Reduction ratio : 5	Approx. weight : 9.0kg



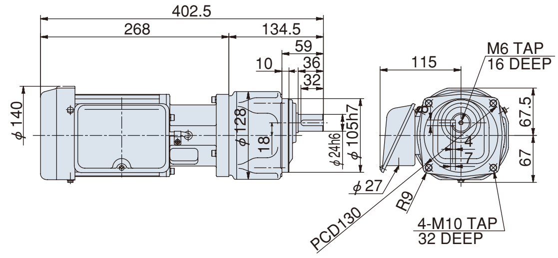
GMTA020-18U10~25CB 6

Reduction ratio : 10, 15, 20, 25	Approx. weight : 7.6kg



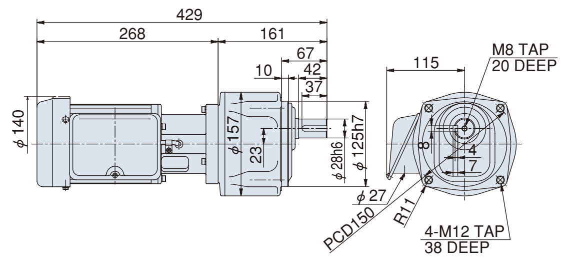
GMTA020-24U30~75CB 7

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 9.0kg



GMTA020-28U100~200CB 8

Reduction ratio : 100, 120, 165, 200	Approx. weight : 11.4kg

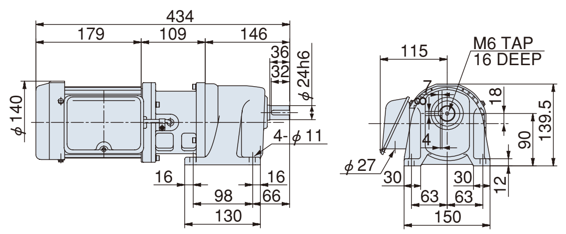


Outline Dimensions

Three-phase 0.4 kW — Foot mount

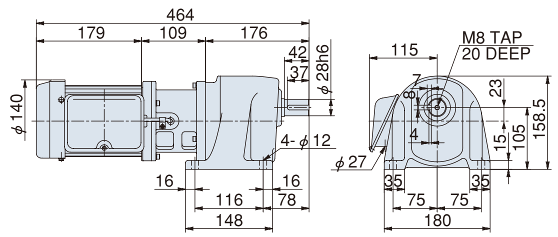
GMTA040-24L5～25CB **1**

Reduction ratio : 5, 10, 15, 20, 25	Approx. weight : 12.0kg



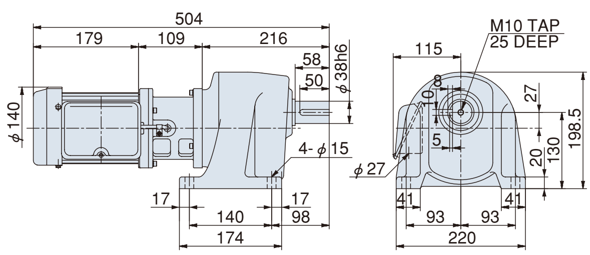
GMTA040-28L30～75CB **2**

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 12.5kg



GMTA040-38L100～200CB **3**

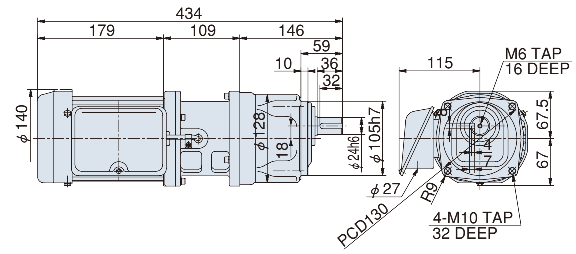
Reduction ratio : 100, 120, 165, 200	Approx. weight : 16.5kg



Three-phase 0.4 kW — Face mount

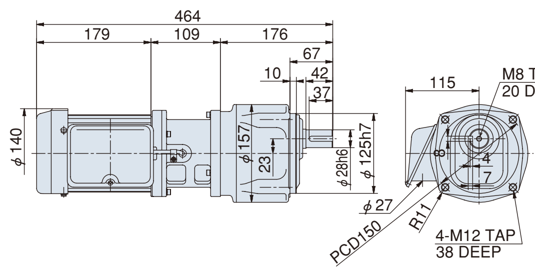
GMTA040-24U5～25CB **4**

Reduction ratio : 5, 10, 15, 20, 25	Approx. weight : 9.8kg



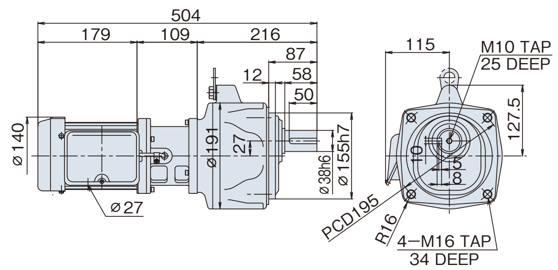
GMTA040-28U30～75CB **5**

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 12.5kg



GMTA040-38U100～200CB **6**

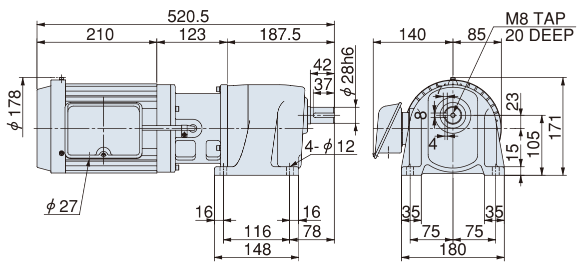
Reduction ratio : 100, 120, 165, 200	Approx. weight : 22.5kg



Three-phase 0.75 kW | Foot mount

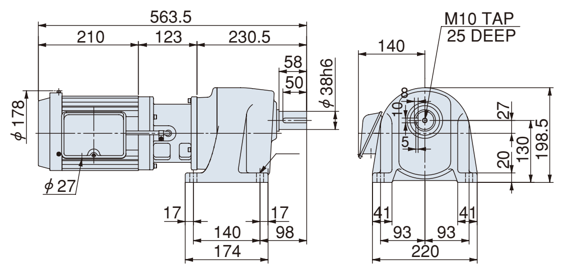
GMTE075-28L5～25CB 1

Reduction ratio : 5, 10, 15, 20, 25	Approx. weight : 21.8kg



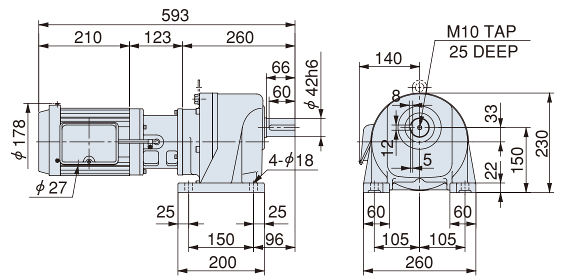
GMTE075-38L30～75CB 2

Reduction ratio : 30, 40, 50, 60, 75	Approx. weight : 25.8kg



GMTE075-42L100～200CB 3

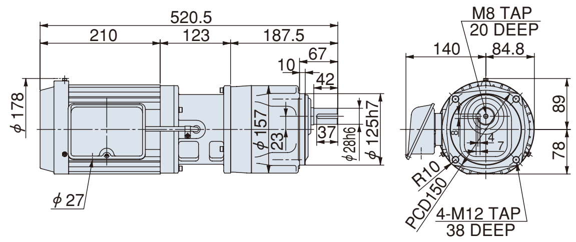
Reduction ratio : 100, 120, 165, 200	Approx. weight : 47.3kg



Three-phase 0.75 kW | Face mount

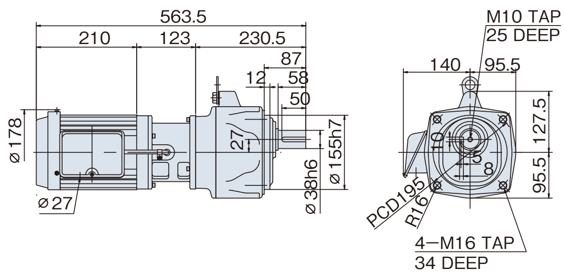
GMTE075-28U5～25CB 4

Reduction ratio : 5, 10, 15, 20, 25	Approx. weight : 21.8kg



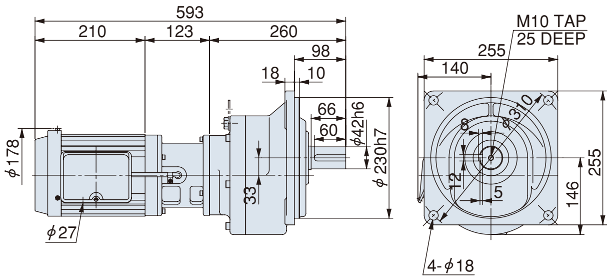
GMTE075-38U30～75CB 5

Reduction ratio : 減速比：30, 40, 50, 60, 7	Approx. weight : 31.8kg



GMTE075-42F100～200CB 6

Reduction ratio : 100, 120, 165, 200	Approx. weight : 49.3kg



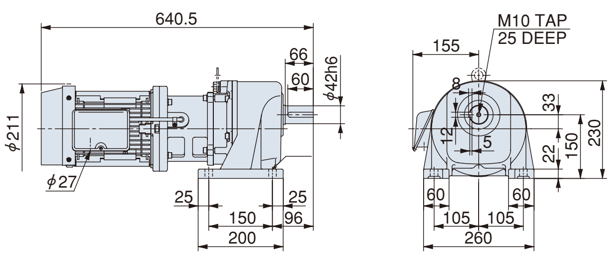
Note: On the GMTE075-28L5-25CB, the motor protrudes from the mounting surface in the terminal box P5 position.

Outline Dimensions

Three-phase 1.5 kW — Foot mount

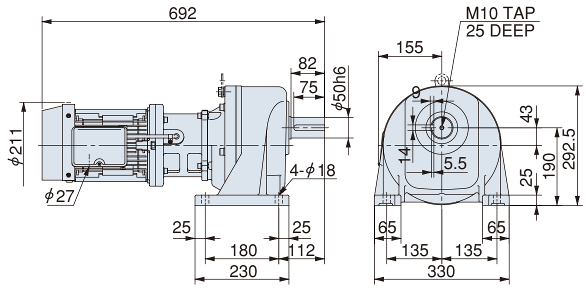
GMTE150-42L5～30CB — 1

Reduction ratio : 5, 10, 15, 20, 25, 30	Approx. weight : 62.0kg



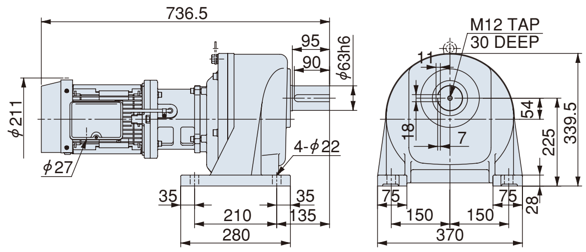
GMTE150-50L40～75CB — 2

Reduction ratio : 40, 50, 60, 75	Approx. weight : 83.0kg



GMTE150-63L100～200CB — 3

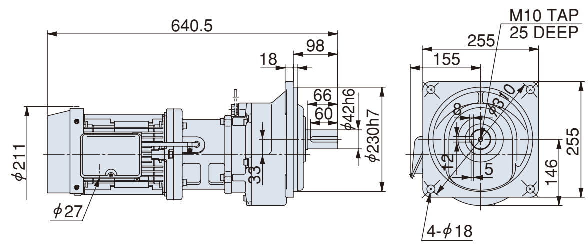
Reduction ratio : 100, 120, 165, 200	Approx. weight : 114.0kg



Three-phase 1.5 kW — Flange mount

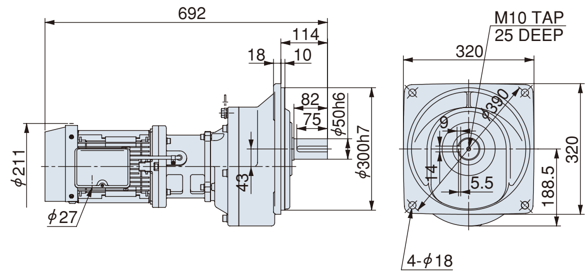
GMTE150-42F5～30CB — 4

Reduction ratio : 5, 10, 15, 20, 25, 30	Approx. weight : 69.0kg



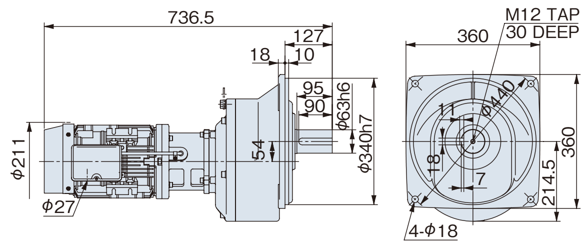
GMTE150-50F40～75CB — 5

Reduction ratio : 40, 50, 60, 75	Approx. weight : 84.0kg



GMTE150-63F100～200CB — 6

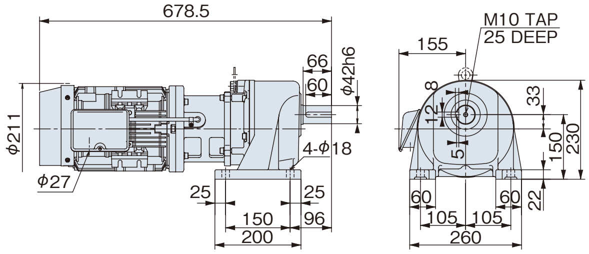
Reduction ratio : 100, 120, 165, 200	Approx. weight : 118.0kg



Three-phase 2.2 kW — Foot mount

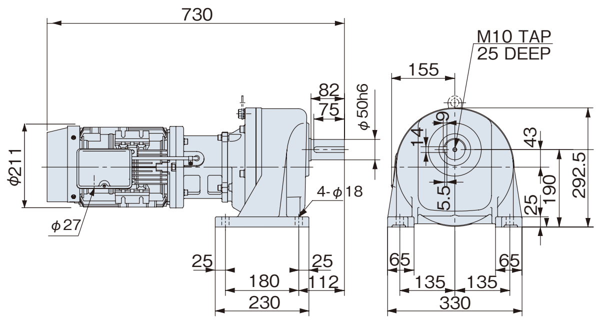
GMTE220-42L5～30CB 1

Reduction ratio : 5, 10, 15, 20, 25, 30	Approx. weight : 69.0kg



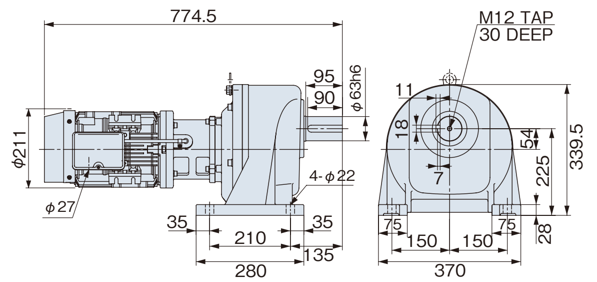
GMTE220-50L40～75CB 2

Reduction ratio : 40, 50, 60, 75	Approx. weight : 90.0kg



GMTE220-63L100～200CB 3

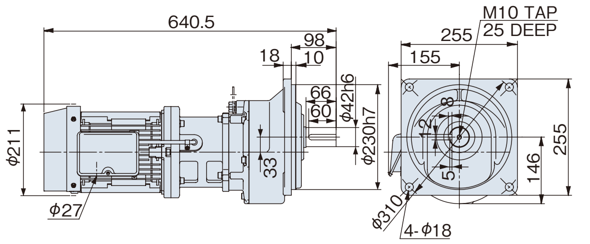
Reduction ratio : 100, 120, 165, 200	Approx. weight : 121.0kg



Three-phase 2.2 kW — Flange mount

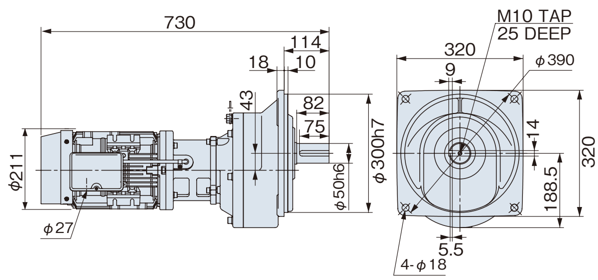
GMTE220-42F5～30CB 4

Reduction ratio : 5, 10, 15, 20, 25, 30	Approx. weight : 71.0kg



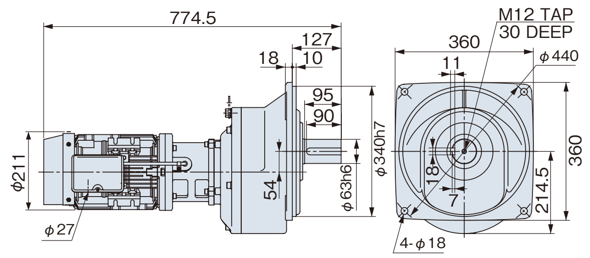
GMTE220-50F40～75CB 5

Reduction ratio : 40, 50, 60, 75	Approx. weight : 93.0kg



GMTE220-63F100～200CB 6

Reduction ratio : 100, 120, 165, 200	Approx. weight : 125.0kg



GEAR MOTOR, CB GEAR MOTOR

Outline Dimensions