■Features
- Power-OFF brake used will positively brake and hold the load even the power supply is turned OFF.
- The override amount for motor alone is 2 ~ 4 rotations.
- Simple switching enables up to 6 stops per minute. (Allow 3 seconds or more for each stopped state.)
- The brake integrates a rectifier circuit and an AC power can be directly connected as with the motor.
- The life of brake is 1 million cycles at allowed inertia rating.

■Response Characteristics
- Electromagnetic brake motors have response characteristics such as Rise Time/ Stopping Time, and Override. All of these parameters are affected by the load inertia.
- Electromagnetic brake motor's response characteristics are affected by the following three points.
  1. Motor's Average Acceleration Torque
  2. Average Braking Torque
  3. Load Torque and Inertia
     Careful evaluation is needed on the load inertia since it varies greatly depending on the mating system.

· Characteristics Table

Part Number		Output (W)	Frequency	Response Characteristics (Motor Unit)			Average Acceleration Torque		Inertia of the Rotor		Braking Torque		Allowable Load Inertia	
Type	A			Rise Time (sec)	Stopping Time (sec)	Override (Rotation)	(N · m)	(kgf · cm)	J(kg · cm²)	GD(kgf · cm²)	(N · m)	(kgf · cm)	J(kg · cm²)	GD(kgf · cm²)
PACMB	60	6	50Hz	0.07	0.08	1.5	0.0637	0.65	0.201	0.805	0.049	0.5	0.080	0.32
			60Hz	0.09	0.09	1.6	0.0647	0.66						
	70	15	50Hz	0.07	0.05	1.5	0.120	1.22	0.329	1.316	0.078	0.8	0.158	0.63
			60Hz	0.085	0.07	1.5	0.114	1.16						
	80	25	50Hz	0.05	0.13	2.2	0.235	2.40	0.603	2.411	0.10	1.0	0.178	0.71
			60Hz	0.06	0.14	2.3	0.222	2.27						
	90	40	50Hz	0.065	0.14	3	0.439	4.48	1.362	5.446	0.20	2.0	0.735	2.94
			60Hz	0.08	0.15	3.5	0.420	4.29						
		60	50Hz	0.055	0.11	2.5	0.639	6.52	1.862	7.447	0.39	4.0	0.875	3.5
			60Hz	0.065	0.12	2.9	0.615	6.28						
		90	50Hz	0.07	0.13	2.8	0.859	8.77	2.353	9.413	0.39	4.0	1	4
			60Hz	0.075	0.14	3.2	0.804	8.20						
PACMTB	80	25	50Hz	0.05	0.13	2.2	0.388	3.96	0.603	2.411	0.10	1.0	0.178	0.71
			60Hz	0.06	0.14	2.3	0.306	3.12						
	90	40	50Hz	0.05	0.15	3.5	0.667	6.81	1.362	5.446	0.20	2.0	0.735	2.94
			60Hz	0.06	0.16	4	0.513	5.23						
		60	50Hz	0.06	0.12	3	1.031	10.52	1.862	7.447	0.39	4.0	0.875	3.5
			60Hz	0.065	0.13	3.4	0.767	7.83						
		90	50Hz	0.06	0.14	3.3	1.429	14.58	2.286	9.143	0.39	4.0	1	4
			60Hz	0.065	0.15	3.7	1.065	10.87						

· Calculation for Rise Time

<SI Units>

$$TS=\frac{J_M+J_L}{9.55\times10^4}\times\frac{n}{T_A-T_L}$$

T_S : Rise Time (sec)
T_A : Average Acceleration Torque (N · m)
T_L : Load Torque (N · m)
J_M : Motor Inertia (kg · cm²)
J_L : Load Inertia (kg · cm²)
n : Motor Rotational Speed (r/min)

<Gravitational Metric Units>

$$TS=\frac{GD^2_M+GD^2_L}{37500}\times\frac{n}{T_A-T_L}$$

T_S : Rise Time (sec)
T_A : Average Acceleration Torque (kgf · cm)
T_L : Load Torque (kgf · cm)
GD^2_M : Rotor GD^2 (kgf · cm²)
GD^2_L : Load GD^2 (kgf · cm²)
n : Motor Rotational Speed (r/min)

· Calculations for Stopping Time

<SI Units>

Tb=Ta+Tb1

$$Tb1=\frac{J_M+J_L}{9.55\times10^4}\times\frac{n}{TbB}$$

Tb : Stopping Time (sec)
Ta : Armature Attraction Time
Independent OFF Circuit : Approx. 0.02 second
Common Off Circuit : Approx. 0.1 second
Tb_1 : Braking Time (sec)
TbB : Braking Torque (N · m)

<Gravitational Metric Units>

Tb=Ta+Tb1

$$Tb1=\frac{GD^2_M+GD^2_L}{37500}\times\frac{n}{TbB}$$

Tb : Stopping Time (sec)
Ta : Armature Attraction Time
Independent OFF Circuit : Approx. 0.02 second
Common Off Circuit : Approx. 0.1 second
Tb_1 : Braking Time (sec)
TbB : Braking Torque (kgf · cm)

· Time to Stop and "Override"

"Override" is the number of free shaft rotations after a STOP signal is given, and calculated from the equation below considering the response time constant of the brake armature.

$$nbB=a+\frac{n}{120}\times Tb_1$$

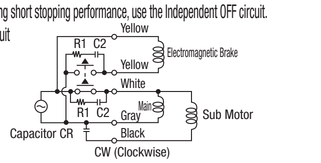
nbB : Override (Rotations) for a Motor with Electromagnetic Brake
a : Delay Time Constant : Independent OFF Circuit: 0.43 (50Hz), 0.53 (60Hz)
Common Off Circuit : 2.15 (50Hz), 2.65 (60Hz)
n : Motor Rotational Speed
Tb_1 : Braking Time

· Independent OFF and Common OFF Circuits

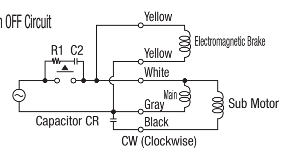
Electromagnetic brake motor's stopping time varies depending on where the switch is placed within the circuit.

With the Common OFF circuit, the motor coil and the brake coil form a closed loop circuit, and the residual magnetism from the motor will affect the brake coil time constant. As a result, the brake armature release is delayed and the motor will require more time to stop.
For applications requiring short stopping performance, use the Independent OFF circuit.

• Independent OFF Circuit

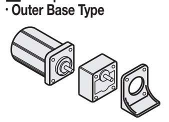


• Common OFF Circuit

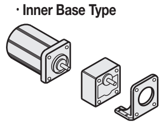


■Alteration: Mounting Bracket for Small Geared Motor

■Example of Installation
· Outer Base Type

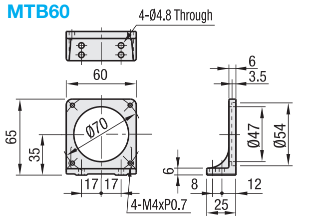


· Inner Base Type

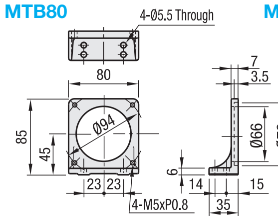


■Outer Base Type

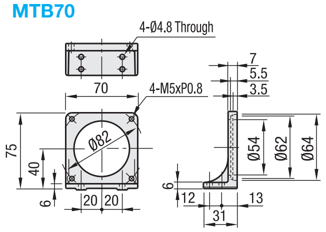
MTB60



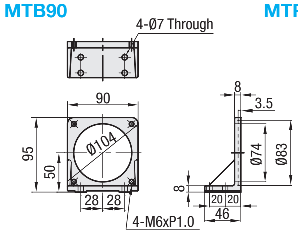
MTB80



MTB70

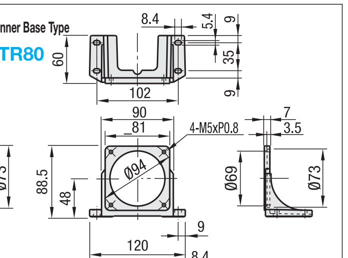


MTB90

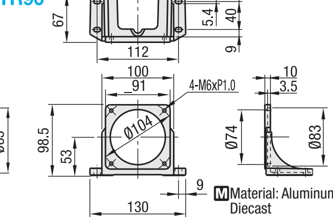


■Inner Base Type

MTR80



MTR90



M Material: Aluminum Diecast

Alterations

Part Number	-	Output (W)	-	Voltage (V)	-	(MTB, MTR)
PACMS80	-	W25	-	V100	-	MTB80

Alteration Code	Alteration Code
MTB60	MTB90
MTB70	MTR80
MTB80	MTR90

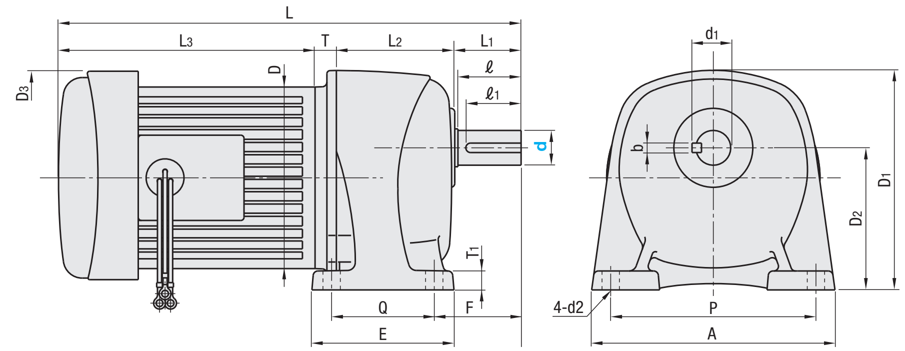
Separate items are available for purchase using the following format:
·MTB□□=PACTB□□
·MTR□□=PACTB□□R

■Features: Long life and low noise with a helical gear design. Maintenance free and mounting orientation free.

■Medium Geared Motors

NGM

* Terminal box is included with 0.75kW motor only.



Part Number		Output (kW)	Reduction Ratio		Voltage (V)	50Hz Ratings Current (A)	50Hz Ratings Rotational Speed rpm	50Hz Torque N · m (kgf · cm)	50Hz Output Shaft Rotational Speed (rpm)	60Hz Ratings Current (A)	60Hz Ratings Rotational Speed (rpm)	60Hz Torque N · m (kgf · cm)	60Hz Output Shaft Rotational Speed (rpm)	Unit Price
Type	d													1 ~ 4 pc(s).
NGM	18	0.1	10	10/1	3-Phase 200	0.61	1420	6.1(0.62)	150	0.54	1700	5(0.51)	180	
			15	15/1		0.61	1420	9.1(0.93)	100	0.54	1700	7.5(0.77)	120	
			20	20/1		0.61	1420	12(1.2)	75	0.54	1700	9.8(1)	90	
			40	40/1		0.61	1420	24(2.4)	37.5	0.54	1700	19.6(2)	45	
			50	50/1		0.61	1420	29(3)	30	0.54	1700	24.5(2.5)	36	
		0.2	5	5/1		1.1	1420	6.1(0.62)	300	1.00	1710	5(0.51)	360	
			10	10/1		1.1	1420	11.8(1.2)	150	1.00	1710	9.8(1)	180	
			15	15/1		1.1	1420	18.6(1.9)	100	1.00	1710	14.7(1.5)	120	
			20	20/1		1.1	1420	24.5(2.5)	75	1.00	1710	20.6(2.1)	90	
	22	0.1	80	80/1		0.61	1420	47(4.8)	18.8	0.54	1700	39.2(4)	22.5	
			100	100/1		0.61	1420	59(6)	15	0.54	1700	49(5)	18	
		0.2	30	30/1		1.1	1420	36.3(3.7)	50	1.00	1710	30.4(3.1)	60	
			40	40/1		1.1	1420	47(4.8)	37.5	1.00	1710	39.2(4)	45	
			50	50/1		1.1	1420	58.8(6)	30	1.00	1710	49(5)	36	
			80	80/1		1.1	1420	94.1(9.6)	18.8	1.00	1710	78.4(8)	22.5	
			100	100/1		1.1	1420	97(9.9)	15	1.00	1710	80.4(8.2)	18	
		0.4	5	5/1		2.1	1410	12(1.2)	300	1.80	1690	10(1)	360	
			10	10/1		2.1	1410	25(2.5)	150	1.80	1690	21(2.1)	180	
			15	15/1		2.1	1410	36(3.7)	100	1.80	1690	30(3.1)	120	
			20	20/1		2.1	1410	48(4.9)	75	1.80	1690	40(4.1)	90	
	28	0.2	100	100/1		1.1	1420	117(11.9)	15	1.00	1710	98(10)	18	
			120	120/1		1.1	1420	140(14.3)	12.5	1.00	1710	117(11.9)	15	
			200	200/1		1.1	1420	234(23.9)	7.5	1.00	1710	195(19.9)	9	
		0.4	30	30/1		2.1	1410	73(7.4)	50	1.80	1690	61(6.2)	60	
			40	40/1		2.1	1410	94(9.6)	37.5	1.80	1690	78(8)	45	
			50	50/1		2.1	1410	117(11.9)	30	1.80	1690	98(10)	36	
			60	60/1		2.1	1410	140(14.3)	25	1.80	1690	117(11.9)	30	
			80	80/1		2.1	1410	187(19.1)	18.8	1.80	1690	156(15.9)	22.5	
			100	100/1		2.1	1410	193(19.7)	15	1.80	1690	161(16.4)	18	
	32	0.4	120	120/1		2.1	1410	281(28.7)	12.5	1.80	1690	234(23.9)	15	
			200	200/1		2.1	1410	431(44)	7.5	1.80	1690	390(39.8)	9	

* Terminal box is included with 0.75kW motor only.
For orders larger than indicated quantity, please request a quotation.

Part Number Type	d	Output (kW)	D	D1	D2	D3	d	d1	d2	b	L	L1	L2	L3	ℓ	ℓ1	T	T1	E	F	Q	A	P	Mass (kg)
NGM	18	0.1	115	131	85	-	18	20.5	9	6	221	32	58	116.5	30	27	14.5	10	64	45	40	134	110	6.0
		0.2	115	136	85	135	18				267	32	58	162.5	30	27	14.5	10	64	45	40	134	110	6.5
	22	0.1	115	139	90	-	22	24.5	11	6	247	42	75	116.5	40	35	13.5	12	90	55	65	154	130	7.0
		0.2	115	139	90	135	22				293	42	75	162.5	40	35	13.5	12	90	55	65	154	130	7.5
		0.4	128	141.5	90	141	22				314	42	75	180.5	40	35	16.5	12	90	55	65	154	130	9.5
	28	0.2	115	167	110	135	28	31	11	8	306	47	89	162.5	45	40	7.5	15	125	65	90	175	140	9.5
		0.4	128	167	110	141	28				330	47	89	180.5	45	40	13.5	15	125	65	90	175	140	11.5
	32	0.4	128	198	130	141	32	35	13	10	349	58	100	180.5	55	50	10.5	18	168	70	130	208	170	14.5

Ordering Example

Part Number	-	Output (kW)	-	Reduction Ratio
NGM18	-	0.1	-	20