Panasonic
ideas for life

Brushless Motor
with internal drive

2007/3

# B1-G

## Brushless Motor

Compatible with PANATERM® for BL

# B1G series

**Speed Control**

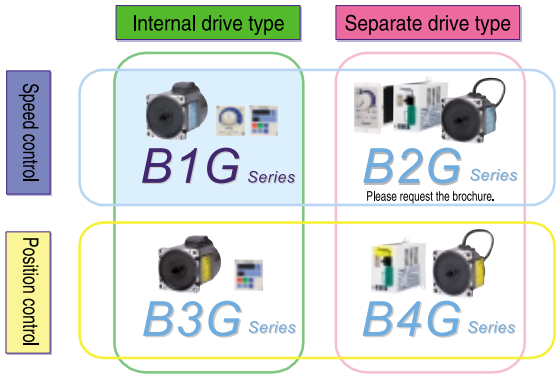
# B1G Speed Control series

## Features

### Great space saver

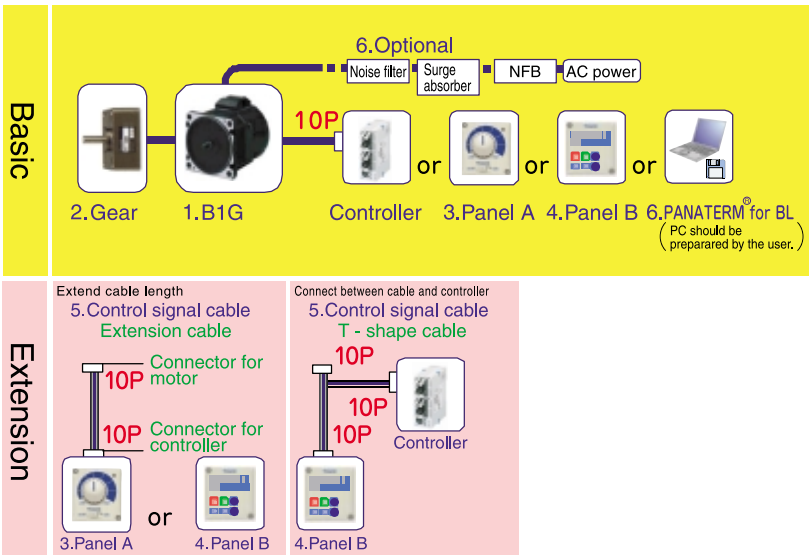
- **Space saving with internal drive**
- **Wide speed control range with stable torque**
  (30 to 3000 rpm)
- **Smooth run with sine wave drive**
  (Low noise, Low vibration)
- **Fitting face is same as our geared motor**
- **Compatible with setup support software PANATERM® for BL**
  For operation monitoring by graphic waveform displays and setting/editing of parameters
  (e.g. acceleration/deceleration time)
- **Power voltage : Single phase 100-120 & 200-240V**
- **CE/UL rated & IP65 rated**

### Product positioning (B1G)

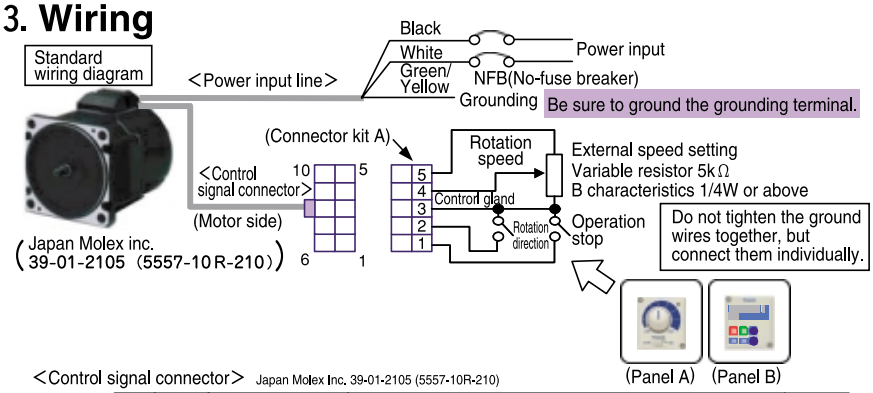



## System configuration

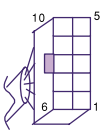
### 1. System configuration




### 3. Wiring




<Control signal connector> Japan Molex Inc. 39-01-2105 (5557-10R-210)




| Terminal number | Terminal symbol | Terminal name | Description of function | Wire color |
|---|---|---|---|---|
| 1 | I1 ※1 | Operation instruction input | Motor runs when "I1" and "GND" are shorted, and stops when they are opened. | Brown |
| 2 | I2 ※1 | Rotation speed changeover input | CW operation when "I2" and "GND" are shorted, and CCW operation when they are opened. ※2 | Red |
| 3 | GND | Control ground | Common ground terminal for control signal. ※3 | Orange |
| 4 | FIN | Analog speed command input | Speed can be by applying voltage DC0-5V. Input impedance 100kΩ. | Yellow |
| 5 | +5V | External speed setting power supply | Power output dedicated when connecting an external variable resistor (5kΩ, B characteristics) to FIN input (Cannot be used for any other purpose.) | Green |
| 6 | O1 ※1 | Trip output | Trip signal output.※1 "L" in trip (Contact ON) Open collector Vce max : DC30V, Ic max : 50mA | Blue |
| 7 | SCK | Digital key pad I/F | Interface for digital key pad | Purple (Pink) |
| 8 | SIN | | | Gray |
| 9 | SOT | | | White |
| 10 | (N/A) | – | (Do not connect anything.) | Brack |

### 2 . Model number

1.B1G

MBMC 3A 1 A X B

B1G

Output
3A : 30W
5A : 50W
9A : 90W
1E : 130W

Power
1 : Single 100~120V
2 : Single 200~240V

Structure
A : Standard

Shaft
X : For MX8G gear
Z : For MZ9G gear
S : Round

Function B : Compatible with PANATERM® for BL

2.Gear head

M X 8 G 30 B

Size
MX8 : 80mm square
MZ9 : 90mm square

Ratio (Example) 30 : 1/30
3, 3.6, 5, 6, 7.5, 9, 10, 12.5, 15, 18, 20, 25, 30, 36, 50, 60, 75, 90, 100, 120, 150, 180, 200
Note: 200 is available for 90mm square only

Bearing B : Ball bearing

3.Panel A
DV0P3500

4.Panel B
DV0P3510

5.Control signal cable

Extension cable
DV0P35910 : 1m 10 Pins
DV0P35930 : 3m 10 Pins
DV0P35950 : 5m 10 Pins

T - shape cable
DV0P37505 : 0.5m 10 Pins to 10 Pins,10 Pins

connector kit
DV0P3600 : Motor 10 Pins
DV0P3610 : Connector 10 Pins

6.Optional
DV0P4150 : PANATERM® for BL (communication software):Japanese version
DV0P4270 : PANATERM® for BL (communication software):English version
DV0P4386 : PANATERM® for BL (communication software):European version (except UK)
DV0P4140 : 1.5m PC connection cable
DV0P1450 : Surge absorber
DV0P3611-5 : Noise filter

※1 Function of input/output can be changed by the Digital key pad. Default is shown.
※2 Rotation direction is that on motor shaft. When gear head is incorporated, the rotation direction of motor and that of gear output shaft are reversed for some gear reduction raito. See the allowable shaft torque table on page 8.
(CW: Rotation clockwise when seen from the motor shaft, CCW: Rotation counterclockwise when see from the motor shaft)
※3 When resistor, and control GND are disconnected in use of external variable resistor, 5V is input to FIN irrespective of setting of variable resistor, and upper speed limit is directed; therefore use caution enough for connecting GND.

■ See the optional connector kit A (DV0P3600) for compatible connector.
In extending the control signal wire, keep it below 5m long, and use wire rod above AWG26 (0.12mm²).

# Specification

## Specification

| Model number | | Output (W) | Input power | | | | Rated torque (N·m) | Start torque (N·m) | Rated speed (r/min) |
|---|---|---|---|---|---|---|---|---|---|
| Geared shaft | Round shaft | | Voltage AC (V) | Error (%) | f (Hz) | Current (A) | | | |
| MBMC3A1AXB | MBMC3A1ASB | 30 | Single 100~120 | ±10 | 50/60 | 1.0 | 0.095 | 0.14 | 3000 |
| MBMC3A2AXB | MBMC3A2ASB | | Single 200~240 | | | 0.6 | | | |
| MBMC5A1AXB | MBMC5A1ASB | 50 | Single 100~120 | | | 1.5 | 0.16 | 0.24 | |
| MBMC5A2AXB | MBMC5A2ASB | | Single 200~240 | | | 0.7 | | | |
| MBMC9A1AZB | MBMC9A1ASB | 90 | Single 100~120 | | | 2.0 | 0.29 | 0.43 | |
| MBMC9A2AZB | MBMC9A2ASB | | Single 200~240 | | | 1.1 | | | |
| MBMC1E2AZB | MBMC1E2ASB | 130 | Single 200~240 | | | 1.5 | 0.41 | 0.62 | |

## Common specification

| Item | | Description | | | |
|---|---|---|---|---|---|
| Model number | | MBMC3A＊＊＊＊ | MBMC5A＊＊＊＊ | MBMC9A＊＊＊＊ | MBMC1E＊＊＊＊ |
| Rated output(W) | | 30 | 50 | 90 | 130 |
| Control speed | | 30~3000 r/min (Speed ratio 1:100) | | | |
| Speed fluctuation | Load | ±1% or less (Rated speed & 0 to rated torque) | | | |
| | Voltage | ±1% or less (Power source voltage±10% & Rated speed) | | | |
| | Temperature | ±1% or less (−10~40℃ & Rated speed) | | | |
| Accel/Decele time | | 0.3 seconds (Time from to 1000 r/min)※ | | | |
| Stop method | | Free run & Stop※ | | | |
| Speed setting | | 0~3000 r/min (Analogue voltage (0~5V), Set by Panel A or Panel B) | | | |
| Accuracy of set speed (At 20℃) | | Analogue : ±3% or less of upper limit speed (±90 r/min or less when upper limit is 3000r/min) [Digital : 1% or less of upper limit speed] | | | |
| Protective function | | Under-voltage warning※ (Under-voltage protection※), Over-load, Over-current, Regenerative over-voltage, Parameter error, CPU error, Over-speed, Sensor error, Over-heat | | | |
| Insulation level | | 130 (B) (UL certified 105 (A)) | | | |
| Rated time | | Continuous | | | 30 minutes or Continuous at 80% loading |
| | | (Do not run motor continuously with force from outside such as winding it down; No continuous regenerative operation.) | | | |
| Overload warning level | | 100% | | | 80% |
| Time limit at overload | | 60 seconds at 150% loading | | | |
| IP rating | | Motor is IP65 rated, excluding foot of shaft and end of lead wires EN standard(EN60529,EN60034-5) Not suitable to application where motor is exposed to or in water for long. | | | |
| | | Panel A and Panel B is IP20 rated. | | | |
| Mass (kg) | | 1.1 | 1.3 | 2.3 | 2.3 |

※ Can be set by Panel B.

## Acceptable torque with gear (N·m)

| Model# | ratio | 3 | 3.6 | 5 | 6 | 7.5 | 9 | 10 | 12.5 | 15 | 18 | 20 | 25 | 30 | 36 | 50 | 60 | 75 | 90 | 100 | 120 | 150 | 180 | 200 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBMC3A□AXB MX8G□B | | 0.23 | 0.28 | 0.38 | 0.46 | 0.58 | 0.69 | 0.77 | 0.96 | 1.15 | 1.39 | 1.55 | 1.93 | 2.16 | 2.60 | 3.55 | 4.36 | 5.43 | 6.45 | 6.99 | 7.84 | 7.84 | 7.84 | — |
| MBMC5A□AXB MX8G□B | | 0.39 | 0.46 | 0.64 | 0.77 | 0.96 | 1.16 | 1.29 | 1.61 | 1.92 | 2.33 | 2.59 | 3.23 | 3.61 | 4.33 | 5.93 | 7.29 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | 7.84 | — |
| MBMC9A□AZB MZ9G□B | | 0.67 | 0.81 | 1.12 | 1.34 | 1.69 | 2.02 | 2.28 | 2.54 | 3.06 | 3.72 | 4.11 | 5.27 | 6.22 | 6.96 | 9.81 | 11.7 | 14.7 | 17.3 | 19.0 | 19.6 | 19.6 | 19.6 | 19.6 |
| MBMC1E□AZB MZ9G□B | | 1.01 | 1.21 | 1.69 | 2.02 | 2.54 | 3.04 | 3.42 | 3.82 | 4.59 | 5.58 | 6.17 | 7.91 | 9.34 | 10.5 | 14.7 | 17.5 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 | 19.6 |

※ At □, shaft of gear head runs in same way as motor runs.

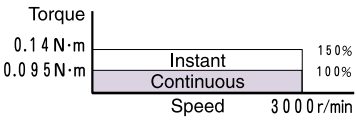
## Acceptable load inertia moment ( $\times 10^{-4}$ kg · m$^2$ )

Acceleration/Deceleration time is 0.3 seconds.

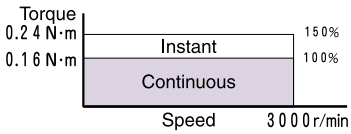
| Model# | ratio | 3 | 3.6 | 5 | 6 | 7.5 | 9 | 10 | 12.5 | 15 | 18 | 20 | 25 | 30 | 36 | 50 | 60 | 75 | 90 | 100 | 120 | 150 | 180 | 200 | No gear |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBMC3A□AXB MBMC5A□AXB MX8G□B | | 1.25 | 1.79 | 3.42 | 4.90 | 7.72 | 11.2 | 13.8 | 21.6 | 30.6 | 45.2 | 55.8 | 86.9 | 127 | 183 | 342 | 342 | 342 | 342 | 342 | 342 | 342 | 342 | — | 2.5 |
| MBMC9A□AZB MBMC1E□AZB MZ9G□B | | 5.93 | 8.47 | 16.4 | 23.6 | 37.3 | 53.4 | 67.6 | 98.3 | 142 | 211 | 257 | 423 | 589 | 847 | 1684 | 1684 | 1684 | 1684 | 1684 | 1684 | 1684 | 1684 | 1684 | 5.6 |

## Speed-Torque

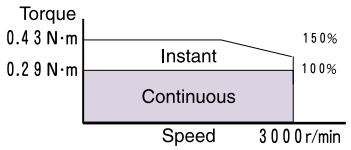
**MBMC3A1AXB／MBMC3A1ASB**
**MBMC3A2AXB／MBMC3A2ASB**



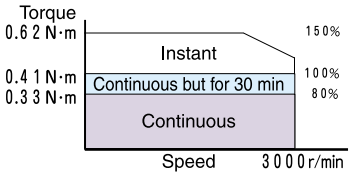

**MBMC5A1AXB／MBMC5A1ASB**
**MBMC5A2AXB／MBMC5A2ASB**




**MBMC9A1AZB／MBMC9A1ASB**
**MBMC9A2AZB／MBMC9A2ASB**




**MBMC1E2AZB／MBMC1E2ASB**




## Life time

-Motor alone

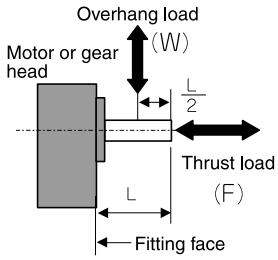
10,000 hours

-Motor with gear head

5,000 hours

(Oil seal performance is 5,000 hours long.)

## Acceptable load on shaft



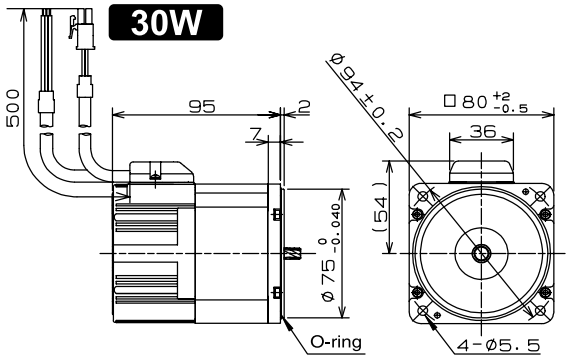

| | Output | Overhang (W) | Thrust (F) |
|---|---|---|---|
| Motor only | 30W | 100N | 10N |
| | 50W | 100N | 10N |
| | 90W | 150N | 20N |
| | 130W | 150N | 20N |
| Gear head | MX8G | 294N | 49N |
| | MZ9G | 588N | 147N |

## Drawing

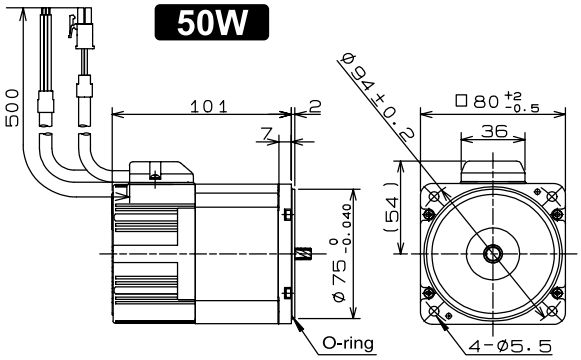
(Unit : mm)

Motor

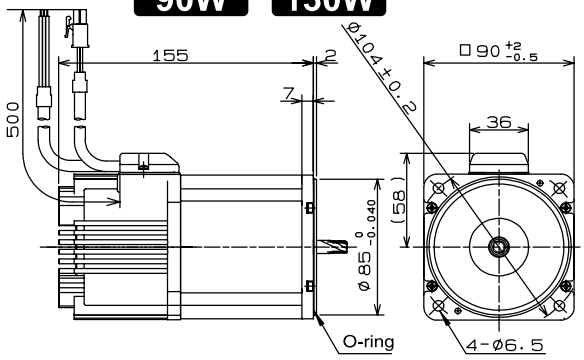
30W



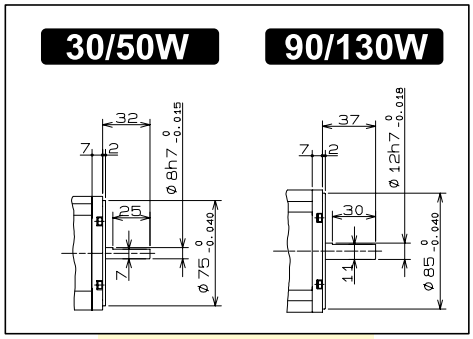

50W




90W 130W



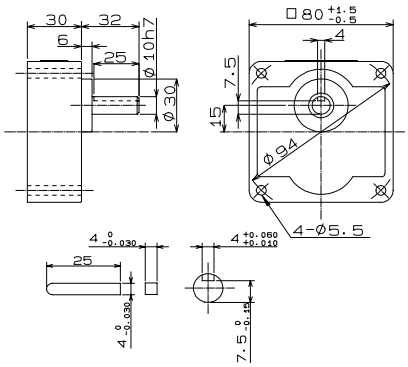

30/50W 90/130W



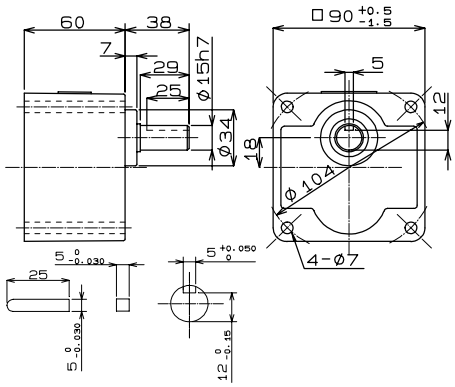

Details of round shaft

Gear head

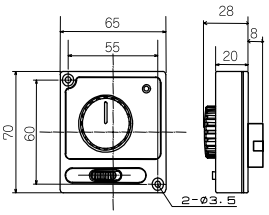
● MX8G□B(For 30W & 50W motor)



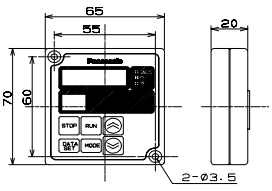

● MZ9G□B(For 90W & 130W motor)




Panel A

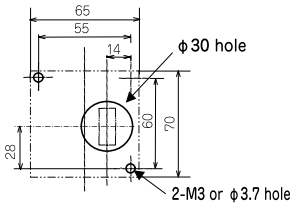



Panel B




(Fitting hole)

※Same for both Panel A and Panel B




### Cautions for Proper Use

- This product is intended to be used with a general industrial product, but not designed or manufactured to be used in a machine or system that may cause personal death when it is failed.
- Install a safety equipments or apparatus in your application, when a serious accident or loss of property is expected due to the failure of this product.
- Consult us if the application of this product is under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a least air contamination.
- We have been making the best effort to ensure the highest quality of the products, however, application of exceptionally larger, external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content, may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Please be careful when using in an environment with high concentrations of sulphur or sulphuric gases, as sulphuration can lead to disconnection from the chip resistor or a poor contact connection.
- Take care to avoid inputting a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may result in damage to the internal parts, causing smoking and/or a fire and other trouble.
- Read and observe the instruction manual without fail for proper usage of the products.


• Printed colors may be slightly different from the actual products.
• Specifications and design of the products are subject to change without notice for the product improvement.
• For environmental protection, this document is made of recycled paper, and printed with soybean oil ink.



Motor Company
Matsushita Electric Industrial Co., Ltd.
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