

Instruction Manual

Contactless Brake Unit

for Small Geared Motors

MB48X Series

Model: DVMB48XZ



Terminal block:
sold separately

- Thank you for purchasing the Panasonic Contactless Brake Unit for small geared motors.
- This manual contains information on safety connection and operation of the product and associated equipment.
- Although the product is easy to operate, it may cause injury to personnel or damage to property or degrade the performance and shorten its life when not properly and safely used. Please review the material in this manual thoroughly before using the product.
- Keep this manual in a safe location where it can easily be accessed for reference.
- The user and the operator should always refer to this manual.
- This product is for industrial equipment. Don't use this product at general household.



IME79
P0414-0

Safety Precautions

Please strictly observe safety precautions described below to prevent personal injury and property damage.

- The below explains what will happen if someone fails to heed a particular precaution statement.

	Danger	Indicates hazards or unsafe practices which could result in severe personal injury or death.
	Caution	Indicates hazards or unsafe practices which could result in minor personal injury or product or property damage.

- The following symbols are used to describe the type of Do and Don't.

	This symbol is used to indicate a practice that shall not be attempted.
	This symbol is used to indicate a practice that shall be done.

Danger

Risk of electric shock, injury or fire

	Don't use the unit in or near environment containing water, corrosive gas, flammable gas or flammable substance.
	Don't attempt to touch manual control with wet hands.
	When an unauthorized person can access the unit, install it in a lockable control board and protect its terminal block from inadvertent contact.
	Use overcurrent protection device, ground-fault circuit interrupter, overtemperature protecting device and emergency stop device.
	Be sure to connect the ground of the motor to the earth.
	Be sure to turn off power to the unit before wiring it or connecting/disconnecting it to/from socket or terminal block.

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Caution

Risk of electric shock, injury or fire

	Don't make soldering joint on a round pin of the brake unit.
	Don't use the unit in an environment where large amount of static electricity or charges are obtained.
	Don't damage leadwires; don't subject leadwires to excessive stress such as strong pressure, heavy object and clamping load; don't soak leadwires in oil or water.
	Don't lock the motor shaft while it is running.
	Don't start or stop the motor by turning on or off the main power.
	Don't touch rotating member of the motor while it is running.
	Don't touch potentially hot motor casing.
	Don't use the unit when it is damaged.
	Don't get on the product. Don't place heavy object on the product.
	Don't attempt to perform modification, dismantle or repair.
	Test-run the securely fixed motor isolated from mechanical system to verify normal operation (e.g. rotating direction), and then install it to the machine.
	Securely install the equipment to prevent bodily injury or fire in case of earthquake.
	After correctly connecting leadwires, insulate the live parts with insulator.
	Always keep power disconnected when the power is not necessary for a long time.
	After an earthquake, first verify safety.
	Once power failure occurs or the overtemperature protecting device activates, don't come close to the machine that will unexpectedly start upon recovery of the power. Provide secure mechanism so that the restarting of the machine will not cause personal injury.
	Repair must be performed by Panasonic authorized service shop.
	Before installing, transferring, wiring or mechanically checking product, disconnect the power source.
	The product must be disposed as industrial waste.

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Unpacking

- Verify that the model No. matches the number specified on your order sheet.
- Make sure that any damage in transit is not found.

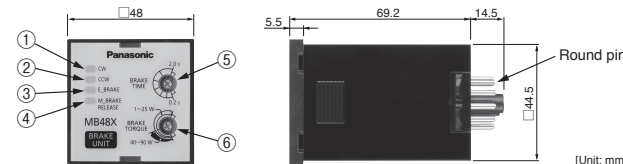
Should you find any discrepancy in the product, consult your local dealer.

Applicable motor

Panasonic small geared motor new G series
Induction motors, reversible motors and single-phase motors with electro-magnetic brake

* The unit cannot be used with Sq.42 mm size geared motor.

External dimensions, names and functions



[Unit: mm]

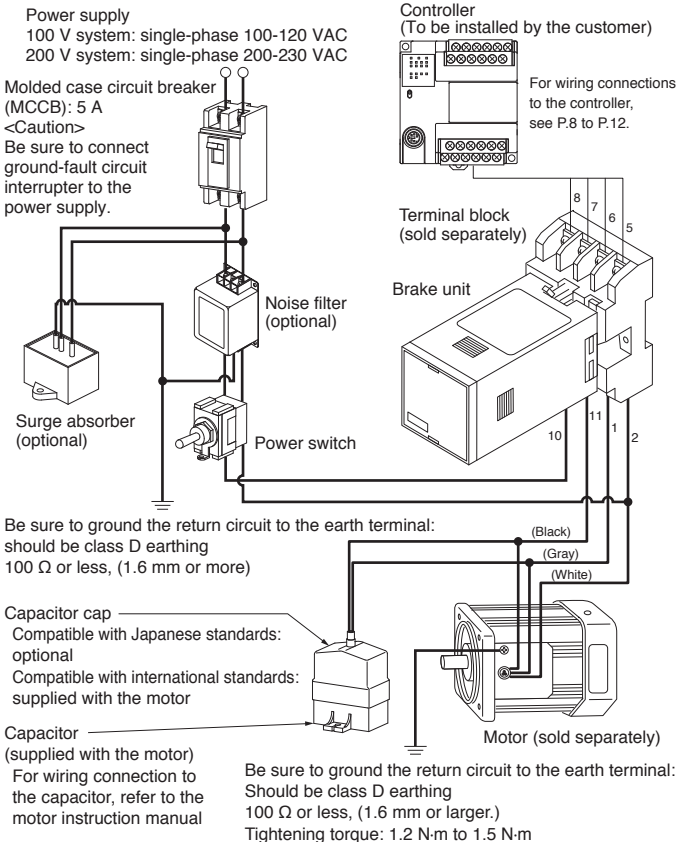
Name	Function
① CW lamp	Lights when motor is turning clockwise when viewed from output shaft.
② CCW lamp	Lights when motor is turning counterclockwise when viewed from output shaft.
③ E_BRAKE lamp	Lights when the electric brake is operating.
④ M_BRAKE RELEASE lamp	Lights when the electromagnetic brake is energized, releasing braking.
⑤ Braking time control	Adjust the operating time of electric brake in response to inertia of the load. For normal braking operation, minimum setting of 0.2 s will do. Since a longer braking time will cause the motor to become hot, shortening its life, the time should be the minimum possible value. The motor frame temperature must be kept below 90 °C.
⑥ Braking torque control	To increase the braking torque, turn the knob CW. For a motor sized between 40 W and 90 W, adjust the torque within the range indicated by the black arrow. Setting beyond the limit will cause malfunctioning or shorten the life of product.



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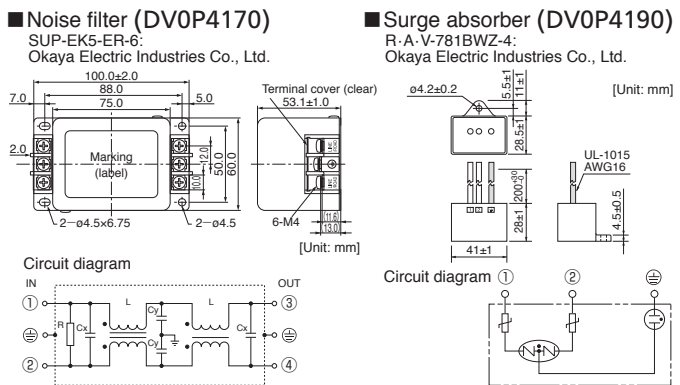
Wiring diagram (for reversible motor)

- The thick solid lines represent main circuit. Use conductor of size 0.5 mm² or larger for the main circuit.
- The thin solid lines represent signal circuit. Use conductor of size 0.3 mm² or larger in the signal line circuit.

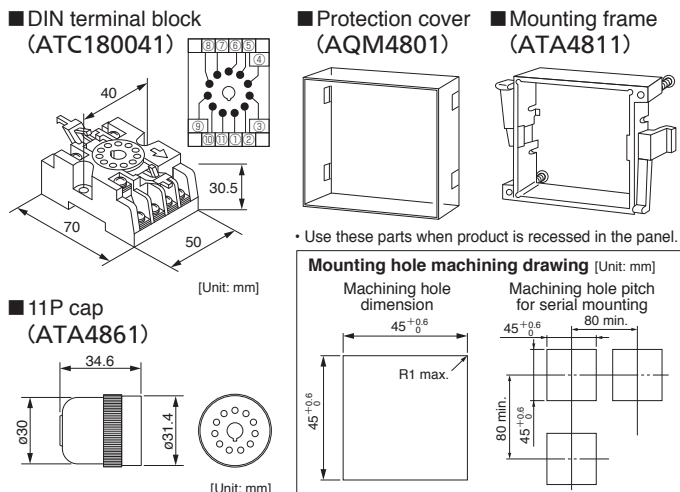


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Options



Recommended parts (Panasonic Industrial Devices SUNX Co., Ltd.)



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Before using the product

Installation location

- Avoid the following locations:
 - Place where the product will be exposed to direct sun light for a long time (e.g. outdoor).
 - Place where the product will be subjected to excessive vibration or shock (5.9 m/s² or more).
 - Place where the product will be exposed to nonnegligible amount of dust and humidity.
 - Place where the product will be exposed to flammable gas or corrosive gas.
 - Place where large amount of static electricity will generate (near forming, powdering or fluid processing facilities).
 - Place where the product is exposed to high electrical field (near radio transmitting device or welder). Provide appropriate shield as necessary.
- When unauthorized person can access the unit, install it in a lockable control board.
- When the unit is installed in the control board, do not place flammable material near the unit.

Considerations for wiring

- Use a terminal block or socket for wiring connection. Do not solder the lead to the round pin.
- When wiring or connecting the unit to the terminal block or socket, turn off power.
- The brake unit is not provided with a protective device: Use overcurrent protection device, ground-fault circuit interrupter, and overtemperature protecting device.
- Wrong wiring will damage the brake unit or cause motor burnout.
- Do not run cables and wirings of the unit in the same or in parallel with those of high capacity electric furnace or welder which controlled by the thyristor, or any other high- power/frequency equipment. Induced noise voltages will cause malfunction.
- In buildings (e.g. mountain lodge and plastic greenhouse) and locations where lightning often hits, connect the surge absorber to the secondary circuit of master circuit of the power distribution board.
Example of surge absorber: R-A-V-781BWZ-4, Okaya Electric Industries Co., Ltd. (Panasonic optional part number: DV0P4190)
- Because the unit is controlled by the thyristor, it may induce electric noise to the radio receiver and wireless equipment. If this is the case, use a noise filter.
Example of noise filter: SUP-EK5-ER-6, Okaya Electric Industries Co., Ltd. (Panasonic optional part number: DV0P4170)
- When the electromagnetic contactor or electromagnetic switch is used, connect voltage-surge suppressor e.g. spark killer across contacts.

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Considerations on power supply

- Be sure to turn off power when it will not be used for a long period.
- When using a transformer or variable transformer, its capacity must be larger than the rated power input of the product, to assure reliable operation.

Operating precautions

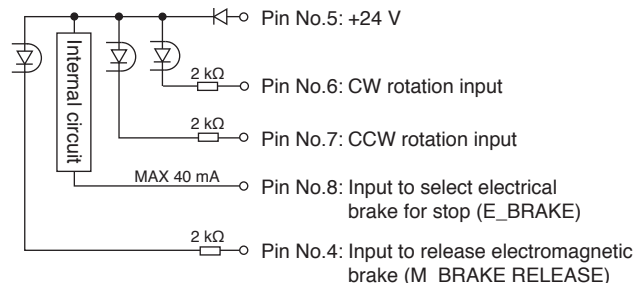
- The motor housing temperature must be kept below 90 °C. The motor frame temperature depends on ambient temperature, loading condition and start/stop cycles. When the frame temperature exceeds 90 °C, replace the motor with a larger size motor. (Measure the motor frame temperature by using thermometer, thermocouple, thermo-tape, etc.)
- The number of start/stop operations should be 6 times/min or less.
- One brake unit must be connected to only one motor.

Considerations on chemical, oil and water

- Do not use the product in atmosphere containing organic solvents such as alcohol, benzoin and thinner; oils such as cutting oil and grease; or strong alkaline materials such as ammonia and caustic soda.
- Prevent intrusion of water or oil. The product is not waterproof.
- Do not operate the unit with bare hands.

For proper use

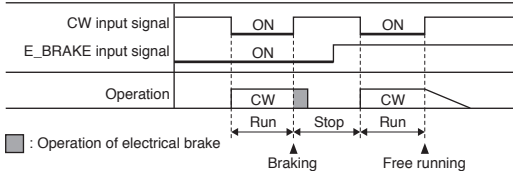
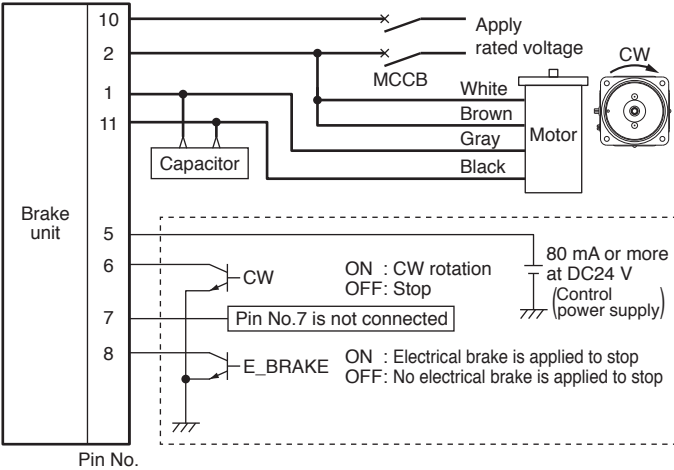
Signal input terminal equivalent circuit



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Standard electrical wiring diagram

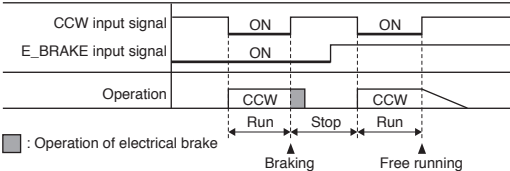
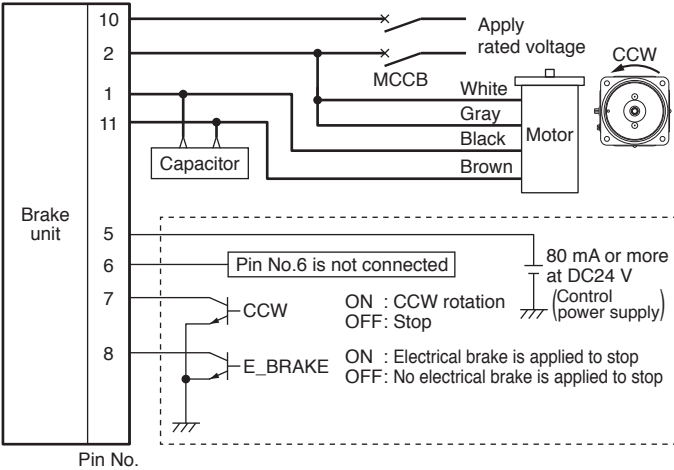
Induction motor (compatible with Japanese standards) CW rotation



- Notes:
- The thick solid lines represent main circuit. Use conductor of size 0.5 mm² or larger for the main circuit.
 - Leave pins 3, 4, 7 and 9 unconnected. (These pins are not isolated from the internal circuit.)
 - According to this wiring diagram, the motor rotates clockwise (CW) when viewed from the end of shaft. Note that output shaft of the gear head may rotate CCW.
 - The CW lamp lights while the motor is running.

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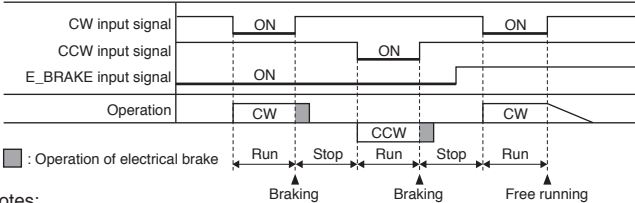
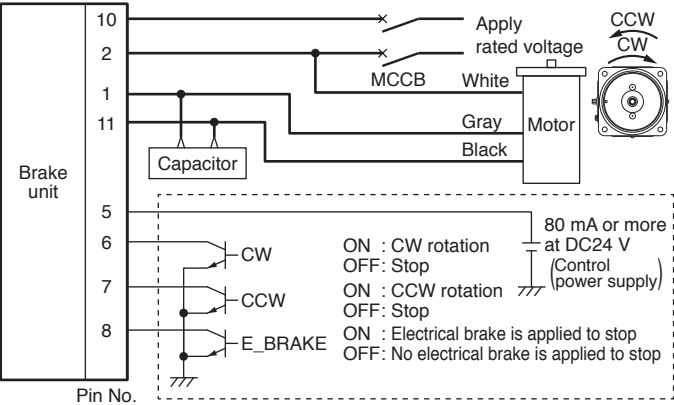
Induction motor (compatible with Japanese standards) CCW rotation



- Notes:
- The thick solid lines represent main circuit. Use conductor of size 0.5 mm² or larger for the main circuit.
 - Leave pins 3, 4, 6 and 9 unconnected. (These pins are not isolated from the internal circuit.)
 - According to this wiring diagram, the motor rotates counterclockwise (CCW) when viewed from the end of shaft. Note that output shaft of the gear head may rotate CW.
 - The CCW lamp lights while the motor is running.

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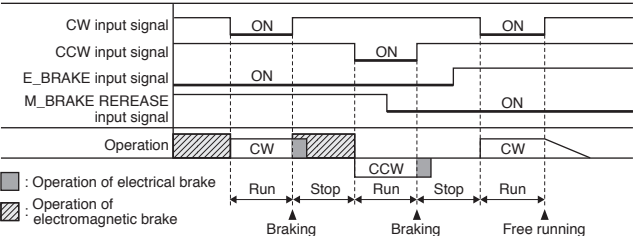
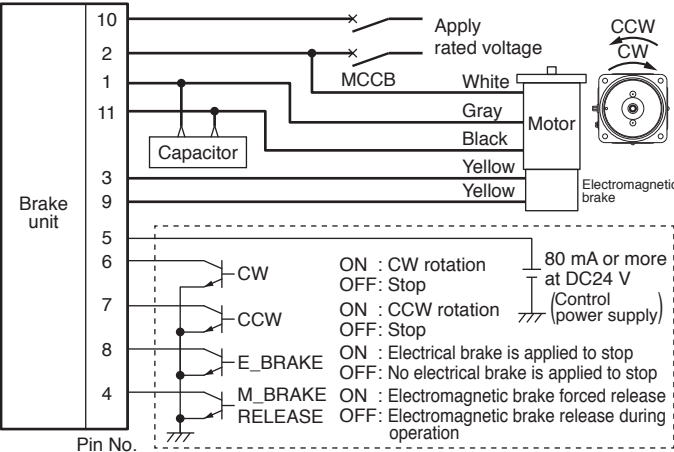
Induction motor (compatible with international standards) Reversible motor



- Notes:
- The thick solid lines represent main circuit. Use conductor of size 0.5 mm² or larger for the main circuit.
 - Do not input CW rotation signal and CCW rotation signal at the same time. Otherwise, both signals cause application of excessive power to the motor to burn out.
 - Do not input rotating direction change signal or the operation instruction while the electrical brake is being applied.
 - Leave the pins 3, 4 and 9 unconnected. (These pins are not isolated from the internal circuit)
 - For the purpose of this diagram, CW and CCW refer to direction of the motor rotation when viewed it from the motor shaft end. Note that output shaft of the gear head may turn in opposite direction.
 - To change the rotating direction of the induction motor, wait until the motor stops completely.

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Single-phase motor with electromagnetic brake



- Notes:
- The thick solid lines represent main circuit. Use conductor of size 0.5 mm² or larger for the main circuit.
 - Do not input CW rotation signal and CCW rotation signal at the same time. Otherwise, both signals cause application of excessive power to the motor to burn out.
 - Do not input rotating direction change signal or the operation instruction while the electrical brake is being applied.
 - For the purpose of this diagram, CW and CCW refer to direction of the motor rotation when viewed it from the motor shaft end. Note that output shaft of the gear head may turn in opposite direction.

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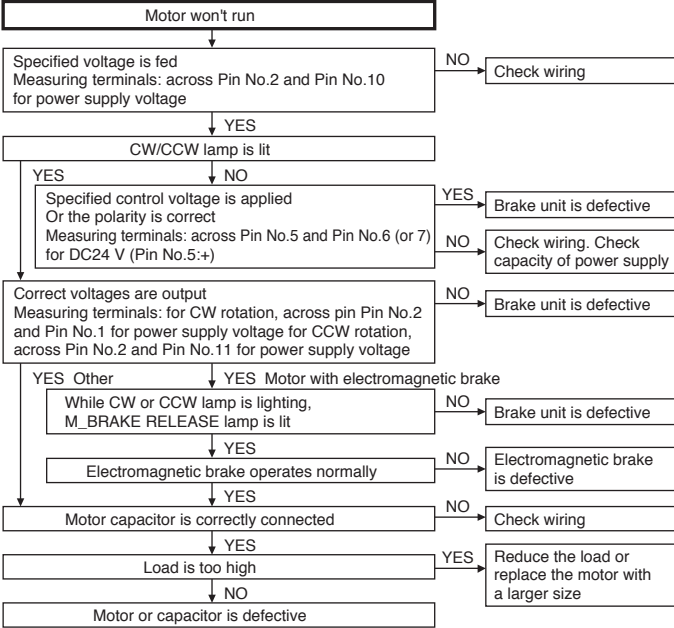
Maintenance

To prevent unpredictable malfunction due to effects of operating environment (temperature, humidity, dust, vibration, etc.) and aging of parts, periodical checking procedure as described below is necessary to assure safe and reliable operation.

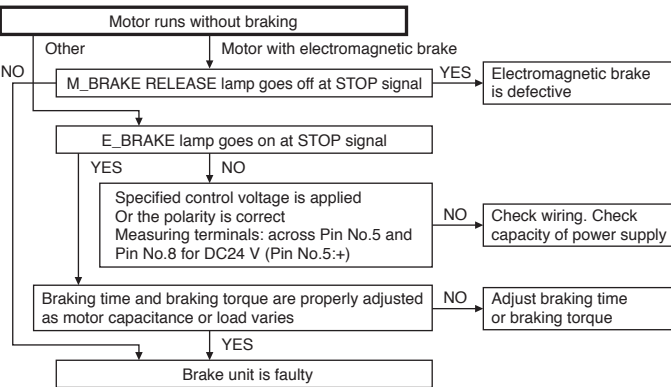
- Check for smooth operation
- Check the motor for abnormal noise
- Check motor temperature
- Replace part that has been used for specified period. Standard life expectancy of the parts is 5 years (not the guaranteed life).

Troubleshooting

If a problem occurs with your system, use the following procedure for locating and removing the cause. In the event the problem cannot be isolated or the unit is suspected, or if you have any questions, please contact us or your local agency.



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Specification

Basic specification	Rated voltage	Single-phase AC100 V to AC230 V
	Allowable power fluctuation range	±10 %
	Power supply frequency	50/60 Hz
	Control input voltage	DC24 V (±10 %)
	Off-state voltage	DC3 V or higher
	Ambient temperature	−10 °C to +40 °C (no freezing) ^{*1}
	Ambient humidity	20 % to 85 % RH (no dewing)
	Altitude	1000 m or lower
	Vibration	5.9 m/s ² or below (10 Hz to 60 Hz)
	Storage temperature, storage humidity	Normal temperature ^{*2} . Normal humidity
Basic function		Run/stop, normal/reverse rotation using the same wiring ^{*3} , instantaneous stop with electric brake, electromagnetic brake control
Braking time setting range		Stepless regulation between 0.2 sec and 2.0 sec
Braking torque regulation		Stepless regulation
Protection degree		IP20 or equivalent
Mass		130 g

^{*1}: Measured at a point 5 cm from brake unit body.
^{*2}: −20 to +60 °C (no freezing) for a short period (a few days) of transportation
^{*3}: Exclude induction motor (compatible with Japanese standards).

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 in case of failure.
- Install a safety device 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 as nuclear energy control, aerospace, transportation, medical equipment, various safety devices, equipment requiring high cleanliness or used under radioactive environment.
- We have been making the best effort to ensure the highest quality of the products. However, application of exceptionally large 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.
- Failure of this product depending on its content, may generate smoke of about one cigarette. Take this into consideration if the machine is used in a clean room.
- Please be careful when using in an environment with high concentrations of sulphur or sulphuric gases, as sulphuration can lead to opening of 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.
- The user is responsible for checking compatibilities of the unit with the equipment to which it is to be installed and associated parts, in various aspects such as configuration, dimensions, characteristics, life expectancy and regulations.

Technical information

- Technical information of this product (Instruction Manual, CAD data) can be downloaded from the following web site.
http://industrial.panasonic.com/ww/i_e/25000/motor_fa_e/motor_fa_e.html

MEMO (Fill in the blanks for reference in case of inquiry or repair.)

Date of purchase		Model No.	DVMB48XZ
Dealer			
	Tel: () —		

Panasonic Corporation, Appliances Company,
Motor Business Division

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