

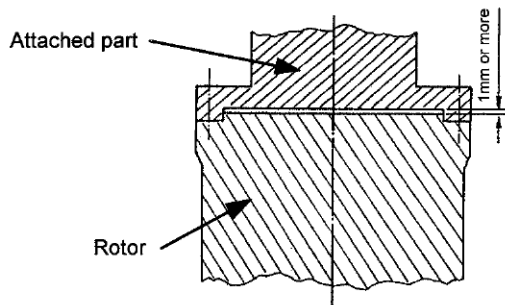
**DD Servo Motor DYNASERV
DM/DR Series Motor + DrvGII Driver**

Contents

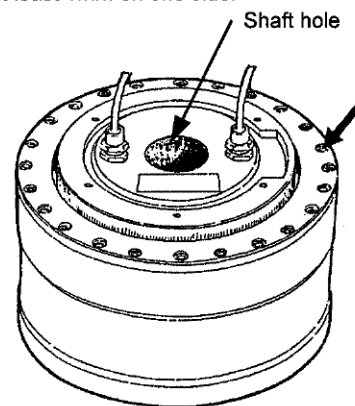
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Handling Precautions

1. Do not install the motor in reverse direction in such a way that the rotor of the motor is fixed and the stator rotates.
2. Make sure to turn the power off before removing the side panel of the driver to set jumpers, etc. Touching the high voltage part inside the driver is dangerous.
3. This motor rotates at a high speed and with a high torque. Take the rotation radius into consideration and pay special attention to the prevention of any dangerous situations that may occur during the operation when a load is attached to the motor.
4. Make sure to ground the ground terminal to earth.
5. When attached a load to the rotor, make sure to keep a clearance of 1 mm or more between the load and the upper surface of the motor in order to maintain the surface precision. Furthermore, never push or squeeze an object into the shaft hole. (See the figure below.)

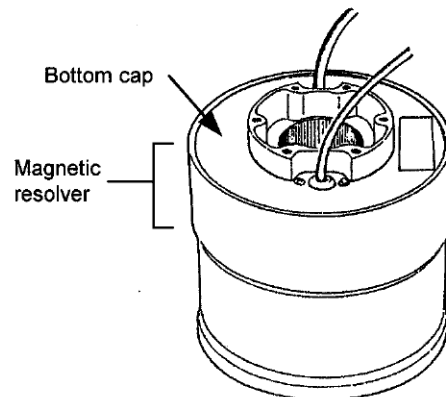


When feeding an object through the shaft hole, make sure to secure a clearance of at least 1mm on one side.



DM series motor

6. Do not touch the bolts (indicated by the arrow) that fix the bottom part of the rotor (see the figure to the right). If these bolts are loosened or tightened, the commutation angle will become inaccurate, which may result in uneven rotation (this applies only to the DM series).
7. The motor surface is magnetized; do not place things that can be affected by magnetism close to it.
8. The motor part shown in the figure to the right includes a magnetic resolver. Strong force, impacts, or magnetic fields should not be applied to the motor part (this applies only to the DR series).
9. Make sure to use load attachment screws that are shorter than the effective depth of the thread in the motor part. Depending on the model, if a screw exceeds the effective thread depth, the function may be impaired (this applies only to the DR series).

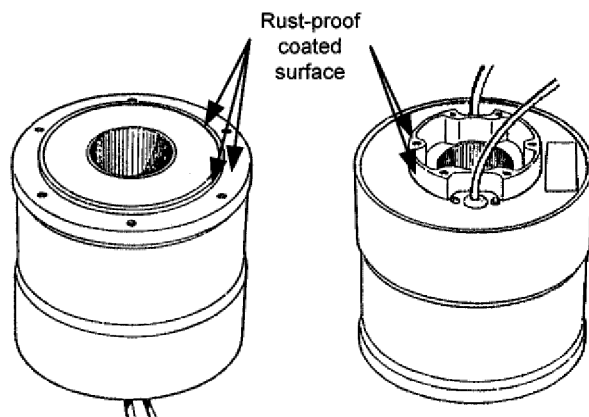


DR series motor

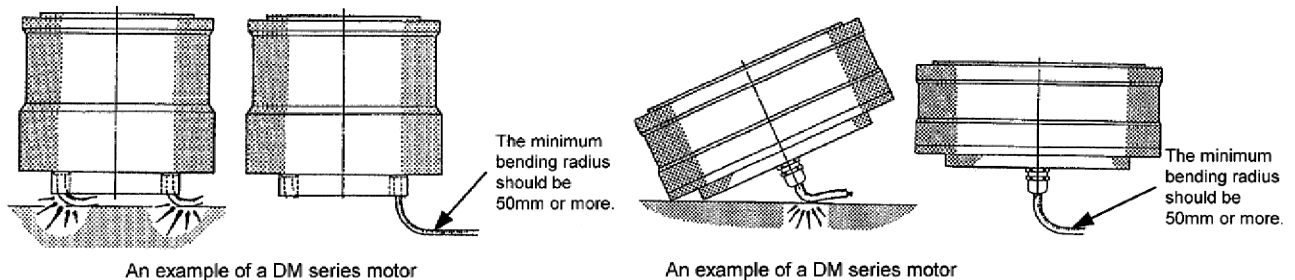
10. The motor is neither dust-, drip- nor water (oil)-proof; the motor should be installed in carefully chosen environments.
11. If the motor will be oscillating or rotating at small angles (50° or less), it should be allowed to oscillate at an angle of 90° or more for approximately 10 times (running-in operation) each time it has made 10,000 small-angle oscillations in order to prevent poor lubrication of the bearing.
12. In order for the motor and driver to be compatible with each other, they must be of the same model.

13. Never attempt to disassemble or remodel the motor and driver. If such service is necessary, please contact us. We assume no responsibility for products that have been disassembled or remodeled without permission.

14. For the DYNASERV DR series motors, a coating has been applied on the load attachment surface of the upper surface of the motor and the stator on the lower surface in order to prevent rust. When starting to use the product, wipe off the coating completely with cloth or paper soaked in a petroleum or chlorine solvent before assembling. If any of the coating remains, it may affect the mechanical precision.

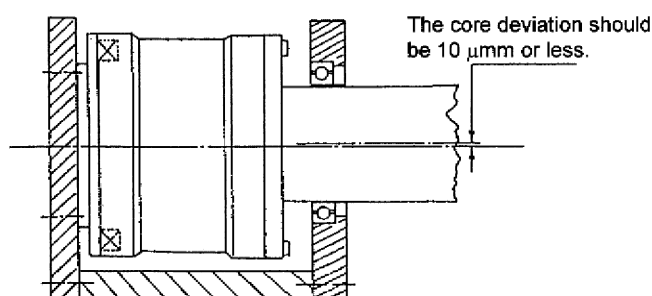


15. Do not place the motor on the floor and other surface in the manner shown in the figure below when carrying and installing the DYNASERV. The cables are crushed by the motor's own weight and the copper wires may be broken inside the cables. If it cannot be avoided to place the motor in such a manner, a support bench should always be placed so that the cables are lifted. Furthermore, if the cables need to be bent when installed in a device, etc., the minimum bending radius should be 50 mm or more. The cables are not strong enough to live up to robot cable specifications, so they should not be bent repeatedly.



16. Do not perform a withstanding voltage test on this device. If such a test is performed without discretion, the circuits may be damaged. If such test must be conducted, make sure to contact us.

17. When connecting the motor with a load, the centerlines of both cores should be aligned to a sufficient degree. Please note that if the deviation between the two cores becomes 10 μ m or more, the bearings inside the motor may be damaged.



18. In the case of UD1B-075□- drive ; Notch filter frequency (**Hz) peculiar to a motor is stuck and displayed on the motor. First of all please set this value as a parameter 153 (frequency notch filter #1) and a parameter 154 (frequency notch filter #2). Then, please tune the servo.

1. Overview of the Product

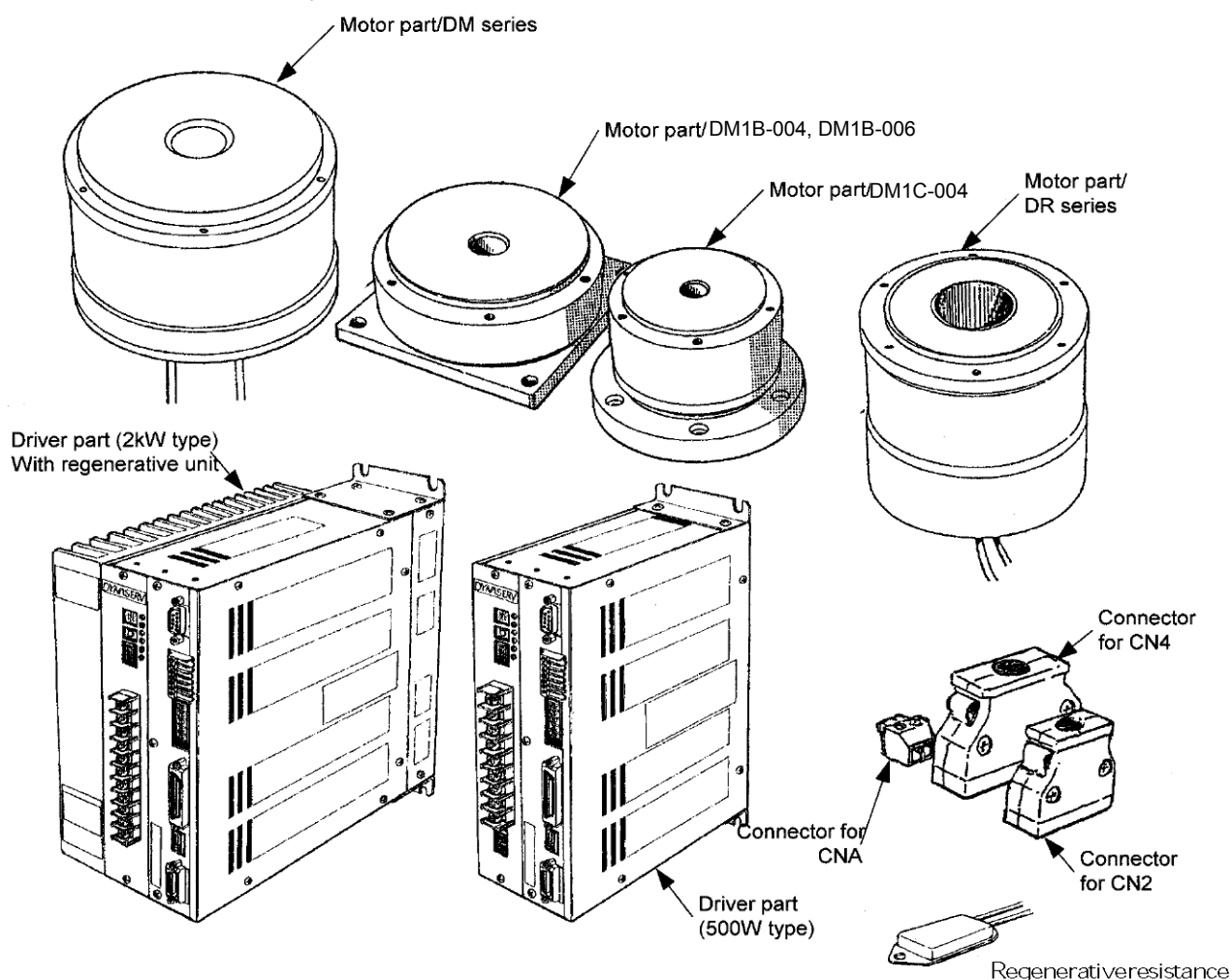
Components of the Standard Product

The standard set of this product is comprised of the following parts. Please check that the type of product is correct, whether or not all the standard accessories are included, and also the quantity supplied.

Part name	Number	Notes
Main body	Motor part	1
	Driver part	1
Standard accessory	Connector for driver CN2	1
	Connector for driver CN4 *	1
	Terminal for driver CNA**	1
Regenerative Resistance	1	80W 60Ω(100V) or 80W 200Ω(200V)

* Supplied for drivers whose interface type is the I/O contact type.

** Supplied only for 500W type drivers with regenerative terminals



Note: The exact shape varies depending on the model you ordered. Refer to the figure showing the outer dimensions for more details.

When you receive the product, you should first verify that the model and type of the product are correct, whether all the accessories are included, and that the combination of a motor and a driver is correct before you begin installation and wiring.

2. Installation of the Motor

The motor part can be installed and used in either a horizontal or a vertical position. However, if installed in a wrong way or position, the life of the motor may be shortened or the motor may fail. Always follow the instructions explained below.

(1) Installation Position

The motor part is designed based on the assumption that it is used indoors. Therefore, choose the location of installation so that it satisfies the following conditions:

- It should be indoors and not in a place where it can be exposed to corrosive and/or volatile gases.
- The ambient air temperature should be from 0 to 45 °C.
- There should not be too much dust or particles, the ventilation should be good, and the humidity should be low.

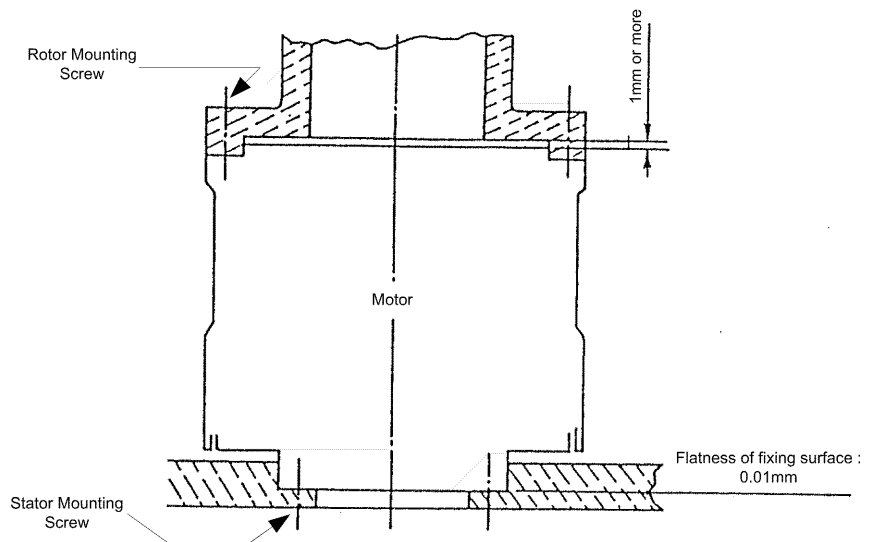
Note: The DYNASERV is not drip- or water (oil)-proof. If it is used in such an environment, a proper drip- or water (oil)-proof cover should be applied.

(2) Mechanical Installation

- When installing a load on the rotor of the motor, make sure to secure a clearance of 1 mm or more between the upper surface of the motor and the installed part in order to maintain the surface accuracy.
- The clamping torque of the screws used to install the rotor and stator of the motor should be equal to or less than the value indicated below.
- The surface flatness where the motor is fixed should be 0.01 mm or less.

Mounting Screw Clamping Torque (maximum)

Motor	Rotor	Stator
DM1A	21N·m	16N·m
DR1A		21N·m
DR1E		
DR5E	11N·m	11N·m
DM1B		
DR1B		
DR5B	6N·m	11N·m
DR5C		
DM1B-004	2N·m	2N·m
DM1B-006		
DM1C-004		



Note: When tightening the screws, make sure to apply a screw lock using Loctite 601 or equivalent product.

3. Installation of the Driver

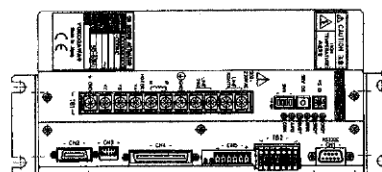
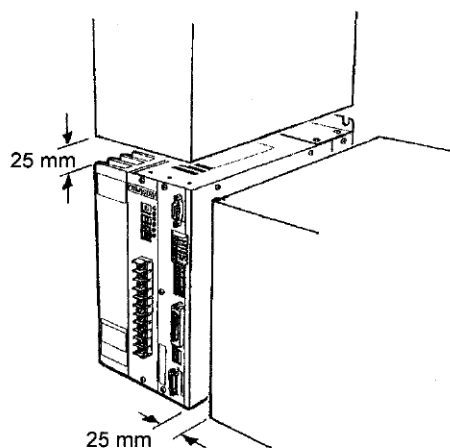
The standard installation method for the driver is either to mount it on a rack or a wall.

(1) Installation Position

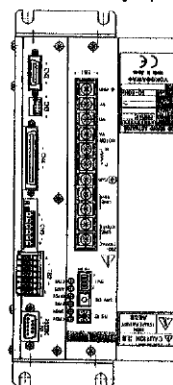
- If there is a heating source near by, the temperature should be prevented from increasing by installing a shielding cover, etc.; the temperature around the driver should not exceed 50 °C (Note 1).
- If there is a source of vibration near by, the rack should be installed via a vibration absorption material.
- In addition to the above, it should be avoided to install the driver in surroundings that are high in temperature and humidity, filled with dust, metal powder, corrosive gas, etc.

(2) Installation Method

- The standard way of installation is to install the driver on a rack, aligning the top and bottom with the front panel in the front. Do not put the panel surface into a sideways position or upside down (see the figure below).
- The driver box employs a natural air ventilation system. Make sure to secure space for ventilation above and below (25 mm or more) and right and left (25 mm or more) (see the figure below).
- Make sure to use the installation holes (four places) of the upper and lower brackets at installation.

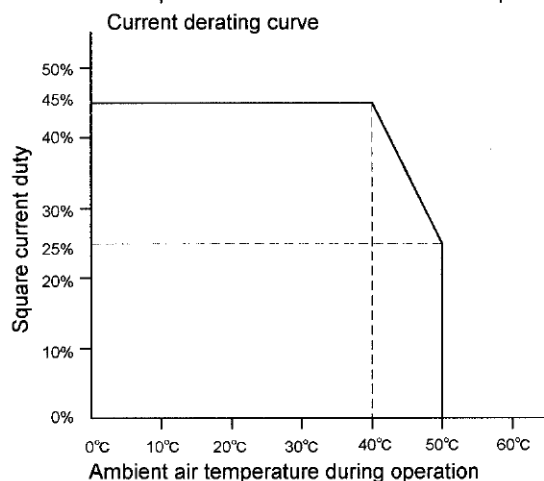


Should not be installed in a sideways position.



Should not be installed upside down.

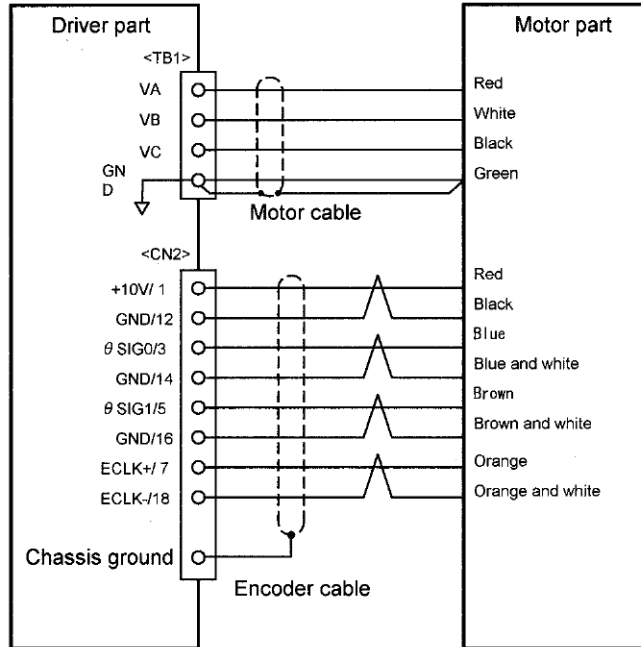
(Note: 1) 2 kW type drivers, but not other types, will have the current characteristics shown in the graph below as a function of the ambient air temperature during operation. Therefore, it is recommended to use the driver in an ambient air temperature of 40 °C or less in order to prolong its life.



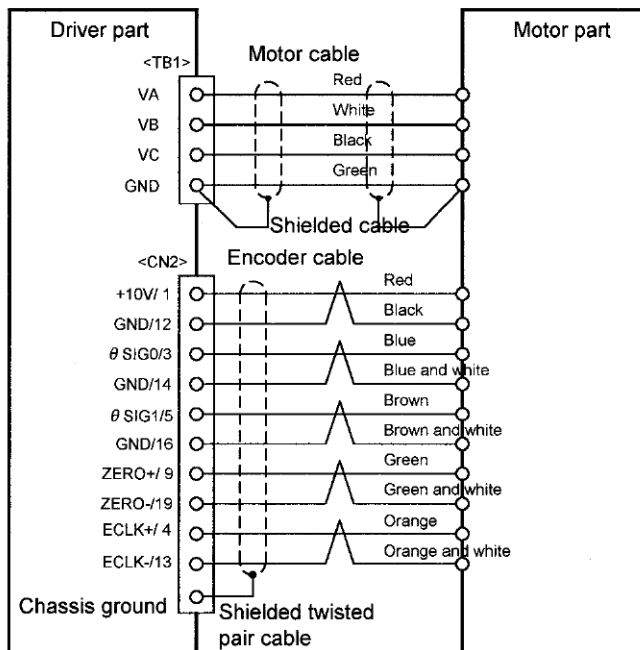
4. Connection between Motor and Driver

Note: Shielding should be applied to each wire.

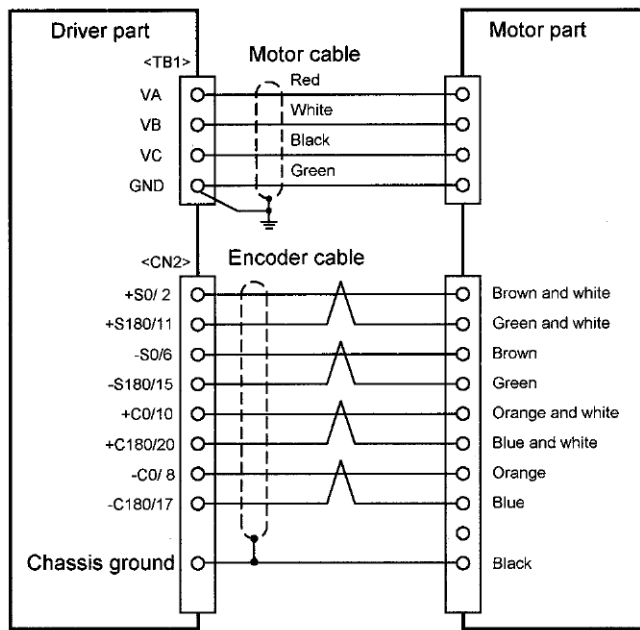
(1) DM Series (DM1B-004, DM1B-006, DM1C-004) motors



(2) DM Series motors (models other than the above)



(3) DR Series motors

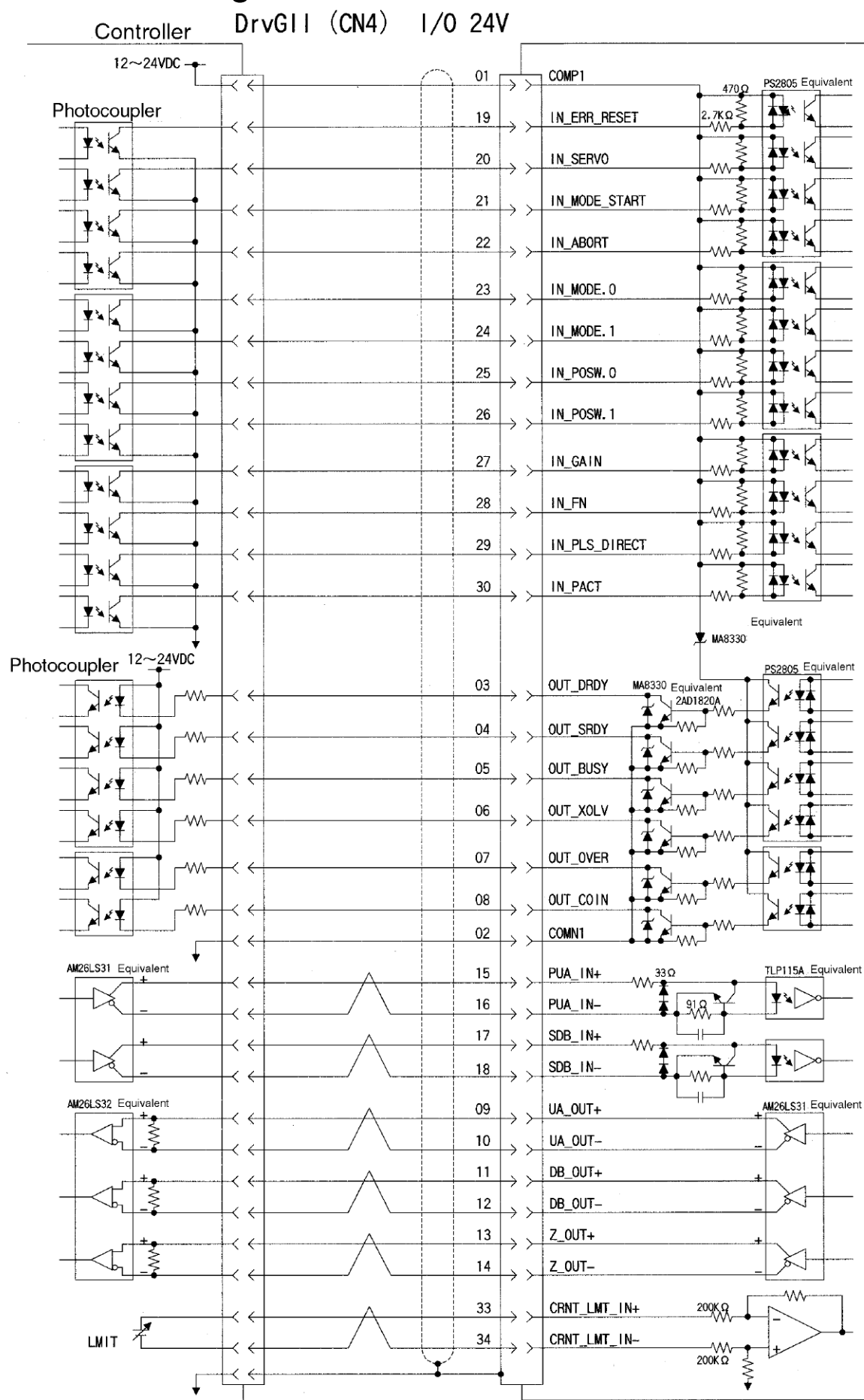


5. Cable specification list

	Cable name	Electric cable size	Driver	Current (A)
1)	AC power supply cable	2.0mm ² or more, 30 m or less in length	TB1	※
2)	Ground cable (power supply)	2.0 mm ² or more	TB1	※
3)	Motor cable	2.0mm ² or more, 30 m or less in length	TB1	※
4)	Sensor brake cable	0.3 to 0.75 mm ²	TB2	
5)	RS232C communication cable	Dedicated cable is required.	CN1	
6)	Encoder cable	0.2 mm ² twisted pair, batch shielded cable, outer diameter ϕ 14 mm or less, 10 m or less in length	CN2	Maximum 100 mA DC
7)	Jumper cable	2.0 mm ² or more		
8)	Analog monitor card	Dedicated cable [R7033YB] is required.	CN3	
9)	Contact I/O (1) cable	0.2 to 0.5 mm ² , batch shielded cable, outer diameter ϕ 9 mm or less, 3 m or less in length	CN4	Maximum 500 mA DC

※ 20A for the A (10") and E (8") types for both the DM and DR series
 15A for the B (6") type, and 10A for the DM1B-004, DM1B-006, DM1C-004 motors.

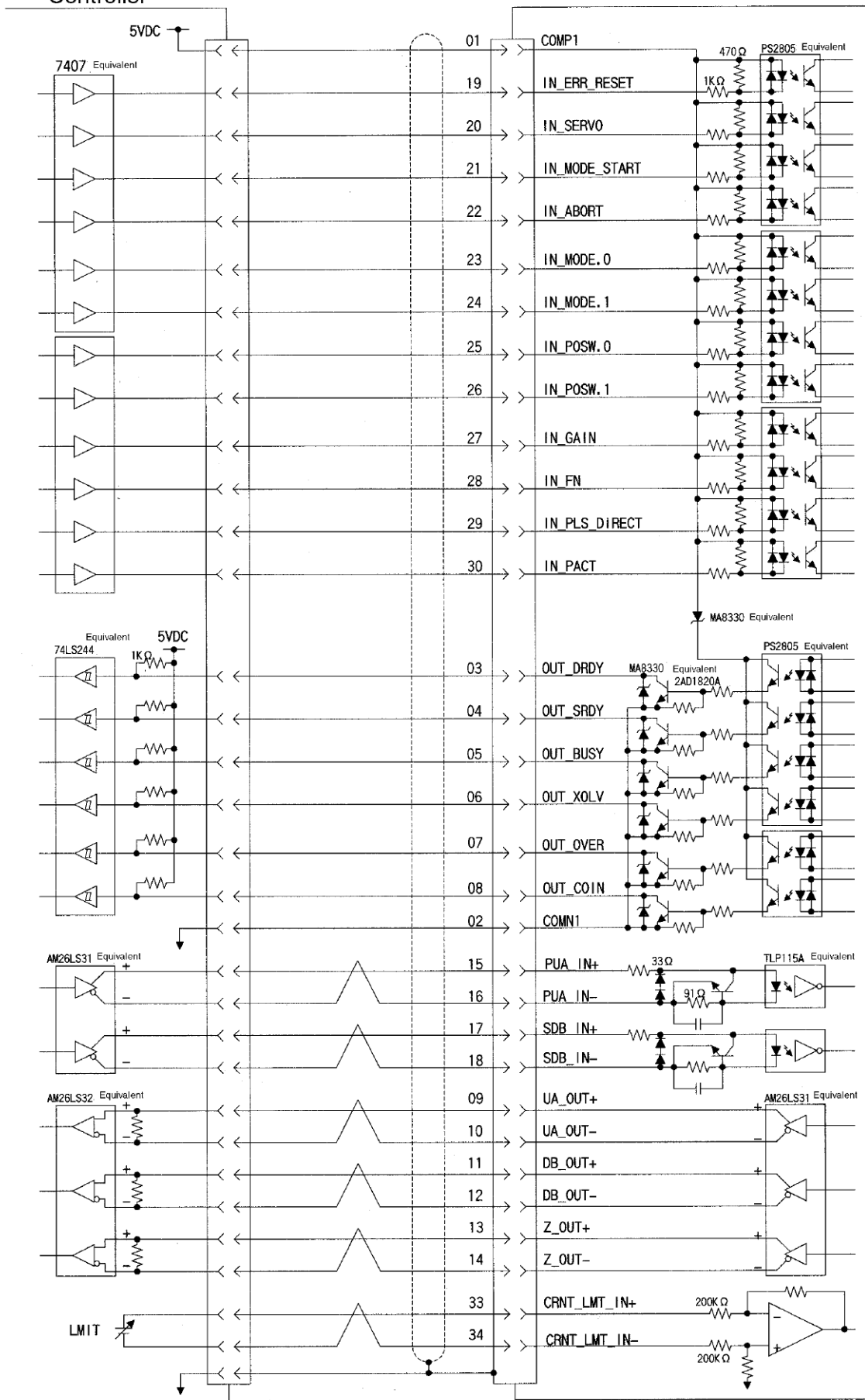
6. CN4 Pin assignment



Must be connect shielded wire to the shell of connector

Controller

DrvG11 (CN4) I/O 5V



Must be connect shielded wire to the shell of connector

7. Maintenance

7.1 Motor Part

Simple daily checks need be performed on the motor part. Check the motor for excessive noise or abnormal vibration.

Do not dismount the motor.

If the motor operates abnormally after 20,000 hours of operation or five years since installation, depending on the environment and conditions used, replace the motor, and also the servo driver if necessary.

7.2 Driver Part

There is no need for a daily maintenance and inspection of the driver part. However, it is prudent to clean the driver unit periodically to protect it from dust or particles since they may damage insulation.

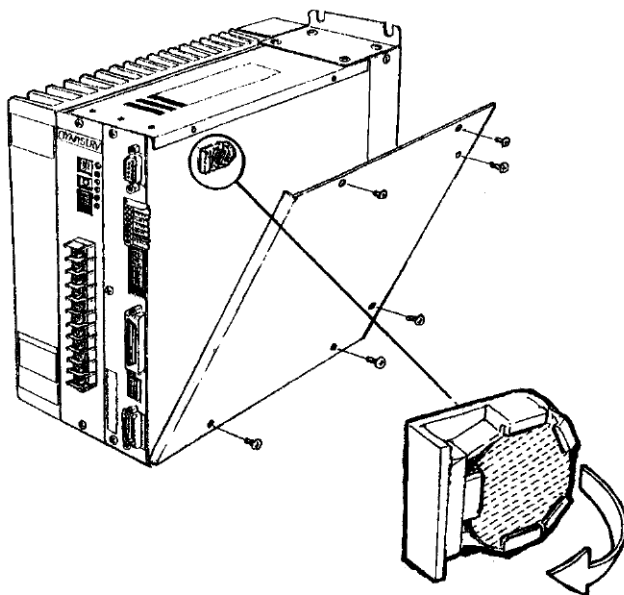
7.3 Replacing the Battery for Memory Backup

A lithium battery is provided inside the driver in order to store parameter data in memory. The life span of the lithium battery is normally 20,000 hours.

When the battery reaches the end of its life, an alarm signal will be displayed. When this happens, replace the battery as soon as possible.

The following describes the procedure used to replace the battery:

- 1) Back up parameters, programs, cam data and other important data stored in memory to flash ROM before replacing the battery. (For details on memory backup, see Technical Information)
- 2) Turn OFF the power.
- 3) Remove the six screws located on the side panel of the driver. (See the figure below.)



- 4) Replace the battery quickly (within 10 seconds).
- 5) Check the connection and turn ON the power. If no error is displayed, the battery has been replaced correctly.

Note 1: If a battery error is displayed, it is necessary to reset the system after replacing the battery. In this case, parameters and other data must be set again.

Note 2: Be sure to use ≤CR2032> 3V or equivalent battery. Be careful on the front and back orientation of the battery.

7.4 Motor Problems and Corrective Actions

When an abnormality occurs during motor operation, first check the LED display on the front panel of the driver. If the cause of the problem cannot be determined by the indication of the LED display, take an appropriate corrective action as provided below.

If the driver is still not be able to return to a normal operating condition despite corrective actions taken, stop operating the drive and contact us.

Problem	Possible cause	Item(s) to be inspected	Corrective action
The motor does not servo-lock.	◆ No AC power is being supplied.	Check the wiring.	Turn on the power.
	◆ The servo ON terminal is set to H.	Inspect.	Set to L.
	◆ The Servo ON disable (SRVDS) button is being pressed.	Inspect.	Release the button.
	◆ Position control bandwidth, velocity control bandwidth, and/or position integral limiting value are too small.	Inspect.	Adjust to the proper value(s) or perform auto-tuning.
The motor does not start.	◆ Motor is overloaded.	Check to see if the motor operates without any load.	Reduce the load or replace a motor with higher torque if the motor starts.
	◆ Incorrect external wiring	Inspect the wiring.	Refer to the connection diagram and connect correctly.
	◆ Position control bandwidth, velocity control bandwidth, and/or position integral limiting value are too small.	Inspect.	Adjust to the proper value(s) or perform auto-tuning.
The motor rotation is unstable.	◆ Improper connections	Check the motor connections in phases A, B, C, and GND.	Refer to the connection diagram and connect correctly.
	◆ Incorrect motor/driver model combination	Check the model numbers on the rating nameplates.	If the combination is incorrect, change to the correct combination.
The motor overheats.	◆ Ambient temperature is too high.	Check if the ambient temperature is above 45°C.	Lower the ambient temperature to 45°C or less.
	◆ Motor is overloaded.	Check to see if the motor operates without any load.	Reduce the load or replace a motor with higher torque if the motor starts.
Abnormal sounds are generated.	◆ Improper mounting	Mounting screws are loosened.	Tighten the screws.
	◆ Bearing problem	Check for abnormal sound and vibration from the bearings.	Motor replacement is necessary. (Contact us.)
	◆ Mounting base vibration	Check the mounting base.	Reinforce the mounting base.
Motor torque is too small.	◆ Incorrect motor/driver model combination	Check the model numbers on rating nameplates.	If the combination is incorrect, change it to the correct combination.
	◆ Motor is overloaded.	Check the OVL error signal.	Review the operation. Reduce the load.
	◆ Position control bandwidth, velocity control bandwidth, and/or position integral limiting value are too small.	Inspect.	Adjust to the proper value(s) or perform auto-tuning.
Motor runs out of control.	◆ Incorrect motor/driver model combination	Check the model numbers on rating nameplates.	If the combination is incorrect, change it to the correct combination.
	◆ Improper connections	Check the motor/encoder connections	Refer to the connection diagram and connect correctly.

In the case of UD1B-075□- drive ; Notch filter frequency (**Hz) peculiar to a motor is stuck and displayed on the motor. First of all please set this value as a parameter 153 (frequency notch filter #1) and a parameter 154 (frequency notch filter #2). Then, please tune the servo.