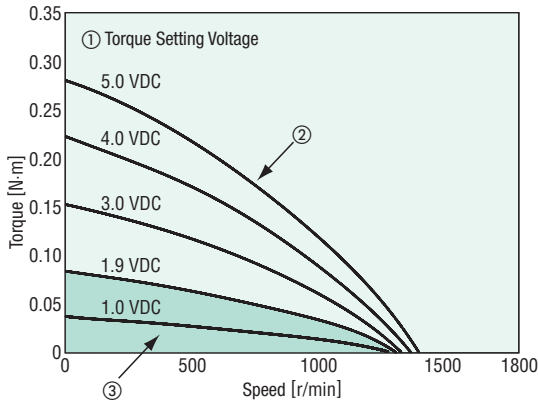


# How to Read Speed – Torque Characteristics Diagram

The **TM** Series changes its speed – torque characteristics when the setting value of the internal or external torque potentiometer or external DC voltage is changed.

Characteristics of each product are shown below.

## Speed – Torque Characteristics Example



### ① Torque Setting Voltage

The setting value when a DC power supply of 0 to 5 VDC is used with the external voltage select switch set to the "5 V" position. \*

## Torque Setting Method

Torque is set using the internal torque potentiometer, accessory external torque potentiometer (**PAVR-20KZ**) or external DC voltage.

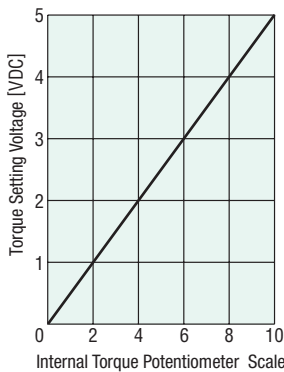
### Setting by Internal Torque Potentiometer

When the INT/EXT switch input is "OFF," motor torque can be adjusted using the internal torque potentiometer. The relationship of internal torque potentiometer scale – torque characteristics (representative values) can be checked as follows:

- Using the graph below, check the torque setting voltage corresponding to each scale on the internal torque potentiometer.
- Based on the torque setting voltage\*<sup>1</sup>, check the corresponding motor torque from the speed – torque characteristics\*<sup>2</sup>.

1 The value when the external voltage select switch is set to the "5 V" position.  
2 Refer to the specifications pages of respective products.

→ Page A-168, Page A-170, Page A-172, Page A-174



Internal Torque Potentiometer  
(No scale numbers are indicated on the actual unit.)

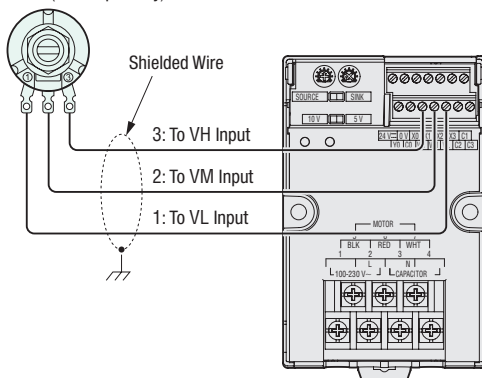
Internal Torque Potentiometer Scale – Torque Setting Voltage Characteristics (Representative values)

### Setting by External Torque Potentiometer

When the INT/EXT switch input is "ON," motor torque can be adjusted using the accessory external torque potentiometer (**PAVR-20KZ**).

Connect the external torque potentiometer as follows.

External Torque Potentiometer  
**PAVR-20 KZ** (Sold separately)



### ② Service Rating: 5 minutes

If the torque setting voltage is 5.0 VDC, the service rating is 5 minutes.

The rated time is determined by the permissible temperature of the motor.

### ③ Service Rating: Continuous

The range where the motor can be used continuously. The torque setting voltage that permits continuous motor operation varies from one product to another. Check the specific voltage for each product in the specifications table.

If torque is set using a method other than a DC power supply of 0 to 5 VDC, convert the relevant characteristics to torque setting voltages and check them on the characteristics diagram.

#### ● Use the internal torque potentiometer

You can check the relationship of potentiometer scales and torque setting voltages from the internal torque potentiometer scale – torque setting voltage characteristics on page A-184.

#### ● Use the external torque potentiometer

You can check the relationship of potentiometer scales and torque setting voltages from the external torque potentiometer scale – torque setting voltage characteristics on page A-184.

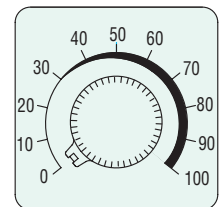
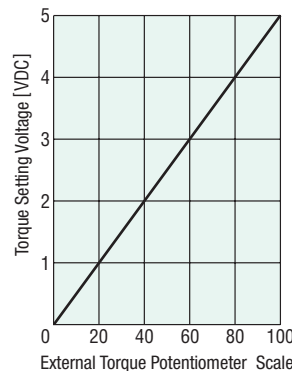
● When using a DC power supply of 0 to 10 VDC by setting the external voltage select switch to the "10 V" position, the torque setting voltage is twice what it is when a power supply of 0 to 5 VDC is set.

The relationship of external torque potentiometer scale - torque characteristics (representative values) can be checked as follows:

- Using the graph below, check the torque setting voltage corresponding to each scale on the external torque potentiometer.
- Based on the torque setting voltage\*<sup>1</sup>, check the corresponding motor torque from the speed – torque characteristics\*<sup>2</sup>.

1 The value when the external voltage select switch is set to the "5 V" position.  
2 Refer to the specifications pages of respective products.

→ Page A-168, Page A-170, Page A-172, Page A-174

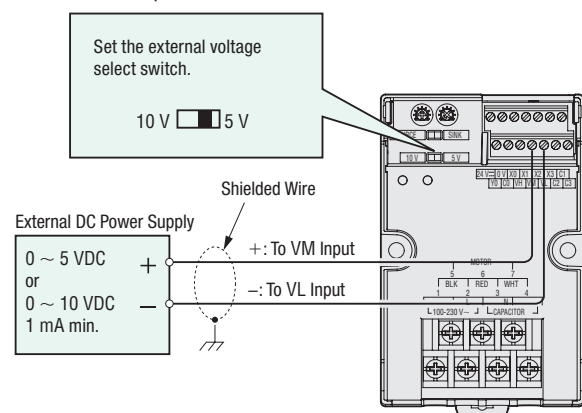


External Torque Potentiometer  
**PAVR-20KZ**

External Torque Potentiometer Scale – Torque Setting Voltage Characteristics (Representative values)

### Setting by External DC Voltage

Set the external voltage select switch on the power controller according to 5 VDC or 10 VDC input voltage from the external DC power supply used. The initial setting is the "5 V" position. The INT/EXT switch input should be "ON."



The torque setting voltages of respective products in the specifications tables and speed – torque characteristics are values when the external voltage select switch is set to the "5 V" position. If the external voltage select switch is set to the "10 V" position, each torque setting voltage becomes twice the corresponding value at 5 VDC.