Best Motors for Transport Vehicles

**BLV Series** Brushless Motors for Smooth Travel, Reduced Size, High Load Capacity, and High Towing Capacity

The demand for using machines to automate simple operations is increasing more than ever.

In particular, many transport vehicles have been used for transport operations in factories and warehouses.

Our **BLV** Series brushless motors satisfy the needs of AGVs and other transport vehicles for speed stability and load capacities.

With capabilities designed for transport vehicles, these motors can contribute to higher operational efficiency at your facilities.
Prevents weaving while offering smooth travel

High speed stability
The speed difference between the left and right wheels may cause the transport vehicle to weave. A motor with less speed fluctuations can reduce the speed difference between the left and right wheels and helps prevent weaving.

Stable speed while traveling down a slope
The vector control delivers stable speed control when the vehicle travels down a slope.

Compact design as well as high load capacity and high towing capacity

Space-saving gear and motor directly connected to the drive shaft
The compact motor features high-rigidity gears that can be directly connected to the drive shaft without using a connecting part, which helps minimize equipment footprint.

High torque and high permissible radial load
The gear motor delivers high torque and high permissible radial load thanks to the rigid gear case design and larger diameter gear bearing.

Wide Travel Speed Range
Motor shaft speed 80* ∼ 4000 r/min
Fast torque increase and high response. This mechanism ensures that the motor drives at a stable speed over its entire speed range from low to high.

*These specifications apply when an OPX-2A control module (sold separately) or communication is used for data setting.
Precision Stopping and Braking Function

Deceleration Control for Precision Stopping

The motor can be decelerated to a stop. Decelerating the motor to a stop can prevent shock to the equipment or load on the transport vehicle and improve stop position accuracy.

### Table: Deceleration Control for Precision Stopping

<table>
<thead>
<tr>
<th>Vehicle speed before stopping</th>
<th>(motor shaft speed)</th>
<th>Overrun amount after stop command is entered</th>
</tr>
</thead>
<tbody>
<tr>
<td>62.76 m/min</td>
<td>[ 3000 r/min ]</td>
<td>335 mm</td>
</tr>
<tr>
<td>10.5 m/min</td>
<td>[ 500 r/min ]</td>
<td>7.95 mm – 9.21 mm</td>
</tr>
<tr>
<td>1.68 m/min</td>
<td>[ 80 r/min ]</td>
<td>0.83 mm – 1.88 mm</td>
</tr>
</tbody>
</table>

※ This is a reference value obtained by converting the overrun amount on the motor shaft into the overrun amount on the wheel.

### Diagram: Deceleration Control for Precision Stopping

Stopping and Holding with Electromagnetic Brake

Use a motor with a built-in electromagnetic brake to securely hold the stop position of the vehicle while transferring or processing the load.

### Diagram: Stopping and Holding with Electromagnetic Brake

In addition, the electromagnetic brake can also be used for vertical operation.

Corresponding to Battery Supply Fluctuations

Actions Corresponding to Battery Voltage Fluctuations

A limit is placed on the max. speed according to the input voltage to prevent the motor from stopping due to a dead battery. When the power supply voltage falls below the set level, a warning is output. This warning can prevent the motor from stopping due to a voltage drop and can be used as an indication to recharge the battery.

### Diagram: Actions Corresponding to Battery Supply Fluctuations

Wide operating voltage range

Continuous operation with reduced speed

Network Compatible

Supported Communication Protocol

Wheels on the transport vehicle, conveyor on the transport vehicle, and other axes of motion can be integrated into one system.

### Diagram: Supported Communication Protocol

Only the BLV Series can be connected when the network converter is used.

Other Functions

Torque Limiting Function

The output torque can be limited to prevent damage to the mechanism or motor. Also, TLC signals are output when the set limiting value is reached. The signals are detected and utilized on the PLC side.

### Diagram: Torque Limiting Function

Alarm Output/Warning Output/Monitoring Function

**Alarm**

- Stops the operation and outputs signals
  - Overload, overheat, undervoltage, etc.

**Warning**

- Outputs signals when a desired value is reached before an alarm is issued
  - Circuit overheat, undervoltage, overload, etc.

**Monitoring**

- Outputs various motor statuses *
  - Actual motor speed, load factor, I/O, alarm, etc.
Selection Examples

<<Selection Conditions>>

- Weight capacity m = 500 kg
- Wheel diameter r = 200 mm x dual axis
- Wheel friction coefficient u = 0.01
- Acceleration/deceleration time t1 = 5 sec
- Traveling speed t2 = 60 m/min

- The tire weight is 2 kg/shaft

<<Selection Result>>

BLV Series 200 W/Gear ratio 30
(Product name: BLV620NM30F)

Other DC Input Products

Suitable for Space Saving Devices

BLH Series Brushless Motors

- Analog, RS-485*, or Digital Setting* type drivers. 24 VDC board type driver suitable for devices that require a space-saving design.
- Output: 15/30/50/100 W
- Speed Control Range: 100~3000 r/min
- Speed Regulation: ±0.5% (±0.2% Digital driver)
- Speed Setting Method: Potentiometer/external DC voltage/Software

- Available for 15, 30, 50 W motors only

Higher Precision Stopping Capability

Hybrid Control System αSTEP AR/AZ Series (DC input)

- Consider the stepper-motor-based hybrid control system “αSTEP” if precision stopping capability higher than brushless motors is required. The “αSTEP” features high responsiveness with the positioning accuracy of ±0.05° or less. With AZ Series, its battery-less absolute sensor <ABZO> achieves control that does not require any external sensors. It is equipped with an interface connectable with various host systems and a built-in pulse generator function. A simple sequence can be set and executed without PLC.

BLV Series Product Specifications

<table>
<thead>
<tr>
<th>Speed Control Range</th>
<th>(80°) 100~4000 r/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed Regulation (Load)</td>
<td>±0.5% (±0.2%)</td>
</tr>
<tr>
<td>Output Motor Frame Size</td>
<td>100 W/90 mm, 200 W/104 mm, 400 W/104 mm</td>
</tr>
<tr>
<td>Power Supply</td>
<td>100 W 24 VDC, 200 W 24 VDC, 400 W 48 VDC</td>
</tr>
<tr>
<td>Electromagnetic Brake</td>
<td>Available</td>
</tr>
<tr>
<td>Speed Setting Method</td>
<td>Potentiometer, External DC Voltage, Network RS-485 communication</td>
</tr>
<tr>
<td>Speed Output Type</td>
<td>Resolution: 30 p/r, Type: Pulse output, network</td>
</tr>
<tr>
<td>Torque Limiting</td>
<td>Can be set between 0~200% of rated torque</td>
</tr>
</tbody>
</table>

*The value when OPX-2 is used.

When the motor shaft is rotated by an external force while the vehicle is traveling down a slope or in case of a sudden stop, regenerative energy is generated. Because the driver is not equipped with a function that processes regenerative energy, the protective function for the power supply and driver may be activated. Use the power supply or battery with adequate output capacity and overvoltage tolerance.

Quick & Easy AGV Motor Sizing Tool

Available Online

Simply input your parameters, and the motor sizing tool will calculate your torque, speed, and load inertia requirements for your specific AGV. A detailed report can also be generated.

If you need help with product selection, our knowledgeable technical support engineers will be happy to assist.

1-800-GO-VEXTA (468-3982) (M-F 7:30am CST to 5:00pm PST)