

# **Brushless Motor Troubleshooting: Rotating at an unintended speed**

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- (1) In order to ensure a safe use of the system, please refer to the operating manuals and operating instructions for each device such as "Safety Precautions" and "Safety Essentials". Please check the contents before use.
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- (3) The information contained in this document is as of August 2021.  
The information in this document is subject to change without notice.
- (4) This document describes the malfunction of the equipment and does not cover the individual operation, installation or wiring methods. For further information, other than the malfunction of the equipment, please refer to the operating manual of the product or contact the manufacturer for more information.

## Problem: Rotating at an unintended speed

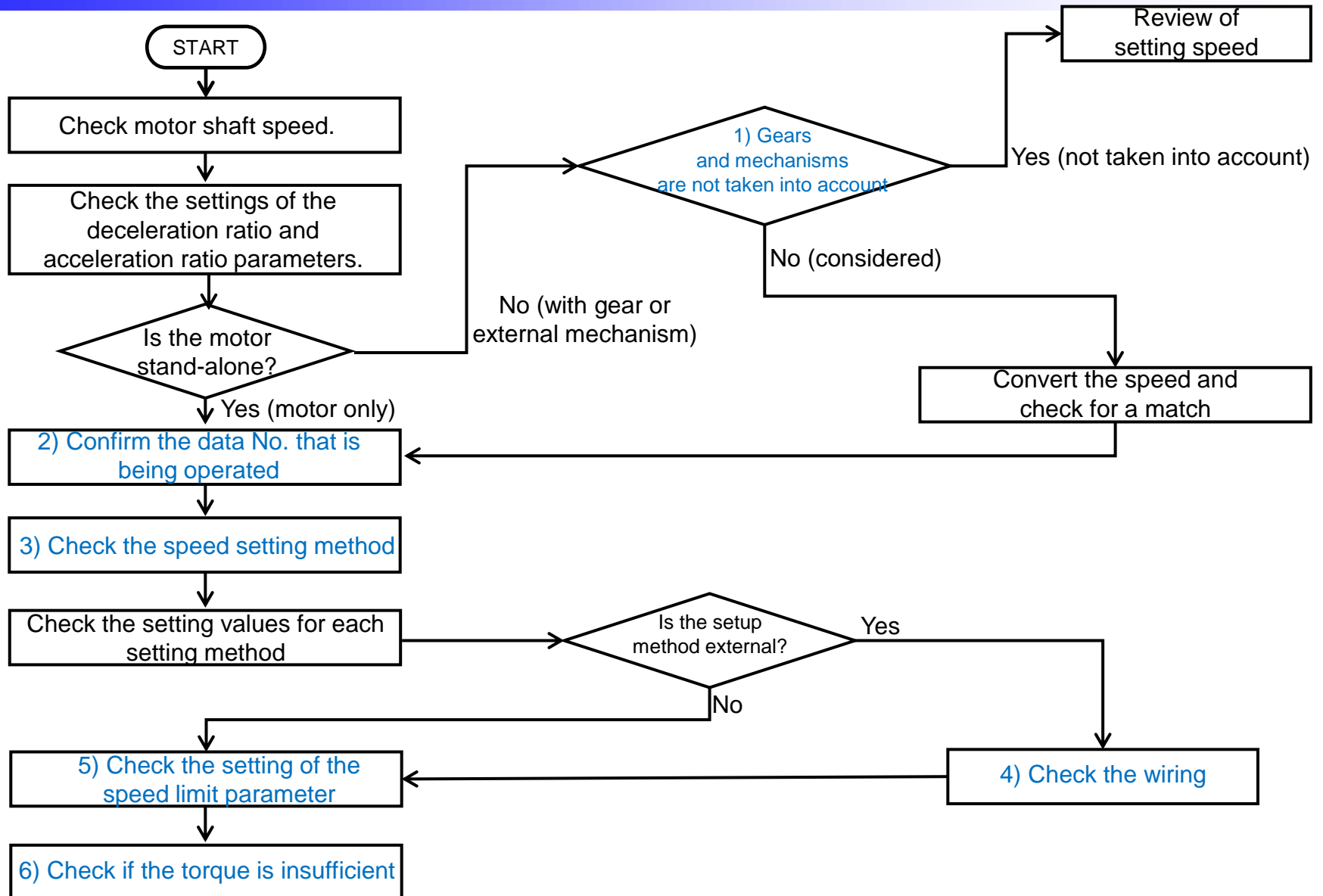
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If the motor rotates at an unintended speed, the cause could be

- 1) Gears or external mechanisms are not taken into account.
- 2) The data No. in operation is different from the assumption.
- 3) The speed setting method is different from the intended method.
- 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.
- 5) Speed limit is set.
- 6) Insufficient torque.

If the motor does not run, please refer to the troubleshooting section “The motor does’nt run”.

# What to do if the motor rotates at an unintended speed



## Prior confirmation

### Check the motor shaft speed

If the motor rotates at an unintended speed, first check the speed of the motor shaft. BL motors have feedback information from the motor, so you can check the motor shaft rotation speed. Since the method of checking the rotation speed and operation differs depending on the series, please refer to the instruction manual for details.

	BMU	BLE2	BLH			BLV
			Analogue	Digital	RS-485	
Control Panel	●	●	-	●	●	-
MEXE02 Support Software	-	● (USB-mini-B)	-	● (USB-mini-B)	● (USB-mini-B)	● (special cable)
OPX-2A Data Setting Device	-	-	-	-	-	●
Via Network	-	-	-	-	●	●

Dedicated communication cable: CC05IF-USB.

When checking the control panel or OPX-2A, also check that the deceleration ratio and acceleration ratio parameters are not set.

# Prior confirmation

## Example: BLE2 Series (MEXE02 Status Monitor)

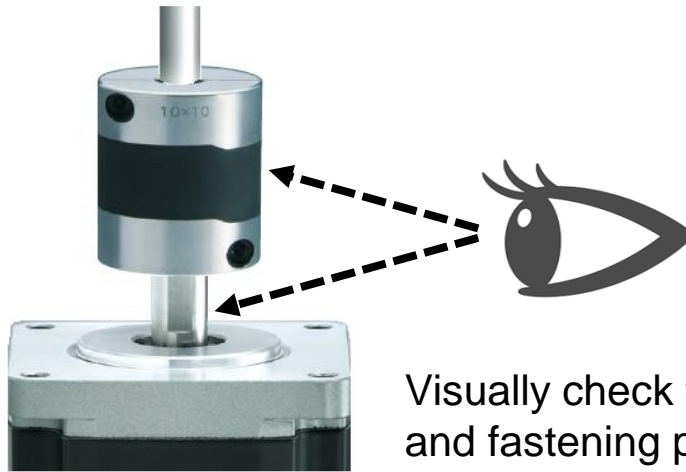
New1 | BLE2 [AC] - Status monitor
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Start Status Monitor

Command speed (motor shaft)	<input type="text" value="0"/>	[r/min]	<b>Actual Speed(Motor)</b>	<input type="text" value="0"/>	[r/min]
Command speed (gearhead shaft)	<input type="text" value="0"/>	[r/min]	Actual Speed(Gear)	<input type="text" value="0"/>	[r/min]
Gear ratio	<input type="text" value="0.00"/>		Operation Number	<input type="text" value="0"/>	
Speed increasing ratio	<input type="text" value="0.00"/>		Load Factor	<input type="text" value="0"/>	[%]
Main circuit DC voltage	<input type="text" value="0"/>	[V]	External analog setting devices	<input type="text" value="0.0"/>	[V]
Elapsed time from BOOT	<input type="text" value="0"/>	[ms]	Driver temperature	<input type="text" value="0.0"/>	[°C]
Odometer	<input type="text" value="0.0"/>	[kRev]	Tripmeter	<input type="text" value="0.0"/>	[kRev]

Present
Past

If the motor shaft speed is normal, the speed may not match due to a problem on the mechanism side. Check the output shaft of the motor and the fastening part of the mechanism, and make sure that both are rotating.



Visually check the condition of the motor output shaft and fastening parts.

**If the output shaft of the motor is rotating and the fasteners and mechanical parts such as couplings are not rotating**

It may be a mechanical problem such as a loose fastener or a missing key. Please review the mechanism side such as tightening again.

If the motor output shaft is not rotating, check the other items.

## Problem: Rotating at an unintended speed

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If the motor rotates at an unintended speed, the cause could be

- 1) **Gears or external mechanisms are not taken into account.**
- 2) The data No. in operation is different from the assumption.
- 3) The speed setting method is different from the intended method.
- 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.
- 5) Speed limit is set.
- 6) Insufficient torque.

If the motor does not run, please refer to the troubleshooting section “The motor doesn't run”.



## 1) Gears or external mechanisms are not taken into account

If the speed does not match the intended speed with gears or external mechanisms attached, please check the following two items first.

<Please check>

1. Is the speed set in consideration of gears and external mechanisms?
2. Is the speed converted from the motor shaft speed and gear reduction ratio (or external mechanism) and does it match the intended speed?

## 1) Gears or external mechanisms are not taken into account

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### 1. Is the speed set in consideration of gears and external mechanisms?

The speed is set with respect to the motor axis.

If the motor is geared or has an external mechanism, be sure to take these factors into account when setting the motor.

### 2. Calculate and convert the speed of each axis and check if they match.

Calculate the required speed on the mechanism again from the confirmed motor shaft speed and gear reduction ratio or external mechanism, and see if it matches.

## Problem: Rotating at an unintended speed

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If the motor rotates at an unintended speed, the cause could be

- 1) Gears or external mechanisms are not taken into account.
- 2) **The data No. in operation is different from the assumption.**
- 3) The speed setting method is different from the intended method.
- 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.
- 5) Speed limit is set.
- 6) Insufficient torque.

If the motor does not run, please refer to the troubleshooting section “The motor does’nt run”.

2) The data No. in operation is different from the assumption.

If the unit rotates at an unintended speed, check the data No. being operated.

<Please check>

Does the data No. being operated match the assumed data No.?

There are several ways to check the data No. you are driving, but they vary depending on the series. Here's how to check each series.

	BMU	BLE2	BLH			BLV
			Analogue	Digital	RS-485	
Control Panel	●	●	-	●	●	-
MEXE02 Support Software	-	● (USB-mini-B)	-	● (USB-mini-B)	● (USB-mini-B)	● (special cable)
OPX-2A Data Setting Device	-	-	-	-	-	●
Via Network	-	-	-	-	●	●

Please refer to the operating manual of each series for details.

2) The data No. in operation is different from the assumption.

To check the data No. in MEXE02, use the status monitor.

Example: BLE2 Series (Status Monitor)

Start Status Monitor

Command speed (motor shaft)	<input type="text" value="0"/>	[r/min]	Actual Speed(Motor)	<input type="text" value="0"/>	[r/min]
Command speed (gearhead shaft)	<input type="text" value="0"/>	[r/min]	Actual Speed(Gear)	<input type="text" value="0"/>	[r/min]
Gear ratio	<input type="text" value="0,00"/>		Operation Number	<input type="text" value="0"/>	
Speed increasing ratio	<input type="text" value="0,00"/>		Load Factor	<input type="text" value="0"/>	[%]
Main circuit DC voltage	<input type="text" value="0"/>	[V]	External analog setting devices	<input type="text" value="0,0"/>	[V]
Elapsed time from BOOT	<input type="text" value="0"/>	[ms]	Driver temperature	<input type="text" value="0,0"/>	[°C]
Odometer	<input type="text" value="0,0"/>	[kRev]	Tripmeter	<input type="text" value="0,0"/>	[kRev]

Present Past

<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
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## Problem: Rotating at an unintended speed

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If the motor rotates at an unintended speed, the cause could be

- 1) Gears or external mechanisms are not taken into account.
- 2) The data No. in operation is different from the assumption.
- 3) **The speed setting method is different from the intended method.**
- 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.
- 5) Speed limit is set.
- 6) Insufficient torque.

If the motor does not run, please refer to the troubleshooting section “The motor does’nt run”.

### 3) The speed setting method is different from the intended method. **Orientalmotor**

If it rotates at an unintended speed, the most common cause is a case where the speed setting method is different from the intended one.

(e.g., the setting was done digitally, but the setting method was external analog...)

Please confirm how to set the data No. and the set speed that you are driving.

The default value of the rotation speed setting method and how to set and check the setting varies depending on the series. For details, please refer to the operating manual for each series.

The initial values of the rotation speed setting method for each series are as follows (BMU and BLH (analog) are fixed).

Data No.	BLE2	BMU	BLH			BLV
			Analogue	Digital	RS-485	
0	Digital setting	Digital setting	External Analog	External Analog	Digital setting	VR1
1	Digital setting	Digital setting	VR1	VR1	Digital setting	External Analog
2~	Digital setting	Digital setting	-	Digital setting	Digital setting	Digital setting

VR1: Internal setting unit

### 3) The speed setting method is different from the intended method. **Orientalmotor**

The following table shows how to change and check the rotation speed setting method for each series.

	BMU	BLE2	BLH			BLV
			Analogue	Digital	RS-485	
Control Panel	●	●	-	●	●	-
MEXE02 Support Software	-	● (USB-mini-B)	-	● (USB-mini-B)	● (USB-mini-B)	● (special cable)
OPX-2A Data Setting Device	-	-	-	-	-	●
Via Network	-	-	-	-	●	●





### 3) The speed setting method is different from the intended method. **Orientalmotor**

For series other than the BLH and BLV series, check the setting values of the operation data setting method parameters.

Example: BLE2 Series (Basic setting  $\Rightarrow$  Speed/torque limit command selection parameter)

MEXE02 English Edition - [New2 | BLE2 [AC]]

File Edit Move View Communication Tool Window Help

BLE2 [AC]

- Data
  - Operation data
- Parameter
  - Base settings**
  - Speed/torque limiting adjust
  - Alarm/Information setting
  - Operation
  - I/O action
  - I/O function selection[Input]
  - I/O function selection[Output]
  - I/F function

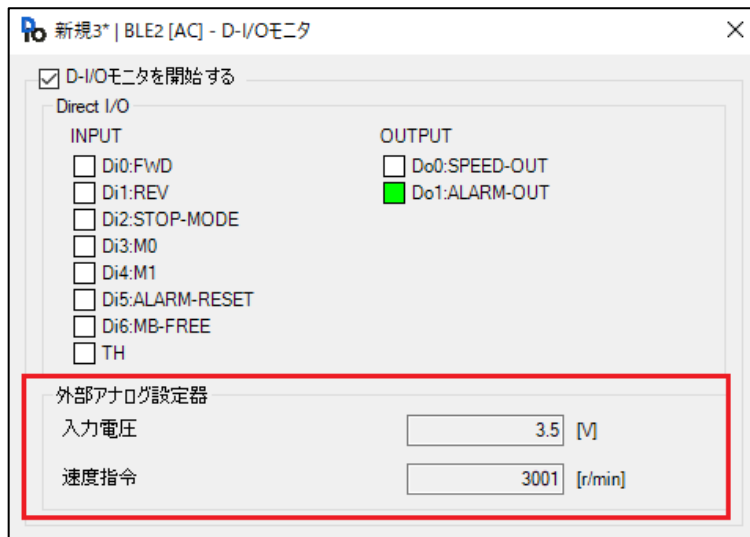
Operation data		Base settings
1	Driver user name	
2		
3	Speed/torque limiting command selection	Digital
4	Gear ratio	100
5	Decimal place for gear ratio	$\times 0.01$
6	Multiplying gear	1.00
7	Motor rotation direction	Positive direction=CW

### 3) The speed setting method is different from the intended method. **Orientalmotor**

After confirming the setting method, please check the set value in each setting method (digital, external analog, internal setter).

You can check the setting values only from MEXE02.

#### Example: BLE2 Series (D-I/O Monitor)



If the input voltage value does not match the expected value, there may be a problem with the wiring of the external analog line.

Check if VH and VL are not reversed or if the cable is disconnected.

Check 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.

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- 2) The data No. in operation is different from the assumption.
- 3) The speed setting method is different from the intended method.
- 4) **There is an abnormality in the external potentiometer or the wiring of the external potentiometer.**
- 5) Speed limit is set.
- 6) Insufficient torque.

If the motor does not run, please refer to the troubleshooting section “The motor does’nt run”.

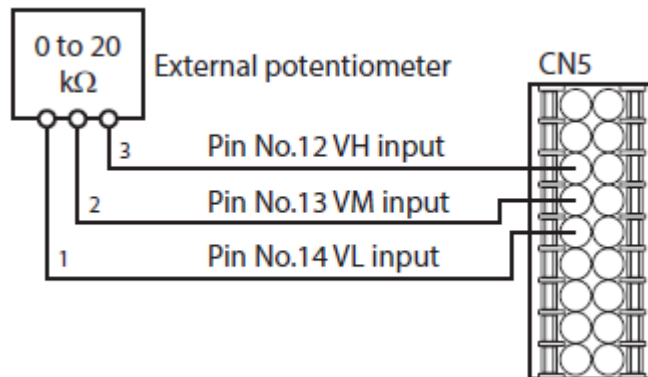
4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.

When the value (input voltage) of the external potentiometer is different from the expected value in 3), there may be a problem with the potentiometer itself or with the wiring.

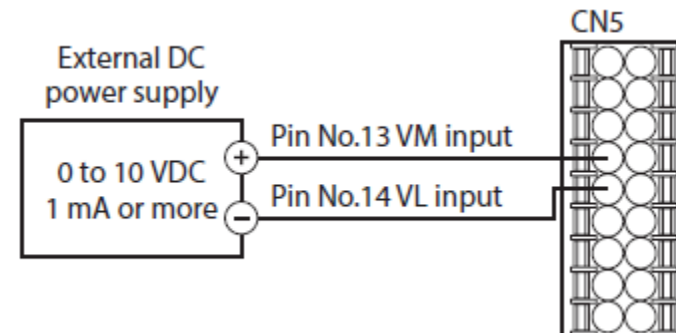
Check that the wiring is not broken in the middle or that there is no problem with the connection (e.g., VL and VH are reversed).

Example: BLE2 Series

External potentiometer



External DC voltage



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- 3) The speed setting method is different from the intended method.
- 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.
- 5) **Speed limit is set.**
- 6) Insufficient torque.

If the motor does not run, please refer to the troubleshooting section “The motor doesn't run”.

## 5) Speed limit is set

If it rotates at an unintended speed, the speed may be limited by the speed limit parameter.

Please check if you are not limited by the speed limit parameter.

Item	BLE2	BMU	BLH			BLV
			Analogue	Digital	RS-485	
Upper limit method	Digital External analogue	Digital	-	Digital VR External analogue	Digital External analogue	-
Parameter Name (Parameter Category)	Speed upper limit (Speed/torque limiting adjustment)	Speed upper limit (-)	-	Speed upper limit (Operation data extension setting)	Speed upper limit (Operation data extension setting)	-

### Example: BLE2 Series

MEXE02 English Edition - [New6 | BLE2 [AC]]

File Edit Move View Communication Tool Window Help

Operation data	Speed/torque limiting adjustment	
1	Speed upper limit [r/min]	4000
2	Speed lower limit [r/min]	50
3	Analog speed command gain [r/min/V]	850
4	Analog speed command offset [r/min]	0
5	Analog torque limit gain [%/V]	65
6	Analog torque limit offset [%]	0
7	Analog torque limit maximum value [%]	300

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- 4) There is an abnormality in the external potentiometer or the wiring of the external potentiometer.
- 5) Speed limit is set.
- 6) **Insufficient torque.**

If the motor does not run, please refer to the troubleshooting section “The motor does’nt run”.



## 6) Insufficient torque

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If any of the following conditions exist, torque may be insufficient to achieve the intended speed.

If the speeds do not match, please check the following.

- (1) The torque limit is set. Increase the setting value and check for changes.
- (2) Check if the model numbers of the driver and motor match.

If the problem persists even after checking the information in 1) to 6), please contact the Customer Service Center.

## **Contact us**

Please feel free to contact us with any questions you may have about motors, how to select a product, delivery times, prices, orders, etc.

All countries except below: Tel. 00 800 22556622, [info@orientalmotor.de](mailto:info@orientalmotor.de)

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France: Tel. 01 47 86 97 50, [info@orientalmotor.fr](mailto:info@orientalmotor.fr)

Italy: Tel. 02 9390 6346, [info@orientalmotor.it](mailto:info@orientalmotor.it)