

RoHS Directive Compliance (Last updated December 2008)

The E.U. (European Union) established the WEEE Directive and RoHS Directive for the purpose of building a system of classification and collection of waste electrical and electronic equipment differently from general wastes, thereby limiting the use of hazardous substances in electrical and electronic equipment and minimizing the environmental risks and health risks to consumers. Similar laws that limit and control the use of hazardous substances are adopted at various levels outside the E.U. region, and the awareness of environmental protection is increasing on a global scale. Today, environmental protection is considered a common goal of mankind. Oriental Motor offers a wide range of standard products conforming to the RoHS Directive in recognition that limiting the use of hazardous substances in our products and thereby protecting the global environment is our corporate responsibility to society.

■ RoHS Directive

● RoHS Directive

Directive on restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC).

(RoHS: the restriction of the use of certain hazardous substances in electrical and electronic equipment)

The RoHS Directive prohibits the use of six chemical substances in electrical and electronic products sold in the E.U. member countries.

The six controlled substances are lead, hexavalent chromium, cadmium, mercury and two specific brominated flame-retardants (PBB and PBDE).

● Maximum Allowable Concentrations

Inhomogeneous material

Lead, hexavalent chromium, mercury, PBB, PBDE: 0.1wt%

Cadmium: 0.01wt%

Excluding the applications specified in the Annex to the RoHS Directive

● Scope

Electrical and electronic equipment classified under Categories 1, 2, 3, 4, 5, 6, 7 and 10 as specified in Annex IA to the WEEE Directive (Directive on Waste Electrical and Electronic Equipment) 2002/96/EC.

Categories

1. Large household appliances
2. Small household appliances
3. IT and telecommunications equipment
4. Consumer equipment
5. Lighting equipment
6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools)
7. Toys, leisure and sports equipment
10. Automatic dispensers

■ RoHS-Compliant

At Oriental Motor, products that contain the six chemical substances subject to the RoHS directive by no more than the maximum allowable concentrations are designated as "RoHS-Compliant." Our RoHS-Compliant products are indicated by "(RoHS) RoHS-Compliant" in this catalogue and also by (RoHS) marked on the product package label.

No marking is provided on the product.



Example of marking on the package label

Quality Management Systems

ISO 9001

Oriental Motor has put in place a quality management system to ensure our products satisfy the quality needs of all customers. Our quality management system consists of four components: a forward-thinking product development system for creating new products that meet the anticipated needs of our customers in the future; an immediate delivery system that is flexible to meet the demands for multi-product, small-lot production; a responsive sales system for answering all customer inquiries in a timely manner; and a comprehensive after-sales service system. We at Oriental Motor are continually improving these key components of our quality management system.

● Plants that Have Acquired Certification for ISO 9001 and ISO 14001

Plant	Product
Tsuruoka-Chuo Plant	AC motors
Tsuruoka-Nishi Plant	brushless DC motors
Tsuruoka-Higashi Plant	stepping motors
Tsuchiura Plant	servo motors
Takamatsu-Kozai Plant	fan motors
Takamatsu-Tarumi Plant	controllers
Soma Plant	electric actuators
Kashiwa Plant	gearheads
Kofu Plant*	related parts
U.S.A. Plant*	

*Kofu Plant and U.S.A. Plant have only ISO 9001 certification.

Environmental Management Systems

ISO 14001

Protecting the global environment is a major task for all humankind. There is an urgent call for companies to reduce the environmental impact in all aspects of corporate activity.

Oriental Motor is utilizing to all possible avenues, such as driving green purchasing initiatives and implementing various measures to reduce hazardous substances and waste materials, so that we can help preserve the environment.

- Safety Standards
- List of Safety Standard Approved Products
- RoHS Directive Compliance
- ISO 9001, ISO 14001
- Global Power Supply Voltages
- Oriental Motor Corporate Overview
- Oriental Motor Global Sales Network
- Product Recommendation Sheets
- Conversion Charts
- Product Line Updates
- Product Index

Global Power Supply Voltages

Power Supply Voltage in Major Countries

Power Supply Voltage Specifications are shown below.

Region/Country	Frequency	Voltage
North America	U.S.A.	60 Hz Single-Phase 115/230 VAC, Three-Phase 230 VAC
	Canada	60 Hz Single-Phase 120/347 VAC, Three-Phase 208/240/600 VAC
Europe	Austria	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Belgium	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Bulgaria	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Denmark	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Finland	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	France	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Germany	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Greece	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Hungary	50 Hz Single-Phase 230 VAC, Three-Phase 380 VAC
	Italy	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Luxembourg	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Netherlands	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
	Norway	50 Hz Single-Phase 220/230 VAC, Three-Phase 380 VAC
	Poland	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Portugal	50 Hz Single-Phase 230 VAC, Three-Phase 400/480 VAC
	Romania	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Spain	50 Hz Single-Phase 127/220 VAC, Three-Phase 220/380 VAC
	Sweden	50 Hz Single-Phase 230/400 VAC, Three-Phase 400/690 VAC
	Switzerland	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC
United Kingdom	50 Hz Single-Phase 230 VAC, Three-Phase 400 VAC	
Czech	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC	
Japan	50/60 Hz Single-Phase 100/200 VAC, Three-Phase 200 VAC	
Asia	Korea	60 Hz Single-Phase 220 VAC, Three-Phase 200/220/380 VAC
	China	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Taiwan	60 Hz Single-Phase 110/220 VAC, Three-Phase 220/380 VAC
	Hong Kong	50 Hz Single-Phase 200/220 VAC, Three-Phase 346/380 VAC
	Singapore	50 Hz Single-Phase 230/240 VAC, Three-Phase 400/415 VAC
	Malaysia	50 Hz Single-Phase 240 VAC, Three-Phase 415 VAC
	Thailand	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	India	50 Hz Single-Phase 230/240 VAC, Three-Phase 400/415 VAC
	Indonesia	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Philippines	60 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
	Viet Num	50 Hz Single-Phase 220 VAC, Three-Phase 380 VAC
Oceania	Australia	50 Hz Single-Phase 240 VAC, Three-Phase 480 VAC
	New Zealand	50 Hz Single-Phase 230 VAC, Three-Phase 230/415 VAC

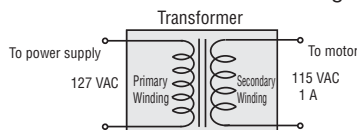
Note:

- Depending on countries or cities, the voltages other than those shown above may be used.

Power Supply Voltage and Our Products

Power supply voltage varies from country to country and, in some places, from city to city. The power supply voltages and frequencies of many countries are shown in the table to the left. Oriental Motor offers motors and fans for worldwide use. Our wide range of products includes those that meet North American voltage specifications, as well as European and Asian voltage specifications. If a motor is to be used with a different power supply voltage than specified, a transformer must be connected between the power supply and the motor.

- The primary winding of the transformer should be of the same voltage as the power supply, and the secondary winding voltage should be the same as the voltage rating of the motor.



The transformer should be rated for a current of at least twice the rated motor current to allow for the current peak at motor start. The transformer should also possess stable transforming characteristics.