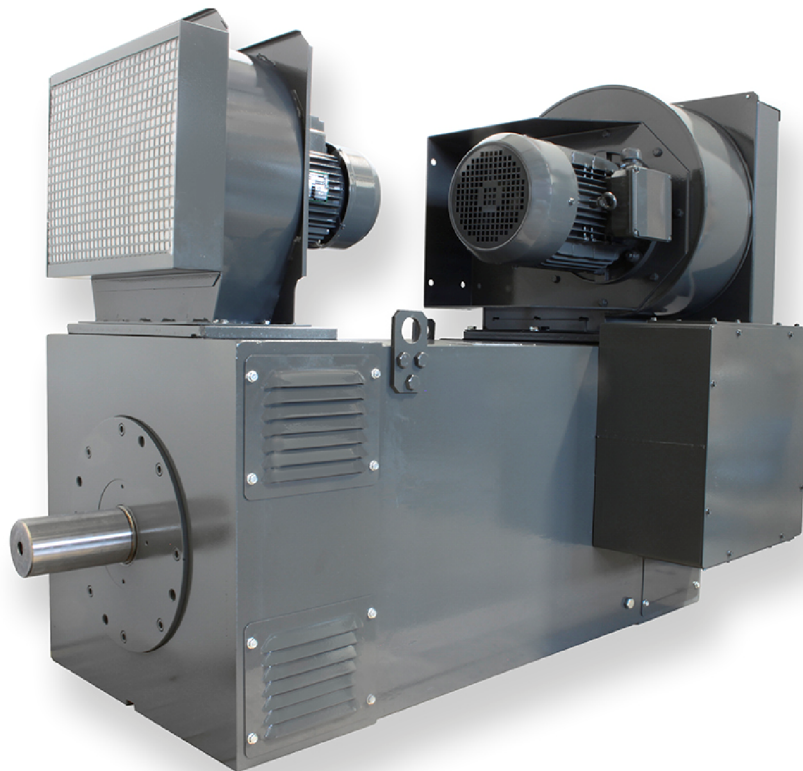


OPERATION AND MAINTENANCE MANUAL

MAC-HS4 MOTORS





1. LEGAL NOTES AND SAFETY INSTRUCTIONS

1.1 Justification

VASCAT motors contain low-voltage parts and rotating elements that make them hazardous; they also contain hot surfaces. Users must take notice of all the hazard warning signs described in this manual (see section 1.3).

All tasks related to the transport, connection, commissioning and maintenance must be performed by responsible, skilled personnel (in accordance with the EN 50110-1 (VDE 0105-100) and IEC 60364 standards). Inappropriate procedures may cause serious personal injury and material damages.

VASCAT motors may only be used for the purposes specified in Section 0.

Furthermore, the site conditions must meet all the requirements given on the motor nameplate and in this document.

1.2 Target readership and purpose

The purpose of the operation manual is to provide all the information required for the appropriate mounting, commissioning and maintenance of the MAC HS4 motors and avoid hazards that may cause serious injury. The manual is targeted for any person or individual who handles or is responsible for operation of the motors dealt with in the manual.

All the individuals working with MAC HS4 three-phase motors must have this manual at their disposal and they must follow the relevant instructions and indications.

The operation and maintenance instructions must be read carefully before operating the machine. This will guarantee proper operation free from hazards and complications and will extend the service life of the machine.

These service instructions provide a description of the machine and information for its proper handling and operation from delivery to the end of its service life.

This manual must always be complete and perfectly legible.



1.3 Hazards and warning signs

The manual contains the information required for personnel safety and the prevention of material damages. All information related to personnel safety is highlighted in general with a warning triangle; however, the hints (to avoid only material damages) are not. Depending on the hazard level, the signs indicate hazards from major to minor as follows:



DANGER

If no appropriate measures are taken, the result will be death or serious injury.



WARNING

If no preventive measures are adopted, the result may be death or serious injury.



CAUTION

If no appropriate measures are taken, the result may be serious injury.

PRECAUTION

If no appropriate measures are taken, the result may be material damages.

NB

The result may be an unwanted condition or situation if the corresponding safety instruction is not observed.

If several hazard levels are present at the same time, the most stringent instruction for each case will apply. If a safety instruction with a warning triangle warns of personal injury, the same instruction may also contain a warning of possible material damages.

Signs indicating the type of danger Warning or Caution in the manual that may be used together with the pictograms above are as follows:



VOLTAGE

Indicates the presence of voltage on connection terminals or live parts.



HOT SURFACE

Indicates the possibility of the contact surface having a very high temperature with the consequent risk of burns.



MOVING ROTATING PARTS

Indicates the possibility of injury and trauma caused by contact with shafts and other rotating parts.



1.4 Intended use



WARNING

VASCAT motors have been designed for industry plants. They comply with the requirements of the harmonised standards of the EN 60034 series.

Such pieces of equipment are devices designed to be mounted in machines in accordance with the current Machinery Directive. Commissioning is not allowed until the end product is checked and found to be compliant with said Directive (please see, among others, the EN 60204-1 standard).

VASCAT MAC HS4 motors must be used only for the applications provided in the catalogues and the related technical documentation.

If third-party products and parts are used, they must be previously approved by VASCAT.

Proper and safe operation of the products requires their proper transportation, storage, installation, mounting, assembly, operation and maintenance.

Allowed ambient conditions must be observed. The use of MAC HS4 motors in hazardous areas is strictly prohibited unless they have been designed specifically for said circumstance, in which case the indications and warnings given in the related documentation must be observed.

1.5 Skilled personnel



WARNING

VASCAT motors must be installed and operated in accordance with the specifications given in this document. Only skilled personnel in the context of the manual, i. e. individuals who have the required technical know-how and skills for handling, commissioning and starting the motors according to safety standards, shall be allowed to operate the motors.

Skilled personnel refers to those individuals who are capable of recognising the risks related to their field of activity and avoiding the related hazards.



1.6 Disclaimer

The indications given in the manual describe the product features, but no warranty is implied.

VASCAT declines all liability for damages and operating faults caused by the following:

- Failure to follow the operating instructions.
- Damages caused by inappropriate motor handling.
- Changes made to motors without prior authorisation.
- Operating errors.
- Carrying out inappropriate work on and with the motors.

The indications that refer to procedures and the connection details provided in the manual must be considered only as proposals and whether or not they are applicable must be studied for each case in particular. VASCAT does not guarantee their appropriateness in any case.

The data given in this manual is reviewed regularly and subsequent editions are published when corrections are necessary.

1.7 Scope of the documentation and external references

The manual contains all the information required for the correct handling, installation (electrical and mechanical), commissioning and subsequent maintenance of MAC HS4 series motors, together with the accessories required for proper operation.

It also describes the safety instructions to guarantee that no personal injuries or material damages will be caused during the entire process.

If the motor design includes any special features (considered as non-standard), additional documentation may be necessary. In those cases, the customer must check with VASCAT to make sure that he has all the relevant information.

This document provides no information about the technical data sheets or the specific technical data of the various MAC HS4 models or their characteristic curve.

To obtain said information, please log on to the VASCAT website at <http://www.vascat.com>.



2. DECLARATIONS OF CONFORMITY

	CE CONFORMITY DECLARATION MAC HS4 MOTORS
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VASCAT, S.A., CONFORMITY DECLARATION

The company VASCAT S.A., with registered offices in C/ Esquirol s/n – 08570 Torelló –Spain

DECLARES

The motors of the series MAC HS4 100 to MAC HS4 250 comply with the basic requirements set forth in the following Directives:

2006/95/CE – Low Voltage Directive
2006/46/CE – Machinery Directive
89/336/CEE & 92/31/CEE – Electromagnetic Compatibility Directive
93/68/CEE – CE Marking Directive

These motors have been manufactured in compliance with the following standards:

- UNE-EN 60034-1
- UNE-EN 60034-5
- UNE-EN 60034-8
- UNE-EN 60034-9

In consequence to the above-mentioned standards, this declaration will no longer be valid when changes are made without our prior consent.

The specified product shall be installed as a part of a machine only. Commissioning of the product is not allowed until it has not been checked that the end product complies with above mentioned operation standards.

Torelló 24th April 2014


J.L. García Bujía
General Manager



 Departament de R+D	DECLARACIÓN DE CONFORMIDAD CON LAS DIRECTIVAS 2002/95/CE RoHS Y 2002/96/CE WEEE DECLARATION OF COMPLIANCE WITH THE EUROPEAN DIRECTIVES 2002/95/EC AND 2002/96/CE WEEE	Página 1/1 Fecha 15/06/06
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Torelló, 15 de junio de 2006

La firma VASCAT, S.A. con domicilio en C/ Esquirol s/n - 08570 Torelló

DECLARA

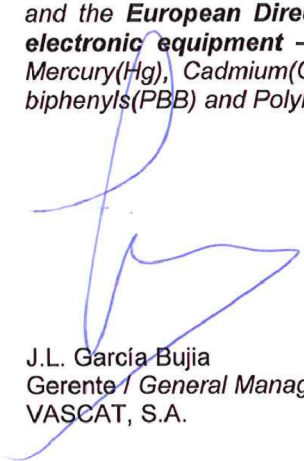
Que los productos fabricados por VASCAT, S.A. –Motores eléctricos de CC o CA para aplicaciones de velocidad variable - así como sus accesorios standard –Electroventiladores, Dinamos tacométricas, encóderes y frenos- , son conformes a la **Directiva Europea 2002/95/CE sobre restricciones a la utilización de determinadas sustancias peligrosas en aparatos eléctricos y electrónicos** y la **Directiva Europea 2002/96/CE sobre residuos de aparatos eléctricos y electrónicos** en lo concerniente al contenido en Plomo(Pb), Mercurio(Hg), Cadmio(Cd), Cromo Hexavalente (Cr 6+), Polibromobifenilos (PBB) y Polibromodifeniléteres (PBDE).

Torelló, June 15th 2006

VASCAT, S.A. with address in C/ Esquirol s/n - 08570 Torelló

DECLARE

That the products manufactured by VASCAT, S.A. –Electric DC and AC motors for variable speed operation- and their standard accessories – Electric blowers, tachodinamos, encoders and brakes -, are in compliance with **European Directives 2005/95/EC about Restrictions of hazardous substances in waste from electrical and electronic equipment – RoHS –** and the **European Directives 2005/96/EC about waste of electrical and electronic equipment – WEEE –** as related to the content of Lead(Pb), Mercury(Hg), Cadmium(Cd), Hexavalent Chromium (Cr 6+), Polybrominated biphenyls(PBB) and Polybrominated Diphenylethers (PBDE).


J.L. García-Bujia
Gerente / General Manager
VASCAT, S.A.



3. PRODUCT DESCRIPTION

VASCAT MAC HS4 motors are asynchronous AC electrical machines with a squirrel-cage rotor, square laminated steel frame and forced cooling. They have been specially designed to operate in high-dynamics applications that require speed variation. They must be powered exclusively by frequency converters.

3.1 General information

The following table shows the standard technical specifications of the MAC-HS4 series:

Technical specifications	Description
Motor type	<i>Three-phase asynchronous motor with squirrel-cage rotor</i>
Frame sizes (Shaft heights)	<i>MAC-HS4 series: 100, 132, 160, 200 and 250 mm</i>
No. of poles	<i>MAC-HS4 series: 4 poles</i>
Protection rating (According to the IEC/EN 60034-5 standard)	<i>MAC-HS4 series: IP23</i>
Type of cooling (According to the IEC/EN 60034-6 standard)	<i>MAC-HS4 series: IC06</i>
Power-supply voltage	<i>Up to 500 VAC (other voltages on request)</i>
Insulation class (According to the IEC/EN 60034-1 standard)	<i>Materials Class H - Operating temperature Class F</i>
Mounting type (According to the IEC/EN 60034-7 standard)	<i>IM B3 or B35 (other types of assembly optional)</i>
Thermal protection (According to the IEC/EN 60034-11 standard)	<i>PTC140 and Pt100 probes on stator winding and Pt100 on the bearings (other sensors optional)</i>
Installation altitude (According to the IEC/EN 60034-1 standard)	<i><1000 m above sea level</i>
Operating temperature (According to the IEC/EN 60034-1 standard)	<i>0 to +40°C</i>
Vibration level (According to the IEC/EN 60034-14 standard)	<i>Class B</i>
Shaft and flange types (According to the IEC/EN 60072-1 standard)	<i>Solid shaft without keyway and B5 flange (other setups optional)</i>
Bearings	<i>High speed hybrid ceramic spindle bearings</i>
Paint	<i>Synthetic enamel RAL 7043 colour (other types optional)</i>
Feedback sensors (optional)	<i>Incremental optical TTL, HTL and Sin/Cos 1 Vpp 1024 or 2084 ppr encoder (Other types of sensors available on request)</i>
Provision for torque flange assembly (optional)	<i>Assembly according to customer's requirements</i>
Blocking device (optional).	<i>Available with torque flange provision only</i>
Provision for accelerometers (optional)	<i>Assembly according to customer's requirements</i>

Table 1: General specifications of MAC-HS4 motors

On many occasions, VASCAT, S.A. adapts its motors to the specific requirements of each customer/application. Therefore, the above table must be understood as a general reference only. The exact specifications of each motor can be found on the corresponding technical data sheet and the additional documentation provided to the customer (where applicable).



3.2 Reference standards

The MAC-HS4 motors are designed and manufactured according to the Low Voltage Directive 2006/95/CE and they have been designed for their use in industrial applications as an incomplete machine or as a machine component as provided for in the 2006/46/CE Machinery Directive.

The following table summarises the main reference technical standards that have been taken into account for the design of these motors:

Standard	Description
IEC/EN 60034-1	<i>Rating and performance</i>
IEC/EN 60034-2	<i>Standard methods for determining losses</i>
IEC/EN 60034-5	<i>Degrees of protection</i>
IEC/EN 60034-6	<i>Cooling</i>
IEC/EN 60034-7	<i>Classification of construction types</i>
IEC/EN 60034-8	<i>Terminal markings and direction of rotation</i>
IEC/EN 60034-9	<i>Noise limits</i>
IEC/EN 60034-11	<i>Thermal protection</i>
IEC/EN 60034-14	<i>Mechanical vibration levels</i>
IEC/EN 60034-18	<i>Functional evaluation of insulation systems</i>
TS 60034-25	<i>Guidance for the design and performance of a.c. motors specifically designed for converter supply</i>
IEC/EN 60072-1	<i>Power series and dimensions of rotating electrical machines</i>

Table 2: Reference standards

In accordance with the current Machinery Directive, the commissioning of these motors is prohibited in the European Union until conformity of the installation has been confirmed in which the machine is to be installed (see EN 60204-1). If the electrical machine is to be used outside the European Union, the specific laws of the country in which it is located will apply. Furthermore, safety standards, local installation and industry-specific standards must be applied.