

<p style="text-align: center;"><b>TEST REPORT</b>  <b>IEC 60034-5</b>  Rotating electrical machines –  Part 5:  Degrees of protection provided by the integral  design of rotating electrical machines (IP code) – Classification</p>	
<p><b>Report Reference No.</b>.....: 28105442 002 Annex I</p> <p>Tested by (name + signature) .....: S. Orecchia</p> <p>Approved by (name + signature).....: F. Ceriani</p> <p>Date of issue.....: 22/11/2012</p>	
<p><b>Testing Laboratory</b> .....: TUV RHEINLAND ITALIA S.r.l.</p> <p>Address .....: Via Mattei, 3</p> <p style="padding-left: 150px;">20010 Pogliano Milanese (MI) – Italy</p> <p>Testing location / address .....: As above</p>	
<p><b>Applicant's name</b>.....: Bronzoni Motori Elettrici srl</p> <p>Address .....: Via G. Baisi 20/A</p> <p style="padding-left: 150px;">42030 Raniseto (RE) - Italy</p>	
<p><b>Test specification:</b></p> <p>Standard.....: IEC 60034-5:2000+A1:2006</p> <p>Test procedure .....: N/A</p> <p>Non-standard test method.....: N/A</p>	
<p><b>Test Report Form No.</b>.....: N/A</p> <p>TRF Originator.....: N/A</p> <p>Master TRF.....: N/A</p>	
<p><b>Test item description</b> .....: Electric motor.</p> <p>Trade Mark .....: Bronzoni Motori Elettrici srl</p> <p>Manufacturer .....: Bronzoni Motori Elettrici srl</p> <p style="padding-left: 150px;">Via G. Baisi 20/A 42030 Raniseto (RE) - Italy</p> <p>Model and/or Type reference .....: GR 100 (model with 3.0 mm gasket)</p> <p>Rating(s).....: IP 56 (for additional information see annex rating plate)</p>	

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Clause	Requirement – Test	Result	Verdict

**Copy of marking plate**

**Summary of testing:** The item under test fulfilled all the test

**Test item particulars**

- :  
 - Classification of installation and use : Fixed installation  
 - Supply Connection : N/A

**Possible test case verdicts:**

- test case does not apply to the test object.....: N/A  
 - test object does meet the requirement.....: P(Pass)  
 - test object does not meet the requirement.....: F(Fail)

**Testing** .....

Date of receipt of test item .....: 19/10/2012

Date(s) of performance of tests .....: 08/11/2012

**General remarks:**

The test results presented in this report relate only to the object tested.  
 This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

**General product information:**

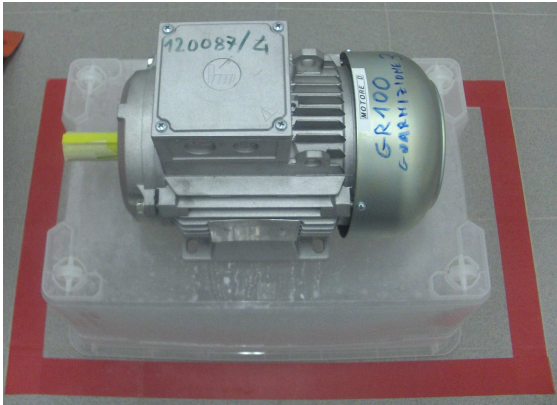
Tested complete one samples of three and single-phase induction motors without power cable connected and with 3.0 mm gasket under the metal cover of terminal box. No open hole was made in the terminal box and no insert any cable glands.

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**Photos: Dust Test IP 5X**

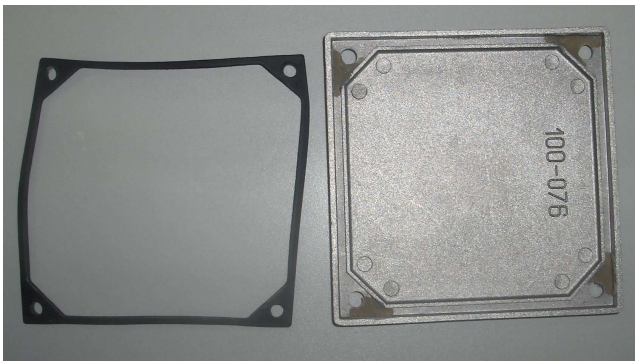
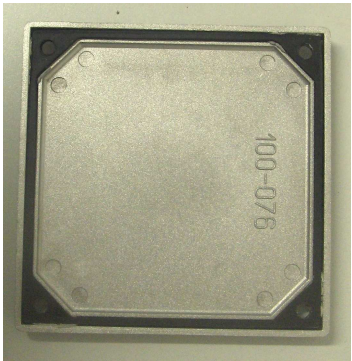
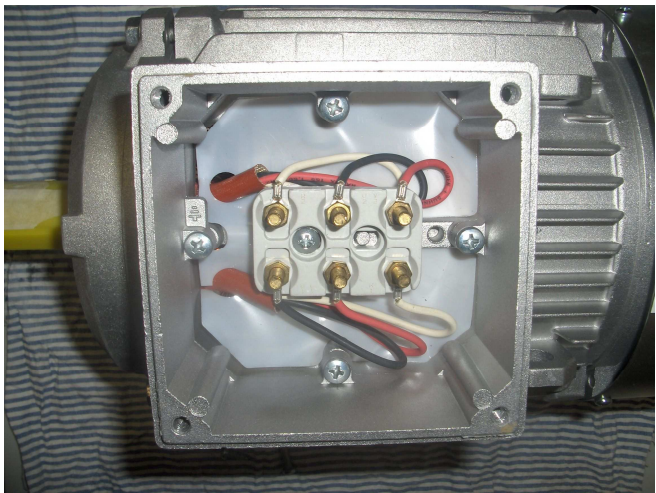
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Photos: Water Test IP X6



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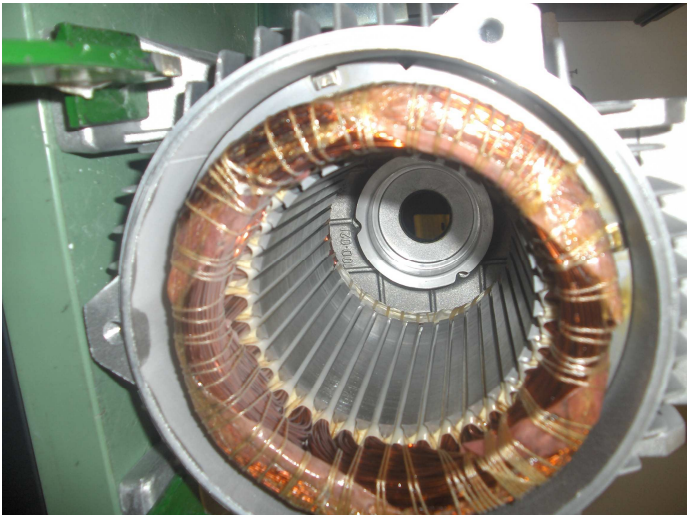
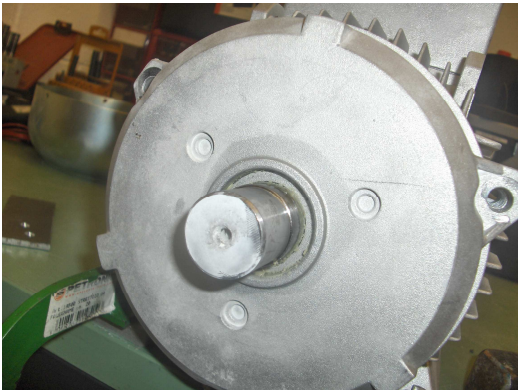
Photos.





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Clause	Requirement – Test	Result	Verdict

Photos.



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Clause	Requirement – Test	Result	Verdict
4	Degrees of protection – First characteristic numeral		
4.1	Indication of degree of protection		
	<p>The first characteristic numeral indicates the degree of protection provided by the enclosure to persons and to the parts of the machine inside the enclosure.</p> <p>Table 2 gives, in the third column, brief details of objects which will be 'excluded' from the enclosure for each of the degrees of protection represented by the first characteristic numeral. The term 'excluded' implies that a part of the body, a tool or a wire held by a person, either will not enter the machine or, if it enters, that adequate clearance will be maintained between it and the live parts or dangerous moving parts (smooth rotating shafts and the like are not considered dangerous).</p> <p>The third column of table 2 also indicates the minimum size of solid foreign objects which will be excluded.</p>		P
4.2	Compliance to indicated degree of protection		P
	Compliance of an enclosure with an indicated degree of protection implies that the enclosure will also comply with all lower degrees of protection in table 2. In consequence, the tests establishing these lower degrees of protection are not required, except in case of doubt.		P
4.3	External fans		P
	The blades and spokes of fans external to the enclosure shall be protected against contact by means of guards complying with table 1.		P
	<p>Table 1 – Test requirements for guards</p> <p>Protection of machine</p> <p>For the test, the rotor shall be slowly rotated, for example by hand when possible.</p> <p>Smooth rotating shafts and similar parts are not considered dangerous.</p>	Finger test	P
4.4	Drain holes		N/A
	<p>If the machine is provided with drain holes, the following shall apply:</p> <ul style="list-style-type: none"> <li>– drain holes intended normally to be open on site shall be kept open during testing;</li> <li>– drain holes intended normally to be closed on site shall be kept closed during testing;</li> <li>– if machines with protection IP3X or IP4X are intended to be run with open drain holes, the drain holes may comply with protection IP2X;</li> <li>– if machines with protection IP5X are intended to be run with open drain holes, the drain holes shall comply with protection IP4X.</li> </ul>	No drain holes	N/A

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	Table 2 – Degrees of protection indicated by the first characteristic numeral First Degree of protection characteristic numeral Brief description	IP5X	P
5	Degrees of protection – Second characteristic numeral		P
5.1	The second characteristic numeral indicates the degree of protection provided by the enclosure with respect to harmful effects due to ingress of water.		P
	Table 3 gives, in the third column, details of the type of protection provided by the enclosure for each of the degrees of protection represented by the second characteristic numeral.	IPX6	P
	An air-cooled open machine is weather-protected when its design reduces the ingress of rain, snow and airborne particles, under specified conditions, to an amount consistent with correct operation.		N/A
	This degree of protection is designated by the letter W placed after the second characteristic numeral.		N/A
5.2	For second characteristic numerals up to and including 6, compliance of an enclosure with an indicated degree of protection implies that the enclosure will also comply with all lower degrees of protection in table 3.		P
	In consequence, the tests establishing these lower degrees of protection are not required, except in case of doubt. For IPX7 and IPX8, it shall not be assumed that compliance of the enclosure implies that the enclosure will also comply with all lower degrees of protection in table 3		P
	Table 3 – Degrees of protection indicated by the second characteristic numeral Second Degree of protection characteristic numeral . Brief description		P
6	Marking		P
	It is recommended that the characteristic letters and numerals be marked on the machine preferably on the rating plate or, if this is not practicable, on the enclosure.	In the rating metal plate is stamp IP 56	P
	When all parts of a machine do not have the same degree of protection, at least the designation of the lowest degree shall be shown, followed, if necessary, by the higher designation with clear reference to the part to which it applies.		N/A



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	<p>NOTE Space limitations on the rating plate usually only allow the lowest IP code to be marked. Parts or components having a higher degree of protection should then be specified in the documentation and/or in the operating instructions.</p> <p>The lower degree of protection of:</p> <ul style="list-style-type: none"> <li>– guards for external fans (as allowed in 4.3);</li> <li>– drain holes (as allowed in 4.4);</li> </ul> <p>need not be specified on the rating plate or in the documentation.</p> <p>Where the mounting of the machine has an influence on the degree of protection, the intended mounting arrangements shall be indicated by the manufacturer on the rating plate or in the instructions for mounting.</p>		N/A
7	General requirements for tests		P
	The tests specified in this standard are type tests. They shall be carried out on standard products or models of them. Where this is not feasible, verification either by an alternative test or by examination of drawings shall be the subject of an agreement between manufacturer and user.	Test made on the complete product.	P
	Unless otherwise specified, the machine for each test shall be clean with all the parts in place and mounted in the manner stated by the manufacturer.		N/A
	In the case of both first and second characteristic numerals 1, 2, 3 and 4, a visual inspection may, in certain obvious cases, show that the intended degree of protection is obtained. In such cases, no test need be made. However, in case of doubt, tests shall be made as prescribed in clauses 8 and 9.		N/A
7.1	Adequate clearance		P
	For the purpose of the following test clauses in this standard, the term 'adequate clearance' has the meaning given in 7.1.1 or 7.1.2.		P
7.1.1	Low-voltage machines (rated voltages not exceeding 1 000 V a.c. and 1 500 V d.c.) The test device (sphere, finger, wire, etc.) does not touch the live parts or moving parts other than non-dangerous parts such as smooth rotating shafts.		P

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7.1.2	High-voltage machines (rated voltages exceeding 1 000 V a.c. and 1 500 V d.c.) When the test device is placed in the most unfavorable position, the machine shall be capable of withstanding the dielectric test applicable to the machine. This dielectric test requirement may be replaced by a specified clearance dimension in air which would ensure that this test would be satisfactory under the most unfavorable electrical field configuration.		N/A
8	Tests for first characteristic numeral		P
	Test and acceptance conditions for the first characteristic numeral are given in table 4.		P
	The dust test for numerals 5 and 6 shall be performed with the shaft stationary, provided that the difference in pressure between running and stationary (caused by fan effects) is lower than 2 kPa. If the pressure difference is greater than 2 kPa, the internal machine pressure during the dust test shall be depressed accordingly.	The test IP 5X was made with air depression internal to the motor (see annex photos).	P
	Alternatively, the machine may be tested with the shaft rotating at rated speed.		N/A
	Table 4 – Test and acceptance conditions for first characteristic numeral First characteristic numeral Test and acceptance conditions	No dust is present in the internal side of machine.	P
9	Tests for second characteristic numeral		P
9.1	Test conditions		P
	Test conditions for the second characteristic numeral are given in table 5.		P
	The test shall be conducted with fresh water. During the test, the moisture contained inside the enclosure may be partly condensed. The dew which may thus be deposited should not be mistaken for an ingress of water. For the purpose of the tests, the surface area of the machine shall be calculated with an accuracy of 10 %.		P
	When possible, the machine shall be run at rated speed. This can be achieved by mechanical means or by energization. If the machine is energized, adequate safety precautions shall be taken.		N/A
	Table 5 – Test conditions for second characteristic numeral Second characteristic numeral Test conditions		P
9.2	Acceptance conditions		P
	After the test in accordance with table 5 has been carried out, the machine shall be inspected for ingress of water and subjected to the following verification and tests:		P

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9.2.1	The amount of water which has entered the machine shall not be capable of interfering with its satisfactory operation. The windings and live parts not designed to operate when wet shall not be wet and no accumulation of water which could reach them shall occur inside the machine. It is, however, permissible for the blades of fans inside rotating machines to be wet and leakage along the shaft is allowable if provision is made for drainage of this water.	No water has entered in the machine.	P
9.2.2	In the case of a test on a machine not running: a) the machine shall be operated under no-load conditions at rated voltage for 15 min, b) then be submitted to a withstand voltage test, the test voltage being 50 % of the test voltage for a new machine (but not less than 125 % of the rated voltage). In the case of a test on a running machine, only the withstand voltage test is made, in accordance with item b) above. The test is deemed satisfactory if these checks show no failure.		N/A
10	Requirements and tests for open weather-protected machines		N/A
	The degree of protection W is intended for air-cooled open machines with open circuit cooling, that is, machines with cooling systems designated by IC0X to IC3X according to IEC 60034-6. Weather-protected machines shall be so designed that the ingress of rain, snow and airborne particles into the electrical parts is reduced. Other measures providing weather protection (such as encapsulated windings or total enclosure) are not designated by W.		N/A
	Machines with degree of protection W shall have ventilation passages constructed such that:		N/A
	a) at both intake and discharge, high-velocity air and airborne particles are prevented from entering the internal passages leading directly to the electrical parts of the machine;		N/A
	b) the air intake path, by baffling or use of separate housings, provides at least three abrupt changes in the direction of the air intake, each of which is at least 90°;		N/A
	c) the air intake path provides an area of average velocity not exceeding 3 m/s, enabling any particles to settle. Removable or otherwise easy to clean filters or any other arrangement for the separation of particles may be provided instead of a settling chamber.		N/A

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	The protection of the machine against contact, foreign objects and water shall comply with the conditions and tests specified for the stated degree of protection. The design of the terminal box shall ensure a degree of protection of at least IP54. If necessary, arrangements to provide protection against icing, moisture, corrosion or other abnormal conditions shall be made by agreement (e.g. by using anti-condensation heating). For the verification of weather protection W, a study of drawings is generally sufficient.		N/A

END OF TEST REPORT