



| <b>Type Test Report</b>                                                                                                  |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | Date of issue: 2011.09.26                           |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
|--------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------|---------|----------------------------|----------|--------------------------|-------|----|-------|---|-------|------|-----|------|-----|-----|------|------|----|-----|------|-----|-----|-------|------|----|-----|------|-----|------|------|------|----|
| Customer:                                                                                                                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | Serial No.: 3GE113113P4910                          |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Customer ref.:                                                                                                           |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | Type: M3AA 132MA 6<br>Product Code: 3GAA133312- _DE |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Rating:                                                                                                                  |             | <table border="1"> <thead> <tr> <th>V</th> <th>Hz</th> <th>kW</th> <th>r/min</th> <th>A</th> <th>cos φ</th> <th>Duty</th> </tr> </thead> <tbody> <tr> <td>690</td> <td>Y 50</td> <td>4,0</td> <td>960</td> <td>5,70</td> <td>0,68</td> <td>S1</td> </tr> <tr> <td>400</td> <td>D 50</td> <td>4,0</td> <td>960</td> <td>10,00</td> <td>0,68</td> <td>S1</td> </tr> <tr> <td>460</td> <td>D 60</td> <td>4,0</td> <td>1165</td> <td>8,70</td> <td>0,67</td> <td>S1</td> </tr> </tbody> </table> |       |                                                     |         |                            |          | V                        | Hz    | kW | r/min | A | cos φ | Duty | 690 | Y 50 | 4,0 | 960 | 5,70 | 0,68 | S1 | 400 | D 50 | 4,0 | 960 | 10,00 | 0,68 | S1 | 460 | D 60 | 4,0 | 1165 | 8,70 | 0,67 | S1 |
| V                                                                                                                        | Hz          | kW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | r/min | A                                                   | cos φ   | Duty                       |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| 690                                                                                                                      | Y 50        | 4,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 960   | 5,70                                                | 0,68    | S1                         |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| 400                                                                                                                      | D 50        | 4,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 960   | 10,00                                               | 0,68    | S1                         |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| 460                                                                                                                      | D 60        | 4,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1165  | 8,70                                                | 0,67    | S1                         |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| 3~Motor                                                                                                                  |             | 50Hz : IE2 - 84,9(100%) - 85,3(75%) - 83,9(50%)                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Insul.cl.F                                                                                                               |             | 60Hz : IE1 - 85,4(100%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| IP55                                                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Resistance                                                                                                               |             | Ambient: 24,9 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       | Insulation resistance at 28,4 °C                    |         | Overload                   |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Line                                                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | R > 2000 Mohm 1000 V                                |         | Current 150 % 120s         |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| U <sub>1</sub> - V <sub>1</sub>                                                                                          |             | 1,72600 Ω                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                     |         | Torque 160 % 15s           |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| U <sub>1</sub> - W <sub>1</sub>                                                                                          |             | 1,72600 Ω                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                     |         | Speed 120 % 120s           |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| V <sub>1</sub> - W <sub>1</sub>                                                                                          |             | 1,72500 Ω                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
|                                                                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       | High-voltage test winding 2400 V                    |         | 60 s                       |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Test                                                                                                                     | Torque [Nm] | Line U[V]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | f[Hz] | Input I[A]                                          | P1 [kW] | Output P2 [kW]             | n[r/min] | cos φ                    | η [%] |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| No load test                                                                                                             |             | 400 D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50    | 6,6                                                 | 0,36    |                            | 1000     | 0,08                     |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Locked rotor test                                                                                                        |             | 105 D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50    | 10,0                                                | 0,88    |                            | 0        | 0,48                     |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Thermal test ( 100% load )                                                                                               | 39,8        | 400 D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50    | 10,0                                                | 4,71    | 4,00                       | 960      | 0,68                     | 84,90 |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Partial load points:                                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| ~75% load                                                                                                                | 29,4        | 400 D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50    | 8,1                                                 | 3,52    | 3,00                       | 975      | 0,62                     | 85,30 |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| ~50% load                                                                                                                | 19,4        | 400 D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50    | 6,8                                                 | 2,38    | 2,00                       | 984      | 0,50                     | 83,90 |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| ~25% load                                                                                                                | 9,6         | 400 D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 50    | 6,0                                                 | 1,31    | 1,00                       | 992      | 0,31                     | 76,40 |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Temperature rise at rated load.                                                                                          |             | [°C]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       | [K]                                                 |         | Method                     |          | Measurement method       |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Stator winding :                                                                                                         |             | 59,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       | 3                                                   |         |                            |          | 1 Resistance             |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Frame :                                                                                                                  |             | 27,0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       | 3                                                   |         |                            |          | 2 Thermometer            |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Bearing D-end :                                                                                                          |             | 34,2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       | 3                                                   |         |                            |          | 3 Thermocouples          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Ambient Temperature :                                                                                                    |             | 25                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       | 3                                                   |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Manufactured and tested in accordance with rules of IEC 60034-1 and IEC 60034-2-1.<br>PLL determined from residual loss. |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| On behalf of customer                                                                                                    |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                     |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| On behalf of manufacturer                                                                                                |             | Date of test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       | 8.9.2011                                            |         |                            |          |                          |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |
| Tested by Asea Brown Boveri, S.A., Fabrica Motores , 08192 Sant Quirze del Valles , Spain                                |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                                                     |         | Telephone +34 93 728 85 00 |          | Telefax +34 93 728 85 33 |       |    |       |   |       |      |     |      |     |     |      |      |    |     |      |     |     |       |      |    |     |      |     |      |      |      |    |

Computer print-out valid without signature.