



|                                                                                                                                                                                                                                                                                     |             |           |       |                                                                            |         |                                                            |          |                    |       |         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------|-------|----------------------------------------------------------------------------|---------|------------------------------------------------------------|----------|--------------------|-------|---------|
| <b>Type Test Report</b>                                                                                                                                                                                                                                                             |             |           |       | Date of issue: 1.9.2015                                                    |         |                                                            |          |                    |       |         |
| Customer:                                                                                                                                                                                                                                                                           |             |           |       | Serial No.:                                                                |         |                                                            |          |                    |       |         |
|                                                                                                                                                                                                                                                                                     |             |           |       | Type: M3AA 225SMC 2<br>Product Code: 3GAA221230-ADG                        |         |                                                            |          |                    |       |         |
| Customer ref.:                                                                                                                                                                                                                                                                      |             |           |       |                                                                            |         |                                                            |          |                    |       |         |
| Rating:                                                                                                                                                                                                                                                                             |             |           |       |                                                                            |         |                                                            |          |                    |       |         |
|                                                                                                                                                                                                                                                                                     |             |           |       | V                                                                          | Hz      | kW                                                         | r/min    | A                  | cos φ | Duty    |
| 3-Motor                                                                                                                                                                                                                                                                             |             |           |       | 690                                                                        | Y       | 50                                                         | 75,0     | 2969               | 78,8  | 0,84 S1 |
| Insul.cl.F                                                                                                                                                                                                                                                                          |             |           |       | 400                                                                        | D       | 50                                                         | 75,0     | 2969               | 136,0 | 0,84 S1 |
| IP55                                                                                                                                                                                                                                                                                |             |           |       | 415                                                                        | D       | 50                                                         | 75,0     | 2971               | 139,0 | 0,79 S1 |
|                                                                                                                                                                                                                                                                                     |             |           |       | 440                                                                        | D       | 60                                                         | 75,0     | 3570               | 117,0 | 0,89 S1 |
|                                                                                                                                                                                                                                                                                     |             |           |       | 460                                                                        | D       | 60                                                         | 75,0     | 3573               | 116,0 | 0,86 S1 |
| Eff class IE2                                                                                                                                                                                                                                                                       |             |           |       | 50Hz : IE2 - 94,4(100%) - 94,6(75%) - 94,0(50%)<br>60Hz : IE3 - 94,2(100%) |         |                                                            |          |                    |       |         |
| Resistance                                                                                                                                                                                                                                                                          |             |           |       | Insulation resistance at 245 °C                                            |         |                                                            |          | Overload           |       |         |
| Line                                                                                                                                                                                                                                                                                |             |           |       | R > 2000 Mohm 1000 V                                                       |         |                                                            |          | Current 150 % 120s |       |         |
| U <sub>1</sub> - V <sub>1</sub>                                                                                                                                                                                                                                                     |             |           |       | Ambient: 23,6 °C                                                           |         |                                                            |          | Torque 160 % 15s   |       |         |
| U <sub>1</sub> - W <sub>1</sub>                                                                                                                                                                                                                                                     |             |           |       | 0,03164 Ω                                                                  |         |                                                            |          | Speed 120 % 120s   |       |         |
| V <sub>1</sub> - W <sub>1</sub>                                                                                                                                                                                                                                                     |             |           |       | 0,03099 Ω                                                                  |         |                                                            |          |                    |       |         |
|                                                                                                                                                                                                                                                                                     |             |           |       | 0,03190 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    | 47,2                                                                       | 1,76    |                                                            | 3000     | 0,05               |       |         |
| Locked rotor test                                                                                                                                                                                                                                                                   |             | 70,2 D    | 50    | 133,3                                                                      | 6,56    |                                                            | 0        | 0,41               |       |         |
| Thermal test ( 100% load )                                                                                                                                                                                                                                                          | 240,9       | 400 D     | 50    | 134,5                                                                      | 79,04   | 75,00                                                      | 2973     | 0,85               | 94,89 |         |
| Partial load points:                                                                                                                                                                                                                                                                |             |           |       |                                                                            |         |                                                            |          |                    |       |         |
| ~75% load                                                                                                                                                                                                                                                                           | 181,3       | 400 D     | 50    | 106,5                                                                      | 59,63   | 56,60                                                      | 2981     | 0,81               | 94,93 |         |
| ~50% load                                                                                                                                                                                                                                                                           | 122,7       | 400 D     | 50    | 80,9                                                                       | 40,70   | 38,38                                                      | 2988     | 0,73               | 94,32 |         |
| ~25% load                                                                                                                                                                                                                                                                           | 62,1        | 400 D     | 50    | 59,6                                                                       | 21,35   | 19,47                                                      | 2995     | 0,52               | 91,19 |         |
| Temperature rise at rated load.                                                                                                                                                                                                                                                     |             |           |       | °C                                                                         | K       | Method                                                     |          | Measurement method |       |         |
| Stator winding :                                                                                                                                                                                                                                                                    |             |           |       | 79,8                                                                       | 1       |                                                            |          | 1 Resistance       |       |         |
| Frame :                                                                                                                                                                                                                                                                             |             |           |       | 39,3                                                                       | 2       |                                                            |          | 2 Thermometer      |       |         |
| Bearing D-end :                                                                                                                                                                                                                                                                     |             |           |       | 56,1                                                                       | 2       |                                                            |          | 3 Thermocouples    |       |         |
| Ambient Temperature :                                                                                                                                                                                                                                                               |             |           |       | 25                                                                         | 2       |                                                            |          |                    |       |         |
| <p>These tests have been carried out on motor no. 3GV1110849869001, on date 2012-01-19 which is identical in electrical design with the above.</p> <p>Manufactured and tested in accordance with rules of IEC 60034-1 and IEC 60034-2-1.<br/>PLL determined from residual loss.</p> |             |           |       |                                                                            |         |                                                            |          |                    |       |         |
| On behalf of customer                                                                                                                                                                                                                                                               |             |           |       |                                                                            |         |                                                            |          |                    |       |         |
| On behalf of manufacturer                                                                                                                                                                                                                                                           |             |           |       | Date of test                                                               |         |                                                            |          |                    |       |         |
| Tested by ABB AB, LV Motors, 721 70 Västerås, Sweden                                                                                                                                                                                                                                |             |           |       |                                                                            |         | Telephone +46 (0)21 32 90 00<br>Telefax +46 (0)21 32 90 22 |          |                    |       |         |

Computer print-out valid without signature.