



# Field Certification Certificate of Compliance

**Certificate:** 70108314

**Master Contract:** 267577

**Project:** 70108314

**Date Issued:** March 22, 2017

**Issued to:** CG Electric Systems Hungary Zrt.  
Soroksári út 30-34.  
H-1095 Budapest  
HUNGARY

**Attention:** Brigitta Bilicska

*The products listed below are eligible to bear CSA Field Certification Labels, bearing the CSA Mark shown with adjacent indicators 'C' and 'US'.*



Issued by: Maroof Siddiqui  
*Maroof Siddiqui*

## **PRODUCTS**

CLASS – 4211 01 – Motors and Generators

CLASS – 4211 81 – Motors and Generators – Certified to US Standard

**CSA Field Certification Label(s) issued: FC 240600 to FC 240601**

The subject are 2 squirrel cage induction open type air cooled motor with free shaft end at one end. Model FHC400K2, Serial No. 451535/2017-01 and 451536/2017-01, rated 4.16 kV; 76 A; 450kW; 60 Hz; three phase; 3577 RPM; Insulation Class F; Temperature Rise in the windings Class B. Power Factor: 0.88.

Cooling Arrangement: air cooled.

Direction of Rotation: Counter clockwise.

Max. Ambient Temperature: + 50 degree Celsius; Max. Altitude: 1000 m above sea level.

Notes: The motor is provided with terminal box. The final combination of terminal box shall be according to CSA C22.2 No.100-14 and may be reevaluated by local authorities.

## **APPLICABLE REQUIREMENTS**

CSA-C22.2 0-10 - General Requirements - Canadian Electrical Code, Part II

CSA C22.2 100-14 - Motors and Generators

UL1004-1 2<sup>nd</sup> Edition - Rotating machines



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**MARKINGS**

- a) Manufacturer's name;
- b) Machine catalog and model number;
- c) Rated voltage;
- d) Full-load amperes, watts or kilowatts, or both;
- e) Rated speed;
- g) Rated temperature rise and the insulation system class;
- h) Rated ambient temperature;
- i) Rated frequency
- j) Number of phases.



# Descriptive Report and Test Results

**MASTER CONTRACT: 70108314**  
**REPORT: 70108314**  
**PROJECT: 70108314**

**Edition 1:** Project – 70108314; March 20, 2017; Frankfurt  
Issued by Maroof Siddiqui

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Site visit date: 2017-03-07

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**MARKINGS**

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

- a) Manufacturer's name;
- b) Machine catalog and model number;
- c) Rated voltage;
- d) Full-load amperes, watts or kilowatts, or both;
- e) Rated speed;
- g) Rated temperature rise and the insulation system class;
- h) Rated ambient temperature;
- i) Rated frequency
- j) Number of phases.

The rating plate is made of stainless steel and riveted on the frame of the machine.

**ALTERATIONS**

N.A

**FACTORY TESTS:**

N.A

**DESCRIPTION**

Type	Serial No.	Label
FHC400K2	451535/2017-01	FC 240600
FHC400K2	451536/2017-01	FC 240601

The subject are 2 squirrel cage induction open type air cooled motor with free shaft end at non drive end. Model FHC400K2, Rated 4.16 kV; 76 A; 450kW; 60 Hz; three phase; 3577 RPM; Insulation Class F; Temperature Rise in the windings Class B. Power Factor: 0.88.

The motor is identical to the motor evaluated under project 70096744.

Electrical Spacings: The electrical spacing complies with the requirements of the CSA C22.2 No.100-14 as stated in the table 3 (3.2mm through air and 6.3mm through surface for 375V and less circuits; 6.3mm through air and 9.5mm through surface for 750V and less circuits) and table 9 (50mm through air and 88mm through surface for 4.2 kV circuits).

Frame and Mounting: The enclosure of material S235G2+N of minimum 4 mm of welded steel. The total length of the machine with shaft and mounting or sole-plate with pedestals for support included is approx. 1430mm with the total width of the mounting is 950mm. The frame is provided with Louvers and their spacing is validated according to Clause 5.2.2.1 of CSA Standard C22.2 No.100-14.

Lifting Lugs: 4 Lifting lugs are provided for part assembly lifting. These lugs are specially marked for their intended use. The lifting lugs were tested according to UL1004-1 2<sup>nd</sup> Edition Clause 33.7.

Main Terminal Box: The motor is provided with a phase segregated terminal box planted on top of the machine. The terminal box is listed under certificate 03ATEX4223U. The dimension of the terminal box is 251mm x 666 mm x 795 mm .The electrical spacings in the terminal box are according to CSA C22.2 No.100-14.

Aux. Terminal Box for auxiliary connection: The auxiliary terminal box is defined under PTB04ATEXQ034-5. Dimensions are 300mm x 120mm x 300mm by Rittal type KEL93 06 000. T. The auxiliary box is of stainless steel and secured by means of key.

Terminal Block: Used for circuits for 600V and less. Ground modular terminal block with terminals (power) from Weidmuller of type WDU 2.5-2 and for grounding type ZPE 2.5-2. The heaters are connected through the type WDU10 from Weidmuller rated 600V or less.

Anti-Condensation Heater: Accepted by construction review and test: 2 provided rated 127V 200W and 60Hz. Manufactured by Pentair of type Tyco EH02 certified file no. 20130508-67540.

Grounding: Grounding is provided with a screw of size M12 mounted on a plate with lock washer and welded on the frame.

Bonding: Bonding of different metallic parts of the generator by means of suitable insulated copper wire which are connected with bolts and washers to welded threaded nut.

Stator: The stator is made of 42 slots with a step of 15 and has 2 Poles. The coil has 14 number of turn in series. The length of the core is 390 mm and the length of the coil is 445mm.the total length of coil is 861mm. Insulation Material: Stator winding is made of insulated copper strips coated by glass bonded mica tape. slot corona protection is made by Contafel H0865 (Isovolta). Sealing is made by raw glass tape of type 305 VRA20 (Von Roll).Winding heads are reinforced by vacuum pressure impregnation.

Main Stator Coil Leads and internal wiring: Certified leads, SIWO-KUL class 5 rated at 4.2kV by Nexans (2193117).

Cooling Method: Fan cooled.14 blades and material S355G2+N.

Cable Glands: A nickel-plated brass cable gland with metric connecting thread provided by Weidmuller(SIRA 05 ATEX 1286X) of type KDSW M20 BN L NI 1G16.

Rotor: Rotor shaft is made of forged steel material St 52-3 N with dimensions of diameter of 123mm and shaft length of the rotor 1445mm.

RTDs: 6 in windings (2 per phase) of Type S-NWth (3 lead system) by Heraaus Sensor Technology GmbH. Certified under file PTB 03 ATEX 2162 U.

Bearing: Anti friction roller bearing at drive end and non-drive end of material 6219M/C3 by SKF/FAG.

**TEST HISTORY**

The subject are 2 squirrel cage induction open type air cooled motor with free shaft end at one end. Model FHC400K2, Rated 4.16 kV; 76 A; 450kW; 60 Hz; three phase; 3577 RPM; Insulation Class F; Temperature Rise in the windings Class B. Power Factor: 0.88.

Cooling Arrangement: air cooled.

Direction of Rotation: Counter clockwise.

Max. Ambient Temperature: + 40 degree Celsius; Max. Altitude: 250 m above sea level.

Test location was the facility of CG Electric Systems Hungary Zrt. The test have been supervised by Ms Brigitta Bilicska and witnessed by the CSA representative Maroof Siddiqui.

For Temperature test, rating test and construction review checklist, the project 70096744 test results can be found in Att3 Test Results from Page 16 to 40. The motor is identical to 70096744 and the test performed during project 70096744 were accepted.

Following tests were performed:

Standard	Clause	Test
C22.2 No. 100-14 / UL 1004-1 2 <sup>nd</sup>	7.4 / 37	Di-electric strength test
UL 1004-1 2 <sup>nd</sup> Edition	33.7	Lifting lug test

All the test were performed with satisfactory results. The results are attached in project folder under test results.

---End of Report---