



Descriptive and Test Report

MASTER CONTRACT: 189340
REPORT: 1290683
PROJECT: 1499247

Edition 1: June 4, 2002; Project 1290683 - Montreal
Issued by J. -P. Boivin, Eng.

Edition 2: July 13, 2004; Project 1499247 – Montreal
Issued by J.-P. Boivin, Eng.

Pages Replaced: **REPORT RE-ISSUED**

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PRODUCTS

CLASS 4228 01 - MOTORS AND GENERATORS - For Hazardous Locations

Class I, Division 2, Groups C and D
Class II, Divisions 2, Groups F and G
Temperature Code T3B-165C

Squirrel-cage induction motors, Three-phase, Four pole, Insulation Class F-155, 230/460V ac, 332/575V ac, 60Hz, Ambient Rated 40C, continuous duty, TEFC, Service Factor 1.15, RPM 1650 to 1780, vary per size.

MODELS	OUTPUT (kw)
63S/4	0.12
63L/4	0.18
71S/4	0.25
71L/4	0.37
80S/4	0.55
80LH/4, 80L/4	0.75
90SH/4, 90S/4	1.1
90LH/4, 90L/4	1.5
100LH/4, 100L/4, 100L/40	2.2
112MH/4, 112LH/4	3.7
132SH/4, 132S/4	5.5
132MH/4, 132M/4	7.5

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Note: The product Model No. corresponds to the IEC motor frame size code and appear on the motor nameplate.

APPLICABLE REQUIREMENTS

- CSA Std C22.2 No. 0-M91 - General Requirements- Canadian Electrical Code Part II
- CSA Std C22.2 No. 25-1966 - Enclosures for Use in Class II, Groups E, F and G
Hazardous Locations(Classified) Locations
- CSA Std C22.2 No. 100-95 - Motors and generators
- CSA Electrical Certification Notice No 672 - Technical Information Letter No. E-22, Requirements
for Motors and Generators for use in Class I Division 2
and Class II Division 2 (Classified) Hazardous locations.

MARKINGS

The following markings shall be plainly marked in a permanent manner, mechanically secured metallic nameplate, aluminium or stainless 0.5mm thick in a place where the details will be readily seen after the installation with the following information:

- Manufacturer's name or trademark or CSA file number; LR 112560 or LR 189340.
- Catalogue, style or model designation;
- Rated input voltage, frequency in Hz, rated input in Amperes; output in HP or KW, RPM, insulation class F service factor.
- Hazardous location designation (i.e. Class II, Division 2, Groups F and G, Class I, Division 2 Groups C and D); temperature code T3B.
- The CSA Mark

ALTERATIONS

- Markings appear as above. All the information shall appear on a single nameplate.
- Electromagnetic brakes are not covered by this report.

FACTORY TESTS

Each motor at the conclusion of manufacture, before shipment, shall withstand for one min, without breakdown, the application between live parts and exposed metal parts, of potentials as follows:

- (a) Motors rated less than ½ hp from 31 to 375V-1000V ac
- (b) Motors rated ½ hp and over – twice rated voltage plus 1000V ac.

As an alternative, potentials 20 percent higher may be applied for one second.

Warning: The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.

RATING AND CONDITIONS OF ACCEPTANCE

1. Squirrel cage 3 ph induction motor, TEFC enclosure flange mounted, intended for use with submittor's mechanical gear reductor.
2. Motors are rated 600V max, 4 pole, 3 ph, 60Hz, 0.12 kW to 7.5 kW (0.16 to 10 hp).
3. Insulation Class F-155
4. Motor designation 63 S/4 to 132 MH/4 , as shown under section subject of the present report.
5. The optional temperature protection is accomplished by thermistors which are connected to appropriate protective relays. The motors are not considered thermally protected as defined by the Canadian Electrical Code.
6. Types other than described below polymeric plastic material cooling fans are not included in this report.

DESCRIPTION:

General: The subject motors are similar in construction to those covered under the submitter's Certification Report LR 112560-1, Revision LR 112560-7 issued October 25, 1999 for use in ordinary locations. The purpose of this file report is to cover the subject motors for use in Class I, Division 2, Groups C and D and Class II, Division 2, Groups F and G, Hazardous Locations.

Construction: The subject squirrel cage induction ac motors vary from 0.12 up to 7.5KW (10hp). In addition to ordinary location requirements, the subject motors are built and designed according to construction details specified below.

The constructional design of the subject motors are based on the construction requirements of CSA Electrical Certification Notice No 672 and in addition to ordinary location compliance described in Standard C22.2 No. 100-1995.

Accessories: The subject motors may be provided with accessories. See section for ac motor accessories of the present report.

MOTOR CONSTRUCTION (for use in Class I, Div. 2, Groups C and D and Class II, Div. 2, Groups F and G)

See Annex A page 1 to 6 and attachments 1 to 12 of certificate LR112560-1

1. The motor shall have Class F-155 insulation.
2. A motor may be overframed to meet temperature limitations provided the total external surface temperature (rise plus ambient) does not exceed the limits of the temperature code on the nameplate.
3. External fans shall be explosion-proof tested non-sparking plastic, polypropylene.
4. The motor shall have a neoprene or equivalent conduit base gasket between the frame and the conduit box. It will also have a neoprene or equivalent conduit box cover gasket. Customer lead opening into conduit box shall be a drilled and tapped hole for sealed conduit entry. The conduit entry shall have at least three thread fully engaged.
5. A grounding lug shall be provided in the conduit box either under one of the mounting bolts or on the special grounding bus.
6. The external surface temperatures on motors when operating at service factor shall not exceed the following:

<u>Temp. Code</u>	<u>Groups</u>	<u>Max Surface Temp °C</u>
T3C	F, G	160
T3B	F, G	165
T3A	F	180
T3	F	200

7. Motors shall be standard totally-enclosed, TEFC.

- 8a) Requirement for joint. Dust exclusion: Class II, Div. 2, Group F and G:
Motors shall have a minimum rabbet or face fit length of 3/16 (0.19) inch with a maximum radial clearance of 0.002 inch. Radial clearance may be increased 0.001 inch for each additional 1/8 (.12) in fit length up to a maximum of 0.008 inch radially. Compliance verified by drawing for drive endbells to housing, non-drive endbell to the housing.
- 8b) Shaft openings shall have a minimum length of 1/2 (0.50) inch with a maximum diametrical clearance of 0.010 inch; or a length of 1-1/2 (1.50) inch with a maximum of 0.022 inch diametrical clearance; or any proportional values in between. An approved explosion proof labyrinth slinger may be used to meet this requirement, or shielded and sealed bearings and explosion proof shaft clearances. Compliance verified by the use of shaft seal, WDR (nitrile rubber) for example on model 71L/4, shaft seal size WDR 20 x 30 x 5 A and WDR 20 x 30 x 7, flat.
- 8c) Conduit Openings: Machines shall have provision for permanent connection to a wiring system (eg . conduit or cable gland). Threaded conduit openings shall comply with the requirements of CSA Std C22.2 No 0.5.
- 8d) Terminal Box: Dust tightness provided by seal gasket min. width, 5mm, thickness, 1.33mm thick between the cover and box. 2.9mm thick between housing and terminal box.

AC MOTORS ACCESSORIES (optional)

- A. Winding RTD's: One or more may be installed between turns on intercoils and shunt field coils and leads are brought into the terminal box. All leads are identified on a marking strip mounted on the terminal block. Circuit are segregated form power circuit.

Manufacturer Name: Various
Model Number: Various

- B. Winding Thermistors: One or more are installed between turns on intercoils and shunt field coils and leads are brought into the terminal box. A controller may be mounted in a conduit box or in a separate location by the customer (i.e., not mounted on the motor).

Manufacturer Name: Various
Cat. Number: Various

- C. Tachometer: CSA approved for Division 1 or Division 2
Vendor: Any

- D. Brakes: Use of brake is not covered by this report.

- E. Space Heaters: None provided

- F. Winding Thermocouples:
Vendors: Various
Cat. No.: Various

TESTS

1. Dust-Tightness: ECN 672 Cl 6.2.1

In view that the subject motors construction are built in compliance with the joint requirement specified in Cls 4.1.2 and 4.1.3 the dust-tightness test was waived.

2. Temperature: Normal operation full load, ECN 672 Cl 6.3

In view that several representative motors having HP rating to cover the range 0.17 to 10 hp were tested to CSA C22.2 No 100-95 in the submitter's facility and covered under file LR 112560-1. The motor winding temperatures were below the limit for a class F-155 ins. system. The results indicated that the external surface temperature of the motor did not exceed 200C for Group F nor 165C for Group G locations.

3. Accumulation of Static Electricity: ECN 672 Cl 6.4

To CSA C22.2 No. 145 M1986
Test performed on Polypropylene Fan, Result: Satisfactory.

4. Dielectric strength:

1000V plus twice the rated voltage between live part to the chassis.

Performed in standard location, file LR112560-1.

No further tests were considered necessary based on the construction design as specified in the description.

Test data attached to the CSA copy.

Edition 2 – Project 1499247

Addition of motor range 80L/4 to 132M/4 for Class I, Div. 2, Gr. A, B, C, D and Class II, Div. 2, Gr. F and G. The motors are standard efficiency and are identical to the high efficiency in all aspect except for winding construction detail.

Test performed in project 1290683 is considered representative.

No test performed.