



Certificate of Compliance

Certificate: 2590988

Master Contract: 186777

Project: 70020330

Date Issued: May 7, 2015

Issued to: **Crompton Greaves Ltd**
LT Motors Division
A-6/2 MIDC Industrial Area
Ahmednagar, Maharashtra 414111
INDIA
Attention: **Ramanand Ventekar**

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only



Issued by:

Sham Das Gupta
Shaon Das Gupta

PRODUCTS

CLASS 4211 01 - MOTORS AND GENERATORS

CLASS 4211 81 - MOTORS AND GENERATORS - Certified to US Standards

Induction Motors, Premium Efficiency Series with prefixes PAXXXX and PCXXXX, NEMA/ IEC frame, Three phase, 208-230 V, 460 V, 575 V, 60 Hz, 40°C ambient, TEFC, Class F or H insulation, SF 1.15 (for 208-230 V/460 V motors S.F. 1.0 at 208 V). Motors also for Inverter duty 6-60 Hz, Variable Torque (VT); 12-60 Hz, Constant Torque (CT), inverter type PWM, SF 1.0 max.

Motor ratings are as follows:

Aluminum / Cast Iron Body Motors:								
HP	NEMA Frame	IEC Frame	Poles	Synchronous RPM		Volts	Amps	Connection
				Base	Max			
1	143	90S	4	1800	3600	208-230 / 460, 575	3.3-3.0/1.5, 1.2	YY / Y, Y
	145	90L	6	1200	2400	208-230 / 460, 575	4.0-3.6/1.8, 1.45	YY / Y, Y
1.5	143	90S	2	3600	7200	208-230 / 460, 575	4.9-4.4/2.2, 1.76	YY / Y, Y
	145	90L	4	1800	3600	208-230 / 460, 575	4.9-4.4/2.2, 1.76	YY / Y, Y



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Aluminum / Cast Iron Body Motors:

HP	NEMA Frame	IEC Frame	Poles	Synchronous RPM		Volts	Amps	Connection
				Base	Max			
2	182	112M	6	1200	2400	208-230 / 460, 575	4.9-4.4/2.2, 1.76	YY / Y, Y
	145	90L	2	3600	7200	208-230 / 460, 575	6.0-5.4/2.7, 2.15	YY / Y, Y
	145	90L	4	1800	3600	208-230 / 460, 575	6.4-5.8/2.9, 2.35	YY / Y, Y
3	184	112M	6	1200	2400	208-230 / 460, 575	6.2-5.6 / 2.8, 2.25	YY / Y, Y
	182	112M	2	3600	7200	208-230 / 460, 575	7.7-7.0/3.5, 2.8	YY / Y, Y
	182	112M	4	1800	3600	208-230 / 460, 575	8.6-7.8/3.9, 3.1	YY / Y, Y
5	213	132S	6	1200	2400	208-230 / 460, 575	10.0-9.0/4.5, 3.6	YY / Y, Y
	184	112M	2	3600	7200	208-230 / 460, 575	13.0-11.8/5.9, 4.7	YY / Y, D
	184	112M	4	1800	3600	208-230 / 460, 575	14.6-13.2/6.6, 5.3	YY / Y, D
7.5	215	132M	6	1200	2400	208-230 / 460, 575	16.2-14.6/7.3, 5.8	YY / Y, D
	213	132S	2	3600	5400	208-230 / 460, 575	18.8-17.0/8.5, 6.8	YY / Y, D
	213	132S	4	1800	3600	208-230 / 460, 575	20.8-18.8/9.4, 7.5	YY / Y, D
10	215	132M	2	3600	5400	208-230 / 460, 575	26.5-24.0/12.0, 9.6	YY / Y, D
	215	132M	4	1800	3600	208-230 / 460, 575	29.4-26.6/13.3, 10.6	YY / Y, D
	256	160L	6	1200	2400	208-230 / 460, 575	28.8-26/13,10.4	DD / D,D
15	254	160M	2	3600	7200	208-230 / 460, 575	37.6-34/17,13.6	DD / D,D
	254	160M	4	1800	3600	208-230 / 460, 575	37.6-34/17,13.6	DD / D,D
	284	180M	6	1200	2400	208-230 / 460, 575	42-38/19,15.2	DD / D,D
20	256	160L	2	3600	7200	208-230 / 460, 575	50.9-46/23,18.4	DD / D,D
	256	160L	4	1800	3600	208-230 / 460, 575	53.1-48/24,19.2	DD / D,D
	286	180L	6	1200	2400	208-230 / 460, 575	57.5-52/26,20.8	DD / D,D
25	284	180M	2	3600	7200	208-230 / 460, 575	61.9-56/28,22.4	DD / D,D
	284	180M	4	1800	3600	208-230 / 460, 575	64.1-58/29,23.2	DD / D,D
	324	200M	6	1200	2400	208-230 / 460, 575	69-62/31,25	DD / D,D
30	286	180L	2	3600	7200	208-230 / 460, 575	75.2-68/34,27.2	DD / D,D
	286	180L	4	1800	3600	208-230 / 460, 575	75.2-68/34,27.2	DD / D,D
	326	200L	6	1200	2400	208-230 / 460, 575	83-75/38,30	DD / D,D
40	324	200M	2	3600	7200	208-230 / 460, 575	100-91/45,36	DD / D,D
	324	200M	4	1800	3600	208-230 / 460, 575	101-91/45,36	DD / D,D
	364	225S	6	1200	2400	208-230 / 460, 575	117-106/53,43	DD / D,D
50	326	200L	2	3600	7200	208-230 / 460, 575	121-110/55,44	DD / D,D
	326	200L	4	1800	3600	208-230 / 460, 575	123-112/56,45	DD / D,D
	365	225M	6	1200	2400	208-230 / 460, 575	138-125/62, 50	DD / D,D
60	364	225S	2	3600	7200	208-230 / 460, 575	147-133/66,53	DD / D,D
	364	225S	4	1800	3600	208-230 / 460, 575	153-138/69,55	DD / D,D
	404	250S	6	1200	2400	208-230 / 460, 575	165-149/75,60	DD / D,D
75	365	225M	2	3600	7200	208-230 / 460, 575	179-162/81,65	DD / D,D
	365	225M	4	1800	3600	208-230 / 460, 575	182-164/82,66	DD / D,D



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Aluminum / Cast Iron Body Motors:

HP	NEMA Frame	IEC Frame	Poles	Synchronous RPM		Volts	Amps	Connection
				Base	Max			
100	405	250M	6	1200	2400	208-230 / 460, 575	202-183/91,73	DD / D,D
	405	250M	2	3600	7200	208-230 / 460, 575	243-220/110,88	DD / D,D
	405	250M	4	1800	3600	208-230 / 460, 575	250-226/113,91	DD / D,D
OPTIONAL O/P								
7.5	184	112M	2	3600	5400	208-230 / 460, 575	19-17.2/8.5,6.9	YY / Y, D
7.5	184	112M	4	1800	3600	208-230 / 460, 575	21.6-20/10,7.8	YY / Y, D
15	215	132M	2	3600	5400	208-230 / 460, 575	38.0 -34.4/17.2, 13.8	YY / Y, D
25	256	160L	2	3600	7200	208-230 / 460, 575	63-57/28.5,22.8	DD / D,D
15	256	160L	6	1200	2400	208-230 / 460, 575	42-38/19,15.2	DD / D,D

Notes:

1. Connections:

- i. YY / Y - Parallel Star / Series Star for dual voltage
- ii. Y - Star connected
- iii. D - Delta connected
- iv. DD / D - Parallel Delta / Series Delta for dual Voltage

Motors may be offered with connections different from those stated in the table.

2. Series PAXXXX and PCXXXX are denoted as follows:

- i. "PA" - Aluminium Frame
- ii. "PC" - Cast Iron Frame
- iii. XXX - Frame Size (Or the equivalent IEC frames for various NEMA frames are as shown in table below)

NEMA Frame	IEC Frame
143	90S
145	90L
182	112S
184	112M
213	132S
215	132M
254	160M
256	160L
284	180M
286	180L

NEMA Frame	IEC Frame
324	200M
326	200L
364	225S
365	225M
404	250S
405	250M



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Motors having Frame Letter 'T' or 'TC' or 'TD' as suffixes, have dimensions as per Clause 4.4 of NEMA MG – 1 Part 4.

3. Motors may be made for other Multi voltages i.e. 1:3^{1/2} ratio e.g. 230/400V or 1:3^{1/2}:2 ratio e.g. 230/400/460 V by changing the winding connections.
4. Motors may be offered for operating at frequencies other than 60Hz e.g. 50 / 60 Hz with equivalent voltage at 50Hz.
"CSA has investigated this equipment only under conditions of usage specifically described in the installation instructions, which require adaptation to the 415V 50Hz system(s) of supply", or equivalent.
5. Motors offered are for ambient up to 40°C. For higher ambient following de-rating to be applied:

Ambient	De-rating factor	Temperature rise
Up to 45°C	0.95 x rated output	Corresponding to Class B Insulation
Above 45°C and up to 50°C	0.90 x rated output	Corresponding to Class B Insulation
Above 50°C and up to 55°C	0.85 x rated output	Corresponding to Class B Insulation

6. Winding leads are either terminated on a terminal block inside the terminal box or alternatively open leads of approx 9"length (without terminal block) is provided to facilitate supply connection.
7. Motors may be marked for lower service factor for specific application requirements. (minimum SF=1)
8. Motors may be marked for lower ambient temperature up to -25°C with lithium base greased bearings. Or below -25°C with suitable low temperature grease in the bearings.
9. Motors may incorporate anti-condensation heaters. Terminals of the heaters are brought to separate terminal block inside the main terminal box or separate auxiliary terminal box fitted on the motor.
10. Motors may include options: Thermistors, Thermostats, RTDs embedded in winding, Bearing temperature sensing devices fitted on bearing housing, Terminals of such auxiliaries are brought to terminal block inside the main terminal box or separate auxiliary terminal box fitted on the motor.
11. Motors may be mounted as Horizontal / Vertical with Foot / Flange mounting.
12. These motors are suitable for speed variation of 5:1 (12-60 Hz) for Constant Torque and 10:1 (6-60 Hz) for Variable Torque applications. Also suitable for Constant HP applications for speeds higher than base speeds (up to max synchronous speed as tabulated above).
13. These motors also have been verified for max safe operating speed (no load for 2 minutes) of 10% above the max speed (when max speed is more than the base speed) or 25% above the max speed tabulated above (when max speed is same as base speed).
14. These motors are certified as components of certified equipment where the suitability of the combination is to be determined by CSA International.



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APPLICABLE REQUIREMENTS

- CSA C22.2 No 100-14 - Motors and Generators
- UL 1004-1 (2nd Edition) - Rotating Electrical Machine - General Requirements
- UL 1004-8 (2nd Edition) - Inverter duty motors.



Supplement to Certificate of Compliance

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*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
70020330	May 7, 2015	Update of Report 2590988 to cover addition of NEMA Frame sizes till 405.
70015439	December 29, 2014	Update of Report 2590988 to cover addition of NEMA Frame sizes till 286.
2590988	January 22, 2013	Induction Motors, Premium Efficiency Series with prefixes PAXXXX and PCXXXX. (C/US)