



1 **TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 06ATEX4332X** Issue: **2**

4 Equipment: **Range of PPA/PPC Induction Motors frame sizes 80 to 400**

5 Applicant: **CMG Pty Ltd** **CMG Electric Motors (UK) Limited** **CMG Electric Motors NZ Ltd**

6 Address: 19 Corporate Avenue Unit A, Stafford Park 2, 303E/315A, Rowville Telford Rosebank Road Victoria 3178 TF3 3AR Avondale, Australia UK Auckland New Zealand

Applicant: **CMG Electric Motors Asia Pacific Pte Ltd.,**

Address: 21, Tuas South Street 1 Singapore 638032

7 This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service certifies that this equipment has been found to comply with the Essential Health and Safety Requirements that relate to the design of Category 3 equipment, which is intended for use in potentially explosive atmospheres. These Essential Health and Safety Requirements are given in Annex II to European Union Directive 94/9/EC of 23 March 1994.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN 60079-0: 2004 EN 60079-15: 2005 IEC 61241-0: 2004  
IEC 61241-1: 2004 EN 13463-1: 2001 EN 13463-5: 2003

10 If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This TYPE EXAMINATION CERTIFICATE relates only to the design of the specified equipment, and not to specific items of equipment subsequently manufactured.

12 The marking of the equipment shall include the following:

II 3 G c  
Ex nA II T3  
Tamb -20°C to +60°C

II 3 G D c  
Ex nA II T3  
Ex tD A22 IP66 T135°C  
Tamb -20°C to +50°C

II 3 D c  
Ex tD A22 IP66 T135°C  
Tamb -20°C to +50°C

Project Number 51A17344  
C. Index 01

D R Stubbings BA MIET  
Certification Manager

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**SCHEDULE**

**TYPE EXAMINATION CERTIFICATE**

**Sira 06ATEX4332X  
Issue 2**

**13 DESCRIPTION OF EQUIPMENT**

The PPA/PPC squirrel cage induction motors are manufactured from cast iron and comprise a main body with a separate bolt-on terminal box. They are designed to operate on 3 phase, 100 V to 1000 V, 40 Hz, 50 Hz or 60 Hz power systems, and may be supplied with auxiliary terminal boxes that are used to connect optional, anti-condensation heaters, RTDS and thermistors. The motors are available as foot mounted, flange mounted or foot and flange mounted. The bearings have V-ring seals with a nitrile rubber gasket seal on the lid of the main terminal box, these give the motors an IP rating of IP66. Electrical connection is made via a threaded entry in the main terminal box wall, this is designed to accommodate either a gland or conduit.

The range of motors are designated either type PPA or PPC and is listed in Table 1, the type PPA is for Australian output (kW/Frame) and the type PPC is for CENELEC (kW/Frame), both are identical in construction. The equipment may include one or more of the options detailed in Table 2.

<b>Table 1: Range of Induction Motors frame sizes PPA/PPC 80 to PPA/PPC 400</b>					
<b>2 POLE MOTORS</b>					
<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>	<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>
80	0.75		315S	132	110
80	1.1		315M	150	132
90S	1.5		315M		150
90L	2.2		315L	185	185
100L	3		315LX	200	
112M	4		315LX	220	
132S	5.5		355L	250	200
132S	7.5		355L		220
160M	11		355L		225
160M	15		355L		250
160L	18.5		355L	280	280
180M	22		355L	315	
200L	30		355L	355	
200L	37		355LX	400	
225M	45	45			
250S	55				
250M	75	55			
280S	90	75			
280M	110	90			

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**SCHEDULE**

**TYPE EXAMINATION CERTIFICATE**

**Sira 06ATEX4332X  
Issue 2**

<b>4 POLE MOTORS</b>					
<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>	<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>
80	0.55		315S	132	110
80	0.75		315M	150	132
90S	1.1		315M		150
90L	1.5		315L	185	185
100L	2.2		315L	200	
100L	3		315L	220	
112M	4		315LX	250	
132S	5.5		355L	280	200
132M	7.5		355L		220
160M	11		355L		225
160L	15		355L		250
180M	18.5		355L		280
180L	22		355L	315	
200L	30		355L	355	
225S	37	37	355L	400	
225M	45	45	355LX	450	
250S	55		400L	450	
250M	75	55	400L	500	
280S	90	75	400L	560	
280M	110	90	400LX	630	

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**SCHEDULE**

**TYPE EXAMINATION CERTIFICATE**

**Sira 06ATEX4332X  
Issue 2**

<b>6 POLE MOTORS</b>					
<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>	<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>
90S	0.75		315S	90	75
90L	1.1		315M	110	90
100L	1.5		315M		110
112M	2.2		315M	132	132
132S	3		315L	150	150
132M	4		315LX	185	
132M	5.5		355L	200	185
160M	7.5		355L		200
160L	11		355L	220	220
180L	15		355L		225
200L	18.5		355L	250	250
200L	22		355L	280	280
225M	30	30	355LX	315	
250S	37		400L	355	
250M	45	37	400L	400	
280S	55	45	400L	450	
280M	75	55	400LX	500	
<b>8 POLE MOTORS</b>					
<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>	<b>Frame Size</b>	<b>Output (kW) Type PPA</b>	<b>Output (kW) Type PPC</b>
132S	2.2		315S	75	55
132M	3		315M		75
160M	4		315M	90	90
160M	5.5		315M		110
160L	7.5		315L	110	
180L	11		315LX	132	
200L	15		315LX	150	
225S	18.5	18.5	355L	150	132
225M	22	22	355L	185	150
250S	30		355L	200	185
250M	37	30	355L	220	200
280S	45	37	355L	250	220
280M	55	45	355LX	280	250
400L	280		400L	315	
400L	355		400LX	400	

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**SCHEDULE**

**TYPE EXAMINATION CERTIFICATE**

**Sira 06ATEX4332X  
Issue 2**

<b>Table 2: Options for PPA/PPC 80 to PPA/PPC 400</b>	
1	Left-handed terminal box when viewed from drive-end
2	Anti-condensation heaters for frames 80 – 225 are optional. Frames 250 and above anti-condensation heaters are fitted as standard see drawing PPA138 for fitting instructions.
3	Additional sets (3) of PTC thermistors. Fitting of thermistors in accordance to drawing PPA138
4	Auxiliary terminal box for the termination of the thermistors, RTD's and heaters. Auxiliary box fitted in accordance to drawing PPA139.
5	Winding RTD's-PT100 RTD's fitted into motor windings; RTD's fitted in accordance to drawing PPA138.
6	Bearing thermistors fitted into the bearing housing with leads sleeved and routed into auxiliary terminal box. Leads shall be covered with Vidaflex fibreglass sleeve.
7	Bearing RTD's fitted into the bearing housing. Leads terminated in separate terminal box. Arrangement as shown in drawing 7476A.
8	Vibration adaptors fitted in tapped blind holes in endshields or as shown on drawing 7476B.
9	Stainless steel fasteners.
10	Stainless steel shaft. Magnetic grades of stainless steel only for 2 pole motors. Other poles can have magnetic or non-magnetic grades of stainless steel.
11	Alterations to shaft extension diameter and/or length. Shaft diameter shall comply with IEC 60072-1 table 4 "shaft extensions keys and keyway dimensions. Greatest permissible torque on continuous duty for AC motors" Alternatively, shaft design shall meet the requirements of AS 1403-2004: Design of rotating steel shafts.
12	Alternative types of rolling bearings i.e., ball, roller, angular contact. (As per manufacturer's recommendations).
13	Flange size and type changes external to motor enclosure.
14	Operation on VVVF drives, for Ex nA and Ex tD motors only. Ex nA & Ex tD motors shall be fitted with a thermistor to limit the surface temperature of the motor. Ex nA motor load ability determined as per drawing PPA151
15	Forced ventilation by separately driven cooling fan -the main motor protected by thermistors. The motor driving the fan shall have the same protection as the main motor. The cooling unit shall be fitted as shown on drawing PPA142, PPA142A & PPA142B.
16	Fan and Fan cover design changes for noise reduction maintaining required clearances and airflow. New fan cover shall be of steel / stainless steel with same thickness or thicker than original fan cover with same fixing.
17	Additional eyebolt for vertical lifting
18	Rain canopy for vertical mount (shaft down) motors without reducing airflow over motor. Rain canopy made out of steel / stainless steel -Minimum thickness 1.5 mm
19	Sun shields made from steel / stainless steel. Minimum thickness 1.5 mm.
20	Extended leads and blanking plate shall be fitted in accordance with drawing PPA141.
21	Brass, aluminium or steel gland plate in place of cast iron. Alloys to contain < 7.5 % in total magnesium and titanium by mass and <6% magnesium by mass'
22	Larger terminal box.
23	Larger terminal blocks with larger box.

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**SCHEDULE**

**TYPE EXAMINATION CERTIFICATE**

**Sira 06ATEX4332X  
Issue 2**

<b>Table 2: Options for PPA/PPC 80 to PPA/PPC 400</b>	
24	Other supply voltages within 100V to 1000V, 40 Hz, 50 Hz or 60 Hz Ref to General Assembly drawings PPA101 to PPA104.
25	Location of drain plug at lowest point for different mounting arrangements.
26	Operation of motors with Electronic Soft Starters. Electronic Soft Starters shall be disconnected from the circuit once the motor is started and supply to motor shall be direct from mains only.
27	Supply terminals to suit star-delta starting with six supply leads.
28	Lower kW Output Rating Other than Standard. Other rating data for lower kW output to be declared by test and/or calculation based on test for standard kW rating.
29	Attachment of shaft encoder certified by IECEx and ATEX Approved for Zone 2 Group II, T3 for Ex nA or Ex tD A21, T135°C for Ex tD
30	Socket Head Cap Screws to replace bolts and / or Screws.

**14 DESCRIPTIVE DOCUMENTS**

**14.1 Drawings**

Refer to Certificate Annexe.

**14.2 Associated Sira Reports and Certificate History**

<b>Issue</b>	<b>Date</b>	<b>Report No</b>	<b>Comment</b>
0	2 November 2006	R51F14849A	The release of the prime certificate.
1	6 March 2007	R51E16072A	Re-Issued to include the UK Facility
			This Issue covers the following changes: <ul style="list-style-type: none"> <li>All previously issued certification was rationalised into a single certificate, Issue , Issues 0 to 1 referenced above are only intended to reflect the history of the previous certification and have not been issued as documents in this format.</li> </ul>
2	8 November 2007	R51A17344A	<ul style="list-style-type: none"> <li>Re-Issued to include the Facilities in New Zealand and Singapore</li> </ul>

**15 SPECIAL CONDITIONS FOR SAFE USE**

15.1 The motors shall only be operated from VACON Variable Frequency Drive Types CX/CXL/CXS or drives of equivalent characteristics as determined by test and/or calculation; in addition:

- a) The applied load shall be inside the limits specified by the loadability curve shown in drawing PPA151.
- b) The thermal protection devices shall be connected into the motor control circuit in such a manner as to disconnect the source of supply in order to prevent the nominated temperature class from being exceeded.

**16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS (EHSRs)**

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed reports listed in Section 14.2.

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**SCHEDULE**

**TYPE EXAMINATION CERTIFICATE**

**Sira 06ATEX4332X  
Issue 2**

**17 CONDITIONS OF CERTIFICATION**

- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.
- 17.2 Holders of Type Examination Certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.
- 17.3 The manufacturer shall perform a dielectric strength test in accordance with Clause 33.3.4.1.5 of EN 60079-15:2004.
- 17.4 The manufacturer shall use the appropriate name and address for the manufacturing location on the approved label affixed to the apparatus.

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