



# IECEx Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx BAS 14.0017X Issue No: 0 Certificate history:  
Issue No. 0 (2014-06-11)

Status: Current Page 1 of 3

Date of Issue: 2014-06-11

Applicant: Regal Beloit Australia Pty Limited  
19 Corporate Ave.  
Rowville  
VIC 3178  
Australia

Electrical Apparatus: Range of PPA/PPC induction motors of frame sizes 80 to 400  
Optional accessory:

Type of Protection: Ex nA, Ex tc

Marking:  
Ex nA IIC T3 Gc Tamb(-20°C to +60°C) or,  
Ex tc IIIC T135°C Dc Tamb(-20°C to +50°C) or,  
Ex nA IIC T3 Gc Tamb(-20°C to +50°C)  
Ex tc IIIC T135°C Dc

Approved for issue on behalf of the IECEx  
Certification Body:

R S Sinclair

Position:

General Manager

Signature:  
(for printed version)

Date:

  
17 JUNE 2014

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

SGS Baseefa Limited  
Rockhead Business Park  
Staden Lane  
Buxton  
Derbyshire  
SK17 9RZ  
United Kingdom





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Date of Issue: 2014-06-11 Page 2 of 3  
Manufacturer: Regal Beloit Australia Pty Limited  
19 Corporate Ave.  
Rowville  
VIC 3178  
Australia

Additional Manufacturing  
location(s):

**CMG Electric Motors NZ Ltd**  
18 Jomac Place, Avondale, Auckland 1026  
New Zealand

**CMG Electric Motors Asia Pacific Pte Ltd**  
12 Tuas Loop, Singapore 637346  
Singapore

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

## STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-15 : 2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

## TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

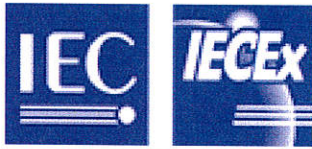
[GB/BAS/ExTR14.0039/00](#)

Quality Assessment Report:

[AU/TSA/QAR06.0012/05](#)

[AU/TSA/QAR07.0008/06](#)

[AU/TSA/QAR07.0009/04](#)



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The PPA/PPC range of squirrel cage induction motors is manufactured from cast iron and comprises a main body with a separate bolt-on terminal box. The motors are designed to operate on 3 phase, 100V-1000V and 40-60Hz power systems. Motors may be supplied with auxiliary terminal boxes as required for the connection of optional anti-condensation heaters, RTD's and thermistors. Motors are available as foot mounted, flange mounted or foot and flange mounted. The bearings have V-ring seals and the lid of the main terminal box has a nitrile rubber gasket seal, which gives the motors an IP rating of IP66. Electrical connection is via a threaded entry in the main terminal box wall, designed to accommodate either a gland or conduit.

The range of motors is designated as type PPA for Australian output (kW/frame) or type PPC for the EU (kW/frame) and are identical in construction.

See Annex for further details.

### CONDITIONS OF CERTIFICATION: YES as shown below:

1. The equipment may present a potential electrostatic charging hazard; the user instructions shall be followed in order to minimize the risk of electrostatic discharge.
2. For arrangements which include a separate motor driven cooling fan, these shall be tested to verify that the rating of the cooling fan motor is not exceeded.
3. The RTDs, thermistors and thermocouples must be connected to an appropriate intrinsically safe system. They must be tested at 500V to ground and must be grounded whenever dielectric testing of the machine takes place.

### Annex:

[IECEx BAS 14.0017X Annex.pdf](#)



**PPA/PPC Range of Induction Motors** with shaft centre heights ranging from 80 to 400mm are manufactured with cast iron frames for horizontal or vertical, foot and/or flange mounting. The flanges may be oversize or undersize as required and the enclosure provides a degree of ingress protection of at least IP66. The range covers 2 pole to 8 pole 3 phase windings for 40, 50 or 60Hz operation at voltages of 100 to 1000V. The range is rated up to 630kW, the largest power ratings being the 4 pole frame size 400LX.

The range of motors is designated as type PPA for Australian output (kW/frame) or type PPC for the EU (kW/frame) and are identical in construction.

The machine ratings as covered by this certificate are shown in the table below.

	Ex nA		Ex t	
	Frame size	kW Rating	Frame size	kW Rating
PPA (2P – 8P)	80 to 400	0.55 to 630	80 to 400	0.55 to 630
PPC (2P – 8P)	225 to 355	18.5 to 280	225 to 355	18.5 to 280

#### Bearing Arrangements

Spigots are machined at either end of the stator frame onto which the machined spigots of cast iron end shields are fitted. The end shields carry the grease lubricated rolling element bearing arrangements which are of ball or roller or angular contact designs. The bearings are covered either by the end shield itself as in smaller frames or by separate bearing covers with appropriate sealing arrangement for ingress protection.

#### Stator

The stator core packs are built from insulated silicon steel laminations which are clamped together. The wound and impregnated stator assembly is secured in the stator frame by an interference fit.

#### Rotor

The rotor core packs built from insulated steel laminations are fitted on to the steel shaft with an interference fit. The rotor cage is of die cast aluminium and is dynamically balanced by the addition of balanced weights secured onto cast studs on the rotor cage. Double shaft extensions or alterations to standard shaft extensions are included in the range. The rotor construction is designed to be compliant with the requirements of Table 6 of IEC 60079-15 for any potential risk of air gap sparking with due considerations to risk factors.

#### Terminal Arrangement

The motors are fitted with separate bolt-on cast iron terminal boxes fitted with bolt-on covers incorporating a gasket which is glued to one surface. The position of terminal boxes can be on either side of the motor frame.


Main terminal boxes contain moulded resin/fibre glass terminal blocks incorporating threaded terminal studs to support the winding ends and supply cables with provision for optional auxiliary terminals. Optionally the winding ends may be brought out as extended flying leads via suitably IECEx certified conduit fittings for direct connection to the supply terminals. Adequate clearance and creepage distances are provided as required by the standards for Ex nA protection for the applicable voltage category.

Auxiliary terminal boxes may be fitted to the main terminal box to facilitate termination of auxiliary devices such as thermistors, anti-condensation heaters and RTDs. IECEx certified terminal blocks are used to terminate these auxiliary devices.

Cable glands or conduit fittings shall be suitably IECEx certified with IP rating equivalent to or better than that of the equipment rating. Unused cable or conduit entries must be fitted with appropriately certified plugs.

#### Ventilation

Various methods of cooling are used including TEFC or TEBC with the blower motor being separately IECEx certified. Optionally an IECEx certified encoder may be attached to the main motor shaft.

<p><b>SGS Baseefa Limited</b>  Rockhead Business Park  Staden lane, Buxton, Derbyshire  SK17 9RZ  United Kingdom</p>	
<p>ANNEX to IECEx BAS 14.0017X</p>	<p>Issue No. 0</p> <p>Date: 2014/06/11</p>

#### Windings

Motors are wound with modified polyester or polyester-imide enamelled copper wires with the winding overhangs suitably insulated and adequately tied in order to compact them and keep the insulation between phases.

#### Use of Variable Voltage Variable Frequency (VVVF) Drives

Ex nA motors may be operated with VVVF drives in the following conditions-

- Use of PWM inverters (VVVF drives) with carrier switching frequency > 5kHz or the default switching frequency of the drive whichever is lower.
- When motors are operated below 50Hz with constant torque loads, a de-rating factor to be applied as per the loadability curve published in the Installation, Operation and Maintenance (IOM) manuals supplied with each motor.
- Ex nA and Ex t motors shall be fitted with thermal protective devices which shall be connected to 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.

#### Ambient Temperatures

The standard ambient temperature range for Ex t motors is -20°C to +50°C. For Ex nA motors the standard ambient temperature is -20°C to +60°C.

#### Ingress Protection Rating

The standard ingress protection rating for Ex t and Ex nA motors is IP66.

#### Dielectric Strength Test

All Ex nA motors shall be subjected to a routine dielectric strength test in accordance with the requirements of IEC 60079-15.