



## EC-TYPE EXAMINATION CERTIFICATE

**Equipment or Protective System Intended for use  
in Potentially Explosive Atmospheres  
Directive 94/9/EC**

EC-Type Examination Certificate Number : **BAS00ATEX2205X**

Equipment or Protective System: **W-DA 71-180 AND W-DF 80-180 CAGE INDUCTION  
MOTORS**

Manufacturer: **INVENSYS BROOK CROMPTON**

Address: **St Thomas Road, Huddersfield, HD1 3LJ**

This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

The Electrical Equipment Certification Service, notified body number 600 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report N°

**00(C)0692/1 dated 12 June 2001**

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 50281-1-1: 1998**

except in respect of those requirements listed at item 18 of the Schedule.

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

This EC-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified equipment or protective system. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment or protective system.

The marking of the equipment or protective system shall include the following:-

**Ex II 2D T125°C**

This certificate may only be reproduced in its entirety and without any change, schedule included.

File No: EECS 0165/03/025

This certificate is granted subject to the general conditions of the Electrical Equipment Certification Service. It does not necessarily indicate that the apparatus may be used in particular industries or circumstances.



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**I M CLEARE**  
DIRECTOR  
4 July 2001



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#### Description of Equipment or Protective System

A range of cage induction motors with shaft centre heights from 71 mm to 180 mm made from either cast iron (80 mm to 180 mm only) or aluminium (71 mm to 180 mm).

The motors are of totally enclosed construction and are fully described in the drawings listed in this report and on the certificate. Motors are rated for S1 duty within the limits of Class 'F' or Class 'H' insulation when connected to a 3 phase supply up to 100 Hz and 800 volts maximum having a symmetry not worse than that defined in IEC 60034-1 clause 6.2.11. The air gap must be sufficient for the maximum rotational speed of the motor. Class 'H' insulation may be used with adjusted outputs provided that the temperature class T3 is not exceeded.

The motors may be supplied for horizontal, vertical, c-flange or pad mounting. In the case of machines supplied for vertical (shaft down) mounting, a sheet steel drip proof cover is fitted to prevent foreign bodies falling into the fan inlet.

#### Polarity and Multi speed

Motors of higher pole numbers than listed in the drawings may be manufactured. Multi-speed machines, either multi-winding or tapped winding may be manufactured in a frame having mechanical dimensions associated with any of its pole numbers providing that the air gap is not less than that appropriate to the lowest pole number.

#### Rotor Construction

The rotor laminations are held on the mandrel whilst the aluminium bars and short circuiting rings are pressure die cast to form an integral rotor. The complete core and cage assembly is then either pressed or shrunk onto the shaft.

Rotor dynamic balancing is achieved by either subtracting weight by drilling the rotor core or by adding washers to integral balance pips or to the rotor blades.

#### Fan Cover

A sheet steel fan cover is fitted as standard to all motors

#### Cooling Fans

The cooling fans may be either plastic (polypropylene) or metal (cast iron or aluminium).

Plastic fans are secured radially with a key and axially by a circlip. Metal fans are additionally secured by a grub screw which may or may not have a lock nut. Fans with peripheral speeds greater than  $50 \text{ ms}^{-1}$  must always be metal.



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Plastic fans are only used as follows, either:-

- (a) A natural (white) conductive polypropylene Type Novolen 2300 manufactured by Targor Polypropylene, to be used between  $T_{amb}$   $-30^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ , see BASEEFA Test Report 00(T)6101, dated 6.3.01, held on EECS File No. 0245/44/004,

OR

- (b) A black Nylon 6 Grade BF13BK manufactured by Warwick Polymers UK, to be used between  $T_{amb}$   $-20^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ , see BASEEFA Test Report 00(T)6101, dated 6.3.01.

#### Terminal Boxes

The various terminal boxes allowable on this range of motors are fully described in the certified drawings.

Cast iron motors W-DF 80-180 may be fitted with cast iron or aluminium terminal boxes and lids of the same material. Frame sizes up to 90 may use an aluminium terminal box with a sheet steel lid.

Aluminium motors up to frame size W-DA 90 use an aluminium terminal box with a sheet steel lid. Larger frame sizes use cast aluminium terminal boxes and lids.

Neoprene gaskets are used between the terminal box and the body and the terminal box and the lid. The gasket between the box and the lid is adhered to the lid.

Terminal boxes may be mounted directly to the motor frame, using an adaptor plate if necessary or remotely according to Drawing No. Y08AC010/0 provided certified Brook Crompton terminal boxes and boards are used. Terminal enclosure size may be increased to the next size in the range if required.

#### Terminal Boards

Component approved terminal boards covered by BASEEFA Certificate No. Ex 89C3051U are used with creepage and clearances meeting or exceeding the requirements of EN 50281-1-1: 1998. The only exception to this is when an oversize terminal box is required for a W-DF 160 or 180 motor in which case the terminal box / board arrangement shown on drawing no. Y42AC001/0 is used. The creepage and clearance distances for this arrangement satisfy the requirements of EN 50281-1-1: 1998.

The certification drawings specify which boards can be used with which terminal boxes for each motor frame size.

#### Loose Leads

The motors may be supplied with loose leads fitted with crimp connections as described on drawing no. Y08AC012/0.



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#### Auxiliary Connections

Auxiliary connections may be made using Klippon BK2 terminals covered by certificate BAS98ATEX3084U which can be mounted within the main terminal boxes in the positions shown on the certification drawings. Alternatively, when a cast iron terminal box is used, an auxiliary terminal box shown on drawing no. Y08AC011/0 may be used containing Klippon BK3 or BK4 terminals also covered by certificate BAS98ATEX3084U.

#### Auxiliaries

The motors may be fitted with thermistors and anti-condensation heaters.

Thermistors may be embedded into each phase or cemented to the periphery of the winding overhang. They may be fitted singularly or in multiples. Extension leads, if required, are insulated with class F sleeving and secured to windings.

Anti condensation heaters type RCH/E manufactured by Resistance Heating Technology and covered by certificate BAS00ATEX2103U may be fitted by Ivensys Brook Crompton in accordance with the instructions provided by the heater manufacturer and special conditions listed on the certificate.

#### Ambient Temperature

The motors are designed for use in an ambient temperature range from -20°C to 40°C. This may be extended to -55°C to 60°C by making suitable design and material changes. In this case the certification plate described on drawing Y08AC016 will be marked accordingly.

#### Air Stream Rated Motors

Motors may be air stream rated, with four mounting pads on the frame periphery, without mounting feet and the external fan cowl omitted. The minimum air velocity required along the surface of the motor is indicated on the motor rating and nameplate label.

#### Enhanced Corrosion Protection

All internal surfaces may be corrosion protected with a paint/varnish layer.

### 17. Special Conditions For Safe Use

1. The supply lead insulation must be suitably rated for the supply.
2. Embedded temperature detectors must be connected to earth during high voltage tests of the stator windings.
3. All drain plugs must be replaced and sealed immediately after use.



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4. When anti-condensation heaters are fitted, unless it is specifically indicated on the motor data plate that they remain energised whilst the motor is energised, the supply to the heaters must be interlocked so that it cannot be connected whilst the motor is running.
5. Any unused cable entries shall be blanked using suitably approved cable blanks.
6. When the machine is used on an inverter derived supply the supply must automatically be tripped when detectors in the windings indicate a temperature of 160°C.
7. When using a c-flange mounting the manufacturers instructions must be followed to ensure the IP rating of the motor is maintained.
8. Motors fitted with plastic fans of type (a) shall not be used below -30°C, and those fitted with fans of type (b) shall not be used below -20°C.

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### Essential Health and Safety Requirements

All requirements are covered by compliance with EN 50281-1-1: 1998.

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### DRAWINGS

Number	Issue	Date	Description
** Y08AC016/0	0	8/7/00	Typical arrangement - dust proof motors
* Y08AC007/1	1	19/4/01	General assembly
* Y08AC008	0	25/4/00	Running clearances
* Y08AC009	0	25/4/00	Al & Fe terminal boxes
* W37AC003	0	25/4/00	Al box 100-180
* D06AC003	0	25/4/00	Al box 71-90
* Y42AC001	0	26/9/00	Fe oversize box 160-180
* Y08AC015	0	21/6/00	Heater and thermistor details
* Y08AC010	0	25/4/00	Remote terminal box
* Y08AC011	0	25/4/00	Auxiliary terminal box
* Y08AC012	0	25/4/00	Crimped loose leads

\* These drawings are used in common with Certificates BAS00ATEX3119X and Certificate BAS00ATEX3206X and are held on file EECS 0165/03/024.

\*\* This drawing is used in common with Certificates BAS00ATEX3206X and BAS00ATEX3119X and is held on file EECS 0165/03/025.

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BASEEFA List Keywords  
23PHIMOT