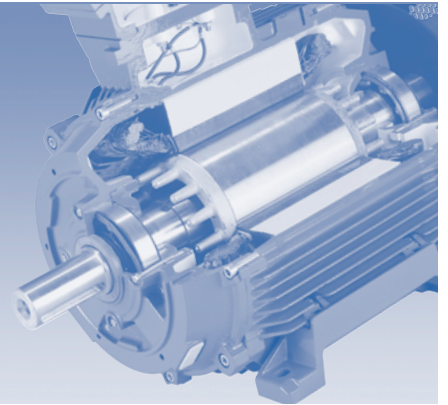


# Spare parts, installation and maintenance

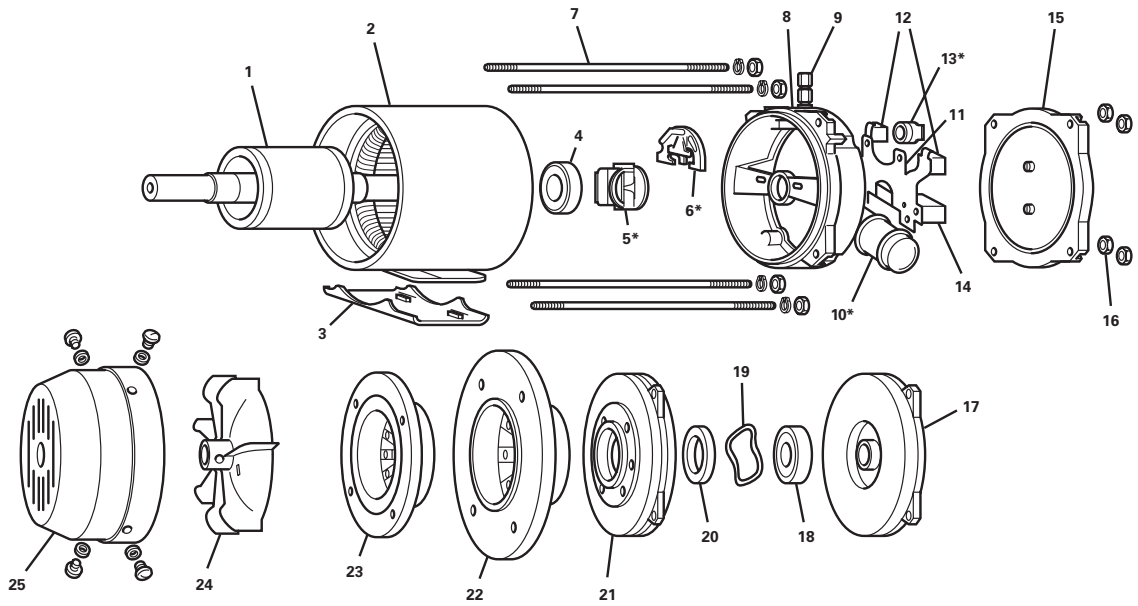


**Totally enclosed and totally enclosed fan ventilated flameproof motors  
EEx d and EEx de designs  
Frame sizes 89 to 315**

**Typical marking is as follows:**

1180  II 2G EEx d II B T4

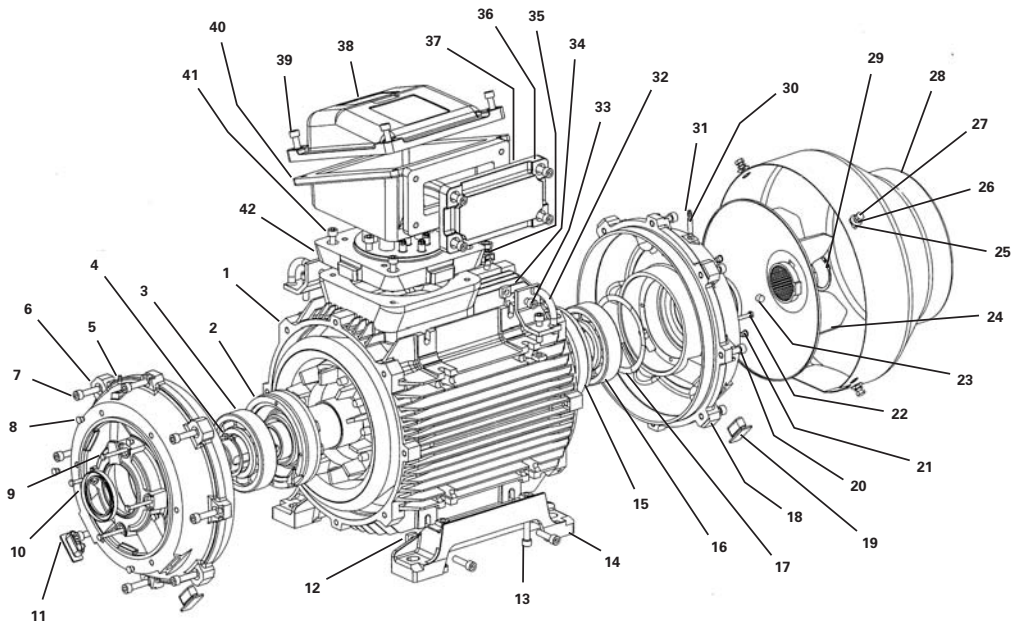
# Typical ES89 single or three phase EEx d design



Ref	Part description	Ref	Part description	Ref	Part description
1	Rotor assembly	11	Bracket for supporting ref numbers: 10, 12, 13 and 14	19	Preload washer
2	Stator assembly	12	Two terminal blocks for single phase or one terminal block for 3-phase	20	Oilseal (when fitted)
3	Foot	13	Thermal protector (when fitted)	21	71 face endshield
4	Non-driving end bearing	14	Switch relay (when fitted)*	22	80 flange endshield
5	Centrifugal switch*	15	Non-drive end cover	23	71 flange endshield
6	Switch backplate*	16	Through pin/end cover fixing nuts	24	Fan (fitted to drive end endshield of TEFV designs)
7	Through pins	17	Drive end endshield	25	Fan cover (when fitted)
8	Non-drive end endshield	18	Drive end bearing		
9	Barrier glands (when fitted)				
10	Single or double capacitors*				

\* Fitted to single phase designs only

# Typical EEx d and EEx de\* motor



Ref	Part description
1	Stator frame
2	Drive end inner bearing cap
3	Drive end bearing
4	Drive end bearing circlip
5	Drive end grease nipple
6	Drive end endshield
7	Drive end endshield fixing screws
8	Drive end endshield plug
9	Drive end bearing cap fixing screws
10	Drive end oilseal
11	Drive end endshield grease plug
12	Stator foot fixing nut
13	Stator foot fixing screw
14	Stator foot

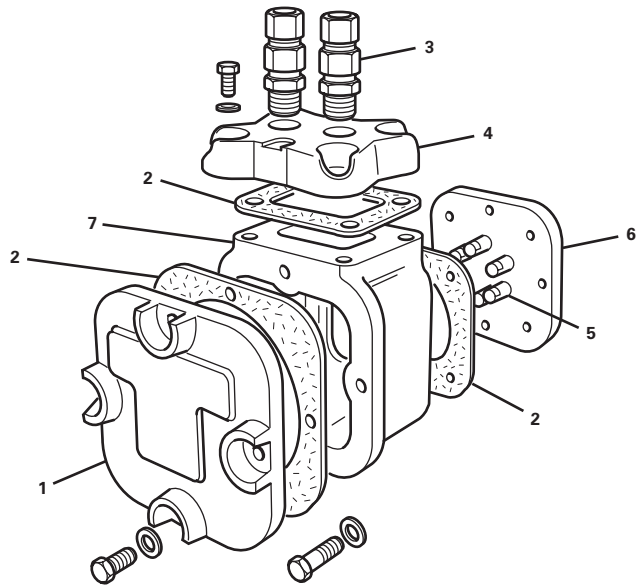
Ref	Part description
15	Non-drive end inner bearing cap
16	Non-drive end bearing
17	Preloaded washer
18	Non-drive end endshield
19	Non-drive end endshield grease plug
20	Non-drive end endshield fixing screws
21	Non-drive end endshield plug
22	Non-drive end bearing cap screws
23	External fan key
24	External fan
25	Fan cover fixing flat washer
26	Fan cover fixing shakeproof washer
27	Fan cover fixing screw
28	Fan cover

Ref	Part description
29	External fan circlip
30	Non-drive end grease nipple extension
31	Non-drive end grease nipple
32	Lifting lug
33	Lifting lug fixing screw
34	Lifting lug fixing nut
35	External earth stud
36	Gland plate fixing screw
37	Gland plate
38	Terminal box lid
39	Terminal box lid fixing screw
40	Terminal box
41	Terminal plate fixing screw
42	Terminal plate and terminals

\* EEx de motors have gaskets fitted between terminal plate and terminal box, terminal box lid and terminal box and terminal box and glandplate.  
See drawing of EEx de terminal box on page 4

The above illustration is typical only and actual machine design may vary

## Typical EEx de terminal box arrangement



Ref	Part description
1	Terminal box cover and screws
2	Gasket*
3	Certified glands
4	Gland plate
5	Increased safety terminals
6	Terminal plate
7	Terminal box and screws

\* EEx d terminal boxes do not have gaskets fitted

# Marking

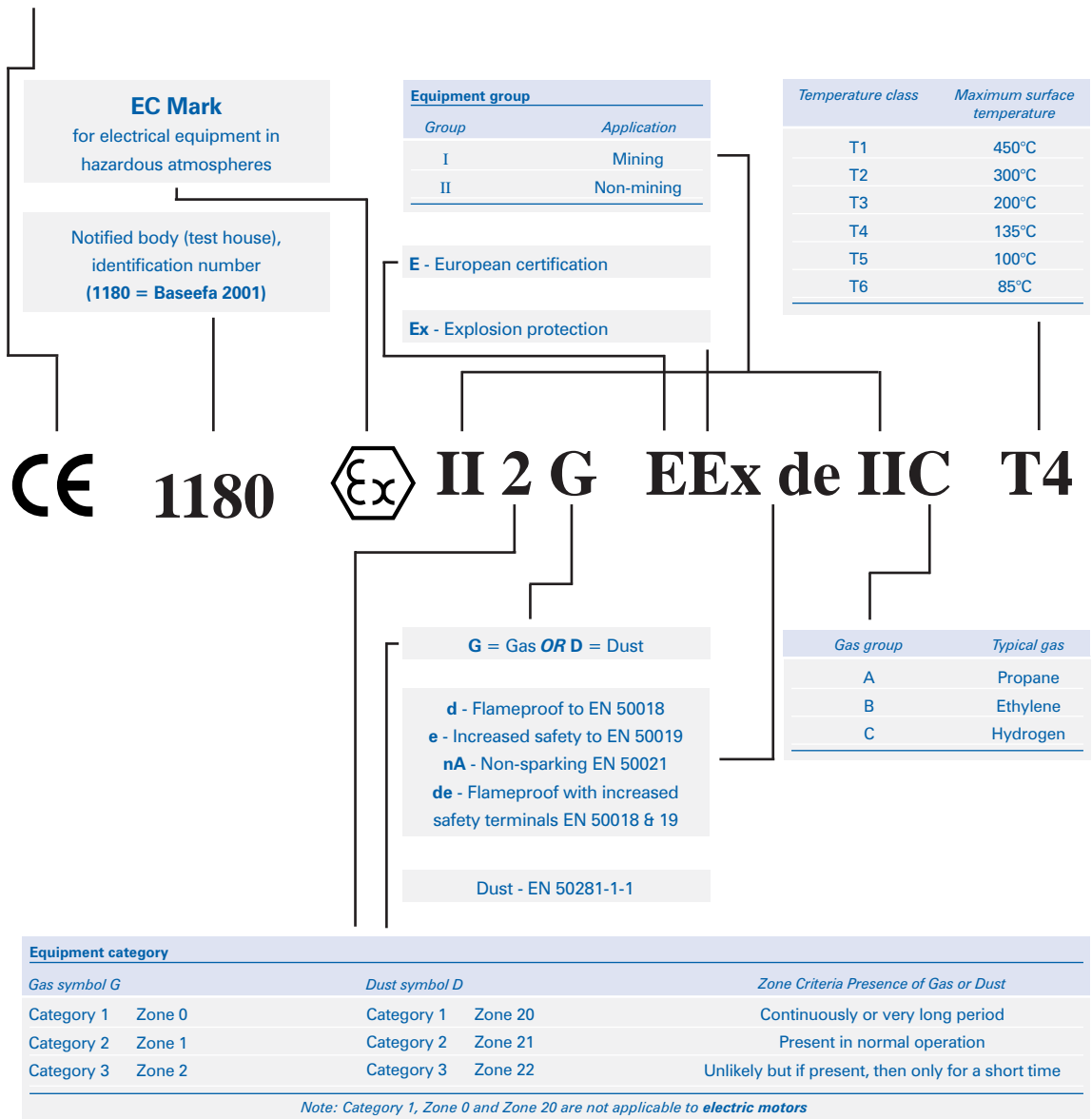
## Marking

Typical marking is as shown below

**CE 1180**  **II 2G EEx de II B T4**

and has the following meaning:

### Compliant with European Directives



Dust are marked differently, eg:

**CE 1180**  **II 2 D T125°C**

T125°C = certified external surface temperature

## Bolt sizes and torques

Location	Frame size		Poles	Bolt size	Torque	
	European	BS			Minimum Nm	Maximum Nm
Foot and lifting lugs	W-UEF200L/250MNE	W-EF200L/250S	All	M10*	55	67
	W-UEF280SE/315ME	W-EF250M/315S	All	M16*	237	292
	W-UEF315M & 315L	W-EF315M & 315L	All	M20*	375	450
Flange and endshield	ES89M/L	ES89M/L	All	M8	10	12
	A-EF90S/100L	A-EF90S/100L	All	M6	8	10
	A-EF112M/132M	A-EF112M/132M	All	M8	20	24
	A-EF160M/180L	A-EF160M/180L	All	M10	28	32
	W-UEF200L/250ME	W-EF200L/250S	All	M10*	55	67
	W-UEF200L/250ME	W-EF250M/315S	All	M16*	237	292
	W-UEF315M & 315L	W-EF315M & 315L	All	M20*	375	450
Bearing cap	ES89M/L	ES89M/L	All	-	-	-
	A-EF90S/132M	A-EF90S/132M	All	M6	8	10
	A-EF160M/L	A-EF160M/L	All	M8	8	10
	A-EF180M/L	A-EF180M/L	All	M10	28	32
	W-UEF200L/225S	W-EF200L/225S	All	M6	7	8
	W-UEF225M/280ME	W-EF225M/280S	All	M8	16	20
	W-UEF315SE/315L	W-EF280M/315L	2 pole	M8	16	20
Gland plate and terminal box lid	W-UEF315SE/315L	W-EF280M/315L	4 pole +	M10	32	39
	A-EF90S/180L	A-EF90S/180L	All	M8	20	24
	W-UEF200L/280ME	W-EF200L/280S	All	M8	16	20
Terminal box lid	W-UEF315SE/315L	W-EF280M/315L	All	M10	32	39
	ES89M/L	ES89M/L	All	M8**	10	10

\* Socket head bolts and square nuts MUST be used (Grade 12.9)

\*\* Nut

## Approximate shipping specifications

Type		Net weight kg	Gross weight kg	Cubage m <sup>3</sup>
European	BS			
ES89S	ES89S	21	23	0.037
ES89M	ES89M	22	24	0.037
ES89L	ES89L	26	28	0.037
A-EF90S	A-EF90S	30	32	0.05
A-EF90L	A-EF90L	34	36	0.05
A-EF100L	A-EF100L	46	48	0.65
A-EF112M	A-EF112M	58	64	0.119
A-EF132S	A-EF132S	80	86	0.119
A-EF132M	A-EF132M	96	102	0.119
A-EF160M	A-EF160M	144	156	0.161
A-EF160L	A-EF160L	162	174	0.161
A-EF180M	A-EF180M	208	224	0.324
A-EF180L	A-EF180L	223	248	0.324
W-UEF200L	W-EF200L	325	353	0.324
W-UEF225S	W-EF225S	355	392	0.433
W-UEF225M	W-EF225M	423	452	0.433
W-UEF250MNE	W-EF250S	474	529	0.801
W-UEF280SNE	W-EF250M	580	620	0.831
W-UEF280MNE	W-EF280S	755	835	1.3
W-UEF315SNE	W-EF280M	870	950	1.3
W-UEF315MNE	W-EF315S	1284	1379	1.9
W-UEF315M	W-EF315M	1350	1445	1.9
W-UEF315L	W-EF315L	1550	1645	2.0

# General/installation

## Warning

These motors are certified by a European Notified Body for use in hazardous atmospheres and should be installed, maintained and repaired (if necessary), strictly in accordance with the relevant standards and codes of practice of the user country for the repair and overhaul of Ex electrical apparatus. (For example, in UK: EN 60079-19 and recommendations outlined in the BEAMA/AEMT 'Code of Practice' for repair and overhaul of Ex electrical apparatus').

The certificates issued apply to motors as originally supplied, and in order to maintain validity, it is essential that any servicing/repair be undertaken only by accredited establishments (see paragraph on 'Spare parts and Repairs'). Only genuine replacement parts can be used on these certified motors - always specify motor serial number, output (kW), RPM, voltage, Hz and mounting when ordering spares.

## Warning

Qualified personnel only must undertake handling and lifting of electric motors. See additional sections of this manual and the customer safety and installation instructions. Full product documentation and operating instructions must be available together with tools and equipment necessary for safe working practice.

*Note - before any work commences, reference should be made to the warning paragraph at the top of this page.*

## Receipt

Before any motor is accepted on site, it should be carefully inspected for damage or loss incurred during transit.

Wherever possible, damage should be recorded, photographed and witnessed. Report any findings to the carriers and Brook Crompton, quoting the motor number and consignment note reference.

## Storage

If the motor is not to be used immediately, it should be stored in a clean, dry place which is vibration free. Temperature should be stabilised to -20°C to +40°C.

## Lifting

Eyebolts and/or lifting trunnions supplied with the motor should be screwed down until its shoulder is firmly against the face of

the stator frame to be lifted. Eyebolts are normally designed for a vertical lift.

Where two eyebolts are used with inclined loading, the maximum safe working loads of the table on page 10 (approximate weights) should not be exceeded.

## Bearings

To avoid static indentation (false brinelling), the storage area should be vibration free. Where exposure to some vibration is unavoidable, the shaft should be locked. Roller and thrust bearings are fitted with a shaft-locking device, which should be kept in place during storage.

Shafts should be rotated by hand (90°), weekly/periodically.

## Grease

Factory fitted regreasable bearings use either Lithium or Polyurea based grease with a recommended shelf life of two years. If stored for a longer period, the grease may need to be replaced. Shielded bearings have a storage life of five years and a further two years operational life following installation.

## Heaters

Where anti-condensation heaters have been fitted, it is strongly recommended that they are energised during storage. In such cases, prominent warnings of live terminals (inside the terminal box) must be posted inside and outside the terminal box.

Heaters must be isolated whilst the motor is energised, since the heaters, if energised, could cause the motor surface temperature to exceed the maximum for which it is certified. This would invalidate the certification and could result in ignition of the surrounding atmosphere. Heaters must be de-energised before opening any part of the motor enclosure.

Where the certificate permits, the winding may be energised at a low voltage as an alternative to anti-condensation heaters (for maximum voltage see marking on motor). The mains supply must be disconnected during these periods.

Where anti-condensation heaters are not fitted, the use of a desiccant is recommended.

## Installation

### Withdrawal from storage

Before taking any motor from storage, ensure that anti-condensation heaters (if fitted), have been disconnected and isolated before moving the motor. Check that no foreign matter is present and remove all surface dust and dirt.

Test the stator insulation resistance between phases and also to earth. If an insulation resistance of lower than ten Megohms at 20°C is measured, the windings must be dried out. Any such tests must not be carried out whilst there is risk of the presence of an explosive atmosphere. After measurement, the windings should be discharged immediately to avoid the risk of electric shock.

## Location

Motors must be installed with adequate access for routine maintenance. A minimum of 0.75m of working space around the motor is recommended. Adequate space around the motor, particularly at the fan inlet (50mm), is also necessary to facilitate airflow.

Where several motors are installed in close proximity or other heat sources are present, care must be taken to ensure that there is no re-circulation of exhausted warm air. Foundations must be solid, rigid and level.

On motors which are mounted vertically with the output shaft facing upwards, the driven equipment must prevent falling objects from entering the fan housing.

## Electrical connection

The connection diagram is shown on the leaflet enclosed in the motor terminal box or the diagram inside the terminal box lid. The cables used should be capable of carrying the full load current of the motor (see motor nameplate), without overheating or undue voltage drop.

## Cable terminations

### a) EEx d motors - with flameproof terminal boxes:

This type of motor may have terminal pins with bushings, or a terminal board. Terminal screws and/or nuts should be secured, but avoid excessive torque to the terminals as this can result in damage to them.

# Installation

## b) EEx de motors - with increased safety terminal boxes:

These motors are fitted with increased safety terminals, which comprise either slotted terminal pins, non-rotational clamps and screw fixings or a terminal board.

Permanently attached cables shall be suitably protected against mechanical damage and terminated within the terminal or junction facility suitable for the conditions of use.

Wiring should be carried out or checked by a qualified electrician and equipment must be earthed in accordance with current regulations.

When the motor is despatched with plastic plugs fitted into the cable entry holes, these plugs *must* be removed prior to commissioning and a suitably certified gland inserted. Cable entries are not to be left open, therefore if any holes are unused or made redundant, they must be plugged with a suitably certified and correctly inserted stopping plugs (stopping plugs to be removed only with the aid of a tool). Alternatively, a replacement gland plate or terminal box must be obtained from Brook Crompton. All cable glands/conduit/plugs etc, must have at least the same IP rating and the hazardous area certification as the motor, thereby ensuring that the motor certification and protection are not compromised.

*Note - the operating temperatures at the conduit or cable entry may exceed 70°C and at the branching point of the conductors may exceed 80°C under rated conditions.*

If aluminium cables are used they must be terminated in such a way, as to ensure protection against corrosion due to dissimilar metals. Earth bonding of the motor, both on the motor frame and inside the terminal box, should always be carried out to eliminate the risk of electrostatic discharges from the motor.

## Sealing of terminal box area

In order to maintain design degree of protection:

### a) EEx d motors - with flameproof terminal boxes:

Motors are despatched with terminal box cover and gland plate (where required), joint faces sealing with a non-setting joint compound. On installation or reassembly after fitting cables, these surfaces should be cleaned and re-sealed using a non-setting jointing compound.

*Note - all joint faces must be undamaged and clean prior to applying the jointing compound.*

### b) EEx de motors - with increased safety terminal boxes:

Gaskets are fitted between terminal facing plate and terminal box, terminal box and lid, glandplate and box. All gaskets must be secured to terminal box using Bostick No.2 or equivalent (see diagram on page 4). If a drain plug is fitted in the box, when removed and subsequently refitted, it must be resealed with a suitable approved non-setting jointing compound.

## Bearings

Ball and roller bearings are despatched from the works fully charged with grease. Shielded bearings have sufficient grease for an operating life of at least two years in normal ambient temperatures, providing there is little or no grease leakage.

On motors with re-lubrication facilities, replenish with a compatible grease but take care to avoid overfilling the bearing housings. It should be noted that over greasing presents a far greater hazard to trouble-free service than under greasing but careful attention is a mandatory requirement. Bearings without re-lubrication facilities will eventually need replacing.

## Fitting pinions, pulleys and couplings

These should be bored to suit the shaft diameter.

### Warning

Tapping of fittings onto the motor shaft with a hammer or mallet, causes bearing damage. This results in an increase in bearing noise and a significant reduction in bearing life.

## Re-lubrication

Recommended re-lubrication intervals are available on request as these are load dependant. When replenishing, use a type that is compatible to the grease detailed on the motor nameplate.

Re-lubrication table		
Frame size	Grease	Type
89/315	Esso	Lithium complex
	Unirex N3	
	NSK EA6	Polyurea

*Note: Lithium complex type greases are not compatible with Polyurea type greases.*

Standard regreasing facility	
Frame size	Facility
89 & 90	Sealed for life bearings
100/180	On request
200/315	Regrease facility as standard

## Frequency converters

When installed for use with frequency converters, special conditions of use apply with respect to limiting fundamental frequency, thermal protection and surface temperatures. Consult Brook Crompton for verification of use. Limits of total harmonic distortion may apply.

## Thermal protection

When thermal protectors (e.g. thermistors, thermostats) are located in the stator windings, they must be connected to a suitable control circuit, such that the motor is disconnected from the mains supply at a predetermined temperature. Failure to utilise the thermal protection devices would invalidate the certification.

# Maintenance

## Maintenance

### Warning

Isolate power supply to motor before commencing any routine cleaning or maintenance work.

### Routing cleaning

Remove the fan cover and ensure that all air inlet holes are completely free. Clean any dust or dirt and obstructions from behind the fan and along the ribs of the frame.

Dust should not be allowed to accumulate on the outside of the motor. It should be removed at intervals (to be decided by the user), such that it does not cover the motor in a layer which is sufficiently thick so as to impair cooling. Tightening torques and bolt sizes are detailed on table 3 (page 10).

### Periodic maintenance

- a) As routine cleaning first.
- b) Remove the fan cover and the fan. Loosen and remove bearing cap screws and endshield screws/studs. The endshields should then be eased off their spigots and removed.
- c) The rotor can now be carefully withdrawn from the stator - taking care not to damage the stator bore, the stator winding and the rotor.
- d) Having dismantled the motor, maintenance can be carried out to remove all dirt. For this purpose, the use of an air line supplying dry compressed air under comparatively low pressure is best as a high velocity air stream can force dirt into the spaces between the windings and insulation etc. Grease removing solvents should only be used very sparingly to avoid damage to impregnation varnish or insulation.
- e) For lubrication details, refer to earlier 'Installation' paragraph.
- f) Motors should be reassembled in the reverse order from dismantling, remembering to ease endshields into bearings and spigots. Do not use force. Joints should be resealed where applicable, with an approved jointing compound to maintain IP rating of the enclosure.
- g) Before starting, check that the rotor revolves freely. Ensure that the electrical connections are correct and terminal nuts tight (see section - 'Electrical Connection').
- h) Refit any pulley, coupling, sprocket etc

which has been removed - being particularly careful to ensure correct alignment with the driven part, as misalignment will lead to ultimate bearing trouble and shaft breakage.

- i) When replacing screws and bolts, care should be taken to use only those with the requisite quality and tensile strength recommended by the manufacturer. A minimum grade of 8.8 is required for all fixing screws except socket head cap screws which must be a minimum of grade 12.9. These must also be of identical thread form and screw/bolt length. A marginally longer bolt, screwed into a blind hole could 'bottom' and prevent correct closure of a flamepath joint, which could lead to a potentially dangerous explosion. Recovery of tapped holes by counter drilling and fitment of proprietary inserts is not recommended by Brook Crompton.

The practices given in IEC 60079-14 and the AEMT/BEAMA repair code should be followed for inspection of components and the treatment of corrosion during maintenance. It should be noted that irrespective of the gas group specified on the nameplate for sizes 200-315, that the minimum length and maximum gaps of flamepath of the shaft to bearing caps - must comply with the Group IIC dimensions.

### Spares and repairs

When ordering spares, it is important to state the motor serial number to ensure that the correct spares will be supplied.

#### Notes:

- a) Fixing bolts, nuts, studs, screws, spacers or washers are not included with these parts and, if required, should be clearly specified on the order in addition to the part description number. The fixing duty and part description reference number for which they are required should also be clearly stated.
- b) Bearings ordered direct from bearing manufacturers must be specified as follows: 'ISO CN, ISO C3', with bearing size. (Bearing fit to be as original motor drawing).

Responsibility for the validity of certification after repair work or the fitting or spares rests with the user. Such repairs should be

carried out by competent engineers who are fully trained in working on equipment for hazardous areas.

Spares for our certified motor ranges are quoted/supplied on the understanding that the subsequent validity or certification of any repair\* work and/or fitting of spares and replacement parts, rests with the user or accredited repair establishment. This is one where:

#### 1) Either:

- a) Personnel have attended a course appropriate to the codes of practice and standards of the nation where the motor is installed. This will normally be a course recognised by the national trade association, health and safety inspectorate or certifying authority (eg, in the UK the AEMT course 'Repair and Overhaul of Ex Electrical Apparatus').

or

- b) Personnel have attended Brook Crompton's 'Hazardous Atmosphere Motor Repair Course'.
- 2) The workshop is approved by Brook Crompton's authorised repair agent liaison officer or is otherwise suitably accredited by a nationally recognised competent authority.
- 3) Brook Crompton's hazardous atmosphere repair manual is held and strictly adhered to.

Where the motor has been originally repaired as indicated by symbol 'R' in accordance with the code\*, or IEC 60079-19, details of the repair should be obtained from the user/repairer before proceeding with repair. Alternatively, contact Brook Crompton.

\*See AEMT/BEAMA publication No. 300 - 'Code of Practice for Repair and Overhaul of Electrical Apparatus'.

### Training videos

Brook Crompton has produced a set of videos covering the theory, design, construction and repair of electric motors for use in hazardous areas. These are available from Brook Crompton marketing department, alternatively these can be purchased online by visiting our website: [www.brookcrompton.com](http://www.brookcrompton.com)

# Inspection schedules

Table 1 – Apparatus with type of protection d: Flameproof enclosure. IEC 60079-14

Check that	Inspection category*	
	Initial	Periodic
Apparatus is appropriate to area classification	A	B
Surface temperature is correct	A	B
Apparatus subgroup (if any) is correct	A	B
1 Apparatus carries the correct circuit identification	A	B
Obstructions do not conflict with IEC 60079-14	A	A
Enclosure seals are satisfactory	A	A
Gaps are free from corrosion, dirt and paint	A	B
Dimensions of gaps are correct	A	B
There are no unauthorised modifications	A	A
Bolts, glands and stoppers are complete and tight	A	A
2 There is no undue accumulation of dust or dirt	B	B
All conduit runs and fittings are tight and free from corrosion	A	B
Earthing is satisfactory	A	A
Condition of enclosure gaskets or sealants are satisfactory	A	B
Electrical connections are tight	A	B
Motor fans and couplings are not rubbing on covers/guards	A	A
3 Electrical protection is satisfactory, overcurrent protection etc	A	A
Stopper boxes and cable boxes are correctly fitted	A	B
There is no leakage of compound from stopper or cable boxes	B	B
4 There is no obvious damage to cables, cable sheaths or cable glands	A	A
Apparatus is adequately protected against corrosion, the weather, vibration and other adverse factors	A	A
Guards, where used, are present and correctly fitted	A	A
Fan cowl is undamaged and fitted correctly	A	A

Table 2 – Apparatus with type of protection e: increased safety. IEC 60079-14

Check that	Inspection category*	
	Initial	Periodic
Apparatus is appropriate to area classification	A	B
Surface temperature is correct	A	B
Apparatus subgroup (if any) is correct	A	B
1 Apparatus carries the correct circuit identification	A	B
Enclosures are satisfactory and undamaged	A	A
There are no unauthorised modifications	A	A
Bolts, glands and stoppers are complete and tight	A	A
2 There is no undue accumulation of dust or dirt	B	B
Earthing is satisfactory	A	A
Condition of enclosure gaskets or sealants are satisfactory	A	B
Electrical connections are tight	A	B
Motor air gaps and other running clearances are satisfactory	B	B
3 Electrical protection is satisfactory, overcurrent protection etc	A	A
There is no deterioration of encapsulating materials	A	B
Stopper boxes and cable boxes are correctly fitted	A	B
There is no leakage of compound from stopper or cable boxes	B	B
4 There is no obvious damage to cables	A	A
Apparatus is adequately protected against corrosion, the weather, vibration and other adverse factors	A	A
Guards, where used, are present and correctly fitted	A	A
Fan cowl is undamaged and fitted correctly	A	A

## Notes:

- 1 Apparatus must be positively identified with its circuit to ensure that correct isolation can be carried out.
- 2 Accumulation of dust or dirt can interfere with heat dissipation and result in surface temperature higher than those permitted in the hazardous area.
- 3 See the particular requirements for motor protection in IEC 60079-14.
- 4 Particular attention should be paid to flexible cables used with portable apparatus.

\*Category A inspections should be carried out in all cases. Category A intervals must not exceed 2 years. More frequent and/or more detailed inspection will be necessary where there is a corrosive or other adverse atmosphere, a high risk of mechanical damage or vibration, or where there are other onerous circumstances. The need for more frequent inspection may also be determined by operating experience.

The need for, the method, and the frequency of category B inspections is at the discretion of the engineer responsible. It is not intended that periodic inspections should incur undue disturbance of apparatus unless considered necessary by the engineer responsible.

# ATEX certificates

ATEX certificates covered by this manual are as listed below:

Basic frame size designation	Hazardous area protection concept	Gas group	Equipment category		Marking (including certificate number)	
			Category	Zone		
A-EF90S & A-EF90L	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB Baseefa02ATEX0013X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB Baseefa02ATEX0014X
A-EF100L	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB Baseefa02ATEX0015X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB Baseefa02ATEX0016X
A-EF112M	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB Baseefa02ATEX0017X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB Baseefa02ATEX0018X
A-EF132S & A-EF132M	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB Baseefa02ATEX0019X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB Baseefa02ATEX0020X
A-EF160M & A-EF160L	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB Baseefa02ATEX0021X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB Baseefa02ATEX0022X
A-EF180M & A-EF180L	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB Baseefa02ATEX0023X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB Baseefa02ATEX0024X
W-EF200L & W-EF225S	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB BAS02ATEX2111X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB BAS02ATEX2112X
	EEx de	IIC	2	1	CE 1180	II 2G EEx de IIC BAS02ATEX2113X
W-EF225M & W-EF250S	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB BAS02ATEX2114X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB BAS02ATEX2115X
	EEx de	IIC	2	1	CE 1180	II 2G EEx de IIC BAS02ATEX2116X
W-EF250M & W-EF280S	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB BAS02ATEX2117X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB BAS02ATEX2118X
	EEx de	IIC	2	1	CE 1180	II 2G EEx de IIC BAS02ATEX2119X
W-EF280M & W-EF315S	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB BAS02ATEX2120X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB BAS02ATEX2121X
	EEx de	IIC	2	1	CE 1180	II 2G EEx de IIC BAS02ATEX2122X
W-EF315M & W-EF315L	EEx d	IIB	2	1	CE 1180	II 2G EEx d IIB BAS02ATEX2123X
	EEx de	IIB	2	1	CE 1180	II 2G EEx de IIB BAS02ATEX2124X
	EEx de	IIC	2	1	CE 1180	II 2G EEx de IIC BAS02ATEX2125X

This document is intended to guide the user in the safe installation, maintenance and use of equipment intended for operation in a Zone 1 environment. Where the certificate number is suffixed with an X, particular limitations of use apply. Such limitations of use may apply to the T class temperature and the permissible ambient range. Other limitations may include any or all of: maximum operating speed, the use of anti-condensation heaters, vertical operation, drain plugs in EEx de terminal boxes, frequency converter use, the tensile strength of bolts, minimum widths and gaps of flamepaths. For definitive information on these

limitations, see the particular certificate as listed in the above table, eg BAS02ATEX2111X.

For the T class temperature and other specific details relating to the limitations of and safe use of motors supplied, refer to the order acknowledgement, the installation and maintenance manual and the certificate which are contained within the documentation package provided with each order.

# Rotating Electrical Machines

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