ID-Nr. EM028352
Okt. 2017

Operation and Maintenance Manual

E-Motor Equipment Shearer EL3000

Serial-N°.: LSW30138

If the measured insulation resistance is still reading lower than the recommended value, contact ATB Morley Limited, Sales Department requesting advice.

Also, before the motor is started, check the switchgear for correct operation; check the rating of the fuses, check that the overload protection device operates at the full load current on the motor nameplate; check the function of all protection devices.

5.2 Drying Out

The only way that moisture can be removed from the windings is by the application of heat, it is necessary that all moisture be evaporated from the insulation before it is subjected to the stress of normal voltage.

The winding temperature should be raised to at least 75^{o}C but **MUST NOT EXCEED 100^{o}C** by the use of hot air blowers or some such method, which can be used to circulate warm air through the machine windings.

!! CAUTION!!

Irrespective of the method of drying, it is essential that the temperature of the windings be brought up slowly, as any rapid heating may result in damage to the insulation layers due to expanding air and moisture being unable to escape quickly enough.

NOTE!

Grease lubricated bearings should be inspected after drying out to ensure that the grease has not melted. If so, clean out and re-charge with grease.

5.3 Starting

! WARNINGS!

COVERS WHICH PREVENT CONTACT WITH ↯LIVE↯ PARTS MUST NOT BE OPENED DURING OPERATION

LETHAL VOLTAGES WILL EXIST WITHIN THE MACHINE, IMPOSE FULL SAFETY PRECAUTIONS PARTICULARLY;-

ENSURE THAT THE MOTOR IS CORRECTLY CONNECTED TO THE APPROPRIATE WATER SUPPLY AND THAT THECORRECT INLET AND OUTLET WATER PORTS ARE USED. THE SUPPLY SYSTEM SHOULD BE RATED AT A MINIMUM OF 15L/MIN, AT A MAXIMUM PRESSURE OF 34.5 BAR AND AN INLET TEMPERATURE OF 30^{O}C AND THIS SHOULD BE TURNED ON BEFORE THE MOTOR IS STARTED.

The motor should be uncoupled when it is first started. During the initial start check that the direction of rotation corresponds to that required by the driven machinery. Be aware of any unusual noise and vibration. Investigate and remedy the causes. If the rotation is incorrect according to the requirements of the driven machinery, refer to ATB Morley Engineering Department.
When the motor is run for the first time it should be allowed to run for a short period to allow any surplus grease to be ejected.
If all is well the motor can be connected to the driven machinery and restarted. After approximately two hours running, re-check the alignment, and when it is known that this is acceptable, locate the motor.
After the driven machine has been commissioned check the overload protection devices. During normal operation the motor must be regularly maintained and greased in accordance with the instructions given on the machine nameplate and/or in the technical section of this manual.

9.7 Motor Assembly

Before assembly, all components must be checked to ensure they are clean, free from damage and burrs. Always replace all 'O'rings and shaft seals, fasteners, Dowty or spring washers and bearings with new.

1). Check the rotor shaft and shaft shoulders for damage. A burr on the shaft shoulder can cause bearing misalignment.

2). At the non-terminal box end of the motor where the roller bearing is located, lightly oil the bearing seating of the rotor shaft.

CAUTION - NEVER HEAT A BEARING USING AN OPEN FLAME and ALWAYS USE CLEAN PROTECTIVE GLOVES TO HOLD HOT BEARING ELEMENTS AND ASSEMBLIES.

3). Heat the inner race of the roller bearing up to a temperature of 80 to 90^{o}C in an oil bath or bearing induction heater to expand the inner bore.

4). When the correct temperature has been reached, fit the inner race of the roller bearing on to the rotor shaft ensuring that the face of the bearing race fits snugly up to the locating shoulder on the shaft. Fit the retaining circlip

5). Leave the inner race to cool.

6). Heat the terminal end bearing end shield up to 80 to 90^{o}C using a bearing induction heater to expand the inner bore to accept the outer raceway of the ball bearing.

7). When the correct temperature is reached, fit the ball bearing into the bore of the end shield.

8) Replace the complete bearing and end shield assembly back on to the induction heater and re-heat to 80 to 90^{o}C measured at the inner ball bearing bore.

9). When at the correct temperature, remove the bearing end shield assembly from the heater and quickly fit the whole bearing assembly onto the rotor shaft. Ensure that an even pressure is kept hard against the shaft abutment face so that the inner bearing race fits snugly up to the shaft abutment shoulder.

10). Fit the external circlip and cover the bearing assembly immediately to prevent damage to the elements and raceways of the bearing.

11). The bearing assembly must then be allowed to cool to room temperature before any more assembly work can continue.

12). Heat the non terminal end bearing end shield up to 80 to 90^{o}C using a bearing induction heater to expand the inner bore to accept the outer raceway of the roller bearing.

13). First carefully insert the FLP bush into the back bore of the bearing end shield. Ensure that the bush is in the correct position and up to its abutment shoulder.

14). Insert the rolling elements and outer race into the bore of the bearing end shield ensuring that the edge of the outer race is hard against the locating shoulder of the end shield. Leave the bearing end shield to cool to room temperature before proceeding further. Cover the bearing assembly to protect it from dirt and debris entering the rolling elements and causing damage.

15). From the terminal end of the motor, thread the rotor assembly into the stator frame using the same slinging and lifting technique in reverse as was used for dismantling. Attach bearing RTD's and connect Thermostats removed during strip down to the bearing housings when convenient during the rotor threading operation.

***CAUTION*:- GREAT CARE must be taken whilst inserting the rotor so that damage does not occur to the stator core or the windings. Ensure that the rotor core remains central to the stator core and the windings at all times. A layer of insulating material can be used to protect the winding overhangs during the rotor threading operation.**

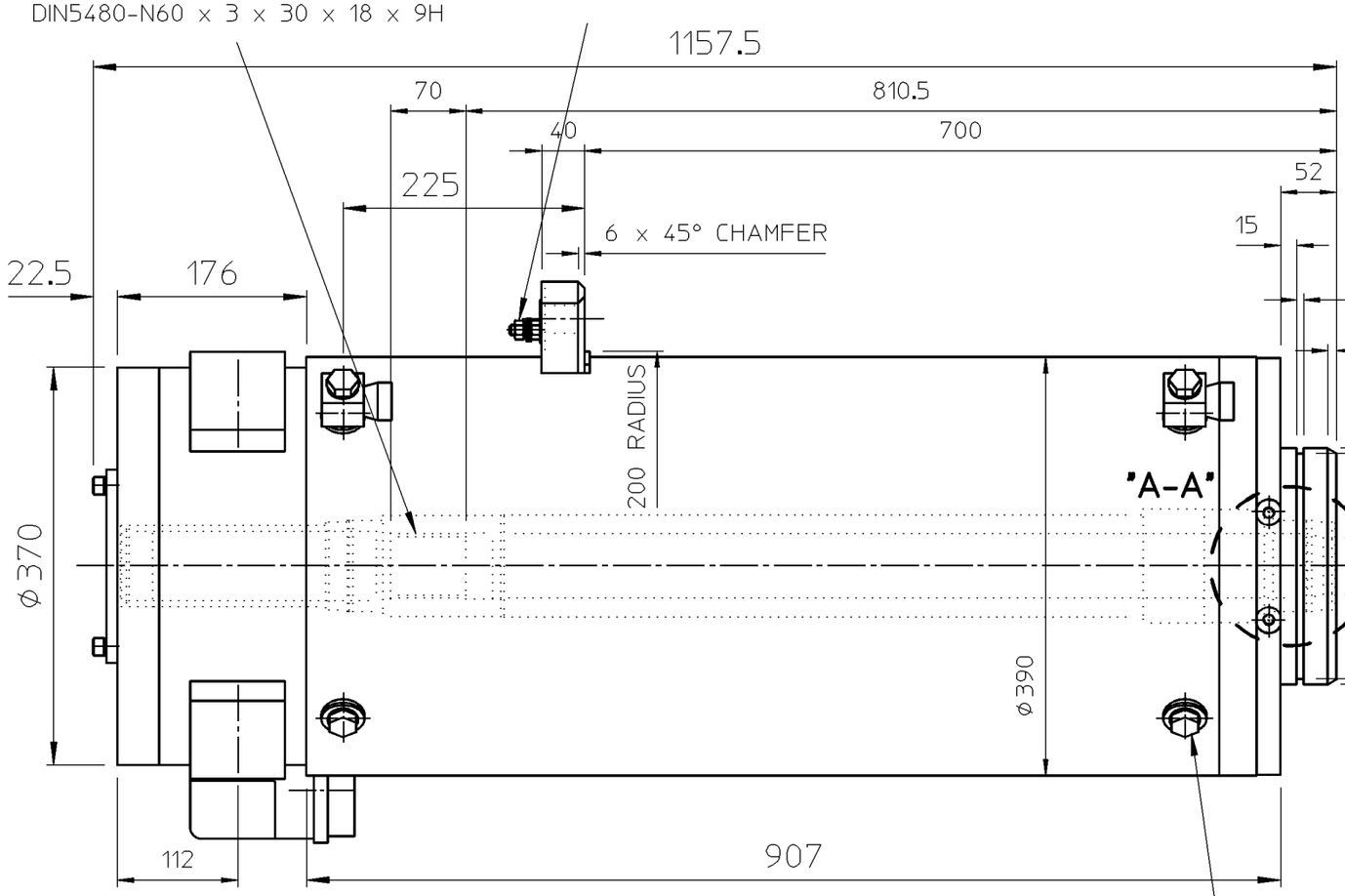
DRAWING No.	ISSUE
3-33452	0

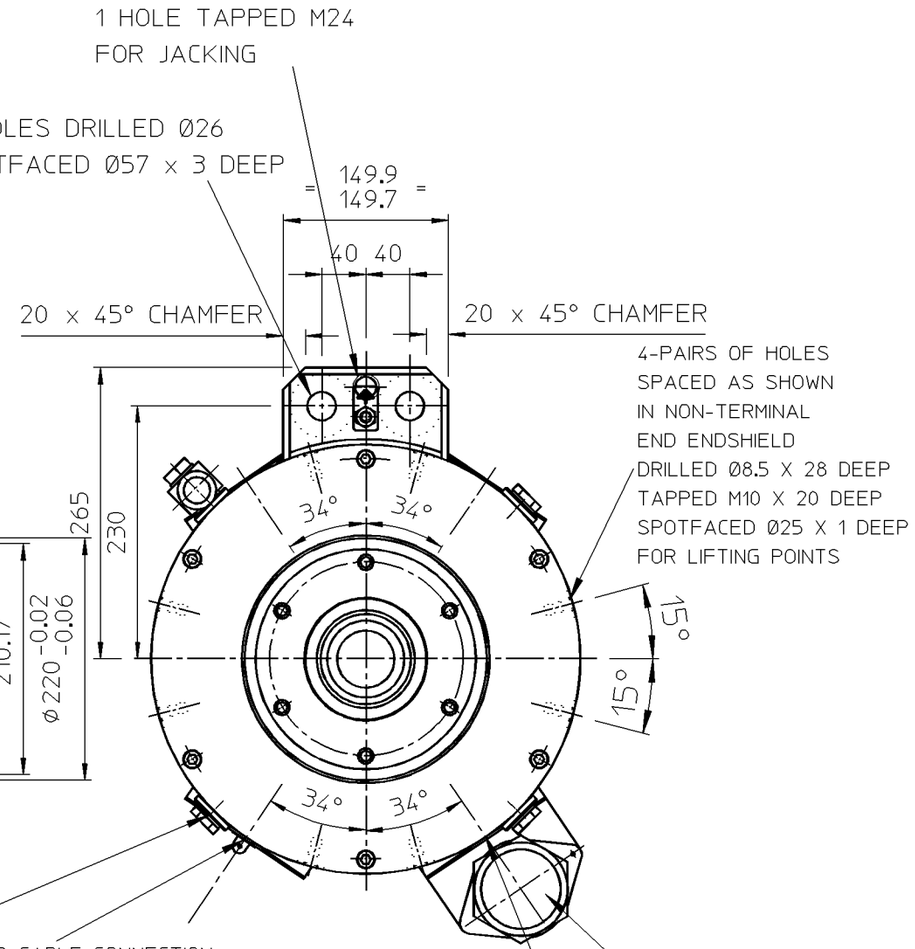
SIMILAR TO DRG NO. 3-32518

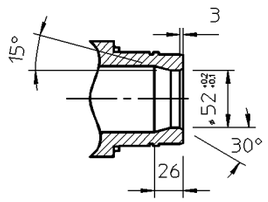
IF IN DOUBT ASK  DO NOT SCALE

M10 EARTH CONNECTION COMPRISES ZINC PLATED STUD, 2 OFF NUTS, 2 OFF PLAIN WASHERS, SQUARE SECTION SINGLE COIL SPRING WASHER & EARTH MARKING TAG

SPLINE DETAIL
DIN5480-N60 x 3 x 30 x 18 x 9H







PART VIEW ON "A-A"

8 WATER PORTS (4 EACH END) EQUALLY SPACED AS SHOWN
1 INLET & 1 OUTLET PORT TO BE FITTED WITH 1/2" BSP BANJO FITTING. REMAINING PORTS FITTED WITH BLANKING PLUGS

M20 CABLE CONNECTION PLATE FITTED WITH STOPPING PLUG WHILE IN TRANSIT.

M75 CABLE CONNECTION ADAPTOR FITTED WITH 2-1/2" BSP ADAPTOR & STOPPING PLUG WHILE IN TRANSIT.

CABLE CONNECTION ADAPTORS MAY BE FITTED AT ANY OF 4 POSITIONS SPACED AS SHOWN. ADAPTORS FITTED WITH BLANK ADAPTORS. OTHER OPENINGS FITTED WITH BLANKING PLUG

ISSUE	DATE	CHANGE

kW	150
R.P.M.	1769
VOLTS	600
PHASE	3
FREQUENCY	60
RATING	MCR

PROVISIONAL DRAWING
YOUR REF.:
.
OUR REF.:
120279

ALL DIMENSIONS IN MILLIMETRES UNLESS INDICATED OTHERWISE.

TOLERANCES UNLESS OTHERWISE STATED ±0.2

OUTLINE OF EL55F SHEARER MOTOR

DRAWN	M.W.
APPROVED	J.P.
DATE	30-OCT-2012
SCALE	1:6

ATB MORLEY
BRADFORD RD, LEEDS, LS28 6QA, UK

DRAWING No.	ISSUE
3-33452	0

format A3_0

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

Certificate No.:	IECEx TSA 08.0025X issue No.:2	Certificate history: Issue No. 2 (2014-10-1) Issue No. 1 (2011-2-23) Issue No. 0 (2008-6-17)
Status:	**Current**	
Date of Issue:	**2014-10-01**	Page 1 of 4

Applicant: **Morley Electric Motors Australia Pty Ltd**
25 Beacon Ave
Glenhaven
NSW 2156
Australia

Electrical Apparatus: **Type EL55 Motor**
Optional accessory:

Type of Protection: **Ex d**

Marking: ATB Morley
Model No._____
Ex d I
Serial No._____
IECEx TSA 08.0025X

Approved for issue on behalf of the IECEx Certification Body: Ujen Singh

Position: Quality & Certification Manager

Signature:
(for printed version)

Date: 01 OCTOBER 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.

Certificate issued by:

TestSafe Australia
919 Londonderry Road
Londonderry NSW 2753
Australia

Test Safe AUSTRALIA

1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 03ATEX1135X** Issue: **6**

4 Equipment: **Type EL55* Induction Motor**

5 Applicant: **ATB Morley Limited**

6 Address: Bradford Road
Leeds
West Yorkshire LS28 6QA
UK

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

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

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 to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (amendments 1 and 2) EN 50018:2000

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation, which is available on request.

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 EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

I M2
EEx d I

Project Number 33174
C. Index 01

C Ellaby
Deputy Certification Manager

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

U.S. Department of Labor

Mine Safety and Health Administration
Industrial Park Road
RR1, Box 251
Triadelphia, West Virginia 26059

Revised Approval Modification Program

Acceptance issued to:

Company: Morley Electric Motors Ltd. Attn: Mr. Peter Ramsden Address: Bradford Road Leeds, West Yorkshire LS28 6QA, England	Investigation. No. PS-21929 Appl. Code No. N/A Appr./Cert. No. 7J-03015-0 PAR No. 91845

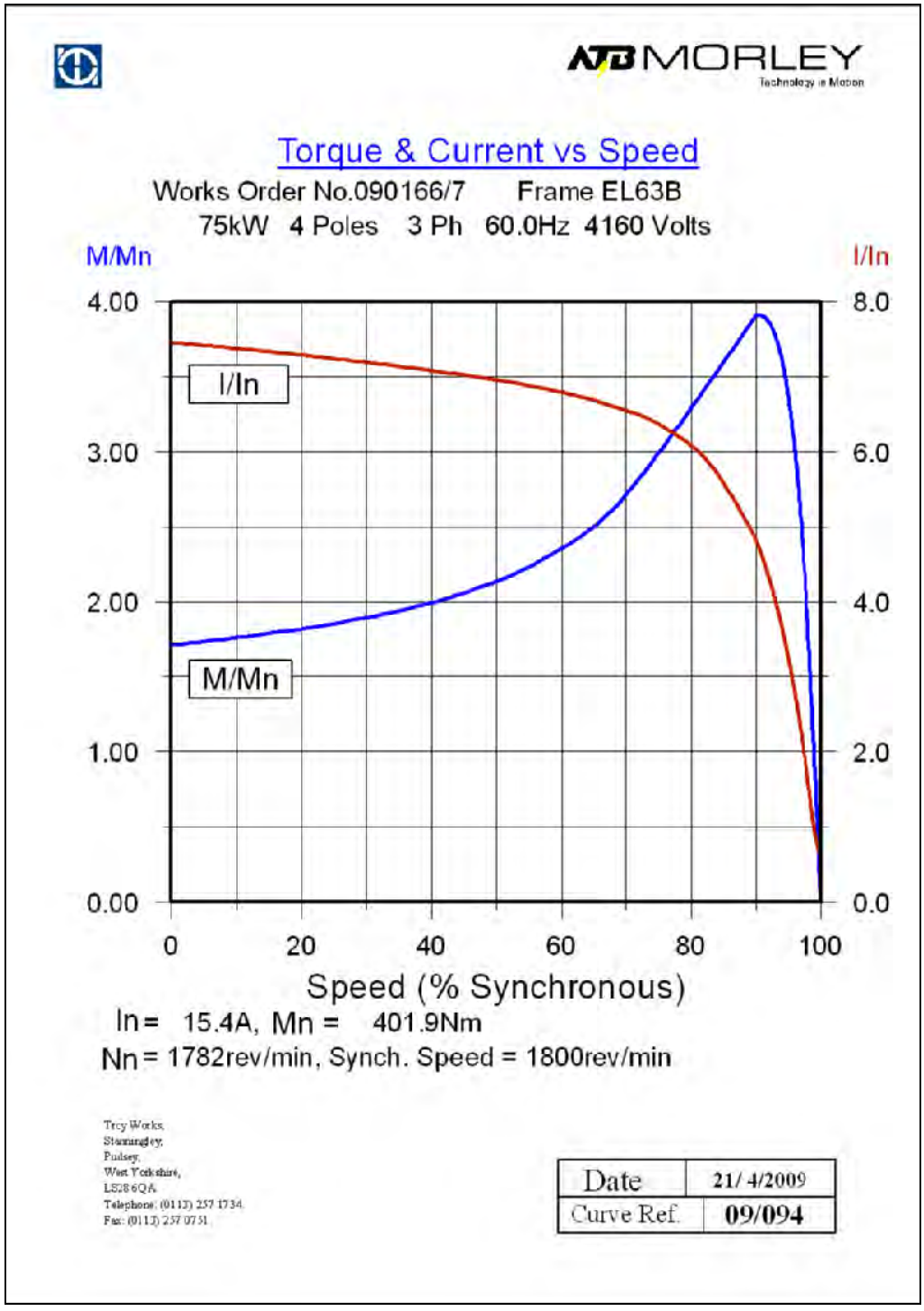
Description of Change: The RAMP change consists of correcting cable gland range and adding motor designation EL55 **A thru Z.**

Drawing List			
Title	Drawing No.	Revision	Status
Sectional Arrangement of an EL55(**AMW**)	1-18793	C	Revised
Alternate Cable Gland Details	2-22163	A	Revised

Supervisor Acceptance Kathy J. Post
Date 11-1-05

Revised: November 14, 2007

D Torque Characteristics Curve (Typical)



ATB MORLEY
Technology in Motion

Motor Number: 166011 Test Cert. Number: 13727 Winding Ref: AM40/4/1

Customer: Caterpillar Global Mining Europe GmbH Order Number: 4501856822-10

Output: 75 kW. 3 Phase. 50 /60 /60 Hz. 3300 /2300 /4160 Volts. 17.8 /26.6 /15.4 Amps. 1475 /1780 /1782 RPM

Type: AM40 Frame Size: EL63B Rating: MCR Enclosure: TEWJC FLP

Insulation Class: H Temp. Rise: 135 K Connection: STAR / DELTA / STAR

Bearings: Drive End NU217-C3 Non-Drive End 6314-C3

Maximum Ambient Water 30oC

LOAD P.U.	VOLTAGE V	CURRENT A	INPUT kW	POWER FACTOR	SLIP %	SPEED RPM	OUTPUT kW	EFFICIENCY %
No load	3300	7.72	2.46	.055	-	1500	50 Hz	(Star)
Lock Rotor	880	20.0	7.02	.230	-	-	50 Hz	(Star)
No load	4160	8.32	3.20	.053	-	1800	60 Hz	(Star)
Lock Rotor	880	16.6	5.02	.198	-	-	60 Hz	(Star)
No load	2300	15.3	4.03	.066	-	1800	60 Hz	(Delta)
Lock Rotor	480	27.6	4.51	.196	-	-	60 Hz	(Delta)
Full Load	3300	18.27	84.06	.805	1.33	1480	77.10	91.72

TEMPERATURE RISES RECORDED AFTER RUNNING AT FULL LOAD FOR 1.0 HOURS

	Ambient	Water	Frame	Stator Wdg	Rotor Wdg	Slip Rings	DE Bearing	NDE Bearing
Temp °C	20.0	20.0	24.0	97.0	-	-	45.7	62.6
Rise K	-	4.0	4.0	77.0	-	-	25.7	42.6

50 HzTemperature Rise By RTD = 73.2 oC Cooling Water Flow Rate = 15 Litres / Minute (13 PSI)

STATOR OHMS PER PHASE		ROTOR OHMS PER PHASE	
Cold (15°C)	Hot	Cold (15°C)	Hot
2.615	3.473 (1 Minute)	-	-

STARTING CURRENT:	596	% FULL LOAD CURRENT =	106	AMPS	3300	VOLTS
STARTING TORQUE:	120	% FULL LOAD TORQUE =	582	Nm	3300	VOLTS

(VALUES CORRECTED TO RATED VOLTAGE INCLUDING SATURATION)

VIBRATIONS NO KEY FITTED

Drive End		Non-Drive End
0.95	Horizontal	0.95
0.85	Vertical	0.90
0.65	Axial	0.55

Velocity in mm/sec RMS.

PHASE SEQUENCE ROTATION

U V W CLOCKWISE
R Y B looking on drive end

HIGH VOLTAGE PRESSURE TEST (1 minute)
Stator 9320 Rotor -

POLARISATION INDEX AT 2000 VOLTS

1 minute	2990				
10 minutes	16900	Index =	4.20	@ 75	°C

INSULATION RESISTANCE
Stator 2990 Rotor -
All insulation resistance values in Megohms

FLP Cert No: See Comments Group 1 FLP Gaps Checked OK
Spigot T.I.R. - Shaft T.I.R. - DE shaft lift - Rotor Balance <1.00 ISO

COMMENTS
RTDs (Winding, Bearings+ Water Jacket) Thermostats - (Winding + Water Jacket) (Live + Spare)
Continuity Check OK. Insulation Resistance = 1000+ Megohms OK (See Page 2 For Individual Readings)
60Hz Starting Torque 163% = 654Nm / 174% = 699Nm (Star 4160V / Delta 2300V)
60Hz Starting Current 734% = 113 Amps / 707% = 118 Amps (Star 4160V / Delta 2300V)

FLP Cert Numbers. IECEx TSA 10.0035X. MSHA 07-JA050012-0. IECx SIR 09.0113X

Temperatures On Load (5.0 Hours)	Water In	Water Out	DE Bearing	NDE Bearing	Winding RTD	Winding Rise By Resistance
50 Hz Type Test Readings oC	25.4	31.2	69.6	96.0	97.2	85.03 (1 Minute)
60 Hz Type Test Readings oC	24.6	30.0	61.9	84.9	70.4	65.34 (1 Minute)

Signed ..... Date 29-4-16

MQF130a

IECEx Certificate of Conformity

Certificate No.: IECEx SIR 09.0113X

Date of Issue: **2014-07-08** Issue No.: **3**

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 – this Issue introduced the following changes:	
12	The existing Condition of Certification associated with water cooling was modified to define the maximum temperature and to authorise the use of the thermal trips in situations where the 15 l/min. water flow requirement may not be satisfied or when the motor is supplied from non-sinusoidal supplies
2.	Modification to the water flow requirement from 15 l/min to 1.4 l/min per kW of losses.
Issue 2 – this Issue introduced the following change:	
1	Issued to allow ExTR GB/SIR/ExTR09.0190/01 to replace ExTR GB/SIR/ExTR09.0190/00.
Issue 3 – this Issue introduced the following change:	
1.	The use of an alternative terminal arrangement was approved.

ПРИЛОЖЕНИЕ

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ТС RU C-GB.ME92.B.00581

Серия RU № 0246194

AMW 33…AMW 70	PB Ex d I Mb	IP54	56÷200	1140	водяное
EL63	PB Ex d I Mb	IP54	до 150	2200÷4160	водяное
EL71	PB Ex d I Mb	IP54	60÷150	3300÷4160	водяное
EL72	PB Ex d I Mb	IP54	до 240	до 4160	водяное
IM50...IM130	PB Ex d I Mb	IP54	450÷1000	900÷6600	воздушное
IX50…IX130	PB Ex d I Mb	IP54	540÷1200	900÷6600	воздушное
IMW50… IMW150	PB Ex d I Mb	IP54	450÷2090	900÷11000	водяное
IXW50… IXW150	PB Ex d I Mb	IP54	450÷2090	900÷11000	водяное
AE160WJC	PB Ex d I Mb	IP54	35÷60	1000÷4160	водяное
AE220WJC	PB Ex d I Mb	IP54	60÷70	1140÷4160	водяное
AE355WJC	PB Ex d I Mb	IP54	500÷550	3300÷4160	водяное
EL68	PB Ex d I Mb	IP54	45÷900	600÷4160	водяное
AMWX38	PB Ex d I Mb	IP54	до 52	1100	водяное
AAMW38	PB Ex d I Mb	IP54	до 40	1140	водяное
AMW31	PB Ex d I Mb	IP54	до 75	380	водяное
AAMW20…AAMW34	PB Ex d I Mb	IP54	до 40	1140	водяное
FG(W)45…FG(W)100	PB Ex d I Mb	IP54	153÷990	900÷6600	водяное
ABW20…ABW70	PB Ex d I Mb	IP54	45÷190	900÷3300	водяное
AE160SPWJC	PB Ex d I Mb	IP54	до 22	1000	водяное
AE315LWJC	PB Ex d I Mb	IP54	620÷680	3300÷4000	водяное
FFGW 30…FFGW70	PB Ex d I Mb	IP54	160÷460	300÷4160	водяное

3. ОПИСАНИЕ КОНСТРУКЦИИ И СРЕДСТВ ОБЕСПЕЧЕНИЯ ВЗРЫВОЗАЩИТЫ

Электродвигатель состоит из следующих основных узлов: статора, ротора, подшипниковых щитов и коробки (коробок) выводов. Вид охлаждения электродвигателя в зависимости от исполнения водяное или воздушное (см. таблицу 2.1). В электродвигателях с водяным охлаждением предусмотрена рубашка водяного охлаждения, с воздушным охлаждением – вентилятор, закрытый защитным кожухом.

Статор состоит из станины, сердечника и обмотки. Станина – стальная, сварная. Внутри корпуса помещен, набранный из листов электротехнической стали пакет, в пазах которого уложена обмотка. В зависимости от типоисполнения электродвигатель снаружи может закрываться стальным кожухом.

Ротор двигателя выполнен в виде вала, на котором закреплен пакетированный сердечник. Ротор отбалансирован динамически.

Коробка выводов - стальная, сварная. Внутри её корпуса расположены изоляторы с клеммами для подключения силового кабеля и датчиков температуры (в случае комплектации).

Подшипниковый щит – стальной, сварной. В подшипниковых щитах размещены подшипниковые узлы, состоящие из подшипников.

В конструкции электродвигателей предусмотрены внутренний и внешний заземляющие зажимы.

Примечания: при монтаже и эксплуатации электродвигателей необходимо строго следовать всем рекомендациям завода-изготовителя по их безопасной эксплуатации, в том числе касающихся номинального расхода охлаждающей жидкости (воды) и её максимальной температуры (для электродвигателей с водяным охлаждением); применяемые встроенные обогреватели для удаления конденсата должны быть обесточены перед пуском электродвигателя и наоборот.

Взрывозащищенность электродвигателей обеспечивается взрывозащитой вида «взрывонепроницаемая оболочка» по ГОСТ IEC 60079-1-2011, а также выполнением требований ГОСТ Р МЭК 60079-0-2011.

Маркировка, наносимая на электродвигатель, должна включать следующие данные:

- наименование изготовителя или его зарегистрированный товарный знак;
- наименование изделия и маркировку взрывозащиты;
- единый знак обращения продукции на рынке государств-членов Таможенного союза;
- специальный знак Ex взрывобезопасности (Приложение 2 к ТР ТС 012/2011);
- дату выпуска и порядковый номер изделия по системе нумерации предприятия-изготовителя;
- номер сертификата соответствия;
- другие данные, которые должен отразить изготовитель, если это требуется технической документацией.

Внесение изменений в конструкцию и техническую документацию согласно ТР ТС 012/2011.

ОРГАН ПО СЕРТИФИКАЦИИ ВЗРЫВОЗАЩИЩЕННОГО И РУДНИЧНОГО ОБОРУДОВАНИЯ "СЕРТИНЖ" МЕЖОТРАСЛЕВОЙ ОРГАН СЕРТИФИКАЦИИ

Для сертификатов

RA.RU.11ME92

М.П.

Руководитель (уполномоченное лицо) органа по сертификации (подпись) А. Н. Шатило (инициалы, фамилия)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) (подпись) Ю. В. Буров (инициалы, фамилия)

5.2 Drying Out

The only way that moisture can be removed from the windings is by the application of heat, it is necessary that all moisture be evaporated from the insulation before it is subjected to the stress of normal voltage.

The winding temperature should be raised to at least 75^{o}C but **MUST NOT EXCEED 100^{o}C** and hot air blowers for example can be used to circulate warm air through the machine windings.

!! CAUTION!!

Irrespective of the method or drying, it is essential that the temperature of the windings be brought up slowly, as any rapid heating may result in damage to the insulation layers due to expanding air and moisture being unable to escape quickly enough.

5.3 Starting

! WARNINGS!

COVERS WHICH PREVENT CONTACT WITH ⁄LIVE⁄ PARTS MUST NOT BE OPENED DURING OPERATION

LETHAL VOLTAGES WILL BE PRESENT, IMPOSE FULL SAFETY PRECAUTIONS PARTICULARLY;-

ENSURE THAT THE MOTOR IS ATTACHED TO A SUITABLE COOLING WATER SUPPLY RATED AT A MINIMUM OF 15 l/min AT A MAX. PRESSURE OF 34.5 BAR AND HAVING AN INLET TEMPERATURE NOT EXCEEDING 35^{O}C.

CHECK THAT THE SUPPLY IS DISCONNECTED AND CANNOT BE RE-CONNECTED WITHOUT YOUR CONSENT

ENSURE THE FRAME AND THE SHAFT ARE SOLIDLY EARTHED

EARTH ANY WINDINGS NOT BEING TESTED

A WINDING CAN HOLD A CHARGE FOR A LONG PERIOD, TAKE CARE WHEN EARTHING IT AFTER TESTING.

If the measured insulation resistance is still reading lower than the recommended value, contact ATB Morley, Sales Department requesting advice.

Also, before the motor is started, check the switchgear for correct operation; check the rating of the fuses; check the overload protection device to operate full load current declared on the nameplate, check the function of all protection devices.

During the commissioning programme, the starting frequency must be kept to a minimum.

The motor should be uncoupled when it is first started.

During the initial start, check that the direction of rotation corresponds to that required by the driven machine; also be aware of any unusual noise or vibration. Investigate and remedy the cause of any vibration and/or unusual noise.

If the rotation is incorrect according to the requirements of the driven machine, refer to ATB Morley, Engineering Dept.

11 Machine Maintenance History

The following is a proposed style for 'machine history'.

A machine history should record all work from monthly maintenance to bi-annual maintenance and the replacement of bearings etc.

PARTICULARLY NOTE !

When entering the history notes compare the serial number of the machine that has been serviced with that at the top of the table.

MOTOR SERIAL No. :-

DATE	ACTION TAKEN

12 Spares & Service Backup

When in difficulty, contact ATB Morley, at the Fax / Telephone numbers below and ask for the Sales Department.

The Fax is manned during normal business hours and messages that occur outside these times are received and stored for dissemination when normal business hours resume.

Telephone Number :- **+ 44 (0) 113 2571 734**

Fax Number :- **+ 44 (0) 113 2570 751**

E-mail :- **sales@uk.atb-motors.com**

Web Site :- **www.atb-motors.com**

WHEN REQUIRING ASSISTANCE OR ORDERING SPARES, PLEASE QUOTE THE MOTOR SERIAL NUMBER !

5 Commissioning and First Starting

5.1 Insulation Resistance Measurement

Before the motor is started, it's windings must be known to be unaffected by moisture, therefore review the history of the machine and if there is any doubt, check the value of the insulation resistance.

This is temperature dependent but because the motor has not yet been run, the temperature of the windings can be taken as being the ambient temperature.

The recommended minimum values are given below. For intermediate ambient temperature use the next above.

MOTOR SUPPLY VOLTS		RECOMMENDED INSTRUMENT TERMINAL VOLTAGE	RECOMMENDED MINIMUM INSULATION RESISTANCE IN MEGOHMS AT WINDING TEMPERATURE OF					
Over	**Upto & Including**		**10°C**	**15°C**	**20°C**	**25°C**	**30°C**	**40°C**
110v	**1100v**	500v	16	11	8	6	4	2
3.3kV	**6.6kV**	1000v	40	28	20	14	10	5

As a further safeguard it is strongly recommended that the polarisation index of the insulation system be measured.

To obtain the Polarisation Index a mains or battery powered D.C. insulation resistance tester (Megger) must be used.

Measure the Insulation Resistance after 1 minute and again after 10 minutes.

$$\text{P.I.} = \frac{\text{10 Minute Reading}}{\text{1 Minute Reading}}$$

TEST PARAMETERS

MOTOR VOLTAGE	INSTRUMENT TEST VOLTAGE	MINIMUM ACCEPTABLE P.I.
1100	500	2.0
1101-3300	1000	3.0
above 3300	2000	3.0

5.2 Drying Out

The only way that moisture can be removed from the windings is by the application of heat, it is necessary that all moisture be evaporated from the insulation before it is subjected to the stress of normal voltage.

The winding temperature should be raised to at least 75°C but **MUST NOT EXCEED 100°C**

a). Hot air blowers can be used to circulate warm air through the machine windings.

!! CAUTION!!

Irrespective of the method or drying, it is essential that the temperature of the windings be brought up slowly, as any rapid heating may result in damage to the insulation layers due to expanding air and moisture being unable to escape quickly enough.

21. At the terminal end, attach the bearing thermistor (58,59) to the bearing housing.

22. To aid location, insert lengths of screwed rod into the tapped holes of the bearing housing and a couple of rods into the stator frame ends.

23. Fit the ‘O’ ring seals (30) and (24) and (27) into the bearing endplate (3) in their respective positions.

24. Completely fill the voids between the rolling elements of the bearing with grease as indicated on the motor rating plate and 50% to 75% fill the void in the bearing endplate with lubricating grease.

25. Locating all the lengths of screwed rod into the clearance holes of the endplate (3), gradually and carefully slide the endplate (3) over the bearing housing (4) and into the stator frame spigot location using the socket cap screws provided.

26. As the bearing will float axially inside the housing, the screwed rod will have to be pulled out every so often to ensure the endplate and housing are fitting together properly.

27. Firstly secure all the screws that fasten the endplate to the stator frame.

28. Secondly secure the cap screws that fasten the endplate to the bearing housing. Fit the bearing cover, re-assembled with new seals (19,29) into the bearing endshield (3). Ensure the lip seal (19) is very well lubricated with bearing grease.

29. At the terminal end, completely fill the voids between the ball elements of the bearing with grease as indicated on the motor rating plate.

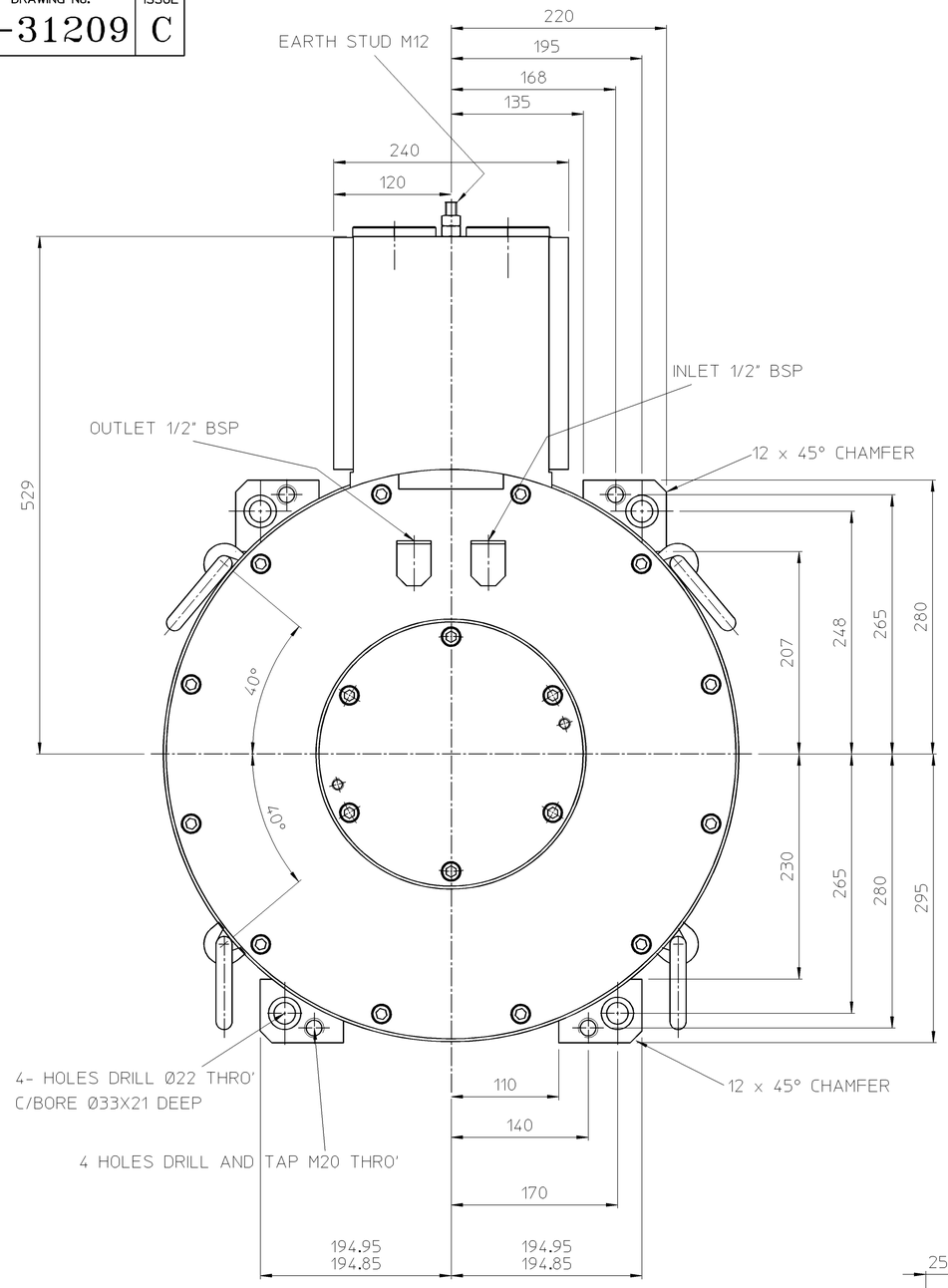
30. 50% to 75% fill the free space in the bearing cover (5) with grease and fit the shaft seal (18). Ensure the lip seal (18) is very well lubricated with bearing grease.

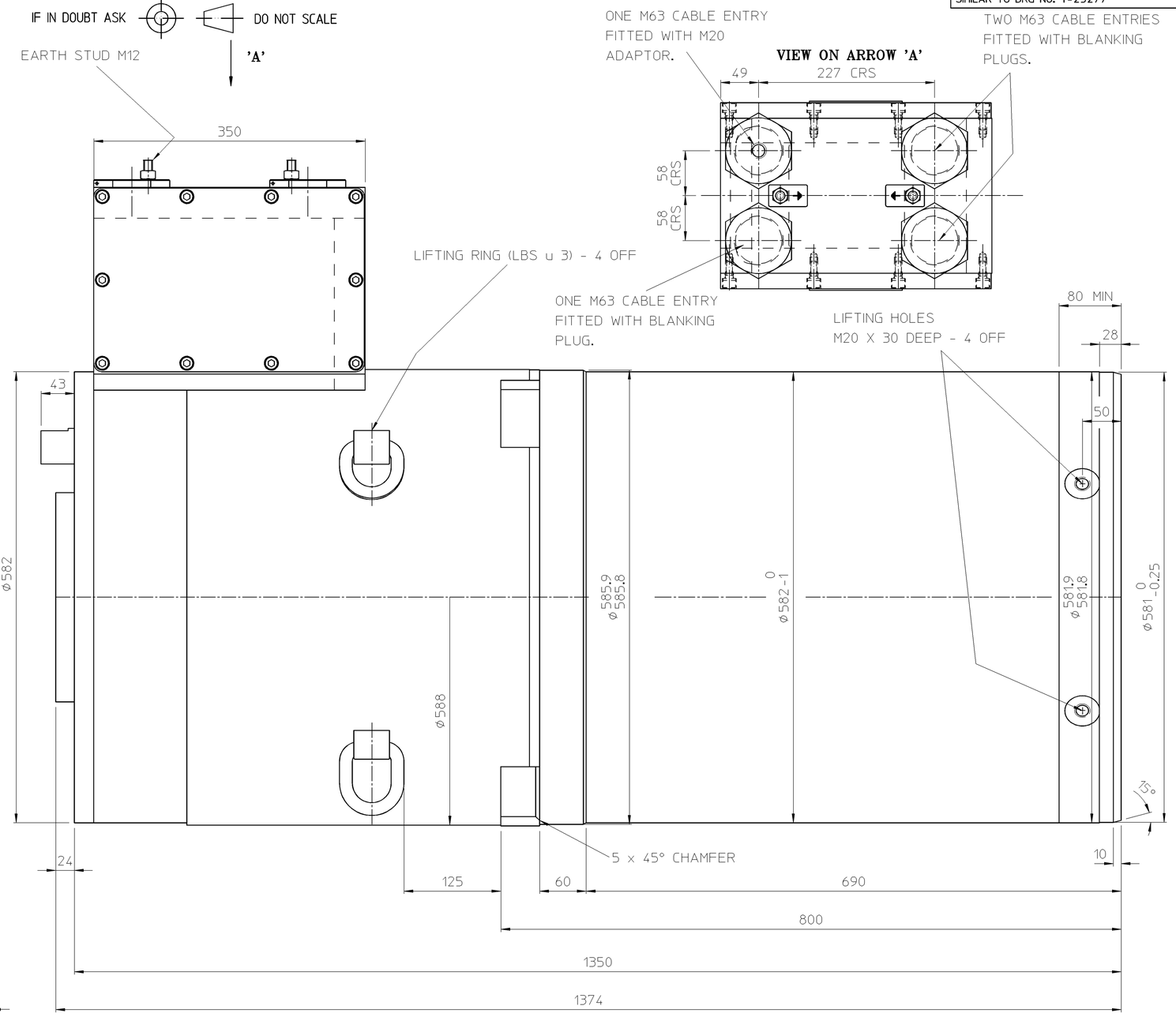
31. Secure the bearing cover to the endplate with the appropriate socket cap screws.

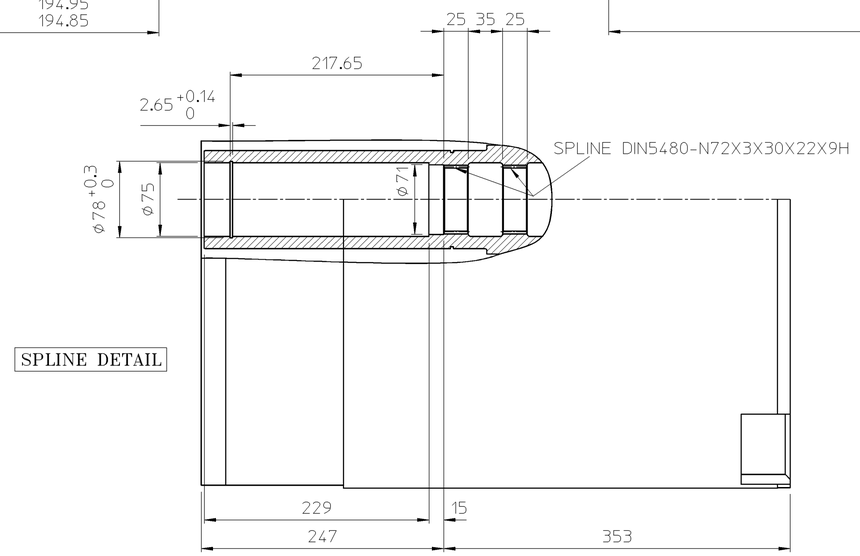
32. Check the shaft is running freely by rotating it by hand for a couple of turns.

DRAWING No. 1-31209 | ISSUE C

SIMILAR TO DRG NO. 1-23277







SPLINE DETAIL

NOTE!
MOTOR IS SUPPLIED FOR SHEARER RIGHT HAND USE.
FOR SHEARER LEFT HAND USE MAIN TERMINAL BLOCK, AUXILIARY BLOCKS, INCLINOMETER AND CAN-BUS/MDT MUST BE MOVED TO SUIT NEW HANDING.

ISSUE	DATE	CHANGE	ZONE	SIG
C	21-MAY-2013	DIMENSION Ø581 +0.00/-0.25 ADDED (CN 11864).	6B	N.T.
B	15-OCT-2012	FIXING LUG CHAMFER WAS 10 x 45° NOW 12 x 45° (CN 11246).		N.T.
A	2-SEP-2011	NOTE ABOUT MOTOR HANDING ALTERED (CN 9874).	6D	N.T.

kW	.
R.P.M.	.
VOLTS	.
PHASE	.
FREQUENCY	.
RATING	.

CERTIFIED DRAWING
CUSTOMER REF.: .
MORLEY REF.: .

ALL DIMENSIONS IN MILLIMETRES UNLESS INDICATED OTHERWISE.
TOLERANCES UNLESS OTHERWISE STATED ±0.2

OUTLINE OF SHEL68B 4 POLE SHEARER MOTOR

DRAWN	N.T.
APPROVED	J.P.
DATE	25-JUL-2011
SCALE	1:3.333

ATB MORLEY
BRADFORD RD, LEEDS, LS28 6QA, UK

DRAWING No. 1-31209 | ISSUE C

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

Certificate No.:	IECEx TSA 05.0042X	issue No.:6
Status:	**Current**	
Date of Issue:	**2015-12-17**	Page 1 of 4

Certificate history:
Issue No. 6 (2015-12-17)
Issue No. 5 (2014-6-30)
Issue No. 4 (2012-9-6)
Issue No. 3 (2011-11-14)
Issue No. 2 (2011-4-12)
Issue No. 1 (2007-8-6)
Issue No. 0 (2005-9-7)

Applicant: **Morley Electric Motors Australia Pty Ltd**
25 Beacon Ave
Glenhaven
NSW 2156
Australia

Electrical Apparatus: **Induction motor types EM, EW and EMW**
Optional accessory:

Type of Protection: **Ex d**

Marking: ATB Morley Limited
E** **
Ex d I
Serial number _ _ _ _
IECEx TSA 05.0042X

Approved for issue on behalf of the IECEx Certification Body: Ujen Singh

Position: Quality & Certification Manager

Signature:
(for printed version)

Date: 17 DECEMBER 2015

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.

Certificate issued by:

TestSafe Australia
919 Londonderry Road
Londonderry NSW 2753
Australia

Test Safe AUSTRALIA

1 **EC TYPE-EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 01ATEX1062X** Issue: **24**

4 Equipment: **Type EM 21/78 Induction Motor**

5 Applicant: **ATB Morley Limited**

6 Address: Troy Works
Bradford Road
Stanningley
Leeds
West Yorkshire LS28 6QA
UK

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

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

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 to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (amendments 1 and 2) EN 50018:2000 EN 13463-1:1998

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation, which is available on request

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 EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

I M2
EEx d I

Project Number 70059531

N Jones
Certification Manager

Sira Certification Service
Unit 6, Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom

Tel: +44 (0) 1244 670 900
Fax: +44 (0) 1244 539 301
Email: ukinfo@csagroup.org
Web: www.csagroupuk.org

Certificate Annexe

Certificate Number: **Sira 01ATEX1062X**

Equipment: **Type EM 21/78 Induction Motor**

Applicant: **ATB Morley Limited**

Issue 0 and 1

The drawings associated with these Issues were replaced by those listed in Issue 2.

Issue 2

Drawing	Sheet	Rev.	Date	Description
3-18007	1 of 1	A	01 Jul 03	Socket interface details
1-18043	1 of 1	A	02 Jul 03	Adaptor for spigot fitting glands (for use with 1-18042)
1-18006	1 of 1	A	02 Jul 03	Adaptor for spigot fitting glands (for use with 1-18004)
2-18005	1 of 1	A	02 Jul 03	Dual entry adaptor (for use with 1-18004)
1-18008	1 of 1	A	02 Jul 03	Angled adaptor (for use with 1-18004)
1-18063	1 of 1	A	01 Jul 03	Terminal box lid security cover
1-18042	1 of 1	A	03 Jul 03	2.2/3.3 kV terminal box arrangement
1-18041	1 of 1	A	03 Jul 03	Auxiliary terminal box arrangement
1-18004	1 of 1	A	03 Jul 03	1100 V terminal box arrangement
2-18095	1 of 1	A	03 Jul 03	Restrained receptacle adaptor (for use with 1-18004
2-18065	1 of 1	A	03 Jul 03	Alternative adaptor (for use with 1-18698)
1-18053	1 of 1	A	03 Jul 03	2.2/4.2 kV terminal box arrangement
1-18019	1 of 1	A	03 Jul 03	Alternative cable gland adaptor (for use with 1-18004)
1-18020	1 of 1	A	03 Jul 03	Alternative cable gland adaptor (for use with 1-18004
2-18054	1 of 1	A	03 Jul 03	Restrained receptacle adaptor (for use with 1-18053)
2-18094	1 of 1	A	04 Jul 03	Restrained receptacle adaptor (for use with 1-18042)
1-18017	1 of 1	C	07 Jan 04	Cable gland adaptor (for use with 1-18059)
1-18018	1 of 1	A	04 Jul 03	Alternative 1100 V terminal box arrangement
1-18060	1 of 1	C	07 Jan 04	Alternative cable gland adaptor (for use with 1-18059)
1-18076	1 of 1	A	04 Jul 03	Alternative 1100 V terminal box arrangement
1-18077	1 of 1	A	04 Jul 03	Alternative cable gland adaptor (for use with 1-18004)
1-18078	1 of 1	A	04 Jul 03	Alternative cable gland adaptor (for use with 1-18004)
1-18375	1 of 1	A	04 Jul 03	Cable gland adaptor (for use with 1-18042)
1-17155	1 of 1	A	01 Jul 03	Secn. Arrgt. of EMW 21/78 size T.E.W.C FLP Motor Gp I.
1-17115	1 of 1	B	26 Jun 03	Secn. Arrgt. of EM 21/78 size T.E.F.C FLP Motor
3-17171	1 of 1	A	31 Jan 02	ATEX Group I Nameplate
1-8158	1 of 1	B	27 Jun 03	Terminal Arrgt. for EM W/Cooled 2.2/4.2kV FLP Gr I
1-17114	1 of 1	A	30 Apr 01	Secn. Arrgt. of EM 21/78 size T.E.F.C FLP Motor (Group I)
1-17164	1 of 1	A	03 Jul 03	Secn. Arrgt. of EM Type Motor showing sealing of joints to IP 56
2-17176	1 of 1	A	03 Jul 03	Sectional View of Water Cooled Version of Type EM Motors with Double Flange and Shaft
3-17172	1 of 1	A	03 Jul 03	EM Alternative bearing housings with temperature monitoring devices
2-19166	1 of 1	A	07 Jan 04	Dual entry adaptor
2-19172	1 of 1	0	10 Mar 03	Shaft clamp assembly
1-17168	1 of 1	A	03 Apr 03	2.2/4.2 kV terminal box arrangement

Issue 3

Drawing	Sheet	Rev.	Date	Description
1-20801	1 of 1	B	07 Apr 05	JX600 general arrangement
1-21023	1 of 1	A	25 Jan 05	JX600 terminal arrangements
1-21024	1 of 1	A	20 Jan 05	JX 600 flamepath details
3-21170	1 of 1	0	28 Jul 04	Alternative bearing 'O' ring arrangement.

Sira Certification Service
Unit 6, Hawarden Industrial Park,
Hawarden, CH5 3US, United Kingdom

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