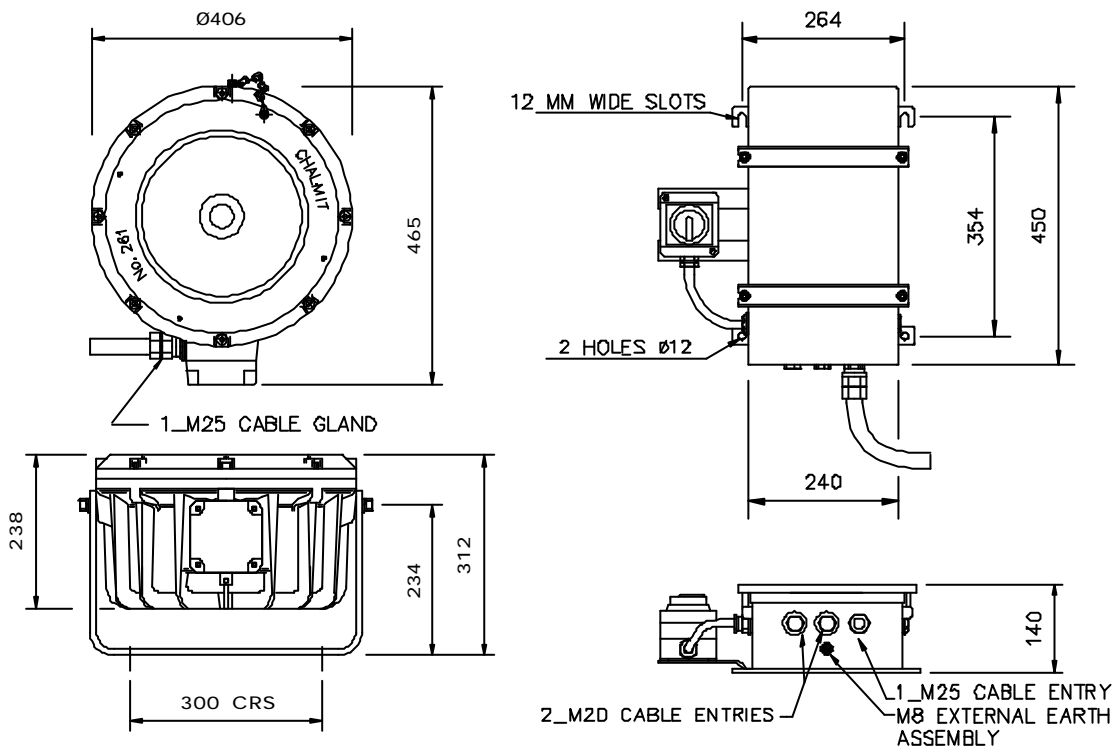





INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS 261e Projector & 723 Battery Box (ATEX)

Important : Please read these instructions carefully before installing or maintaining this equipment. Good electrical practices should be followed at all times and this data should be used as a guide only.



0.0 Specification

Type of Protection	Ex de (flameproof and increased safety).
Protection Standards	EN 50014: 1998, EN 50018: 2000, EN 50019: 2000
ATEX Equipment Classification	Group II Category 2 G
Area Classification	Zone 1 and Zone 2 areas to BS EN 60079-10 and installation to BS EN 60079-14
Certificate	EC Type Examination Certificate BAS01ATEX2310
Equipment Coding	 II 2 G EEx de IIB T4
Ingress Protection	IP66 and IP67 to BS EN 60529

Type Of Protection	Ex em (increased safety and encapsulation)
Protection Standards	EN 50014: 1998, EN 50019: 2000, EN 50028: 1987, EN 50281-1-1: 1998
ATEX Equipment Classification	Group II Category 2 G D
Area Classification	Zone 1 and Zone 2 areas to BS EN 60079-10 and installation to BS EN 60079-14
Certificate	EC Type Examination Certificate Baseefa03ATEX0003
Equipment Coding	 II 2 G EEx em II T4  II 2 D EEx em II T4
Ingress Protection	IP66 to BS EN 60529
Operating Temperature Range	-10°C to +40°C
CE Mark	The CE marking of this product applies to 94/9/EC "The Electrical Equipment (Safety) Regulations 1994", "The Electromagnetic Compatibility Regulations 1992", it does not apply to the "Equipment and Protective Systems intended for use in Explosive Atmospheres Regulations 1996". [This legislation is the equivalent in UK law of EC directives 73/23EEC, 89/336/EEC and 94/9/EC respectively].



ATEX Declaration	The Equipment as described and identified in these instructions is declared to meet the provisions of the ATEX directive by reason of the EC Examination denoted based on the harmonised standards listed above.
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R R Cochran General Manager.

Reference: D03/09-00 dated 19.6.03

1.0 Introduction – 261E and 723 Emergency Projector.

The type 261E projector and 723 battery box are designed to be used in combination to provide projected emergency illumination for 90 minutes in situations where an area needs to be lit for escape purposes. This is a specialised system which incorporates a luminaire with a 24V dc control unit for a 70W SON/T lamp and a separate battery box with manual control switch. The electronic circuits for charging the battery are mounted in the luminaire. The supply current is brought into the battery/terminal box.

A control switch is coupled to the battery/terminal box and the whole system connected together electrically by a multi-core cable. The battery is a 7Ah Ni-Cd with 20 cells. The battery is split into four sections which are individually monitored for voltage, in order to control over voltage and low voltage cut-off in a safe manner.

Two versions of the reflector and lamp arrangement are provided. The circular reflector provides a narrow beam. The conventional floodlight type provides a wider beam. For details contact our lighting design section.

2.0 Storage

Luminaires and control gear boxes are to be stored in cool dry conditions preventing ingress of moisture and condensation.

Any specific instructions concerning emergency luminaires must be complied with.

3.0 Installation and Safety

3.1 General

There are no health hazards associated with this product whilst in normal use. However, care should be exercised during the following operations. Installation should be carried out in accordance with BS EN 60079-14 or the local hazardous area code of practice, whichever is appropriate, and fitting of specified insulating material to be adhered to where a specific fire resistance rating is required.

In the UK the requirements of the "*Health and Safety at Work Act*" must be met.

Handling and electrical work associated with this product to be in accordance with *the "Manual Handling Operations Regulations"* and "*Electricity at Work Regulations, 1989*". Your attention is drawn to the paragraphs (i) 'Electrical Supplies', (ii) 'Electrical Fault Finding and Replacement' and (iii) 'Inspection and Maintenance'. The luminaires are Class 1 and should be effectively earthed.

The luminaires are quite heavy and suitable means of handling on installation must be provided.

Certification details on the rating plate must be verified against the application requirements before installation.

The information in this leaflet is correct at the time of publication. The company reserves the right to make specification changes as required.

3.1.1 Use in Combustible Dust Atmospheres

Where the 723 Battery Box is used in ignitable dust atmospheres reference must be made to the selection and installation standards in order that the equipment is used correctly. In particular this applies to the de-rating of surface temperature for use where dust clouds may be present. Dust layers should not be allowed to accumulate on the fitting surface and good housekeeping is required for safe operation. Dust in layers has the potential to form ignitable clouds and to burn at lower temperatures.

Refer to EN50281-1-2 for additional details of selection, installation and maintenance.

3.1.2 Hybrid Mixtures – Gas plus Dust.

Where Hybrid mixtures exist as defined in EN1127 as a potentially explosive atmosphere, consideration should be given to verifying that the maximum surface temperature of the Battery Box is below the ignition temperature of the hybrid mixture.

3.2 Tools

8, 6 and 5mm A/F socket keys.

3mm and 5mm flat blade screwdriver. 19mm A/F spanners.

Suitable spanners for installing cable glands.

Pliers, knife, wire strippers/cutters.

3.2.1 Operation

When the mains is on, the battery is charged and the dc supply is inhibited by an internal relay. The lamp is initiated by switching the manual switch to on. If the mains has not been interrupted (failed) the light will not go on until they are. (*Various other control systems are possible but these require detailed discussion with Chalmit*).

The light will go on when the manual switch is operated in the on position and the mains is switched off. It will take 4 minutes to reach full brightness. If the lamp does not strike up, the control unit will cut out in 4 seconds. The manual switch will then need to be opened and re-set before a further attempt to strike can occur. The lamp is expected to strike first time if everything is in order.

If the switch is inadvertently switched off when the lamp is warm, or the mains is reinstated, the lamp will switch off. The lamp will then need to cool down for 30/60 seconds before it can be re-energised without the automatic cut-out working.

The battery will run flat after a few days connected without the mains being energised. This is because the individual section monitoring circuits and relays draw current. The units will be supplied initially with the battery disconnected inside the battery box.

3.3 Electrical Supplies

The charging system will accept rated voltages of 220 to 254V, 50 or 60Hz.

A maximum nominal variation from this is +/-6%. The safety limit for T rating is +10%.

3.4 Lamps

European type 70W SON/T lamps are used.

3.5 Mounting

Luminaires and control boxes should be mounted where it is possible to gain access for maintenance and in accordance with any lighting design information provided for the installation. This will usually consist of aiming points and aiming angles.

The top mounting or trunion mounting arrangements should be secured with lock washers or self-locking nuts and bolts.

3.6 Cabling and Cable Glands

3.6.1 Cable Glands

723 Battery Box certified to *EN 50014: 1998*

261E Projector certified to *EN 50014: 1998*

The installer and user take responsibility for the selection of cables, cable glands and seals.

The product is certified for ATEX and to comply with the certification for installation and use within the EU, cable glands and sealing plugs must have ATEX component approval or be certified to EN 50014('E generation').

For installation outside the EU, suitable cable glands in accordance with EN 50014 or IEC 60079-0 will meet the technical requirements.

The cable and gland assembly when installed must maintain a minimum of IP54 rating for Ex e terminals

The cable gland must withstand an impact value of 7Nm where the risk of mechanical damage is high or 4Nm where the risk of mechanical damage is low.

Sealing plugs must be similarly rated and a tool must be used for their removal. Where the cable is not reliably clamped externally to the apparatus, the cable gland must clamp the cable against a pull in Newtons of 20 x the cable OD in mm for non-armoured cable and 80 x the cable OD for armoured cable. Where brass cable glands are used in an corrosive environment cadmium or nickel plating should be used. Two tapped cable entries are provided, one with a plug and seal suitable for permanent use, the other has a travelling plug. M20 x 1.5 entries are standard, other sizes are available on request.

3.6.2 Cable

The temperature ratings of the entries are suitable for ordinary PVC cable (70°C). Users may wish to use fire resistant cables. A 12 core 1.5mm² cable to IEC 331 is available from Chalmit.

The cable length connecting the battery box to the luminaire should be as short as practical to reduce voltage drop, as any voltage drop will slightly reduce the duration of the illumination. The monitoring system does not see the voltage drop, so the power loss in the cable is all that is lost (1.6W for 5 metres of 1.5mm²).

3.6.3 Cable Connection

The accurate connection of the supply and battery monitoring circuits is essential. The connections must be must be carefully checked against the wiring diagrams which are on the equipment and in these instructions, before either the battery is connected or the main energised.

The supply cable can be tested by an electronic 500V 'Megger' (TM) but the dc connections cannot be. If the complete system is tested at the mains input the battery must be connected in. The best approach is to test the supply to the battery/terminal box with all the connections to the multi-core disconnected.

The luminaire is best fitted with its interconnecting cable in the workshop or factory as the space in the terminal chamber is limited and the connections need to be done carefully. The terminal box on the battery unit has plenty of room and can be connected in situ.

The cable connections are made by removing the terminal chamber cover. The retaining screws are captive and should be re-greased as required. The conductors should be bared back so that they make full contact in the terminals but the bare conductor should not be more than 1mm beyond the terminal throat. Unused terminal screws should be tightened. The cores must be connected in accordance with the terminal markings. Before re-fitting the cover, a final check on the correctness of connections should be made.

Cover bolt torque 6Nm. On the battery box the lid(s) are removed and the cable connections made as required. The lids are re-fitted and tightened to a torque of 2Nm (20lbf in) which will compress the gasket against the stops. The battery should be left disconnected until commissioning.

3.7 Fitting Lamps

Make sure the correct lamp is selected as detailed above.

Access for fitting lamps is gained through the lamp glass cover. This should be removed. Take care not to hang the lamp glass on one bolt when removing or replacing. Before removing the lamp glass on any occasion, check that the suspension chain is secure and in good condition. The lamp should be firmly screwed into place. The flameproof path should have a generous coat of silicone (*Dow Corning Molykote III* or similar), or other protective non-setting grease. Replace all bolts and fully tighten. Torque 16Nm.

4.0 Commissioning

Following the wiring up and checking of the equipment, the operation is checked when the mains supply becomes available. If the area is hazardous ensure that the situation is gas free.

Switch off the mains supply and put the manual switch to off. Undo the battery/terminal cover, slide the battery connection terminal block onto the projecting mating pins and tighten up the screws fully. Close up the cover and tighten as above.

As the battery had been disconnected it will be expected to have built up some residual charge.

With the manual switch off, energise the mains for an hour or more. Switch off the mains and put the manual switch to on. Run lamp till it goes out. Switch off the manual switch and re-energise the mains supply for 24 hours. Switch off the mains and switch on manual switch, the lamp will go on. If the mains is available for a long time, discharge the lamp till it goes out and then re-energise the mains supply for 24 hours or more. If the mains is not available, just run the lamp for 10 minutes and turn off and disconnect the battery terminal block in the battery box. If the battery terminal block has been disconnected due to the mains not being available, a note should be taken so that it can be re-connected.

5.0 Re-lamping

The lamp will normally last the life of the installation. If it is necessary to replace the lamp, the area should be gas free, (this is because there are un-assessed electronic components in the unit and these could retain stored energy). Ensure that the manual switch is off and isolate the mains. Release the front cover, before letting the cover hang check that the securing chain is sound. Remove the old lamp and screw the new lamp fully home. Replace the cover and grease with suitable grease, see above. Check operation.

6.0 Fault Finding

If the unit does not operate correctly, fault finding is a process of elimination.

If the unit has been previously working satisfactorily then the connections can be assumed to be correct. If the unit has not run properly a prerequisite is the thorough checking of connections. If any have been made incorrectly, this should be recorded before re-connecting properly. This is to assess whether any damage has been done by the incorrect connections.

All investigation work should be done by a competent electrician in gas free conditions.

- 1 Check the mains is available at the terminal block in the battery/terminal unit, if it is then the starting point of the investigation is the battery itself. Isolate the mains.
- 2 The battery is replaceable as a unit and the assembly contains Ex 'm' fuses made by Chalmit. Disconnect the battery terminals by disconnecting the removable 6 way terminal block from the fixed terminal block. The 5 connections are in order 0V + 6V + 12V + 18V +24V nominal when battery is fully charged. After disconnection, there should be a cumulative voltage difference between each terminal. If the battery is flat it will only be a volt or two, but will be cumulative. If this is not the case check the fuses. Remember that Ni-Cd batteries can give a high short circuit current, so ensure that any testing meter is not on the current connection when measuring voltage. If the voltages at the battery terminals themselves do not correspond with those between the fuses and the battery cable, then a fuse has gone. Replace the fuse(s), re-energise the system then re-check for operation. There is no reason why the battery fuses should blow in service. If the unit does not operate properly and a fuse has gone, this is a clear indication of either an inadvertent short circuit or a fault in the electronics.
- 3 To check the electronics, fit a battery package which is charged up, or substitute for another unit. [If the batteries are to be charged up away from the unit, then a charger suitable for Ni-Cd batteries is required. The normal charging current is 350mA. A 24 hour charge at 700mA is acceptable. Anyone carrying out this work should either be fully familiar with the operation of batteries or briefed by Chalmit. If the lamp operates correctly with a new battery but does not re-charge, the charger module needs to be replaced with a new or proven unit.
- 4 If the lamp does not light with a fully charged battery, check firstly that the lamp control unit is receiving dc volts from the charger module by disconnecting the bullet connection and by using a test meter, the positive lead connected to the bullet connection from the charger unit and the negative connection number 7 (black wire from lamp control unit). When the switch is turned on with mains voltage off you should get a dc voltage reading on test meter. If there is no voltage reading then replace charger unit. If there is a voltage reading, reconnect bullet connection and try again with a replacement lamp. If there is no sign of the lamp striking up, replace the lamp control unit with a new or proven unit.
The control unit for the lamp can be checked in the workshop using a suitable 24V dc supply. This will have to either be a suitably rated battery or a 10A bench supply, a lower power bench supply may not have enough inrush capacity to operate the unit.

Note : *Care will be needed as the striking voltage at the lamp is 2.5kV.*

7.0 Inspection and Maintenance

Individual organisations will have their own procedures for inspection and maintenance. What follows are guidelines based on BS EN 60079-17 and on our experience. Maintenance work and fault finding must be performed by competent personnel under an appropriate permit to work and with the apparatus isolated. Frequency of maintenance will depend on experience and the operating conditions.

Luminaire should not be opened when an explosive atmosphere is present.

- 1 Check that the emergency light goes on when the manual switch is operated and the mains are isolated.
- 2 Check that the lamp goes out when the manual switch is on and the mains is re-energised. Refer to the procedure above.
- 3 Check the luminaire terminal chamber bolts for tightness. Torque 6Nm.
- 4 Check the cable glands for tightness and nip if necessary.
- 5 Check any external earthing.
- 6 Examine the lamp glass for any signs of damage. The luminaire lamp glass is sealed with silicone RTV. There is a moulded silicone seal between the lamp glass and the outer cover. This material is extremely durable in normal operating conditions. If there has been significant contamination by hydrocarbons look out for softening and yellowing of the silicone seal. If this is significant compared to a new unit, the lamp glass should be replaced and returned to Chalmit for refurbishment. Check luminaire cover bolts for tightness. Torque 16Nm.

- 7 Check for signs of corrosion between the lamp glass cover and main housing. Evaluation of this will be a matter of judgement and experience, as there may be little evidence on the outside. If there are serious signs of corrosion remove the cover, wipe the flameproof path with a clean cloth and non metallic scrapper. Examine the surface for pitting, any pitted component must be replaced. A damaged or non resilient cover gasket must be replaced. The cord diameter is 3mm.
The cover should be re-greased with silicone (*Dow Corning Molykote III* or a non-setting grease) and all bolts fully tightened. Any replacement bolts must be identical with the original.
All are 18/8 stainless steel with a minimum of ISO262 Grade A 2-70.
With this type of flameproof enclosure all the bolts must be in place and tightened. The maximum gap for IIB in this case is 0.15mm. It would be usual for any of our luminaires to have a gap exceeding 0.1mm when tried with a feeler gauge. If 0.1mm is exceeded check that no foreign bodies or debris at the bottom of blank tapped holes are keeping the surfaces apart and if not, a workshop overhaul should be carried out to bring the unit into new condition. Because of the operation of this type of equipment, the lamp will not require changing. Even if there are no signs of external corrosion the front cover should be removed at a minimum of every 3 years and the internal connections checked for tightness and any signs of overheating.
- 8 The terminal chamber should be opened periodically and checked for moisture ingress. The cable connections should be checked for tightness. The gasket should be checked for lack of elasticity and if necessary replaced (it may well be practical to replace the gasket on each occasion if this is 2-3 year interval). Torque 6Nm.
- 9 If painting operations have taken place near the luminaire ensure that coatings have not entered into the flameproof path or been deposited on the lamp-glass. If they have been, dismantle and clean carefully.
- 10 Check the mountings are secure.
- 11 Cover the bolt heads with silicone grease to prevent corrosion and the accumulation of dirt and screw threads.
- 12 Clean the lamp glass.
- 13 If there is suspicion that the luminaire has suffered mechanical damage, a stringent workshop check should be made.
- 14 On the battery/terminal box check the tightness of cable glands and the tightness of the cover fixings. Every two years open up the box having isolated the mains. Check the mains connections for tightness and overheating. Check the battery connection for tightness and overheating. Remember that the battery connections are live and must not be shorted together. Examine the battery for any signs of leakage or corrosion and if this has taken place and battery sections must be replaced.
If any moisture is in the box and the cause of this is not obvious, such as a slack cover, then the cover gasket should be replaced. The cover gasket is fixed on to the box rather than the lid, so it is probably better to do this in the workshop.
Gasket strips are obtained from Chalmit. These are cut and fixed in place by silicone RTV. After the initial assembly, check that the joints in corners are sealed with silicone. When the silicone is cured refit the cover. Where spares are needed, these must be replaced by our specified parts. No modification should be made unless approved by the manufacturer.

8.0 Current Ratings

The power drawn by each battery box when charging is 20W at unity power factor.

9.0 Disposal of Material

The units are chiefly made of incombustible material. The control gear contains electronic components and synthetic resin. All these may give off noxious fumes if incinerated. Care must be taken to render these fumes harmless and avoid inhalation. Any local regulations concerning disposal must be complied with.

9.1 Lamps

Discharge lamps in modest quantities are not "special waste". The outer envelope should be broken in the container to avoid injury.

This applies to the UK, there may be other regulations on disposal operating in other countries.

Important : *Do not incinerate lamps.*

9.2 Battery Disposal

Nickel cadmium batteries are defined as 'controlled waste' under the hazardous waste regulations and the disposer needs to observe a 'duty of care'.

Batteries can be returned to the manufacturers for recycling. They must be stored and transported safely and any necessary pollution control forms completed prior to transportation. Take care to fully discharge batteries before transporting or otherwise ensure that there can be no release of stored energy in transit. For further details refer to our Technical Department.

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