# INSTALLATION INSTRUCTIONS

## FOR AD SERIES MINI-INTEGRATED MODULES with AUTOTEST

| Module: | Reference | Cells | Rating | Duration | Lamps |
|---|---|---|---|---|---|
| | AD222 | 3 | 4 Ah | 3 hours | 16 & 21W 2D |
| | AD223 | 3 | 4 Ah | 3 hours | 28W 2D |
| | AD224 | 4 | 4 Ah | 3 hours | 16 & 21W 2D |
| | AD225 | 4 | 4 Ah | 3 hours | 28W 2D |
| | AD227 | 4 | 4 Ah | 3 hours | 38W 2D (70%) |
| | AD228 | 4 | 4 Ah | 3 hours | 28W 2D (70%) |

Variation: Add suffix /M1 for 1 hour duration, use with 1.5 Ah NiCd Sub C cells.

Batteries: 3 or 4 cells as required: 4 Ah NiCd for 3 hour duration, 1.5 Ah NiCd Sub C for 1 hour duration

### GENERAL DESCRIPTION

The module comprises high frequency ballast, battery charger, solid state circuit operating changeover relay, deep discharge protection circuit and LED charge indicator for use with 4Ah rechargeable NiCd cells. A pre-programmed microprocessor system routinely tests all functions of the emergency circuits reporting status through the LED. The method of connection is by terminal block and a quick release mechanism is fitted so that leads may easily be removed. Wires of cross sectional area 0.5 – 2.5mm² may be connected by pushing a solid conductor into the connection or operating the release mechanism to insert a stranded conductor. Earthing is achieved via the fixing screws.

### REMOTE MOUNTING OF MODULES

In general these units are not suitable for remote mounting due to their inherent low power consumption. **MINERAL INSULATED CABLES MUST NOT BE USED IN ANY CIRCUMSTANCE.** Multicore cables also have an inherently high capacitance between wires but may be used with caution providing the insulation is thick and opposite sides of the cable are used for opposite ends of the lamp to minimise losses.

### TEMPERATURE

The ambient temperature range for the module is 0 – 55°C but in any event the centre side of can should not exceed 70°C.

### BATTERIES

Mackwell supply a wide range of high quality battery packs for use with our products. They have all been designed to provide the 4 year life required by BS EN 60598-2-22 and ICEL 1001, when operated within the temperature range specified. The maximum operating temperature of Mackwell battery packs is detailed in our web site. This should not be exceeded, or the operational life of the cells will be reduced.

### DEEP DISCHARGE PROTECTION

The module is fitted with a deep discharge circuit, which disconnects the battery after the cell voltage has dropped below the end of discharge level (1 volt per cell) and the circuit will remain inert until the supply is restored. This protects the battery against excessive discharge when the mains supply is removed for long periods.

### FUSES

Battery A battery fuse is incorporated in the module to protect the battery from heavy discharge

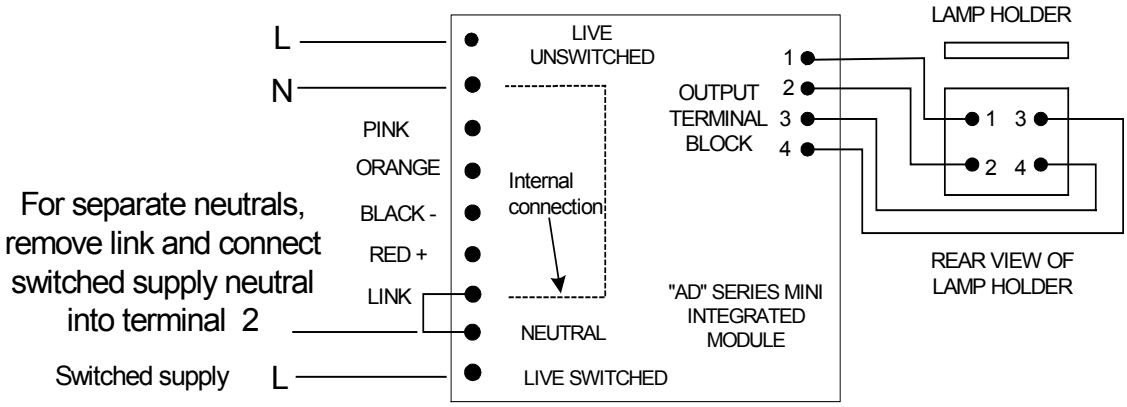
Charger Although the charger is already short circuit protected it may be desirable for isolation to include a fuse in the circuit. A suitable value is 750mA or 1A.

Ballast Overload and short circuit protection is incorporated so that the ballast will safely shut down to stand by mode when an abnormal load is detected in the lamp circuit.

### ELECTRICAL INSTALLATION

Modules comply with the EMC directive in both modes of operation, mains and emergency. Compliance will be protected by keeping lamp leads away from mains leads to avoid transfer of RFI to the live and neutral connections. The fused terminal block should be situated so that the incoming mains connections are short. To prevent premature lamp damage, after test the assembled luminaire should be energised for a minimum of 24 hours to fully charge the batteries. The unswitched supply should be left undisturbed during the commissioning and installation period, as otherwise lamp damage may occur.

**WIRING** To minimise mercury migration, ensure lamp holder is connected thus:




**OPERATION**

When the un-switched live and neutral are connected, the indicator will light to show that the battery is receiving charge and after a period of 24 hours the unit will be capable of achieving a 3 hour emergency duration. It should be noted that inserting the plug alone (connecting the battery) will not light the lamp – this will only operate when the mains has been applied and failed. Connecting the switched live will cause the ballast to operate the lamp in mains mode and this can be switched in the usual way.

The module routinely tests all functions of the emergency system and reports on status through the LED.

| | | |
|---|---|---|
| **A continuous green LED indicates** | - | mains present and connected |
| | - | battery present and in circuit |
| | - | charge current satisfactory |
| **A flashing green LED indicates** | - | lamp fault |
| **LED off indicates** | - | battery fault or lack of mains |

**All fault indications persist until fault rectified and system reset.**

The autotest system goes into self test mode within a period of 37 days from commissioning. The test schedule is programmed into the microprocessor during manufacture to ensure that no more than 15% of luminaires are on test in any one day. Tests are repeated on a 30 day time frame. **Three test durations are provided - 5 minutes/monthly - 1 hour/6 monthly - 3 hours/12 monthly.**

| | | |
|---|---|---|
| **User reset facility** | - | To reset the LED after the fault condition has been rectified, the user simply switches the unswitched supply OFF/ON/OFF/ON within 10 seconds either external to or within the luminaire |
| **Test report status** | - | After each monthly test the memory status is incremented by one. The current status is displayed by the LED each time the mains is turned on. After a delay of 30 seconds the LED extinguishes (in groups of three to facilitate counting) to indicate the number of the next test to be carried out on an annual basis. The count is reset back to one after each annual test. In this way, users can be assured that essential monthly and annual tests have been carried out and compile any supporting records they may require. |
| **Audible alarm** | - | An audible alarm will sound if a fault is found during a test. The alarm will sound 3 times every 35 minutes until the fault condition is rectified and the unit reset. |

**WARRANTY**

All our electronic products are guaranteed for three years to cover both faulty workmanship and materials. This “Return to Base” warranty requires that the product is used within the terms and conditions stated above and in our literature, and in particular, modules must be used with the correct or approved battery pack. Items should be carefully checked thermally so that the specified temperatures are not exceeded under any conditions. Do not insulation test this product. Products returned to us under warranty must be carriage paid. Mackwell Electronics accept no liability for costs incurred. This does not affect your statutory rights.

Battery packs are guaranteed for one year, but when operating within the temperature specified in our web site have a design life in excess of four years as required by BS EN 60598-2-22.