The emergency lighting system and all of its components shall be manufactured and certified to meet the requirements of BS EN 50171 and the system should be CE marked.

Central inverter system
The system should offer the following standard features as summarised below and further detailed in sections 3.0, 4.0, 5.0, 6.0 & 7.0:

- True AC/AC 50/60Hz output
- Ability to use standard proprietary AC distribution and protection devices on outgoing circuits
- Rated for any load power factor, zero to unity, at any output power up to the maximum rated kVA
- Compatibility with addressable test package using EMEX technology
- Excellent overload capability in full emergency mode: 200% for 10 seconds without reduction in output voltage
- Excellent recharge capability – 80% after 12 hours following rated discharge
- MCB protection throughout – no fuses

- EMEX Power true modular construction with common spares (inverter, charger, control PCB, and system interface common across the full system range)
- Individual MCB protection for each module – AC and DC circuits
- Individual cooling fans for all modules with on-demand operation (not continuously running)
- Split parallel charger above 10 amps – enhanced integrity with the ability to operate with one or more charger modules isolated (subject to increased recharge time)
- Integral maintenance bypass facility (ability to support output load in bypass mode whilst maintenance is performed)
- Temperature compensated charger
- Comprehensive display
- Charger and inverter alarm pack
- Momentary “push to test” button
- Fire alarm interface
- Final exit interlock
- Internal and external MCB monitoring
- Local/remote maintained circuit control
- Sub-circuit monitor connection
- Two sets of volt–free alarm relay contacts
- Inverter-inhibit engineers’ switch
- Remote Alarm Unit option
- Easy front panel access
- Inter-cabinet trunking for battery cables
- Fork-lift plinth
- Lifting eyes for crane lift as standard
- Cabinet levelling feet available
- Installation pack with tools included
- Detailed instruction manual
- Transfer time both directions max. 0.5 seconds
- Battery earth leakage monitor option
The system should use EMEX Technology to provide full addressable monitoring of the complete emergency lighting system including the EMEX Power Central Power Supply System(s).

Software
System should use EMEX test software to schedule the automatic regular testing of emergency lighting system components. The system should automatically generate and collate test reports. These reports should be automatically date-stamped and should be available in a notepad format such that engineer’s notes can be added.

CPS capacity
The system can support multiple Central Power Supply Systems (CPS). Each CPS must be able to communicate with up to 4,000 luminaires.

Communication
The system must use data cable to link the control computer to the CPS unit(s), and from each CPS to the associated luminaire interfaces only. Data cables will NOT be fitted direct to any luminaires. Up to 100 substations may be fed from the internal transmitter within the CPS.

MXD4 substation
The system must offer remote MXD4 substations each having 4 separate outputs, each capable of monitoring up to 4 no. fluorescent, filament, LED, or halogen luminaires completely without modification to the luminaire. The systems should be capable of monitoring a lamp wattage of up to 230 watts. The substation should provide minimum 8 no. monitoring inputs, free programmable switched or unswitched with mixed mode of operation (maintained, non-maintained, switched maintained).

MXC substation
The system must offer remote MXC substations each having 2 outputs, which are capable of monitoring up to 40 no. luminaires / 10 amps in total. The substation should provide minimum 8 no. monitoring inputs, free programmable switched or unswitched. Luminaires must share the same supply cable with mixed mode of operation (maintained, non-maintained, switched maintained).

LTC luminaire module
Luminaires for use with MXC each require a local LTC module. Each LTC must provide 1 no. switched and 1 no. unswitched local monitoring input to act directly on the luminaire in addition to any communication received from the substation. A full range of exit signs, bulkhead luminaires, decorative luminaires, and twinspot units must be available ready fitted with LTC modules. LTC modules must also be available loose and in remote enclosures for the adaptation of standard slave 230V luminaires to the MXC system.

Each LTC must be capable of switching up to 230 watts. The LTC module must retain the existing mains ballast in the luminaire.

Flexibility
The system must permit both MXD4 and MXC solutions on the same system, controlled from a single PC.

Cable specification
Cable must be 2 core with additional earth or drain wire and must be a composite screened cable. The conductor cross section must be a minimum of 1.5 mm sq cable and must be rated for 230V AC. General data cables do not meet this requirement.

These requirements can be met by using FP200 or similar fireproof cable or LSFOH type cable.
## Technical reference
### Manufacturing & certification

#### Static inverter specification

<table>
<thead>
<tr>
<th>LED Indications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains healthy</td>
<td>Green</td>
</tr>
<tr>
<td>Maintained circuit on</td>
<td>Green</td>
</tr>
<tr>
<td>Battery high volts</td>
<td>Amber</td>
</tr>
<tr>
<td>Battery low volts</td>
<td>Amber</td>
</tr>
<tr>
<td>Supply from battery</td>
<td>Red</td>
</tr>
<tr>
<td>Charge fail</td>
<td>Red</td>
</tr>
<tr>
<td>System fault</td>
<td>Red</td>
</tr>
<tr>
<td>Common alarm</td>
<td>Red</td>
</tr>
<tr>
<td>Battery discharged</td>
<td>Red</td>
</tr>
<tr>
<td>System inhibited</td>
<td>Red</td>
</tr>
</tbody>
</table>

#### Inverter modules

- **Nominal output:** 220V – 240V 50/60Hz AC
- **Rating:** 1.5kVA or 3kVA rating with Master or configuration Slave
- **Overload:**
  - 120% continuous with full output
  - 125% for 20 minutes with full output
  - 150% for 1 minute with full output
  - 200% for 10 seconds with full output
- **Short circuit:** 350% for 5 seconds
- **Cooling:** Integral fan (on-demand operation)
- **Protection:** AC 2 pole type D  
  DC 2 pole type B
- **Module dimensions:** 360mm x 170mm x 575mm
- **Handling:** Recessed handles front and rear
- **Weight:** 50kg

#### Charger modules

- **Rating:** 10 amp minimum
- **Cooling:** Integral fan (on-demand operation)
- **Protection:** AC 2 pole type D  
  DC 2 pole type B
- **Module dimensions:** 360mm x 170mm x 575mm
- **Handling:** Recessed handles front and rear
- **Weight:** 50kg

#### Metering

- **DC metering:** Combined digital battery voltage and charge/discharge current
- **AC metering:** Combined digital AC output Voltage and current

#### Controls

- **Final exit interlock:** Requires volt-free contact
- **Sub-circuit monitor:** 24V control loop
- **Maintained circuit control:** 24V control loop
- **Fire alarm control:** 12/24V DC from fire panel
- **Remote MCB monitoring:** 24V control loop
- **Changeover device:** Four pole contactor to BS 5424 and EN 60947

#### Mechanical

- **Input / output terminals:** 10mm/50mm dependant on rating
- **Control terminals:** 2.5mm

#### Transient overvoltage protection

To protect against damage caused by transient overvoltages, factory fitted Furse ESP transient overvoltage protectors available as an option.
Battery
Battery should be comprised of one or more strings of no more than 120V nominal voltage.

The batteries shall be maintenance free sealed lead acid, gas recombination type with a minimum design life of 10 years. They shall have extremely low gas generation, low self-discharge and have sealed pressure release vents. Other battery technologies to be available upon special request.

The batteries shall be sized to power the complete system for the rated duration following mains failure at 100% light output of all emergency lamps.

Environmental conditions
Ambient temperature of the installation (switch room) should be in the range 15 – 25°C. Air conditioning is required where normal ambient will exceed 25°C. This is to achieve optimum battery life expectations.

NOTE: Batteries must not be subject to prolonged extreme temperatures prior to installation and must be stored in a suitable environment.

### Indoor equipment categorized

<table>
<thead>
<tr>
<th></th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature (Nominal)</td>
<td>5°C – 35°C</td>
<td></td>
</tr>
<tr>
<td>Extreme temperature</td>
<td>0 – 40°C</td>
<td></td>
</tr>
<tr>
<td>Humidity (non-condensing)</td>
<td>40 – 85%</td>
<td></td>
</tr>
<tr>
<td>Noise level at 1 metre</td>
<td>55 dBA</td>
<td></td>
</tr>
<tr>
<td>Altitude without extra ventilation</td>
<td>2,500 metres</td>
<td></td>
</tr>
</tbody>
</table>

### Inverter and battery cabinets

<table>
<thead>
<tr>
<th></th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal output</td>
<td>220V – 240V 50/60Hz AC</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Modular without welds; battery cubicles can be flat-packed for ease of access to site</td>
<td></td>
</tr>
<tr>
<td>Ingress protection</td>
<td>Options up to IP41</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>RAL 5015 gloss (Medium Blue) Other RAL colour finishes available to special order</td>
<td></td>
</tr>
<tr>
<td>Lifting &amp; handling</td>
<td>M12 lifting eyes and 110mm plinth</td>
<td></td>
</tr>
<tr>
<td>Levelling</td>
<td>Levelling feet available</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>Single door with 8mm square block key. Front access only required - opening angle 180° Key lockable doors on request. Removable top gland plate.</td>
<td></td>
</tr>
<tr>
<td>Ventilation</td>
<td>Ventilation in rear and front only – cubicles can be mounted adjacent to each other (no side ventilation)</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>1,800mm x 750mm x 725mm (Dimensions are inclusive of 75mm ventilation back-stop)</td>
<td></td>
</tr>
</tbody>
</table>