

The running costs of central systems are usually lower than those of a system using self-contained luminaires, as only the central unit needs to be monitored whereas self-contained units need regular servicing and replacement of the battery packs.

## 8.4 Emergency lighting equipment

### 8.4.1 Power sources

#### Self contained luminaires

Self-contained luminaires have a secondary sealed battery, a charger (control unit), circuitry (which monitors the mains supply) and a lamp. In the mains-healthy condition, the battery is charged. In the event of a failure of the mains supply, the battery is connected to the lamp either directly or via an inverter module. The battery is usually a sealed rechargeable nickel-cadmium, lead acid or nickel-metal hydride type. These batteries are small, with limited storage capacity and life, and are very temperature sensitive. They should conform to IEC 60285, IEC 60896-2 or IEC 61056-1 and should provide four years service life. Care will be necessary in their disposal (see Section 21.9).

#### Central battery systems

Central battery systems consist of a remotely located power source connected by protected wiring to slave luminaires. The batteries consist of either vented or sealed lead-acid or nickel cadmium alkaline cells. They have high storage capacity, long life and a wide operating voltage range. These batteries should conform with BS EN 50171. In addition to the battery, the system includes subcircuit monitoring of the supply to normal lighting, and an automatic change-over device to connect the slave luminaires to the power supply when the mains supply fails. There are three main types of systems.

AC/DC battery powered systems supply direct current from the battery to the emergency slave luminaires, normally at 24, 50 or 110 V. If a maintained system is required, this is normally achieved by using floating batteries or by using a transformer to provide the appropriate output voltage in the supply healthy condition. Special or modified luminaires have to be used to be compatible with the range of output voltages and the effects of supply-cable voltage drop. These luminaires normally provide higher light outputs than are available from self-contained luminaires.

AC/AC battery powered systems modify the output from the battery by using an inverter to create 230/240 V AC. These systems can operate any suitable normal luminaires, which do not need to be modified, and so they can provide full light output in the emergency condition. The power unit has to be matched to the emergency load and be capable of supplying both the total wattage and VA rating of the load and also providing the full starting surge of the luminaires. Static inverters designed for the application should be compatible with the luminaire characteristics but caution should be exercised if a system using a general purpose uninterruptible power supply unit (see below) is being designed. BS EN 50171 sets out some important points that need to be checked.

Uninterruptible power supplies (UPS) are a form of AC inverter which continue to provide their output without a break during a supply failure enabling them to be used with discharge lamps that otherwise would have unacceptably long re-strike times. Because these inverters are normally used for computer back-up care must be taken to ensure they are correctly engineered for emergency lighting use. The UPS must comply with the requirements of BS EN 50091 as well as BS EN 50171.