DURATION OF STANDBY SUPPLIES

Is the specified standby power supply period suitable for the system type and the level of supervision?

BS 5839-1:2002; clause 25.4

For category **M** or **L** systems the battery standby capacity should be sufficient to maintain the system in an operational condition for **at least 24 hours** after which there should still be sufficient capacity to provide an "Evacuate" signal in all alarm zones for a minimum of **30 minutes.**

If a category **M** or **L** system is installed in a building with an automatically started standby generator and it supplies the fire alarm system then the battery standby capacity should be sufficient to maintain the system in an operational condition for **at least 6 hours** after which there should still be sufficient capacity to provide an "Evacuate" signal in all alarm zones for a minimum of **30 minutes.**

For a category **P** system the battery standby capacity should be sufficient to maintain the system in an operational condition for **at least 24 hours** after which there should still be sufficient capacity to provide an "Evacuate" signal in all alarm zones for a minimum of **30 minutes** ***provided that either of the following conditions are met:***

a) the building is continuously staffed, or inspected outside of normal working hours and that staff would be aware of a power supply fault indication on the system within **6 hours** of its occurrence; **or**

b) power supply fault signals are transmitted automatically to an alarm receiving centre (ARC) and a keyholder is notified by the ARC on receipt of a fault indication from the protected premises.

If neither of the above requirements are met then the battery standby capacity should be sufficient to maintain the system in an operational condition for **at least 24 hours longer than the maximum period the premises is likely to be unoccupied, or for 72 hours in total, whichever is less,** after which there should still be sufficient capacity to provide an "Evacuate" signal in all alarm zones for a minimum of **30 minutes.**

CALCULATION OF STANDBY BATTERY CAPACITY

BS 5839-1:2002; annex D

Cmin = 1.25(T1I1 + DI2T2)

Cmin = minimum capacity of battery when new at a 20 hour discharge rate at 20 ºC in ampere-hours (aH)

1.25 = ageing factor allowing 5% per year over 4 years
T1 = battery standby period in hours
T2 = alarm time in hours (usually 0.5)
I1 = battery standby load in amperes
I2 = battery alarm load in amperes
D = battery de-rating factor (usually assumed at 1.75). This allows for the inefficiency of the battery under high load conditions

Example

Assume standby load of 250mA, alarm load of 750mA and a standby period of 24 hours with 30 minutes in alarm condition:

Cmin = 1.25((24 x 0.25) + 1.75(0.75 x 0.5))

= 1.25((6 + 0.66))

= 8.32 aH

Simplified Calculation

The calculation can be simplified by assuming a de-rating factor of 2 but this makes very little difference to the final figure:

Cmin = 1.25(T1I1 + I2)

NOTE: This formula is only valid if a de-rating factor of 2 is assumed and the alarm period is 0.5 hours (30 minutes). If this is not the case then the formula at the top of the page should be used.

Example using simplified formula

Assume standby load of 250mA, alarm load of 750mA and a standby period of 24 hours with 30 minutes in alarm condition:

Cmin = 1.25((24 x 0.25) + 0.75)

= 1.25((6 + 0.75))

= 8.43 aH