



BS EN 62034:2006

Automatic test systems for battery powered
emergency lighting

Alan Daniels

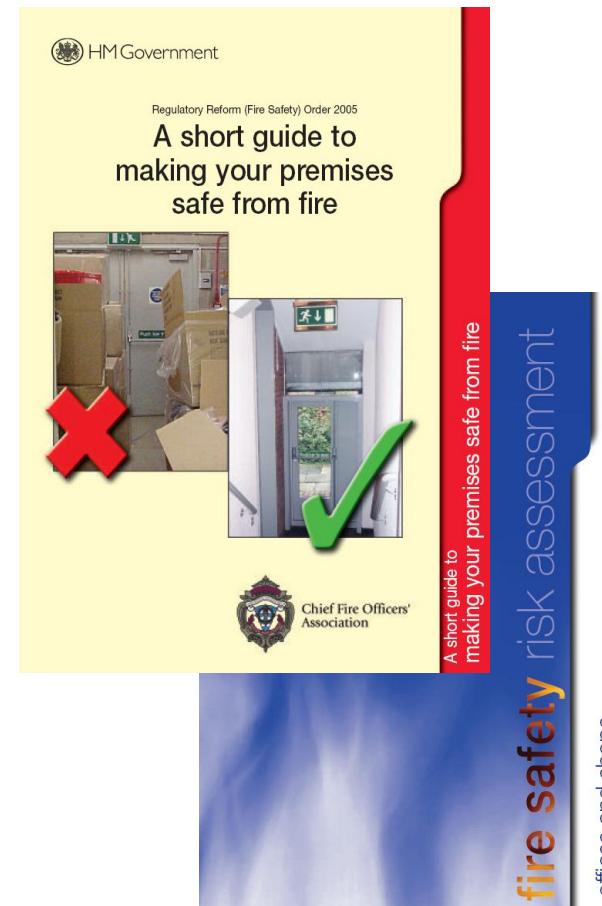
Legislative requirements for testing & maintenance of emergency lighting



Regulatory Reform (Fire Safety) Order - SI No.1541

FSO requires ... that a responsible person ensures any safety related equipment and devices are subjected to a suitable system of maintenance and are maintained in efficient working order and good repair ...

- The emergency lighting system should undergo periodic inspection, maintenance and repair and results recorded.



Testing of emergency lighting

Regardless of testing system type, requirements of BS 5266-1, BS 5266-8 (EN50172) and BS EN 62034 must be met :

- System must be appropriate for the application including testing & records
- Conducted at a safe time, without putting occupants of premises at risk and without disturbing other electrical services
- Re-charging must be checked after the test

Tests must consist of :

- Functional test – at least monthly to check luminaires operate
- A duration test – at least annually for full duration



7. Testing, maintenance and record keeping

Regular servicing and testing to be carried out in accordance with BS5266-8.

– It can be difficult to ensure that the manual testing will be performed consistently, efficiently and correct records maintainedconsider installing an automatic EL testing system to BS EN 62034.

BS 5266-10:2008

BRITISH STANDARD

Guide to the design and provision of emergency lighting to reduce the risks from hazards in the event of failure of the normal lighting supply

ICS 13.200

BSi
British Standards

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

Safety Precautions during Test periods

Testing to be conducted at a safe time and without putting occupants at risk during test periods – reinforced within the new guide BS 5266-10:2008 :

- Possibility exists of failure of the normal lighting supply during or shortly after a full duration test. Therefore tests should either :
 - Take place at times of low risk to allow the batteries to recharge. *or*
 - Suitable arrangements shall be made such as testing alternate self contained luminaires, provided the un-discharged luminaires will provide adequate illumination into each compartment
- Central battery systems need to be tested under full load, specific procedures for the safety of occupants during testing are given in BS EN 50171:2001

Automatic Testing System - type Stand-alone self-contained c/w test facilities



Classification defined in Annex B as : **Type S**

Initiation

Automatic Timed

Can be set to test
alternate luminaires

Indication

Local only

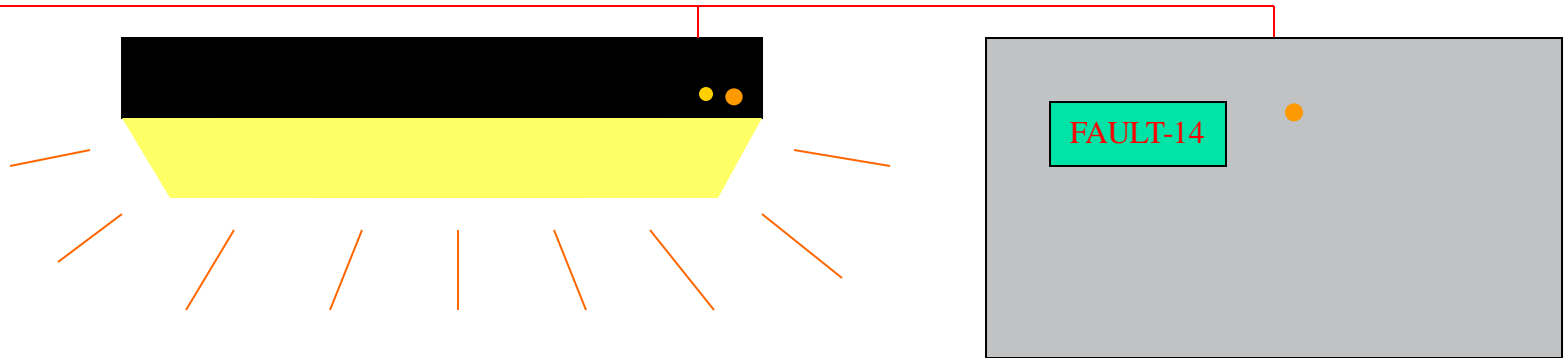
Requires
manual
inspection

Recording

Local only

Requires
manual
recording

Automatic Testing System - type Self-contained & Remote control panel



Initiation

Automatic Timed or manually set

Can be set to test alternate luminaires

Indication

Remote and local

Collated fault indication :
Type PRN

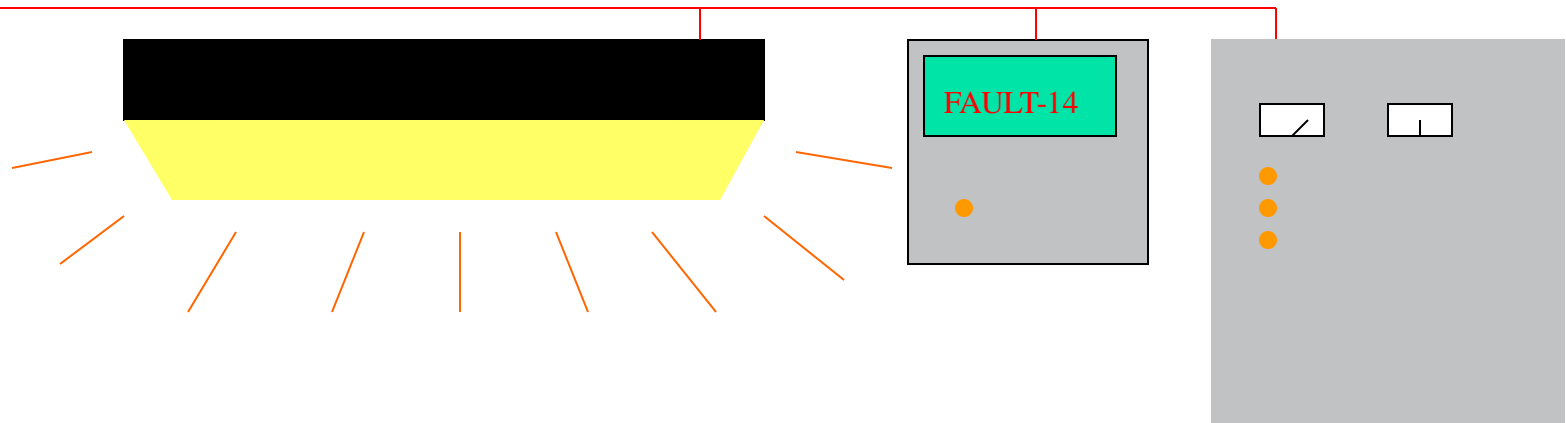
Recording

From remote Panel

Manual : **Type P**

Automatic : **Type ER**

Automatic Testing System - type Central Battery & Remote control panel



Initiation

Special procedures to avoid no cover for emergency lighting in case of mains failure after test condition

Indication

Remote and local

Collated fault indication :
Type PRN

Recording

From remote Panel

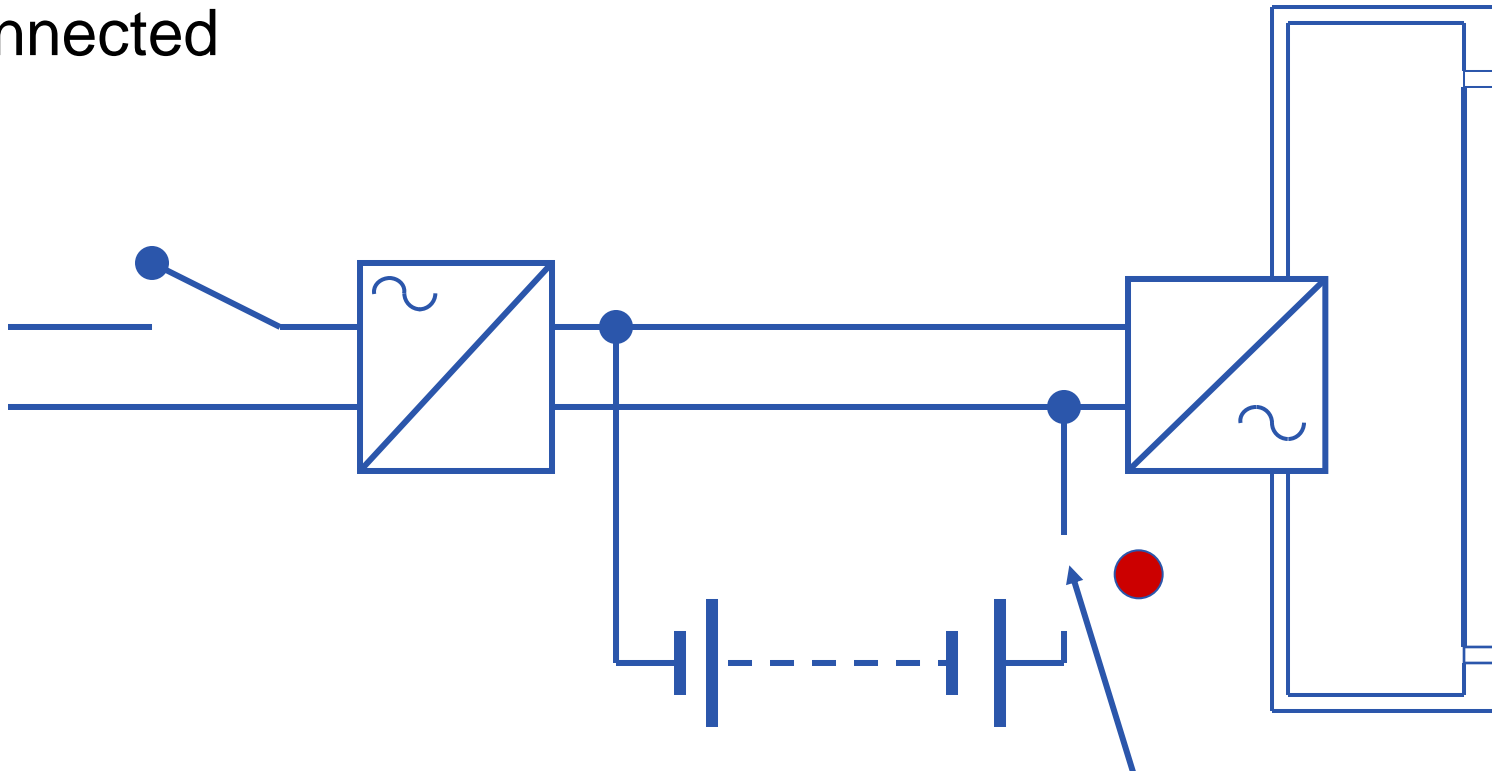
Manual : **Type P**

Automatic : **Type ER**

BS EN 62034 Functional Test – Emergency supply healthy



The test must check that the battery is available and connected

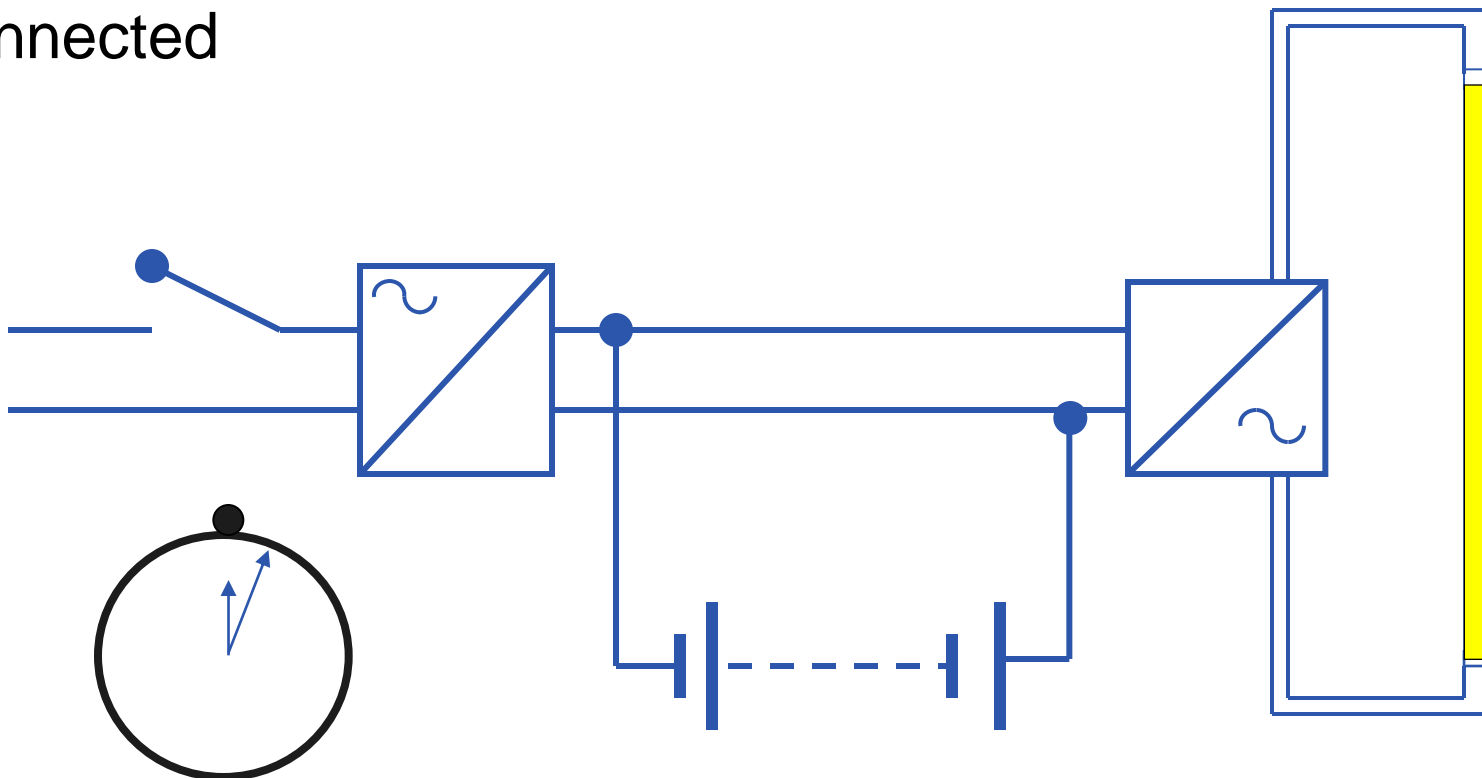


COMPLIANCE TEST Disconnection of the battery must give fault indication

BS EN 62034 Functional Test – Checks that circuit operates



The test must check that the battery is available and connected

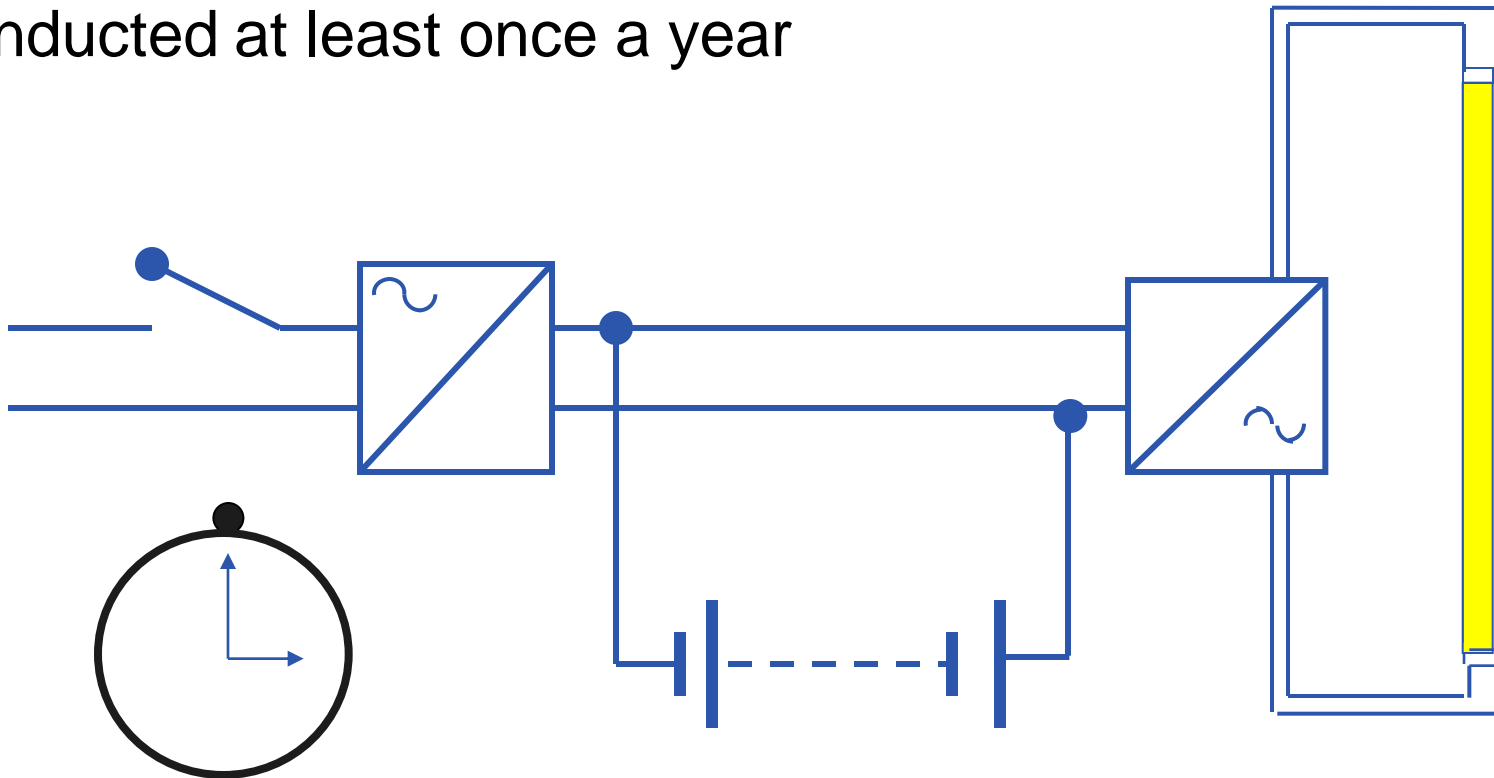


COMPLIANCE TEST - Function test must operate the lamp from the battery

BS EN 62034 Duration Test – Checks operation for rated duration



5.2 The duration test of circuit operation must be automatically conducted at least once a year



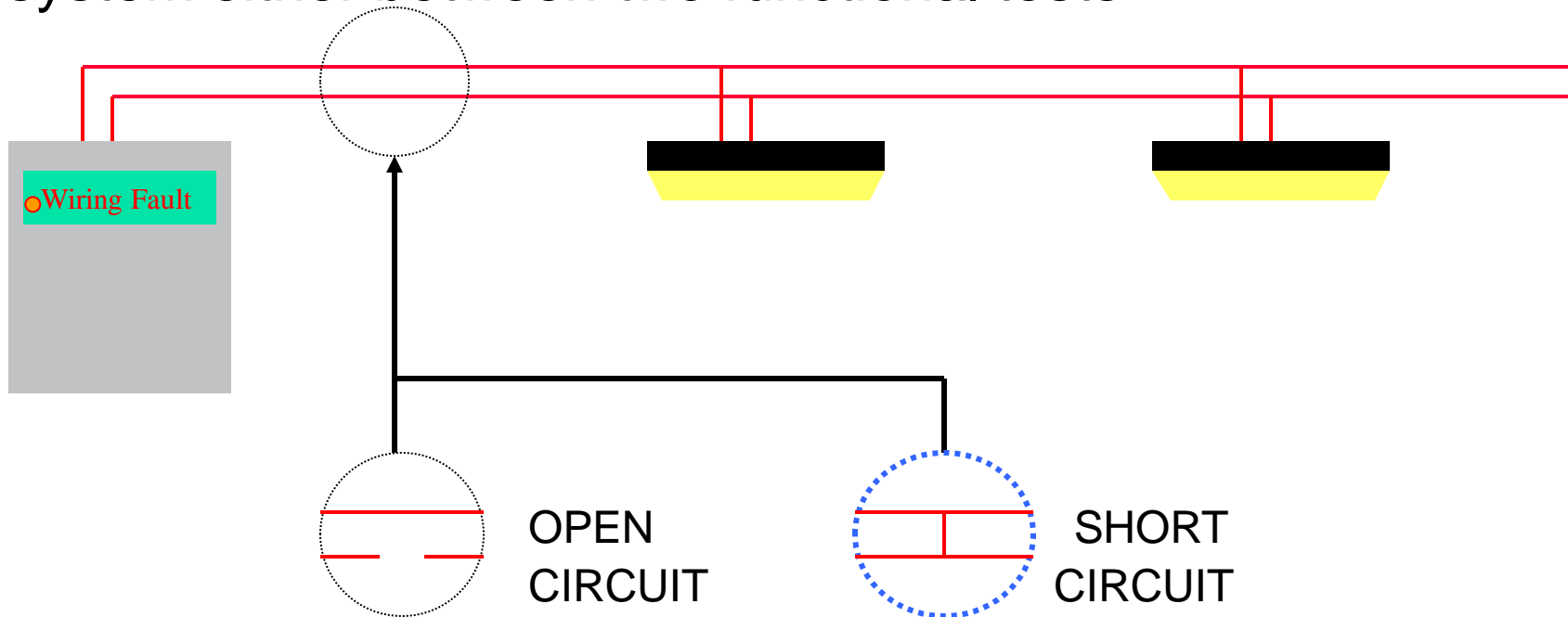
COMPLIANCE TEST - Circuit must operate the lamp for the rated duration

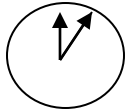
BS EN 62034 System Requirements – Protection of operation if wiring fails



Wiring faults shall not inhibit emergency luminaire operation or initiate an unwanted test.

Indication of a communication fault must be given by the system either between two functional tests.





6.2 Systems that rely on timing to perform the tests correctly and at the right times, the timing device has to be checked for operation, accuracy and also must be immune from over extended power supply failures.


COMPLIANCE TEST

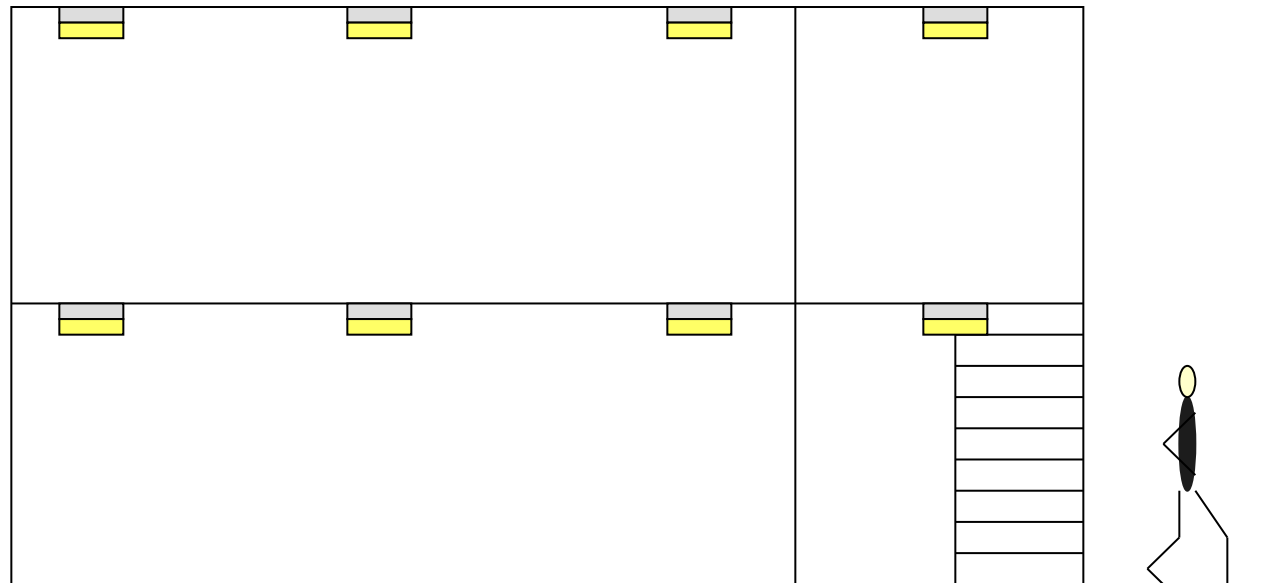
- Any failure of the timing circuit shall be indicated by the system – **manufacturer declaration & evidence**
- The timer shall have an accuracy of better than 75 seconds per week – **timing of test interval & test function**
- The timing function shall be maintained through periods of supply failure of up to 7 days – **tested by simulation**

Protection of occupants – Premises unoccupied during annual duration test.



The duration test cycle timing must perform the test when set to minimise the risks to occupants.


Emergency
luminaires
under test





Compliance test : Accurate timing for the initiation of the test and protection from extended supply failures of up to 7 days

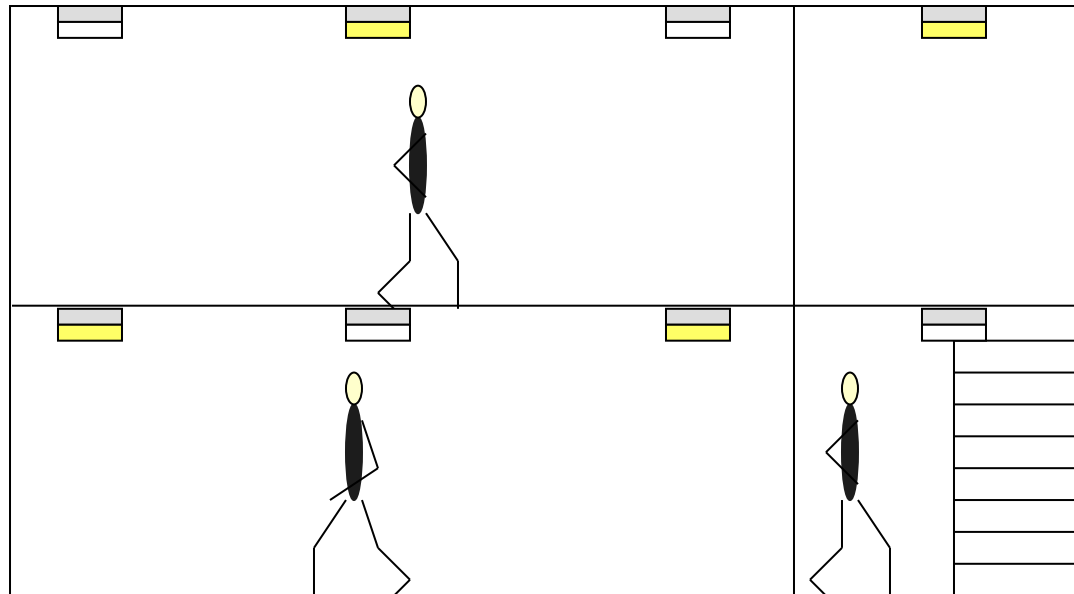
Protection of occupants – Premises that may be occupied at time of the duration test



If it is uncertain the building will be empty for the full discharge test. Self contained emergency lights can be tested alternately


Emergency
luminaires
under test


Charged
ready for use





Compliance test : Manufacturer to provide sufficient information relating to the timing intervals to ensures the timing is sufficiently long to prevent testing in same period

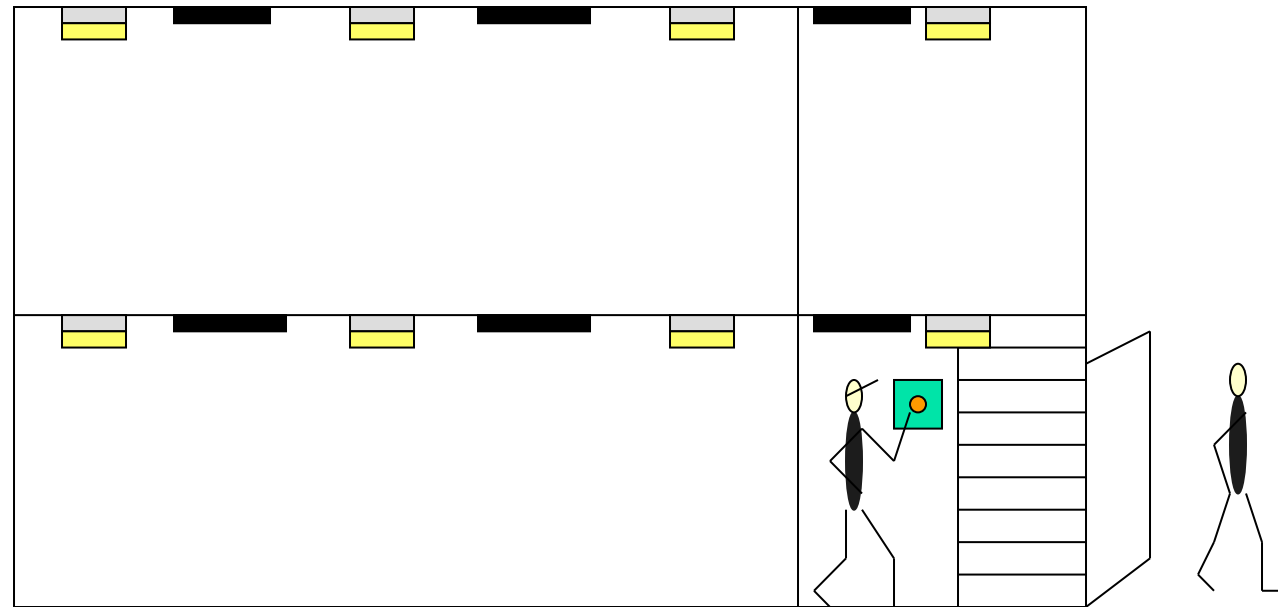
Protection of occupants – State of occupation unknown in advance



If it can not be predicted when the building will be empty for a full discharge test - Manual initiation can be used


Emergency
luminaires
under test


Mains
luminaire



Compliance test : Initiation can be manual providing a fault indicator or records of previous tests which indicates duration test not performed + **automatically return to normal**

Automatic Testing - Central Battery Systems

- Protection of occupants - Premises occupied at time of duration test.



To ensure centrally powered systems perform the tests at periods of minimum risk, acceptable procedures are the use of :

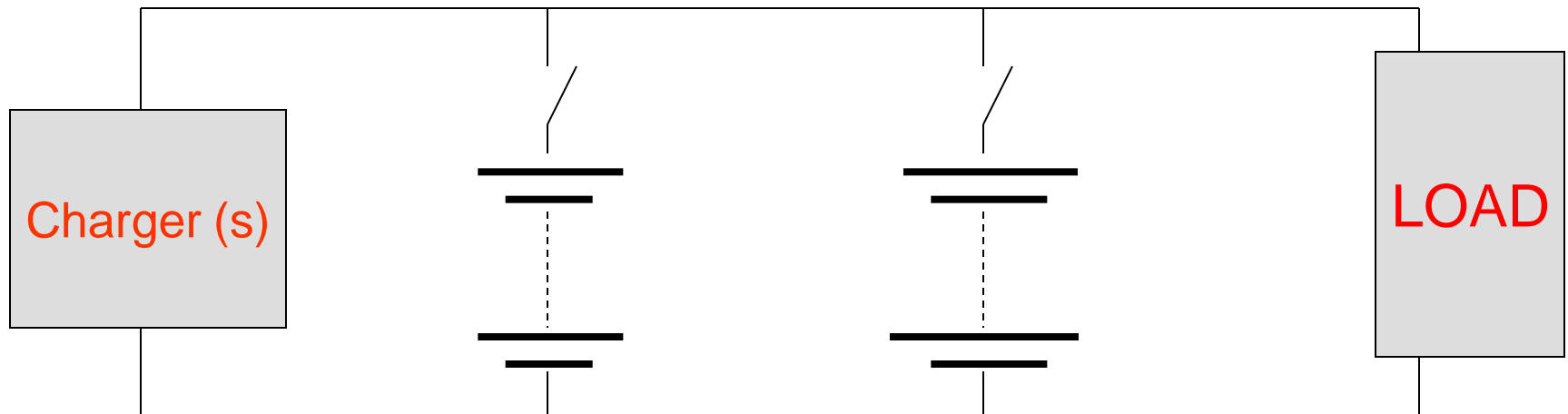
- Manual Initiation of duration test (as with self- contained systems) & return to normal operation automatically
- Dual batteries and outputs to enable either alternate luminaires to be tested or the full system from each section of the battery.
- A limited discharge test – this can only be used when the batteries have a characteristic which enables their condition to be accurately assessed by a 2/3 discharge – manufacturer to provide battery declarations + Battery Volts

Automatic Testing - Central Battery Systems

- Protection of occupants - Premises occupied at time of duration test.



Centrally powered systems with Dual batteries



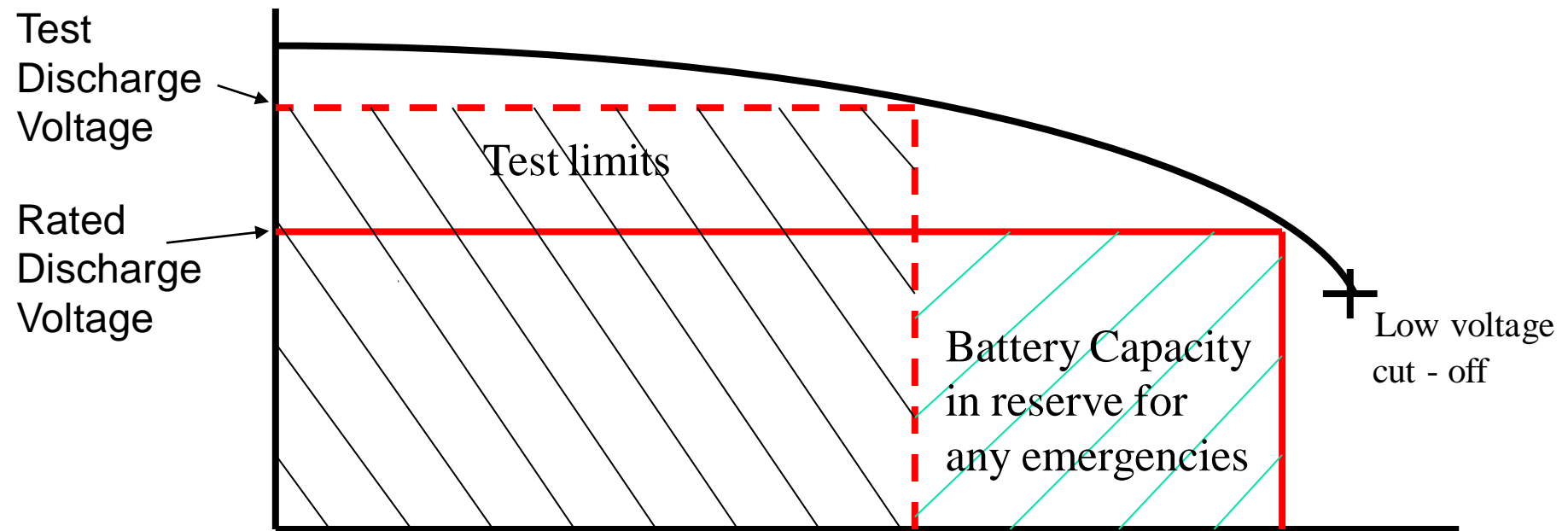
Either battery section can be tested or maintained independently while the other section remains charged and available to supply the load in an emergency.

Automatic Testing - Central Battery Systems

- Protection of occupants - Premises occupied at time of duration test.



Central Systems, limited partial discharge test
Competent engineers should perform the full duration test



Batteries with an appropriate characteristic may be tested for two thirds duration to a discharge voltage corresponding to a predetermined value - retaining emergency capacity.



7. Indication and recording of the results

- Automatic test system shall indicate results of all tests
- Result of test must be reliably indicated
- Indication of failure of a duration test shall not be cancelled by a functional test
- During a mains failure – test failure result shall be retained for 1 week & be indicated when the supply is resumed. ATS will repeat the test
- Indicator lamps should comply with IEC 60073 & shall not contradict indicators defined in BS EN 60598-2-22

Guidance on use of ATS systems

Suitability of ATS for occupancy of premises



Suitable system type (Commissioning set up / test initiation type)	Premises type		
	Known to be unoccupied one year in advance	May be occupied at any time	Only known to be unoccupied 24 hours in advance
Self contained			
Luminaires set to operate full duration test at set time	✓		
Luminaires set to operate functional test at set times	✓	✓	✓
Alternate luminaires set to operate functional and/or full duration test at least 24 hours different from next luminaire	✓	✓	✓
Manual initiation of full duration test			✓

Guidance on use of ATS systems

Suitability of ATS for occupancy of premises



Suitable system type (Commissioning set up / test initiation type)	Premises type		
	Known to be unoccupied one year in advance	May be occupied at any time	Only known to be unoccupied 24 hours in advance
Central Systems			
All Luminaires set to operate full duration test	✓		
Manual initiation of all luminaires for functional test	✓	✓	✓
Dual Battery systems functional and full duration test	✓	✓	✓
Limited duration test to maintain one third capacity at end of test	✓	✓	✓