BS EN 62034:2012

BSI Standards Publication

Automatic test systems for battery powered emergency escape lighting

bsi.

...making excellence a habit.™

National foreword

This British Standard is the UK implementation of EN 62034:2012. It is identical to IEC 62034:2012. It supersedes BS EN 62034:2006, which will be withdrawn on 28 March 2015.

The UK participation in its preparation was entrusted by Technical Committee CPL/34, Lamps and Related Equipment, to Subcommittee CPL/34/4, Luminaires.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Published by BSI Standards Limited 2012

ISBN 978 0 580 67363 4

ICS 29.140.50

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 June 2012.

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62034

May 2012

ICS 29.140.50

Supersedes EN 62034:2006

English version

Automatic test systems for battery powered emergency escape lighting
(IEC 62034:2012)

Systèmes automatiques d'essai pour éclairage de sécurité sur batteries
(CEI 62034:2012)

Automatische Prüfsysteme für batteriebetriebene Sicherheitsbeleuchtung für Rettungswege
(IEC 62034:2012)

This European Standard was approved by CENELEC on 2012-03-28. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 62034:2012 E

Foreword

The text of document 34D/1040/FDIS, future edition 2 of IEC 62034, prepared by SC 34D, "Luminaires", of IEC TC 34, "Lamps and related equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62034:2012.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-12-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2015-03-28

This document supersedes EN 62034:2006.

The main changes with respect to EN 62034:2006 are the improvement of the understanding of the requirements in the various clauses and the compliance requirements listed below and the updating of the normative references.

4.2 Monitoring of the timing circuit

4.3 Functional requirements

4.3.1 The automatic test system (ATS)

4.4.2 Intercommunications failure

4.4.4 Component failures

4.4.7 Software failure

5.1 Functional test

5.2 Duration test

6.2.2 Timing accuracy

6.3.2.2 Testing alternate luminaires

6.3.3.4 Limited duration test

7.1 General

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62034:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61347-2-7	NOTE	Harmonized as EN 61347-2-7.
IEC 61347-2-11	NOTE	Harmonized as EN 61347-2-11.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60073	-	Basic and safety principles for man-machine interface, marking and identification - Coding principles for indicators and actuators	EN 60073	-
IEC 60598-1	-	Luminaires - Part 1: General requirements and tests	EN 60598-1	-
IEC 60598-2-22	-	Luminaires - Part 2-22: Particular requirements - Luminaires for emergency lighting	EN 60598-2-22	-
IEC 61347-1	-	Lamp controlgear - Part 1: General and safety requirements	EN 61347-1	-
IEC 61547	-	Equipment for general lighting purposes - EMC immunity requirements	EN 61547	-

CONTENTS

INTRODUCTION....6
1 Scope....7
2 Normative references....7
3 Terms and definitions....7
4 Requirements....9
4.1 Safety, construction and installation instructions....9
4.2 Monitoring of the timing circuit....9
4.3 Functional requirements....9
4.3.1 The automatic test system (ATS)....9
4.3.2 Emergency battery supply....10
4.3.3 Lamps tested in the emergency mode....10
4.3.4 Maintained luminaires tested in emergency mode and in normal mains condition....10
4.4 System integrity....10
4.4.1 Protection against system part failures and faults....10
4.4.2 Intercommunications failure....11
4.4.3 System interconnection....11
4.4.4 Component failures....11
4.4.5 System parts compatibility....11
4.4.6 Electromagnetic immunity of the ATS....12
4.4.7 Software failure....12
4.5 Test of emergency lamp(s)....12
5 Test duration and interval....13
5.1 Functional test....13
5.2 Duration test....13
6 Protection of a building during the periods of test and subsequent recharge of the emergency lighting system....14
6.1 General....14
6.2 Accuracy and protection of timing periods....14
6.2.1 General....14
6.2.2 Timing accuracy....14
6.2.3 Protection of timing function....14
6.3 Requirements for premises that may be occupied during test and recharge periods....15
6.3.1 General....15
6.3.2 Testing of self-contained luminaires....15
6.3.3 Test of centrally powered systems....16
6.3.4 Automatic test recording facilities....17
7 Indication and recording of results of tests that the equipment has to perform....17
7.1 General....17
7.2 Indication....18
7.3 Recording....18
Annex A (informative) Examples of typical automatic test systems....19
Annex B (normative) Classification of ATS types....24
Annex C (informative) Example of guidance for the use of ATS systems....25

Bibliography 26

Figure A.1 – Stand-alone, self-contained luminaire with automatic test facilities 19
Figure A.2 – Direct connection between luminaires and remote panel 20
Figure A.3 – Alternative system where luminaire's connection is marshalled by a connection box for transmission to remote indicators and control panel.....21
Figure A.4 – Direct connection between luminaires and remote panel 22

Table A.1 – Standards conformity guide 20
Table A.2 – Standards conformity guide 22
Table A.3 – Standards conformity guide 23
Table B.1 – Minimum function according to the ATS type.....24
Table C.1 – Suitable ATS systems for different occupancy of premises.....25

INTRODUCTION

Emergency lighting systems are a safety related product; their correct performance can only be assured by systematic testing and maintenance. Conventional techniques for testing are reliant upon manual testing procedures, and are highly susceptible to neglect. These limitations of conventional techniques can be overcome by automating the testing process. It is essential that automatic testing systems for emergency luminaires schedule tests reliably, and provide timely notification of failures or degradation of performance.

Automatic test systems (ATS) will still require manual intervention to correct faults when they are identified, and procedures should be put in place for such intervention. These systems provide information to assist users to manage risk on their premises.

Automatic test systems for emergency escape lighting assist the operator of the building by showing the results of tests that will have been made at prescribed intervals, without disrupting any other electrical services. It is essential that the notification of failures or reduction in performance be given at the earliest opportunity to enable the emergency escape system to be restored to full operation.

The automatic test system will provide those responsible for an emergency lighting installation with information to enable them to ensure that the installed luminaires operate correctly when required.

The automatic test system may be part of a building management system (BMS) for making the emergency lighting tests; this standard would only apply to the emergency lighting testing part of a BMS.

A visual check of system components and indicators should be included in the routine of safety staff. This check should be made regularly to ensure that the emergency luminaire is present and intact, with lamps and indicators working and visible i.e. not obscured, covered or painted.

AUTOMATIC TEST SYSTEMS FOR BATTERY POWERED EMERGENCY ESCAPE LIGHTING

1 Scope

This International Standard specifies the basic performance and safety requirements for individual products and components that are incorporated into automatic test systems for use with emergency lighting systems on supply voltages not exceeding 1 000 V.

This standard also specifies the required functionality of a complete automatic test system for an emergency lighting system.

This standard is applicable to testing systems consisting of a number of emergency lighting self-contained luminaires or a central battery with associated emergency lighting luminaires.

NOTE Manual test facilities that rely on manual initiation and/or visual inspection of the lamp condition are outside the scope of this standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60073, *Basic and safety principles for man-machine interface, marking and identification – Coding principles for indicators and actuators*

IEC 60598-1, *Luminaires – Part 1: General requirements and tests*

IEC 60598-2-22, *Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting*

IEC 61347-1, *Lamp control gear – Part 1: General and safety requirements*

IEC 61547, *Equipment for general lighting purposes – EMC immunity requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60598-2-22 as well as the following apply.

3.1
automatic test system
ATS
automated test system that may be manually initiated, consisting of parts (such as timers, current detectors, light detectors, changeover switches) which, when connected together, make a system that can carry out the routine testing requirements of emergency lighting luminaires, and indicate the test results

3.2
self-contained luminaires with ATS
emergency luminaire that is self-contained with built-in testing facilities to perform tests and indicate the test results

NOTE Examples of self-contained luminaires are shown in Annex A.

3.3
self-contained luminaire system
system that performs tests on one or more self-contained emergency luminaires, which is connected to a remote panel giving a proper indication of results

NOTE Examples of a self-contained luminaire system are shown in Annex A.

3.4
centrally powered luminaire system
system that performs tests on one or more emergency luminaires, which is connected to a central power supply system or a remote power supply system and giving a proper indication of results

NOTE Examples of a centrally powered luminaire system are shown in Annex A.

3.5
remote panel
part of a system that receives and/or sends information from and/or to the emergency lighting luminaires, and may also indicate the test results

3.6
functional test
test to check the integrity of the circuit and the correct operation of a lamp, a changeover device and battery emergency power supply

3.7
duration test
test to check if the battery emergency power supply source supplies the system within the limits of rated duration of emergency operation

3.8
alternate luminaires
luminaires configured so that tests conducted by the ATS are not made on two adjacent luminaires at the same time

3.9
test facility
main testing and recording device that may consist of a remote panel and/or computerized system, which facilitates and controls the manual and automatic testing and recording of relevant information, and has the ability to indicate test results in a visual and/or printed form

3.10
test sequence
sequence of the test or simulation that the ATS carried out during the test period

3.11
test period
interval of time where the ATS perform the test sequence on the luminaire

3.12
polling rate
rate at which a unit is interrogated by the control system

3.13
changeover device
device which provides a switchover operation of the lamps from normal operation control gear to emergency control gear

4 Requirements

4.1 Safety, construction and installation instructions

All parts of the ATS shall conform to the requirements of IEC 60598-1 and IEC 60598-2-22 where these are appropriate.

NOTE 1 Guidance for the appropriate application of standards for typical systems is provided in Annex A.

The design and construction of the ATS shall ensure that only authorized personnel can change the test duration and the frequency of tests.

The manufacturer shall include installation instructions for the ATS, which shall define any limits of the size and compatibility of the ATS.

In the installation instructions, manufacturers shall advise the type of emergency luminaires for which the ATS is designed.

Compliance is checked by inspection of the manufacturer's instructions and/or of the instruction sheet provided by the manufacturer.

The ATS shall be classified and marked according to one of the type stated in Annex B.

NOTE 2 Test circuit components may be installed within or adjacent to either self-contained or centrally powered luminaires. Additional components may be located in a remote panel.

4.2 Monitoring of the timing circuit

In all ATS types (see Annex B), any failure of the progress of the test sequence of the ATS shall be indicated locally on the luminaire and/or on the remote panel as applicable to the ATS type.

NOTE The monitoring of the timing circuit is essential as the duration of testing periods and the intervals between them need to be ensured and maintained.

This failure shall be tested by simulating a fault that interrupts the progress of the test sequence or any other procedure that can be agreed with the system designer/manufacturer and the test laboratory to demonstrate compliance with this clause, and checking that the failure is indicated locally on the luminaire and/or on the remote panel as applicable to the ATS type.

Compliance is checked by testing a sample according to the instructions provided by the manufacturer.

4.3 Functional requirements

NOTE The tests of 4.3 and 4.4 should be carried out before the tests of Clause 5.

4.3.1 The automatic test system (ATS)

The ATS shall check the functional operation of the emergency lighting luminaires and associated power supplies, at intervals and for the duration specified in Clause 5, to identify any faults that would impair their operational duty. Any faults shall be indicated or reported

within 24 h after their detection. For types P, ER, PER and PERC, verification for a fully loaded system may be made by extrapolation of the polling rate measured on the individual unit.

NOTE Types P, ER, PER and PERC are defined in Annex B.

Compliance is checked by inspection and prescribed test (see Clause 5).

4.3.2 Emergency battery supply

The test system shall check and indicate if the emergency battery supply has failed.

Compliance is checked by disconnecting the battery during the test sequence – a fault shall be indicated within the test period.

4.3.3 Lamps tested in the emergency mode

The test system shall check that any changeover device, where fitted, has powered the lamp from the emergency power supply.

NOTE The full load from the battery is equivalent to the maximum discharge load current of the circuit, excluding the starting period.

Compliance is checked as follows:

- *if the charging current to the battery is higher than 15 % of the full load, the charger shall be disconnected during the test;*
- *if the charging current is between 5 % and 15 % of the full load, the charger shall be compensated during the test;*
- *if the charging current is less than 5 % of the full load, the charger should be ignored during the test.*

4.3.4 Maintained luminaires tested in emergency mode and in normal mains condition

For maintained luminaire that do not have a changeover device, the test system shall check that the lamp operates correctly in both the normal mains supply and failed supply conditions.

For maintained luminaries with a changeover device, test shall be carried out according to 4.3.3 with the monitoring of the battery current or output voltage to check the changeover.

Compliance is checked by inspection of the test system when the maintained lamps are operating.

4.4 System integrity

4.4.1 Protection against system part failures and faults

Any single fault or part-failure that occurs in the ATS, or within one of the system parts, shall not affect the emergency operation of the ATS, in accordance with the requirements of 4.4.2 to 4.4.7.

Compliance is checked by inspection and the requirements of 4.4.2 to 4.4.7.

4.4.2 Intercommunications failure

Any failure of intercommunication between the parts of ATS system, as defined in 3.3 and 3.4, shall not inhibit the emergency operation of the luminaires connected to the ATS, or initiate an unwanted test. Furthermore, in the case P, ER, PER and PERC ATS types (see Annex B), any failure of intercommunication between ATS parts shall be indicated as a fault on the remote panel within 24 h of the failure occurring.

For this test, the communication shall be interrupted by the appropriate means (according to the manufacturer's instructions). The following checks are then made:

– *no unwanted test is initiated;*
– *the emergency operation of the luminaires operates if the normal supply is switched off;*
– *the failure of the interconnection between ATS parts is indicated as a fault on the remote panel within 24 h.*

NOTE Subclauses 22.3.18 and 22.3.21 of IEC 60598-2-22 are to be considered.

4.4.3 System interconnection

The operation of luminaires in the emergency mode shall not be affected by any faults in the wiring of the interconnections of the ATS, including a short circuit, contacts to earth or an interruption in the wiring of the ATS supply or communications wiring. No unwanted test shall be initiated. The test shall only operate at correct times; other tests would put the system's emergency duty at risk.

Compliance is checked by simulation of these wiring faults to the ATS.

NOTE Short circuit connections between supply and communications wiring are not included in the test if they are separated by double insulation.

4.4.4 Component failures

The failure of any single part within the ATS shall not inhibit the emergency operation of more than one of the luminaires connected to the ATS, or initiate an unwanted test.

For component failures that mimic a control signal or inhibit an emergency operation, the requirements of IEC 61347-1 apply.

NOTE For the ATS systems and devices, it may be appropriate to seek the advice of the control gear manufacturers with respect to selection of the internal parts that are most likely to cause a failure against the requirements of this test.

4.4.5 System parts compatibility

The individual parts, control gear and other electronic devices selected to form an ATS shall be proven to be compatible with each other.

It shall be the responsibility of the system designer to ensure ATS component and procedure compatibility. The manufacturer of ATS components/system shall provide details of compatible system components.

The manufacturer shall declare:

– the limits of the installation in the instruction sheet, length of the cabling, quantity of luminaires;
– in the technical folder: the justification of compatibility between any part within the ATS.

NOTE Conformity of individual parts against the requirements of relevant IEC or regional standards cannot be relied on to completely ensure compatibility in this instance. EMC, voltage transfer, switching phenomena, etc. should be considered.

4.4.6 Electromagnetic immunity of the ATS

Electromagnetic phenomena shall not inhibit operation of the ATS or initiate an unwanted test.

Compliance is checked by the tests of IEC 61547 applying the requirements and compliance criteria for emergency lighting luminaires. The IEC 61547 test report shall be provided either by the manufacturer or a third part test house.

In addition, the supply voltage dips and interruptions tests shall be conducted in accordance with IEC 61547. During testing, operation of the ATS shall not be affected, and no unwanted tests shall be initiated.

4.4.7 Software failure

The correct operation of ATS software shall be proven.

It shall be the responsibility of the system designer to conduct sufficient investigations and operational trials to ensure the correct operation of software and failure protection. Detailed software design documentation, for example functional descriptions of the main programme flow, flowcharts for the software operation, fault mode analysis, how the software and hardware interact etc., shall be provided by the designer/manufacturer in order that the test laboratory can ensure the reliability of the software.

Any software failure shall not inhibit the emergency operation of more than one of the luminaires connected to the system, and shall not initiate an unwanted test.

NOTE For product certification (e.g. third party testing), the designer/manufacturer should have available detailed software design documentation, including functional descriptions of the main program flow, including flow charts fault mode analysis, etc. and how the software and hardware interact in order that the test laboratory can ensure the reliability of the software.

Compliance is checked by inspection.

4.5 Test of emergency lamp(s)

The ATS shall check and indicate if the emergency lamp(s) do not operate in emergency mode. In the case of P, ER, PER and PERC ATS types (see Annex B), the indication shall be on the remote panel and possibly on the luminaries.

Compliance is checked by:

a) removal of the emergency incandescent lamp during test; and
b) the fault abnormal conditions of IEC 60598-1 for fluorescent, discharge lamps or any other appropriate emergency lamp technology, e.g. LED.

A fault indication shall be given locally on the luminaire and/or on the remote panel as applicable for a) and b) above.

5 Test duration and interval

5.1 Functional test

A functional test shall be performed at least once a month. For batteries, repeated tests may entail a loss of capacity. For this reason the test duration shall be sufficient to check the illumination of the lamp, but shall not be longer than 10 % of rated duration. For batteries that exhibit loss of capacity from repeated short duration discharges, the total of these test durations shall not exceed 10 % of rated duration in a month. The rated duration is defined in IEC 60598-2-22.

NOTE 1 Attention is drawn to national regulations that may dictate the testing frequency and types of testing required.

NOTE 2 This test gives the earliest warning of luminaire failure that is consistent with luminaire component life. Manual logging of fault conditions, when required, should be actioned within one month or in line with national regulations. Attention is drawn to national regulations that may require other test conditions.

NOTE 3 Proven compatibility of lamps, lamp-control gear, and the automatic test regime is the responsibility of the system provider.

If a mains supply failure occurs before a functional test and within such a time that the battery could not be re-charged sufficiently to run a successful functional test, then the test should be postponed until the battery is recharged sufficiently to perform the test after the restoration of the mains supply up to a period of 24 h. The compatibility of the final ATS parts shall ensure their reliable operation. In the case of P, ER, PER and PERC ATS types (see Annex B) in the event that a functional test is postponed, indication of the pending test shall be given on the remote panel. Where applicable, the test function and test postponement functions are to be demonstrated. If a mains supply failure occurs whilst a functional test is in progress, the test shall be postponed and the system shall enter emergency operation. Following restoration of the mains supply, a postponed functional test shall re-commence automatically as soon as conditions permit. If the duration of the functional test is less than 1 % of the rated duration, then the postponed function is not required.

The conformity of timing requirements including the periodicity and details of the tests (hierarchy, managements of the test delays) is checked by inspection of the manufacturer's declaration and the technical file provided by the manufacturer.

NOTE 4 It is known that non-standardized low-power operation of fluorescent lamps can be damaging to some types/makes of fluorescent lamp.

5.2 Duration test

For full rated duration, a test shall be performed according to the manufacturer's instructions at the commissioning of the ATS, and repeated automatically at least annually.

NOTE 1 The test should check that the emergency lamp(s) are illuminated for their duration of emergency operation for the application or equivalent battery discharge rate.

NOTE 2 Attention is drawn to national regulations that may dictate the testing frequency and types of testing required.

Random automatically-initiated rated duration tests shall be carried out within 52 weeks after commissioning.

NOTE 3 For the use of random initiated ATS, careful consideration may be required for some applications.

The test duration shall not be able to be changed by unauthorized persons.

A duration test shall only be started when the battery supply is fully charged. If a mains supply failure occurs whilst a duration test is in progress, the test shall be postponed and the system shall enter emergency operation. Following restoration of the mains supply, a postponed duration test shall re-commence automatically when the battery supply is fully re-charged.

The design of the system should ensure this, for example by allowing a fixed delay time for the battery supply to re-charge or by monitoring the real-time charge state of the battery). In the case of P, ER, PER and PERC ATS types (see Annex B) in the event that a duration test is postponed, indication of the pending test shall be given on the remote panel.

NOTE 4 In some locations, the duration test should be done always at the same settled time. In this case, the postponed test should be launched when the battery is fully charged and at the same time as the "programmed test + n×24 h, where n is an integer number taking in account the time when the battery is fully charged".

Compliance is checked, where applicable, by confirming that the test function and test postponement functions have functioned correctly.

Conformity of timing requirements, details of operation, declaration and verification through detailed examination of software shall be provided by manufacturers.

6 Protection of a building during the periods of test and subsequent recharge of the emergency lighting system

6.1 General

This clause applies to all ATS types where appropriate time and dates are used to programme the testing sequences. Manufacturer's declaration and appropriate document evidence shall be provided.

ATS shall be designed to minimize the effects of a mains supply failure on the availability of the emergency lighting when batteries are only partially charged as a result of a duration test and subsequent battery recharge.

If there is a possibility that a building could be occupied during the duration test, only the procedures in 6.3 shall be used.

6.2 Accuracy and protection of timing periods

6.2.1 General

The accuracy and the function of an ATS timer shall conform to the requirements of 6.2.2 and 6.2.3.

6.2.2 Timing accuracy

The ATS timer consists of two timing requirements – timing of test interval and timing of test function. The accuracy of the timing of the test interval shall be tested to ensure that it has an accuracy of ±75 s per week. The accuracy of the timing of the test function shall be tested to ensure that it has the same accuracy as the timing of the test interval.

Compliance shall be checked by the periodicity of two successive functional tests. This periodicity shall be stated in the instruction sheet of the manufacturer.

6.2.3 Protection of timing function

The timing function shall be retained through periods of mains supply failure or interruption for up to 7 days, unless:

a) the ATS automatically restores separated timings of alternate luminaires;

b) the ATS is designed to provide automatic restoring for testing alternative luminaires or automatic initiation of test function.

Operating instructions shall state that the ATS be re-commissioned following extended periods of mains supply failure. The extended period of mains supply failure shall be specified by the manufacturer in the operating instructions, and shall be greater than 7 days.

Compliance is checked by:

– *the simulation of a mains failure, and*
– *the verification of the correct functioning of the timing.*

This last compliance is checked by measuring the periodicity of the functional test.

After a charging cycle of 24 h at 0,9 times the rated supply voltage, the time and the date of the first test which occurred is noted.

Switch off the mains of the ATS during seven days.

Switch on the mains of the ATS.

The time and date of the first functional test which occurred is noted after the restoration of the mains supply. The periodicity of the test declared by the manufacturer is checked.

In the case of a periodicity less than 1 week + 24 h, the periodicity between the first test happening after the restoration of the normal supply and the following test is checked. The tests shall be performed at the time and date initially scheduled before the mains interruption.

6.3 Requirements for premises that may be occupied during test and recharge periods

6.3.1 General

Systems designed for installation in premises which may be occupied during the duration test and subsequent battery recharge shall conform to the precautionary measures of either

a) 6.3.2 for systems of self-contained luminaires; or
b) 6.3.3 for centrally supplied systems.

NOTE At the design stage, it should be reinforced that the correct type of automatic test system should be selected and set up to ensure testing takes place at periods of minimum risk.

6.3.2 Testing of self-contained luminaires

6.3.2.1 General

Self-contained emergency luminaires shall be tested by one of the procedures in 6.3.2.2, 6.3.2.3 or 6.3.2.4 to keep a security level of the emergency lighting in case of supply failure.

6.3.2.2 Testing alternate luminaires

The ATS shall be designed to test and allow full recharge of a luminaire prior to the testing of the next alternate luminaire. Installation information shall be provided for each ATS by the ATS provider.

The manufacturer shall provide sufficient information for the setting of the ATS timers to ensure that the timing interval between adjacent luminaires is sufficiently long to prevent drifting into the same test period.

NOTE 1 In some countries, random testing of self-contained luminaires is acceptable. In this case, this requirement does not apply.

NOTE 2 All the other requirements of the test including timing and checking operation should be carried out automatically.

Compliance is checked by confirming that the sequence of testing does not affect alternate luminaires during the same test period. This is checked by inspection of the documentation of the manufacturer.

6.3.2.3 Manual initiation of the test function

In case of a non-automatic initiation of the test, manual initiation of the test shall be acceptable providing that there is a visible fault indication (as described in 7.2), or records of previous tests which indicate that the discharge test has not been carried out within the previous 12-month period.

NOTE 1 After the manual initiation, the operation of the test is automatic, including return to normal operation and fault reporting.

NOTE 2 The purpose of these requirements is to ensure the safety of the premises when carrying out the duration test.

Compliance is checked by inspection.

6.3.2.4 Automatic initiation of test function

Automatically initiated tests shall perform the tests in accordance with Clause 5. However, the duration test shall be carried out within 52 weeks after commissioning. This requirement is applicable only in combination with 6.3.2.2 for premises which may be occupied during the test and the subsequent recharging period.

Random automatically-initiated rated duration tests shall be carried out within 52 weeks after commissioning.

NOTE The operating instructions should draw attention to the possibility of adjacent luminaires being tested simultaneously. This should include the points of emphasis and emergency exit signs along the escape route.

Compliance is checked by inspection.

6.3.3 Test of centrally powered systems

6.3.3.1 General

Centrally powered ATS's shall provide facilities to enable the ATS to be tested by:

– one of the procedures in 6.3.3.2, or 6.3.3.4 to keep a security level of some emergency lighting in case of mains supply failure;
– and optionally 6.3.3.3 in case of a manual initiation of the test.

6.3.3.2 Dual batteries

If the ATS is equipped with dual parallel batteries, they shall be arranged to enable the ATS to be tested in two sections, where each section shall be capable of providing illumination while the other is discharged.

NOTE 1 This system also enables some luminaires to operate while the batteries are being serviced or replaced.

Compliance is checked by the alternate operation of the dual batteries, allowing the batteries to recharge for 24 h between the two tests.

NOTE 2 The location of luminaires connected to the fully charged battery should ensure that if a mains supply failure occurs at any time in the test cycles, no part of the escape route will be in total darkness.

6.3.3.3 Manual initiation of the test function

Manual initiation of the test shall be acceptable providing that there is a visible fault indication, (as described in 7.2), or records of previous tests which indicate that the duration test has not been carried out within the previous 12-month period.

NOTE 1 After the manual initiation, the operation of the test is automatic including return to normal operation and fault reporting.

NOTE 2 Automatic initiation of the test is acceptable when not carried out randomly and at times of low risk. This is only accepted if it can be guaranteed that the building would not be in use for a period of 24 h after the automatic discharge.

Compliance is checked by inspection.

6.3.3.4 Limited duration test

The limited duration test shall be performed for two-thirds of the rated duration. The central emergency power supply system shall be automatically checked to ensure that the battery has not discharged to a lower voltage than is required for a discharge of two-thirds of the rated duration.

The manufacturer shall provide a battery declaration and details of the test requirements which includes the minimum battery voltage for the limited duration test for a discharge of two-thirds of the rated duration.

6.3.4 Automatic test recording facilities

Where an ATS with a recording facility is used to monitor the status of the installation of the emergency lighting, the ATS shall indicate the results of testing in accordance with Clause 4, with an indication of the location of any fault.

7 Indication and recording of results of tests that the equipment has to perform

7.1 General

The ATS shall give an indication of all test results. The ATS test results indicator shall be designed and constructed so that the indication of the failure of a duration test shall not be cancelled out by a subsequent successful functional test.

During a mains failure condition, the results of a test failure shall be retained for at least one week after the mains failure and be indicated when the mains supply is resumed, or the ATS shall automatically repeat the failed test after recharging for a period of 24 h. For P and S types, the records are displayed by local indicators.

Complete the test specification as follows:

– create a failure of the duration test according to the manufacturer's instructions;
– initiate a functional test according to the manufacturer's instructions;
– check that the result of the duration test has not been influenced by this last test and switch off during one week;
– restore the supply source and check that the failure is retained.

If not, check that a duration test is initiated automatically after 24 h of charging.

Compliance is checked by inspection of records/log.

7.2 Indication

Each ATS shall indicate whether the mains supply is functioning normally or has failed. The results of all tests shall be indicated. If the indicator lamps are used, they shall comply with IEC 60073.

NOTE 1 Flashing indicators and character displays are also acceptable for use as test indicators.

NOTE 2 The test indicator may be the same device as the indicator required by IEC 60598-2-22, provided it does not contradict the requirement defined in IEC 60598-2-22.

NOTE 3 The mains supply failure may be indicated by the extinction of the indicator lamp defined in IEC 60598-2-22.

Compliance is checked by inspection.

7.3 Recording

Self-contained luminaires with built-in automatic testing facilities (see 3.2) shall comprise a visual indication of the results of the test, which may be simplified to illuminated indicators.

Fault indicators shall only be reset to their non-fault status by correction of the fault.

For central monitored automatic test systems (see 3.3 and 3.4), the results of the tests shall be stored electronically with either a visual warning or a visual and audible warning of a failure. Test histories shall be available as both a visual and a printable record.

Compliance is checked by inspection.

Annex A
(informative)

Examples of typical automatic test systems

A.1 General

This annex contains examples of typical automatic test systems (ATS) for battery-powered emergency escape lighting, and includes guidance regarding conformity that is required under 4.1 of this standard, for the separate component parts of a system.

Due to the nature of ATS, the actual components and the configuration of components will vary from system to system as indicated in Figures A.1, A.2, A.3 and A.4. Tables A.1 to A.3 give the standards conformity guide.

A.2 Self-contained luminaires

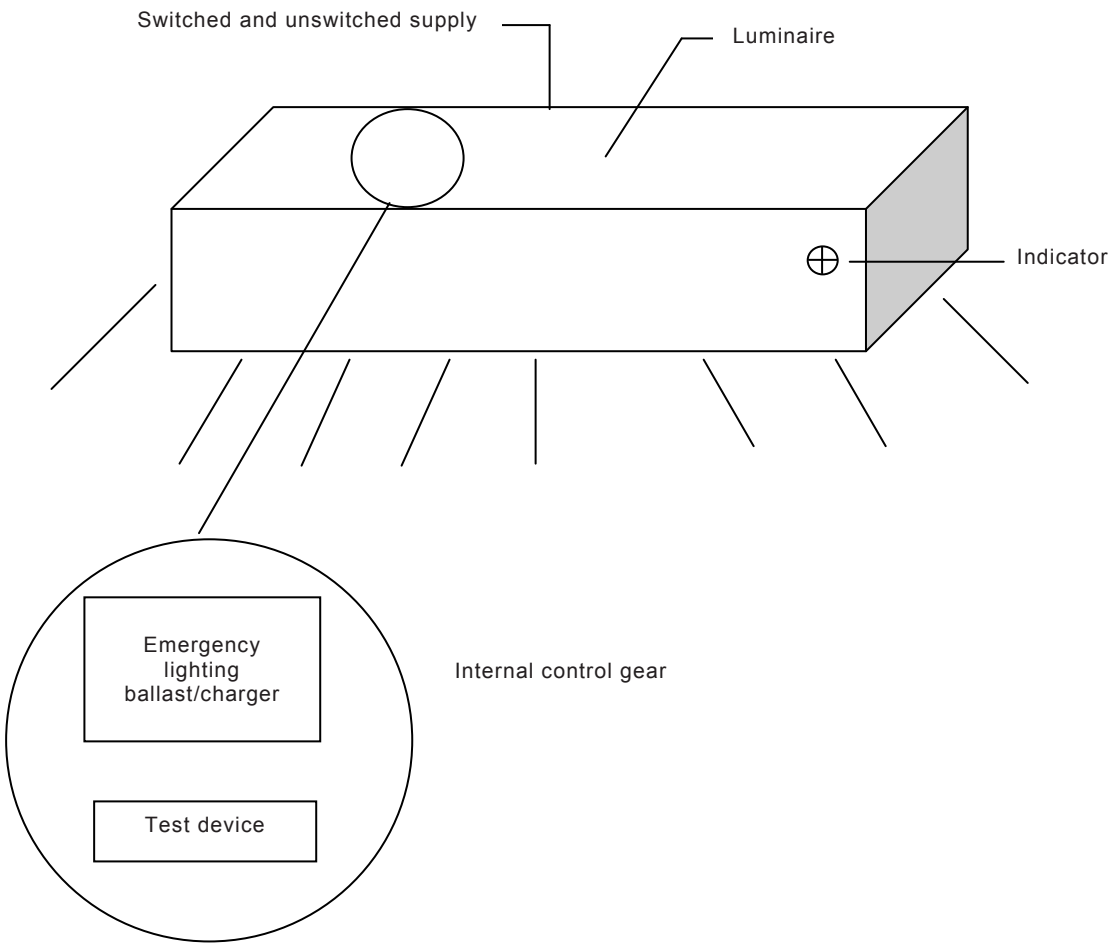

Figure A.1 – Stand-alone, self-contained luminaire with automatic test facilities

Table A.1 – Standards conformity guide

Part/Component	Relevant IEC standards
Luminaire	IEC 60598-2-22 and IEC 62034
Ballast	IEC 61347-2-7
Test circuit	IEC 61347-2-11 and IEC 62034

A.3 Multi-luminaire system with central monitoring for self-contained emergency luminaires

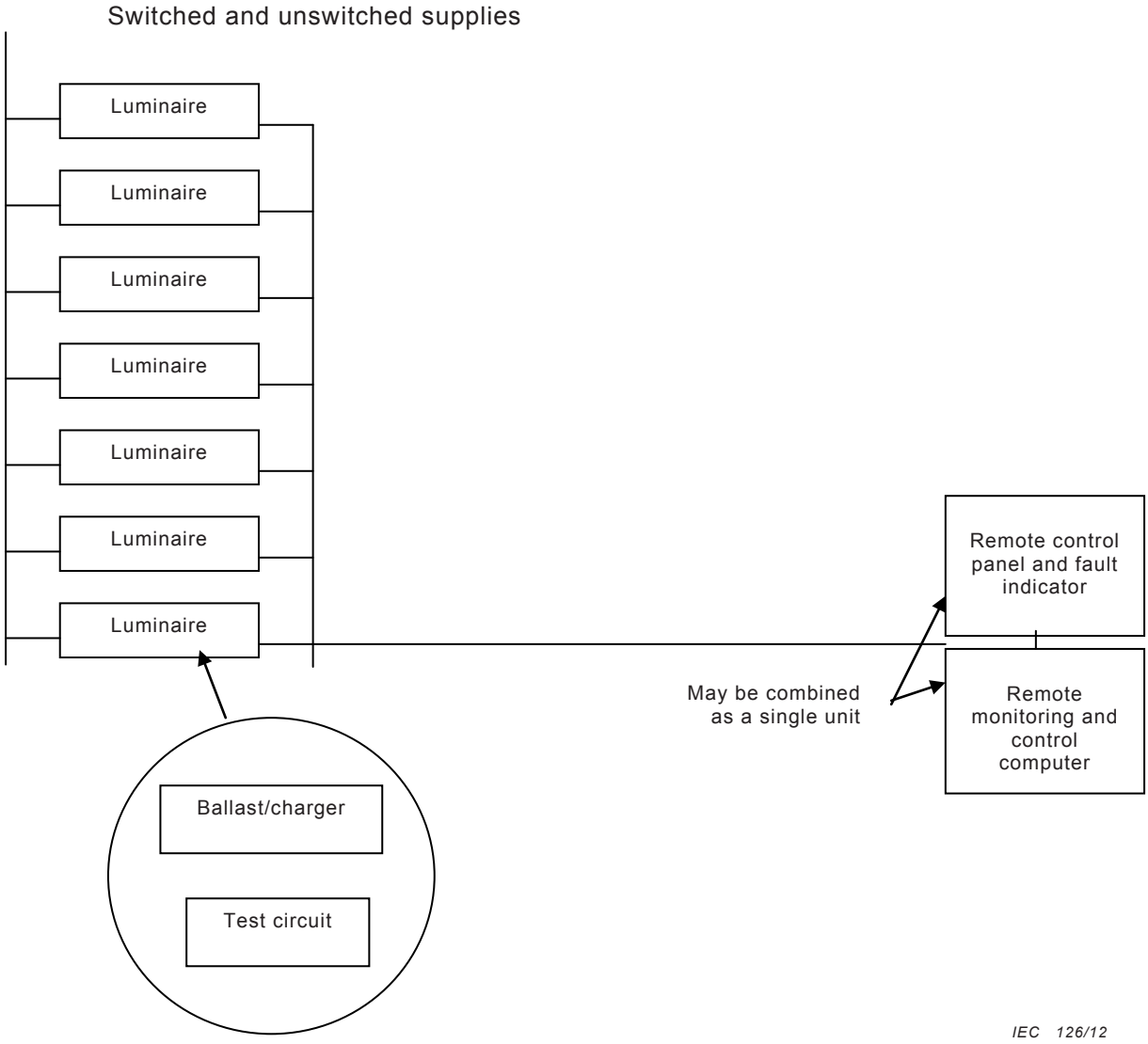

Figure A.2 – Direct connection between luminaires and remote panel

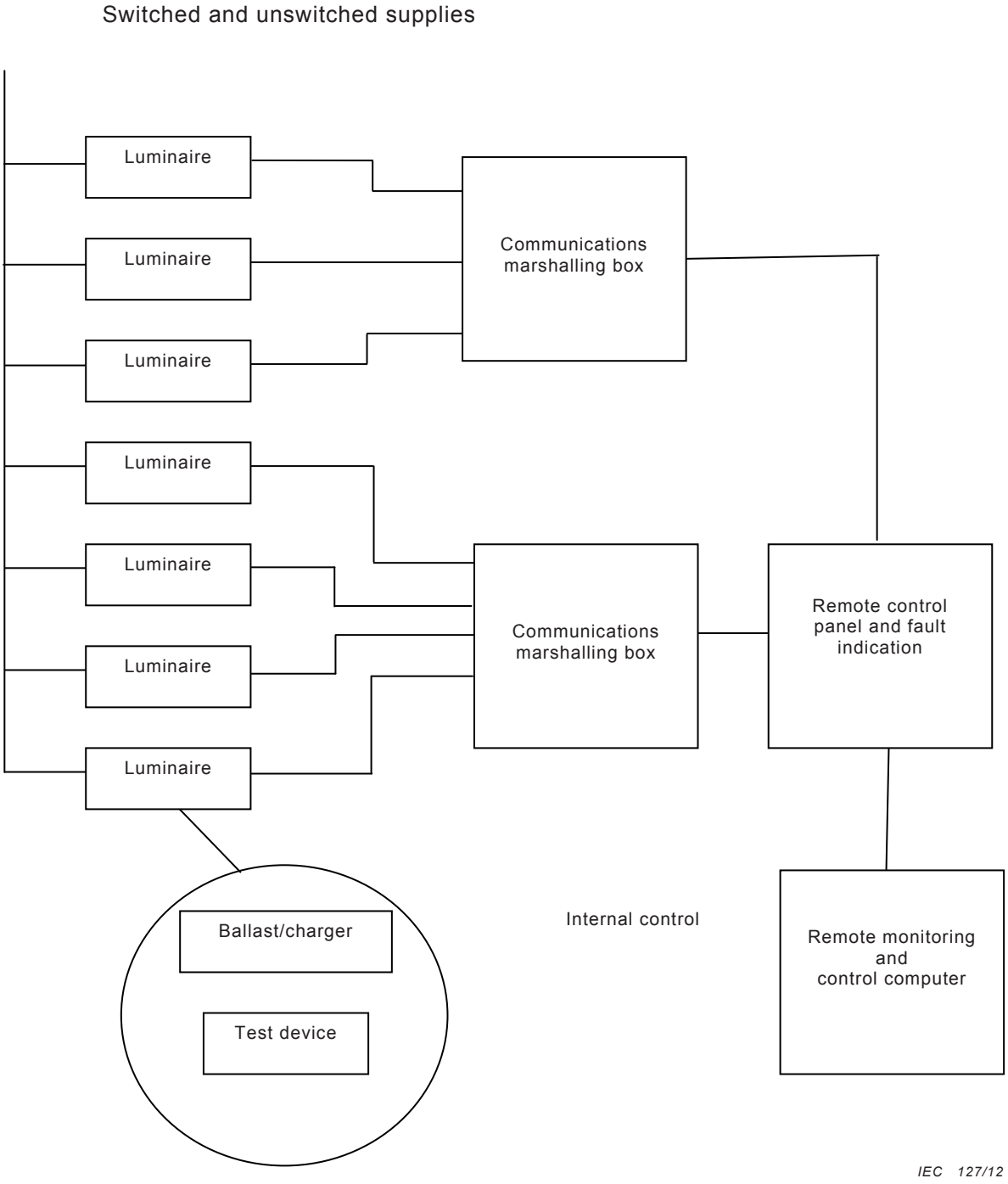

Figure A.3 – Alternative system where luminaire's connection is marshalled by a connection box for transmission to remote indicators and control panel

Table A.2 – Standards conformity guide

Part/Component	Standards
Luminaire	IEC 60598-2-22 and IEC 62034
Ballast	IEC 61347-2-7
Test circuit	IEC 61347-2-11 and IEC 62034
Marshalling box (Figure A.3)	IEC 61347-2-11 and IEC 62034
Control panel	IEC 61347-2-11 and IEC 62034
Computer	IEC 62034 (software only)
System (see Note 1)	IEC 62034
Communications wiring	IEC 62034
Connectors	Relevant IEC standard
NOTE 1 The system must be fully assembled with sufficient luminaires and other components to allow the assessment of discrete component failures on the overall operation of the system to be checked. NOTE 2 Conformity to IEC 62034 can only be declared for a complete system and not for component parts that has been inspected in isolation.	

A.4 Central battery multi luminaire systems

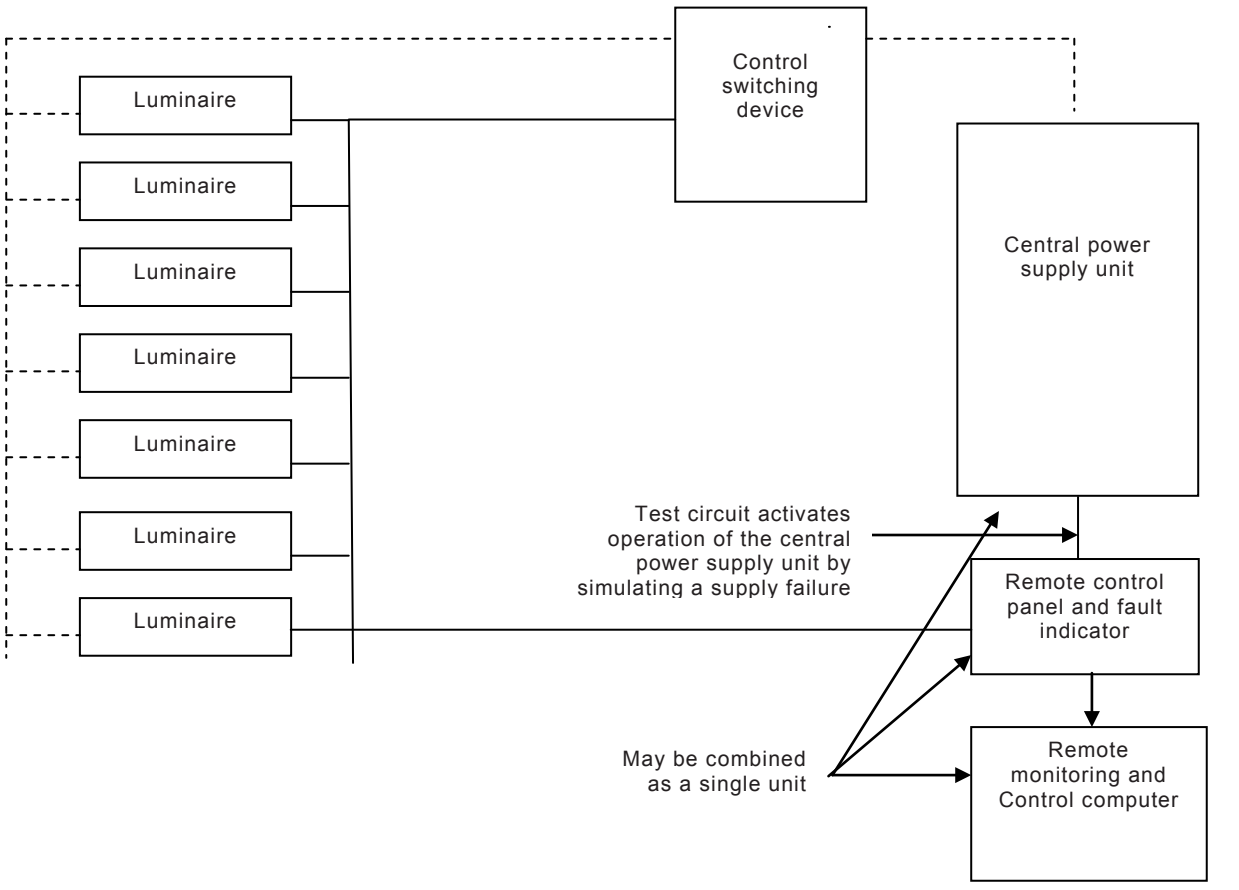

Figure A.4 – Direct connection between luminaires and remote panel

Table A.3 – Standards conformity guide

Part/component	Standards
Luminaire	IEC 60598-2-22 and IEC 62034
Ballast	IEC 61347-2-7
Test circuit	IEC 61347-2-11 and IEC 62034
Central power supply unit	Relevant national standard
Control switching device	Relevant national standard
Control panel	IEC 61347-2-11 and IEC 62034
Computer	IEC 62034 (software only)
System (see Note1)	IEC 62034
Communications wiring	IEC 62034
Connectors	Relevant IEC standard
NOTE 1 The system must be fully assembled with sufficient luminaires and other components to allow the assessment of discrete component failures on the overall operation of the system to be checked. NOTE 2 Conformity to IEC 62034 can only be declared for a complete system and not for component parts that has been inspected in isolation.	

Annex B
(normative)

Classification of ATS types

B.1 General

This annex shows the different formats of ATS with the minimum function according to the SAT type given in Table B.1.

There are different formats of automatic testing systems (ATS). In order to increase the speed and efficacy of the selection process, the following ATS classifications have been developed.

Type S This is a stand-alone ATS consisting of a self-contained luminaire with a built-in testing facility, that provides a local indication of the condition of the luminaire, but still requires all luminaires to be manually inspected, with a manual record made of the information indicated by luminaires.

Type P The emergency luminaires are monitored and their condition is indicated by a test facility that collects and displays the results of the tests, but requires manual recording of information on the tests.

Type ER As type P, but the test facility collects results, and data is recorded and logged by the ATS.

Type PER As types P or ER, but with a collated fault indicator that automatically gives remote indication of failure of any of the luminaires that have been tested.

Type PERC As type PER, but with the additional features of a central controller, for setting parameters, configuration of the system and the central controlled initialization of the test and where the date, time and duration of the test is defined by the central controller.

Table B.1 – Minimum function according to the ATS type

ATS type/function	Local display of the test result	Remote display of the system test result	Remote display of the luminaire test result	Recording of the results and history
S	Yes	No	No	No
P	Optional	Yes	Optional	No
ER	Optional	Yes	Optional	Yes
PER	Optional	Yes	Yes	Optional
PERC	Optional	Yes	Yes	Optional

NOTE A remote display of the system results should have local indication on the luminaires to assist in the identification of the fault.

Annex C
(informative)

Example of guidance for the use of ATS systems

C.1 General

This annex gives examples of suitable ATS systems for different occupancy of premises as shown in Table C.1.

Table C.1 – Suitable ATS systems for different occupancy of premises

Suitable system Commissioning set-up and relevant clause to protect required operation	Premises type		
	Known to be unoccupied one year in advance	May be occupied at any time	Known to be unoccupied 24 h in advance
Self-contained			
Luminaires set to operate full duration test	✓		
Luminaires set to operate functional test	✓	✓	✓
Alternate luminaires set to operate functional and/or full duration test at least 24 h different from next luminaire	✓	✓	✓
Manual initiation of full duration test			✓
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	✓	✓	✓

NOTE Attention is drawn to national regulations that may dictate the testing frequency and types of testing required.

Bibliography

IEC 61347-2-7, *Lamp controlgear – Part 2-7: Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)*

IEC 61347-2-11, *Lamp controlgear – Part 2-11: Particular requirements for miscellaneous electronic circuits used with luminaires*

_____

This page deliberately left blank

This page deliberately left blank

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards -based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email bsmusales@bsigroup.com.

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Copyright

Useful Contacts:

Customer Services
Tel: +44 845 086 9001
Email (orders): orders@bsigroup.com
Email (enquiries): cservices@bsigroup.com

Subscriptions
Tel: +44 845 086 9001
Email: subscriptions@bsigroup.com

Knowledge Centre
Tel: +44 20 8996 7004
Email: knowledgecentre@bsigroup.com

Copyright & Licensing
Tel: +44 20 8996 7070
Email: copyright@bsigroup.com

bsi.

...making excellence a habit.™