



NEGARA BRUNEI DARUSSALAM

**BRUNEI DARUSSALAM STANDARD
PIAWAI BRUNEI DARUSSALAM**

**PBD IEC 61347-2-3:2008
IEC 61347-2-3:2008
Edition 1.1**

**LAMP CONTROL GEAR PART 2-3 –
PARTICULAR REQUIREMENTS FOR A.C. SUPPLIED ELECTRONIC
BALLASTS FOR FLUORESCENT LAMPS**

**ENERGY DIVISION, PRIME MINISTER'S OFFICE
IN COLLABORATION WITH MINISTRY OF DEVELOPMENT
NEGARA BRUNEI DARUSSALAM**

FOREWORD

This Brunei Darussalam Electrical Standard was prepared by the Technical Committee on Electrical Standards [TECO (Electrical)], Energy Division at Prime Minister's Office in collaboration with the authority of the standards committee, Construction Planning and Research Unit (CPRU), Ministry of Development, Brunei Darussalam with the objective of developing the National Electrical Standards for electrical products, systems, equipment and facilities for the local industries and consumers with reference to international standards, guidelines and procedures. In developing the national electrical standards, the aim is to promote quality, technical integrity, health, safety and environmental standards for the local industries and consumers.

This Brunei Darussalam Electrical Standard is an adoption of the International Electrotechnical Commission IEC 61347-2-3: 2008 (Edition 1.1) standard and implements it as the Brunei Darussalam National Standard.

Attention is drawn to the fact that this Brunei Darussalam Electrical Standard does not confer any immunity from legal obligations in any contract for compliance to the Standard.

The National Electrical Standards are subject to periodical review according to the current needs of the local industries and consumers to keep abreast of progress in the industries and consumers concerned. Suggestions of amendments will be recorded and in due course brought to the notice of the committees concerned.

COMMITTEE MEMBERS

The Technical Committee on Electrical Standards [TECO (Electrical)] was tasked by the Energy Division at the Prime Minister's Office in collaboration with Construction Planning and Research Unit (CPRU), Ministry of Development, Brunei Darussalam for the preparation of this Brunei Darussalam Electrical Standard. The members of the Technical Committee are as follows:

- | | |
|---|--|
| 1. Awg Haji Abd Shawal Yaman
(Chairman) | Energy Division, Prime Minister's Office |
| 2. Awg Liaw Wai Khiong
(Co-Chairman) | Brunei LNG Sdn Bhd |
| 3. Pg Shahrudin Pg Haji Yusoff
(Secretary) | CPRU, Ministry of Development |
| 4. Awg William Voon
(Assistant Secretary 1) | Institution of Engineering and Technology,
Brunei Network |
| 5. Awg Simon K A Leong
(Assistant Secretary 2) | KR Kamarulzaman & Associates |
| 6. Awg Haji Md Azrul Azrin Hj Md Zain | Energy Division, Prime Minister's Office |
| 7. Awg Musa Metali | Department of Electrical Services, PMO |
| 8. Awg Md Amir Sharifuddin Haji Ali | Department of Electrical Services, PMO |
| 9. Dyg Hajah Norhayati Ahmad | Department of Electrical Services, PMO |
| 10. Awg Majid Ali | Ministry of Industry & Primary Resources |
| 11. Awg Dennis Wong Tet Yin | Department of Mechanical & Electrical, PWD |
| 12. Awg Nohi Irwan Surkarki Haji Pawi | Department of Fire & Rescue Services |
| 13. Awg Martin Blundell | University Brunei Darussalam |
| 14. Awg Haji Morsidi Haji Kassim | Institut Teknologi Brunei |
| 15. Awg Haji Ismit Haji Mohamad | Institut Teknologi Brunei |
| 16. Awg Matyassin Haji Masri | Maktab Kejuruteraan Jefri Bolkihah |
| 17. Awg Sylvester Kong | Brunei Shell Petroleum Co. Sdn Bhd. |
| 18. Dyg Seri Malati OKIP Hj Zolkeflee | Brunei Shell Petroleum Co. Sdn Bhd |
| 19. Awang Aristoteles Momin | Brunei LNG Sdn Bhd |

20. Steve Turner	Berakas Power Management Company
21. Caius Yong	Berakas Power Management Company
22. Awg Rick Liaw	Hamzah Hassan Consultant
23. Awg Kyaw Moe Aung	HSE Engineering Sdn Bhd
24. Awg Khairul Ezam bin Haji Mohd. Zain	CPRU, Ministry of Development

**INTERNATIONAL
STANDARD**

**IEC
61347-2-3**

Edition 1.1

2004-09

Edition 1:2000 consolidated with amendment 1:2004

Lamp controlgear –

**Part 2-3:
Particular requirements for a.c. supplied
electronic ballasts for fluorescent lamps**



Reference number
CEI/IEC 61347-2-3:2000+A1:2004

**PBD IEC 61347-2-3:2008 (Published by IEC in 2004)
This IEC International Standard has been adopted by CPRU, Ministry of Development,
Negara Brunei Darussalam as a national standard under the IEC Affiliate Country Programme**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Definitions	7
4 General requirements	8
5 General notes on tests	9
6 Classification.....	9
7 Marking	9
7.1 Mandatory markings	9
7.2 Information to be provided, if applicable	9
8 Protection against accidental contact with live parts	10
9 Terminals	10
10 Provisions for earthing.....	10
11 Moisture resistance and insulation.....	10
12 Electric strength	10
13 Thermal endurance test for windings	10
14 Fault conditions	10
15 Protection of associated components	10
16 Abnormal conditions	11
17 Behaviour of the ballast at end of lamp life	12
17.1 End of lamp life effects	12
17.2 Asymmetric pulse test	13
17.3 Asymmetric power test	15
17.4 Open filament test.....	16
18 Construction.....	20
19 Creepage distances and clearances	20
20 Screws, current-carrying parts and connections.....	20
21 Resistance to heat, fire and tracking.....	20
22 Resistance to corrosion	20
Annexes	23
Figure 1a – Circuit for testing.....	21
Figure 1b – Recovery time t_{rr} of the diode	21
Figure 1 – Rectifying effect test	21
Figure 2 – Limits for capacitive leakage current in r.m.s. of HF-operated tubular fluorescent lamps depending on duration.....	22
Figure 3 – Asymmetric pulse test circuit.....	14
Figure 4 – Asymmetric power detection circuit	16

Figure 5a – Open filament test circuit; electrode (1) check	19
Figure 5b – Open filament test circuit; electrode (2) check	19
Figure 5c – Detection of lamp current	19
Figure 5 – Open filament test circuits	19
Figure I.1 – Test arrangement	25
Table 1 – Relation between r.m.s. working voltage and maximum peak voltage	11
Table J.1 – Pulse voltages	28
Table K.1 – Material specification	29
Table K.2 – Transformer specification	29

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LAMP CONTROLGEAR –

Part 2-3: Particular requirements for a.c. supplied electronic ballasts
for fluorescent lamps

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes international Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61347-2-3 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This standard shall be used in conjunction with IEC 61347-1. It was established on the basis of the first edition (2000) of that standard.

This part 2 supplements or modifies the corresponding clauses in IEC 61347-1 so as to convert that publication into the IEC standard: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps.

NOTE In this standard, the following print types are used:

- Requirements proper: in roman type.
- *Test specifications: in italic type.*
- Explanatory matter: in smaller roman type.

This consolidated version of IEC 61347-2-3 consists of the first edition (2000) [documents 34C/500/FDIS and 34C/514/RVD] and its amendment 1 (2004) [documents 34C/636/FDIS and 34C/644/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 1.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

Annexes A to J form an integral part of this standard.

Annex K is for information only.

IEC 61347 consists of the following parts, under the general title *Lamp controlgear*:

- Part 1: General and safety requirements
- Part 2-1: Particular requirements for starting devices (other than glow starters)
- Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps.
- Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps
- Part 2-4: Particular requirements for d.c. electronic ballasts for general lighting
- Part 2-5: Particular requirements for d.c. supplied electronic ballasts for public transport lighting
- Part 2-6: Particular requirements for d.c. supplied electronic ballasts for aircraft lighting
- Part 2-7: Particular requirements for d.c. supplied electronic ballasts for emergency lighting
- Part 2-8: Particular requirements for ballasts for fluorescent lamps
- Part 2-9: Particular requirements for ballasts for discharge lamps (excluding fluorescent lamps)
- Part 2-10: Particular requirements for electronic invertors and convertors for high-frequency operation of cold start tubular discharge lamps (neon tubes)
- Part 2-11: Particular requirements for miscellaneous electronic circuits used with luminaires¹⁾

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

¹⁾ To be published.

INTRODUCTION

This first edition of IEC 61347-2-3, published in conjunction with IEC 61347-1, represents an editorial review of IEC 60928. The formatting into separately published parts provides for ease of future amendments and revisions. Additional requirements will be added as and when a need for them is recognized.

This standard, and the parts which make up IEC 61347-2, in referring to any of the clauses of IEC 61347-1, specify the extent to which such a clause is applicable and the order in which the tests are to be performed; they also include additional requirements, as necessary. All parts which make up IEC 61347-2 are intended to be self-contained and, therefore, do not include references to each other. However, for the case of emergency lighting lamp controlgear, some cross-referencing has been necessary.

Where the requirements of any of the clauses of IEC 61347-1 are referred to in this standard by the phrase "The requirements of clause n of IEC 61347-1 apply", this phrase is interpreted as meaning that all requirements of the clause in question of part 1 apply, except any which are clearly inapplicable to the specific type of lamp controlgear covered by this particular part of IEC 61347-2.

LAMP CONTROLGEAR –

Part 2-3: Particular requirements for a.c. supplied electronic ballasts for fluorescent lamps

1 Scope

This part of IEC 61347 specifies particular safety requirements for electronic ballasts for use on a.c. supplies up to 1 000 V at 50 Hz or 60 Hz with operating frequencies deviating from the supply frequency, associated with fluorescent lamps as specified in IEC 60081 and IEC 60901, and other fluorescent lamps for high-frequency operation.

Particular requirements for electronic ballasts with means of protection against overheating are given in annex C.

Particular requirements for a.c./d.c. supplied electronic ballasts for maintained emergency lighting are given in annex J.

Performance requirements are the subject of IEC 60929.

2 Normative references

For the purpose of this part of IEC 61347, the normative references given in clause 2 of IEC 61347-1 which are mentioned in this standard apply, together with the following normative references.

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

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

IEC 61347-2-7, *Lamp controlgear – Part 2-7: Particular requirements for d.c. supplied electronic ballasts for emergency lighting¹⁾*

3 Definitions

For the purpose of this part of IEC 61347, the definitions of clause 3 of IEC 61347-1 apply, together with the following:

3.1

a.c. supplied electronic ballast

mains-supplied a.c. to a.c. inverter including stabilizing elements for starting and operating one or more tubular fluorescent lamps, generally at high frequency

¹⁾ To be published.