

Title: **SPECIFICATION FOR SMALL
POWER DISTRIBUTION UNIT
FOR SPLIT PREPAYMENT
METERING (READY BOARD)
FOR SINGLE-PHASE 230V
SERVICE CONNECTIONS
STANDARD**

Unique Identifier: **240-75659896**

Alternative Reference Number: **<n/a>**

Area of Applicability: **Engineering**

Documentation Type: **Standard**

Revision: **2**

Total Pages: **12**

Next Review Date: **March 2022**

Disclosure Classification: **Controlled
Disclosure**

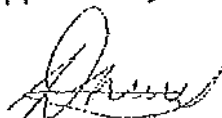
Compiled by



Jutas Maudu
Senior Engineer

Date: 28/03/2017

Approved by



Riaz Asmal
MV/LV SC Chairperson

Date: 22 March 2017

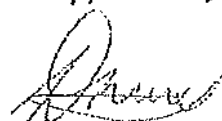
Authorized by



Bheki Ntshangase
Senior manager HV Plant

Date: 29/3/2017

Supported by SCOT/SC



Riaz Asmal
SCOT/SC Chairperson

Date: 22 March 2017

Content

	Page
1. Introduction	3
2. Supporting Clauses	3
2.1 Scope	3
2.1.1 Purpose	3
2.1.2 Applicability	3
2.2 Normative/Informative References.....	3
2.2.1 Normative.....	3
2.2.2 Informative	3
2.3 Definitions.....	4
2.3.1 General	4
2.4 Abbreviations.....	4
2.5 Roles and Responsibilities	4
2.6 Process for monitoring	4
2.7 Related/Supporting Documents	4
3. Requirements	4
3.1 Specification for Small Power Distribution Unit for Split Prepayment Metering (Ready Board) for Single-Phase 230V Service Connections	4
3.1.1 General	4
3.1.2 Miniature circuit-breakers in addition to SANS 1619 clause 4.6.5.....	5
3.1.3 Earth leakage protection in addition to SANS 1619 clause 4.5	5
3.1.4 Fire resistance/flammability SANS 1619 clause 4.2	5
3.2 Tests.....	5
3.3 Marking, Labelling and Packaging	5
3.4 SPD layout.....	6
4. Authorisation.....	6
5. Revisions	6
6. Development team	6
7. Acknowledgements	6
Annex A – Impact Assessment.....	7
Annex B – - Schedules A and B	10

1. Introduction

This specification sets out Eskom's specific requirements for small power distribution units (readyboards) for split prepayment meter single phase 230V service connections, applicable to all suppliers of such ESKOM equipment.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

This specification specifies Eskom's requirements for the manufacture and supply of small power distribution units for nominal system a.c. voltages up to and including 1 kV. It is intended for use in overhead/underground network, single-phase connections to a customer's installation.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions.

2.2 Normative/Informative References

For the purpose of this specification, the references given in SANS 1507-6 will apply

2.2.1 Normative

Parties using this document shall apply the most recent edition of the documents listed below:

- [1] Occupational Health and Safety Act. Act no 85 of 1993.
- [2] SANS 60529: 2001, Degrees of protection provided by enclosures (IP Code)
- [3] ANSI/UL 94:1990, Flammability of plastic materials for parts in devices and appliances, test for,
- [4] SANS 164-1:1992, Plugs and socket-outlets for household and similar purposes. Part 1: Conventional system (6 A and 16 A, 250 V)
- [5] SANS 1619:1995, Electricity distribution small power distribution units (readyboards) for single-phase 230 V service connections.
- [6] 240-75659670, Concentric service cable with communication cores for split prepayment metering.
- [7] DSP _34-1708, Eskom requirements for earth leakage units.
- [8] D-DT-0358: Service-mounting dimensions of electricity dispenser and readyboard to dwelling.
- [9] D-DT-3051: Bracket steel, base/readyboard.
- [10] D-DT-0359: Service-mounting of electricity dispenser or readyboard
- [11] D-DT-3176: Readyboard, split prepayment meter.

2.2.2 Informative

None

2.3 Definitions

2.3.1 General

For the purpose of this specification, the definitions (for terms not given below) and abbreviations given in SANS 1507-1 shall apply.

Definition	Description
Small power distribution unit (readyboard):	The SPDU shall comprise of a completely assembled, closed and wired unit with both the Earth Leakage Breaker Unit and 20A MCB mounted on a Din Rail with conduit to a separate socket outlet box, all mounted on bracket rails

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Description
ELU	Earth Leakage Unit
MCB	Miniature Circuit Breaker
SPDU	Small Power Distribution Unit(s) (ready board)

2.5 Roles and Responsibilities

The relevant sections within Eskom Distribution are responsible to implement the new design according to the requirements as listed in this document

2.6 Process for monitoring

Adherence to this document shall be monitored through routine inspections

2.7 Related/Supporting Documents

Not applicable.

3. Requirements

3.1 Specification for Small Power Distribution Unit for Split Prepayment Metering (Ready Board) for Single-Phase 230V Service Connections

3.1.1 General

- All SPDU's for split prepayment meters shall comply with the requirements of SANS 1619. Material group and colour of SPDU shall comply with SANS 141 and SANS 1091 respectively. Other Eskom's requirements shall be included below in addition to the Schedules. The section should contain the body of the document, with all the requirements.
- The SPDU manufacturer shall be requested to supply the SPDU completely assembled, closed and wired unit with both Earth leakage unit and MCB mounted on a Din-Rail with cable (D-DT 3176) to separate socket outlet box, all mounted on bracket rail. Bracket rails shall be supplied with plastic grommets, mounting bolts and nuts to be used to mount SPDU in the customer's house.
- Eskom approved Earth leakage Breaker Unit shall be in accordance with 240-75661113 (DSP_34-1708). MCB shall be supplied by the SPDU manufacturer/supplier.

ESKOM COPYRIGHT PROTECTED

- d) SPDU shall be supplied with an M20 hole, drilled at the bottom left hand side of the base for cable entry, this entry point must be sealed with a No.1 sized cable gland. Dimensions of completely assembled SPDU shall comply with D-DT 3176. Degree of protection shall be IP31 according to SANS 1222.
- e) SPDU shall include an Earth/Neutral and Live Busbars securely mounted in the base to accommodate for 10mm² sized conductors. See D-DT 3176. Busbars shall be made of copper or brass. Busbar minimum current rating shall be 60A. Wires used for connection socket shall comply with SANS 1507.
- f) SPDU shall include a DIN-Rail securely mounted inside the base to accommodate for the Earth Leakage Breaker Unit and 20A MCB. When ELU and MCB are in the closed position the minimum phase - to phase / neutral / earth clearance shall be 20mm.
- g) Each SPDU shall be supplied with an abridged certificate of compliance (installation certificate) signed by the manufacturer, and this document must be supplied in triplicate format.
- h) The wall box shall have lugs on which an assembly consisting of the two socket outlets and two switches shall be mounted. The mounting centres for the assembly shall be in accordance with the mounting centres for a 105.5 x 105.5 mm flush mounting wall outlet box as specified in SANS 1085. The width of the lugs shall comply with SANS 1085 (10 mm). The holes in the lugs shall be suitable for a 4mm diameter fixing screw. Replacement parts for the assembly and cover plate used shall be available off the shelf. There shall be no gaps between the wall outlet box and the cover plate when it is fitted. The connection conductors shall be 2.5 mm² in conduit to socket outlet box.
- i) The cover for the base shall fit easily and there should be no signs of visible spaces or gaps. The screws used to secure the cover onto the base should have provision for a 'seal' that can be applied to prevent tampering of unit. The cover for the base shall include holes drilled to accommodate and mount the different customer interface units (CIU's) used for split prepayment metering applications and there must also include provision for the communication wires.

3.1.2 Miniature circuit-breakers in addition to SANS 1619 clause 4.6.5

The standard DIN-type rail for mounting the associated miniature circuit-breaker shall be used. The rails shall be such that the Earth Leakage Unit and 20A MCB are in a vertical position.

3.1.3 Earth leakage protection in addition to SANS 1619 clause 4.5

The earth leakage unit shall comply with 240-75661113 (DSPP_ 34-1708). No overload protection is required in the earth leakage unit.

3.1.4 Fire resistance/flammability SANS 1619 clause 4.2

The SPDU shall comply with ANSI/UL 94, classification VI.

3.2 Tests

The tests described in ANSI/UL 94 shall be performed. Tests shall be performed in accordance with SANS 1619.

3.3 Marking, Labelling and Packaging

The complete unit shall be marked legibly and indelibly with the manufacturer's name (outside), and the year manufactured (inside).

The labelling for the SPDU shall be applied on the cover of base. Labelling shall also include "Earth leakage main switch" and "PLUGS" below the ELU and MCB respectively.

Packaging shall not damage the unit and the method of packing shall be specified in Schedule B.

3.4 SPDU layout

The typical SPDU layout for split prepayment metering application shall be in accordance with D-DT-3176

4. Authorisation

This document has been seen and accepted by:

Name and surname	Designation
Jutas Maudu	Senior Engineer
Riaz Asmal	MV/LV SC Chairperson
Roger Cormack	Senior manager HV Plant

5. Revisions

Date	Rev	Compiler	Remarks
March 2017	2	Jutas Maudu	Document content transferred from old template to latest SCOT template, no technical changes on the document.
Feb 2014	1	Jutas Maudu	Document reformatted. No content change. This document supersedes document DSP_34-2025 No change in content; change in format
Jan 2010	0	Jutas Maudu	New standards

6. Development team

- AJ Maudu
- S Goonoa

7. Acknowledgements

Not applicable.

Annex A – Impact Assessment

Impact assessment form to be completed for all documents.

1) Guidelines

- All comments must be completed.
- Motivate why items are N/A (not applicable)
- Indicate actions to be taken, persons or organisations responsible for actions and deadline for action.
- Change control committees to discuss the impact assessment, and if necessary give feedback to the compiler of any omissions or errors.

2) Critical points

2.1 Importance of this document. E.g. is implementation required due to safety deficiencies, statutory requirements, technology changes, document revisions, improved service quality, improved service performance, optimised costs.

New technology for split prepayment metering

2.2 If the document to be released impacts on statutory or legal compliance - this need to be very clearly stated and so highlighted.

N/A

2.3 Impact on stock holding and depletion of existing stock prior to switch over.

New stock shall be in accordance with this specification.

2.4 When will new stock be available?

During implementation of this document.

2.5 Has the interchangeability of the product or item been verified - i.e. when it fails is a straight swap possible with a competitor's product?

Yes

2.6 Identify and provide details of other critical (items required for the successful implementation of this document) points to be considered in the implementation of this document.

N/A

2.7 Provide details of any comments made by the Regions regarding the implementation of this document.

None

3) Implementation timeframe

3.1 Time period for implementation of requirements.

N/A

3.2 Deadline for changeover to new item and personnel to be informed of DX wide change-over.

No deadline

4) Buyers Guide and Power Office

4.1 Does the Buyers Guide or Buyers List need updating?

Yes, Buyers Guide to be created

ESKOM COPYRIGHT PROTECTED

4.2 What Buyer's Guides or items have been created?

New item (Concentric cable with communication cores)

4.3 List all assembly drawing changes that have been revised in conjunction with this document.

None

4.4 If the implementation of this document requires assessment by CAP, provide details under 5

4.5 Which Power Office packages have been created, modified or removed?

Packages to be created

5) CAP / LAP Pre-Qualification Process related impacts

5.1 Is an ad-hoc re-evaluation of all currently accepted suppliers required as a result of implementation of this document?

No

5.2 If NO, provide motivation for issuing this specification before Acceptance Cycle Expiry date.

-Concentric cable with communication cores not on LAP.

-Revision to be done every 5 years.

5.3 Are ALL suppliers (currently accepted per LAP), aware of the nature of changes contained in this document?

N/A

5.4 Is implementation of the provisions of this document required during the current supplier qualification period?

N/A

5.5 If Yes to 5.4, what date has been set for all currently accepted suppliers to comply fully?

N/A

5.6 If Yes to 5.4, have all currently accepted suppliers been sent a prior formal notification informing them of Eskom's expectations, including the implementation date deadline?

N/A

5.7 Can the changes made, potentially impact upon the purchase price of the material/equipment?

New document.

5.8 Material group(s) affected by specification: (Refer to Pre-Qualification invitation schedule for list of material groups)

None

6) Training or communication

6.1 Is training required?

Yes.

6.2 State the level of training required to implement this document. (E.g. awareness training, practical / on job, module, etc.)

No formal training.

6.3 State designations of personnel that will require training.

IARC,T&Q personnel and FS.

6.4 Is the training material available? Identify person responsible for the development of training material.

Training Module to be created by IARC and T&Q

6.5 If applicable, provide details of training that will take place. (E.G. sponsor, costs, trainer, schedule of training, course material availability, training in erection / use of new equipment, maintenance training, etc).

N/A

6.6 Was Technical Training Section consulted w.r.t module development process?

N/A

6.7 State communications channels to be used to inform target audience.

Through T&Qs

7) Special tools, equipment, software

7.1 What special tools, equipment, software, etc will need to be purchased by the Region to effectively implement?

None.

7.2 Are there stock numbers available for the new equipment?

Not yet

7.3 What will be the costs of these special tools, equipment, software?

8) Finances

8.1 What total costs would the Regions be required to incur in implementing this document? Identify all cost activities associated with implementation, e.g. labour, training, tooling, stock, obsolescence

Comment:

.....
.....
.....

Impact assessment completed by:

Name: AJ Maudu

Designation: Senior Engineer

Annex B – - Schedules A and B

(Normative)

The schedules A and B in this annex are included in this document for information only. They are intended to be a guide to purchasers. It includes Eskom's specific technical requirements, to help prepare schedules which are applicable to a particular enquiry or tender.

**REQUIREMENTS FOR A COMPLETELY ASSEMBLED SMALL POWER DISTRIBUTION UNIT (SPDU)
MOUNTED ON BRACKET RAILS WITH CONDUIT TO SOCKET OUTLET BOX**

Schedule A: Eskom Distribution specific requirements

Schedule B: Guarantees and technical particulars of equipment

			Schedule A	Schedule B
Item number	DSP 240-75659896 Clause No.	Technical details	Eskom	Suppliers Offer
		General		
1	4.1.1	Material of SPDU enclosure	GRP (type F laminate)	
		Specification to which SPDU material complies	SANS 141 for GRP	
		Colour of SPDU	Ivory (B77) to SANS 1091	
2	4.1.2	Rails supplied with all plastic grommets, mounting bolts and nuts to be used to mount SPDU in the customers house. Eskom drawings D-DT-0358, D-DT-0359, D-DT-3051 .		
3	4.1.4	A No.1 sized compression gland is to be supplied for cable entry point at the bottom left of SPDU base. These should be removable without damaging the gland or cable.	Yes	
		Dimensions of completely assembled SPDU, as compact as possible	See D-DT 3176	
		Degree of protection of completely assembled unit	IP31 to SANS 1222	
4	4.1.5	Material of live, neutral and earth busbars	copper or brass	
		Rating of neutral/earth busbars and live busbar	60 A (min)	A
		Size of conductor that the neutral/earth and live busbars can accommodate	10 mm ² stranded copper	
		Identification markings for earth busbars and Live busbar respectively.	E or EARTH and L or LIVE	
		Provision to be made on the neutral/earth and live busbars for a 16 mm ² conductor	YES	

ESKOM COPYRIGHT PROTECTED

**SPECIFICATION FOR SMALL POWER DISTRIBUTION
UNIT FOR SPLIT PREPAYMENT METERING (READY
BOARD) FOR SINGLE-PHASE 230V SERVICE
CONNECTIONS STANDARD**

Unique Identifier: **240-75659896**Revision: **2**Page: **11 of 12**

		Specification to which wires comply	SANS 1507 (Table 8) For 600 V/1 000 V	
		Size of wire from earth leakage unit to earth busbar	Between 6 & 10 mm ² stranded copper	
	4.1.6	When ELU and MCB are in the closed position the minimum phase - to phase / neutral / earth clearance shall be 20mm.	YES	
5		Type of mounting rail for protection devices	DIN rail	
		Corrosion protection of rail if made of steel	hot-dip galvanised	
6	4.1.7	An abridged Certificate of compliance (in accordance with Occupational Health and Safety Act 1992 and Electrical Installation Regulations 1993) is required with each SPD. This document must be provided in triplicate format	YES	
	4.1.8	Number and rating of socket outlets with its associated switches	2 x 16 A	A
		Size and type of wires to socket-outlets	2,5 mm ² stranded copper	
7	4.1.9	The cover for the base shall fit easily and there should be no signs of visible spaces or gaps.	YES	
8		The screws used to secure the cover onto the base should have provision for a 'seal' that can be applied to prevent tampering of unit. Specify the type of seal.	Preferred	
		The cover for the base shall include holes drilled to accommodate and mount the different customer interface units (CIU's) used for split prepayment metering applications and there must also include provision for the communication wires	YES	
9	4.2	MCB complies with SANS 1619 – 4.6.5	YES	
		Number and rating of MCB	240 V, 50 Hz 1 x 20 A	V, Hz A
	4.3	Specification to which earth leakage unit complies	SANS 767-1	
	5	Type and Routine tests to be carried out in accordance with SANS 1619 – 5.1 and 5.2 respectively and results provided with tender?	YES	
10		SPDU comply with SANS 1619?	YES	
		SPDU comply with this specification? If	YES	

ESKOM COPYRIGHT PROTECTED

**SPECIFICATION FOR SMALL POWER DISTRIBUTION
UNIT FOR SPLIT PREPAYMENT METERING (READY
BOARD) FOR SINGLE-PHASE 230V SERVICE
CONNECTIONS STANDARD**

Unique Identifier: **240-75659896**Revision: **2**Page: **12 of 12**

		NO, list all deviations points separately.		
	6	Packaging shall not damage the unit, Specify method of packaging		
		Labelling shall also include “ <small>EARTH LEAKAGE</small> ” and “ PLUGS ” below <small>MAIN SWITCH</small> the ELU & MCB respectively.	YES	
		Labelling applied on the base of SPDU and must be in English and of good quality, lettering shall not fade and the adhesive shall adhere firmly to the SPDU surface. With Electric shock hazard sign SANS 1186 - WW7 with (1) IN CASE OF ACCIDENTAL CONTACT OR LEAKAGE SWITCH OFF THIS MAIN SWITCH IMMEDIATELY, (2) TEST OFTEN – (1) & (2) should be applied next to the Earth Leakage Unit.	YES	
11		The complete unit shall be marked legibly and indelibly with the following information: (1) the manufacturer's name & trademark (outside), (2) the year manufactured (inside)	YES	

ESKOM COPYRIGHT PROTECTED