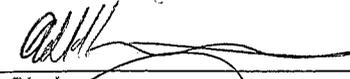


| | |
|----------------|---|
| Document Name: | Specification for switch disconnectors and circuit breakers |
| Document No.: | NE-NT-SP-0049 |
| Version No.: | 1.0 |

| | |
|--------------|---------------------|
| Author: | Willem Grobbelaar |
| Domain: | Network Engineering |
| Review Date: | June 2013 |

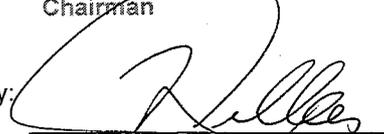
Recommended by
DRC:


Chairman

Date:

2012/05/13

Approved By:


Chief Technical Officer

Date:

25/05/2012

1 SCOPE

The scope of this specification is limited to the requirements for circuit breakers and switch disconnectors to be used in the Broadband Infraco network (AC and DC applications).

2 REFERENCE DOCUMENTATION

- SANS 60947-2/IEC 60947-2 – Low voltage switchgear and controlgear – Part 2: Circuit-breakers
- SANS 60947-3/IEC 60947-3- Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse combination units
- SANS 10142-1 – Wiring of premises
- NE-NT-SP-0009 - Technical Requirement Specification: Rectifiers and Batteries

3 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

3.1 Acronyms and abbreviations

| Acronym | Description |
|----------------|--|
| 1P | Single/One Pole |
| 3P | Three poles |
| AC | Alternating Current |
| DC | Direct Current |
| DIN | A DIN rail or top-hat rail is a standardized 35 mm wide metal rail with hat-shaped cross section widely used for mounting circuit breakers and industrial control equipment inside equipment racks |
| e.g. | exempli gratiā, meaning "for example" |
| I _c | Interrupting current |
| PSCC | Prospective short circuit current |
| SABS | South African Bureau for Standardisation |
| SANS | South African National Standard |
| V | Voltage |

To find Acronym expansions go to <http://www.acronymfinder.com/>

4 GENERAL INFORMATION

4.1 Key Indications

Each requirement of the technical specification carries a letter appended at the end, with the following meanings:

[G] General Information

[M] Mandatory requirement

[I] Information

[D] Description

5 SPECIFICATION

The technical requirements of the cabinets are specified in the following sections.

5.1 Circuit Breakers

- 5.1.1 Offered circuit breakers and switch disconnectors shall be from the same manufacturer of the same range to be used in all AC application and DC application. [M]
- 5.1.2 Circuit breakers shall comply with SANS 60947-2/IEC 60947-2. [M]
- 5.1.3 All circuit breakers shall have thermal and magnetic protection against over-currents and short circuits with isolating properties. [M]
- 5.1.4 Circuit breakers supplied in the range shall be miniature DIN rail mounted circuit breakers and standard 18mm wide and capable of accepting at least 35mm² cables. In certain cases 50mm² cables may be required and additional accessory should be available on request in these cases [M]
- 5.1.5 Breaking capacities at 230V AC and 48V DC to be referenced to nominal rating at $\geq 40^{\circ}\text{C}$ and should be able to operate in a temperature up to 50 $^{\circ}\text{C}$ minimum. [M]
- 5.1.6 All circuit breakers shall be SANS certified to be used in AC and DC applications. AC breakers shall be able to withstand and break up to 10kA (Note: If the relevant tests were conducted to measure the relevant PSCC then a I_c value of 5/6kA may be used if the relevant PSCC value is lower than 5kA) at 230V AC (phase to neutral) and DC breakers be able to withstand and break up to 15kA at 48V DC. Documented proof from a SANS accredited facility indicating compliance to SANS 60947-2/IEC 60947-2 with the applicable I_c values (for AC and DC) of the proposed breakers shall be submitted with the tender/quote responds. [M]
- 5.1.7 Where additional breakers need to be installed in certain rectifier cabinets (Type 4 as per NE-NT-SP-0009), these breakers will require a higher I_c value (20kA). [M]
- 5.1.8 Circuit breaker current ratings to be available (1P and 3P configuration): [M]

| Number | Current ratings |
|--------|-----------------|
| 1 | 6A |
| 2 | 10A |
| 3 | 16A |
| 4 | 20A |
| 5 | 25A |
| 6 | 32A |
| 7 | 40A |
| 8 | 50A |
| 9 | 63A |

Table 1: Circuit breaker ratings

5.2 Switch Disconnectors

- 5.2.1 All switch-disconnectors shall comply with SANS 60947-3/IEC 60947-3. (Proof is required to be supplied). [M]
- 5.2.2 Switch-disconnectors are required to disconnect and reconnect ON-LOAD at nominal voltage operating voltages (230V AC and 48V DC). [M]
- 5.2.3 Switch disconnectors shall be miniature DIN rail mounted and capable of accepting at least 35mm² cables. In certain cases 50mm² cables may be required and additional accessory should be available on request in these cases [M]
- 5.2.4 Switch disconnector current ratings to be available (1P and 3P configuration): [M]

| Number | Current ratings |
|--------|-----------------|
| 1 | 63A |
| 2 | 100A |
| 3 | 125A |

Table 2: Switch disconnector ratings

END

APPENDIX SCHEDULE OF COMPLIANCE / NON-COMPLIANCE / INFORMATION

Suppliers are required to complete this schedule and must take note of the following:

- A detailed statement of compliance or non-compliance, accompanied by reasons (if any) for every requirement called for in the specification, must be submitted. The detailed statements must be in the format as provided as per this specification. Where needed, further notes may also be appended to the schedule.
- The relevant brochure/s and test report/s shall be submitted with all quotes/tenders
- It must be clearly stated whether the equipment offered, for each of the specified requirements, is:
 - **Fully Compliant**, or
 - **Non-compliant**
- Phrases such as "**noted**" must only be used against paragraphs that are for information only and carry no contractual commitment.
- Phrases such as "**noting**", "**will comply**" and "**comply, except**", in a paragraph that requires a

compliance or non-compliance statement will be read as non-compliance.

6. The letter appended at the end of each paragraph in the specification requires the following type of response:

[G] General Information – note paragraph

[M] Mandatory requirement – a statement of compliance, non-compliance or a degree of compliance

[I] Information – gives actual values, quantities or other specific details called for

[D] Description – gives a description of the function of the feature as requested

| 5.1 Circuit breakers | | | |
|----------------------|-----|---|--------------------------|
| Specification | Key | Fully Compliant / Non-compliant / Noted | Comments (if applicable) |
| 5.1.1 | M | | |
| 5.1.2 | M | | |
| 5.1.3 | M | | |
| 5.1.4 | M | | |
| 5.1.5 | M | | |
| 5.1.6 | M | | |
| 5.1.7 | M | | |
| 5.1.8 | M | | |
| 5.1.8.1 | M | | |
| 5.1.8.2 | M | | |
| 5.1.8.3 | M | | |
| 5.1.8.4 | M | | |
| 5.1.8.5 | M | | |
| 5.1.8.6 | M | | |
| 5.1.8.7 | M | | |
| 5.1.8.8 | M | | |
| 5.1.8.9 | M | | |

| 5.2 Switch Disconnectors | | | |
|--------------------------|-----|---|--------------------------|
| Specification | Key | Fully Compliant / Non-compliant / Noted | Comments (if applicable) |
| 5.2.1 | M | | |
| 5.2.2 | M | | |
| 5.2.3 | M | | |
| 5.2.4 | M | | |
| 5.2.4.1 | M | | |
| 5.2.4.2 | M | | |