Discipline
Engineering Standard - NSW

Category
Signalling

Title
Power Supply Units for Signalling Equipment - DC (Unfiltered) Units.

Reference Number
SPS 27 - (RIC Standard: SC 09 10 04 00 SP)

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About This Standard

This Specification describes the specific requirements for unfiltered DC Power Supply Units to be manufactured and supplied to ARTC or to Contractors to ARTC, for Signalling applications.
Document History

Primary Source – RIC Standard SC 09 10 04 00 SP Version 3.0

List of Amendments –

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1. **Introduction**

   This Specification describes the specific requirements for unfiltered DC Power Supply Units to be manufactured and supplied to ARTC or to Contractors to ARTC, for Signalling applications.

   Specification SPS 22 shall form part of this Specification.

2. **Applicable Documents**

2.1. **ARTC Specifications**

   This Specification refers to the following ARTC Specifications:

   - Specification SPS 05: Ratings of Components for Construction Requirements
   - Specification SPS 22: Power Supply Units for Signalling Equipment-General Requirements

3. **Types of Units**

   **Power supply input voltage requirements:**

   120VAC50H and the expected voltage variation 95V-130V

   **Power supply output requirements**

   Types of (Unfiltered) Power Supply Units covered by this Specification shall be as follows:

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<td>Power Supply Unit-DC Unfiltered 12V, 1A DC</td>
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<td>DC402</td>
<td>Power Supply Unit-DC unfiltered 24V, 5A DC (superseded twin channel unit)</td>
<td>(Store 107)</td>
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<tr>
<td>DC403</td>
<td>Power Supply Unit-DC Unfiltered 50V, 0.2A (10VA)</td>
<td>(Store 87)</td>
<td>SPS 27</td>
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<tr>
<td>DC404</td>
<td>Power Supply Unit-DC unfiltered 50V, 2.5A DC</td>
<td>(Store 103)</td>
<td>SPS 27</td>
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4. **Electrical Requirements**

   Components shall conform to the requirements of Specification SPS 05.

4.1. **Rating**

   The rating of the units shall be as specified and the whole of the equipment shall be capable of supplying continuously, and (if applicable) with one or other of the transformer sets inoperative, the maximum voltage and the current required for the unit.
4.2. Input Voltage

The input voltage for ARTC type DC403 shall be as per the drawing M08-435. The input voltages for the remaining items shall be as per Specification SPS 22.

4.3. Output Voltage

The output voltage of the equipment at the nominal input shall be within the nominal voltage - 5% at full load. (Refer to Specification SPS 22 for load Regulation requirements)

4.4. Transformer

The transformer shall comply with AS 2374.

The primary windings shall be provided with tappings to suit input voltages as per Specification SPS 22. The transformer primaries shall be wound with a minimum of 20 B&S gauge wire or equivalent.

The secondaries shall be provided with an additional tappings such that the output voltage of the unit can be increased by 10% above rated value at full load.

The magnetising current shall not exceed the following values:

- for 12V/1A unit: 40mA
- for 24V/5A unit: 100mA,
- for 24V/15 A unit: 250mA,
- for 50V/2.5A unit: 200mA,
- for 50V/0.2A unit: 40mA.

4.5. Rectifier

The rectifier shall have a minimum Peak Inverse Voltage rating of 1KV.

4.6. Termination

Transformer input and output tappings shall be terminated external to the units on "Klippon" BK series terminal blocks or equivalent. Each termination shall be clearly and permanently identified.

The 50V/0.2A and 12V/1A unit shall have Klippon type "BK6" terminal blocks or equivalent.

The 24V/5A and 50V/2.5A unit shall have terminal blocks Klippon type BK or equivalent for the input and output terminals which shall be external to the unit when mounted to the standard rack (refer drawing M08-429 for RSA standard rack).

For 24V/15A DC units shall have terminals consisting of 6mm brass studs on 25mm centres protruding 40mm from the insulating material and each shall be identified as shown on the drawing M08-801. Separate internal terminals shall be provided for the AC input terminations and the indicator outputs (if applicable) and the outgoing DC supplies.
4.7. **Indications**

Refer to Specification SPS 22.

LED indicators shall be provided through the front of the case. The lamps shall be mounted separate from and not inhibit the removal of the unit cover.

5. **Mechanical Requirements**

Refer to Specification SC 091000 00 SP.

5.1. **Housing**

No housing shall be provided for 50V/0.2A DC (ARTC type DC403) and 12V/1A DC units.

Power supplies units with ratings 25VA to 150VA shall be totally enclosed in sheet metal cases to suit rack mounting, with removable covers providing ready access to all the enclosed equipment for replacement.

In case of power supply units greater than 150VA, it shall be designed for panel mounting. Two 30mm bushed holes shall be provided in the base for cable entry.

5.2. **Labelling**

Labelling on the terminals and power supply unit to be provided as appropriate.
Drawings

M08-429 – Standard rack layout for DC Power Supply equipment
M08-430 - Power Supply Unit, DC unfiltered 50V 2.5A (Store 103)
M08-435 - Power Supply Unit, DC unfiltered 50V 0.2A (Store 87)
M08-801 - Power Supply Unit, DC unfiltered General circuit diagram
**Title:** Power Supply Units for Signalling Equipment – DC (Unfiltered) Units

**NOTE:**
Component layout to be taken as a guide only. Base layout and dimensions to be as shown.

Components should not protrude beyond perimeter of base.

Space for silicon bridge rectifier.

Component mounting screws should be physically prevented from coming loose and making contact with mounting structures.

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**Diagram:**

- Component layout diagram with dimensions and notes.
- Circuit diagram showing voltage levels and connections.

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**Drawing Information:**

- **Date:** 24/08/1992
- **Approved:**
- **Issue:** 1
- **Revision:** 3
- **Page:** 12 of 13
CIRCUIT DIAGRAM

TRANSFORMERS PROVIDED WITH TAPS
AS DETAILED IN SPECIFICATION 1621

THIS PROVIDES THE GENERAL CIRCUIT DIAGRAM
FOR THE FOLLOWING POWER SUPPLY UNITS-DC UNFILTERED

12V, 1A DC AS PER MB-435, SEE NOTE 4
24V, 5A DC [STORE 101], SEE NOTES 1,3,4,5,6
15A DC SINGLE CHANNEL, SEE NOTES 2,3,4,5,6
50V, 0.2A [STORE 91] AS PER DRAWING MB-435, SEE NOTE 4
50V, 2.5A [STORE 90 & STORE 103], SEE NOTES 1,3,4,5,6
[STORE 103 SUPERSEDES STORE 90]
REFER DRAWING MB-430 FOR CASE DETAILS

NOTES:
1. 2 X [STORE 101] UNITS REPLACES [STORE 82] UNIT WITH TWIN CHANNELS
   REFER DRAWING NO. MB-435 FOR CASE DETAILS
   SAME DIMENSIONS APPLY TO THIS UNIT, LABELS ARE
   TO BE PROVIDED APPROPRIATELY
2. 25mm BUSHED HOLES TO BE PROVIDED ON BOTTOM OF UNIT
3. VENTILATION TO BE PROVIDED
4. LED DISPLAY TO BE PROVIDED
5. COVER SHOULD BE REMOVABLE AND ALLOW ACCESS, FRONT AND SIDES.
6. BASE PLATE SHALL BE 2mm THICK MILD STEEL