FUJITSU Component PDU
400V class DC PDUs, Socket-outlets and Plugs for DC Power Supply Systems

The 400V class DC power supply system has caught the attention of the ICT field as demands for power rapidly increase. 400V DC power socket-outlets and plugs have excellent safety and practicality are indispensable.

ICT field utilizes direct current (DC) for not only ICT equipment but also UPS storage. Repeated AC/DC and DC/AC conversions through AC distribution systems cause substantial energy loss. In order to realize a sustainable society, energy savings and CO₂ reduction are urgent social issues. From this background, the 400V class DC power supply system has caught the attention of the ICT field because higher power supply efficiency is possible.

Fujitsu Component offers 10A-400V DC power socket-outlets and plugs, which can connect DC power lines and ICT appliances safely.
The PDUs, socket-outlets and plugs are collaboratively developed with NTT FACILITIES, INC.
(Patent pending: patent publication number WO2011/102516 A1 etc.)

- **Key Features**

  **400VDC-PDU**
  - 5 or 10 socket outlets per bar.
  - The socket-outlet mates with IEC TS62735-1 plug. (Refer to page 3)
  - The mating face shape conforms to IEC TS 62735-2. (*1)

  **Socket-outlets**
  - The Socket-outlet has magnetic arc-extinguishing module
  - Mechanical switch has multiple safety designs:
    - It is impossible to operate the switch when the plug is not inserted into the socket-outlet
    - Power flow starts when built-in switch is activated
    - Plug can not be withdrawn while power is ON
  - Ground terminal: First make, last break
  - The socket-outlet mates with IEC TS62735-1 plug (refer to page 3)
  - The mating face shape conforms to IEC TS 62735-2 (*1)

  **Plug-cables**
  - Cable termination options:
    - With "Saf-D-Grid" plug (*2)
    - With round crimp connector
    - No connector
  - The mating face shape conforms to IEC TS 62735-2 (*1)

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*1: Refer to "IEC TS 62735-1 Compatibility" on page 3.
## Safety performance

**Unique mechanical construction ensures safety performance (Neither complicated control circuit nor semiconductor is used)**

- **Plug detection switch**: It detects plug insertion and unlocks switching operation.
- **Operation switch**: A switch to start power from socket-outlet to plug. The switch cannot operate when plug is not inserted.
- **Plug lock pin**: It prevents unexpected withdrawal of plug. It works only when plug is inserted and power is ON.
- **Arc extinguishing module**: A mechanical module which breaks arc discharge, which is generated between contacts when DC power connection is broken, in a short time with built-in permanent magnet.
- **Earth terminal**: Its "first make, last break" construction prevents electric shock and damage to the equipment caused by potential difference.
- **Miss insertion prevention figure**: Figure of each mating face prevents wrong insertion.

**No current is applied onto socket-outlet’s electrode terminals when plug is not inserted or when operation switch is off.**

**Plug cannot be withdrawn when power is ON**

**Withdrawal force (reference, measured data)**

Force to withdraw a plug from socket when power is ON (the inserted plug is locked)

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Withdrawal force</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>225 N</td>
</tr>
<tr>
<td>2</td>
<td>190 N</td>
</tr>
<tr>
<td>3</td>
<td>210 N</td>
</tr>
</tbody>
</table>

**Temperature rise**

Temperature rise of plug terminals (at rated load)
Arc interruption by magnetic extinguisher

Arc discharge is generated when the energized contacts are released. To ensure safety, it is most important to prevent the arc discharge. The arc extinguish module in this socket can interrupt arc discharge in a very short time by combination of mechanical contact and permanent magnet.

Behavior of arc discharge

- Without magnetic arc extinguishing module
  10A-400V d.c was applied on between the contacts, then the contacts were removed at 75mm/s. (The contacts are made of silver (99.99%) and were formed into cylinder with a 5mm diameter)

Arc discharge was generated at contact gap. Wren 60ms passed after the arc started, the discharge created an upward arch. The discharge was about 80mm height just before it disappeared. Contact gap when the arc disappeared was 21.3mm.

- Effectiveness of magnetic arc extinguishing
  10A-400V d.c resistive load was applied on the socket, then the contacts were removed

Arc duration time was within 2 to 3ms. Contact gap when the arc disappeared was approx. 0.3mm.

Duration of arc discharge (when socket and plug are mating)

- 10A-400V d.c resistive load (no inrush current)

IEC TS Compatibility

Fujitsu Component’s socket-outlets are compatible with plugs conforming to IEC TS62735-1. Arc extinguishing function and plug lock function, which are not mandatory under IEC TS62735-1, work when using those plugs with our socket-outlet.

IEC TS62735-1 (2.6kW type)
- Arc extinguishing function is not required
- Plug lock function is not required

Note:
IEC published IEC TS62735-2 about power plug and socket-outlets system for 5.2kW rated power in December 2016. The mating face shapes of these products described in this document conform to IEC TS62735-2. However, the rated power of these products is 4kW (10A-400V d.c). When considering purchasing these products, please contact us.
## Product Overview (Please refer to the each datasheet for detailed specifications)

### 400VDC-PDU

<table>
<thead>
<tr>
<th>Part number (sample)*1</th>
<th>FDU-A305-** (5 outlets), FDU-A310-** (10 outlets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating (Power / Voltage / Current)</td>
<td></td>
</tr>
<tr>
<td>Input</td>
<td>10kW / 260~400V d.c. / 25A</td>
</tr>
<tr>
<td>Output (par 1 outlet)</td>
<td>4kW / 260~400V d.c. / 10A</td>
</tr>
</tbody>
</table>

### Socket-outlet

<table>
<thead>
<tr>
<th>Part number</th>
<th>FCN-961B003-G/1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating (Power / Voltage / Current)</td>
<td>4kW / 260~400V d.c. / 10A</td>
</tr>
</tbody>
</table>

### Plug-cables

<table>
<thead>
<tr>
<th>Part number (sample)*1</th>
<th>Cable length</th>
<th>Terminal treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDU-P115/AP-**</td>
<td>Approx. 1.5m</td>
<td>With 'Saf-D-Grid' plug (*2)</td>
</tr>
<tr>
<td>FDU-P120/AP-**</td>
<td>Approx. 2.0m</td>
<td>Round crimp connector</td>
</tr>
<tr>
<td>FDU-P130/AP-**</td>
<td>Approx. 3.0m</td>
<td>No connector</td>
</tr>
<tr>
<td>FDU-P115-**</td>
<td>4kW / 260~400V d.c. / 10A</td>
<td></td>
</tr>
<tr>
<td>FDU-P120-**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDU-P130-**</td>
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<td></td>
</tr>
</tbody>
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*1: Only samples are available in countries other than Japan. Please contact us for mass production model.

*2: 'Saf-D-Grid' is made by 'Anderson Power Product. Inc.'.

'Saf-D-Grid' and 'Anderson Power Product' are registered trademarks of 'Anderson Power Product. Inc.' in U.S.A. and other countries.

### Safety Precautions

- Always carefully read and understand the product manual and/or delivery specifications for proper operation and handling before actual use.
- Use only at the specified rated supply voltage.
- Never install the products in a wet, highly humid, dusty, oily or smoky environment.
- The products in this document are designed for general use. They are not for use in equipment that poses high fatal risks or danger and not for use requiring extremely high reliability such equipment in nuclear facilities, medical life support system, etc.

### Fujitsu Components International Headquarter Offices

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