



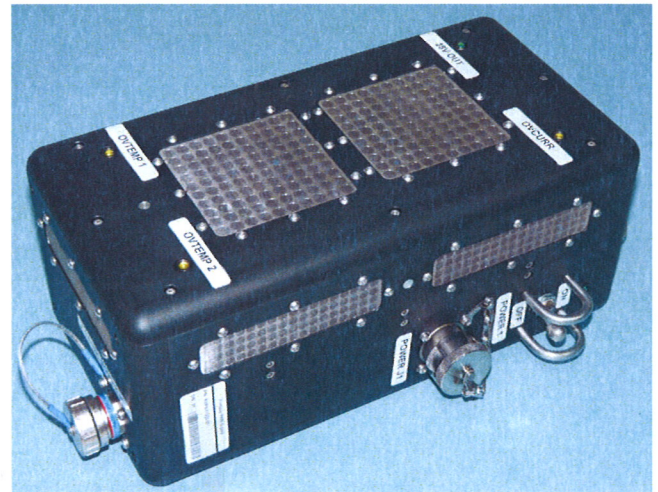
ESA Portable Power Supply (KuPS)

Doc. N.: **KI-KUPS-BR-185** 1/0
 Date : **29-10-2011**
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Project:	KuPS	Subject:	Brochure
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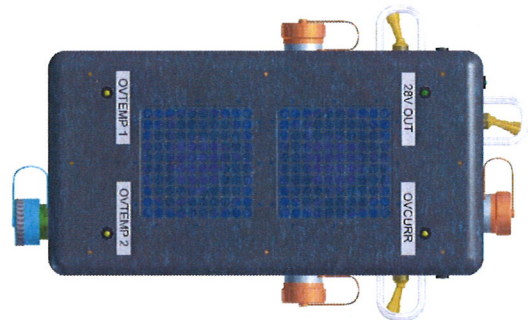
1. GENERAL DESCRIPTION

The **Portable Power Supply** (also namely "KuPS") is an autonomous converter unit to distribute 28V_{DC} to one or more payloads (up to three) taking the upstream power from 120V_{DC} provided by the ISS Columbus Module SUP. The KuPS is qualified to be launched (stowed in a soft transportation bag) with different vehicles for its transport to ISS: Soyuz, Progress, ATV and HTV. KuPS is composed by a metal box containing all the required electronic parts and provided of interface connectors, on/off manual switches and autonomous cooling system (forced air convection). In addition, KuPS provides its own input power cable necessary to connect it to the SUP power outlets (120V_{DC}).

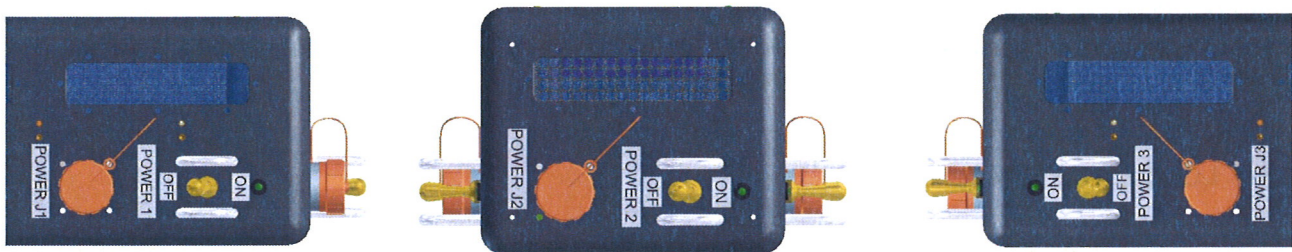


1.1 KuPS LED Indicators and Switches

KuPS is provided of four different LED indicators on the top side



and other three green LED indicators on the box sides near each 28V outlet



The Portable Power Supply is provided of three manual switches (POWER 1, POWER 2 and POWER 3) placed on Front, Left and Right walls. One green LED is located nearby each switch to indicate the presence of 28V_{DC}.

1.2 CABLES

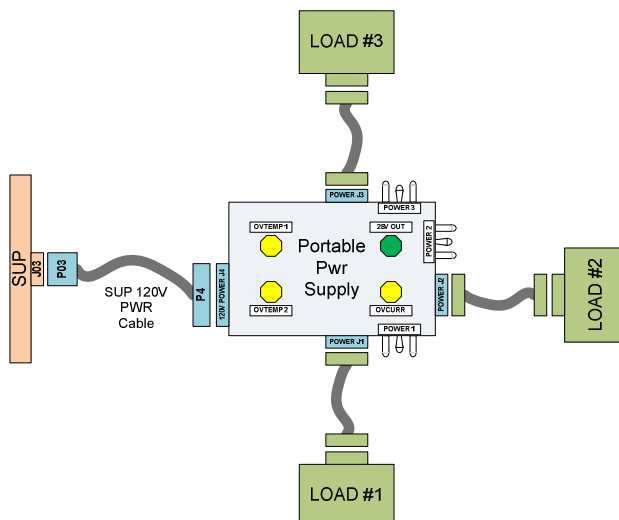
KuPS is provided of one dedicated input power cable necessary to connect it to ISS Columbus Module SUP Power outlet J01 or J02 (120V_{DC}).

The “SUP 120V Pwr Cable” is part of KuPS hardware while the 28V cables required to connect each load, are pertaining to the loads themselves.



2 SYSTEM CONFIGURATION

The Portable Power Supply can deliver 28V_{DC} to maximum three independent loads. The typical configuration is shown in figure below:



3 ELECTRICAL INTERFACES

KuPS Portable Power Supply receives 120V_{DC} nominal voltage from SUP outlets connector via its dedicated SUP 120V Pwr Cable through the input connector Power J4. The Portable Power Supply is provided of three outlets with identical interface connectors (Power J1, Power J2 and Power J3) with three manual on/off switches (Power 1, Power 2 and Power 3) respectively dedicated to the outlets.

3.1 LOAD OUTLETS


Portable Power Supply 28 V_{DC} power outlets are provided on connectors POWER J1, POWER J2 and POWER J3.

3.1.1 OUTLETS OUTPUT VOLTAGE

Each outlet has the following output voltage range:

- Output Voltage Range 27.0 V_{DC} to 29.0 V_{DC}

The steady state voltage is measured directly at POWER J1, POWER J2 or POWER J3 connector (no cable included).

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3.1.2 SINGLE OUTLET MAXIMUM OUTPUT POWER

Each outlet has the following maximum output power:

- Maximum Output Power per Outlet 260.0 W @ 28 V_{DC}

Note: A single outlet can deliver up to 260W exclusively when that the other two outlets are OFF (not used).

3.1.3 SINGLE OUTLET MINIMUM OUTPUT POWER

Each outlet has the following minimum output power:

- Minimum Output Power per Outlet 2.0 W @ 28 V_{DC}

This requirement applies to outlet switched-on.

Note: The minimum output power from an outlet is independent from any other load applied on other outlets also when they are kept off.

3.1.4 COMBINED POWER USAGE

Overall output power delivered by the Portable Power Supply from POWER J1, POWER J2 and POWER J3 outlets shall be:

- Maximum Overall Output Power 260.0 W @ 28V_{DC}

User shall take care that the sum of output power from POWER J1, POWER J2 and POWER J3 connectors (peak and steady-state) is below that limit to avoid tripping of over-current breaker. Adequate margins shall be guaranteed considering that allowed inrush current from a single outlet is reduced as soon as more than one load is connected to the Portable Pwr Supply.

3.1.5 OUTPUT CURRENT BREAKER

KuPS Portable Power Supply provides a single over-current breaker (OCB) to limit the overall current delivered to loads connected to the three outlets.

- I_{THmin} 10.0 A
- I_{THmax} 11.0 A
- T_{TRPmin} 2.0 ms
- T_{TRIPmax} 12.0 ms

Other details on the KuPS outlet interfaces such as inrush current, surge current, ripple and impedance will be discussed for the specific utilization in coordination with ESA.