

# DC-UPS 168W 2U 2/4/8Ah Master Unit

Uninterruptable DC Power Supply for IT- & Communication Systems  
Built in Battery Pack

## Short Specification:

- Metal housing
- 90% efficiency
- +10°C...+40°C ambient
- Free air convection
- Galvanic insulated
- Continuous short circuit & idle proof
- Overload & low voltage protected
- Soft start & auto-recovery
- Buffer times 4h, 8h, 16h
- Minimum load = 0A
- + pole connected to PE
- EMI/EMS EN61000-6-2/3, EN55022 class B
- According to IEC(EN)60950-1
- Extended monitoring
- Thermal load protection
- AC-Fail message
- Built in reliable Panasonic brand batteries
- Output Electrolytic Capacitors +125°C
- 2U 84HP D280mm 19" aluminium enclosure
- Input/output plugs fused against accidental removal
- Battery extension as (slave) available

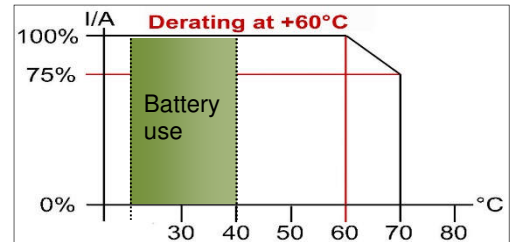


**Made in Germany.**

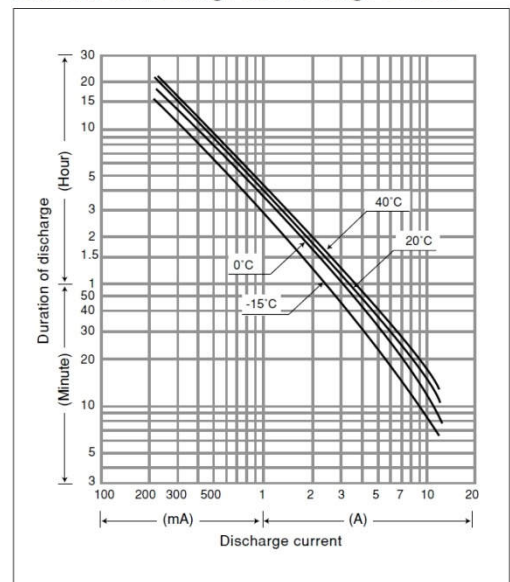


AC Input	230Vac , 47...63Hz , 250...375Vdc		
AC Input Rating	184..265Vac, 230Vac <1.1A		
Rated DC Voltage	12Vdc(13.8V)	24Vdc(28.8V)	56Vdc(48V)
Low DC Voltage	9,5Vdc	18,8Vdc	38Vdc
Rated DC Current (s. graph) 40°C	8.0A/2h	4.0A/2h	2.0A/2h
Maximum DC Current (s. graph) 40°C	10.0A	6.0A	3.0A
Ripple [mVpp] (230Vac available)	50 (20MHz)	65 (20MHz)	150 (20MHz)
Load regulation 0-100%	±0.5%	±0.5%	±0.5%

Tolerance Ua adjusted	± 1%
Transient Time	<1ms (10-100%, 100-10%)
Minimum Load	0 A
Efficiency	90% typical
Load Protection	3/6/10A , manual reset
Short Circuit Protection	Yes, auto recovery
Input Fuse	2x 4AT, N & L fused, UL-listed model
Output Fuse (reset)	Thermal 3/6/10A, push to reset
Inrush Current	< 32A (11,3Arms limiter-option)
Hold Up Time (Battery full)	4/8/12h (1A load)
Cooling	Natural convection
Operation Temperature	+10°C...+40°C IEC60068-2-1
Transport Temperature	-15°C...+55°C IEC60068-2-1
Storage Temperature	+10°C...+30°C IEC60068-2-1
EMI	EN55022 class B / EN61000-3-2
EMS	EN61000-6-2,3
Safety	EN60950-1
Safety class 1(A)	VDE0805, VDE0100
Air & Surface Leakage Paths	> 8mm
Input/output	Galvanic insulated
AC Fail Relay (galv. insulated)	≤48Vdc/500mA , ≤30Vac/500mA
Power Good Relay (galv. ins.)	≤48Vdc/500mA , ≤30Vac/500mA
Relative Humidity (+25°C)	≤95% , no condensations
Pollution Degree	2 (EN50178)
Climatic Class	3K3 (EN60721)
Dimensions (HxWxD(T))	2U 84WU D=280mm
Weight	9800g (incl. Internal batteries)
Connector AC	C14 Schaffner IEC60320-1, L+N lines fused. Dismounting protected by a securing clip Schurter 4700.0001
Connectors DC	Phoenix 1840599 DFK-PC4/6-GF-7,62 Female. Dismounting protection with M3 threads for the mating plug.
Connector Power Good	SUB-D 9pole female DIN41652 T1



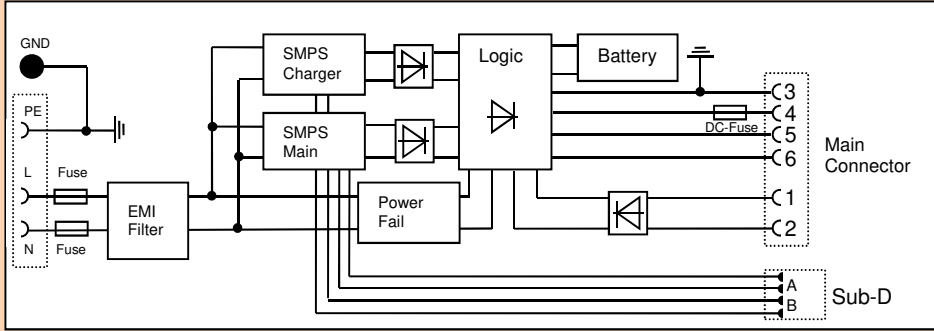
Duration of discharge vs Discharge current



### Specification:

The DCUPS2U-Series is designed as an uninterruptable power supply for telecommunication and IT systems. Its efficiency of 90% makes the DCUPS2U robust, economical and reliable. Camtec power supplies are traditionally made with high-end low ESR electrolytic output capacitors with withstanding +125°C temperature. Our capacitors are rather designed for extended lifetime and longer hold up time. The DCUPS2U is short circuit and zero loads proof. It has a thermal overload fuse at the output to protect the connected load. It is protected against high AC transient and provides very good interference resistance. We use IP20 stabile aluminum housings with ventilation slots in accordance to the demanding VDE norms. The plus pole has an internal connection to ground (PE). The AC-Line connector and the DC-Output connector have a security-clip and screw-fittings to avoid accidental removal of the connected cabling. The DCUPS2U provides a built in AC-Fail detection. The galvanic insulated monitoring is available at the output connector. A DC-fail-function-monitor for the battery charger power supply and the main power supply is a standard feature; each relay is floating and galvanic insulated.

### Block Diagram



#### Main connector:

- 1) Battery Extension +
- 2) Battery Extension -
- 3) Battery Out +
- 4) Battery Out -
- 5) Power Fail Message
- 6) Power Fail Message

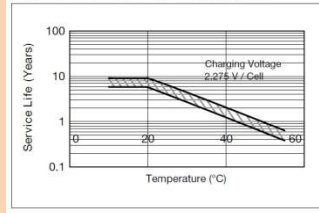
#### Available Options (Sub-D):

- A) DC-o.k.-monitoring for the battery charger power supply
- B) DC-o.k.-monitoring for the main power supply

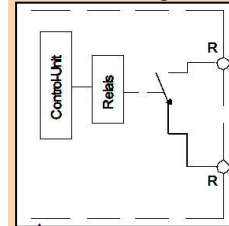
#### Characteristics

Capacity (25 °C)	20 hour rate 10 hour rate 5 hour rate 1 hour rate	4.5 Ah 3.9 Ah 3.5 Ah 2.8 Ah
Internal resistance	Fully charged battery (25 °C)	40 mΩ
Temperature dependency of capacity (20 hour rate)	40 °C	102 %
	25 °C	100 %
	0 °C	85 %
	-15 °C	65 %
Self discharge (25 °C)	After 3 months	91 %
	After 6 months	83 %
	After 12 months	66 %

#### Influence of Temperature on Trickle life



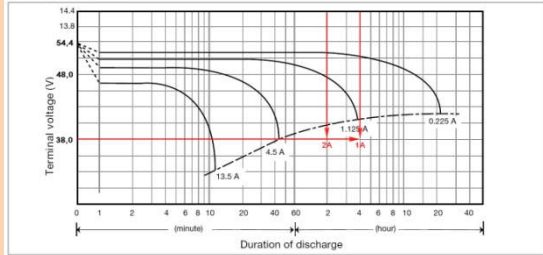
#### AC Fail Message



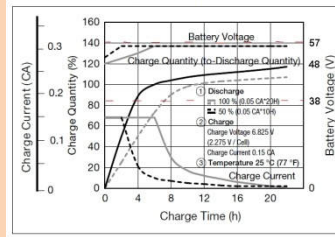
#### Low Voltage:

If the AC-Input drops -20% the AC-OK-Relay (R) opens (control message). The green DC-OK LED is off.

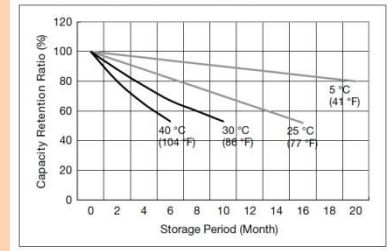
#### Discharge characteristics



#### Constant-voltage and constant-current charge characteristics for Trickle use



#### Residual capacity vs storage period

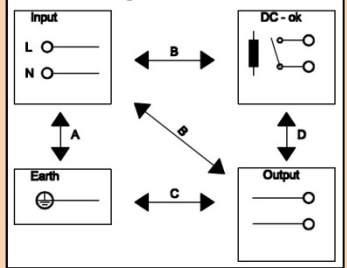


Test	Time	A	B	C	D
Type Test	60s	2500Vac	3000Vac	500Vdc	500Vdc
Factory Test	5s	2000Vac	2000Vac	500Vdc	500Vdc
Field Test	2s	2000Vac	2000Vac	500Vdc	500Vdc

Type test and factory tests are conducted by the manufacturer. Do not repeat the test in the field. Field test rules:

- a) Use appropriate test equipment which apply the voltage with a slow ramp
- b) Connect L1 and N together, as well as all output poles
- c) Use only AC test-voltages with 50/60Hz. The output voltages is floating and has no ohmic reference to ground.
- d) If testing output voltages are  $\geq 60Vdc$  remain to security directives. Use only isolated screw drivers to adjust output voltages.

#### Dielectric Strength



#### Function Table and Messages

Indicators	AC-Line o.k. green LED	AC-Fail Relay Contact	Battery o.k. LED green	Battery Low LED red	Battery Charge LED yellow	Piezo Sound Interval 30s	Battery Extension LED green	DC-o.k. Relay 1 (Charger)	DC-o.k. Relay 2 (Main AC-power)
Normal operation	On	Closed (C)	On	Off	Off	Off	On (if connected)	Open	Open
AC-Main line fail at 184Vac	Off	Open (O)	On	Off	Off	On	On (if connected)	Closed	Closed
Battery Low Voltage $\alpha < 38Vdc$	On/Off (AC-fail)	C/O (AC-fail)	Off	On	On/Off (AC-fail)	Off/On (AC-fail)	On (if connected)	Open/ Closed (AC-fail)	Open / Closed (AC-fail)
Battery 38Vdc $< \alpha > 52Vdc$	On/Off (AC-fail)	C/O (AC-fail)	Off/On (AC-fail)	Off	On/Off (AC-fail)	Off/On (AC-fail)	On (if connected)	Open/ Closed (AC-fail)	Open/ Closed (AC-fail)
Battery o.k. $> 52Vdc$	On/Off (AC-fail)	C/O (AC-fail)	On	Off	Off	On/Off (AC-fail)	On (if connected)	Open/ Closed (AC-fail)	Open/ Closed (AC-fail)
Charger Power Supply disable	On	Open	Off (<90%)	On (<70%)	Off !	Off	On (if connected)	Closed	Open
Main Power Supply disable	On	Open	Off (<90%)	On (<70%)	Off !	Off	On (if connected)	Open	Closed

<b>Terminal Connects:</b>	1 = Battery Extension Input + 2 = Battery Extension Input - 3 = DC + (connected to GND/Housing) 4 = DC - 5 = AC-Line Fail Relay 6 = AC-Line Fail Relay	<b>SK1</b>	1 = L 2 = N 3 = GND+/ PE	<b>SK2</b>		<b>SK3</b>	A = Charger o.k. Relay A = Charger o.k. Relay B = AC Main Line Power o.k. Relay B = AC Main Line Power o.k. Relay	<b>GND-Screw (external)</b> Is the PE-connection to the housing. Note that the +pole is internal connected to GND, too
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#### Battery Management Switch:

We advise the battery management to be switched into the off-position for shipping, storing or for service operations (battery change!). If the switch is not in the off-position, the batteries can be damaged while being total discharged! The piezo warning sound of AC-main failure and the DC-battery backup connection is disabled while the switch is put into the off-position. To enable the battery backup and all warnings, make sure that the battery management is put into the on-position (normal operation mode).

#### Order Code Example:

DCUPS2U4AH.56 for 48Vdc(56,0Vdc/4Ah/1A) , we recommend that specific hold-up time to output current is available on demand

#### Available Component Parts:

AC-line cable L=2m H05VV1,5 with isolated ground receptacle CEE7/7 IEC60083 and connector C13 IEC60320-1 Schurter 4782, Order Code: 3061060001CA  
DC-line connector AWG10...24/0,2...44mm<sup>2</sup> with housing, 45° wiring outlet, and M3 screw fittings, Order Code: 3061051001CA

Monitor line cable with two metal Sub-D 9pole 1:1 with kurlted screws, 35° wiring outlet, L=3m Lappkabel LiYY0.5 DIN47100, Order Code: 3061052001CA

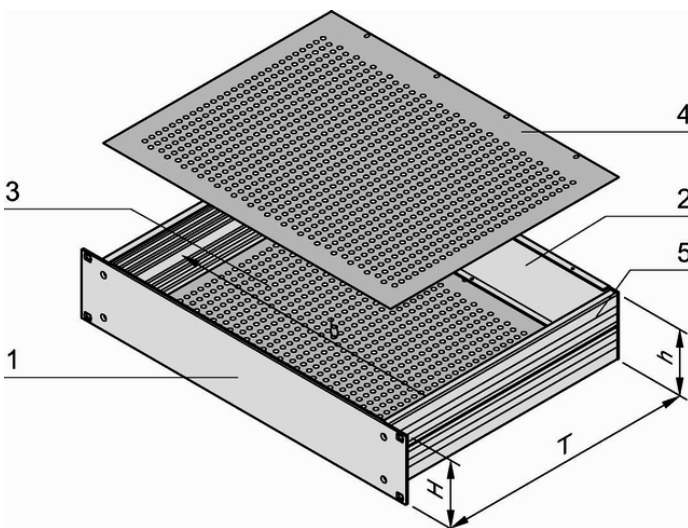
**Attention: always use C13 connector Schurter 4782 to enable securing clips to fit to the AC-line cabling, other C13-connectors may not fit**

#### Mechanics & Installation:

Stable aluminium housing IP20 to allow adequate convection, a free air space of 1U (top/bottom) and 5mm (sidewalls) is required for the DCUPS2U; for active devices 15mm space from its sidewalls. For free air convection it is necessary to install the DCUPS2U horizontal

#### Battery type for service replacement:

To guarantee safe function it is advised to use the same battery type as the installed one, to DC-UPS. The battery type is the Panasonic LC-R124R5P 12V 4,5Ah . We recommend the batteries to change after 2 years cycle operation to prevent malfunctions.



$$H = 2U = 88,1 \text{ mm}$$

$$B = 84WU(TE) = 426,4 \text{ mm}$$

$$T = 280 \text{ mm}$$

We use a very robust full aluminum housing with stable aluminum handholds, drawn side frames and a 2,5mm aluminum anodized front plate.

**Safety Instructions:** Please read all warnings and advices carefully before installing or operating the DCUPS2U. Retain this operation manual always ready to hand. The DCUPS2U must be installed by specialist staff only.

#### Installation:

- 1.) The DCUPS2U is designed for systems fulfilling the safety norms of dangerous voltages/energy and fire prevention
- 2.) Installation is restricted to specialists only, make sure that the AC wire system is free of voltage
- 3.) Opening the DCUPS2U, making any modifications to it, dismantling any screws from it, operating the DCUPS2U out of specification and/or using it in appropriate area will inevitably result in losing manufactureres guarantee; we decline taking any responsibility for risk of damages caused to someones health or to any installed system.
- 4.) Attention: The DCUPS2U has input fuses for the L and the N line. Replace the fuses only with the same type; we recommend to use the same manufacturer. The fuses must be UL-certified switch type. It is also necessary to wire an automatic circuit breaker to the line. We suggest to use a 16A-type with B-characteristic. It is verboten to operate the DCUPS2U without protective earth wired.
- 5.) It is recommended to replace the internal batteries by the same valve regulated lead-acid battery type with Faston 197 connectors: Panasonic LC-R124R5P. For replacing the battery please consult your service provider or send the DCUPS2U to the manufacturer.
- 6.) After lifetime batteries has to be given to a cetified recycle company.

#### Warnings:

**Disregard these warnings can cause fire, electric shock, serious accident and death.**

1. **Never operate the DCUPS2U without Protective Earth Conductor**
2. **Before connecting the DCUPS2U to the AC wire system make all wires free of voltage and assure accidentally switch on**
3. **Allow neat and professional cabling**
4. **Never open nor try to repair the DCUPS2U by yourself. Inside are dangerous voltages that can cause electric shock hazard.**
5. **Avoid metal pieces or other conductive material to fall into the DCUPS2U**
6. **Do not operate the DCUPS2U under damp or wet conditions**
7. **It is verboten to operate the DCUPS2U under Ex conditions or in Ex-Area**

