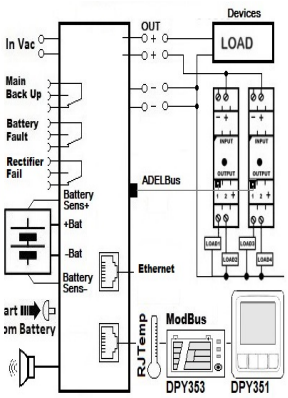
CBI60024A Plus



Input: Single-phase 115 – 277 Vac; 600W
Output Load: power supply 24 Vdc; 25 A
Output Battery: charging 24 Vdc; 25 A
Suited for the following battery types: Open Lead Acid, Sealed Lead Acid, lead Gel and Ni-Cd
Automatic diagnostic of battery status.
Charging curve IUoU, constant voltage and constant current
Battery Life Test function (Battery Care)
Switching technology Four charging levels: Recovery, Bulk, Absorption, Boost, and Float
Protected against short circuit and inverted Batt. polarity
Signal output (contact free) for discharged or damaged battery
Signal output (contact free) for Mains or Back-UP
Modbus RTU for all parameter, Battery and System
Ethernet: SNMP V3, Modbus TCP/IP, HTTPS
Protection degree IP20 - DIN rail; Space saving

New revolutionary product, with Ethernet on board provided with protocol connections: HTTPS, SNMPv3, Modbus TCP. The device also features the ADELBus protocol for connecting other ADELSystem devices.

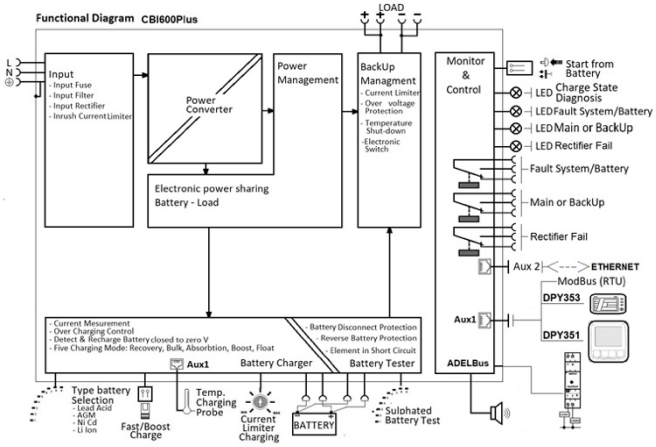
Power Management: Thanks to the All In One units (DC-UPS), it will be possible to optimize power management. The available power is automatically allocated between load and battery, supplying power to the load is the first priority of the unit thus it is not necessary to double the power, because also the power going to the battery will go to the load if the load so requires. The maximum available current on the load output is 3 times the value of the device rated current In.

Battery Care: it's the concept base on algorithms that implement rapid and automatic charging, four state of charge, battery charge optimization during time, flat batteries recovery and real time diagnostic during installation and operation. The Real Time Auto-diagnostic system, monitoring battery faults such as, battery Sulfated, elements in short circuit, accidental reverse polarity connection, disconnection of the battery, they can easily be detected and removed by help of Blink Code of Diagnosis Led or through web server; during the installation and after sell. The continuous monitoring of battery efficiency, reduces battery damage risk and allows a safe operation in permanent connection. Each device is suited for all battery types, by means of manual configuration by push button or web server it is possible setting predefined curves for Open Lead Acid, Sealed Lead Acid, Gel, Ni-Cd(option). They are programmed for five charging levels, recovery, boost, bulk, absorption, float and trickle charge, but they can be changed by the user. A rugged casing for DIN rail mounting, IP20 protection degree. They are extremely compact and cost effective.

Interconnections: The platform communication for ADELSYSTEM devices, allows the connection of all components in a simple but very powerful way, by Ethernet. A protocols communication are based on, MODbus TCP/IP, SNMP or HTTPS. You can select any of the buses depending on your application. It allows to communicate with all the accessories provided by ADELSYSTEM and to develop an independent system for electrical continuity. At the same time, it allows monitoring and control all parameters in the system, even from the other side of the world, by means of application tools on the cloud. ADELSYSTEM allows you to implement very simple but sophisticated monitoring and control for your energy system and opens your mind to new ways to approach your applications.

Norms and Certifications

The CE mark in conformity to EMC 2014/30/EU: Electromagnetic Compatibility Directive; 2014/35/EU: Low Voltage Directive; ROHS 2011/65/EU: Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS), as amended by 2015/863/EU. EMC Immunity: EN61000-6-2;EMC Emission: EN61000-6-3. According to: Electrical Equipment for Machinery EN 60204; Electrical safety (of information technology equipment) IEC/EN EN62368-1.



Climatic Data

Ambient temperature (operation)	**-25 ÷ +70°C**
De Rating Ta > 50°C	**- 2.5%(In) / °C**
Ambient temperature Storage	**-40 ÷ +85°C**
Humidity at 25 °C no condensation	**95% to 25°C**
Altitude: 0 to 2 000m - 0 to 6 560ft	**No restrictions**
Altitude: 2 000 to 6 000m-6 560 to 20 000ft	**De-rating 5°C/1000m**
Cooling	**Auto convention**

General Data

Insulation voltage (IN/OUT)	**3000 Vac**
Insulation voltage (Input / Earth, PE)	**2000 Vac**
Insulation voltage (Out Load & Battery / Earth, PE)	**500 Vac**
Insulation voltage (Out Load, Battery, Aux2 / Fault System & Main or Back Up terminal)	**500 Vac**
Protection Class (EN/IEC 60529)	**IP20**
Reliability: MTBF IEC 61709	**> 300.000 h**
Pollution Degree Environment	**2**
Connect Terminal Blocks screw Type Signal	**2,5mm(24–14AWG)**
Connect Terminal Blocks screw Type Power	**4 mm (30-10 AWG)**
Protection class (PE Connected)	**I, with PE**
Dimensions (w-h-d)	**150x115x135 mm**
Weight	**1.55 kg approx.**

Input Data

Nominal Input Voltage Vac	**115 – 230 – 277**
Voltage range Vac	**90 – 135 : 180 – 305**
Power Factor typ. (115 – 230 Vac)	**0.6 – 0.5**
Input Inrush Current Limiter	**NTC**
Inrush Current (Vn – In nom. Load) I2t	**≤ 35 A ≤ 5 msec.**

Frequency	**47 ÷ 63 Hz**
Input Current (115 – 230 Vac)	**9 – 4.5 A**
Internal fuse (not replaceable)	**10 A**
External Fuse (recommended) MCB curve B	**16 A**
Output Data (internal power supply)	
Output Voltage (Vn) / Nominal Current (I_n)	**24 Vdc**
Output Current I_n = Iload	**25 A**
Efficiency (at 50% of rated current)	**≥ 91 %**
Residual Ripple	**≤ 80 mV_{pp}**
Turn-On delay after applying mains voltage	**1 sec. (max)**
Start up with Strong Load (capacitive load)	**Yes, Unlimited**
Dissipation power load max (W)	**48**
Short-circuit protection (max current)	**Yes (70 A)**
Over Load protection (max current)	**Yes (60 A)**
Over Voltage Output protection	**Yes (typ. 35 Vdc)**
Overheating Thermal protection	**Yes**
Battery Charge	
Output Voltage Battery	**Follow the Out Load**
Boost/Fast charge Jumper Config. 25°C (V/cell).	**Lead Acid: 2.4 NiCd:1.51; Li-ion: 3.65**
Float Charge Jumper Configuration 25°C (V/cell) Jumper Configuration battery type	**Lead Acid: 2.23; 2.25; 2.27;2.3 NiCd:1.4; Li-ion: 3.45**
Max.Time Boost–Bulk charge (Typ. at IN)	**15 h**
Min.Time Boost–Bulk charge (Typ. at IN)	**1 min.**
Recovery Charge	**2 – 20 Vdc**
Charging current max I_{batt}	**25 A ± 5%**
Charging current limiting I_{adj}	**10 ÷ 100 % / I_{bat}**
Reverse battery protection	**Yes**
Quiescent Current max.	**≤ 100 mA**
Charging Curve automatic: IUoU	**5 stage**
Remote Input Control (RTCONN cable)	**Boost / Float**
Battery charge temperature compensated. External probe	**RJTemp 451 or 453 Aux1**
Battery Testing	
Sulfated battery check (SoH)	**Yes**
Short circuit Element Detection	**Yes**
Detection of element in short circuit	**Yes**
Refresh Battery (must enabled Fast Charge)	**Every 288 hours**
State of Charge (SoC)	**Yes**
Low Battery Capacity warning	**Yes**
Threshold alarm Battery almost flat	**21 – 22 Vdc batt**
LVD. (Protections against total Batt. discharge)	**19 – 20 Vdc batt**
Auto or manual test Mode	**Yes**
Purification Charge	**Yes**
Load Output	
Output voltage Vdc (at I_n)	**22 - 28.8 V (31 Ni-Cd)**
Nominal current I_{load}	**1.1 x I_n A ± 5%**
Continuous current (Without battery) $I_{load=} I_n$	**25 A**
Continuous current (With battery) $I_{load=} I_{n+} I_{batt}$	**40 A**
Max. current Output Load (Main) $I_{load\ (4\ sec.)}$	**60 A max.**
Max. current Output Load (Back Up) $I_{load\ (4\ sec.)}$	**40 A max.**
Start From Battery Without Main (Remote Input Control)	**RTCONN (cable) Push Button**
Time Buffering; min (switch output off without main input)	**0.5;2;5;10;15; 20; 30; 45;60;∞**

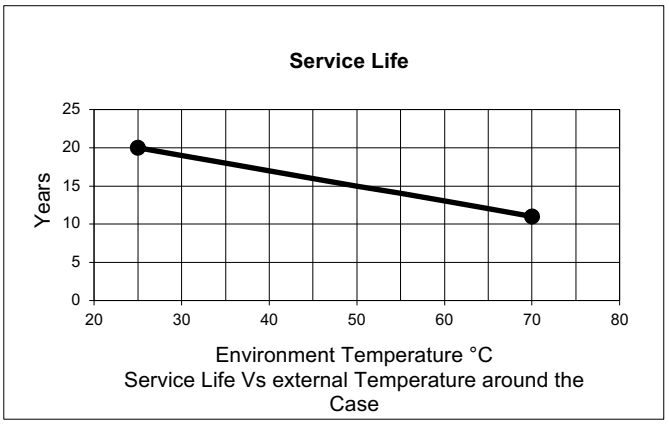
Signal Output (dry switch contacts)			
Main or Backup Input Power	**Yes**		
Low Battery	**Yes**		
Fault Battery or system	**Yes**		
Rectifier Alarm	**Yes**		
Acoustic Buzzer selectable, for:	**Find the device, Alarm features**		
Type of Signal Output Contact			
Dry Contact. Current can be switched (EN60947.4.1): Max: DC1: 30 Vdc 1 A; AC1: 60 Vac 1A (Resistive load) Min: 1mA at 5 Vdc (Min permissive load)			
Fault System / Low Battery	**C**	**NC**	**NO**
Main or Back Up	**C**	**NC**	**NO**
Rectifier Fail	**C**	**NC**	**NO**
Communication Port: Input / Output (RJ45)			
Remote monitoring data Protocol:	**Aux 1 Modbus RTU (RS485)**		
Ethernet communication protocols:	**ModBus TCP/IP - SNMP V3 - HTTPS**		
ADELBus	**CAN Open**		
GUI			
GUI: Embedded web based accessed via Ethernet using:	**Web Server**		
Device feature			
User configurable Alarm	**By Web Server**		
User configurable signals	**By Web Server**		
Downloadable software and firmware upgrades			
PC Shutdown or Device Shutdown			
PC Shutdown function to switch Off and On PC	**By ADELViewSystem and RJUSB280 Cable**		
Switch off device if Ethernet loos the communication	**By setting the device.**		
LED Indicator			
Charging Mode	**Green**		
Diagnosis	**Red**		
Battery / System fault	**Red**		
Mains or Back Up	**Yellow**		
Rectifier fail	**Red**		
LOG File			
Life time Battery statistic History:	**N° of complete Charging, N° of aborted Charging, Tot. Ampere hours, Tot. Run Time, Highest Voltage, Lowest Voltage, N° Power Boost, Max. deep of discharge, Average deep of discharge,**		
Life time Device statistic History:	**N° of internal overtemperature event**		
Life time Input statistic History:	**N° of Time the Vac is lower than min. edge, N° of Time the Vac is higher than max. edge, N° of Back Up, Max. AC Voltage, Min AC Voltage.**		
Life time Load statistic History:	**Highest Voltage on the Load Terminal, Lowest Voltage on the Load Terminal**		
Alarm Battery Log:	**Battery element shorted, Battery temperature, Bad cable connections, Low state of Health SoH, Revers battery connection, Temperature sensor disconnected.**		
Alarm Input Log:	**Input Vac Lower then or Higher then…,**		

Alarm Load Log:	**Output in Short circuit, Output in overload.**
Notification	**Email Alarm**

Lifetime Expectancy

Life Time Expectancy defines the minimum life expectancy of the device in hours of operation. Being a device designed with electrolytic capacitors, the maximum duration is defined at 15 years - 131,400 h. Any value higher than this is to be considered only as a theoretical duration, calculated to be able to compare devices with each other.

Ambient temp.	Out Power	115Vac	230Vac
25°C	24 Vdc - 10 A	642640h	883243h
25°C	24 Vdc - 20 A	158844h	634203h
40°C	24 Vdc - 10 A	187139h	292603h
40°C	24 Vdc - 20 A	25846h	182768h



Service Life Vs external Temperature around the Case

Accuracy Measurement

Accuracy on the Input side

Measure of the Main Input voltage at 47- 63Hz; ±25°C; 90 – 305 Vac	**± 1 % of Full Scale Vac**

Accuracy on the output side

Measure of the Output voltage Load Side Range: 10 - 33Vdc	**± 1.5% of Full Scale Vdc Out**
Measure of the Output current Load Side Range: 0 - 70A	**± 1.5% of Full Scale I Out**
Measure of the Output voltage Battery Side Range: 0 - 33V	**± 1.5% of Full Scale Vdc Out**
Measure of the Output current Battery Side Range: 0 - 30A	**± 1.5% of Full Scale I Out**
Temperature Probe Range:-20 – 60°C	**± 2 °C**

Accessory

RTCONN	**Cable Start from battery Length 1m. Jumper 6**
RJTEMP451	**Temperature Probe Length 1m.**
RJTEMP453	**Temperature Probe Length 3m.**
RJCONN45	**Cable RJ45/RJ45 for Parallel Connection or connection to DPY351**
RJ45COUPLER	**RJ45 Three way "Daisy Chain" for Aux 2**
RJUSB280	**Cable RJ45/USB (Aux2) Length 1m for connection to PC.**
RJTB280	**Connector RJ45/Terminal Block 4pin for Aux 2 To RS485 ModBus RTU**
ADELViewsystem	**PC App for: Monitoring, Logging, Configuration, Control, Alarm, of the devices in ADELBus network.**
DPY351	**HMI panel control for: Monitoring, Logging, Configuration, Control, Alarm, of the devices in ADELBus network.**
DPY353	**Display for: Monitoring the Battery state, Battery Charging Section.**