

# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN



### Highlights & Features

- Full corrosion resistant Aluminium chassis
- Suitable for 24V system up to 40A
- Built-in diagnostic monitoring for DC OK, Discharge and Battery Fail by relay contacts
- LED indicator for DC OK, Battery Fail, DC Input, Battery Reverse Polarity and Battery Discharge
- High MTBF > 500,000 hrs as per Telcordia SR-332
- Wide operation temperature range from -20°C to +60°C
- Conformal coating on PCBA to protect against chemical and dust pollutants

### Safety Standards



CB Certified for worldwide use

**Model Number:** DRU-24V40ABN  
**Unit Weight:** 0.60 kg  
**Dimensions (L x W x D):** 121 x 50 x 117.3 mm

### General Description

The DRU-24V40ABN CliQ II DC-UPS module is designed to support 24V system with up to 40A output and back up time of 4.5 minutes for 15AH battery capacity. It offers a wide input voltage from 24-28V and a wide operating temperature range from -20°C to +60°C. This product comes with potential free contacts for battery management signals and LED indicator for battery status. The rugged compact aluminium case is shock and vibration resistant according to IEC 60068-2.

### Model Information

#### CliQ II DC-UPS Module

| Model Number | Input Voltage Range | Output Voltage                           | Output Current |
|--------------|---------------------|------------------------------------------|----------------|
| DRU-24V40ABN | 24-28Vdc            | 24Vdc typ. (Depends on V <sub>in</sub> ) | 40.0A Max      |

### Model Numbering

| DR       | U –           | 24V            | 40A            | B              | N                                      |
|----------|---------------|----------------|----------------|----------------|----------------------------------------|
| DIN Rail | DC-UPS Module | Output Voltage | Output Current | CliQ II Series | N - Metal Case, without Class I, Div 2 |

# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

### Specifications

#### Input Ratings / Characteristics

|                       |                |                                  |
|-----------------------|----------------|----------------------------------|
| Nominal Input Voltage |                | 24Vdc                            |
| Input Voltage Range   |                | 24-28Vdc                         |
| Input Current         | Charging Mode  | 2A ± 1A                          |
| Charging Time*        |                | < 3hr ± 1hr for battery 24V/15AH |
| Efficiency            | Charging Mode  | > 70.0%                          |
|                       | Buffering Mode | > 99.0%                          |

\*Charging time depends on the last state of discharge w.r.t. buffering time and load current.

#### Output Ratings / Characteristics

|                                       |                |                                         |
|---------------------------------------|----------------|-----------------------------------------|
| Output Voltage Range                  |                | 23-28Vdc                                |
| Output Current                        |                | 40.0A Max                               |
| Output Power                          |                | 960W Max (24V, 40A)                     |
| Voltage Drop Between Input and Output | Charging Mode  | 0V between DC input to load             |
|                                       | Buffering Mode | 0.1V between battery to load @ 40A load |

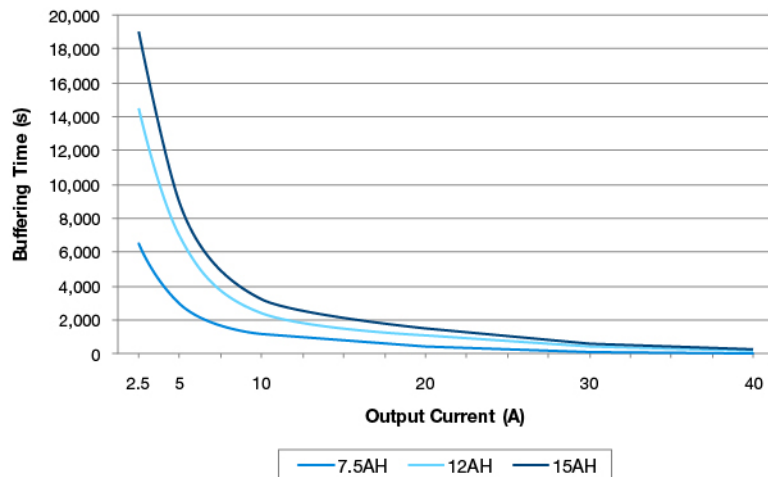
#### Battery Input / Output Characteristics

|                         |                                                                                                                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Battery Voltage | 24Vdc, SLA Sealed lead acid battery<br>2 x 12Vdc, SLA Sealed lead acid battery                                                                                                        |
| Battery Voltage Range   | 23-28Vdc (continuously operating)<br>30Vdc Max (the maximum voltage that will not cause damage to the unit)<br>14Vdc Min (the voltage level of battery to enable "BAT Fail" function) |
| Battery Capacity        | 7.5AH/ 12AH/ 15AH                                                                                                                                                                     |
| Battery Fuse            | Auto 50A / 80V, FK3 (Littelfuse) or similar in the battery path.<br>The battery fuse protects the wires between the battery and the unit.                                             |
| Battery Charging Mode   | CC-mode (constant current) at 2A                                                                                                                                                      |
| End-of-Charge Voltage   | The unit always charge with fix input voltage value                                                                                                                                   |

# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

### Buffering Time



| Output Current | Buffering Time |         |         |
|----------------|----------------|---------|---------|
|                | 7.5AH          | 12AH    | 15AH    |
| 2.5A           | 6,500s         | 14,500s | 19,000s |
| 5A             | 3,000s         | 7,000s  | 9,000s  |
| 10A            | 1,200s         | 2,400s  | 3,200s  |
| 20A            | 400s           | 1,100s  | 1,500s  |
| 30A            | 120s           | 450s    | 600s    |
| 40A            | 25s            | 200s    | 280s    |

Fig. 1 Buffering Time VS. Output Current

### Mechanical

|                                   |                |                                                    |
|-----------------------------------|----------------|----------------------------------------------------|
| Case Cover / Chassis              |                | Aluminium                                          |
| Dimensions (L x W x D)            |                | 121 x 50 x 117.3 mm                                |
| Unit Weight                       |                | 0.60 kg                                            |
| Cooling System                    |                | Convection                                         |
| Terminal                          | Input / Output | 4 Pins (Rated 600V/60A)                            |
|                                   | Signal         | 6 Pins (Rated 300V/27A)                            |
| Wire                              | Input / Output | AWG 12-6 (Load: 0-20A)<br>AWG 8-6 (Load 20-40A)    |
|                                   | Signal         | AWG 24-12                                          |
| Mounting Rail                     |                | Standard TS35 DIN Rail in accordance with EN 60715 |
| Noise (1 Meter from power supply) |                | Sound Pressure Level (SPL) < 40dBA                 |

# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

### Environment

|                             |           |                                                                                                           |
|-----------------------------|-----------|-----------------------------------------------------------------------------------------------------------|
| Surrounding Air Temperature | Operating | -20°C to +60°C (full power)                                                                               |
|                             | Storage   | -40°C to +85°C                                                                                            |
| Operating Humidity          |           | 5 to 95% RH (Non-Condensing)                                                                              |
| Operating Altitude          |           | 0 to 3,000 Meters                                                                                         |
| Shock Test (Non-Operating)  |           | IEC 60068-2-27, 30G (300m/S <sup>2</sup> ) for a duration of 18ms, 1 time per direction, 2 times in total |
| Vibration (Non-Operating)   |           | IEC 60068-2-6, 10Hz to 500Hz @ 30m/S <sup>2</sup> (3G peak); 60 min per axis for all X, Y, Z direction    |
| Pollution Degree            |           | 2                                                                                                         |

### Protections

|                                  |                                                                             |
|----------------------------------|-----------------------------------------------------------------------------|
| Overload / Overcurrent           | 42-52A, Latch-off Mode                                                      |
| Over Temperature                 | < 90°C Surrounding Air Temperature inside the unit, Latch-off Mode          |
| Short Circuit (at system)        | Shutdown, Latch-off Mode                                                    |
| Input Polarity Protection*       | Yes (DC OK = open contact, LED Status = Orange)                             |
| Battery Polarity Protection*     | Yes (DC OK = open contact, LED Status = Orange)                             |
| Wrong Battery Voltage Protection | Yes, 30Vdc Max (the maximum voltage that will not cause damage to the unit) |
| Deep Discharge Protection        | Yes (23V ± 0.5V)**                                                          |
| Degree of Protection             | IP20                                                                        |
| Protection Against Shock         | Class III                                                                   |

\*If the orange status LED is on, this indicates a failure in the installation. In this case, do not turn on power supply while the battery is connected. Danger of explosion!

\*\* The unit will stop operating when the battery voltage detected is less than 23V ± 0.5V

### Reliability Data

|      |                                        |
|------|----------------------------------------|
| MTBF | > 500,000 hrs. as per Telcordia SR-332 |
|------|----------------------------------------|

### Safety Standards / Directives

|                                             |                           |                                                                                                        |
|---------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------|
| Electrical Equipment in Power Installations |                           | EN 50178 / IEC 62103                                                                                   |
| Electrical Safety                           |                           | SIQ to EN 60950-1, UL/cUL recognized to UL 60950-1 and CSA C22.2 No. 60950-1, CB scheme to IEC 60950-1 |
| Industrial Control Equipment                |                           | UL/cUL listed to UL 508 and CSA C22.2 No. 107.1-01, CSA to CSA C22.2 No. 107.1-01 (File No. 181564)    |
| CE                                          |                           | In conformance with EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC                     |
| Material and Parts                          |                           | RoHS Directive 2011/65/EU Compliant                                                                    |
| Galvanic Isolation                          | Power Port to Housing     | 1.0KVac                                                                                                |
|                                             | Signal Port to Housing    | 1.0KVac                                                                                                |
|                                             | Power Port to Signal Port | 1.0KVac                                                                                                |

# CliQ II DC-UPS Module

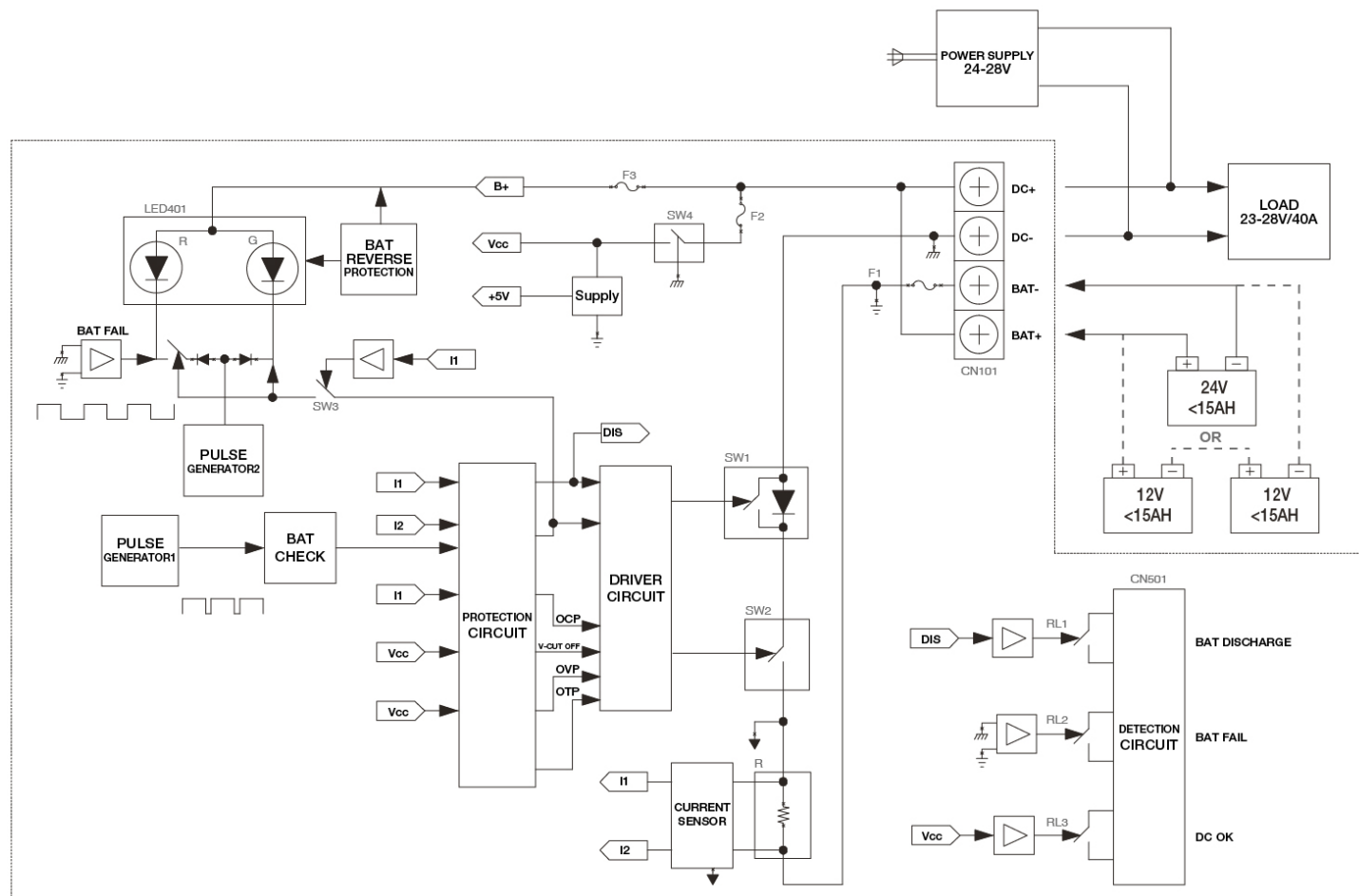
## 24V 40A / DRU-24V40ABN

### EMC

|                                        |               |                                                                                                                                                                      |
|----------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC / Emissions                        |               | CISPR 22, EN 55022, EN 55011, FCC Title 47: Class B                                                                                                                  |
| Component Power Supply for General Use |               | EN 61204-3                                                                                                                                                           |
| Immunity to                            |               | EN 55024, EN 61000-6-2                                                                                                                                               |
| Electrostatic Discharge                | IEC 61000-4-2 | Level 4 Criteria A <sup>1)</sup><br>Air Discharge: 15kV<br>Contact Discharge: 8kV                                                                                    |
| Radiated Field                         | IEC 61000-4-3 | Level 3 Criteria A <sup>1)</sup><br>80MHz-1GHz, 10V/M, 80% modulation (1KHz)<br>1.4GHz-2GHz, 3V/M, 80% modulation (1KHz)<br>2GHz-2.7GHz, 1V/M, 80% modulation (1KHz) |
| Electrical Fast Transient / Burst      | IEC 61000-4-4 | Level 3 Criteria A <sup>1)</sup><br>2kV (Input power ports)                                                                                                          |
| Surge                                  | IEC 61000-4-5 | Level 3 Criteria A <sup>1)</sup><br>0.5kV (Input power ports)                                                                                                        |
| Conducted                              | IEC 61000-4-6 | Level 3 Criteria A <sup>1)</sup><br>150kHz-80MHz, 10Vrms                                                                                                             |
| Power Frequency Magnetic Fields        | IEC 61000-4-8 | Criteria A <sup>1)</sup><br>10A/Meter                                                                                                                                |

1) Criteria A: Normal performance within the specification limits

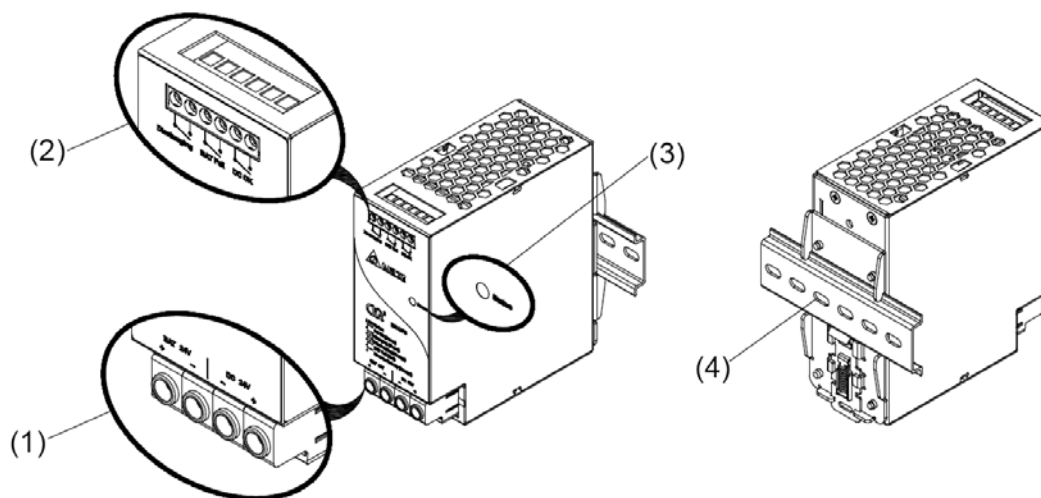
### Block Diagram



# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

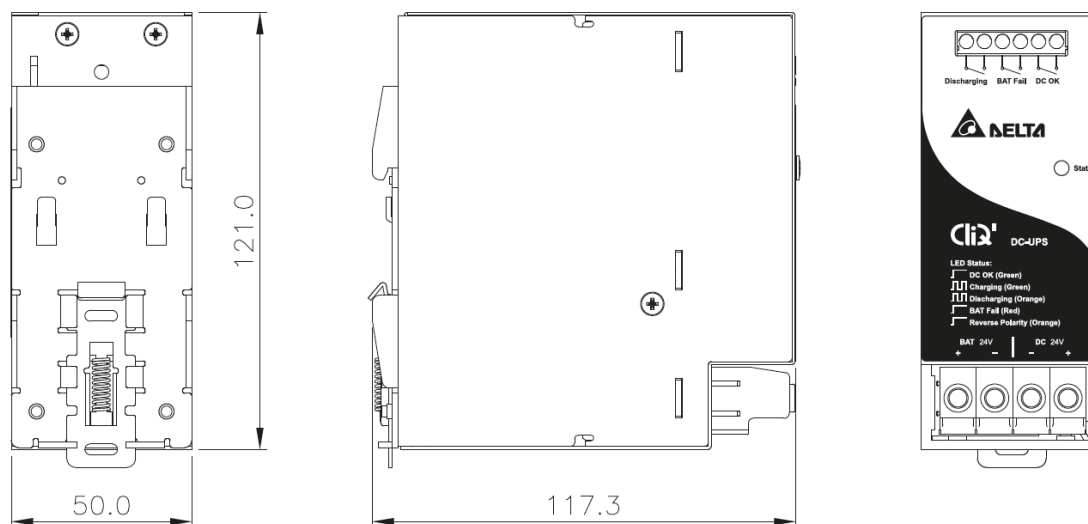
### Device Description



- 1) Input / Output terminal block connector
- 2) Signal terminal block connector
- 3) LED display status
- 4) Universal mounting rail system

### Dimensions

L x W x D: 121 x 50 x 117.3 mm

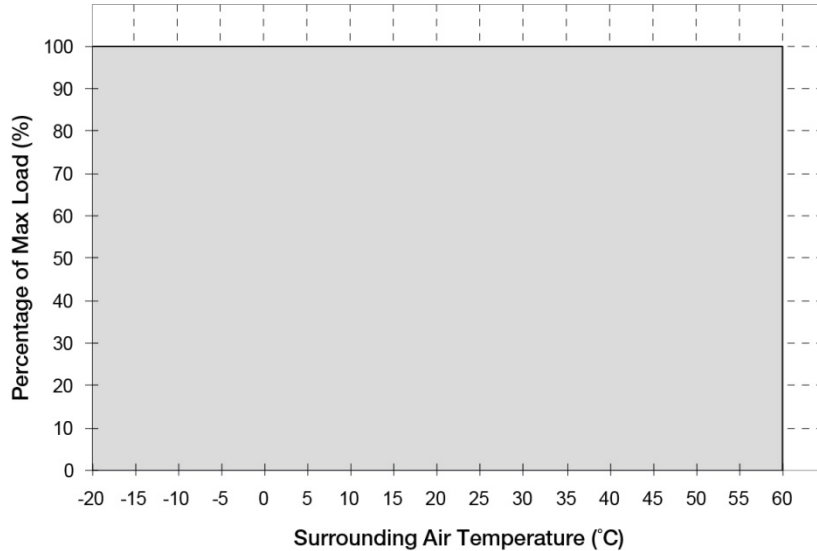


# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

### Engineering Data

#### De-rating



**Fig. 2** No power de-rating across the entire operating temperature range (-20°C to +60°C)

#### Note

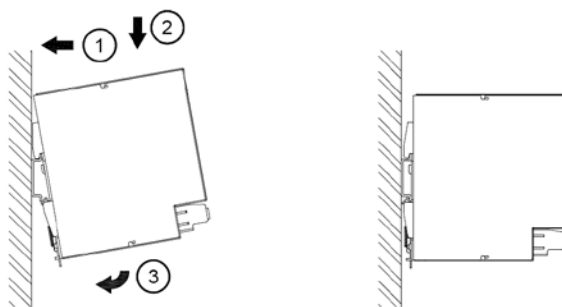
1. The unit may degrade, or be damaged, when it is continuously used outside the shaded region, refer to the graph shown in Fig. 2.
2. When the DC-UPS module is used with power supply of different ratings, user must follow power supply derating curve or whichever is lower.
3. In order for the device to function in the manner intended, it is also necessary to keep a safety distance of 50mm above and below the device as well as a lateral distance of 20mm (for Vertical Mounting) or 50mm (for Horizontal Mounting) with adjacent units while the device is in operation.
4. Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!
5. If the device has to be mounted in any other orientation, please do not hesitate to contact [info@deltapsu.com](mailto:info@deltapsu.com) for more details.

### Assembly & Installation

The unit can be mounted on 35mm DIN rails in accordance with EN 60715. For Vertical Mounting, the device should be installed with Input / Output terminal block on the bottom. For Horizontal Mounting, the device should be installed with Input / Output terminal block on the left side.

Each device is delivered ready to install.

#### Mounting

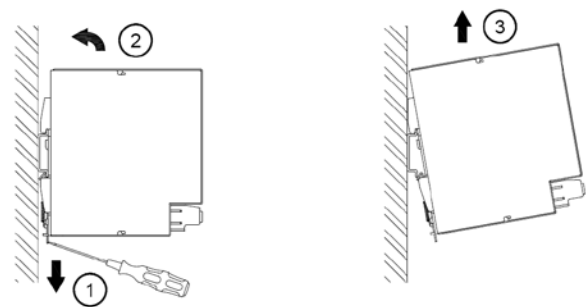


**Fig. 3.1** Mounting

Snap on the DIN rail as shown in Fig. 3.1:

1. Tilt the unit upwards and insert it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

#### Dismounting



**Fig. 3.2** Dismounting

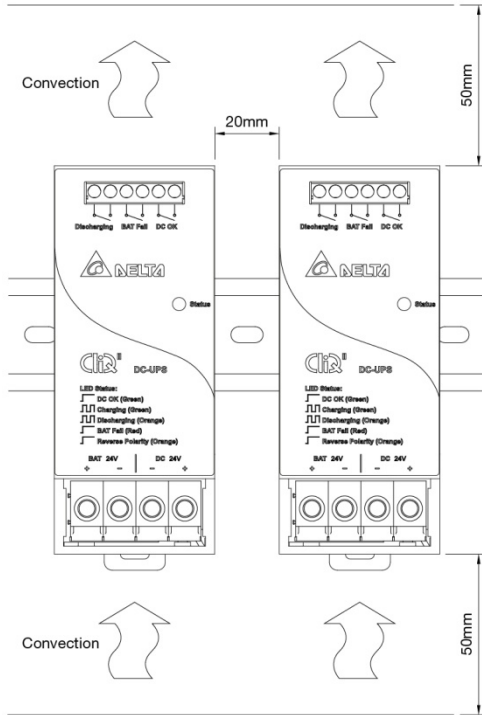
To uninstall, pull or slide down the latch with screw driver as shown in Fig. 3.2. Then slide the unit in the opposite direction, release the latch and pull out the unit from the rail.

# CliQ II DC-UPS Module

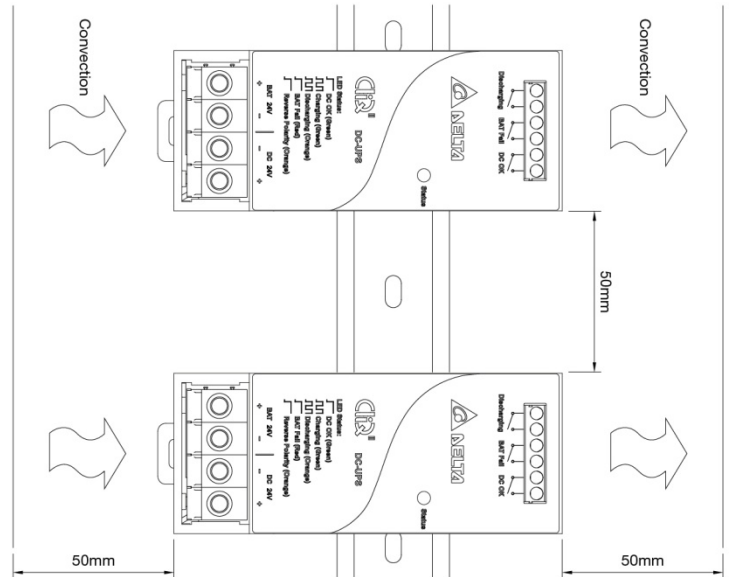
## 24V 40A / DRU-24V40ABN

### Safety Instructions

#### ■ Vertical Mounting



#### ■ Horizontal Mounting



- When replacing batteries, only use the same type of batteries listed under the “Battery Input / Output Characteristics” section on Page 2.
- Proper disposal of batteries is required. Refer to the relevant local codes for disposal requirements.
- ALWAYS switch mains of input power OFF before connecting and disconnecting the input voltage to the unit. If mains are not turned OFF, there is risk of explosion / severe damage.
- If the orange status LED is on, this indicates a failure in the installation. In this case, do not turn on power supply while the battery is connected. Danger of explosion!
- **To guarantee sufficient convection cooling, keep a distance of 50mm above and below the device as well as a lateral distance of 20mm (for Vertical Mounting) or 50mm (for Horizontal Mounting) to other units.**
- Note that the enclosure of the device can become very hot depending on the surrounding air temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- DO NOT insert any objects into the unit.
- Hazardous voltages may be present for up to 5 minutes after the input mains voltage is disconnected. Do not touch the unit during this time.
- The unit is a built-in unit and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.



# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

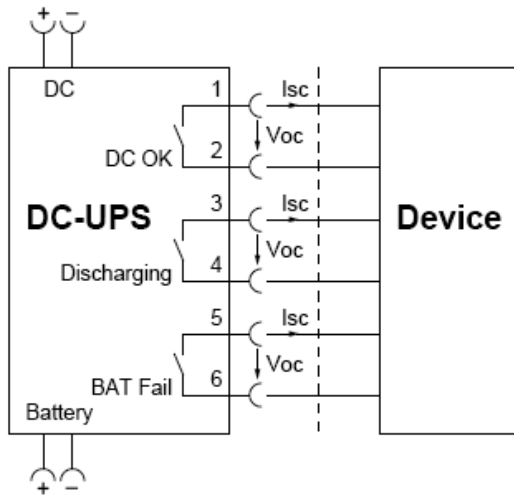
### Functions

#### Relay Contacts Characteristics

|                          |               |                                                                                                                                         |
|--------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Max Relay Contact Rating |               | 24Vdc/Vac, 1.0A                                                                                                                         |
| DC BUS OK                | Relay Contact | "DC OK" contact is closed when the DC input voltage is within 24-28V ( $\pm 10\%$ ) range or the battery voltage is within 23-28V range |
|                          | LED Indicator | Green LED On                                                                                                                            |
| Charging                 | Relay Contact | "DC OK" contact is closed when the unit is in charging mode                                                                             |
|                          | LED Indicator | Green LED Flashing                                                                                                                      |
| Battery Discharge*       | Relay Contact | "Discharging" contact is closed when the unit is in buffering mode                                                                      |
|                          | LED Indicator | Orange LED Flashing                                                                                                                     |
| Battery Fail             | Relay Contact | "BAT Fail" contact is closed when the battery fails to function or battery voltage is less than 14V                                     |
|                          | LED Indicator | Red LED On                                                                                                                              |
| Battery Reverse Polarity | Relay Contact | "DC OK" contact is opened when the battery is in reverse polarity                                                                       |
|                          | LED Indicator | Orange LED On                                                                                                                           |

\* With output current 3A to 40A.

#### Signals Wiring Diagram



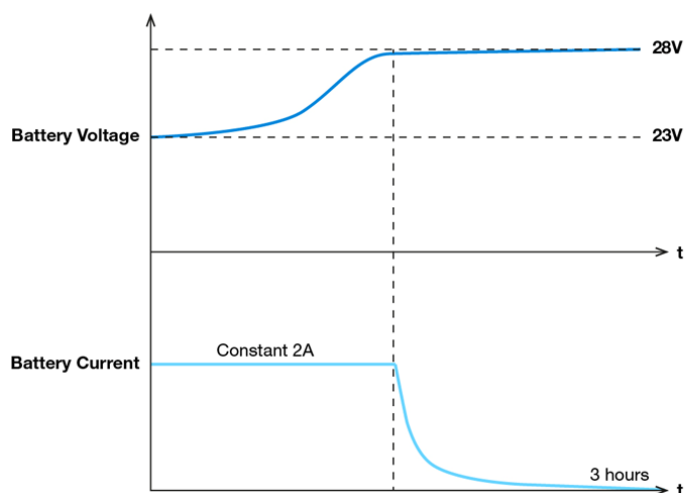
| DC-UPS Status                         | Relay Output Connector |          |       | LED Display Status  |
|---------------------------------------|------------------------|----------|-------|---------------------|
|                                       | Discharging            | BAT Fail | DC OK |                     |
| Battery Fully Charged                 | Open                   | Open     | Close | Green LED On        |
| Battery Charging                      | Open                   | Open     | Close | Green LED Flashing  |
| Battery Discharging* (Buffering Mode) | Close*                 | Open     | Close | Orange LED Flashing |
| No Battery Connected                  | Open                   | Close    | Open  | Red LED On          |
| Output Shutdown                       | Open                   | Open     | Open  | No Light            |

\*With output current 3A to 40A.

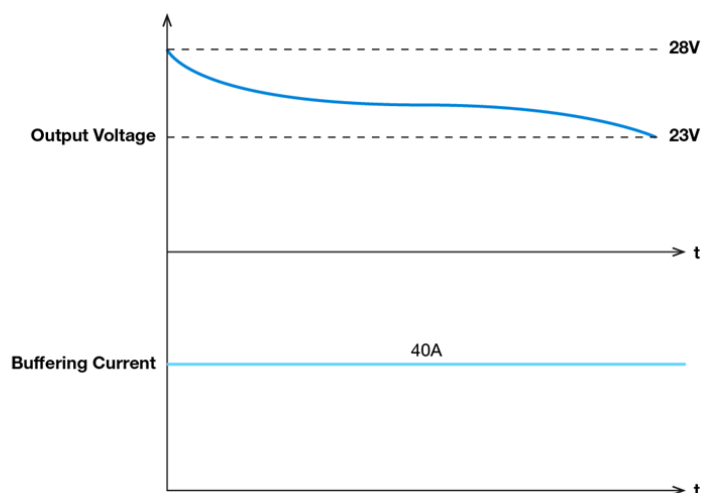
# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

### Charging Mode



### Buffering Mode



### Typical Application Notes

Fig. 4.1 Provide backup power during AC source interruption or failure

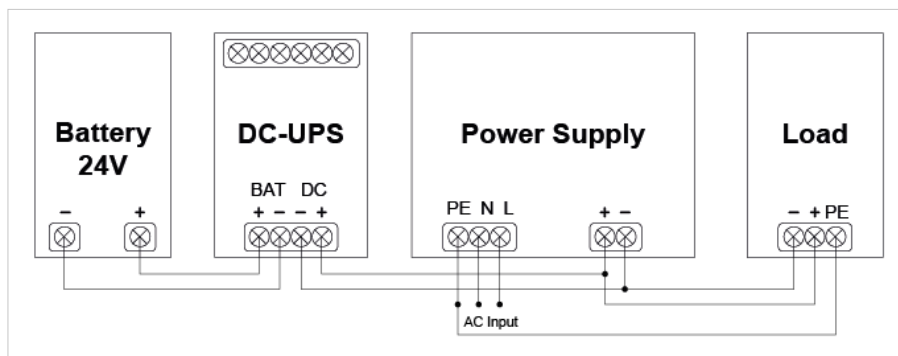
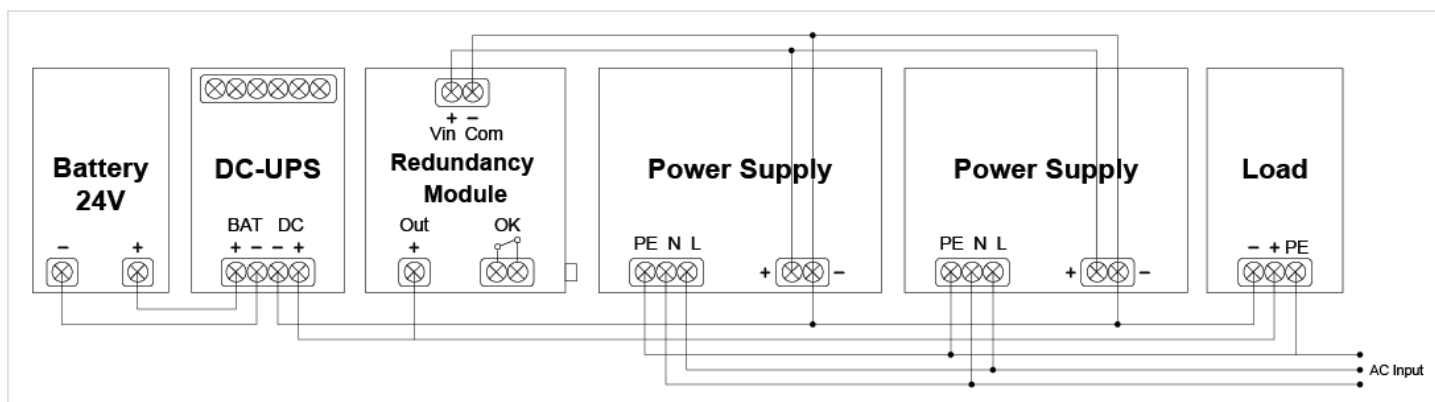


Fig. 4.2 Can be combined with redundancy module (DRR-40A)

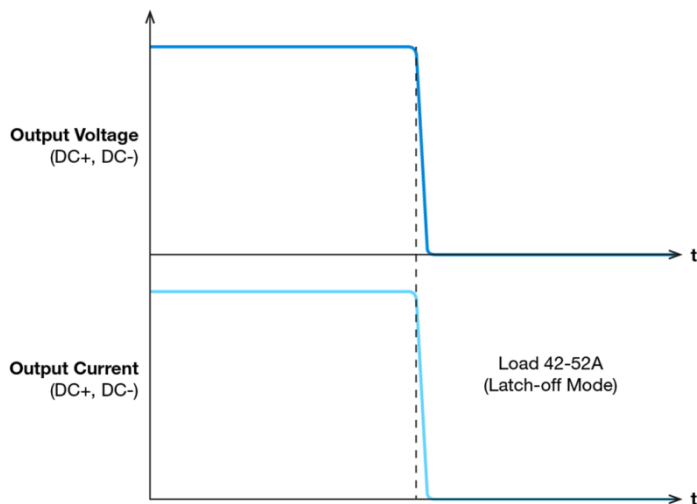


# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

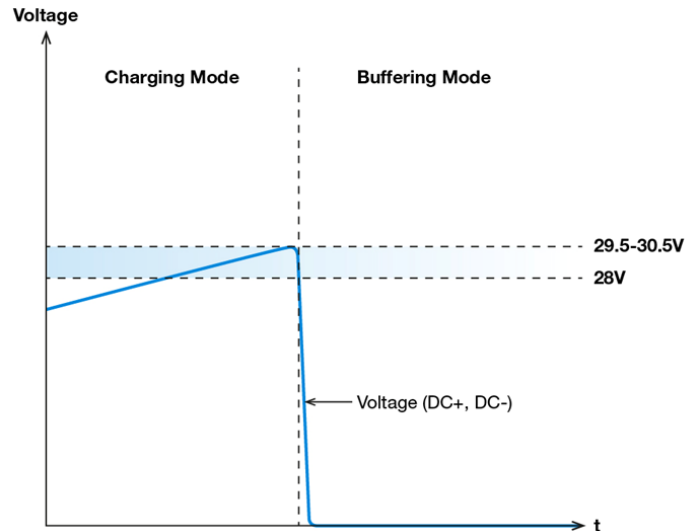
### Overload & Overcurrent Protections

When the output current exceeds the maximum specified output current. The DC-UPS module will shut down and protect itself. Normal operation of the module can be resumed upon removal of fault.



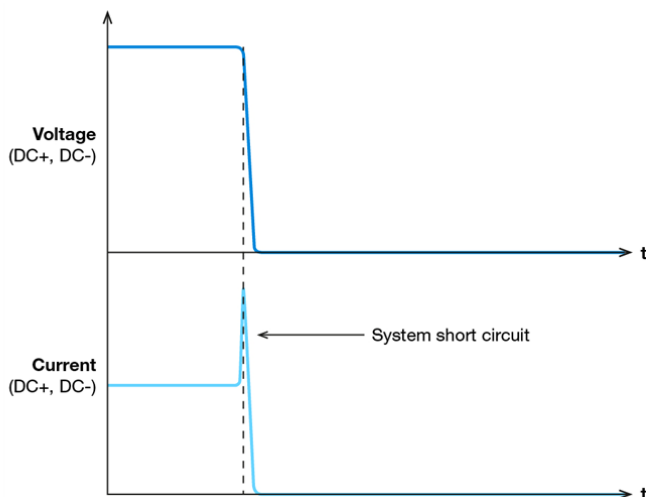
### Overvoltage Protection

The DC-UPS module's overvoltage protection will be activated when DC input to the module exceeds the maximum specified input voltage. The unit shall shutdown and return to normal state when the OVP condition is removed.



### Short Circuit Protection

The module is protected in case of short circuit at customer system, in the event of short circuit the module will shut down and protect itself. Normal operation can be resumed upon removal of fault.



### Over Temperature Protection

In the event of a higher operating temperature at 100% load, the power supply will run into OTP when the operating temperature is beyond what is recommended in the de-rating graph. When activated, the output voltage will shut down and remain in off state until the temperature drops to its normal operating temperature as recommended in the de-rating graph.

# CliQ II DC-UPS Module

## 24V 40A / DRU-24V40ABN

### Others

#### Delta RoHS Compliant

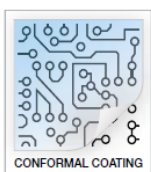


#### Restriction of the usage of hazardous substances

The European directive 2011/65/EU limits the maximum impurity level of homogeneous materials such as lead, mercury, cadmium, chrome, polybrominated flame retardants PBB and PBDE for the use in electrical and electronic equipment. RoHS is the abbreviation for "Restriction of the use of certain hazardous substances in electrical and electronic equipment".

This product conforms to this standard.

#### Conformal Coating



#### The Protective Coating Technology

Delta Electronics Group has designed the perfect dipping technique which penetrates everywhere including under device, and prevents leakage. The conformal coating dipping can be applied to PCBs or circuit board. The coating preserves the performance of precision electronic primarily by preventing ionizable contaminants such as salt from reaching circuit nodes, where the material slumps around sharp edges. This can be a problem especially in highly conversing atmosphere.