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CliQ II Buffer Module

24V 20A / DRB-24V020AB□



Highlights & Features

- Full corrosion resistant Aluminium chassis
- Long minimum buffering time of 250ms @ 24V/20A
- Can connect in parallel to increase buffering time
- Charging time of < 30 seconds
- Conformal coating on PCBA to protect against chemical and dust pollutants
- Hazardous Locations approval to ATEX and Class I, Div 2 (DRB-24V020ABA)
- IP20 Compliant
- Overvoltage / Overcurrent / Short Circuit Protections
- Meets worldwide safety requirements
- RoHS Directive 2011/65/EU Compliant
- Reliable design, with expected life of 10 years

Safety Standards



CB Certified for worldwide use

Model Number: DRB-24V020AB□
Unit Weight: 0.76 kg
Dimensions (L x W x D): 121 x 70 x 120.1 mm

General Description

Delta CliQ II Buffer Module offers the most widely used output voltage of 24V and one of the longest buffering time of 0.25 sec (min) at 20A in wide input range from 22.8Vdc to 28.8Vdc. The Buffer Module utilizes maintenance-free electrolytic capacitors to store energy, thus eliminates the need of periodic replacement as compared to costlier batteries which also have shorter functional life span. Delta CliQ II Buffer Module comes with comprehensive protection features like overcurrent/overload, overvoltage and short circuit protection. Delta CliQ II series of products is IP20 compliant with full corrosion resistant Aluminium chassis and conformal coating on the PCBAs to provide protection against dust and chemical pollutants.

Model Information

CliQ II Buffer Module

| Model Number | Input Voltage Range | Output Voltage | Output Current |
|---------------|---------------------|----------------|----------------|
| DRB-24V020AB□ | 22.8-28.8Vdc | 24Vdc | 20A |

Model Numbering

| DR | B – | 24V | 020A | B | □ |
|----------|---------------|----------------|----------------|----------------|-------------------------------------------------------------------------------|
| DIN Rail | Buffer Module | Output Voltage | Output Current | CliQ II Series | A - Metal Case, with Class I, Div 2 N - Metal Case, without Class I, Div 2 |

CliQ II Buffer Module

24V 20A / DRB-24V020AB□

Specifications

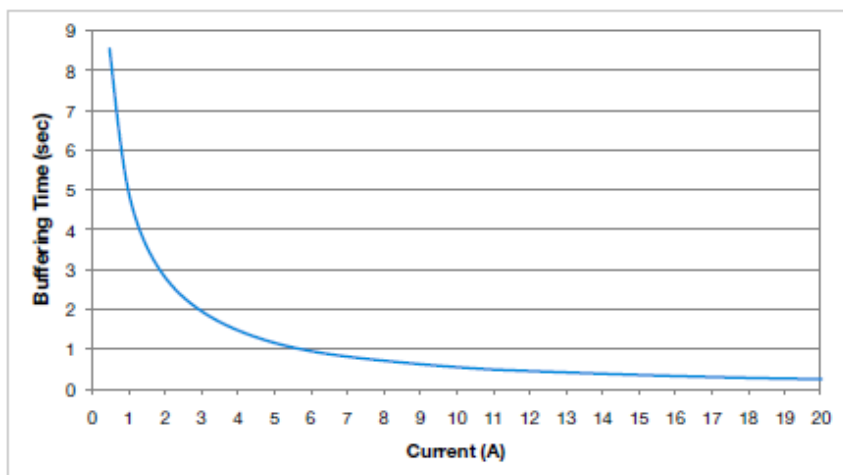
Input Ratings / Characteristics

| | |
|--------------------------------|--------------------------------------------------|
| Nominal Input Voltage | 24Vdc |
| Input Voltage Range | 22.8-28.8Vdc |
| Maximum Input Voltage | 35Vdc |
| Input Current | Charging Mode < 0.6A Discharging Mode 20A Max |
| Input Power (Standby Mode) | 2.5W Average |
| Maximum Signal Input (Inhibit) | 35V / 10mA |
| Max Inrush Current | < 20A |
| Charging Time | < 30sec |

Output Ratings / Characteristics

| | |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Output Voltage | 24Vdc typ. (depends on V_{in}) |
| Output Voltage Adjustment Range | 22-28Vdc |
| | Switch = "Fix 22V" Buffering starts if terminal voltage falls below 22V |
| | Factory Setting, Switch = " $V_{in}-1V$ " Buffering starts if terminal voltage is decreased by > 1V |
| Maximum Output Voltage | 35Vdc |
| Output Current | 20A Max |
| Buffering Time | 250ms Min @ 24V/20A Load, 5sec Min @ 24V/1A Load (Refer to Fig. 1) |
| Maximum Signal Output | 35V / 10mA |
| Signals | Inhibit Signal (I) "Low" = Shuts down Buffer Module Ready Signal (R) "High" = Buffer Module is fully charged or in Standby Mode Buffering Signal (B) "High" = Buffer Module is discharging or in Buffering Mode Supply Voltage (+ V_S) Common + V_S , 35V Max |
| PARD (20MHz) | < 200mVpp @ 25°C during Buffering Mode |
| Parallel Connection | Yes |
| Series Connection | No |
| Protective Device | Transient Voltage Suppressor (TVS) for signals |

Fig.1 Buffering Time (Typical Values at " $V_{in} - 1V$ " Mode)



Mechanical

CliQ II Buffer Module

24V 20A / DRB-24V020AB□

| | | |
|------------------------|-----------------------------------|---------------------------------------------------|
| Case Cover | | Aluminium |
| Dimensions (L x W x D) | | 121 x 70 x 120.1 mm |
| Unit Weight | | 0.76kg |
| LED Indicators | Green LED Off | Unit is discharged or $V_{in} < 22V_{dc}$ |
| | Green LED On | Unit is fully charged |
| | Green LED Blinking Slowly (1Hz) | Unit is charging |
| | Green LED Blinking Quickly (10Hz) | Unit is discharging |
| Cooling System | | Convection |
| Terminal | Input / Output | M3 x 2 Pins (Rated 300V/30A) |
| | Signal | M3 x 5 Pins (Rated 300V/30A) |
| Wire | Input / Output | AWG 12-10 |
| | Signal | AWG 24-10 |
| Mounting Rail | | Standard TS35 DIN Rail in accordance with EN60715 |

Environment

| | | |
|-----------------------------|-----------|----------------------------------------------------------------------------------------------------------|
| Surrounding Air Temperature | Operating | -25°C to +75°C |
| | Storage | -25°C to +85°C |
| Component De-rating | | $V_{in} = 22.8-28.8V_{dc}$, Max load - $T_{ambient} = 50^{\circ}C$ - $T_j < 85\%$ of T_{jmax} |
| Operating Humidity | | < 95% RH (Non-Condensing) |
| Operating Altitude | | 2,500 Meters |
| Shock Test (Non-Operating) | | IEC60068-2-27, 30G (300m/S ²) for a duration of 18ms |
| Vibration (Non-Operating) | | IEC60068-2-6, 10Hz to 500Hz @ 30m/S ² (3G peak); 60 min per axis for all X, Y, Z direction |
| Pollution Degree | | 2 |

Protections

| | |
|-----------------------------|-----------------------------------|
| Overvoltage | 32V \pm 10% |
| Overload / Overcurrent | 30A Max |
| Short Circuit | No Damage |
| Penetration Protection | > 3.5mm (eg. screws, small parts) |
| Reverse Polarity Protection | Yes |
| Degree of Protection | IP20 |
| Protection Against Shock | Class I without PE* connection |

*PE: Primary Earth



CliQ II Buffer Module

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Reliability Data

| | |
|----------------------------|---------------------------------------------------------------------------------------|
| MTBF(at V_{in} -1V Mode) | > 800,000 hrs. as per Telcordia SR-332 at Standby Mode (Buffer Module in Ready State) |
| Expected Cap Life Time | 10 years (Standby Mode @ 40°C) |

Safety Standards / Directives

| | |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electronic Equipment in Power Installations | EN50718 / IEC62103 |
| Electrical Safety (Information Technology Equipment) | SIQ to EN60950-1, UL/cUL recognized to UL60950-1, CSA C22.2 No. 60950-1, CB scheme to IEC60950-1 |
| Industrial Control Equipment | UL/cUL listed to UL508 and CSA C22.2 No. 107.1-01, CSA to CSA C22.2 No. 107.1-01 (File No. 181564) |
| Hazardous Location / ATEX | CSA to CSA C22.2 No. 213-M1987, ANSI / ISA 12.12.01:2007 (Class I, Division 2, Group A, B, C, D, T4) EN60079-0:2009, EN60079-15:2010 ( II 3G Ex nA nC IIc T4 Gc) |
|  II 3G ATEX 94/9/EC; IECEX Test Report | Certificate No. ESP 12 ATEX 1 491 X For IEC60079-0, IEC60079-15 |
| 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 | Input & Output to Ground Signal to Ground |
| | 1.5KVac 1.5KVac |

EMC

| | |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| EMC / Emissions | CISPR22, EN55022, EN55011, FCC Title 47: Class B |
| Component Power Supply for General Use | EN61204-3 |
| Immunity to | EN55024, EN61000-6-2 |
| Electrostatic Discharge | EN61000-4-2 Level 4 Criteria A ¹⁾ Air Discharge: 15kV Contact Discharge: 8kV |
| Radiated Field | EN61000-4-3 Level 3 Criteria A ¹⁾ 80MHz–1GHz, 10V/M with 1kHz tone / 80% modulation |
| Electrical Fast Transient / Burst | EN61000-4-4 Level 3 Criteria A ¹⁾ 2kV |
| Surge | IEC6100-4-5 Level 3 Criteria A ¹⁾ Common Mode ²⁾ : 2kV Differential Mode ³⁾ : 1kV |
| Conducted | EN61000-4-6 Level 3 Criteria A ¹⁾ 150kHz-80MHz, 10Vrms |
| Power Frequency Magnetic Fields | EN61000-4-8 Level 3 Criteria A ¹⁾ 10A/Meter |
| Voltage Dips | EN61000-4-11 Level 3 Criteria A ¹⁾ Additional 100% dip; 1 cycle (20ms); No Damage |
| Low Energy Pulse Test (Ring Wave) | IEC61000-4-12 Level 3 Criteria A ¹⁾ Common Mode ²⁾ : 2kV Differential Mode ³⁾ : 1kV |

Note: Product intended to be used as Apparatus with AC-DC Power Supply, EMC compliance to be verified in correspondence to the connected units.

1) Criteria A: Normal performance within the specification limits

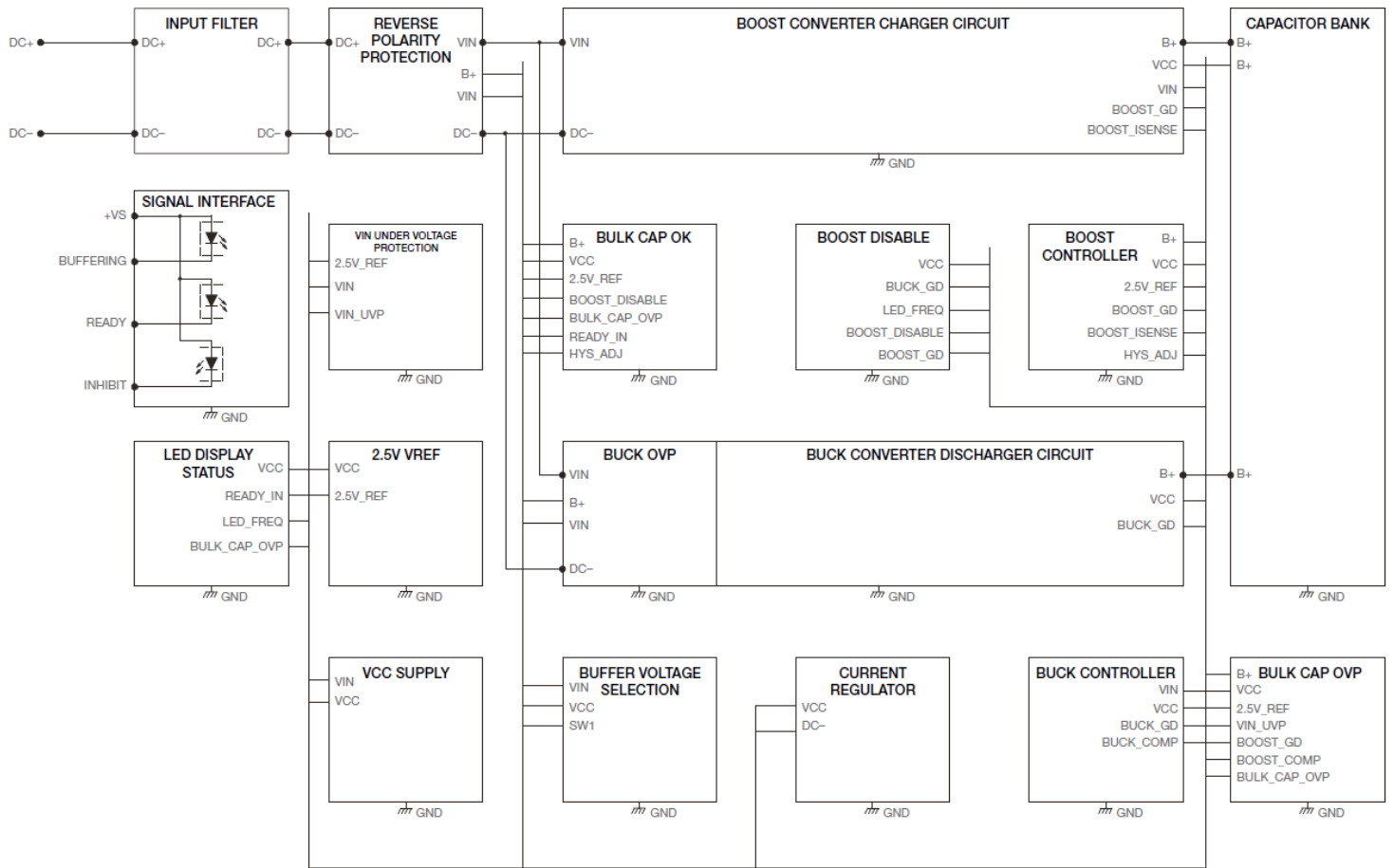
2) Asymmetrical: Common mode (Line to earth)

3) Symmetrical: Differential mode (Line to line)

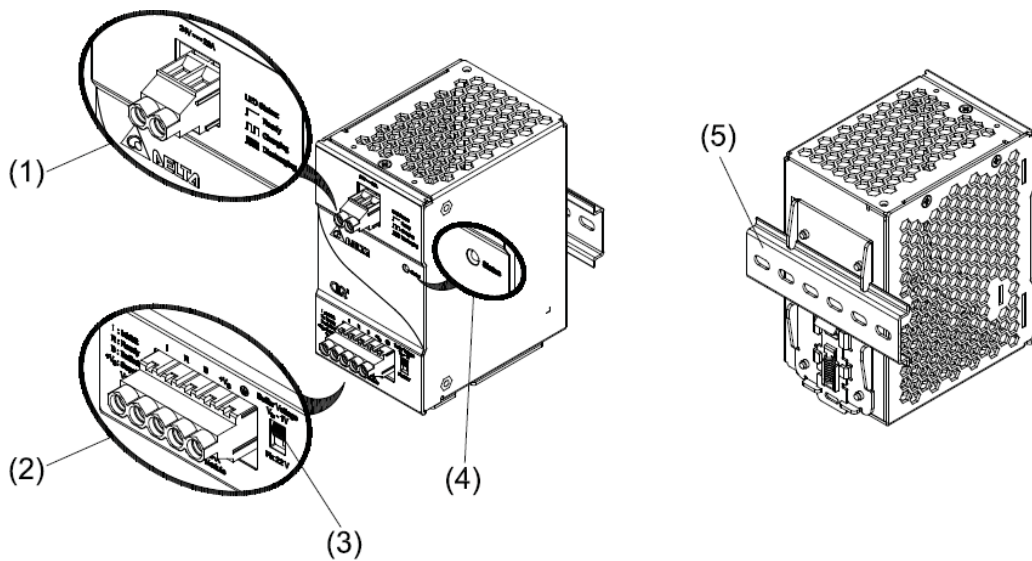
CliQ II Buffer Module

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Block Diagram



Device Description



- 1) Input / Output terminal block connector
- 2) Signal terminal block connector
- 3) Select switch (operation mode)

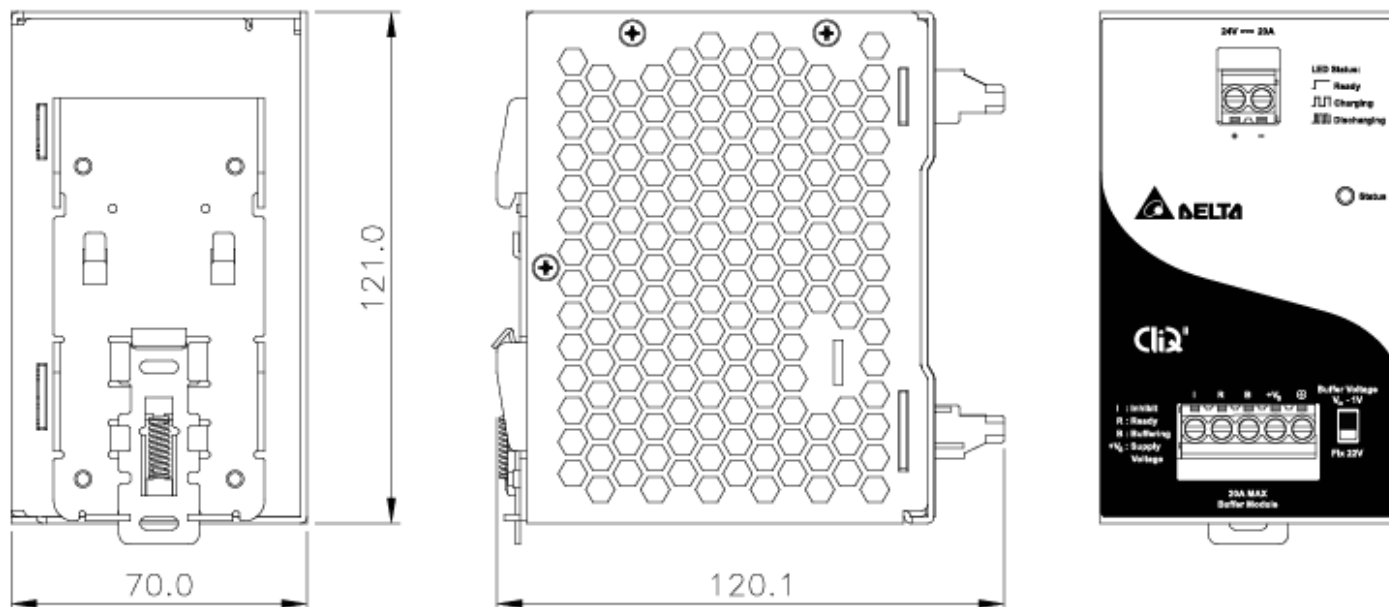
- 4) LED display status
- 5) Universal mounting rail system

CliQ II Buffer Module

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Dimensions

L x W x D: 121 x 70 x 120.1 mm



Engineering Data

De-rating

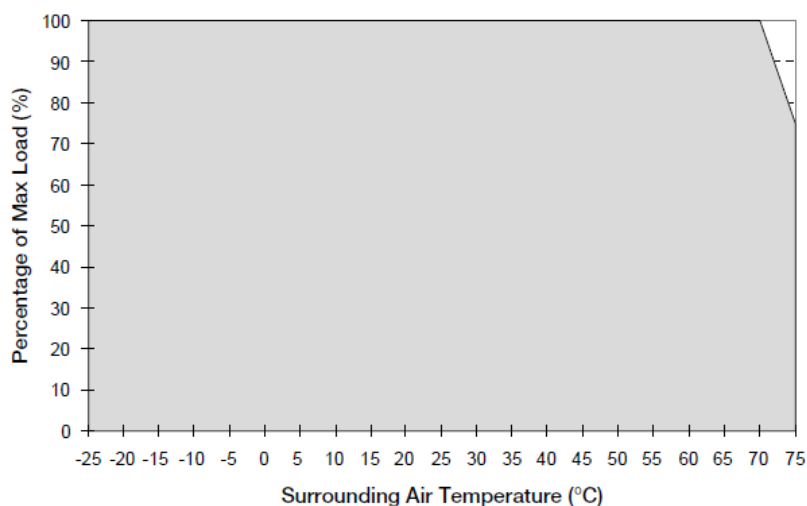


Fig. 2 De-rating for Vertical Mounting Orientation
 > 70°C de-rate power by 5% / °C

Note

1. Components may degrade, or be damaged, when the buffer module is continuously used outside the shaded region, refer to the graph shown in Fig. 2.
2. In order for the device to function in the manner intended, it is also necessary to keep a safety distance of 20mm with adjacent units while the device is in operation.
3. Depending on the surrounding air temperature and output load delivered by the buffer module, the device housing can be very hot!
4. If the device has to be mounted in any other orientation, please do not hesitate to contact info@deltapsu.com for more details.

CliQ II Buffer Module

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Assembly & Installation

The buffer module can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input / output terminal block at the top.

Each device is delivered ready to install.

Mounting

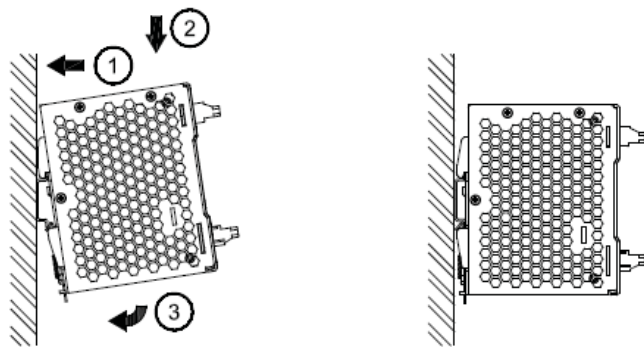


Fig. 3.1 Mounting

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

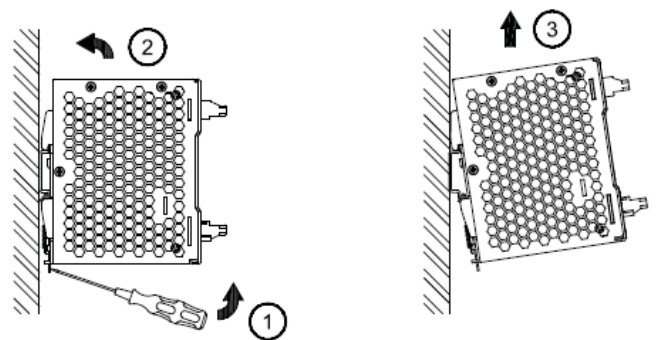
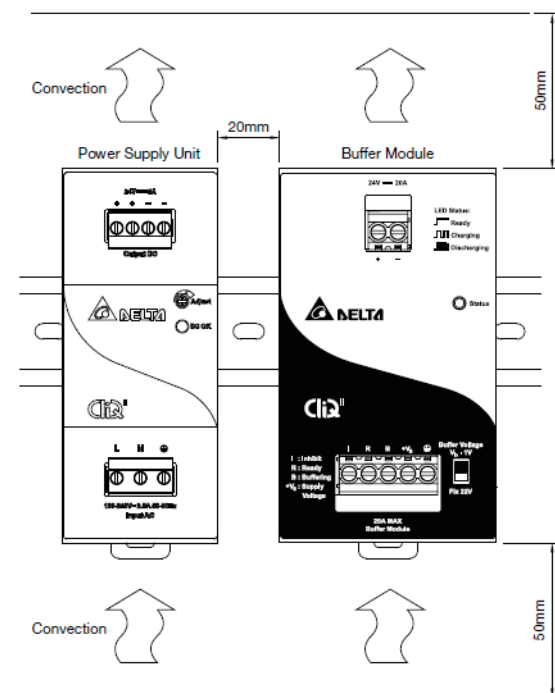


Fig. 3.2 Dismounting

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.

Safety Instructions



- 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.
- **To guarantee sufficient convection cooling, keep a distance of 50mm above and below the device as well as a lateral distance of 20mm 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!
- Only plug in and unplug connectors when power is turned off!
- 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 power supplies unit must be installed in an IP54 enclosure.
- The power supplies are built in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.

CliQ II Buffer Module

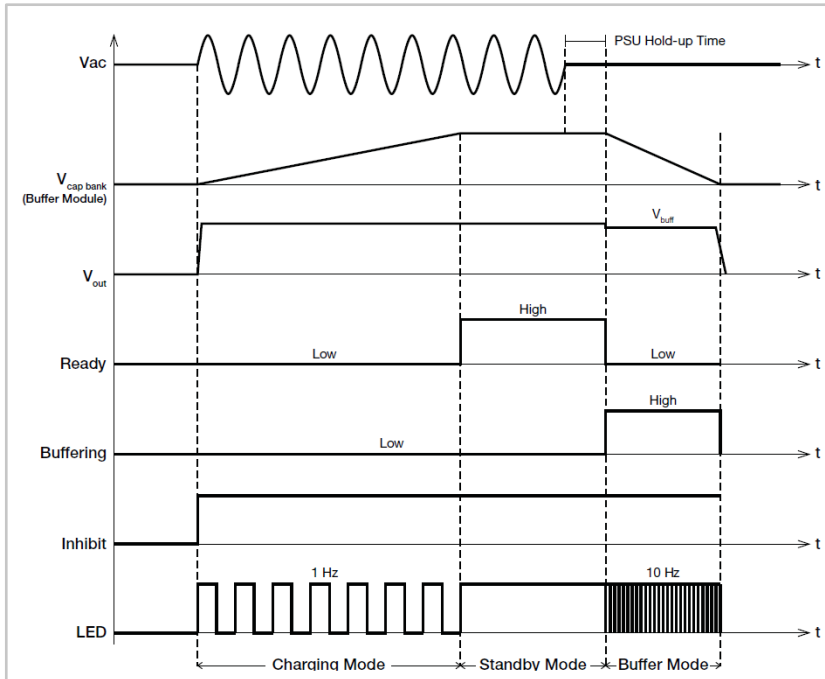
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Functions

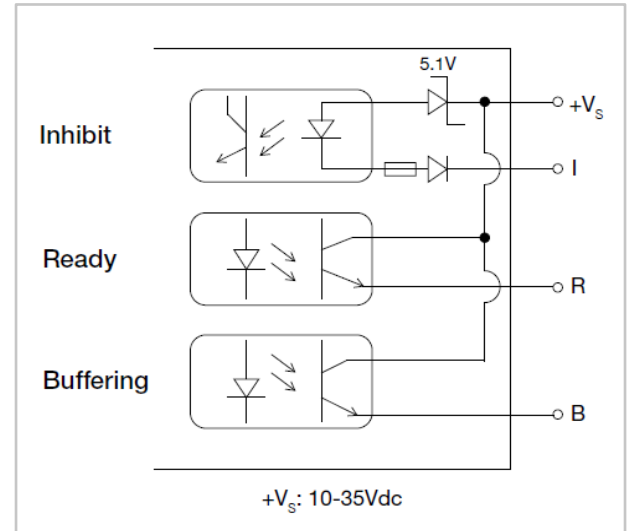
Buffering, Ready, and Inhibit Signal

| | |
|---------------------------------------|------------------------------------------------------------|
| Buffering Signal (B) | “High” = Buffer Module is discharging or in Buffering |
| Maximum Signal Voltage | 35Vdc |
| Maximum Signal Current | 10mA |
| Isolation (Signal Port to Power Port) | 1.5KVac |
| Ready Signal (R) | “High” = Buffer Module is fully charged or in Standby Mode |
| Maximum Signal Voltage | 35Vdc |
| Maximum Signal Current | 10mA |
| Isolation (Signal Port to Power Port) | 1.5KVac |
| Inhibit Signal (I) | “Low” = Shuts down Buffer Module |
| Maximum Signal Voltage | 35Vdc |
| Maximum Signal Current | 10mA |
| Shut-down Threshold | 6Vdc Min / 10Vdc Max |
| Isolation (Signal Port to Power Port) | 1.5KVac |

Operating Diagram



Wiring Schematics



Typical Application Notes can be found on Page 9.

CliQ II Buffer Module

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Typical Application Notes

Fig. 4.1 General Connection/Wiring Diagram

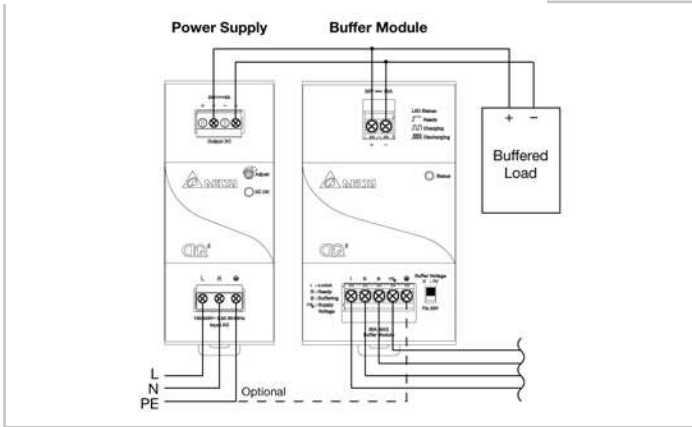


Fig. 4.2 Paralleling of Buffer Units

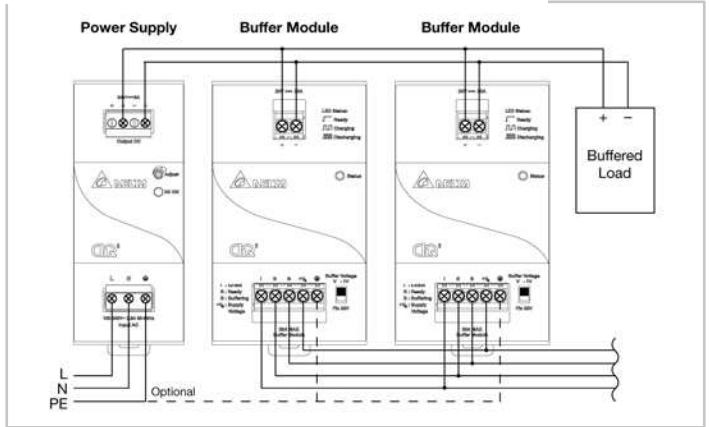


Fig. 4.3 Decoupling of Buffered Branches

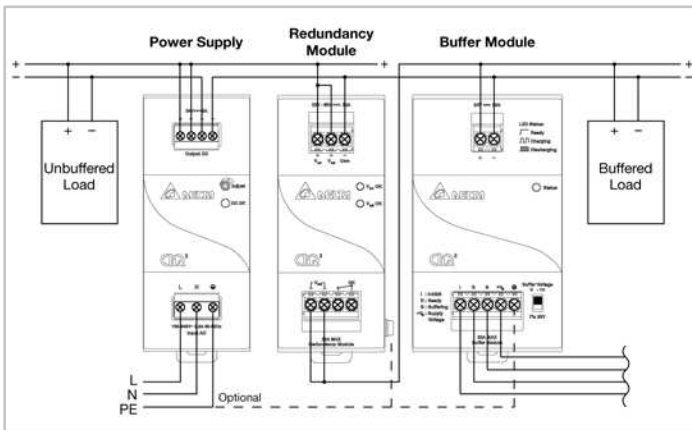


Fig. 4.4 General Signals Wiring

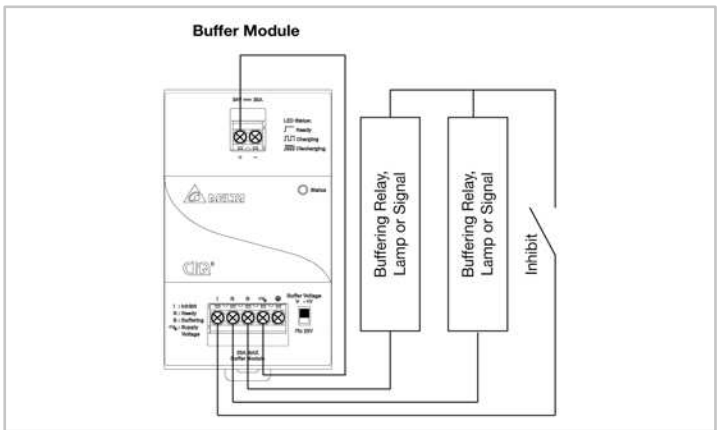


Fig. 4.5 Signals Supplied from an External Voltage

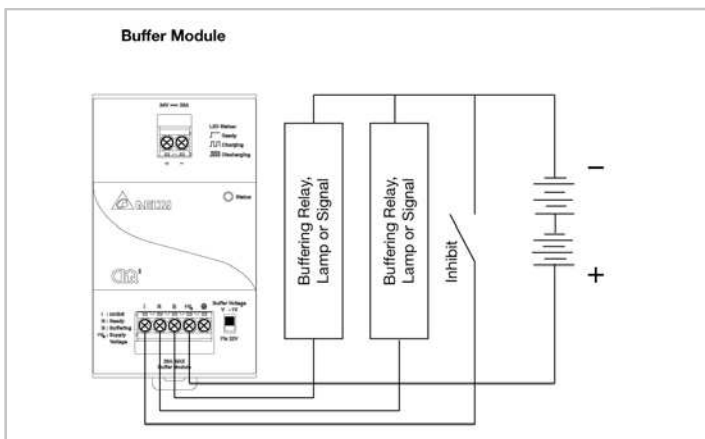
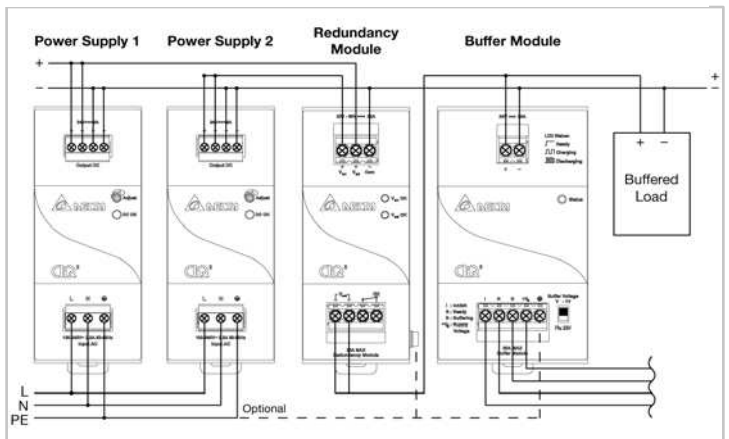


Fig. 4.6 Connection Diagram with Redundant Operation



CliQ II Buffer Module

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Connectable Power Supplies

The buffer module is recommended to be connected with the following power supplies:

CliQ Series

- DRP024V060W1AZ
- DRP024V060W1AA
- DRP024V120W1AA
- DRP024V240W1AA
- DRP024V480W1AA
- DRP024V060W3AA
- DRP024V120W3AA
- DRP024V240W3AA
- DRP024V480W3AA

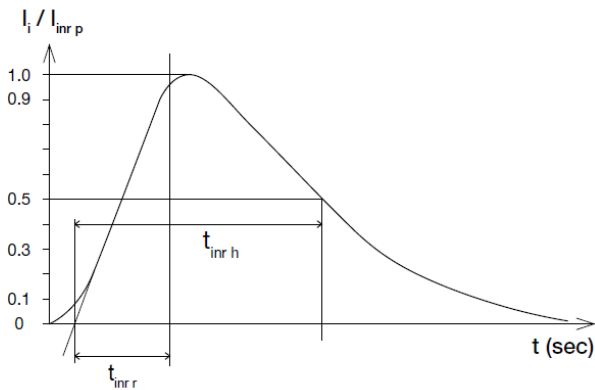
CliQ II Series

- DRP024V060W1BA
- DRP024V120W1BA
- DRP024V240W1BA
- DRP024V480W1BA

More new products can be found at www.DeltaPSU.com

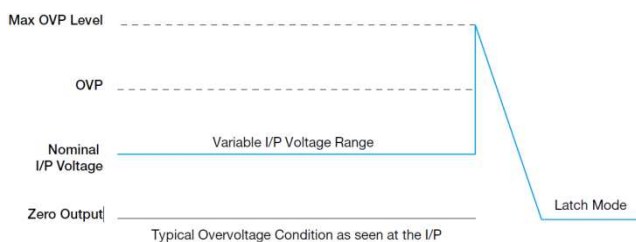
Inrush Current

Inrush current is the peak, instantaneous, input current measured and occurs when input voltage is first applied. For DC input voltage the maximum peak value of inrush will occur during the first applied DC voltage.



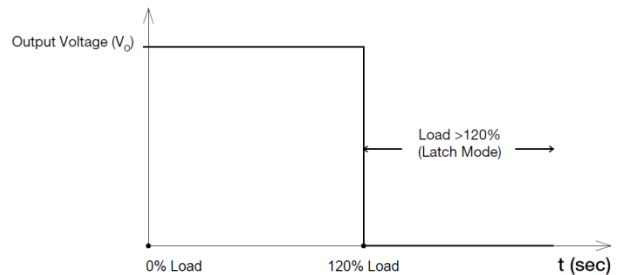
Overvoltage Protection

The buffer module's overvoltage protection will be activated when DC input to the module exceeds the maximum specified input voltage. The overvoltage limits are same as power supply limits, $32V \pm 10\%$. Buffer module will shut down and latch during overvoltage mode, and will return to normal operation upon removal of fault and power supply input is recycled (ON/OFF) or input to buffer module is recycled.



Overload & Overcurrent Protections

When the output current exceeds 120% of IO (Max load) buffer module will shut down and latch. Normal operation of buffer module can be resumed upon removal of fault and power supply input is recycled (ON/OFF) or input to buffer module is recycled.



Short Circuit Protection

Buffer module is protected by short circuit during buffering mode, in the event of short circuit the module will shut down and latch. Operation can be resumed upon removal of fault and power supply input is recycled (ON/OFF) or input to buffer module is recycled.

CliQ II Buffer Module

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Others

Delta RoHS Compliant

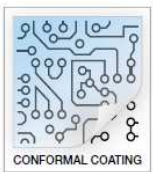


Restriction of the usage of hazardous substances

The European directive 2011/65/EC 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.