

CliQ II Buffer Module

24V 20A / DRB-24V020AB□



Highlights & Features

- Minimum buffering time of 250ms @ 24V/20A
- Flexible operating buffering voltage modes:
 - Fixed mode at 22Vdc
 - Dynamic mode for $V_{in} - 1V$
- Supports parallel connection to extend buffering time
- Conformal coating on PCBAs to protect against common dust and chemical pollutants
- Hazardous Locations approval to ATEX and Class I, Div 2 (DRB-24V020ABA)

Safety Standards



CB Certified for worldwide use

Model Number: DRB-24V020AB□
Unit Weight: 0.76 kg (1.68 lb)
Dimensions (L x W x D): 121 x 70 x 120.1 mm (4.76 x 2.76 x 4.73 inch)

General Description

Delta's CliQ II buffer module offers the most widely used output voltage of 24V and one of the longest minimum buffering time of 250ms 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. The DRB-24V020AB□ comes with comprehensive protection features like overvoltage, over current and short circuit protections. The rugged compact aluminium case is shock and vibration resistant according to IEC 60068-2 standard.

Model Information

CliQ II Buffer Module

Model Number	Input Voltage Range	Rated Output Voltage	Rated Output Current
DRB-24V020AB□	22.8-28.8Vdc	24Vdc typ. (Depends on V_{in})	20.0A

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 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 (Cold Start)	< 20A	
Charging Time	< 30s	

Output Ratings / Characteristics

Nominal Output Voltage Range	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, 5s Min @ 24V/1A Load (Refer to Fig. 1)	
Maximum Signal Output	35V / 10mA	
Signals (Low: < 1V; High: > + V_S -2V)	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, buffering mode	
Parallel Connection	Yes	
Series Connection	No	
Protective Device	Transient Voltage Suppressor (TVS) for signals	

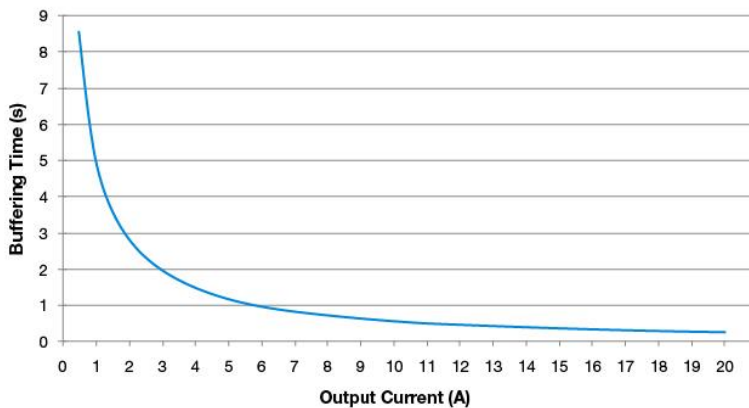


Fig. 1 Buffering Time (Typical Values at " $V_{in}-1V$ ")

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24V 20A / DRB-24V020AB□

Mechanical

Case Cover / Chassis	Aluminium	
Dimensions (L x W x D)	121 x 70 x 120.1 mm (4.76 x 2.76 x 4.73 inch)	
Unit Weight	0.76 kg (1.68 lb)	
LED Indicators	Green LED Off	Unit is discharged or $V_{in} < 22Vdc$
	Green LED On	Unit is fully charged
	Green LED Flashing Slowly (1Hz)	Unit is charging
	Green LED Flashing Quickly (10Hz)	Unit is discharging
Cooling System	Convection	
Terminal	Input / Output	2 Pins (Rated 300V/30A)
	Signal	5 Pins (Rated 300V/30A)
Wire	Input / Output	AWG 12-10
	Signal	AWG 24-10
Mounting Rail	Standard TS35 DIN Rail in accordance with EN 60715	
Noise (1 Meter from power supply)	Sound Pressure Level (SPL) < 40dBA	

Environment

Surrounding Air Temperature	Operating	-25°C to +75°C
	Storage	-25°C to +85°C
Power De-rating	Vertical Mounting	> 70°C de-rate power by 5% / °C
	Horizontal Mounting	> 70°C de-rate power by 5% / °C
Operating Humidity	5 to 95% RH (Non-Condensing)	
Operating Altitude	0 to 2,500 Meters (8,200 ft.)	
Shock Test	Non-Operating	IEC 60068-2-27, 30G (300m/S ²) 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 ² (3G peak); 60 min per axis for all X, Y, Z direction
Pollution Degree	2	

Protections

Overvoltage	32V ± 10%
Overload / Overcurrent	30A Max
Short Circuit	No Damage
Penetration Protection	> 3.5mm (e.g. screws, small parts)
Reverse Polarity Protection	Yes
Degree of Protection	IP20
Protection Against Shock	Class I with PE* connection

*PE: Primary Earth


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24V 20A / DRB-24V020AB□

Reliability Data

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

Safety Standards / Directives

Electrical Equipment of Machines		EN 60204-1
Electrical Equipment for Use in Electrical Power Installations		IEC/EN 62477-1 / IEC 62103
Electrical Safety	SIQ	EN 60950-1, EN 62368-1
	UL/cUL recognized	UL 60950-1 and CSA C22.2 No. 60950-1 (File No. E191395) UL 62368-1 and CSA C22.2 No. 62368-1 (File No. E191395)
	CB scheme	IEC 60950-1, IEC 62368-1
Industrial Control Equipment	UL/cUL listed	UL 508 and CSA C22.2 No. 107.1-01 (File No. E315355)
	CSA	CSA C22.2 No. 107.1-01 (File No. 181564)
Hazardous Location / ATEX (For DRB-24V020ABA)	cCSAus	CSA C22.2 No. 213-M1987, ANSI / ISA 12.12.01:2007 [Class I, Division 2, Group A, B, C, D T4, Ta= -25°C to +75°C (> +70°C derating)]
	ATEX	EN 60079-0:2009, EN 60079-15:2010 [ II 3G Ex nA IIC T4 Gc, Ta= -25°C to +75°C (> +70°C derating)] Certificate No. EPS 12 ATEX 1 491 X
CE		In conformance with EMC Directive 2014/30/EU and Low Voltage Directive 2014/35/EU For DRB-24V020ABA: In conformance with Equipment for explosive atmospheres (ATEX) directive 2014/34/EU
Galvanic Isolation	Input & Output / PE	1.5KVac
	Signal / PE	1.5KVac

CliQ II Buffer Module

24V 20A / DRB-24V020AB□

EMC

Emissions (CE & RE)		Generic Standards: CISPR 32, EN 55032, EN 55011, FCC Title 47: Class B
Component Power Supply for General Use		EN 61204-3
Immunity		Generic Standards: EN 55024, EN 61000-6-2
Electrostatic Discharge	IEC 61000-4-2	Level 4 Criteria A ¹⁾ Air Discharge: 15kV Contact Discharge: 8kV
Radiated Field	IEC 61000-4-3	Level 3 Criteria A ¹⁾ 80MHz-1GHz, 10V/M, 80% modulation (1KHz)
Electrical Fast Transient / Burst	IEC 61000-4-4	Level 3 Criteria A ¹⁾ 2kV
Surge	IEC 61000-4-5	Level 3 Criteria A ¹⁾ Common Mode ²⁾ : 2kV Differential Mode ³⁾ : 1kV
Conducted	IEC 61000-4-6	Level 3 Criteria A ¹⁾ 150kHz-80MHz, 10Vrms
Power Frequency Magnetic Fields	IEC 61000-4-8	Criteria A ¹⁾ 10A/Meter
Voltage Dips	IEC 61000-4-11	Level 3 Criteria A ¹⁾ Additional 100% dip; 1 cycle (20ms); No Damage
Low Energy Pulse Test (Ring Wave)	IEC 61000-4-12	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

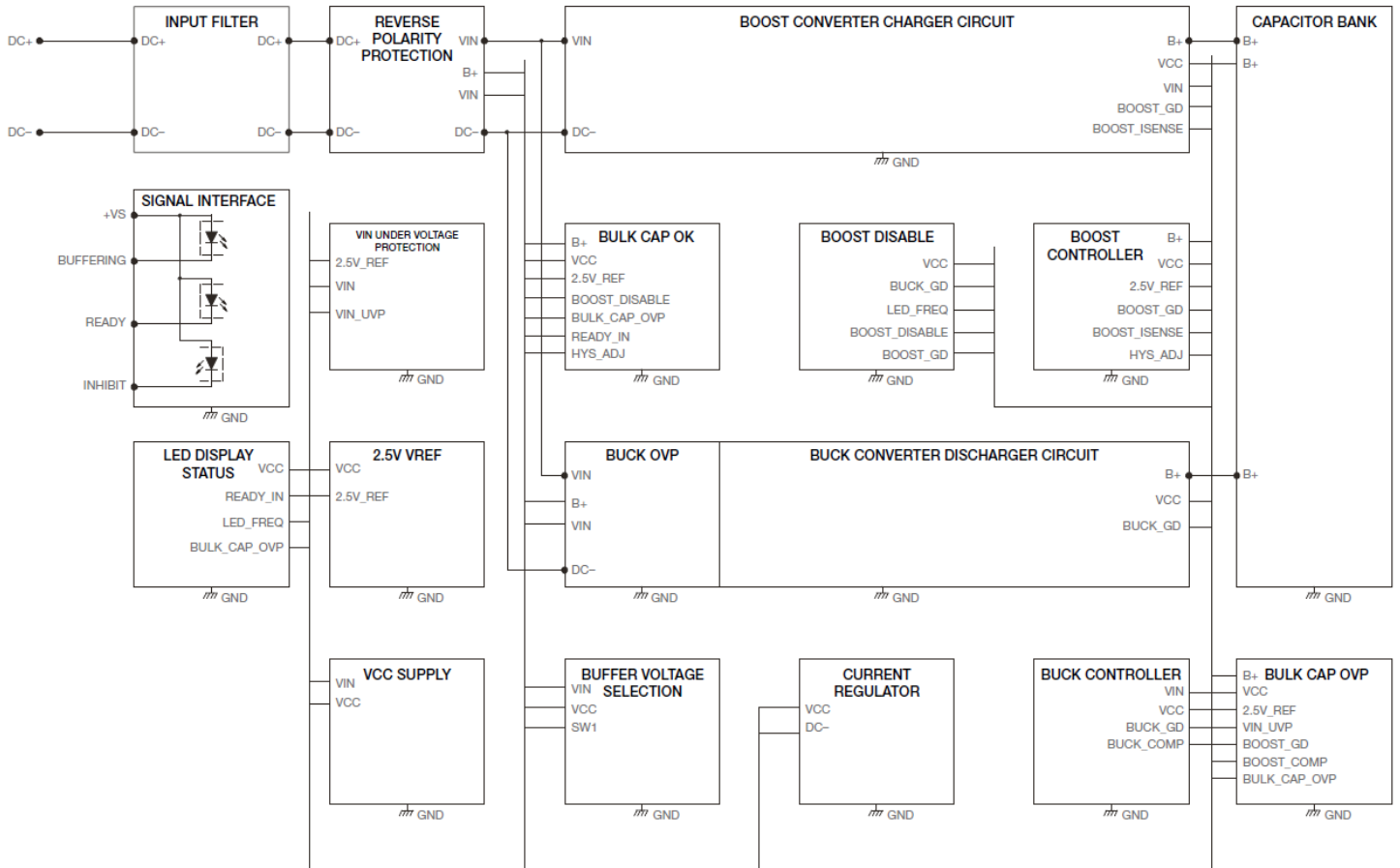
2) Asymmetrical: Common (Line to earth)

3) Symmetrical: Differential mode (Line to line)

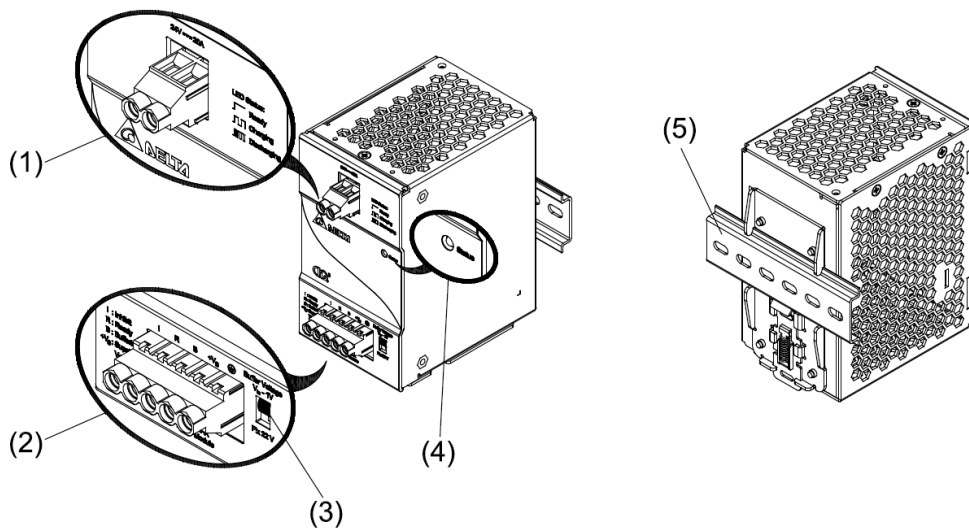
CliQ II Buffer Module

24V 20A / DRB-24V020AB □

Block Diagram



Device Description



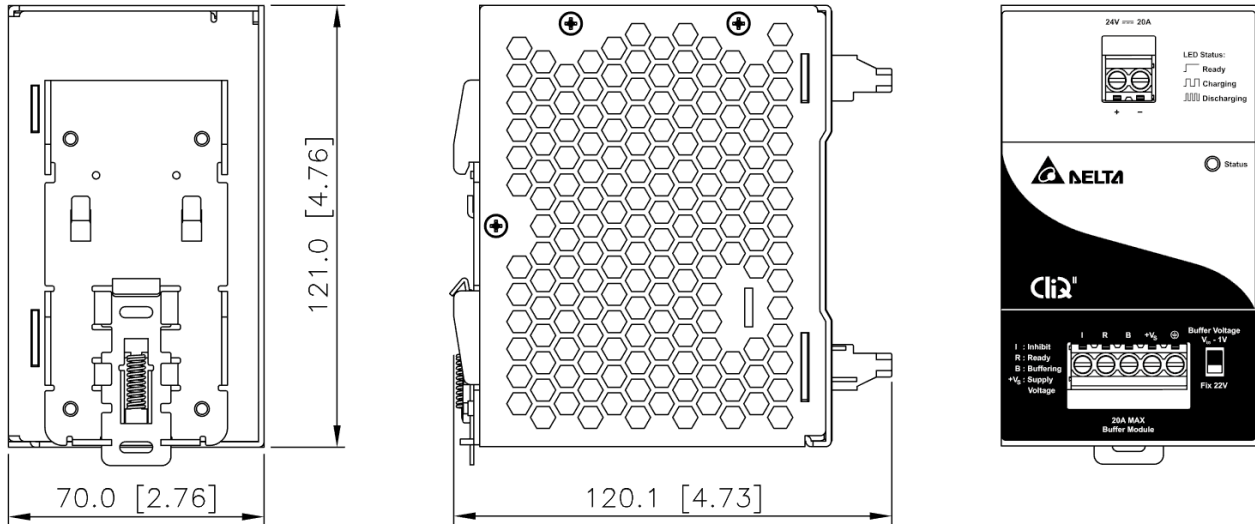
- 1) Input / Output terminal block connector
- 2) Signal terminal block connector
- 3) Select switch (operation mode)
- 4) LED display status
- 5) Universal mounting rail system

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24V 20A / DRB-24V020AB □

Dimensions

L x W x D: 121 x 70 x 120.1 mm (4.76 x 2.76 x 4.73 inch)



Engineering Data

Output Load De-rating VS Surrounding Air Temperature

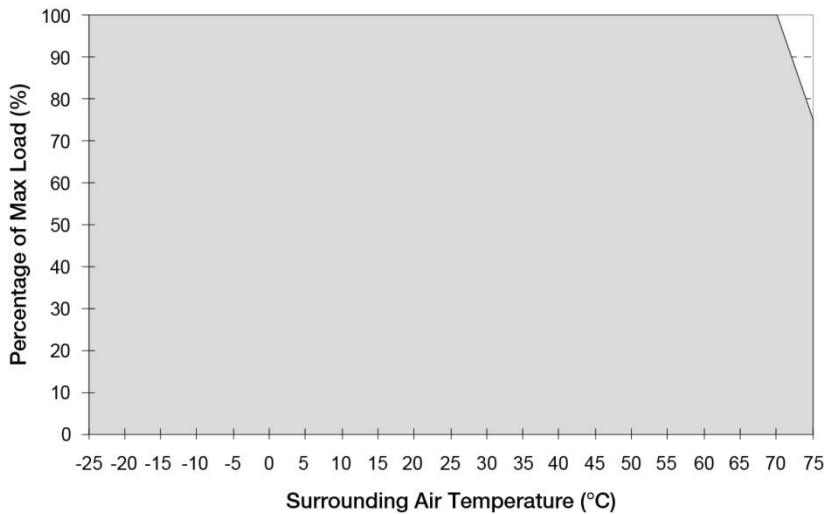


Fig. 2 De-rating for Vertical and Horizontal Mounting Orientation
 > 70°C de-rate power by 5% / °C

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. If the output capacity is not reduced when the surrounding air temperature exceeds its specification as defined on Page 3 under “Environment”, the device may run into Over Temperature Protection. When activated, the output voltage will go into bouncing mode and will recover when the surrounding air temperature is lowered or the load is reduced as far as necessary to keep the device in working condition.
3. In order for the device to function in the manner intended, it is also necessary to keep a safety distance as recommended in the safety instructions 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 contact info@deltapsu.com for more details.

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24V 20A / DRB-24V020AB □

Assembly & Installation

The unit can be mounted on 35mm DIN rails in accordance with EN 60715. The device should be installed with Input / Output terminal block at the top.

Each device is delivered ready to install.

Mounting

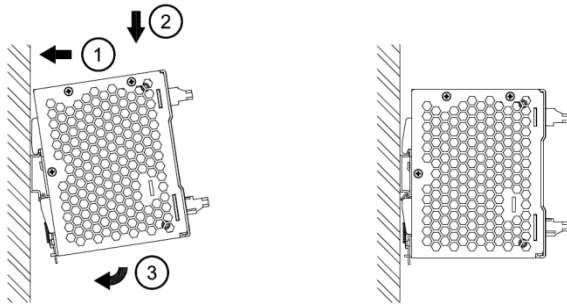


Fig. 3.1 Mounting

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

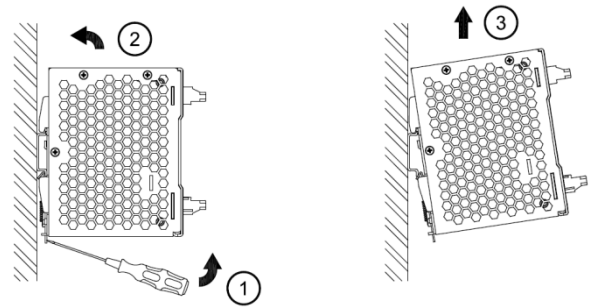


Fig. 3.2 Dismounting

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.

In accordance to EN 60950 / UL 60950 and EN 62368 / UL 62368, flexible cables require ferrules.

Use appropriate copper cables designed to sustain operating temperature of:

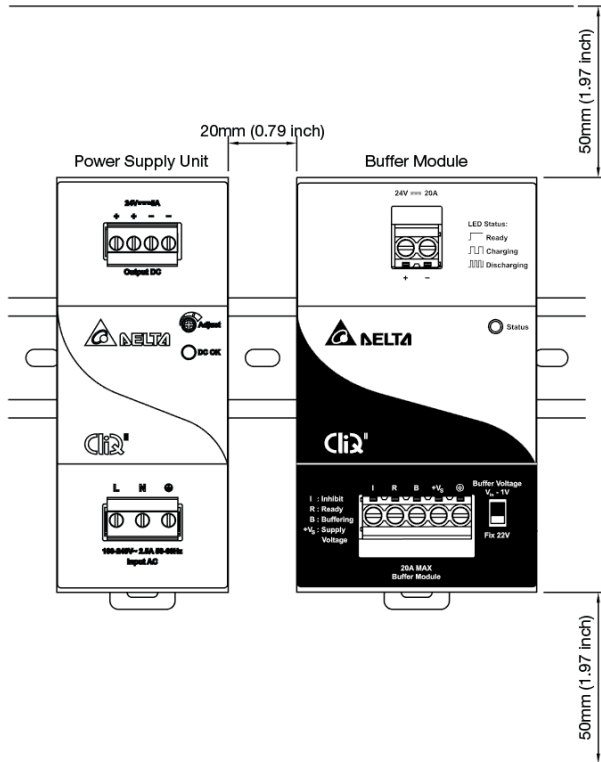
1. 60°C, 60°C / 75°C for USA
2. At least 90°C for Canada.

CliQ II Buffer Module

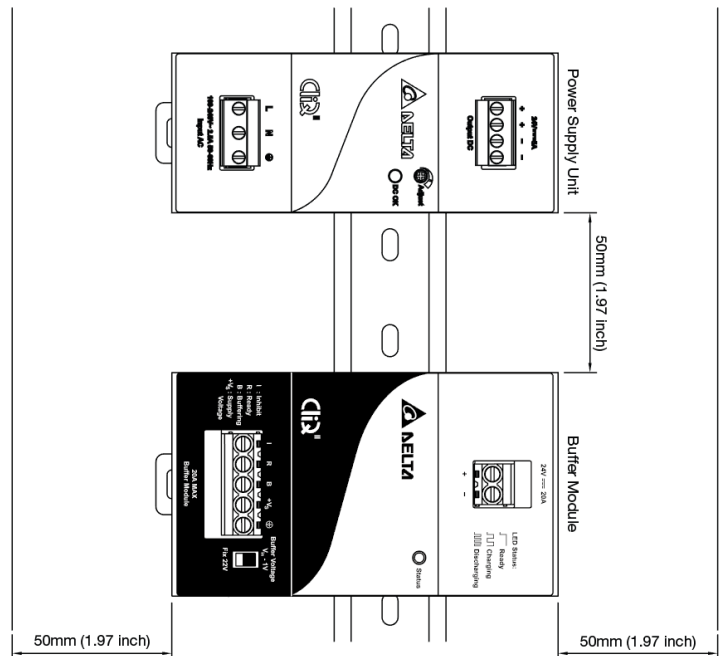
24V 20A / DRB-24V020AB □

Safety Instructions

■ Vertical Mounting



■ Horizontal Mounting



- 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, please refer to the following instructions to ensure sufficient clearance around the device.
Vertical Mounting: 50mm (1.97 inch) above and below the device as well as a lateral distance of 20mm (0.79 inch) to other units.
Horizontal Mounting: 50mm (1.97 inch) above and below the device as well as a lateral distance of 50mm (1.97 inch) 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.

For DRB-24V020ABA:

- The unit must be installed in an IP54 enclosure or cabinet in the final installation. The enclosure or cabinet must comply with EN60079-0 or EN60079-15.
- Warning: Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- Warning: Explosion Hazard - Do not disconnect equipment or adjust switch unless the power has been switched off or the area is known to be non-hazardous.

CliQ II Buffer Module

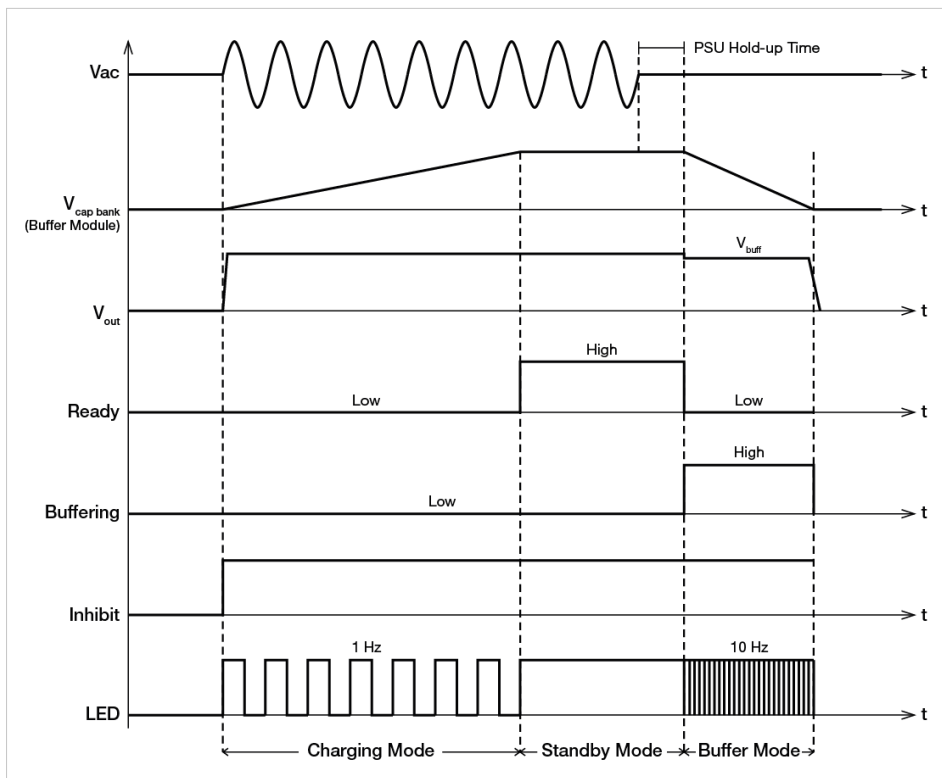
24V 20A / DRB-24V020AB□

Functions

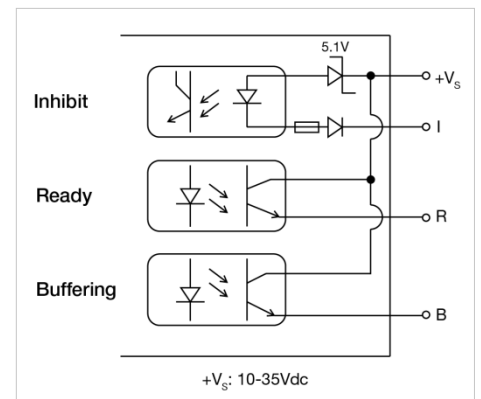
Buffering, Ready and Inhibit Signal

Buffering Signal (B)	"High" = Buffer module is discharging or in buffering mode
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

24V 20A / DRB-24V020AB□

Typical Application Notes

Fig. 4.1 General connection / wiring diagram

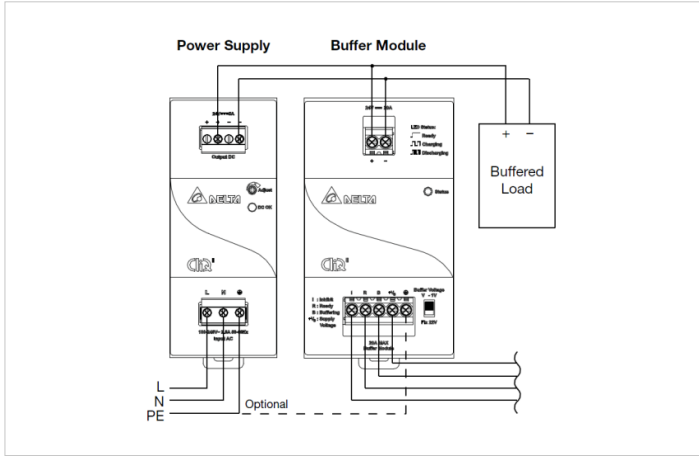


Fig. 4.2 Paralleling of buffer units

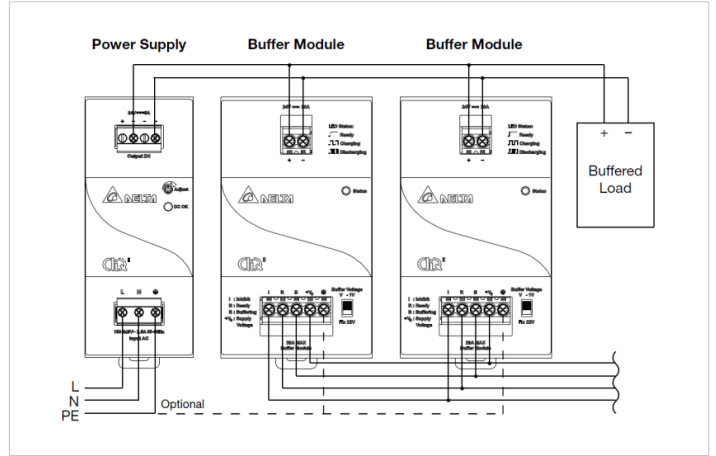


Fig. 4.3 Decoupling of buffered branches

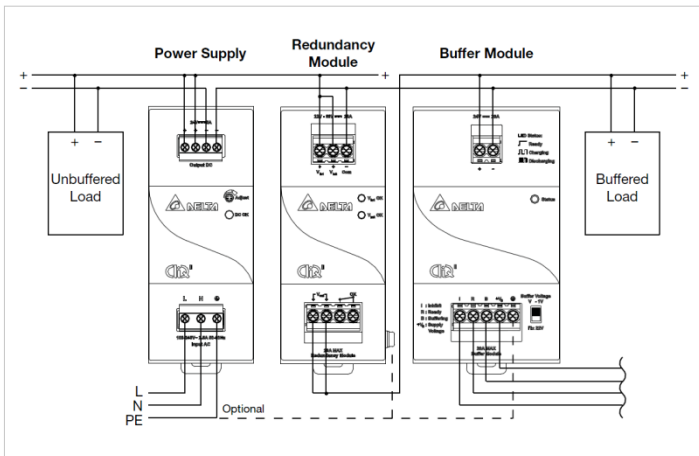


Fig. 4.4 General signals wiring

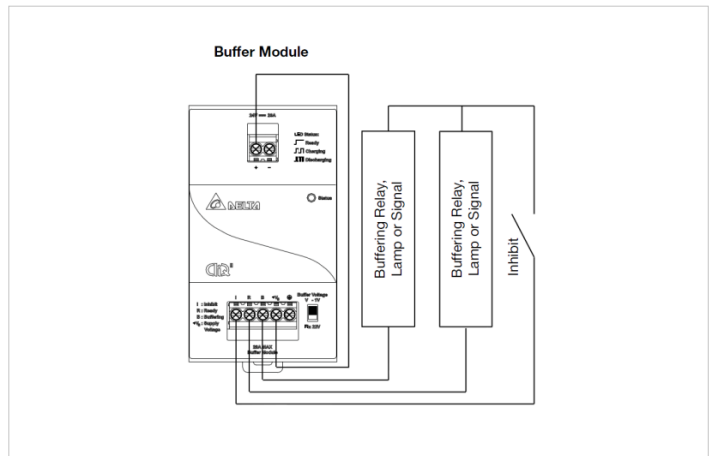


Fig. 4.5 Signals supplied from an external voltage

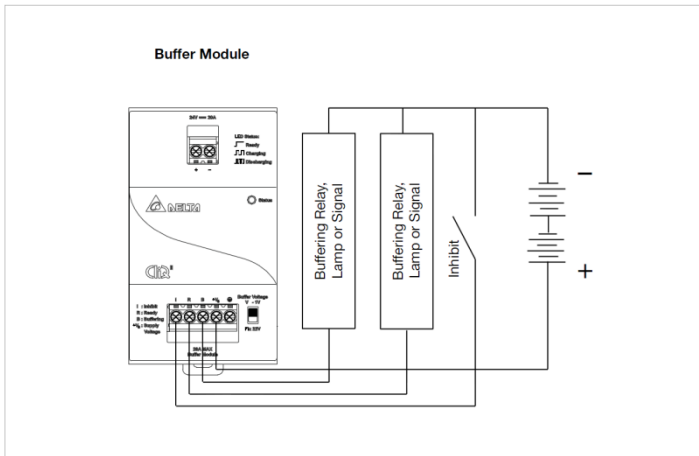
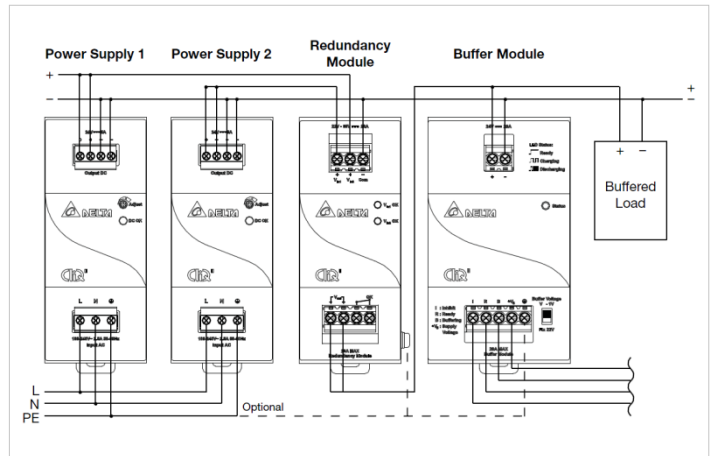


Fig. 4.6 Connection diagram with redundant operation



CliQ II Buffer Module

24V 20A / DRB-24V020AB□

Connectable Power Supplies

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

CliQ Series

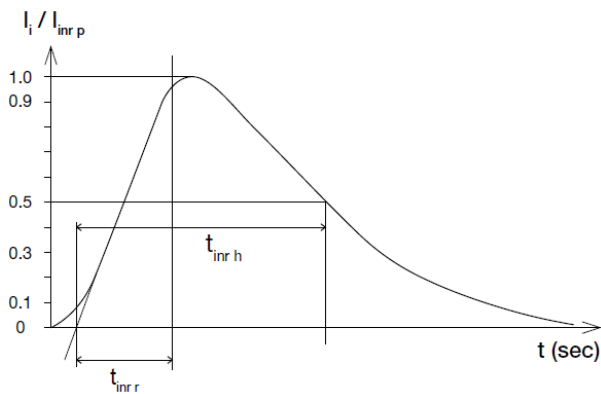
- DRP024V060W1AA
- DRP024V060W1AZ
- DRP024V120W1AA
- DRP024V240W1AA
- DRP024V480W1AA

CliQ II Series

- DRP024V060W1B□
- DRP024V120W1B□
- DRP024V240W1B□
- DRP024V480W1B□

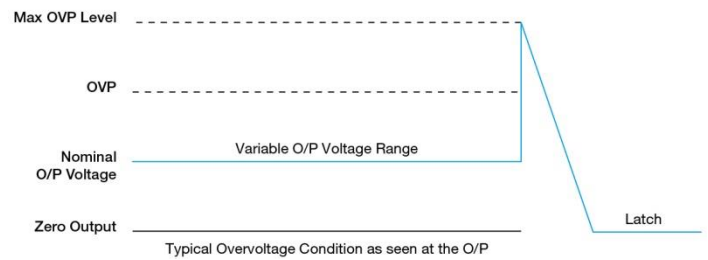
Inrush Current

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



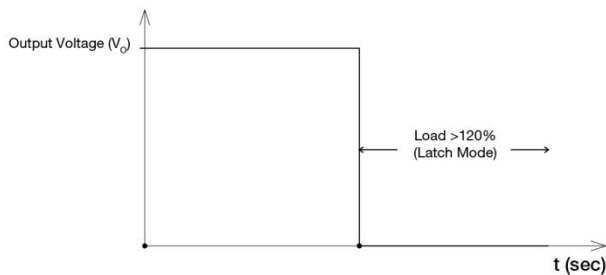
Overvoltage Protection

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 I_o (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

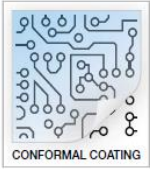
Buffer module is protected by short circuit during buffering mode, in the event of short circuit the module will shut down and latch. Operation can be resumed upon removal of fault and power supply in put is recycled (ON/OFF) or input to buffer module is recycled.

CliQ II Buffer Module

24V 20A / DRB-24V020AB □

Others

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 PCBA's 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 corrosive atmosphere.

Attention

Delta provides all information in the datasheets on an "AS IS" basis and does not offer any kind of warranty through the information for using the product. In the event of any discrepancy between the information in the catalog and datasheets, the datasheets shall prevail (please refer to www.DeltaPSU.com for the latest datasheets information). Delta shall have no liability of indemnification for any claim or action arising from any error for the provided information in the datasheets. Customer shall take its responsibility for evaluation of using the product before placing an order with Delta.

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