RHINO Power Supply Accessories PSB Series

Buffer Module

The RHINO PSB24-BFM20S buffer module is a cost effective alternative to battery-based backup systems. Utilizing electrolytic capacitors the buffer module is maintenance free and will maintain the output voltage of a 24VDC power supply system for 250 msec minimum with a 20A load and 5 sec minimum with a 1A load. A switch is provided to select the voltage level to start buffering. An inhibit input is available for remote shutdown as well as output signals for remote stand-by and buffering mode indication. The module is housed in a corrosion-resistant aluminum chassis with IP20 terminals and conformal coated circuit board for protection against demanding environments.

Features

- Corrosion-resistant aluminum housing
- Long minimum buffering time of 250ms @ 24V/20A
- Units can be connected in parallel to increase buffering time
- Less than 30 second charging time locations
- P20 wiring terminals
- Overvoltage / Overcurrent / Short Circuit protections
- 3-year warranty

Buffer Module	
Part Number	*PSB24-BFM20S*
Price	$129.00
Drawing Link	PDF
Weight kg [lb]	0.76 [1.68]
Buffer Module Input Specifications	
Nominal Input Voltage	24VDC
Voltage Range	22.8 to 28.8 VDC [35VDC Max]
Input Current	Charging mode: < 0.6 A; Discharging mode: 20A Max
Input Power	2.5 W average
Maximum Signal Input (Inhibit)	35V / 10mA
Max Inrush Current	< 20A
Charging Time	< 30sec
Buffer Module Output Specifications	
Nominal Output Voltage	24VDC typ. [depends on V_{in}]
Adjustment Range Of The Voltage	22 to 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 (+Vs) - Common +Vs, 35V Max
Noise and Ripple (20MHz)	<200mVpp @ 25°C [77°F] during buffering mode
Parallel Connection	Yes [requires PSB60-REM redundancy module]
Series Connection	No
Protective Device	Transient voltage suppressor [TVS] for signals

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Figure 1

Buffering Time (Typical Values at "V$_{in}$-1V" Mode)
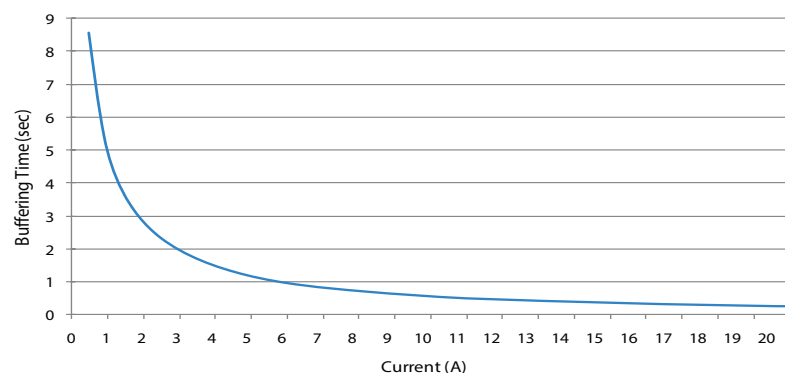
Mechanical Specifications	
Case Cover	Aluminum
LED Indicators	Green LED Off - Unit is discharged or Vin <22VDC Green LED On - Unit is fully charged
Cooling System	Convection
Terminal	Input / Output - M3 x 2 pins [Rated 300V / 30A] Signal - M3 x 5 pins [Rated 300V / 30A]
Wire	Input / Output - AWG 12–10 [0.08–0.10 in]; Torque: 0.72 Nm [6.3 lb-in] Signal - AWG 24–10 [0.02–0.10 in]; Torque: 0.72 Nm [6.3 lb-in]
Environmental Specifications	
Operating Temperature	-25 to 75°C [-13 to 167°F]
Storage Temperature	-25 to 85°C [-13 to 185°F]
Power De-rating	>70°C [158°F] de-rate power by 5% / °C
Operating Humidity	<95% RH [Non-Condensing]
Operating Altitude	2,500 Meters
Shock Test (Non-Operating)	IEC60068-2-27, 30G [300m/S²] for a duration of 18ms
Vibration (Non-Operating)	IEC60068-2-6, 10 Hz to 500 Hz @ 30m/S2 [3G peak]; 60 min per axis for all X, Y, Z direction
Pollution Degree	2
Protection Specifications	
Overvoltage	32V ± 10%
Overload / Overcurrent	30A Max
Short Circuit	No damage
Penetration Protection	> 3.5 mm [eg. screws, small parts]
Reverse Polarity Protection	Yes
Degree of Protection	IP20
Protection Against Shock	Class I with GND connection

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Reliability Specifications	
MTBF (at V$_{in}$-1V Mode)	>2,800,000 hrs. as per Telcordia SR-332 at Standby Mode [Buffer Module in Ready State]
Expected Capacitor Life	10 years [Standby mode @ 40°C]
Safety Standards / Directives	
Electronic Equipment in Power Installations	EN50718 / IEC62103
Electrical Safety (Information Technology Equipment)	UR/cUR recognized to UL60950-1 and CSA C22.2 No. 60950-1 File no. E198298, CB scheme to IEC60950-1
Industrial Control Equipment	UL/cUL listed to UL508 and CSA C22.2 No. 107.1-01 File no. E197592, CSA to CSA C22.2 No. 107.1-01; File No. 249074
Hazardous Location	cCSAus to 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)], File No. 249074
CE	in conformance with EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC
Materials and Parts	RoHS Directive 2011/65/EU Compliant
Galvanic Isolation	Input & Output to Ground - 1.5 KVAC Signal to Ground - 1.5 KVAC
EMC Specifications	
EMC / Emissions	CISPR32, EN55032, EN55011
Component Power Supply for General Use	EN61204-3
Immunity	EN55024, EN61000-6-2
Electrostatic Discharge	EN61000-4-2
Radiated Field	EN61000-4-3
Fast Transient / Burst	EN61000-4-4
Surge	IEC61000-4-5
Conducted	EN61000-4-6
Power Frequency Magnetic Fields	EN61000-4-8
Voltage Dips	EN61000-4-11
Low Energy Pulse Test (Ring Wave)	EN61000-4-12

Note: Product intended to be used as Apparatus with AC-DC Power Supply, EMC compliance to be verified in correspondence to the connected units.
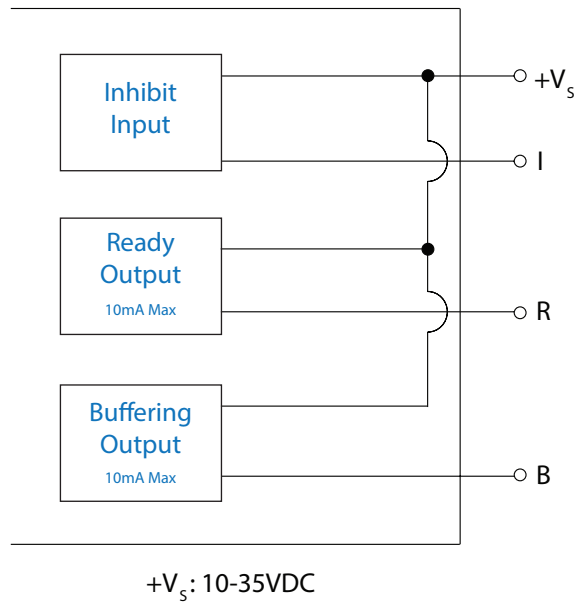
PSB24-BFM20S

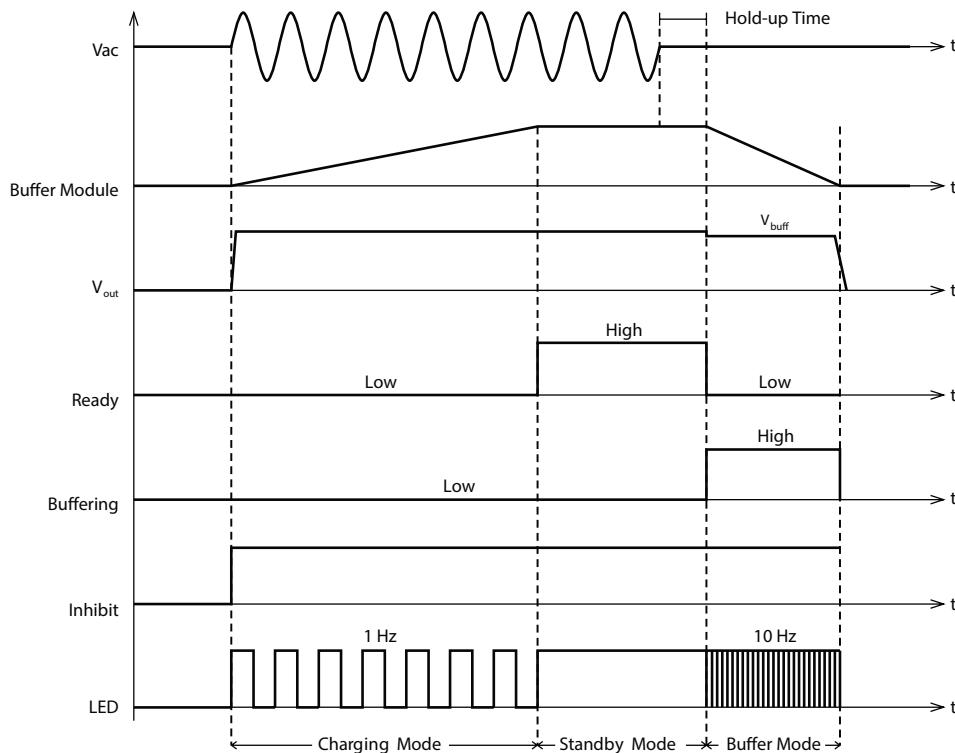| Wiring Connection			
Input		*Output*	
+	DC+	R	Ready
-	DC+	B	Buffering
I	Inhibit	+Vs	+ Voltage Supply
		⏚	Ground

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Buffering, Ready, and Inhibit Signal	
Buffering Output Signal (B)	"High" = PSB24-BFM20S is discharging or in Buffering Mode
Ready Output Signal (R)	"High" = PSB24-BFM20S is fully charged or in Standby Mode
Inhibit Input Signal (I)	"Low" = Shuts down Buffer Module
Signal Voltage	+VS: 10–35 VDC
Maximum Signal Current	10mA
Isolation (Signal to Power)	1.5 KVAC

I/O (input/output) Example

Inhibit Input

Ready Output
10mA Max

Buffering Output
10mA Max

$+V_S$

I

R

B

$+V_S$: 10-35VDC

Buffer Module Operations

Vac

Hold-up Time

t

Buffer Module

t

V_{out}

V_{buff}

t

Ready

High

Low

Low

t

Buffering

High

Low

t

Inhibit

t

LED

1 Hz

10 Hz

t

Charging Mode — Standby Mode — Buffer Mode

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Buffer Module Wiring

General connection / wiring diagram

Power Supply

+ + - -

L N GND

L
N
GND
Optional

Buffer Module

+ -

I R B V+ ⏚

Buffered Load

+ -

Range Select Switch

General signals wiring

Buffer Module

+ -

I R B V+ ⏚

Buffering Relay, lamp or signal

Ready Relay, lamp or signal

Inhibit

Parallelling of buffer units

Power Supply

+ + - -

L N GND

L
N
GND
Optional

Buffer Module

+ -

I R B V+ ⏚

Buffer Module

+ -

I R B V+ ⏚

Buffered Load

+ -
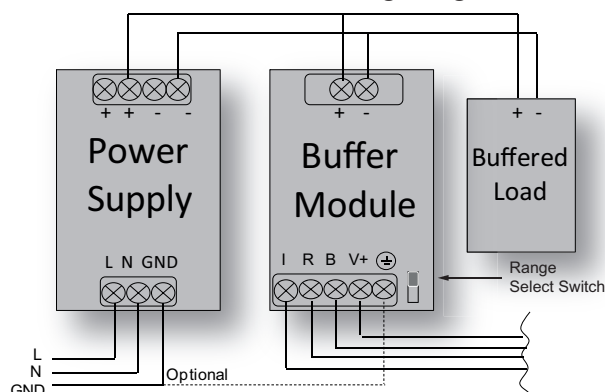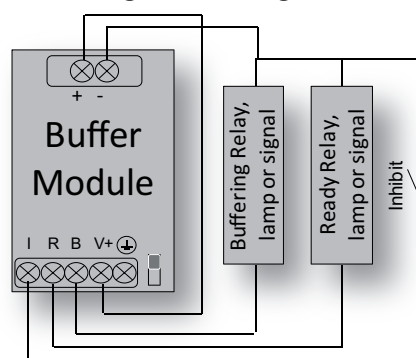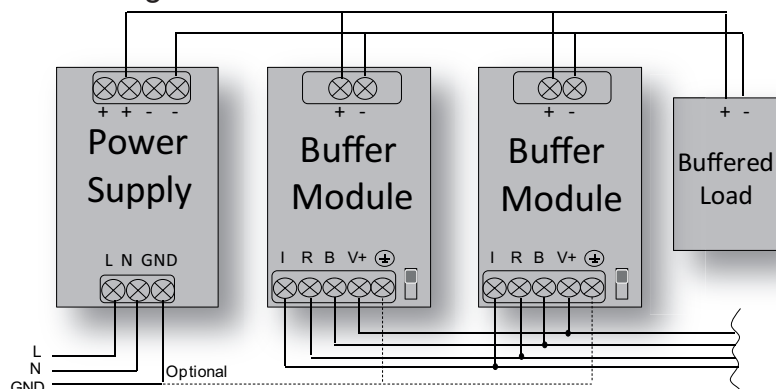
Decoupling of buffered branches

+
-

+
-

Unbuffered Load

+ -

Power Supply

+ + - -

L N GND

L
N
GND
Optional

Redundancy Module

+ + - -

Out
+ +   OK

Buffer Module

+ -

I R B V+ ⏚

Buffered Load

+ -