



## Features

- Buffering with electrolytic capacitors instead of lead acid batteries
- Type buffering time of 350ms @22Vdc/20A
- Buffer mode selectable by switch:
  - Fixed mode at 22Vdc
  - Dynamic mode for  $V_{in}-1V_{dc}$
- LED indicator for signal status
- Supports parallel connection to extend buffering time
- Cooling by free air convection
- $-25\sim+75^{\circ}\text{C}$  wide operating temperature
- 3 years warranty

## Applications

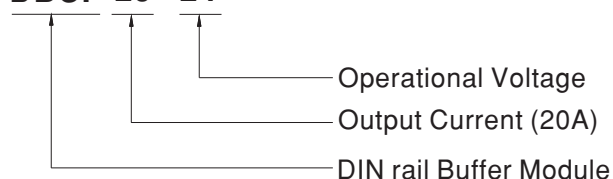
- Industrial control system
- Semiconductor fabrication equipment
- Factory automation
- Electro-mechanical apparatus

## Description

The DBUF20-24 buffer module is a supplementary device for regulated DC 24V power supplies. 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 DBUF20-24 comes with comprehensive protection features like over voltage, over current and short circuit protections. Buffer modules can be connected in parallel to increase the output ampacity or the hold-up time.

## Model Encoding

**DBUF 20 - 24**

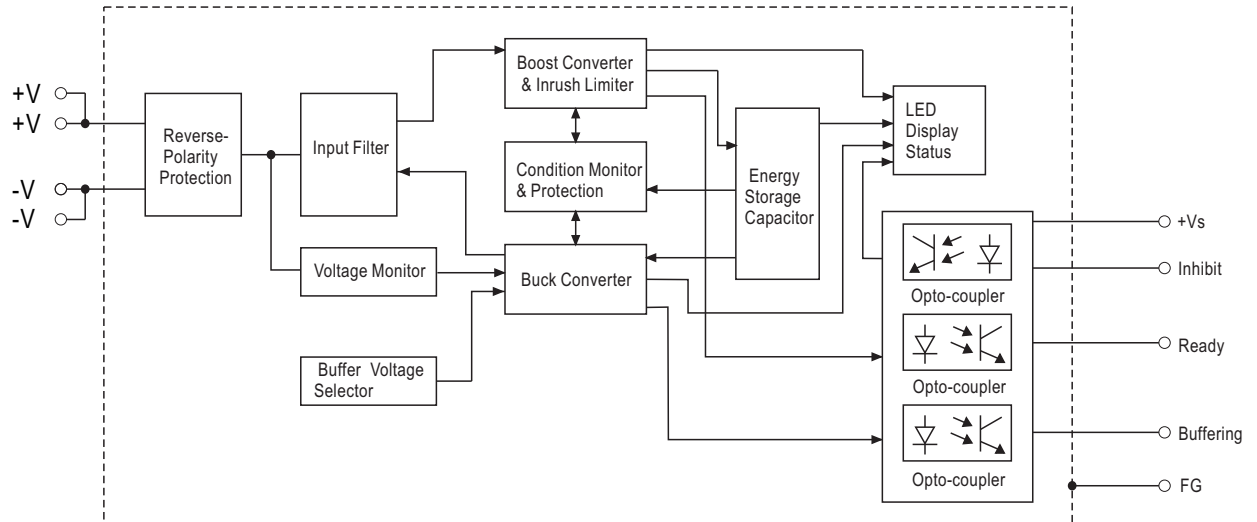


## SPECIFICATION

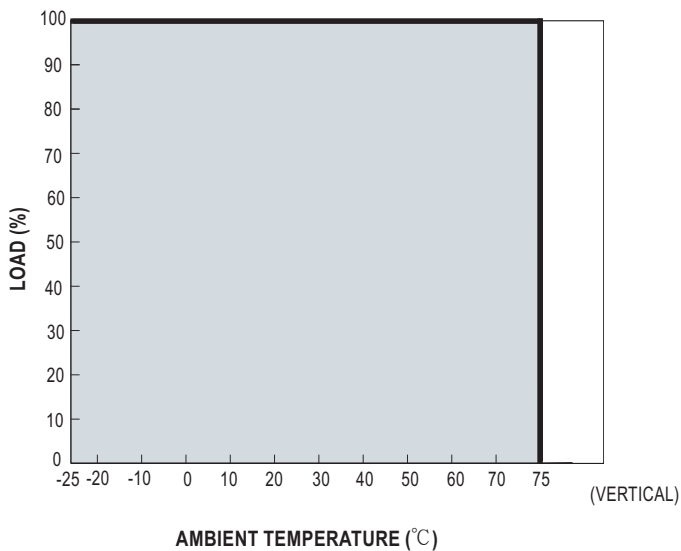
| MODEL               |                                                    |                                            | DBUF20-24                                                                            |           |            |
|---------------------|----------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------|-----------|------------|
| CHARGING MODE       | DC NORMAL OPERATING VOLTAGE                        |                                            | 24Vdc                                                                                |           |            |
|                     | CHARGING VOLTAGE                                   |                                            | 23~30Vdc                                                                             |           |            |
|                     | CHARGING CURRENT                                   |                                            | 900mA Max.                                                                           |           |            |
|                     | CURRENT CONSUMPTION AT STANDBY                     |                                            | 100mA Max.                                                                           |           |            |
|                     | CHARGING TIME                                      |                                            | 15s Typ.                                                                             |           |            |
|                     |                                                    |                                            | 25s Max.                                                                             |           |            |
| BUFFER MODE         | DC NORMAL OPERATING VOLTAGE                        |                                            | 22Vdc/Vin-1Vdc                                                                       |           |            |
|                     | DC OPERATING VOLTAGE RANGE                         |                                            | 22-29Vdc                                                                             |           |            |
|                     | OUTPUT CURRENT(max.)                               |                                            | 20A                                                                                  |           |            |
|                     | BUFFER TIME<br>(Refer to Buffering Curve at 22Vdc) | Output current                             | 20A                                                                                  | 10A       | 0.1A       |
|                     |                                                    | Typ.                                       | 350ms                                                                                | 700ms     | 45s        |
|                     |                                                    | Min.                                       | 250ms                                                                                | 500ms     | 30s        |
|                     | RIPPLE & NOISE (max.)                              |                                            | Note.2                                                                               | 200mVp-p  |            |
| PROTECTION          | OVER VOLTAGE                                       |                                            | 31~37.5V only,shut down o/p voltage                                                  |           |            |
|                     | OVER LOAD                                          |                                            | 105%~125% rated output power at buffer mode                                          |           |            |
|                     |                                                    |                                            | Protection type:Shut down o/p voltage , re-power on to recover                       |           |            |
|                     | SHORT CIRCUIT                                      |                                            | Protection type:Shut down o/p voltage , re-power on to recover                       |           |            |
|                     | TVS FOR SIGNALS (max.)                             |                                            | 35V                                                                                  |           |            |
|                     | REVERSE POLARITY PROTECTION                        |                                            | By internal MOSFET, no damage , recovers automatically after fault condition removed |           |            |
| FUNCTION            | SELECTABLE BY SWITCH                               | Fix 22Vdc(Default)                         | Buffering starts if terminal voltage falls below 22Vdc                               |           |            |
|                     |                                                    | Vin-1Vdc                                   | Buffering starts if terminal voltage is decreased by > 1Vdc                          |           |            |
|                     | CONTROL                                            | Inhibit (I)                                | +Vs - V(I) < 6Vdc: Buffer module ON; +Vs - V(I) >10Vdc: Buffer module OFF            |           |            |
|                     |                                                    |                                            | 35Vdc /4mA Max.                                                                      |           |            |
|                     | SIGNALS                                            | Ready(R)                                   | Charged ready: V(R)>+Vs - 2Vdc; Unready: V(R)<1Vdc                                   |           |            |
|                     |                                                    |                                            | 35Vdc /10mA Max.                                                                     |           |            |
|                     |                                                    | Buffering (B)                              | Buffering: V(B)>+Vs - 2Vdc; Other mode: V(B)<1Vdc                                    |           |            |
|                     |                                                    |                                            | 35Vdc /10mA Max.                                                                     |           |            |
|                     |                                                    | Supply Voltage(+Vs)                        | 10~35Vdc /10mA(Connected to +V or external voltage)                                  |           |            |
|                     | LED STATUS DISPLAY                                 |                                            | ON                                                                                   |           | Ready      |
|                     |                                                    |                                            | OFF                                                                                  |           | Discharged |
| Flashing            |                                                    |                                            | 1Hz                                                                                  | Charging  |            |
|                     |                                                    |                                            | 10Hz                                                                                 | Buffering |            |
| PARALLEL CONNECTION |                                                    | Refer to Typical Application Notes(Page 6) |                                                                                      |           |            |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                       |                                                               |                                                      |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------|
| ENVIRONMENT              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -25~+75℃(Refer to"Derating Curve")                                                                                    |                                                               |                                                      |
|                          | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5 ~ 95% RH non-condensing                                                                                             |                                                               |                                                      |
|                          | STORAGE TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -25~+80℃                                                                                                              |                                                               |                                                      |
|                          | SHOCK TEST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | IEC60068-2-27,30G (300m/S²) for a duration of 1 8ms,1 time per direction,2 times in total                             |                                                               |                                                      |
|                          | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ±0.03%/℃ (0 ~ 75℃)                                                                                                    |                                                               |                                                      |
|                          | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Component: 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes;<br>Mounting clip: Compliance to IEC60068-2-6 |                                                               |                                                      |
|                          | OPERATING ALTITUDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Note.3                                                                                                                | 5000 meters /OVC II                                           |                                                      |
| SAFETY & EMC<br>(Note.4) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | IEC62368-1,UL62368-1 approved                                                                                         |                                                               |                                                      |
|                          | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | IP/OP-FG:2.2KVdc; Signals-FG:2.2KVdc                                                                                  |                                                               |                                                      |
|                          | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IP/OP-FG, Signals-FG: >100M Ohms / 500Vdc / 25℃ / 70% RH                                                              |                                                               |                                                      |
|                          | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Parameter                                                                                                             | Standard                                                      | Test Level / Note                                    |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Conducted                                                                                                             | EN55032                                                       | Class B                                              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Radiated                                                                                                              | EN55032                                                       | Class B                                              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Voltage Flicker                                                                                                       | -----                                                         | -----                                                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Harmonic Current                                                                                                      | -----                                                         | -----                                                |
|                          | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | EN55035, EN61000-6-2                                                                                                  |                                                               |                                                      |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Parameter                                                                                                             | Standard                                                      | Test Level / Note                                    |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ESD                                                                                                                   | EN61000-4-2                                                   | Level 4, 15KV air ; Level 3, 8KV contact; criteria A |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Radiated                                                                                                              | EN61000-4-3                                                   | Level 3, 10V/m ; criteria A                          |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EFT / Burst                                                                                                           | EN61000-4-4                                                   | Level 3, 2KV ; criteria A                            |
| Surge                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EN61000-4-5                                                                                                           | Level 3, 1KV/Line-Line ;Level 3, 2KV/Line-Line-FG ;criteria A |                                                      |
| Conducted                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EN61000-4-6                                                                                                           | Level 3, 10V ; criteria A                                     |                                                      |
| Magnetic Field           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EN61000-4-8                                                                                                           | Level 4, 30A/m ; criteria A                                   |                                                      |
| OTHERS                   | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 164.84K hrs min. MIL-HDBK-217F (25℃) ; 513.46K hrs min. Telcordia TR/SR-332 (Bellcore) (25℃)                          |                                                               |                                                      |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 107.97K hrs min. MIL-HDBK-217F (40℃) ; 255.89K hrs min. Telcordia TR/SR-332 (Bellcore) (40℃)                          |                                                               |                                                      |
|                          | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 63*125.2*114.9mm (W*H*D)                                                                                              |                                                               |                                                      |
|                          | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.062Kg; 12pcs/12.8Kg/0.74CUFT                                                                                        |                                                               |                                                      |
| NOTE                     | 1. All parameters NOT specially mentioned are measured at normal input, rated load and 25℃ of ambient temperature.<br>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ f & 47 μ f parallel capacitor.<br>3. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).<br>4. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a> ) |                                                                                                                       |                                                               |                                                      |

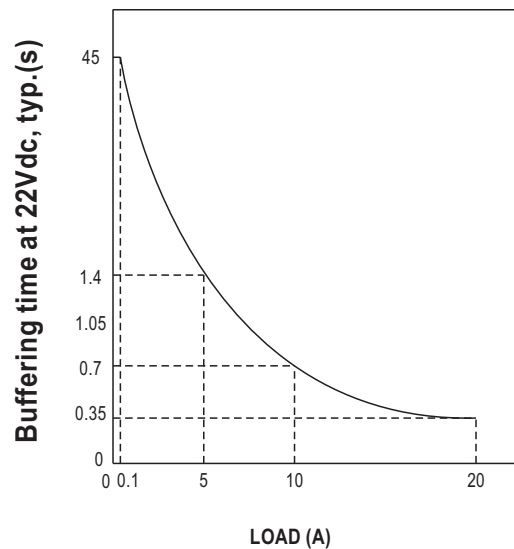
## ■ Block Diagram



## ■ Derating Curve

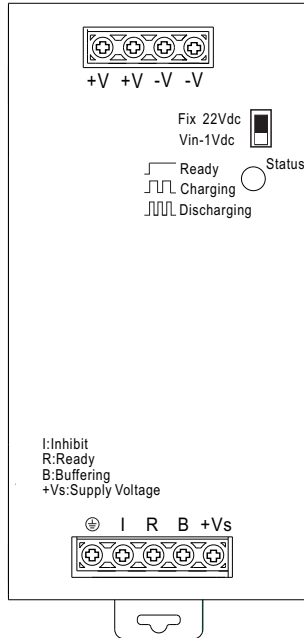


## ■ Buffering Curve



## Function Manual

### 1. User Elements



#### Back-up Threshold Voltage Selectable by Switch:

Option 1: Fixed mode (Switch in Fix 22Vdc)

The unit switches to buffer mode as soon as the voltage falls below 22Vdc.

Option 2: Dynamic mode (Switch in Vin-1Vdc)

Unit switches to buffer mode when input voltage decreases by 1Vdc.

Note: Factory setting is fixed mode.

#### LED Indicator Status:

LED OFF: Capacitors are discharged.

LED ON: Capacitors are fully charged.

LED Flashing slowly (1Hz): Capacitors are getting charged.

LED Flashing quickly (10Hz): Capacitors are getting discharged.

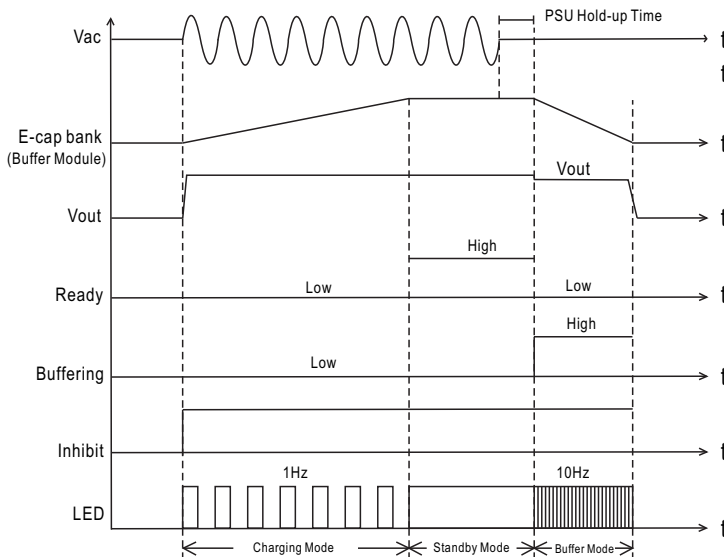
#### Signal Connector:

-Inhibit, +Vs - V(I) < 6Vdc: Buffer module ON; +Vs - V(I) > 10Vdc: Buffer module OFF.

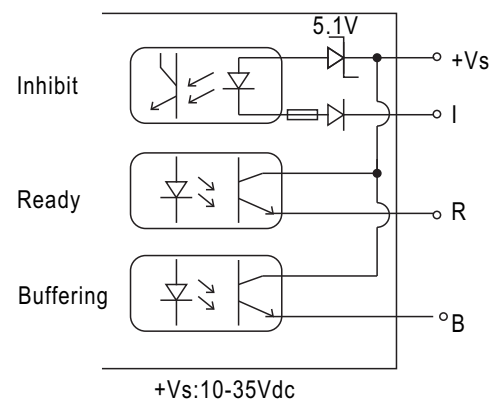
-Ready, Charged ready: V(R) > +Vs - 2Vdc; Unready: V(R) < 1Vdc.

-Buffering, Buffering: V(B) > +Vs - 2Vdc; Other mode: V(B) < 1Vdc.

### 2. Operating Diagram



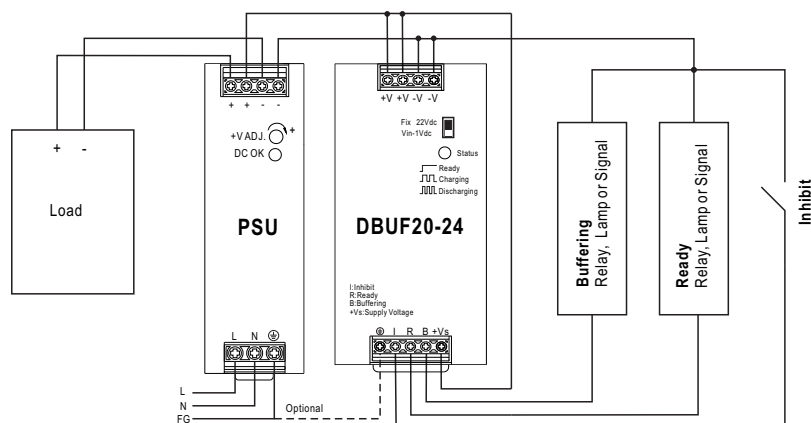
### 3. Signal Schematics



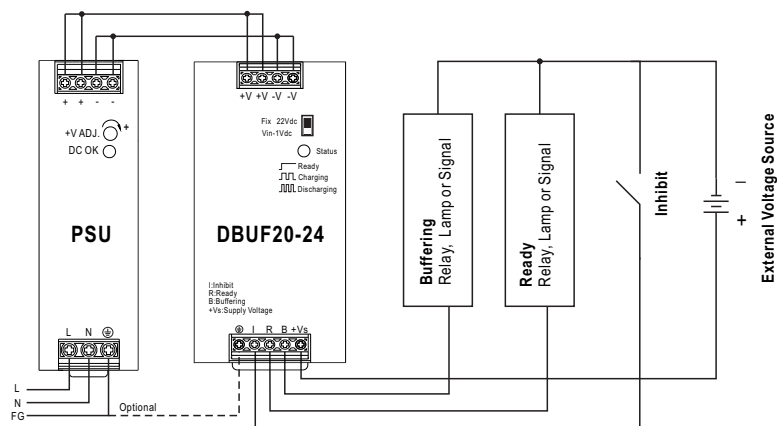
(+Vs can connected to DBUF20 "+V" or external voltage source, Please refer to "Typical Application Notes")

## ■ Typical Application Notes

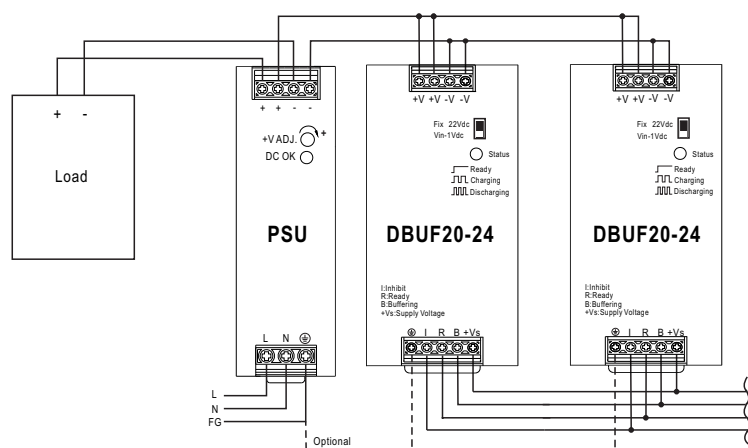
## 1. General wiring diagram



## 2. Signals supplied from an external voltage



### 3.Paralleling of buffer units

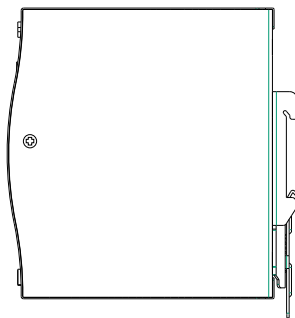
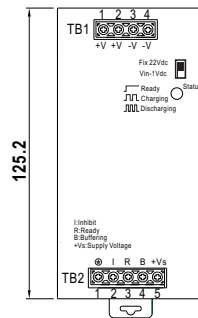
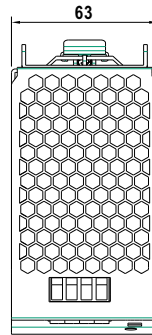
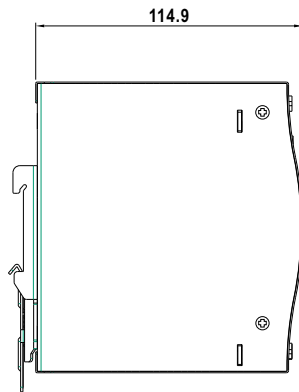


## Mechanical Specification

Case No. 979E Unit:mm

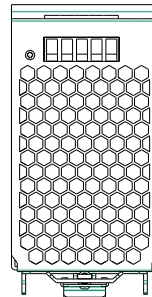
Terminal Pin No. Assignment (TB1)

| Pin No. | Assignment |
|---------|------------|
| 1,2     | DC +V      |
| 3,4     | DC -V      |

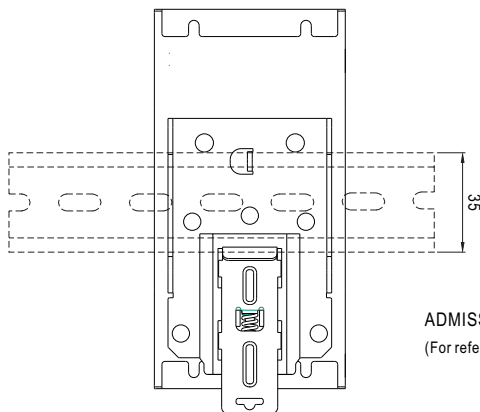


Terminal Pin No. Assignment (TB2)

| Pin No. | Assignment           |
|---------|----------------------|
| 1       | FG Ⓢ                 |
| 2       | Inhibit (I)          |
| 3       | Ready (R)            |
| 4       | Buffering (B)        |
| 5       | Supply Voltage (+Vs) |



## Installation Instruction



This series fits DIN rail TS35/7.5 or TS35/15.  
For installation details, please refer to the Instruction manual.

ADMISSIBLE DIN-RAIL: TS35/7.5 or TS35/15  
(For reference only. Not included with unit.)

## Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>