

## *Semiconductors*

# BONITRON

*Clean Rooms*

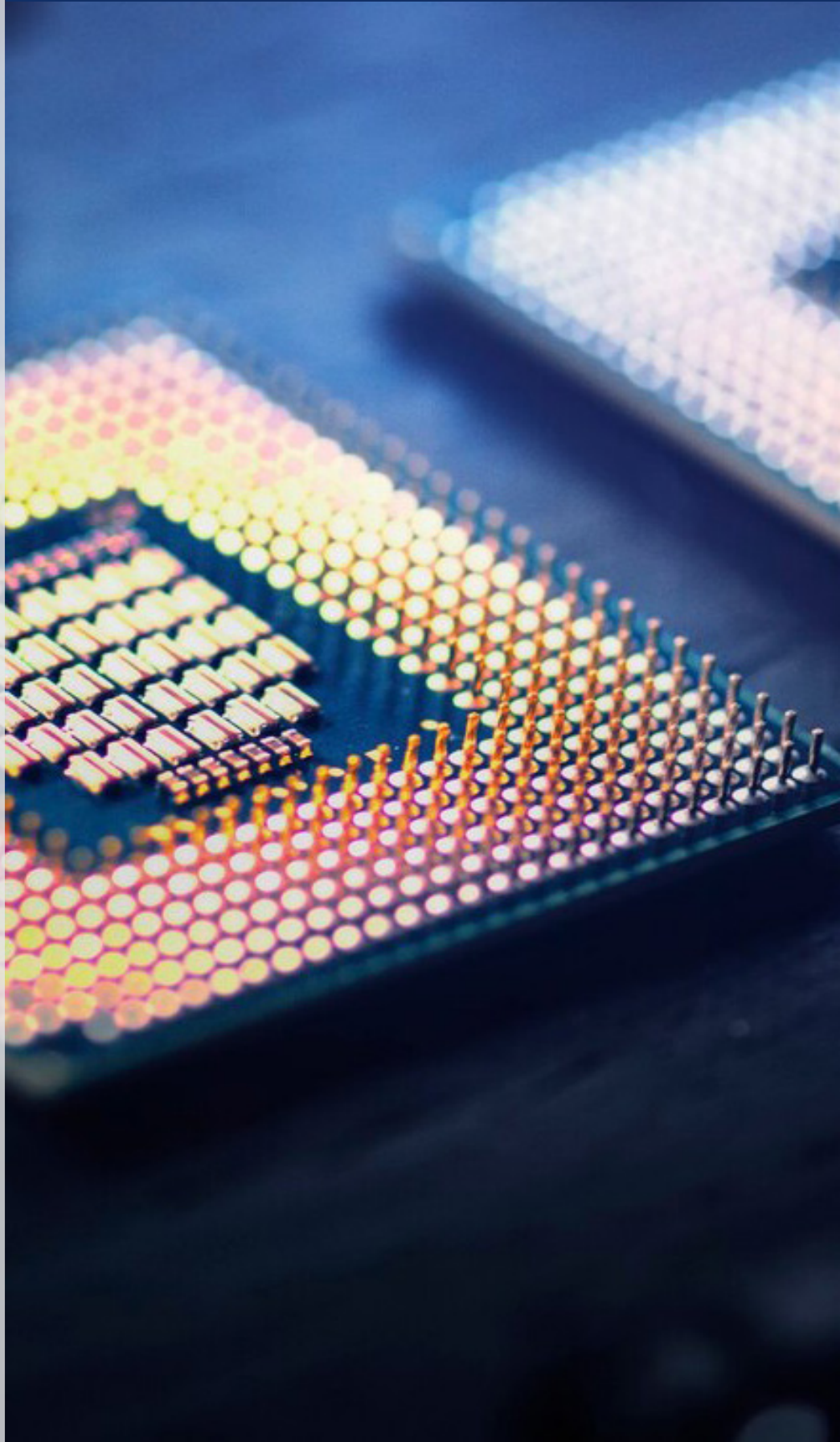
*Chill Water Systems*

*Air Handling Systems*

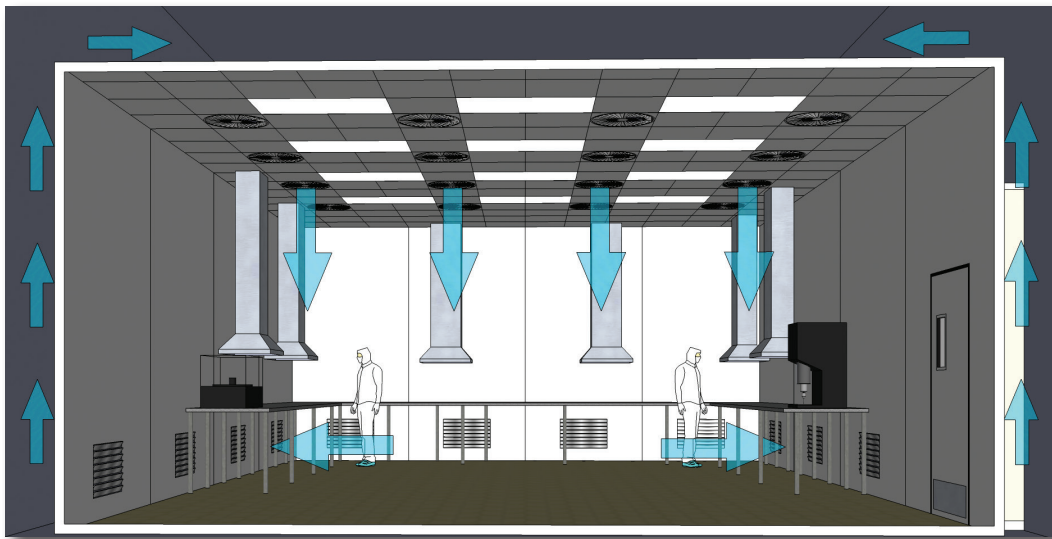


### HVAC Solutions

- *HVAC demands vary among applications*
- *Many require constant power to prevent costly downtime.*
- *Trust a company with 20+ years of critical backup power experience*



Certain hi-tech industries must maintain a production environment free of dust. In these facilities a dust particle in the wrong place can result in product and profit loss. Standards regulate the size and number of particles allowed within a cleanroom of a certain class, which is determined by the needs of the application.



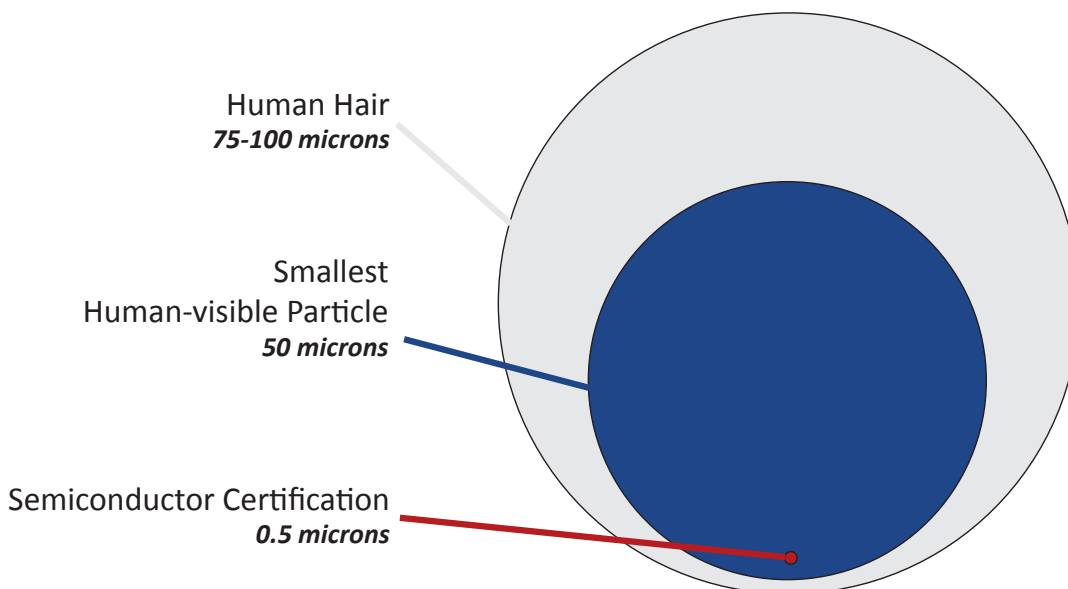
### Cleanroom

- Temperature and humidity tightly controlled
- Pressure differentials prevent contamination
- Constant airflow patterns remove contaminants

### Airflow

To ensure the air is clean, air within a cleanroom is changed 20 - 600 per hour through the use of proper duct work and HVAC control.

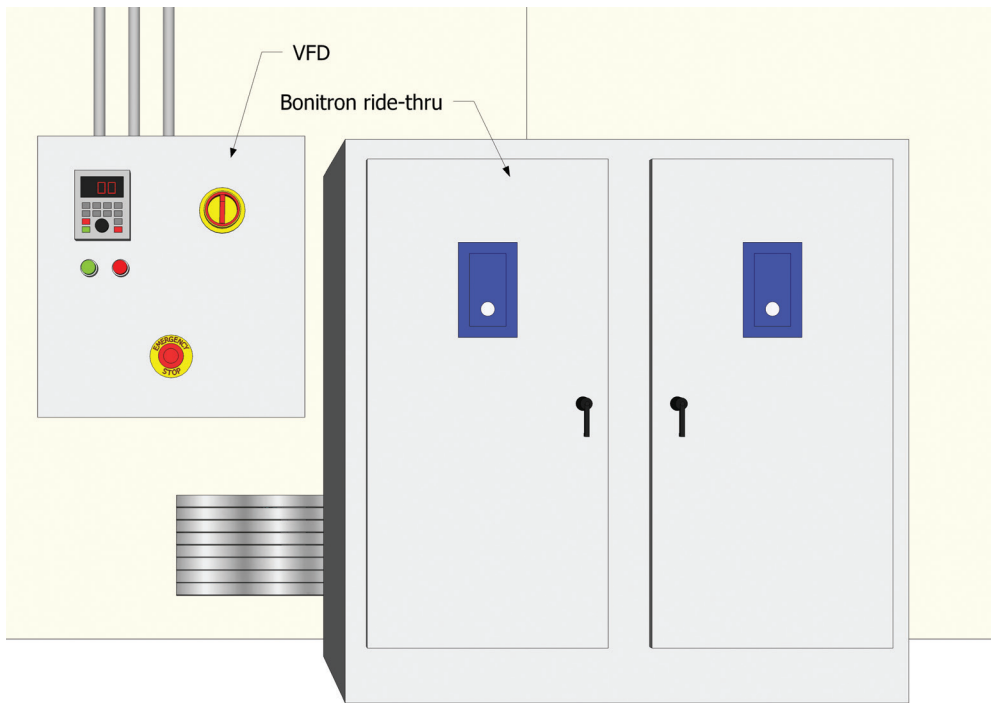
HVAC fans must work continuously to maintain a constant airflow. A disruption in the airflow caused by a voltage sag could result in a contamination of the cleanroom environment.



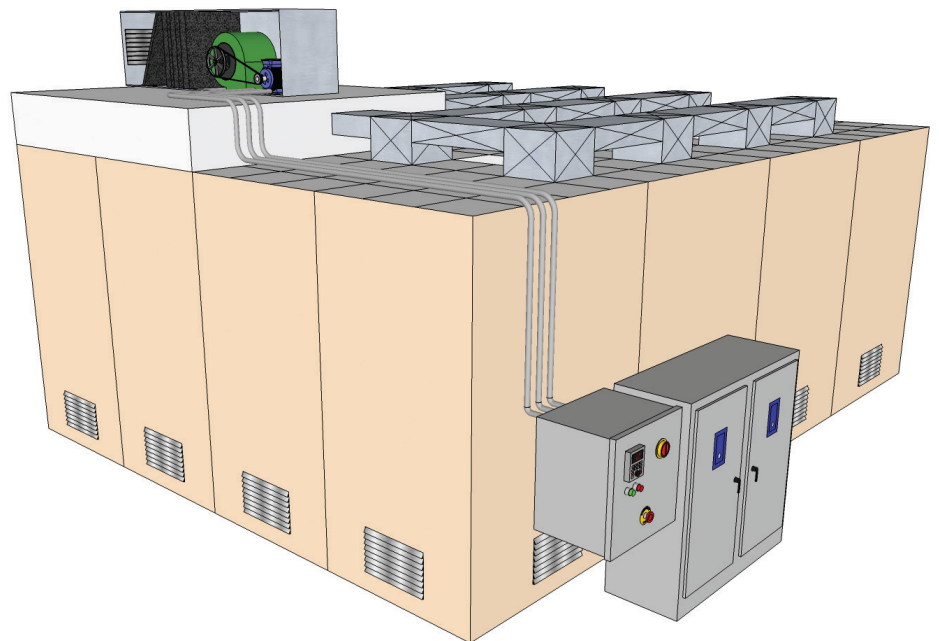
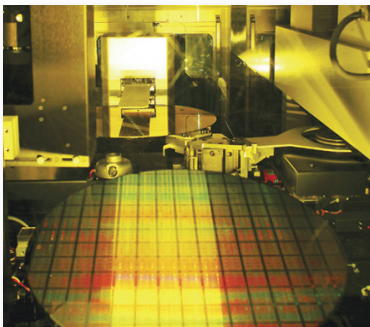
### Particle Size

While our desks may be covered in visible dust, cleanrooms are designed to prevent particles much smaller than what is even detectable by the human eye from entering the cleanroom area.





- A Variable Frequency Drive controls the motor speed.
- The Bonitron UPD unit maintains a constant voltage to the VFD during a voltage sag.
- For longer outages, the UPD unit will need to use batteries or capacitors for uninterrupted operation until the generator is brought online.



### **Continuous Power**

Continuous power is critical for cleanroom applications in order to ensure proper air exchange rates are occurring.

Bonitron Uninterruptible Power for Drives provides continuous power to motors and drive systems in case of a voltage sag so that they do not see any disturbance and maintain a constant speed.



# Battery UPD Systems

When full outage protection for up to 15 minutes is needed, the S3534BR or S3460BR is the ideal solution. The Battery UPD System stores energy in battery banks and releases it onto the drive's DC bus when needed. This allows the drive to "RideThru" power sag or outage events and maintain motor speed and torque.



**S3460BR**

Up to 15 Minute Outage  
Up to 610A



**S3534BR**

Up to 60 Second Outage  
Up to 40A

## Product Highlights

- 208 - 480VAC
- Up to 15-Minute outage protection
- Contact for longer durations
- "A UPS for Drives"
- More efficient and reliable than traditional in-line UPS systems
- Ideal solution to keep drive-driven process online until generators start up
- Seamless power transfer from utility to Bonitron

## System Components

- Voltage Regulator
- Charger
- Batteries (Supplied or acquired locally)
- Cabinet
- Interactive Digital Display
- Monitors and stores history of power quality issues, including status, voltage, and current.
- Standard on BR Series

## System Operation

Under normal conditions, AC input power is provided to the controller. The power outage ride-through system batteries, connected to the DC bus of the controller, are being charged and stand ready to provide backup power to the system upon a loss of normal AC input power.

Upon loss of normal input power, each variable frequency controller system shall continue to operate without interruption to the operation of the corresponding VFD, with all controls and protective functions intact. The system shall continue to operate the pump for the duration of available energy storage at full load, with no AC input power.

## Technical Requirements

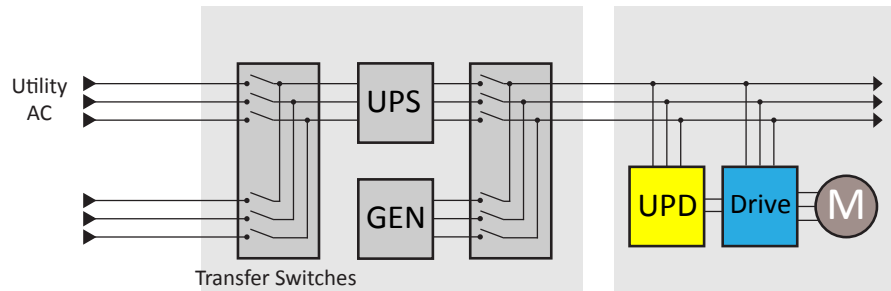
1. System shall be tolerant against power dips and sags compliant with Semi 47, IEC61000-4-11, ITIC and CBEMA curves.
2. System Shall include a voltage regulator, charger, isolation transformer, fusing, common NEMA 12 enclosure.



# Undervoltage Solutions

## Uninterruptible Power for Drives

Electricity travels miles to reach the drives and motors that control your process. While outdoor power lines and substations are vulnerable to power outages caused by cars, weather, and even animals, the lines inside your plant are susceptible to power quality events as well.

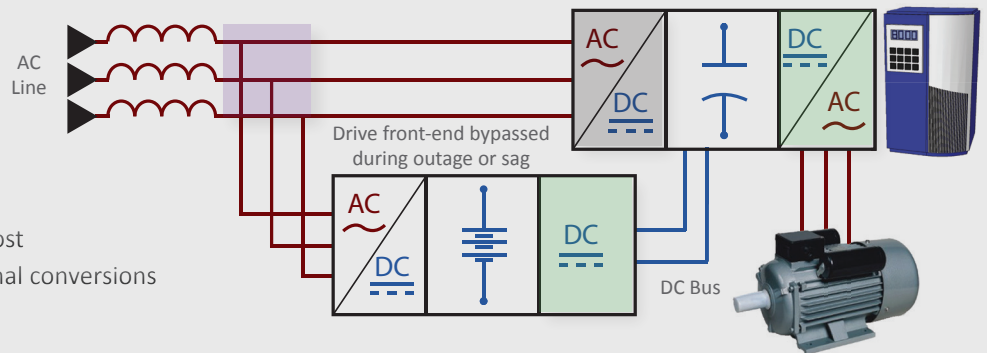


Unlike typical plant wide solutions, Bonitron designed its UPD solutions to connect directly to the DC terminals of one or multiple drives. If drive voltage sags, the Bonitron UPD immediately provides power so motor speed is not affected and the process never sees a disturbance. When properly sized, Bonitron UPD systems provide drives with full-load power until the AC line is restored or generators are online.

*Bonitron UPD Systems use battery or capacitor DC energy to power the DC bus of the drive via DC bus connection terminals on the drive. This eliminates an unnecessary and energy-wasting DC to AC conversion.*

### Bonitron UPD Advantages

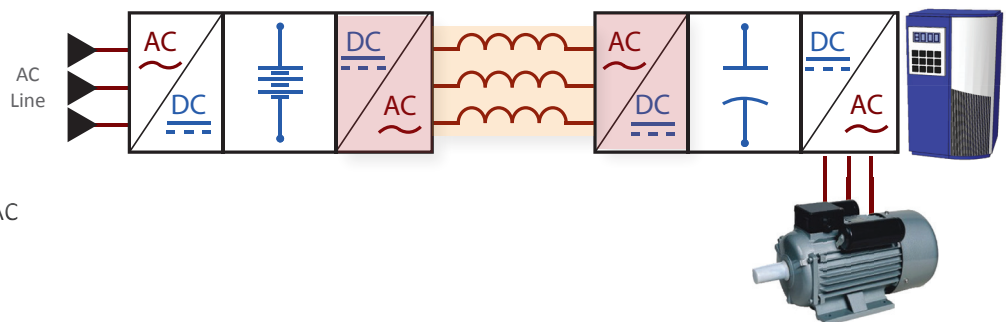
- Parallel Connection
  - High reliability
  - Seamless power source transfer
- Increased efficiency
  - Ultra-low standby power
  - Sized to drive system for reduced cost
  - Power supplied to DC bus for minimal conversions



*Competitors' double conversion UPS systems convert DC voltage that is stored in batteries or capacitors back to AC voltage in order to power the drive, which in turn converts it back to DC. Variable frequency drives are not recommended for use with UPS Systems, as the drive input reactance interacts negatively with UPS inverters.*

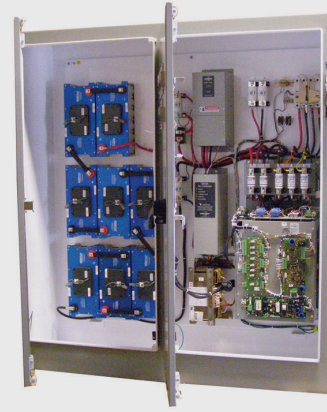
### In-line UPS Disadvantages

- Series Connection
  - Decreased reliability
- Decreased efficiency
  - Unnecessary conversions
  - Converts energy storage back to AC



## Bonitron UPD Highlights

- Seamless transfer from: Utility power - Bonitron - Generator (if necessary)
- Parallel connection for high reliability and remarkable life expectancy
- Delivers DC power for increased efficiency
- Ultra-low standby power
- Easily installs at drive location
- Scalable to your power and outage specifications
- Sag correction solutions available with no energy storage required
- Monitor power quality events with a digital user interface with data logging
- \*SEMI-F47, IEC 61000-4-11, IEC 61000-4-34, Samsung Power Vaccine



\*Contact Bonitron to discuss power standards per model

## Companies protected by Bonitron



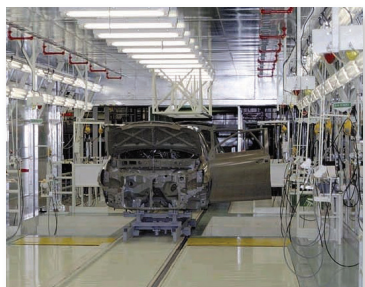
## Common Cleanroom Applications

*Powder Coating Enclosures*

*Storage Rooms*

*Laboratories*

*Compounding Labs*



*Paint System Enclosures*

*Packaging Rooms*

*Semiconductor Manufacturing*

*Pharmaceutical Packaging*