

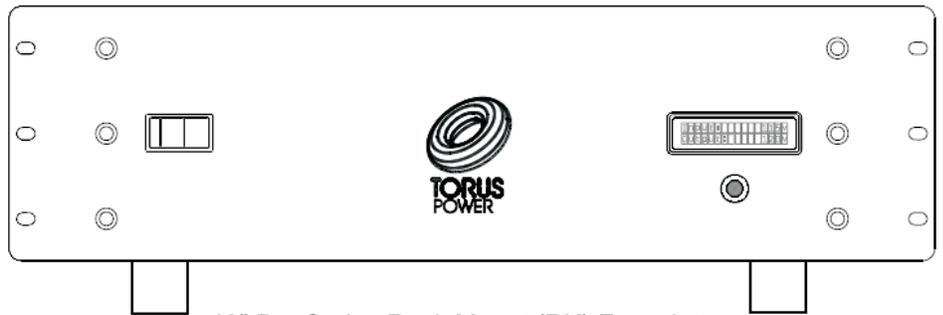


**TORUS
POWER™**

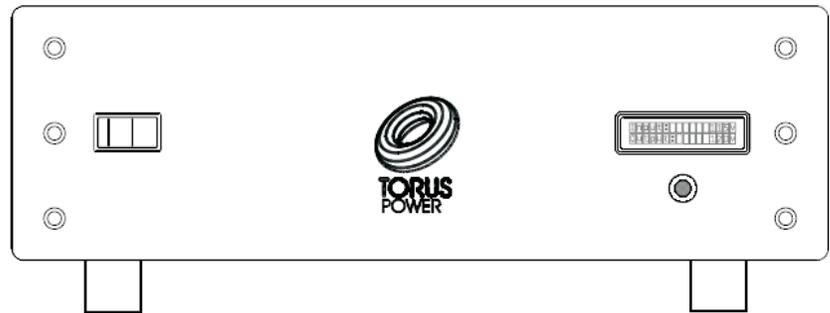
**Toroidal
Isolation
Power
Conditioning**

AVR2 Series Manual

**Toroidal Isolation Power Conditioning
Automatic Voltage Regulation
IP Addressable, Controllable Zones
Surge Protection**



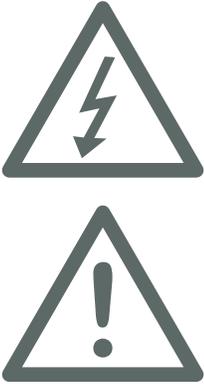
19" Pro Series Rack Mount (RK) Faceplate



17" Consumer Series (C) Faceplate
Available in Black (B) and Silver (S) Colours

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Important Safety Instructions



CAUTION! To reduce the risk of electric shock and fire, do not remove the cover of this device. There are no user serviceable parts inside. Please refer all servicing to licensed service technicians.

CAUTION! The international symbol of a lightning bolt inside a triangle is intended to alert the user to uninsulated "dangerous voltage" within the device's enclosure. The international symbol of an exclamation point inside a triangle is intended to alert the user to the presence of important operating, maintenance and servicing information in the manual accompanying the device.

CAUTION! To prevent electrical shock, match wide blade of plug to wide slot, fully insert.

CAUTION! To reduce the risk of electrical shock, do not expose this equipment to rain or moisture.

1. Read Instructions—All safety and operating instructions should be read before operating the device.
2. Retain Instructions—The safety and operating instructions should be retained for future reference.
3. Heed Warnings—All warnings on the device and in the operating instructions should be adhered to.
4. Follow Instructions—All operating and safety instructions should be followed.
5. Water & Moisture—The device should never be used in, on or near water for risk of fatal shock.
6. Ventilation—The device should always be located in such a way that it maintains proper ventilation. It should never be placed in a built-in installation or anywhere that may impede the flow of air through its ventilation slots.
7. Heat—Never locate the device near heat sources such as radiators, floor registers, stoves or other heat-generating devices.
8. Power Cord Protection—Power cables should be routed so they are not likely to be stepped on or crushed by items placed on them or against them. Special attention should be paid to areas where the plug enters a socket or fused strip and where the cord exits the device.
9. Periods Of Non-Use—The device should be unplugged when not being used for extended periods.
10. Dangerous Entry—Care should be taken that no foreign objects or liquids fall or are spilled inside the device.

11. Damage Requiring Service—The device should be serviced by licensed technicians when:

- The plug or power supply cord has been damaged.
- Objects have fallen or liquid has spilled inside the device.
- The device has been exposed to moisture.
- The device does not appear to be operating properly or exhibits a marked change in performance.
- The device has been dropped or the enclosure becomes damaged.

12. Service—The device should always be serviced by licensed technicians. Only replacement parts specified by the manufacturer should be used. The use of unauthorized substitutions may result in fire, shock, or other hazards.

13. Do not position the equipment so that it is difficult to operate the disconnecting device (power cord).

14. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

15. The power switch should be in the "off" position when connecting or disconnecting equipment from a Torus Power unit.

16. **CAUTION** Some units can be very heavy, please use safe practices when lifting.



≥18 kg (39.7 lb)



≥32 kg (70.5 lb)



≥55 kg (121.2 lb)

Shipping Carton & Packing Material

Please keep the original shipping box and all packing material. This will ensure the AVR2 is protected in future transport.

In the unlikely event you have a problem and must return it for service you must use the original packing material.

Ship the AVR2 only in the original packing material, as the unit is not insurable by carriers otherwise.



Torus Power AVR2 Series - Description

Torus Power AVR2 series products are full-feature state-of-the-art power conditioners and voltage stabilizers, with built-in web interface and multiple-addressable zones to provide the ultimate in monitoring and control of audio/video systems.

AVR2 series provide multiple IP-addressable duplex outlet zones that can be separately turned on or off through the web browser, and/or remotely scheduled. Torus Power AVR2 models clean and condition AC power, providing noise attenuation from 2 kHz to beyond 1MHz.

They provide true isolation (using massive toroidal transformers) along with low source impedance and large enough instantaneous current for today's most sophisticated and powerful audio amplifiers. The performance level is far beyond what any typical power conditioner using discrete filters can provide.

AVR2 series provide voltage stabilization that keeps equipment in the optimal voltage operating range (in North America +/- 5V, in Europe/Asia/Australia +/- 10V of nominal operating voltage, regardless of fluctuations in line voltages. Voltage sags, brownouts, and surges can stress components and shorten equipment life. In the worst case, catastrophic events can destroy valuable equipment. Torus Power products protect connected equipment, and improve the quality and enjoyment of your audio and video experience.

Series mode surge suppression is built into AVR and AVR2 units to provide protection against lighting strikes and other power disturbances.

Connecting Components

The Zones on the AVR2 switch on in sequence: Zone A first, Zone B second and so on. This will allow you to select the order in which your components are switched on. For example, components that should be switched on first (such as front end components) can be connected to Zone A, and Zone B. Components to be switched on last (such as power amplifiers) can be connected to Zones C, D (or Zones F, G in higher capacity units).

Routers should be connected to Zone R if the automatic reboot feature is to be utilized; if this feature is NOT to be used, Zone R can be used as an extra controllable outlet zone. Zone R switches on last.

Since every outlet on the AVR2 is capable of providing full current with no restriction, connecting components for preferred sequencing will NOT compromise performance.



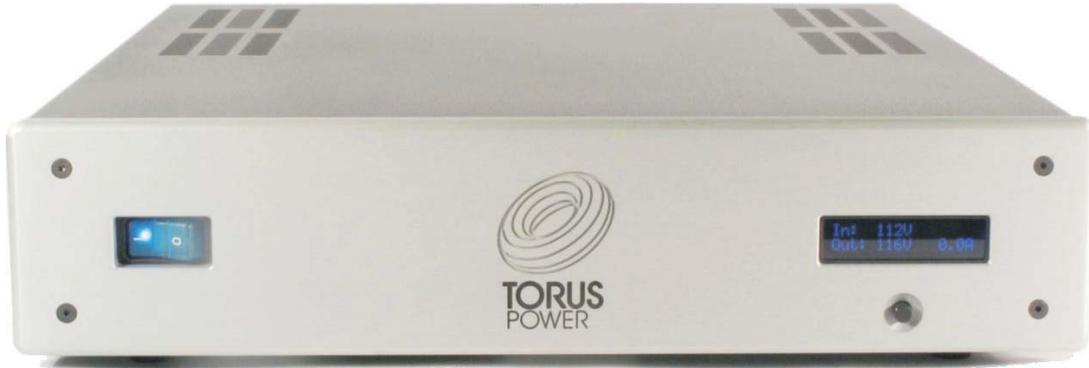
Summary of AVR2 Series features

- Toroidal Isolation Power Conditioning provides the ultimate in clean power performance
- Automatic Voltage Regulation maintains stable output voltage
- Series mode surge suppression protects against lighting strikes
- IP addressable zones with built-in web interface - for remote control and monitoring
- Password control
- Email notification of fault conditions
- RS232 control compatible with Crestron and other major control systems
- Delayed switch on (5 seconds) when power turned on/restored
- Front panel displays voltage conditions (input/output voltage), current draw, and IP address.
- Individually addressable outlet zones (5 individual zones in 15A and 20A models, and 8 individual zones in 60A and 100A models.)
- Zone "R" can be re-configured to provide automatic router reboot in case of internet failure
- Enhanced web browser interface to monitor/control/schedule/sequence individual zones
- Scheduling features allows automatic control (on-off) of any outlet zone according to user-defined schedule. Schedule parameters allow one week repeating schedule, with up to 6 events per day for each controlled zone. Outlets can be sequenced during start up. Each zone can be operated by the schedule, or in real-time via the web browser. Schedule is followed even when internet connection is lost, as long as system power is maintained.

Noise Reduction & Surge Suppression

Noise Reduction: Performs as a low pass filter, attenuating noise by 12db/decade to 500kHz

Surge Suppression: Meets IEEE C62.41-1991: Series mode type; built to withstand 6000V, 3000A for 1000 repeats



Front Panel Display

The Front Panel display consists of a 2 line LCD and 1 push button. Each time you push the button the display will show a different feature of the AVR2.

When you first turn on the AVR2 the System Status will appear. Each time you push the button it will change from one display to another. One last push will take you back to the System Status and will stay here till you push the buttons again.



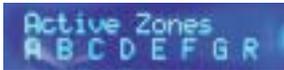
System Status



Power Status



Time/Day/Date



Active Zones



IP Address

Protection in Event of Voltage Faults

If a high or low voltage condition occurs, and remains for 30 seconds or more a voltage fault message is displayed. The fault output is turned on and the system shuts down (unless over-ridden by the user). The user can program the AVR2 software to allow the system to remain on in case of fault (see AVR2 software section for details)

Display will show or



As the output power from the Torus Power AVR2 is shut down, all the connected equipment is turned off. The AVR2 power switch remains in the ON position, although there is no power to the load. When the voltage has been restored to the normal operating range, the unit will automatically switch on. If the fault condition still exists, the AVR2 will require approximately 15 seconds to monitor the incoming voltage, and the system will shut down again.

Notes:

1. AVR2 unit needs to be switched ON at all times for Series Mode Surge Protection to be active. If the AVR2 and connected components will not be used for an extended period of time, it is **recommended** to unplug the AVR2 unit from main power.
2. There is a 20-second delay built into the AVR2 system, to prevent nuisance switching. The AVR2 will take approximately 20-seconds to change relay taps to switch to the proper output voltage setting.
3. A drop in the Input voltage is normal when increasing the load on the Torus AVR2. This is a result of the impedance of the power line, a function of the distance from the electrical panel and transformer regulation.



AVR2 Rear Panel with Key Features

Ethernet: Allows access to the AVR2 and internal software.
RS232: Allows access to automation and external control.
12V Trigger On/Off: Units can be turned on or off by a 12 volt trigger input.
12V Fault: Unit Provides a 12V signal when a fault occurs.

(See page 21)



5 Zones

IP Addressable Zones

Controllable Zones:

- Can be individually controlled and programmed.
- *Zone A will always turn ON first, then Zone B, C and D (Users can set delay time between each zone).
- *Each zone can be scheduled to turn ON or OFF at anytime or day of the week.
- *Each zone can also be individually turned ON or OFF through webpage.

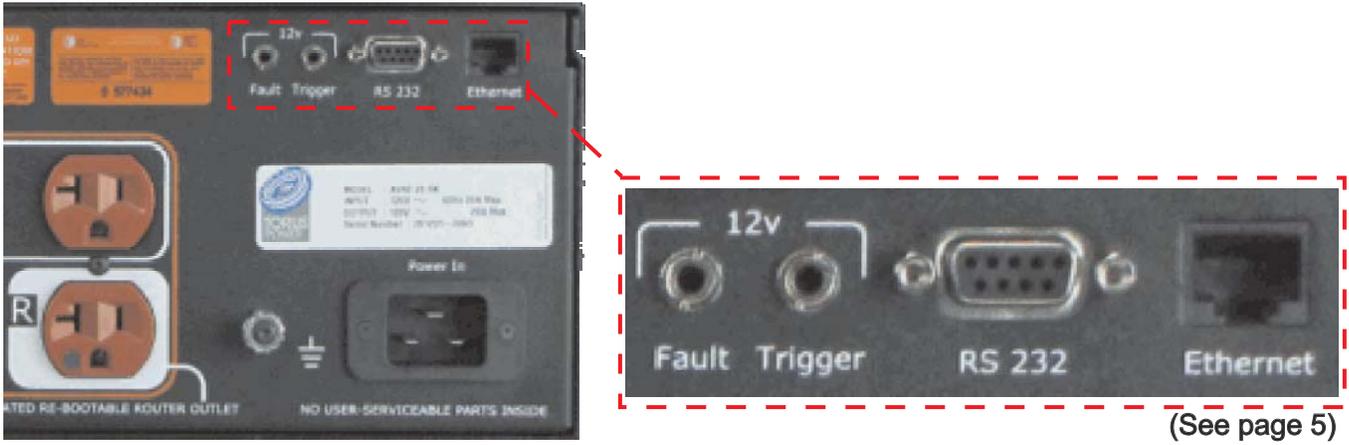
Zone R:

- Unregulated Outlet.
 - *Can be programmed to be used as either a controlled outlet or a Re-bootable Router outlet.
- (See page 9)

8 Zones



Rear Panel Connections and AVR Software & Block Diagram - AVR2 System



(See page 5)

Figure: AVR2 Rear Panel connections.

AVR2 Software

AVR2 software resides in the microprocessor on the internal control board. There are two methods to access the software.

1) Connect the AVR2 to the Ethernet port. Open a web browser on a local computer that is connected to the same network as the AVR2 via another Wall Network Jack. Enter AVR (or the IP address displayed on the LCD, screen#5) into the browser window. Press ENTER and the software will open.

2) Use a three way DHCP Router. You then connect both PC and AVR2 to the same DHCP Router. Open a browser window from the PC. Type AVR, (or the IP address displayed on the LCD, screen#5) into the browser window. Press ENTER and the software will open.

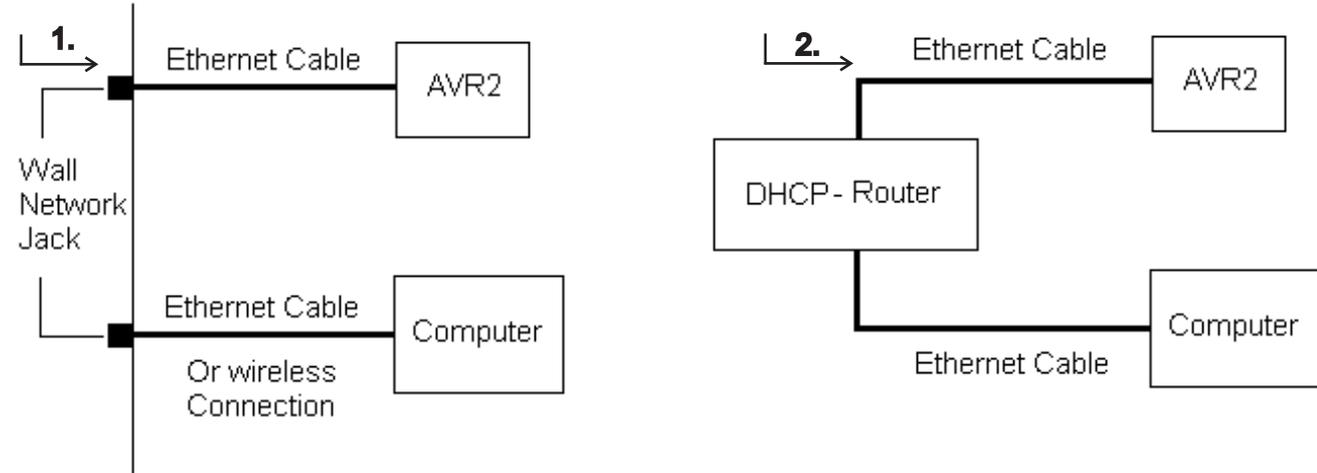
Username and Password

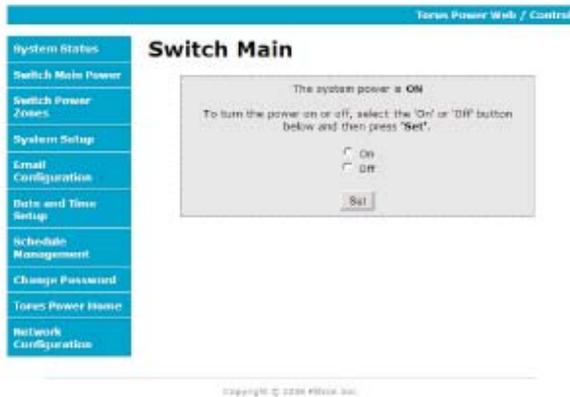
The password is required to change the setup of the Torus unit.

Username is **admin** This is factory set and cannot be changed

Password is **avr** This is the default password, and can be changed.

In case you forget your password, the AVR2 can be restored to the factory default password **avr** by pressing and holding the button on the front panel for at least 10 seconds.

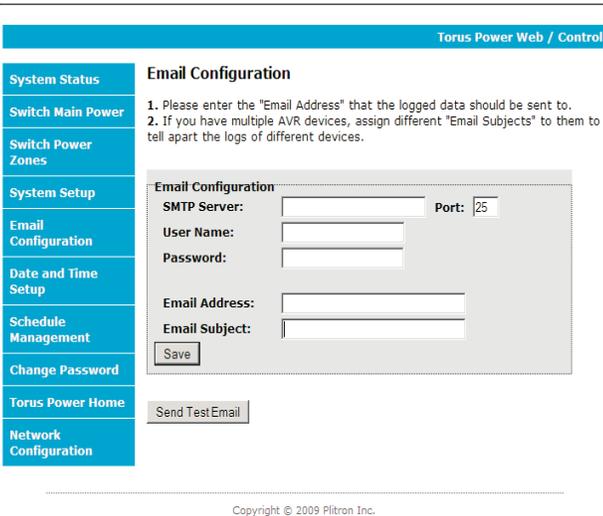




Switch Main Power
 This screen allows ON/OFF control of the AVR2 unit.
 Press the **SET** button to implement your selection. As the output power from the Torus AVR2 unit is shut down, all the connected equipment is turned off. The AVR2 main power switch remains in the ON position, although there is no power to the load.



Zone Power Control
 The current ON/OFF state of each zone is indicated here. Use the 'ON' and 'OFF' buttons to change the zone state. Press **'SET'** to save the new settings. (Each zone can be individually turned on or off)
 Active zones are also shown in the front panel display



Email Fault Alert Notification
 In the unlikely event your AVR2 experiences an issue the AVR2 will shut down and send an email notification if this section is configured. After entering the configuration parameters use the 'Send Test Email' button to confirm your settings are correct.

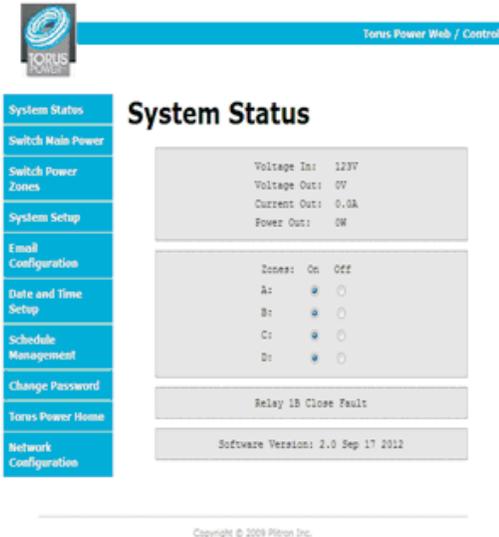


AVR2 Software - Menu Selections

AVR2 Menu Selections

- System Status
- Switch Main Power
- Switch Power Zones
- System Setup
- Email Configuration
- Date and Time Setup
- Schedule Management
- Change Password
- Torus Power Home
- Network Configuration

Below is a screen by screen description of software options for 3U models. 4U and 5U have 7 + Zone R.



System Status

This screen indicates the overall status of the system, showing Voltage In, Voltage Out, Current Output Power Consumption and Active Zones.

It also reports if the system is functioning normally or whether there is a fault condition. (No password required to monitor status)



To Access AVR2 Software

To access AVR2 software, enter user name and password.

User Name : **admin**

User Name is factory set and cannot be changed

Default Password : **avr**

To change the password,
Select Set Password



Torus Power Web / Control

System Status

Switch Main Power

Switch Power Zones

System Setup

Email Configuration

Date and Time Setup

Schedule Management

Change Password

Torus Power Home

Network Configuration

System Setup

This page allows the configuration of the AVR's programmable parameters.

1. **Out of range voltage:** Turn Power off on **low** or **high** line voltage.
2. **Zone R/Router Reset:** Check to Activate Auto Reboot and disable Zone R Scheduling.
Router Reset Delay Time: (1 to 255 minutes)
 Select time interval between router resets. System will attempt 3 resets.
3. **Delay Time between zones (Scheduler and Start-Up):** (1 to 999 seconds)
 Select interval for sequencing and power up between zones.
4. **Front Panel Display:** (0 to 255 seconds)
 Display Always On
5. **Schedule:** System Follow Schedule

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System Setup

1. Out of Range Voltage: The factory default settings is to shut down in case of fault voltage condition (button checked). By un-checking this button it will override and the AVR2 will remain on even if voltage drops or rises beyond acceptable range.

2. Zone R/Reboot: User has the option to assign Zone R (individual zone located at rear panel) to act as an unregulated output zone or to be used for automatic router reboot.

Unregulated Zone: (Unchecked Zone R Router Reset)

- Zone R will act like a regular zone, and can be programmed to switch ON/OFF individually like other zones. (see page 8, Zone Power Control)
- Zone R is not regulated
- Zone R works with the Schedule Manager and can be programmed to turn ON or OFF at any time on any day of the week like other zones (see page 10, Scheduling Management)
- Zone R operates with other zones during sequential start-up. (See page 9, Delay Times Between Zones)

Router Reboot: (Checked Zone R Router Reset)

- Zone R can only be used for router and/or modems
- The Auto reboot feature allows remote power cycling of the router or modem when internet connection is down (system will reset Zone R up to 3 times with adjustable time intervals between each attempts)
- Zone R can no longer be individually turned OFF or ON through Zone Power Control (Zone R will disappear in the Zone Power Control section)
- Zone R can no longer be scheduled or sequenced to turn ON/OFF

3. Delay Time Between Zones (Scheduler and Start Up):
 Select delay time interval for sequential Power Up between zones.

4. Front Panel Display:
 Always ON is the default setting. If you don't want the display to be on all the time, you can select a time from 0-255 seconds. When you have made your selection, press SAVE SETUP.

5. Schedule: By checking this button the system will follow the schedule.



Torus Power Web / Control

- System Status
- Switch Main Power
- Switch Power Zones
- System Setup
- Email Configuration
- Date and Time Setup**
- Schedule Management
- Change Password
- Torus Power Home
- Network Configuration

Date and Time Setup

Date: 0/0/0 mm/dd/yyyy
 Time: 00:01:33 24hr format
 Day: 1
 1-Mon 2-Tue 3-Wed 4-Thu
 5-Fri 6-Sat 7-Sun
 Time Zone: -1 +/- Hours, GMT
 Set Date/Time

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Date and Time Setup

When AVR2 is connected to the internet, the Day, Date and Time will automatically be set. However, when the AVR2 has no access to the internet (internet absent) The Day, Date and Time can be set manually which will allow the AVR2 to follow scheduled programming even if the internet is later unavailable. If internet resumes the Day, Date and Time will be automatically set.
 Day, Date & Time shown in front display

Torus Power Web / Control

- System Status
- Switch Main Power
- Switch Power Zones
- System Setup
- Email Configuration
- Date and Time Setup
- Schedule Management**
- Change Password
- Torus Power Home
- Network Configuration

Schedule Management

Enter "Time" in 24 hour format. (e.g. 21:35 instead of 9:35PM.)

Day	Hour	Min.	Power Zones			
			A	B	C	D R
Monday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday:	0	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Schedule Management

- Allow users to program different times to turn ON or OFF individual zones
- Complete control of your power management at any time or day of the week
- Six events per day/seven days a week
- Sequencing via scheduling
- Scheduling remains active even when the internet is lost, as long as system power is maintained
- 24h format
- Scheduling features allows automatic control (on-off) of any outlet zone according to user-defined schedule. Schedule parameters allow one week repeating schedule, with up to 6 events per day for each controlled zone. Outlets can be sequenced during start up. Each zone can be operated by the schedule, or in real-time via the web browser. Schedule is followed even when internet connection is lost, as long as system power is maintained.



AVR2 Software - Menu Selections (continued)

Torus Power Web / Control

System Status	<h3>Change Password</h3> <div style="border: 1px solid gray; padding: 10px; margin: 10px 0;"><p>Enter New Password: <input type="text"/></p><p>Re-enter Password: <input type="text"/></p><p style="text-align: center;"><input type="button" value="Save Password"/></p></div>
Switch Main Power	
Switch Power Zones	
System Setup	
Email Configuration	
Date and Time Setup	
Schedule Management	
Change Password	
Torus Power Home	
Network Configuration	

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Change Password

If you wish to change the password, use this screen.

In case you forget your new password, you can restore the AVR2 to factory default password by pressing the button on the front of the AVR2 unit and HOLDING it down for at least 10 seconds. The default password is **avr**

Torus Power Web / Control

System Status	<h3>Network Configuration</h3> <p>This page allows the configuration of the board's network settings.</p> <div style="border: 1px solid gray; padding: 5px; margin: 5px 0;">CAUTION: Incorrect settings may cause the board to lose network connectivity. Recovery options will be provided on the next page.</div> <p>Enter the new settings for the board below:</p> <div style="border: 1px solid gray; padding: 10px; margin: 10px 0;"><p>MAC Address: 00:50:C2:B5:D0:00</p><p>Host Name: <input type="text" value="AVR"/></p><p><input checked="" type="checkbox"/> Enable DHCP</p><p>IP Address: <input type="text" value="10.1.1.133"/></p><p>Gateway: <input type="text" value="10.1.1.1"/></p><p>Subnet Mask: <input type="text" value="255.255.255.0"/></p><p>Primary DNS: <input type="text" value="10.1.1.252"/></p><p>Secondary DNS: <input type="text" value="10.1.1.250"/></p><p>NTP Server: <input type="text" value="diδδ□"/></p><p>NTP Query Interval: <input type="text" value="600"/></p><p style="text-align: center;"><input type="button" value="Save Config"/></p></div>
Switch Main Power	
Switch Power Zones	
System Setup	
Email Configuration	
Date and Time Setup	
Schedule Management	
Change Password	
Torus Power Home	
Network Configuration	

Enter the new settings for the board below:

MAC Address: 00:50:C2:B5:D0:00
Host Name: AVR
 Enable DHCP
IP Address: 10.1.1.133
Gateway: 10.1.1.1
Subnet Mask: 255.255.255.0
Primary DNS: 10.1.1.252
Secondary DNS: 10.1.1.250
NTP Server: diδδ□
NTP Query Interval: 600
Save Config

Network Configuration

Each AVR2 unit has a unique MAC Address which is factory assigned.

The IP address assigned to the AVR2 is dynamically assigned and is displayed on this screen as well as on the front panel LCD of the AVR2.

The AVR2 can be programmed through the web browser to automatically get an IP address from the network switch or router and this is the default setting and should work on most networks. Some networks require each PC or device to use a fixed IP address and the AVR2 also supports this option.

Circuit Protection

The front panel power switch is also a circuit breaker. As a circuit breaker, it prevents excessive current from entering the AVR2.

When the power is on, the Switch is illuminated. When the breaker trips, the switch returns to its "off" position.

Thermal Protection

Torus AVR2s will shut-down if internal unit temperature reaches excessive levels.

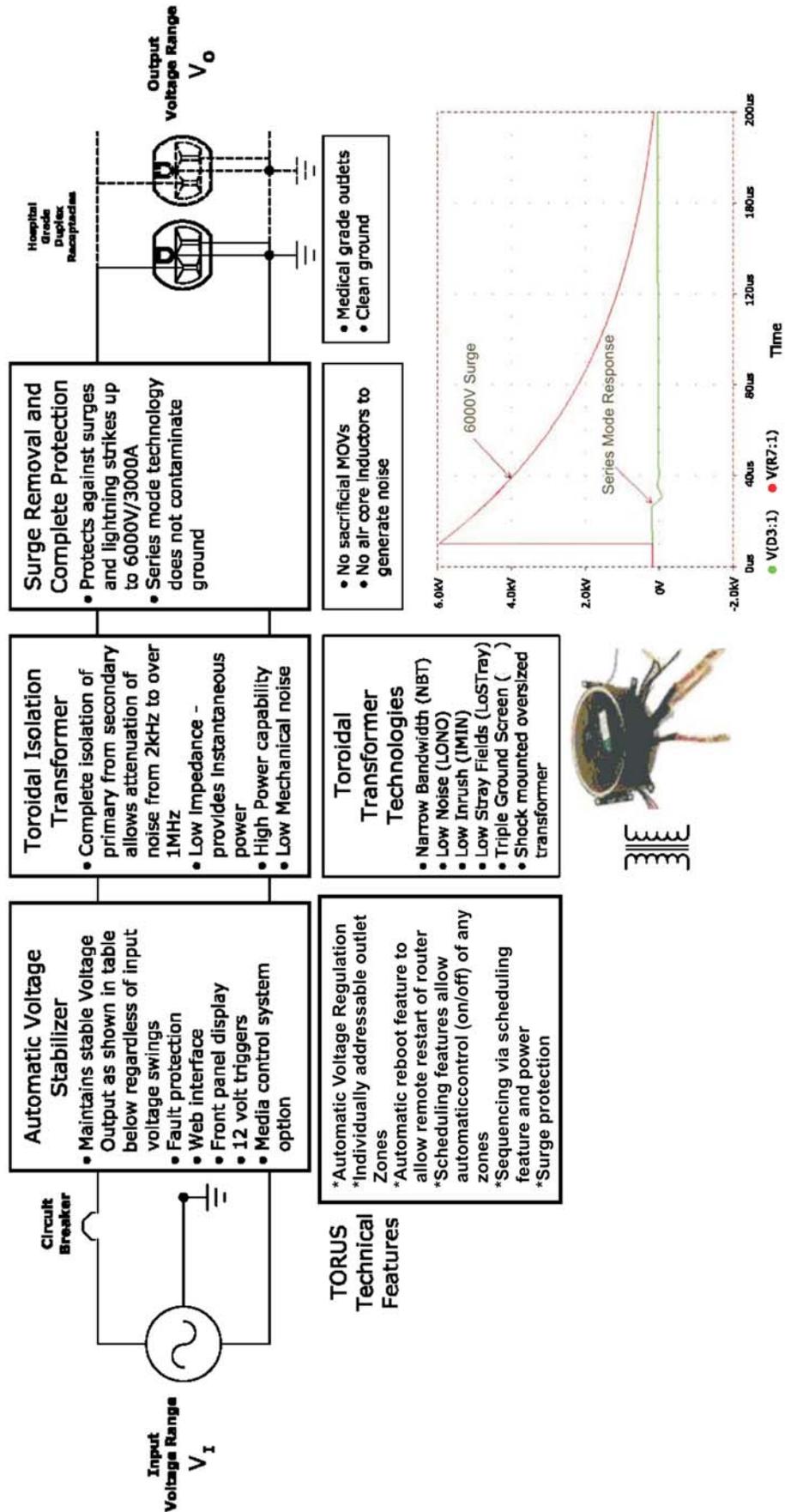
Input Current Rating

Per UL, CSA and National Electrical codes, devices with line cords and plugs must not consume more than 80% of a branch circuit's rating.

While Torus Power AVR2 Units are designed to handle well beyond these limits, they must be marked with a maximum input current that satisfies the requirements.



Block Diagram - AVR2 System



Electrical Specifications

Model Number	Input Voltage Nominal	Output Voltage Nominal	Maximum Available Output Current	Input Circuit Breaker (Fuses)	Number of IP Addressable Zones
North American					
AVR2 15 PLUS RK	120VAC Operating Range 85 to 135VAC	120VAC ±5V	15A	20A Circuit Breaker Front Panel	4 + R
AVR2 20 RK	120VAC Operating Range 85 to 135VAC	120VAC ±5V	20A	15A Circuit Breaker Front Panel	4 + R
AVR2 20 BAL RK	240VAC Operating Range 170V to 270V	120VAC ±5V	20A	10A Circuit Breaker Front Panel	4 + R
AVR2 45 BAL RK	240VAC Operating Range 170V to 270V	120VAC ±5V	45A	2x25A (Fuses)	7 + R
AVR2 60 BAL RK	240VAC Operating Range 170V to 270V	120VAC ±5V	60A	2x30A (Fuses)	7 + R
AVR2 75 BAL RK	240VAC Operating Range 170V to 270V	120VAC ±5V	75A	2x40A (Fuses)	7 + R
AVR2 90 BAL RK	240VAC Operating Range 170V to 270V	120VAC ±5V	90A	2x45A (Fuses)	7 + R
WM 45 BAL AVR2	240VAC Operating Range 170V to 270V	120VAC ±5V	3X20	2x25A (Fuses)	7 + R
WM 60 BAL AVR2			3X20	2x30A (Fuses)	7 + R
WM 75 BAL AVR2			4X20	2x40A (Fuses)	7 + R
WM 90 BAL AVR2			5X20	2x45A (Fuses)	7 + R
WM 45 BAL AVR2 TVSS	240VAC Operating Range 170V to 270V	120VAC ±5V	3X20	2x25A (Fuses)	7 + R
WM 60 BAL AVR2 TVSS			3X20	2x30A (Fuses)	7 + R
WM 75 BAL AVR2 TVSS			4X20	2x40A (Fuses)	7 + R
WM 90 BAL AVR2 TVSS			5X20	2x45A (Fuses)	7 + R
International					
AVR2 8 CE	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	8	1x8	4 + R
AVR2 16 CE			16	1x16	7 + R
AVR2 30 CE			30	2x30A (Fuses)	7 + R
AVR2 45 CE			45	2x45A (Fuses)	7 + R
AVR2 8 UK	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	8	1x8	4 + R
AVR2 16 UK			16	1x16	6 + R
AVR2 30 UK			30	2x30A (Fuses)	6 + R
AVR2 45 UK			45	2x45A (Fuses)	7 + R
AVR2 8 AUS	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	8	1x8	4 + R
AVR2 16 AUS			16	1x16	7 + R
AVR2 30 AUS			30	2x30A (Fuses)	7 + R
AVR2 45 AUS			45	2x45A (Fuses)	7 + R
AVR2 8 NEUTRIK	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	8	1x8	4 + R
AVR2 16 NEUTRIK			16	1x16	7 + R
AVR2 30 NEUTRIK			30	2x30A (Fuses)	7 + R
AVR2 45 NEUTRIK			45	2x45A (Fuses)	7 + R
AVR2 8 IEC	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	8	1x8	4 + R
AVR2 16 IEC			16	1x16	7 + R
AVR2 30 IEC			30	2x30A (Fuses)	7 + R
AVR2 45 IEC			45	2x45A (Fuses)	7 + R
AVR2 8 515R	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	8	1x8	4 + R
AVR2 16 520R			16	1x16	4 + R
AVR2 30 520R			30	2x30A (Fuses)	7 + R
AVR2 45 520R			45	2x45A (Fuses)	7 + R
AVR2 20 JP	100VAC Operating Range 85V to 135V	100V +/- 5V	20	1x20	4 + R
WM 45 BAL AVR2 TVSS	240VAC Operating Range 170V to 270V	220-240VAC +/- 10V	45	2x30A (Fuses)	7 + R
WM 60 BAL AVR2 TVSS			60	2x45A (Fuses)	7 + R



Mechanical Specifications - North American

Model Number	Input (Inlet) connector (Rear Panel)	Line Cord	Output Connector (Rear Panel)	Size, mm (w x d x h) Size, inch (w x d x h)	Weight
North American					
AVR2 15 PLUS	IEC 20A Inlet IEC 15A NEMA C20	N5/15, 14AWG C13, 15A/125V	10 outlets Medical Grade, 15A	533x584x235 21x23x9.25	44.2
AVR2 20	IEC 20A Inlet IEC 15A NEMA C20	N5/20, 12AWG C19, 20A/125V	10 outlets Medical Grade, 20A	533x584x235 21x23x9.25	47.2
AVR2 20 BAL	IEC 20A Inlet NEMA C20	N5/20, 12AWG C19, 20A/125V	10 outlets Medical Grade, 20A	533x584x235 21x23x9.25	50
AVR2 45 BAL	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	18 outlets Medical-grade, 20A	610x762x381 24x30x15	64
AVR2 60 BAL	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	18 outlets Medical-grade, 20A	610x762x381 24x30x15	86
AVR2 75 BAL	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	24 outlets Medical Grade, 20A	610x762x381 24x30x15	98.5
AVR2 90 BAL	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	24 outlets Medical Grade, 20A	610x762x381 24x30x15	124
WM 45 BAL AVR2	Connection to Input Fuses	N/A	3x20A ABB Circuit Breaker	838x1061x584 33x40x23	69
WM 60 BAL AVR2			3x20A ABB Circuit Breaker	838x1061x584 33x40x23	86
WM 75 BAL AVR2			5x20A ABB Circuit Breaker	838x1061x584 33x40x23	94
WM 90 BAL AVR2			5x20A ABB Circuit Breaker	838x1061x584 33x40x23	134
WM 45 BAL AVR2 TVSS	Connection to Input Fuses	N/A	3x20A ABB Circuit Breaker	838x1061x584 33x40x23	73
WM 60 BAL AVR2 TVSS			3x20A ABB Circuit Breaker	838x1061x584 33x40x23	90
WM 75 BAL AVR2 TVSS			5x20A ABB Circuit Breaker	838x1061x584 33x40x23	100
WM 90 BAL AVR2 TVSS			5x20A ABB Circuit Breaker	838x1061x584 33x40x23	140

Chassis Height	3U (5.25")	4U (7.00")	5U (8.75")
AVR2 units	AVR2 15 PLUS AVR2 20 AVR2 20 BAL AVR2 8 CE AVR2 8 UK AVR2 8 AUS AVR2 8 NEUTRIK AVR2 8 IEC AVR2 8 515R AVR2 20 JP	AVR2 45 BAL AVR2 60 BAL AVR2 16 CE AVR2 30 CE AVR2 16 UK AVR2 30 UK AVR2 16 AUS AVR2 30 AUS AVR2 16 NEUTRIK AVR2 30 NEUTRIK AVR2 16 IEC AVR2 30 IEC AVR2 16 520R AVR2 30 520R	AVR2 75 BAL AVR2 90 BAL AVR2 45 CE AVR2 45 UK AVR2 45 AUS AVR2 45 NEUTRIK AVR2 45 IEC AVR2 45 520R

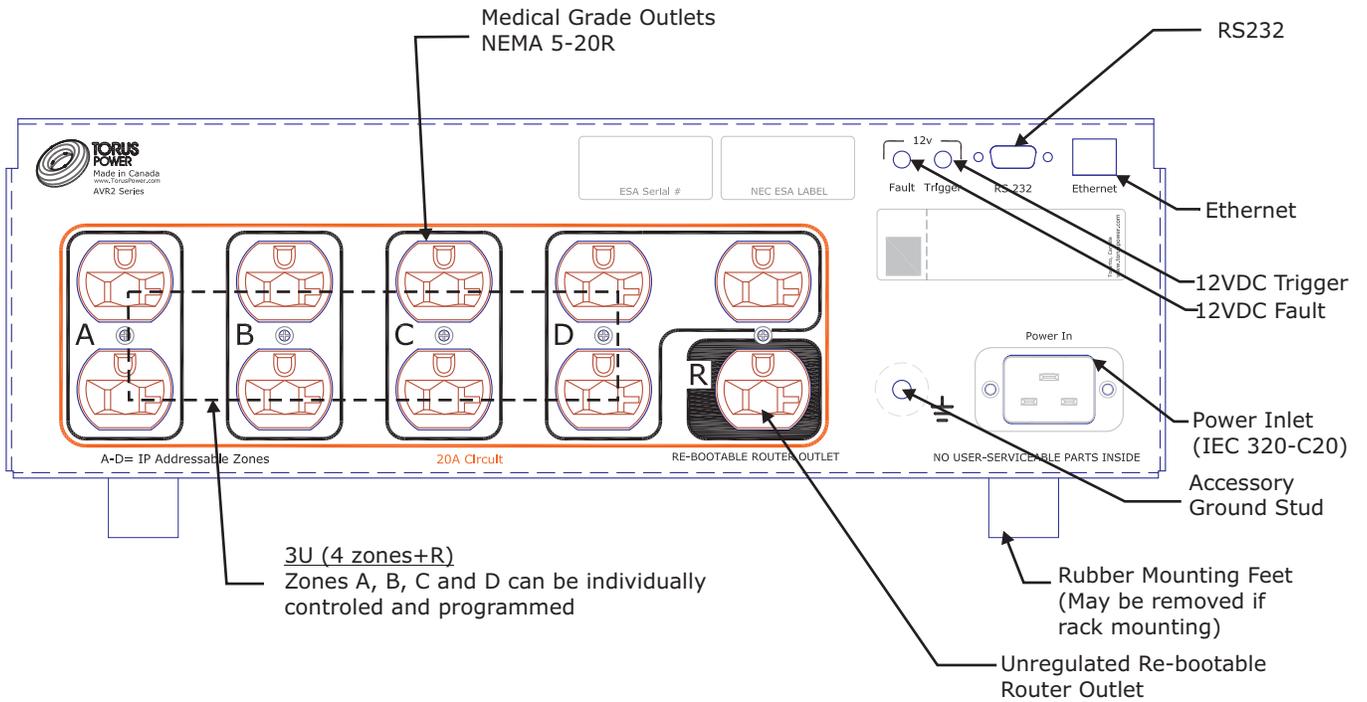


Mechanical Specifications - International

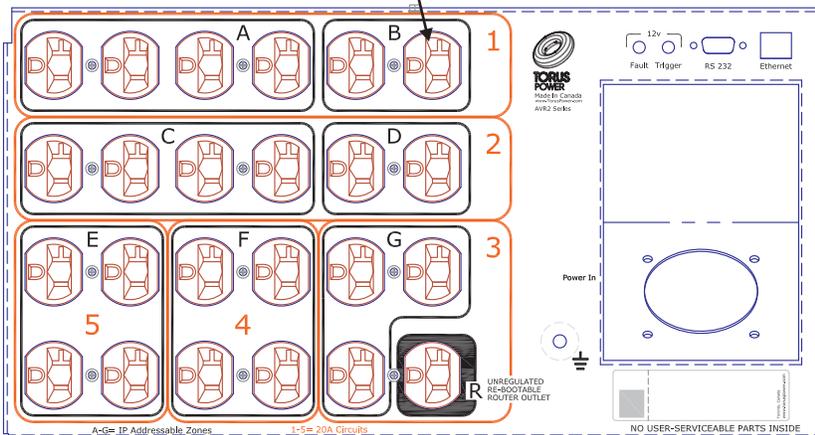
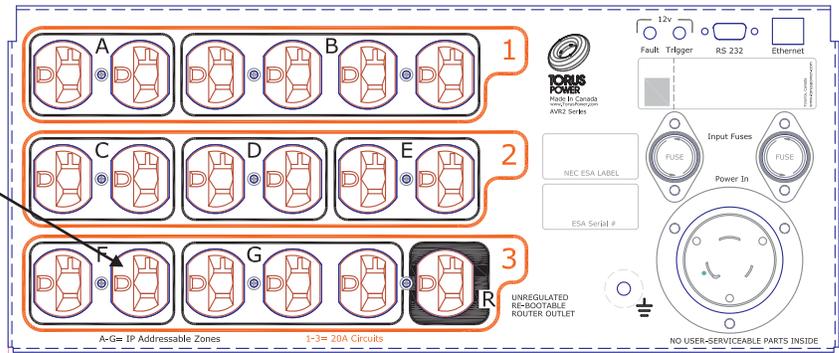
Model Number	Input (Inlet) connector (Rear Panel)	Line Cord	Output Connector (Rear Panel)	Size, mm (w x d x h) Size, inch (w x d x h)	Weight
International					
AVR2 8 CE	IEC 20A Inlet NEMA C20	10A/250VAC, 2.5M PLUG TYPE: CEE 7/7 CONNECTOR TYPE - IEC - C13	16A/250V IVORY CE SOCKET (x5)	21x23x9.25 533x584x235	39
AVR2 16 CE		16A/250VAC, 2.5M PLUG TYPE: CEE 7/7 CONNECTOR TYPE - IEC - C19	16A/250V IVORY CE SOCKET (x4)	24x30x15 610x762x381	60
AVR2 30 CE	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	16A/250V IVORY CE SOCKET (x8)	24x30x15 610x762x381	77.5
AVR2 45 CE	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	16A/250V IVORY CE SOCKET (x12)	24x30x15 610x762x381	134
AVR2 8 UK	IEC 20A Inlet NEMA C20	10A/250VAC, 2.5M PLUG TYPE: BS 1363 CONNECTOR TYPE - IEC - C13	13A / 250V UK Socket (x5)	21x23x9.25 533x584x235	39
AVR2 16 UK		13A/250VAC, 2.5M PLUG TYPE: BS 1363 CONNECTOR TYPE - IEC - C19	13A / 250V UK Socket (x6)	24x30x15 610x762x381	60
AVR2 30 UK	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	13A / 250V UK Socket (x6)	24x30x15 610x762x381	77.5
AVR2 45 UK	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	13A / 250V UK Socket (x10)	24x30x15 610x762x381	134
AVR2 8 AUS	IEC 20A Inlet NEMA C20	10A/250VAC, 2.5M PLUG TYPE: BS 1363 CONNECTOR TYPE - IEC - C13	10A / 250V AUS Socket (x5)	21x23x9.25 533x584x235	39
AVR2 16 AUS		13A/250VAC, 2.5M PLUG TYPE: BS 1363 CONNECTOR TYPE - IEC - C19	20A / 250V AUS Socket (x5)	24x30x15 610x762x381	60
AVR2 30 AUS	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	20A / 250V AUS Socket (x5)	24x30x15 610x762x381	77.5
AVR2 45 AUS	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	20A / 250V AUS Socket (x9)	24x30x15 610x762x381	134
AVR2 8 NEUTRIK	IEC 20A Inlet NEMA C20	10A/250VAC, 2.5M	16A / 250V PowerCON Socket (x8)	21x23x9.25 533x584x235	39
AVR2 16 NEUTRIK		13A/250VAC, 2.5M	16A / 250V PowerCON Socket (x8)	24x30x15 610x762x381	60
AVR2 30 NEUTRIK	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	16A / 250V PowerCON Socket (x8)	24x30x15 610x762x381	77.5
AVR2 45 NEUTRIK	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	16A / 250V PowerCON Socket (x8)	24x30x15 610x762x381	134
AVR2 8 IEC	IEC 20A Inlet NEMA C20	10A/250VAC, 2.5M	IEC 250V 10A Socket (x8)	21x23x9.25 533x584x235	39
AVR2 16 IEC		13A/250VAC, 2.5M	IEC 250V 10A Socket (x8) and IEC 250V 16A Socket (x4)	24x30x15 610x762x381	60
AVR2 30 IEC	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	IEC 250V 10A Socket (x8) and IEC 250V 16A Socket (x4)	24x30x15 610x762x381	77.5
AVR2 45 IEC	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	IEC 250V 10A Socket (x8) and IEC 250V 16A Socket (x4)	24x30x15 610x762x381	134
AVR2 8 515R	IEC 20A Inlet NEMA C20	N5/15, 14AWG-C13, 15A/125V	10 outlets Medical Grade, 15A	21x23x9.25 533x584x235	39
AVR2 16 520R		N5/15, 12AWG - C19, 16A/125V	12 outlets Medical Grade, 20A	24x30x15 610x762x381	60
AVR2 30 520R	Hubbell Twist-lock 30A, 250V NEMA L6-30P	Twist-lock 10AWG, 30A	12 outlets Medical Grade, 20A	24x30x15 610x762x381	77.5
AVR2 45 520R	Hubbell Twist-lock 50A, 250V 2P3W	Twist-lock 6AWG, 50A	12 outlets Medical Grade, 20A	24x30x15 610x762x381	134
AVR2 20 JP	IEC 20A Inlet NEMA C20	N5/20, 12AWG - C19, 20A/125V	10 outlets Medical Grade, 20A	23x23x9.25 583x533x235	49.7
WM 30 AVR2	Connection to Input Fuses	N/A	2x15A ABB Circuit Breaker		86
WM 45 AVR2			4x15A ABB Circuit Breaker		134
WM 30 AVR2 TVSS			2x15A ABB Circuit Breaker		92
WM 45 AVR2 TVSS			4x15A ABB Circuit Breaker		140



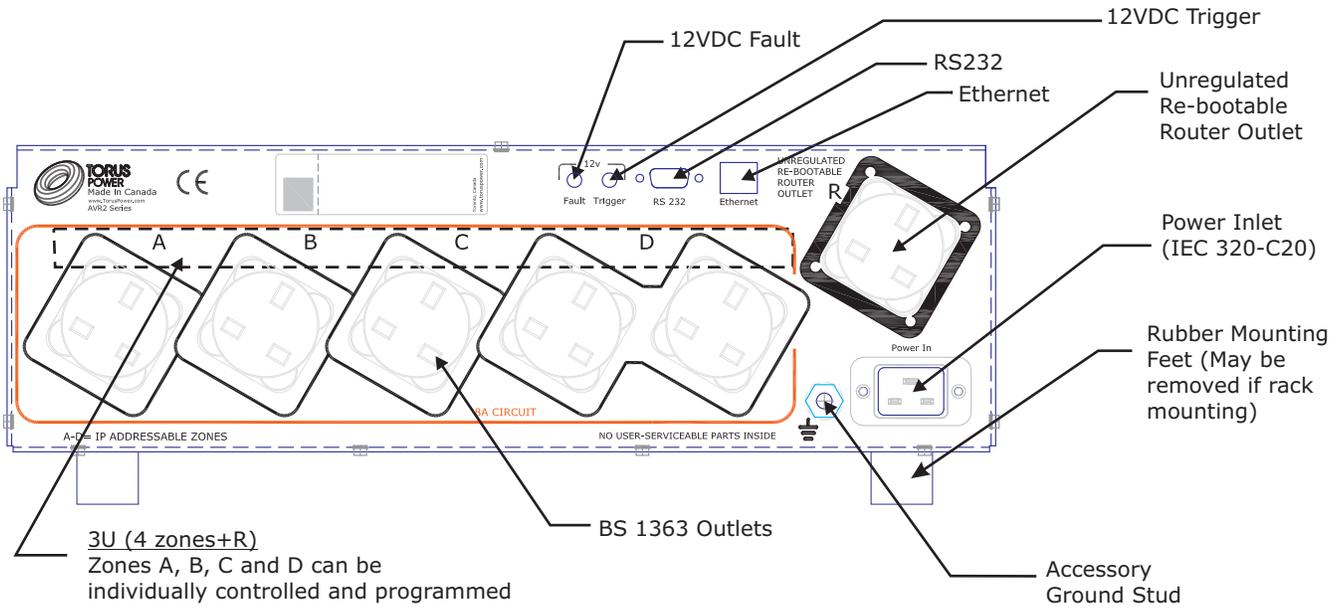
Rear Panel Layout: North American



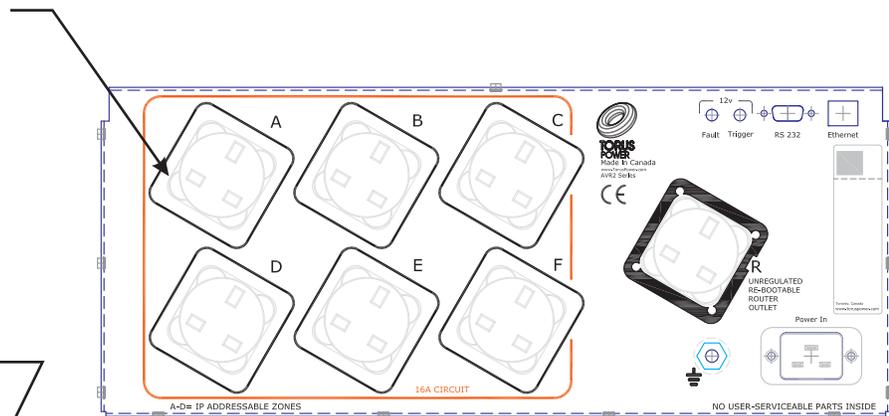
4U & 5U (7 zones+R)
Zones A-G can be individually controlled and programmed



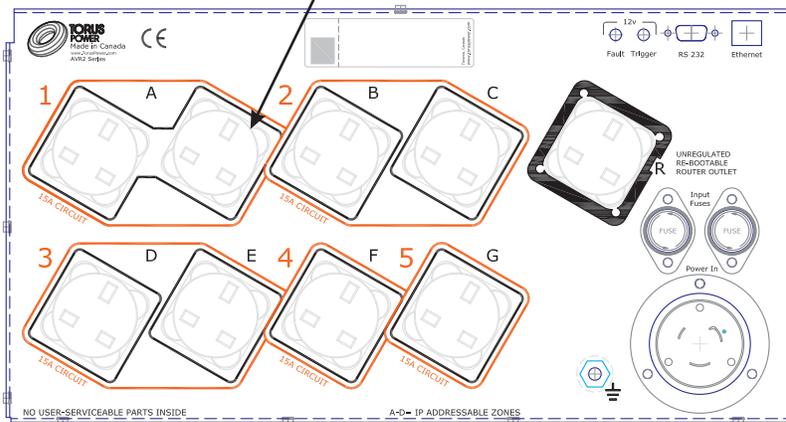
Rear Panel Layout: International - Australia (AUS)/United Kingdom (UK)



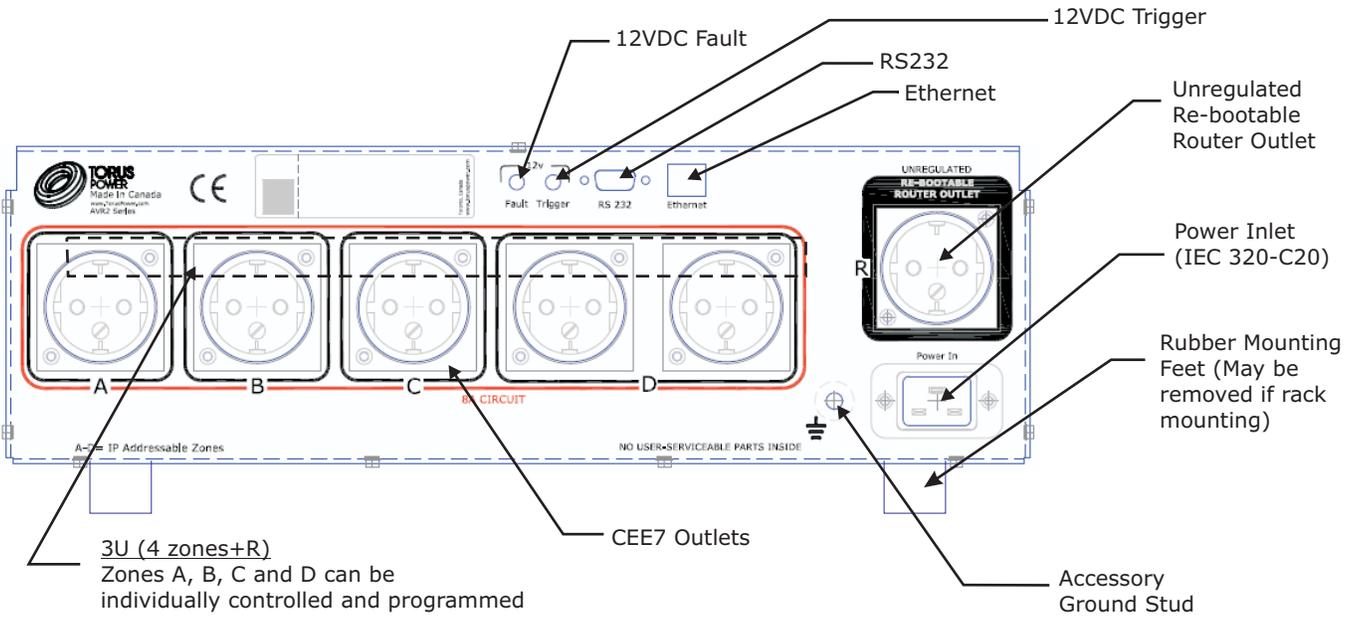
4U & 5U (6 zones+R)
Zones A-F can be individually controlled and programmed



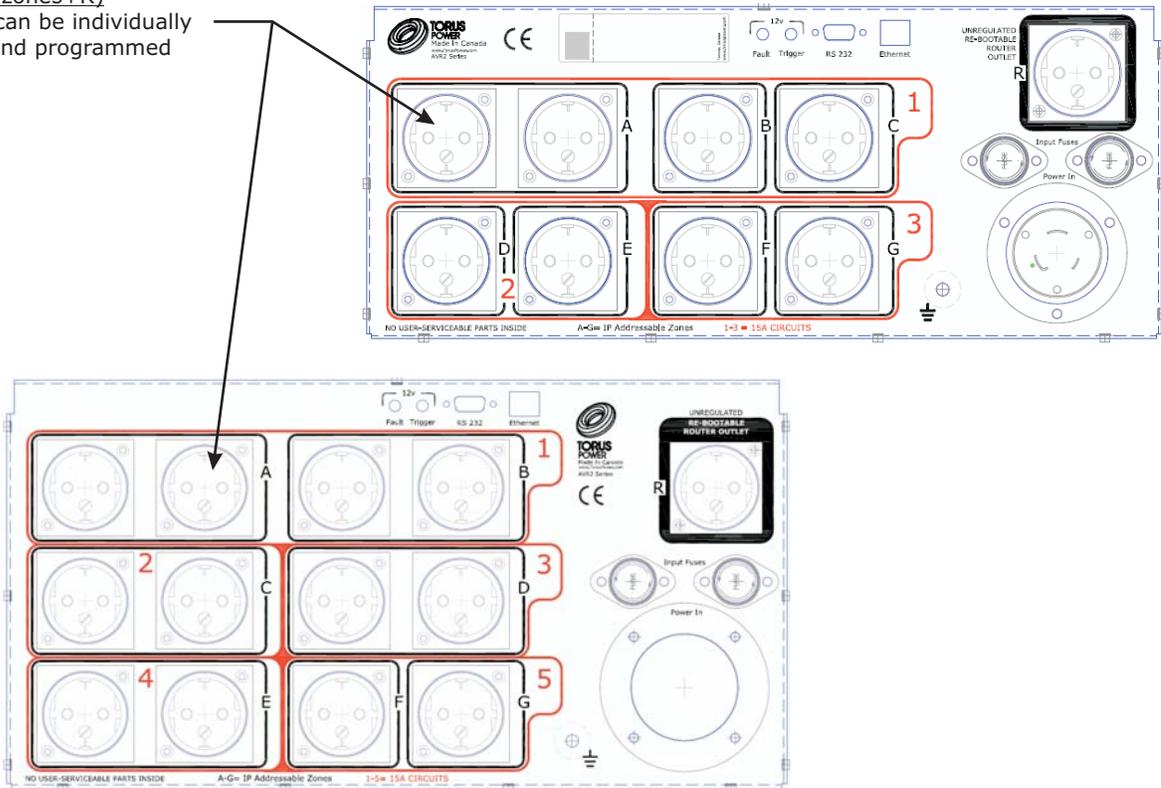
5U & 5U (7 zones+R)
Zones A-G can be individually controlled and programmed



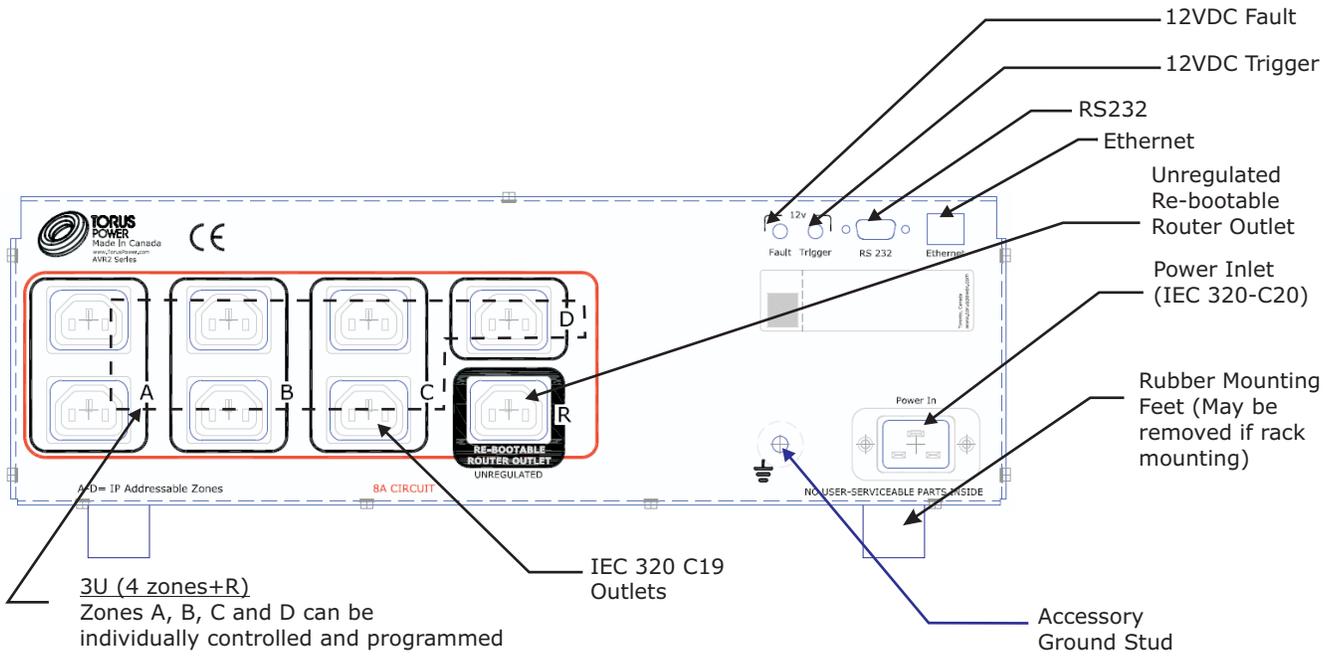
Rear Panel Layout: International - Continental Europe (CE)



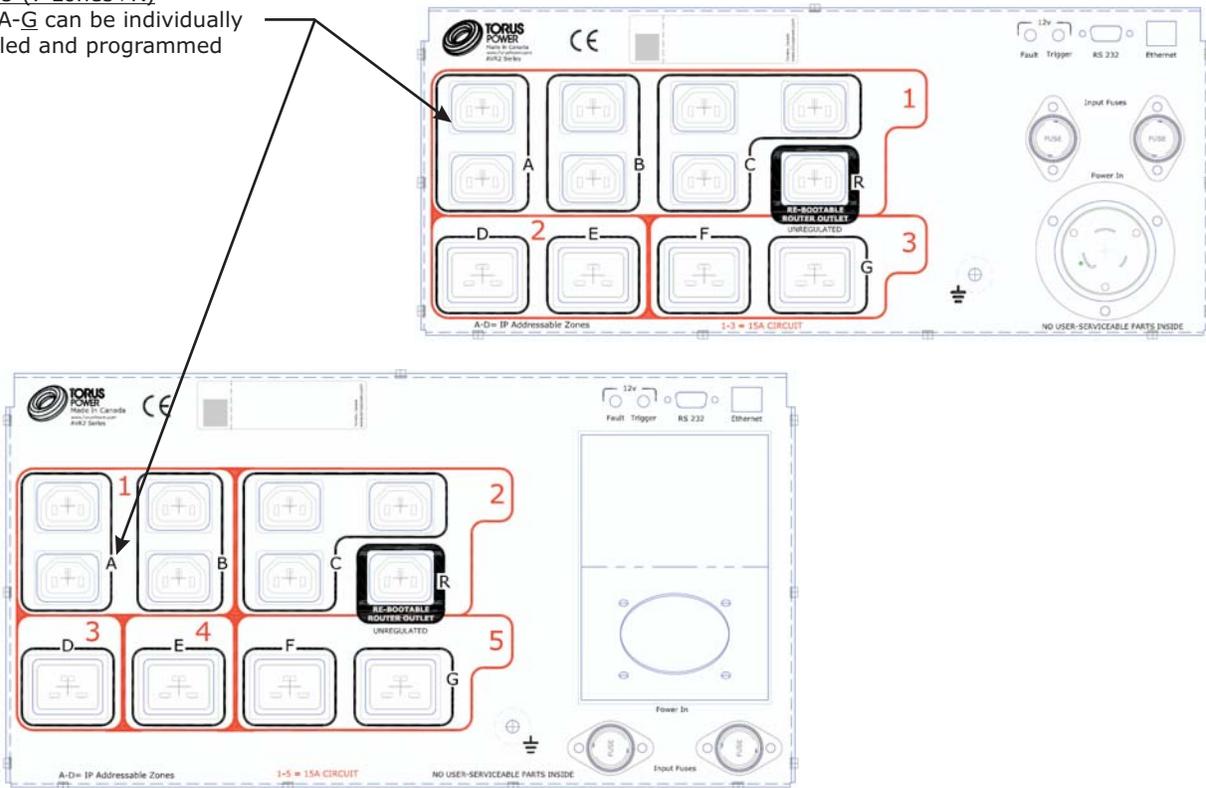
4U & 5U (7 zones+R)
Zones A-G can be individually controlled and programmed



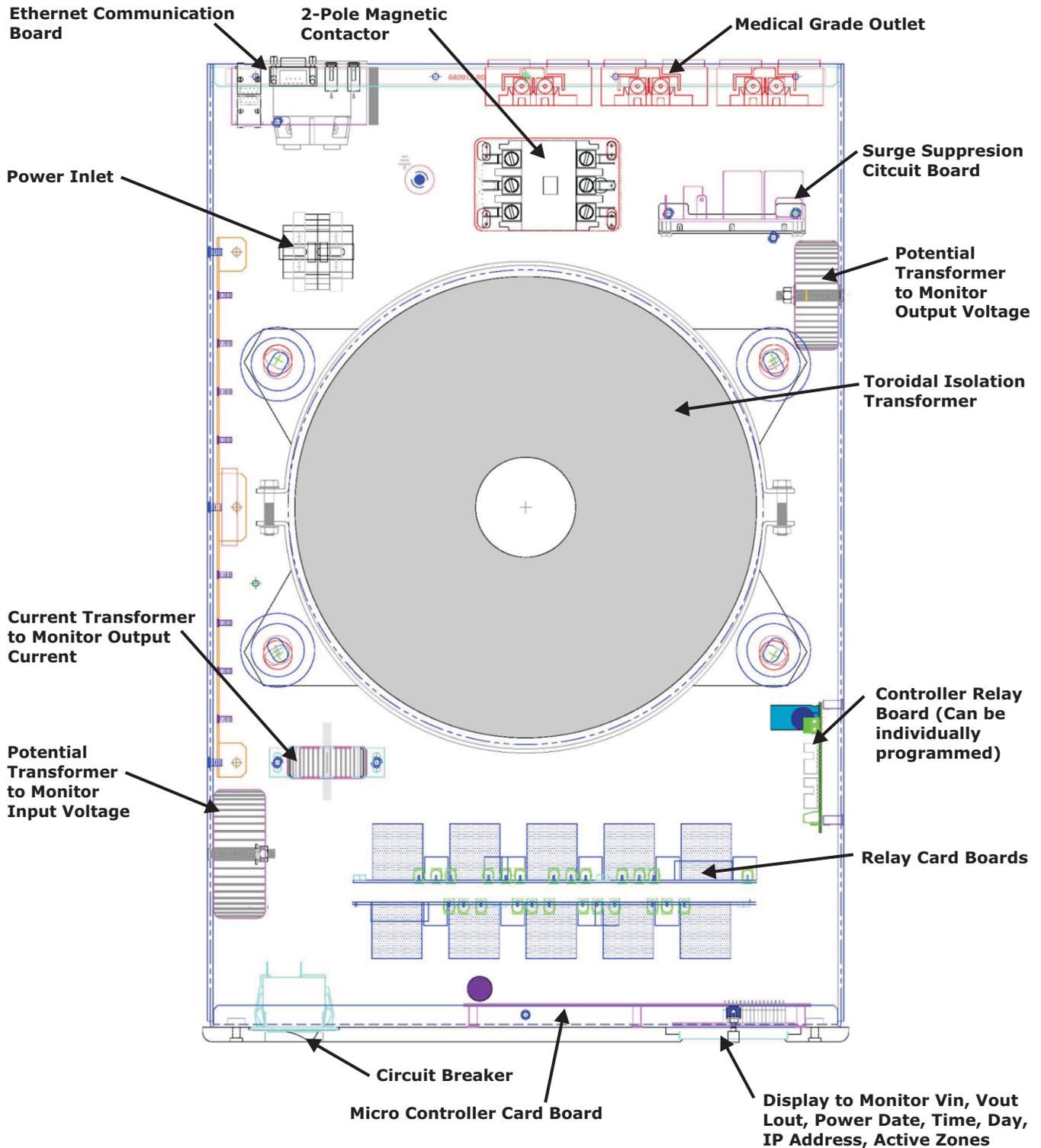
Rear Panel Layout: International - IEC



4U & 5U (7 zones+R)
Zones A-G can be individually controlled and programmed



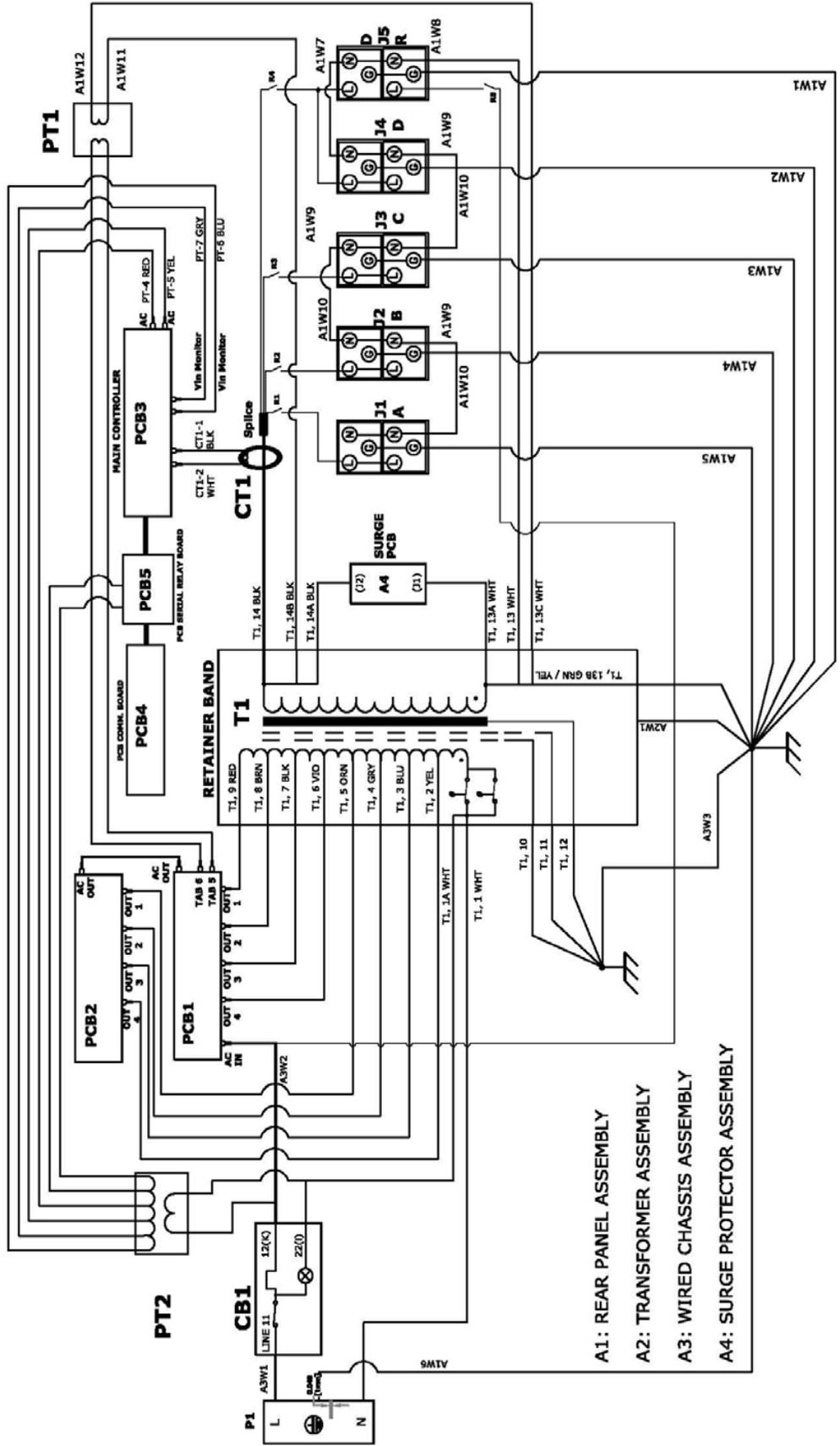
What's Inside RM Series



Internal View of Torus Unit: (AVR2 60 BAL)

Note: Massive toroidal transformer which provides complete isolation and ensures Torus units have sufficient reserve power capabilities to provide all the current needed for high power systems.

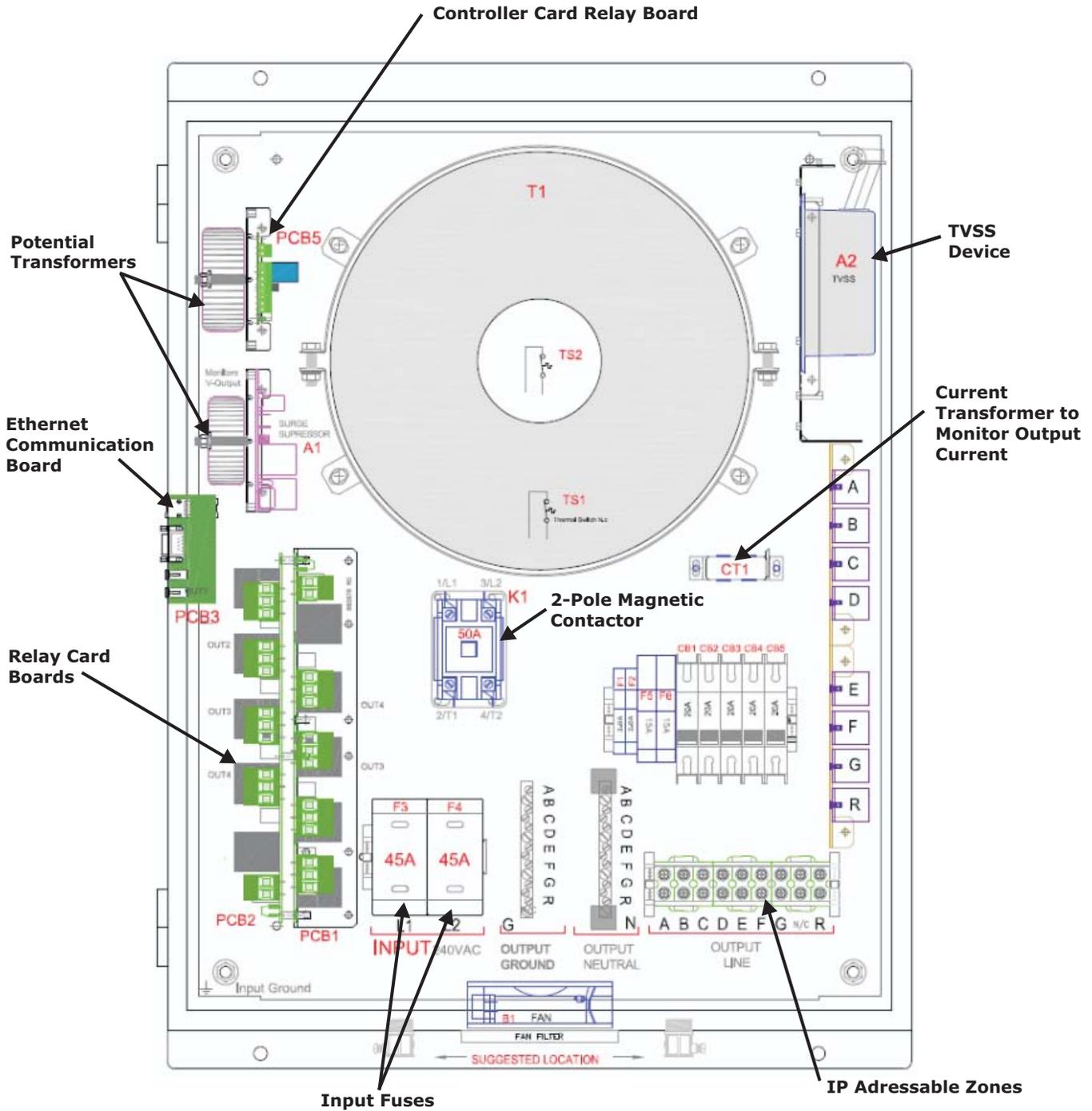




Note:
 Schematic drawings are provided for reference only, Torus Power AVR2 units have no serviceable parts inside. Please return unit to manufacturer for repair and service when required.



What's Inside Wall Mount Series



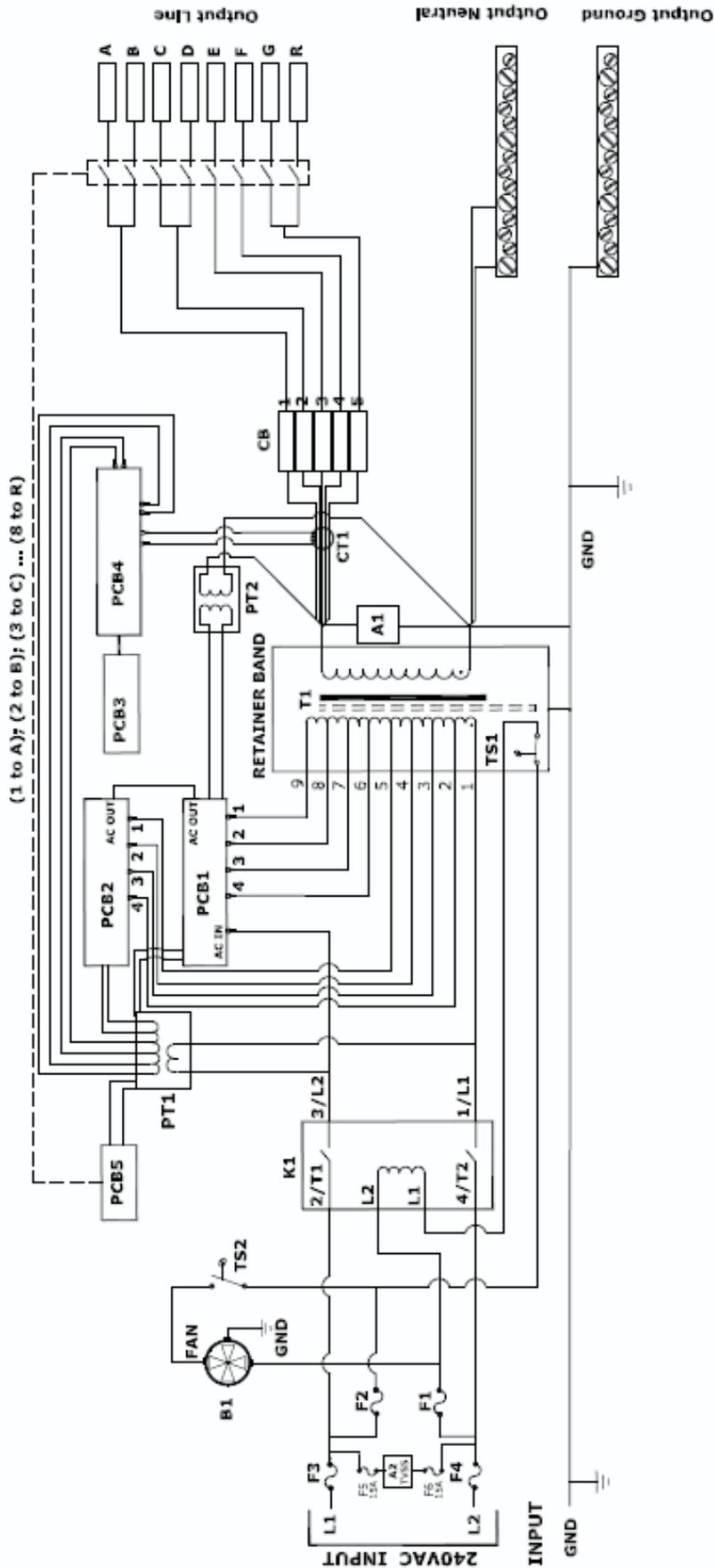
Internal View of Torus Unit: (WM 90 BAL AVR2 TVSS)

Note: Massive toroidal transformer which provides complete isolation and ensures Torus units have sufficient reserve power capabilities to provide all the current needed for high power systems.

TVSS

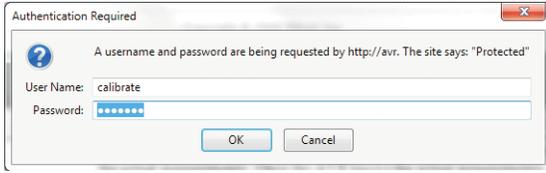
The Wall Mount Torus Power is available with a TVSS device built in to its signal path. This UL certified Panel TVSS has a sub-nanosecond response time and manages surges beyond 20,000 Amps. The TVSS also offers additional noise filtration of EMI and RFI (40dB typical).



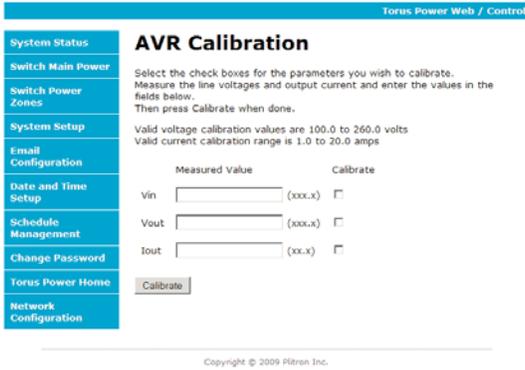


Note:
 Schematic drawings are provided for reference only, Torus Power AVR2 units have no serviceable parts inside. Please return unit to manufacturer for repair and service when required.





The user name is 'calibrate' and the password is 'pitron'.

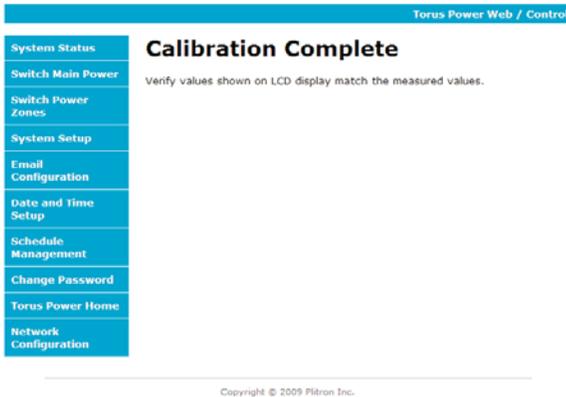


AVR Calibration

1. To calibrate the unit, you will need to have the AVR powered and have Ethernet Connectivity between the PC and AVR.

2. The calibration is performed by applying fixed load to the AVR and measuring the input and output voltages and the output current.

Enter `http://avr/calibrate.htm` [or `http://(IP address)/calibrate.htm`] in your browser. This will provide access to the calibration page where you can calibrate your AVR. Note: The IP address of the unit can be found on the display monitor by pressing the push button twice.



Calibration Complete

Follow the instructions on the web page. You can calibrate all three values at once or calibrate any combination of the three. The check box must be checked for the parameters to be included in the calibration.

Assuming valid values are entered, calibration is performed instantly when 'Calibrate' is pressed and the following screen is then displayed.

Verify from the LCD or the web page that the displayed values now match the measured values.



Crestron Electronics Module for Torus Power AVR2 Models

“Torus Power is an integrated partner with Crestron Electronics. Integrated Partner Program allows Torus power’s customers to operate seamlessly in a Crestron systems environment. Integrated Partner Modules offer the Crestron control systems programmer a simplified, timesaving drag-and-drop solution for integration of partner products. Crestron's Integrated Partner Program initiative makes it easy to take advantage of the enhanced functionality afforded by using a manufacturer's **serial, Ethernet, or other enhanced interface**. To view all current. Torus Power modules for use with a Crestron Control System, please visit the following link:”

The link may be:

www.crestron.com

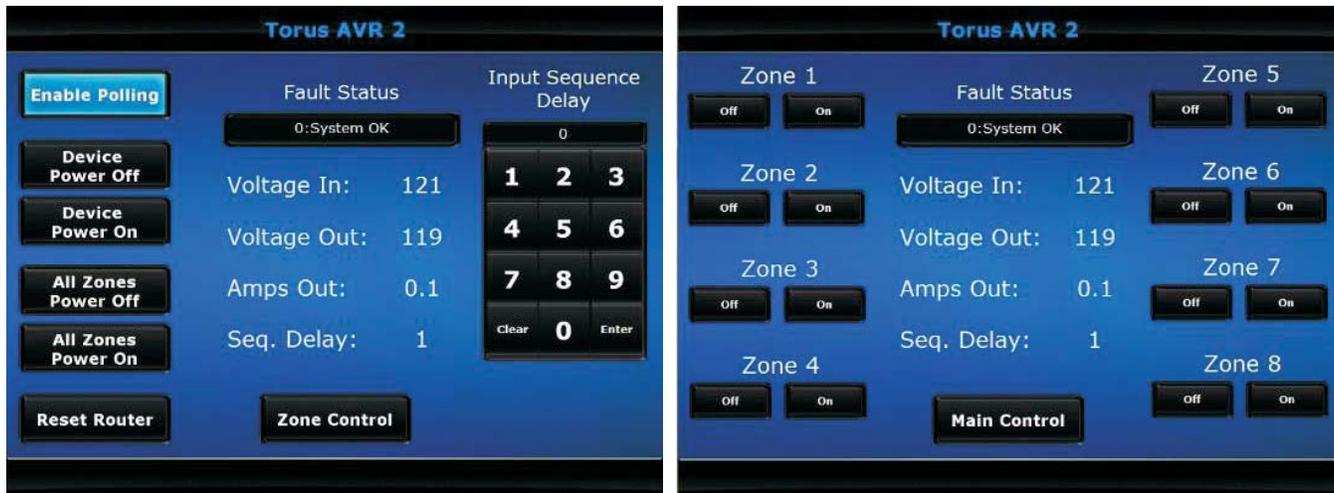
or

http://www.crestron.com/partnerships/integrated_partner_program/

or

http://www.crestron.com/resources/product_and_programming_resources/integrated_partner_modules/default.asp?manufacturer_id=557

Sample AVR2 Crestron Screens



Home Automation Interface Through RS232

AVR-2 Serial Protocol
Data Format
Baud Rate:9600
Data Bits:8
Parity:N

Commands are sent to the AVR in ASCII, and terminated with a CR (0d hex).The following commands are supported.

Command	Description	Response
C0	Turn off	OK<CR><LF>
C1	Turn on	OK<CR><LF>
C2	Get voltage and current readings	Vin:200V,Vout:120V,Iout:10.5A<CR><LF> The voltage is padded with leading zeros if it is less than 100
C3	Get fault status	0:System OK<CR><LF> Or one of the following fault message if the system has a fault condition. 1:Relay 1A Open Fault 1: Relay 1B Close Fault 2:AC Voltage is LOW 2:AC Voltage is High
C4	Reset Router	OK<CR><LF>
C5, MM/DD/YYYY, HH:MM:SS, WeekDay, TimeZone	Set Time Weekday: Sunday is 1, Monday is 2, etc. TimeZone: Time difference from GMT in hours.	OK<CR><LF>
C6	Read Time	MM/DD/YYYY, HH:MM:SS, WeekDay, TimeZone Month/Day/Year, hours:minutes/seconds, weekday, time zone offset Weekday: Sunday is 1, Monday is 2, etc. TimeZone: Time difference from GMT in hours. Example 10/14/2012,14:00:55,1,-6
C7,Z	Turn on zone output Z Z: 1 to 8 or A for all outputs	OK<CR><LF>
C8,Z	Turn off zone output Z	OK<CR><LF>
C9,x	Set Sequence Delay to x seconds	OK<CR><LF>
C10	Read Sequence Delay	Sequence Delay<CR><LF>

Warranty

Torus Power products are warranted to be free from manufacturing defects for five years from the original date of sale. This includes parts, labour and return shipping to the first registered owner and all subsequent registered owners. Warranty coverage is extended to applicable products registered or having proof-of-purchase (sales invoice, etc.).

failure of the product or any component part was caused by damage (not resulting from a defect or malfunction) or abuse while in the possession of the customer. Failure to fully comply with Torus Power operating instructions, voids the warranty.

In the event of a defect or malfunction, Torus Power will remedy the problem by repair or replacement, as we deem necessary, to restore the product to full performance.

This warranty is considered void if the defect, malfunction or



Torus Power products are marketed worldwide through Plitron Manufacturing Inc.

For sales contact:
torussales@plitron.com

Phone: 416-667-9914
Toll free: 1-800-754-8766
Fax: 416-667-8928

Technical inquiries:
torustechnical@plitron.com

Phone: 416-667-9914



www.TorusPower.com

Torus Power
#8 601 Magnetic Drive
Toronto, ON M3J 3J2
Canada
416-667-9914

Specifications subject to change without notice.
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