TORUS POWER

Engineered to perform & protect like no other | **Toroidal Isolation Power Transformers**

AVR2 Series Manual
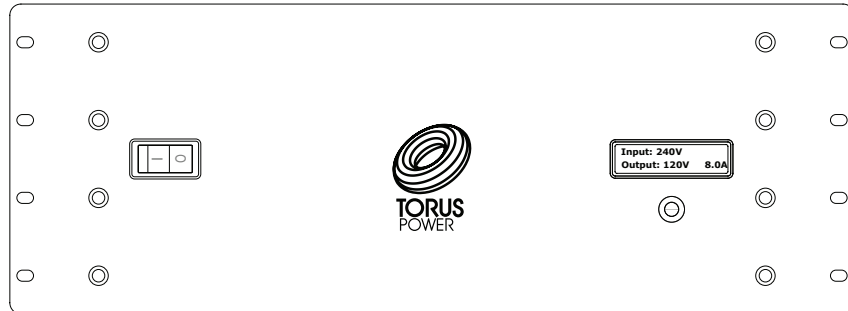
Input: 240V
Output: 120V   8.0A

19" Pro Series Rack Mount (RK) Faceplate

Input: 240V
Output: 120V   8.0A
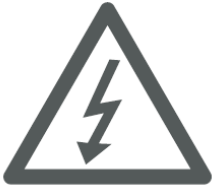
17" Consumer Series (C) Faceplate
Available in Black (B) and Silver (S) colours

Table of Contents

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. 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.

12. 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.

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

Placement & Ventilation

Torus power PIUs (Power Isolation Units) are extremely efficient yet very high power devices, and must be adequately cooled.

PIUs have ventilation slots on the base, side panels and on the cover. Maintain at least 1" distance from each of these surfaces to anything else. Should your installation conditions be constricted, additional forced air-cooling may be necessary.

Do not install the unit directly above heat generating equipment. Maintain at least 6" behind the PIU for adequate wiring space.

Torus Power AVR2 Series Description

Torus Power AVR2 series products are full-feature state-of-the-art power transformers 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 outlet zones that can be separately turned on or off through the web browser, and/or remotely scheduled. Torus Power AVR2 models deliver clean 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. In such real world conditions, Torus Power AVR2 can protect your equipment, and improve the quality and enjoyment of your audio and video experience.

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

Summary of AVR2 Series Features

- Toroidal Isolation provides the ultimate 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 input/output voltage, current drawn and IP address
- Individually addressable outlet zones
- 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 six 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 the Internet connection is lost, as long as system power is maintained.

Connecting Components to IP Addressable Zones

Depending upon the power rating AVR2 units come in two configurations in terms of IP Addressable zones.
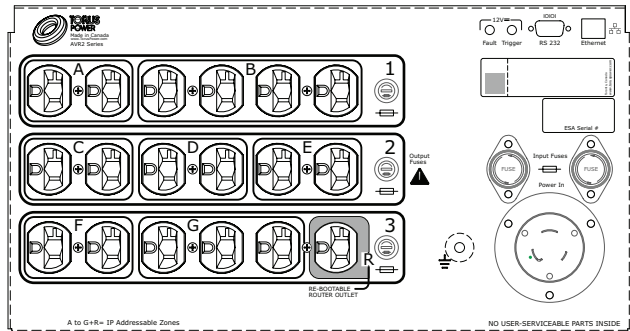**4 Zones + R:** A, B, C, D and R
7 Zones + R: A, B, C, D, E, F, G and R

- Zones A to G can be individually controlled and programmed.
- 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 can be programmed to be used as either a controlled outlet or a rebootable Router outlet.
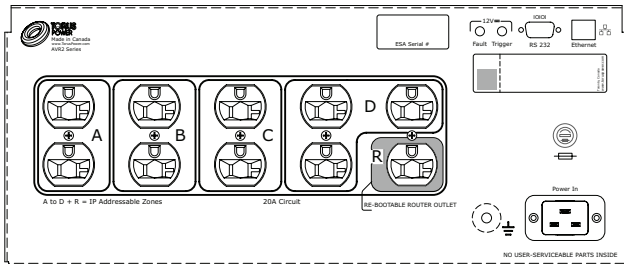
Rear Panel with **4 Zones + R**

Rear Panel with **7 Zones + R**

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 E, 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 wil NOT compromise performance.

Front Panel Display

The front panel display consists of a 2 line LCD and a pushbutton switch. Each time you push the button the display will show a different feature of the AVR2.
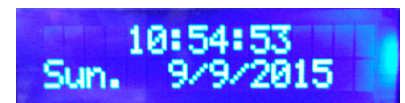
When you first turn on the AVR2 the System Status will appear. Each time you push the button it will change from one display to another. One last push will take you back to the System Status and will stay here till you push the buttons again.
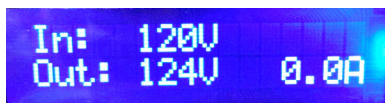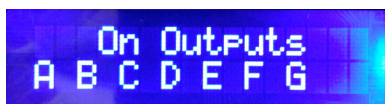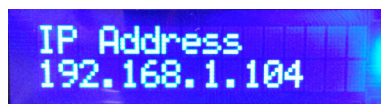

System Status


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).

The display will show one of following messages:

  OR
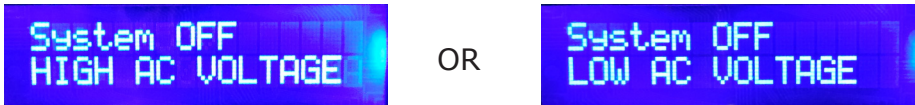
As the output power from the Torus Power AVR2 is shut down, all the connected equipments are turned off. The AVR2 power switch remains in the ON position, although there is no power to the load.

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. The 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. North American models (15A, 20A): Torus AVR2 will keep the output constant within the range of 115Volts to 125Volts, with an input voltage of 90V to 130V. Between 85V to 90V, and between 130V and 135V, the regulation will be reduced.

4. North American BAL models: Torus AVR2 will keep the output constant within the range of 115Volts to 125Volts, with an input voltage of 170V to 270V. Between 160V to 170V, and between 260V and 270V, the regulation will be reduced.

5. International models: Torus AVR2 will keep the output constant within the range of 240±10V, with an input voltage of 170V to 270V. Between 160V to 170V, and between 260V and 270V, the regulation will be reduced.

6. The output current (Amps) displayed on the LCD is the RMS reading of the load. It does not indicate the peak current loads.

7. A drop in the input voltage is normal when increasing the load on the AVR2. This is a result of the impedance of the power line, a function of the distance from the electrical panel and transformer regulation.

Rear Panel Connections
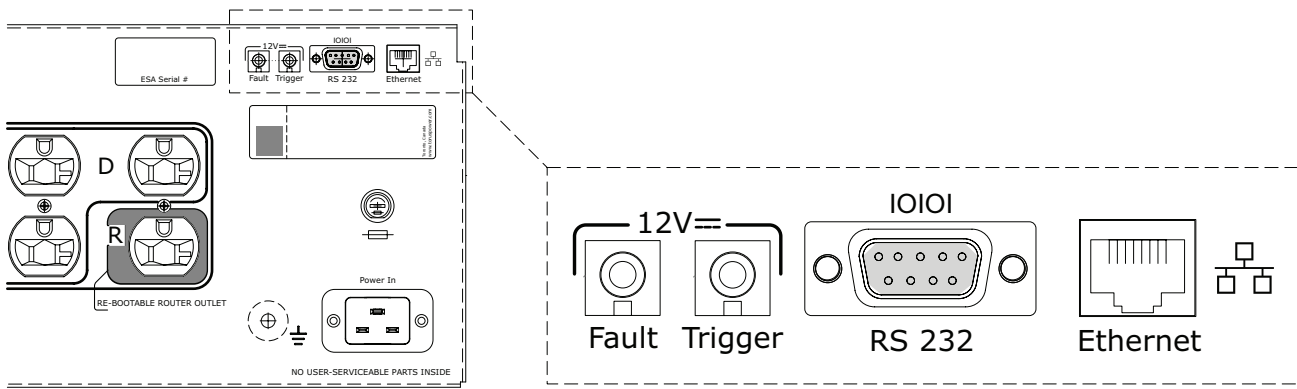
Ethernet
Allows access to the AVR2 and internal software. See AVR2 software section for more details.

RS232
Allows access to automation and external control. See Home Automation Interface commands at end of manual.

12VDC Trigger On/Off
The AVR2 can be turned on and off by a 12 volt trigger input. Applying 12 volts turns ON the AVR2 and removing the 12 volts turns it OFF.

12VDC Fault Output
The AVR2 provides a 12 volt fault output through a jack on the back panel. The output goes to 12 volts when a relay or voltage fault is detected. The maximum current that can be drawn from this output is 75mA.

AVR2 Software

The AVR2 software is resident 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 PC that is connected to the same network through another Ethernet port. Enter AVR (or the IP address displayed on the LCD) 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) into the browser window. Press ENTER and the software will open.
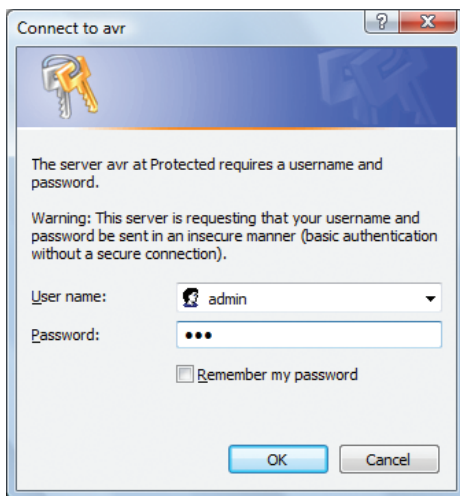
Username and Password
The password is required to change the setup of the Torus unit.

Username: **admin**
The username is factory set and cannot be changed.

Password: **avr**
This is the default password, and can be changed.
You can change your password by selecting: **Set Password**

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.

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& protect like no other | Toroidal Isolation
Power Transformers

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

Screen by screen description of software options

	System Setup This screen indicates the overall status of the system, showing Voltage In, Voltage Out, Current Out, 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)
	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. Each zone can be individually turned on or off.

Use the 'ON' and 'OFF' buttons to change the zone state. Press 'SET' to save the new settings.

Active zones are also shown in the front panel display.

Zone Power Control (panel)

Zones: On Off
A: ● ○
B: ● ○
C: ● ○
D: ● ○

Set

The current on/off state of each zone is indicated above. Use the 'On' and 'Off' buttons to change the zone state.

Press **'Set'** to save the new settings.

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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.

Email Configuration (panel)

1. Please enter the "Email Address" that the logged data should be sent to.
2. If you have multiple AVR devices, assign different "Email Subjects" to them to tell apart the logs of different devices.

Email Configuration

SMTP Server: _____ Port: 25
User Name: _____
Password: _____

Email Address: _____
Email Subject: _____
Save

Send Test Email

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Date and Time Setup

When the 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 the Date, Time and Day can be set manually which will allow the AVR2 to follow scheduled programming even if the Internet is later unavailable.

If the Internet connection is restored the Date, Time and Day will be automatically set.

Set Date and Time (panel)

Date: 09/09/2015 mm/dd/yyyy
Time: 11:29:53 24hr format
Day: 7
1-Thu 2-Fri 3-Sat 4-Sun
5-Mon 6-Tue 7-Wed

Time Zone: -5 +/- Hours, GMT
Set Date/Time

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Torus Power Web / Control

System Setup

This page allows the configuration of the AVR's programmable parameters.
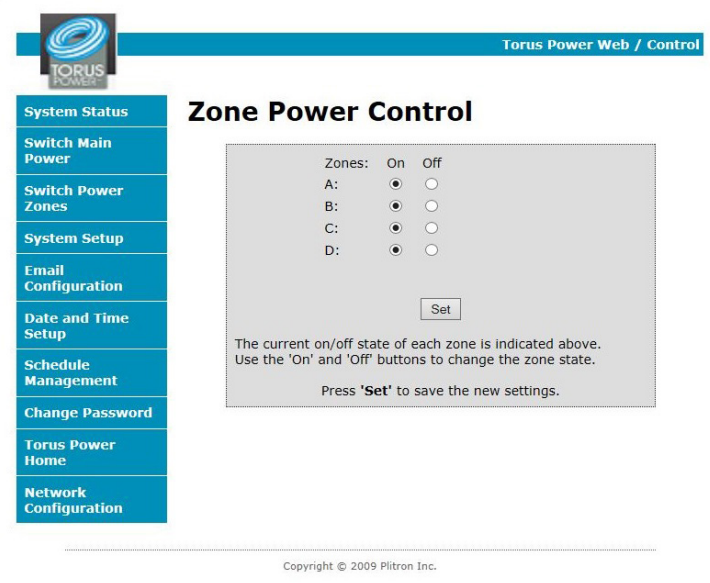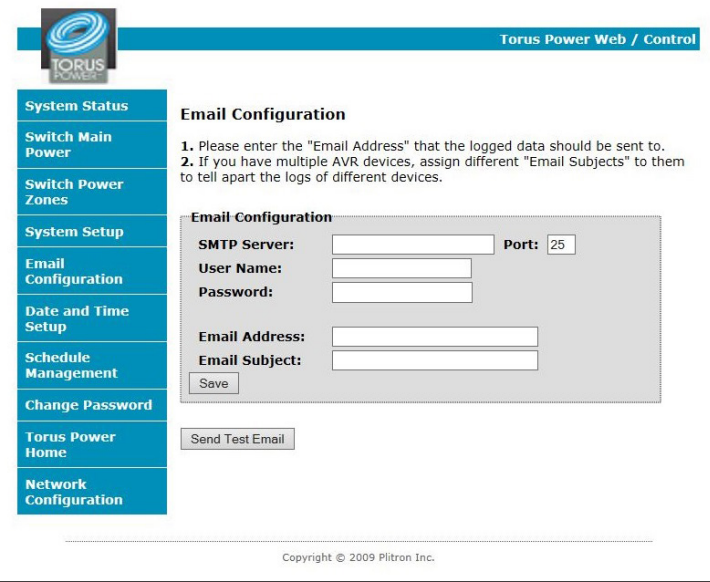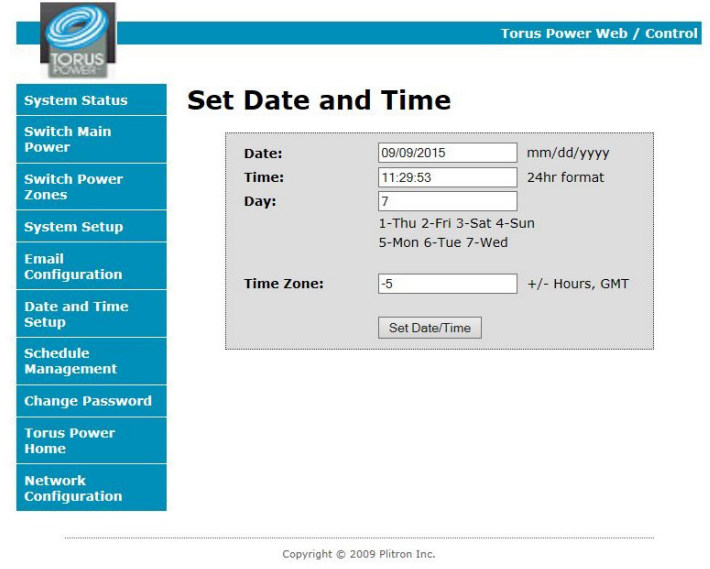
System Status
Switch Main Power
Switch Power Zones
System Setup
Email Configuration
Date and Time Setup
Schedule Management
Change Password
Torus Power Home
Network Configuration

Out of range voltage:	☑ Turn Power off on **low** or **high** line voltage.
Zone R/Router Reset:	☑ Check to Activate Auto Reboot and disable Zone R Scheduling.
Router Reset Delay Time:	`10` (1 to 255 minutes) Select time interval between router resets. System will attempt 3 resets.
Delay Time between zones (Scheduler and Start-Up):	`5` (1 to 999 seconds) Select interval for sequencing and power up between zones.
Front Panel Display:	`255` (0 to 255 seconds) ☑ Display Always On
Schedule:	☑ System Follow Schedule

Save Setup

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

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

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.

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

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 works with the Schedule Manager and can be programmed to turn ON/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.

Checked Zone R/Router Reset:
• Zone R can only be used for router and/or modems.
• The Auto reboot feature initiates power cycling of the router or modem when internet connection is down. The system will reset Zone R up to three times with adjustable time intervals between each attempt.
• Zone R can no longer be individually turned OFF/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.

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

When you have made your selection, press **SAVE SETUP**.

AVR Software - Menu Selections (continued)

Schedule Management

Scheduling features allow 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.

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.

Change Password

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

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

The default password is **avr**.

Block Diagram - AVR2 System

	Automatic Voltage Stabilizer	**Toroidal Isolation Transformer**	**Surge Removal and Complete Protection**	

Circuit Breaker

Input Voltage Range V_I

Automatic Voltage Stabilizer
· Maintains stable Voltage Output as shown in table below regardless of input voltage swings
· Fault protection
· Web interface
· Front panel display
· 12 volt triggers
· Media control system option

Toroidal Isolation Transformer
· Complete isolation of primary from secondary allows attenuation of noise from 2kHz to over 1MHz
· Low impedance - provides instantaneous power
· High Power capability
· Low Mechanical noise

Surge Removal and Complete Protection
· Protects against surges and lightning strikes up to 6000V/3000A
· Series mode technology does not contaminate ground

Hospital Grade Duplex Receptacles

Output Voltage Range V_O

TORUS Technical Features
· Micro-controller based switching system
· Reliable relays rated for 40A

Toroidal Transformer Technologies
· Narrow Bandwidth (NBT)
· Low Noise (LONO)
· Low Inrush (IMIN)
· Low Stray Fields (LoSTray)
· Triple Ground Screen (UST)
· Shock mounted oversized transformer

· No sacrificial MOVs
· No air core inductors to generate noise

· Medical grade outlets
· Clean ground

Model	Nominal Input	Operable Input Range	Output
North American	120V	85V - 135V	120V ± 5V
North American Balanced	240V	170V - 270V	120V ± 5V
International	220V	150V - 250V	220V ± 10V
International	220V	160V - 250V	230V ± 10V
International	230V	160V - 260V	230V ± 10V
International	240V	170V - 270V	240V ± 10V

6000V Surge

Series Mode Response

● V(D3:1) ● V(R7:1)   Time

Circuit Schematic - North American Model (AVR2 20 BAL)

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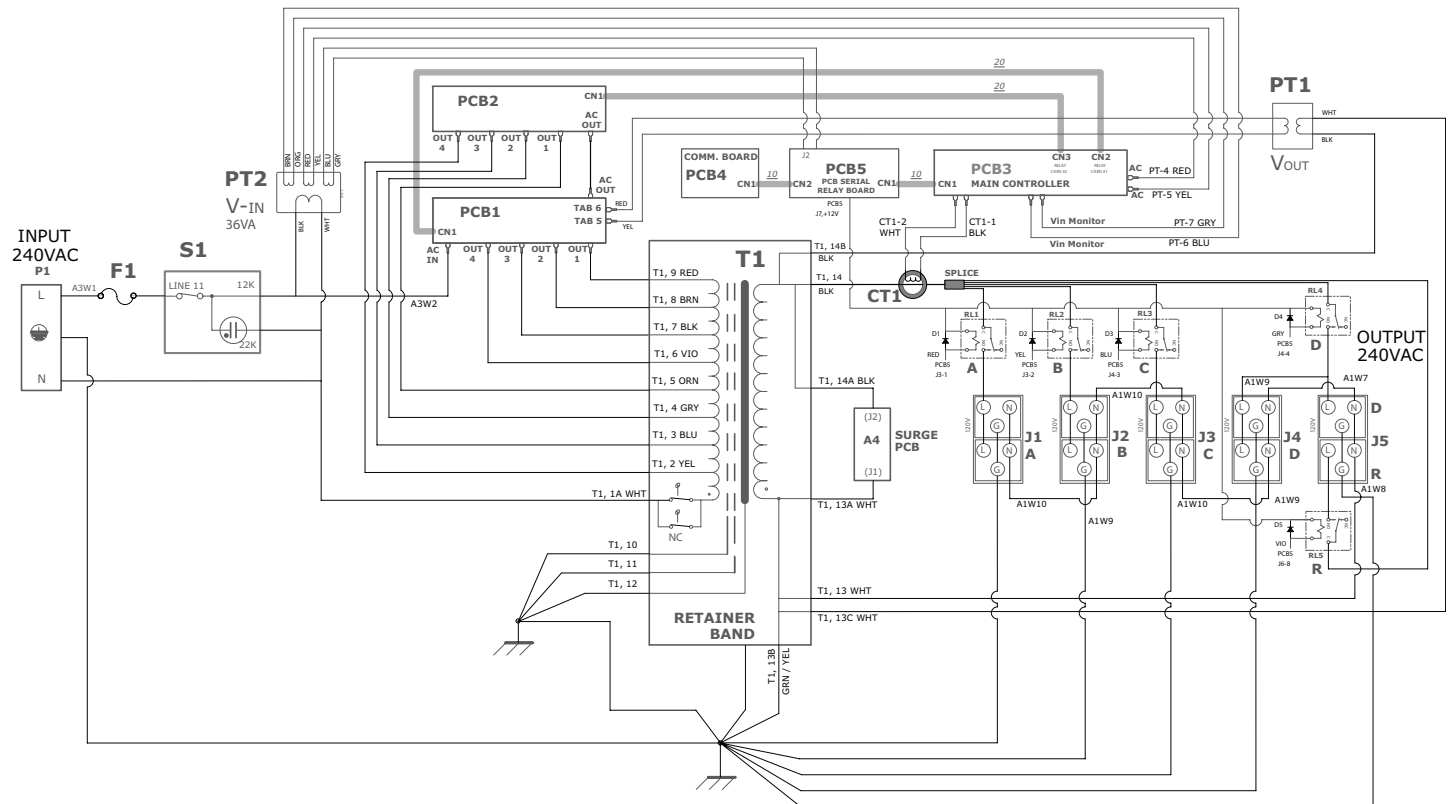
Circuit Schematic - International Model (AVR2 8 CE)
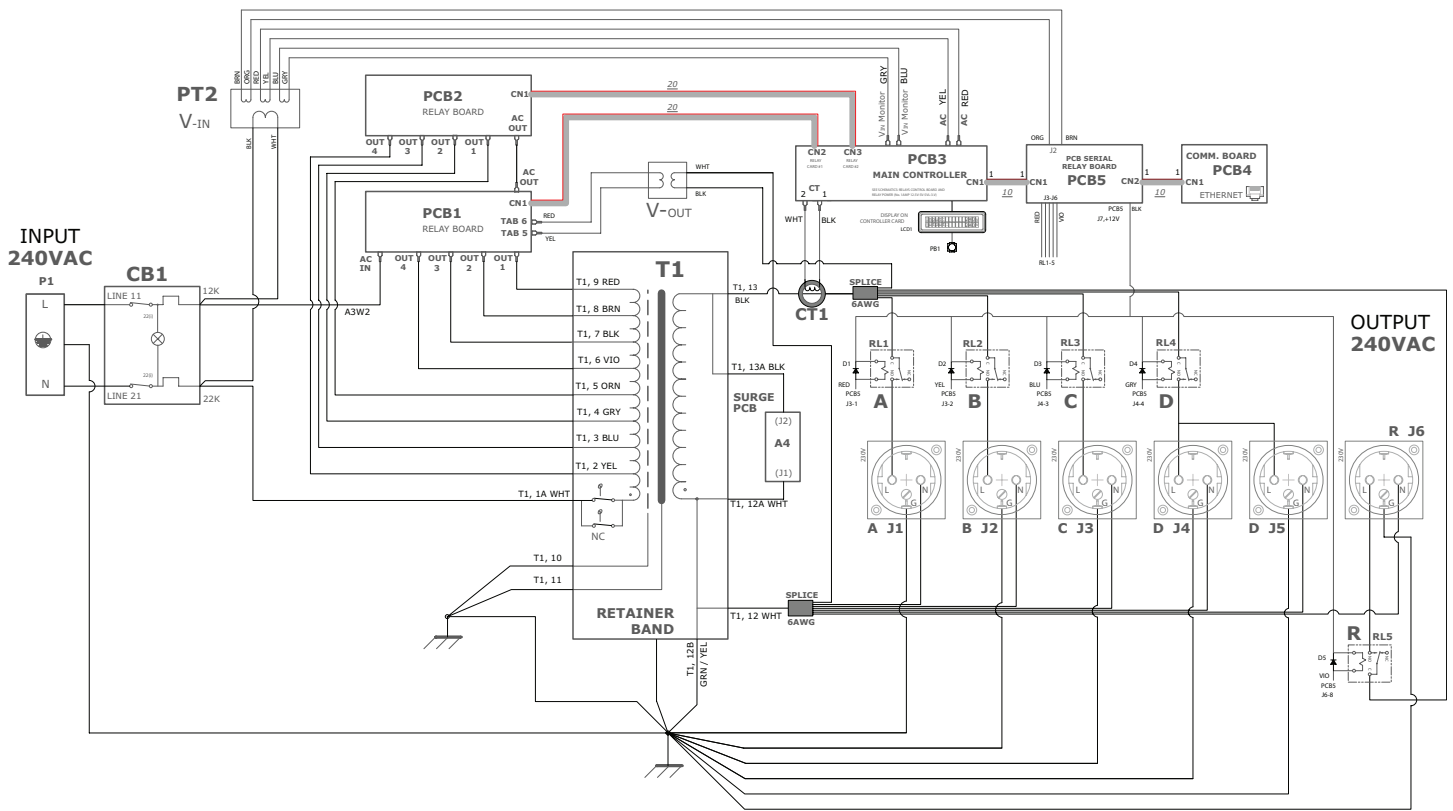
Note:
Circuit schematic drawings are provided for reference only, Torus Power AVR2 units have no user serviceable parts inside. Please return unit to manufacturer for repair and service when required.

Circuit Protection

The Front panel power switch is appropriately fused and hence it prevents excessive current from entering the PIU.

Thermal Protection

Torus Power PIU will shut down if internal unit temperature reached excessive levels.

Electrical Specifications - North American Models

Model Number	Input Voltage Nominal	Output Voltage Nominal	Input Fuses	Maximum Available Output Current	Number of IP Addressable Zones
AVR2 15 PLUS	120VAC, 60Hz (Operating Range 85V to 135V)	120VAC ± 5V	1 x 15A	15A	4 + R
AVR2 20			1 x 20A	20A	4 + R
AVR2 20 BAL	240VAC, 60Hz (Operating Range 170V to 270V)	120VAC ± 5V	1 x 10A	20A	4 + R
AVR2 45 BAL			2 x 25A	45A	7 + R
AVR2 60 BAL			2 x 30A	60A	7 + R
AVR2 75 BAL			2 x 40A	75A	7 + R
AVR2 90 BAL			2 x 45A	90A	7 + R

Electrical Specifications - International Models

Model Number	Input Voltage Nominal	Output Voltage Nominal	Input Circuit Breaker (Fuses)	Maximum Available Output Current	Number of IP Addressable Zones
AVR2 8 CE	240VAC, 50/60Hz (Operating Range 170V to 270V)	220-240VAC ± 10V	1 x 8A	8A	4 + R
AVR2 16 CE			1 x 16A	16A	7 + R
AVR2 30 CE			2 x 30A (Fuses)	30A	7 + R
AVR2 45 CE			2 x 45A (Fuses)	45A	7 + R
AVR2 8 UK	240VAC, 50/60Hz (Operating Range 170V to 270V)	220-240VAC ± 10V	1 x 8A	8A	4 + R
AVR2 16 UK			1 x 16A	16A	7 + R
AVR2 30 UK			2 x 30A (Fuses)	30A	7 + R
AVR2 45 UK			2 x 45A (Fuses)	45A	7 + R
AVR2 8 AUS	240VAC, 50/60Hz (Operating Range 170V to 270V)	220-240VAC ± 10V	1 x 8A	8A	4 + R
AVR2 16 AUS			1 x 16A	16A	7 + R
AVR2 30 AUS			2 x 30A (Fuses)	30A	7 + R
AVR2 45 AUS			2 x 45A (Fuses)	45A	7 + R
AVR2 8 NEUTRIK	240VAC, 50/60Hz (Operating Range 170V to 270V)	220-240VAC ± 10V	1 x 8A	8A	4 + R
AVR2 16 NEUTRIK			1 x 16A	16A	7 + R
AVR2 30 NEUTRIK			2 x 30A (Fuses)	30A	7 + R
AVR2 45 NEUTRIK			2 x 45A (Fuses)	45A	7 + R
AVR2 8 IEC	240VAC, 50/60Hz (Operating Range 170V to 270V)	220-240VAC ± 10V	1 x 8A	8A	4 + R
AVR2 16 IEC			1 x 16A	16A	7 + R
AVR2 30 IEC			2 x 30A (Fuses)	30A	7 + R
AVR2 45 IEC			2 x 45A (Fuses)	45A	7 + R
AVR2 8 615R	240VAC, 50/60Hz (Operating Range 170V to 270V)	220-240VAC ± 10V	1 x 8A (Fuse)	8A	4 + R
AVR2 16 620R			1 x 16A	16A	7 + R
AVR2 30 620R			2 x 30A (Fuses)	30A	7 + R
AVR2 45 620R			2 x 45A (Fuses)	45A	7 + R
AVR2 20 JP	100VAC, 50/60Hz (Operating Range 85V to 135V)	100VAC ± 5V	1 x 20A (Fuse)	20A	4 + R

Mechanical Specifications - North American Models

Model Number	Input Connector (Rear Panel)	Output Connector (Rear Panel)	Line Cord	Size, mm (WxDxH) Size, inch (WxDxH)	Weight KG(lb)	Chassis Height
AVR2 15 PLUS	IEC 20A Inlet, NEMA C20	10 Medical Grade Outlets, 15A	N5/15, 12AWG-C19, 20A/125V	483x483x203 19x19x8	36.8 (81)	4U (7.00")
AVR2 20		10 Medical Grade Outlets, 20A	N5/20, 12AWG-C19, 20A/125V		40.5(89)	
AVR2 20 BAL			N6/15, 14AWG-C19, 15A/125V		40.5(89)	
AVR2 45 BAL	Hubbell Twist-lock 30A/250V NEMA L6-30P	18 Medical Grade Outlets, 20A	Twist-lock, 2.5M 10AWG, 30A	483x559x249 19x22x9.8	63(139)	5U (8.75")
AVR2 60 BAL					75(165)	
AVR2 75 BAL	Hubbell Twist-lock 50A/250V 2P3W	24 Medical Grade Outlets, 20A	Twist-lock, 2.5M 6AWG, 50A	483x660x249 19x26x9.8	89(196)	
AVR2 90 BAL					91(201)	

Mechanical Specifications - International Models

Model Number	Input Connector (Rear Panel)	Output Connector (Rear Panel)	Line Cord	Size, mm (WxDxH) Size, inch (WxDxH)	Weight KG(lb)	Chassis Height
AVR2 8 CE	IEC 15A Inlet, NEMA C14	16A/250V CE Socket (x6)	10A/250VAC, 2.5M Plug: CEE 7/7 Connector: IEC - C13	483x483x203 19x19x8	38.5(85)	4U (7.00")
AVR2 16 CE	IEC 20A Inlet, NEMA C20	16A/250V CE Socket (x9)	16A/250VAC, 2.5M Plug: CEE 7/7 Connector: IEC - C19	483x559x249 19x22x9.8	56.5(125)	5U (8.75")
AVR2 30 CE	Hubbell Twist-lock 30A/250V NEMA L6-30P	16A/250V CE Socket (x9)	Twist-lock, 2.5M 10AWG, 30A		86(190)	
AVR2 45 CE	Hubbell Twist-lock 50A/250V 2P3W	16A/250V CE Socket (x13)	Twist-lock, 2.5M 6AWG, 50A	483x660x249 19x26x9.8	100.5(222)	
AVR2 8 UK	IEC 15A Inlet, NEMA C14	13A/250V UK Socket (x6)	10A/250VAC, 2.5M Plug: BS 1363 Connector: IEC - C13	483x483x203 19x19x8	38.5(85)	4U (7.00")
AVR2 16 UK	IEC 20A Inlet, NEMA C20	13A/250V UK Socket (x8)	13A/250VAC, 2.5M Plug: BS 1363 Connector: IEC - C19	483x559x249 19x22x9.8	56.5(125)	5U (8.75")
AVR2 30 UK	Hubbell Twist-lock 30A/250V NEMA L6-30P	13A/250V UK Socket (x8)	Twist-lock, 2.5M 10AWG, 30A		86(190)	
AVR2 45 UK	Hubbell Twist-lock 50A/250V 2P3W	13A/250V UK Socket (x9)	Twist-lock, 2.5M 6AWG, 50A	483x660x249 19x26x9.8	100.5(222)	

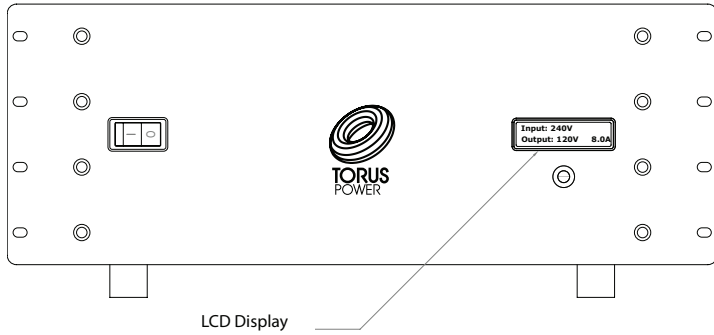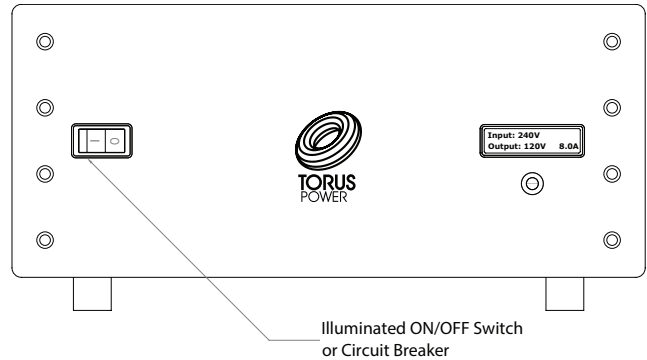## Mechanical Specifications - International Models (Continued)

Model Number	Input Connector (Rear Panel)	Output Connector (Rear Panel)	Line Cord	Size, mm (WxDxH) Size, inch (WxDxH)	Weight KG(lb)	Chassis Height
AVR2 8 AUS	IEC 15A Inlet, NEMA C14	10A/250V AUS Socket (x6)	10A/250VAC, 2.5M Plug: AS/NZS 3112:2000 Connector - IEC C13	483x483x203 19x19x8	38.5(85)	4U (7.00")
AVR2 16 AUS	IEC 20A Inlet, NEMA C20	20A/250V AUS Socket (x8)	13A/250VAC, 2.5M Plug: BS 1363 Connector: IEC - C19	483x559x249 19x22x9.8	56.5(125)	5U (8.75")
AVR2 30 AUS	Hubbell Twist-lock 30A/250V NEMA L6-30P	20A/250V AUS Socket (x8)	Twist-lock, 2.5M 10AWG, 30A		86(190)	
AVR2 45 AUS	Hubbell Twist-lock 50A/250V 2P3W	20A/250V AUS Socket (x9)	Twist-lock, 2.5M 6AWG, 50A	483x660x249 19x26x9.8	100.5(222)	
AVR2 8 NEUTRIK	IEC 15A Inlet, NEMA C14	16A/250V NEUTRIK Socket (x8)	10A/250VAC, 2.5M	483x483x203 19x19x8	38.5(85)	4U (7.00")
AVR2 16 NEUTRIK	IEC 20A Inlet, NEMA C20	16A/250V NEUTRIK Socket (x12)	13A/250VAC, 2.5M	483x559x249 19x22x9.8	56.5(125)	5U (8.75")
AVR2 30 NEUTRIK	Hubbell Twist-lock 30A/250V NEMA L6-30P		Twist-lock, 2.5M 10AWG, 30A		86(190)	
AVR2 45 NEUTRIK	Hubbell Twist-lock 50A/250V 2P3W		Twist-lock, 2.5M 6AWG, 50A	483x660x249 19x26x9.8	100.5(222)	
AVR2 8 IEC	IEC 15A Inlet, NEMA C14	10A/250V IEC Socket (x8)	10A/250VAC, 2.5M	483x483x203 19x19x8	38.5(85)	4U (7.00")
AVR2 16 IEC	IEC 20A Inlet, NEMA C20	10A/250V IEC Socket (x8) 16A/250V IEC Socket (x4)	13A/250VAC, 2.5M	483x559x249 19x22x9.8	56.5(125)	5U (8.75")
AVR2 30 IEC	Hubbell Twist-lock 30A/250V NEMA L6-30P		Twist-lock 10AWG, 30A		86(190)	
AVR2 45 IEC	Hubbell Twist-lock 50A/250V 2P3W		Twist-lock 6AWG, 50A	483x660x249 19x26x9.8	100.5(222)	
AVR2 8 615R	IEC 20A Inlet, NEMA C20	10 Medical Grade Outlets, 15A	N5/20, 12AWG-C19, 2.5M	483x483x203 19x19x8	38.5(85)	4U (7.00")
AVR2 16 620R	IEC 20A Inlet, NEMA C20	12 Medical Grade Outlets, 20A	N5/20, 12AWG-C19, 2.5M	483x559x249 19x22x9.8	56.5(125)	5U (8.75")
AVR2 30 620R	Hubbell Twist-lock 30A/250V NEMA L6-30P	18 Medical Grade Outlets, 20A	Twist-lock, 2.5M 10AWG, 30A		86(190)	
AVR2 45 620R	Hubbell Twist-lock 50A/250V 2P3W	24 Medical Grade Outlets, 20A	Twist-lock, 2.5M 6AWG, 50A	483x660x249 19x26x9.8	100.5(222)	
AVR2 20 JP	IEC 20A Inlet, NEMA C20	10 Medical Grade Outlets, 20A	N5/20, 12AWG-C19, 20A/125V	483x483x203 19x19x8	40.5(89)	4U (7.00")

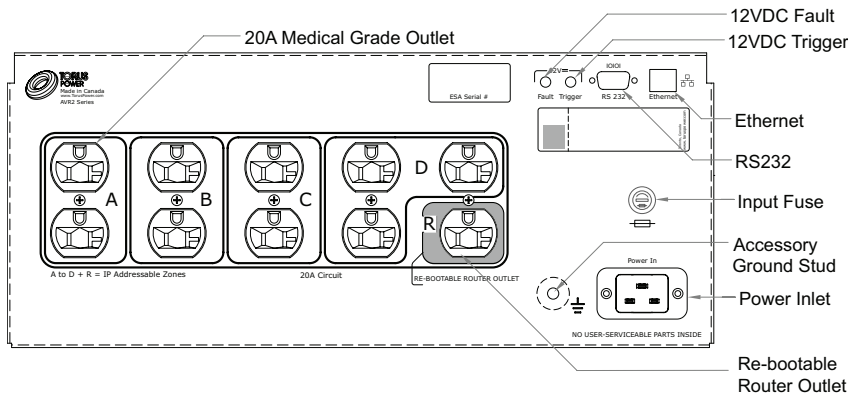# Typical Front Panel Layout - North American and International Models
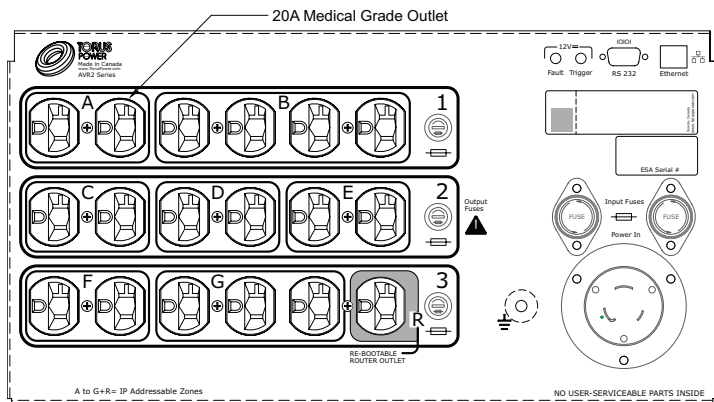
19" Pro Series Rack Mount (RK) Faceplate

Input: 240V
Output: 120V   8.0A

TORUS POWER

LCD Display

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

Input: 240V
Output: 120V   8.0A

TORUS POWER

Illuminated ON/OFF Switch or Circuit Breaker

Rear Panel Layout - North American Models

20A Medical Grade Outlet

12VDC Fault
12VDC Trigger

TORUS POWER
Made in Canada
www.TorusPower.com
AVR2 Series

ESA Serial #

12V⎓   IOIOI
Fault Trigger   RS 232   Ethernet

D
A   B   C
R

A to D + R = IP Addressable Zones   20A Circuit   RE-BOOTABLE ROUTER OUTLET

Ethernet
RS232
Input Fuse
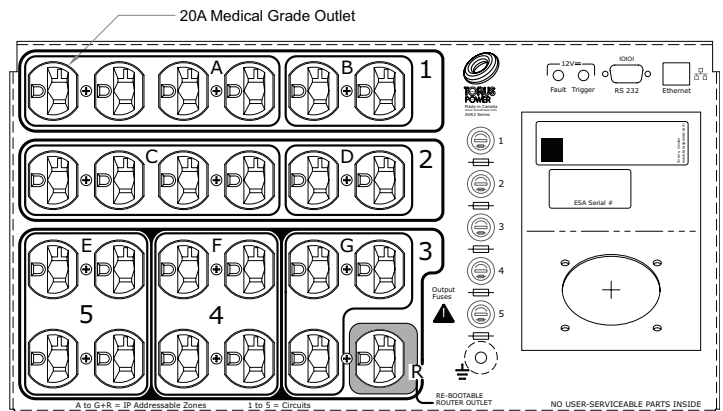Accessory Ground Stud
Power In
Power Inlet
NO USER-SERVICEABLE PARTS INSIDE
Re-bootable Router Outlet

Models: AVR2 20 RK, AVR2 20 CB, AVR2 20 CS
Balanced Models: AVR2 20 BAL RK, AVR2 20 BAL CB, AVR2 20 BAL CS

20A Medical Grade Outlet

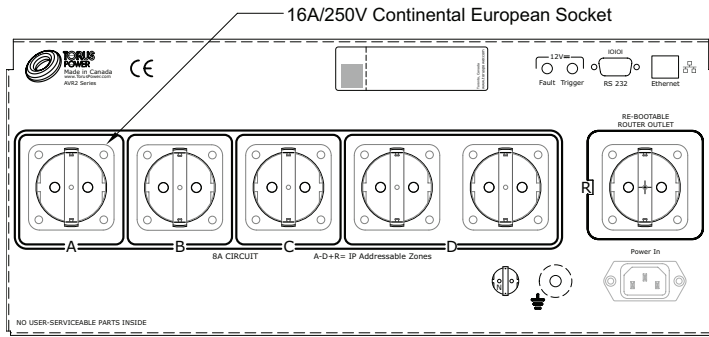TORUS POWER
Made in Canada
www.TorusPower.com
AVR2 Series

12V⎓   IOIOI
Fault Trigger   RS 232   Ethernet

A   B   1
C   D   E   2
F   G   3
R

Output Fuses

ESA Serial #
FUSE   Input Fuses   FUSE
Power In

A to G+R= IP Addressable Zones   RE-BOOTABLE ROUTER OUTLET   NO USER-SERVICEABLE PARTS INSIDE

Models: AVR2 45 BAL RK, AVR2 45 BAL CB, AVR2 45 BAL CS,
AVR2 60 BAL RK, AVR2 60 BAL CB, AVR2 60 BAL CS

20A Medical Grade Outlet

A   B   1
C   D   2
E   F   G   3
5   4   R

Output Fuses

TORUS POWER
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AVR2 Series

12V⎓   IOIOI
Fault Trigger   RS 232   Ethernet

1
2
3
4
5

ESA Serial #

A to G+R = IP Addressable Zones   1 to 5 = Circuits   RE-BOOTABLE ROUTER OUTLET   NO USER-SERVICEABLE PARTS INSIDE

Models: AVR2 75 BAL RK, AVR2 75 BAL CB, AVR2 75 BAL CS,
AVR2 90 BAL RK, AVR2 90 BAL CB, AVR2 90 BAL CS

TORUS POWER
Engineered to perform
& protect like no other | Toroidal Isolation
Power Transformers

Rear Panel Layout - International Models

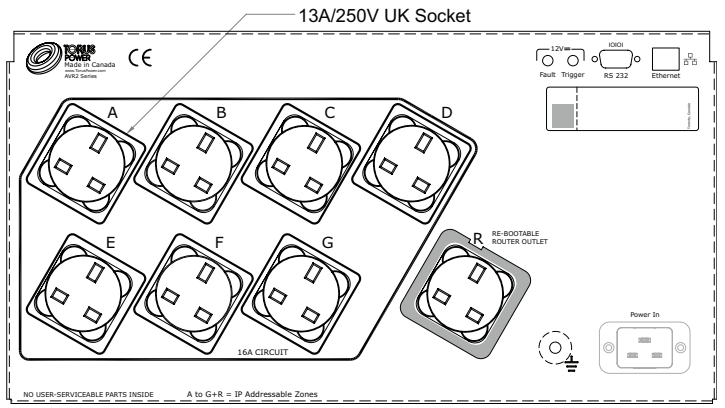16A/250V Continental European Socket

Continental Europe 8A
Models: AVR2 8 CE RK, AVR2 8 CE CB, AVR2 8 CE CS

13A/250V UK Socket
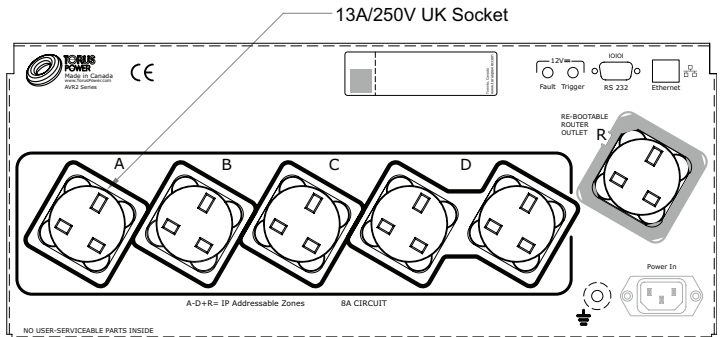
United Kingdom 8A
Models: AVR2 8 UK RK, AVR2 8 UK CB, AVR2 8 UK CS

16A/250V Continental European Socket
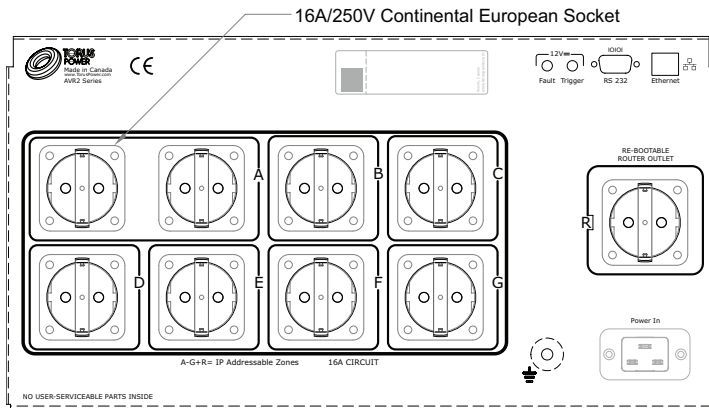
Continental Europe 16A
Models: AVR2 16 CE RK, AVR2 16 CE CB, AVR2 16 CE CS

13A/250V UK Socket

United Kingdom 16A
Models: AVR2 16 UK RK, AVR2 16 UK CB, AVR2 16 UK CS

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:

www.crestron.com

or

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

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 AVR2 in ASCII format and terminated with a CR(0d hex). 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:Thursday is 1, Friday is 2, etc. TimeZone: Time difference from GMTin 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:Thursday is 1, Friday is 2, etc. TimeZone:Time difference from GMT in hours. Example: 09/10/2015,11:30:45,1,-4
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 Inc. products are warranted to be free from manufacturing defects as follows:
• Five years from the original date of sale for toroidal transformers
• Two years from the original date of sale for all other components
The product warranty includes parts, labour and return shipping to the customer. Shipping to Torus Power Inc. for warranty repair is the responsibility of the customer.
Warranty coverage is not transferrable and original proof of purchase is required for warranty claims.
In the event of a warranty claim, Torus Power Inc. will remedy the issue by repair or replacement, as we deem necessary, to restore the product to full performance.
This warranty is considered void if the failure of the product or any component part is caused by damage or misuse.
Failure to fully comply with Torus Power operating instructions voids the warranty.

Torus Power products are marketed worldwide by Torus Power Inc.

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Toll free: 1-877-337-9480

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TORUS POWER

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