

# UST

Utility Systems Technologies, Inc.

## Mini-EVR™


Energy Saving Voltage Regulator

### Protects your equipment from:

- Over/Undervoltage
- Voltage Fluctuations
- Sags • Dips • Swells
- Brownouts • Surges

### For single phase application:

- Any voltage up to 600VAC
- 50 Hz • 60 Hz
- All load types
- All power factors
- 1000% fault clearing capacity
- No over-sizing required
- 99% efficiency
- Cool, quiet operation
- Indoor • Outdoor • Dirty Locations



Quality Power. Better Business.



Small and lightweight, the Mini-EVR™ comes ready for easy wall mounting



Typical applications include:

- Manufacturing • Machining
- Industrial Automation • Mining
- Pharmaceutical • Petrochemical
- Food Processing • Broadcasting
- Power Generation & Transmission
- Schools • Offices • Labs
- Printing • Pulp & Paper
- Medical Imaging & Treatment

The Mini-EVR™ protects your electrical equipment from power quality problems like sags, brownouts, surges and swells without the heat, noise and high electric bills that come with traditional voltage regulators. Conveniently sized for small, single phase applications, the Mini-EVR™ is compatible with all types of equipment and all power factors.

The Mini-EVR's 99% efficiency can save thousands of dollars per year in energy costs by dramatically reducing energy consumption compared to conventional constant voltage transformers (CVT, ferroresonant transformer, ferros). Typical retrofit applications can have a payback in energy costs in 6 to 18 months.

Its high overload capacity eliminates the need to over-size the Mini-EVR™ to account for large inrush currents or fault clearing currents. The small size, light weight, quiet operation, low heat rejection and optional enclosures for outdoor or hazardous locations make it very easy to apply and install.

The Mini-EVR™ utilizes microprocessor-based controls that electronically switch transformer taps to provide a tightly regulated output voltage. When the incoming voltage varies between +10% and -25% of the nominal input voltage, the Mini-EVR™ responds within 1 cycle to provide an output within ±3% of the nominal output voltage.

The Mini-EVR™ difference:

Heavy Duty Voltage Regulation

Not to be confused with the pervasive power factor correction products that claim to save energy, the Mini-EVR™ is first and foremost an industrial-grade voltage regulator and power conditioner. It simply conditions power with an ultra-high efficiency.

Highest Overload Capacity

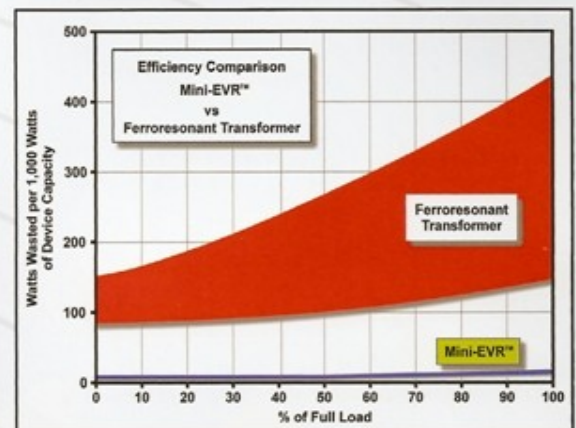
Loads with high inrush currents such as motors or transformers usually require conventional voltage regulators to be 2 or 3 times oversized. The very high overload capacity of the Mini-EVR™ eliminates the need for this over-sizing; just size for the steady state current.

Energy Saving Efficiency

Ferroresonant transformers are very noisy and hot, even at no load. That noise and heat is the result of 10 to 50% of the electricity being wasted. Compare that to the minimal 1% electrical loss of the Mini-EVR™ and it is easy to see how much energy can be saved.

Flexible Installation – Maintenance-Free

Because of its low heat rejection, the Mini-EVR™ can be easily supplied with enclosures for outdoor or hazardous locations or supplied without an enclosure for OEM applications. The all solid state design requires no scheduled maintenance or replacement parts.



The energy saving efficiency of the Mini-EVR™ remains nearly constant across the load range while that of the ferroresonant transformer drops rapidly as the load is decreased.



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© 2007, Utility Systems Technologies, Inc. All Rights Reserved Mini-EVR is a trademark of Utility Systems Technologies, Inc. for its line of electronic voltage regulator products

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# MiniEVR™ Electronic Voltage Regulator-Power Conditioner (MEVR)

## Standard Unit Specifications, Technical Data and Weights & Dimensions

Application						
Power Rating/Size (kVA) [1Ø only]	5, 7.5, 10 (for larger single phase units see UST SureVolt™ power conditioner)					
Voltages	60Hz: 120, 208, 240, 480	50Hz: 110, 120, 220, 380, 400			Non-standard voltages available	
Regulation/Operating Characteristics						
Regulation	Nominal input voltage +10%/-25%, Nominal output voltage ±3 (other options available)					
Regulation Variation	None – regulation constant for 0 to 100% load and any load power factor					
Overload/Inrush Capability	6000% -1 cycle, 1000% - 1 second, 500% - 5 seconds, 200% - 1 min. ; 1000% fault clearing					
Load Power Factor	No limitations, compatible with all load types					
Tap Switching	No load current interruption or waveform distortion on switching at any load or power factor					
Zero Crossing Sensitivity	None, Tap switching not dependent on determining load current zero crossing					
Harmonic Distortion	No distortion added at any load or power factor					
Response Time	1 cycle typical regardless of load or load power factor					
Efficiency	99% typical					
Operating Frequency	±3% of nominal frequency					
Protection / Bypass						
Surge Suppression	Included, complies with ANSI/IEEE C62.41, UL 1449					
Failsafe Electronic Bypass	Auto-actuation on high temperature, over-current, component failure with no loss of load					
Construction						
Technology	Microprocessor-controlled tap switching Auto-Transformer design					
Switching Semiconductors	Non-full power semiconductors – individual SCRs are not required to carry full unit current					
Controls	no controls or programming required, no user-adjustable controls					
Cooling	Natural convection, no cooling fans used					
Transformer	Dry-type auto-transformer, copper wound					
Enclosure	Wall-mounted NEMA-1, ANSI 61 grey, other enclosure types & colors available					
Monitoring	Contacts for remote indication of unit and surge suppression status are included					
Audible sound level	Less than 65 dB @ 1 meter					
Warranty	5 year warranty against SCR Failure, one year on complete unit – see written warranty for details					
Environmental Requirements						
Temperature - Humidity	Ambient 32 to 104°F (0 to 40°C) – Relative humidity 0-95% non-condensing					
Operating Altitude	0 to 3,300 ft (1000m)					
Weights & Dimensions *						
kVA	Height Inches (cm)	Width Inches (cm)	Depth Inches (cm)	Weight – 60Hz Lbs. (kg)	Weight-50Hz Lbs. (kg)	Enclosure
5	20 (51)	20 (51)	10 (26)	85 (39)	94 (43)	M16
7.5	30 (76)	20 (51)	11 (28)	120 (55)	132 (60)	M20
10	30 (76)	20 (51)	11 (28)	150 (68)	165 (75)	M20
Weights & Dimensions for standard units. Certain options may require larger enclosures or more weight. Contact Factory for details.						

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## Model Numbers, Documentation, Common Options, and Lug Sizes

Model Number Construction		
ZZZ:	KVA: 050 (5 kVA), 075 (7.5kVA), 100 (10kVA)	Example: 5kVA, 50Hz, 220v MEVR -050-220-5
AAA:	Input Voltage (L-N) e.g. 120v = 120	
OOO	Options – Refer to common options list for option code	

Standard Documentation & Factory Testing
Installation details (weights, enclosure dimensions, cable entry/exit, conductor connections, wiring connections) are typically issued within 10 working days in "PDF" format. Two(2) copies of Owners Manual with unit information, electrical diagram(s) and factory test data are shipped with each unit. Every unit is factory tested to manufacturer's standards to confirm proper operation of the unit and any options. Contact factory for other requirements.

Common Options		
Option	Code	Description
50 HZ	5	For 50 Hz units
Non-standard Enclosure	E	A variety of enclosures and enclosure cooling options are available including NEMA-3R, 12, and 4X. Contact factory for further details.
Non-standard Voltage (s)	N	For any non-standard input or output voltage
Adjustable target output voltage	O	Permits adjustment of the target output voltage by approximately +/-10% to increase or decrease output voltage or limit normal output to a minimum or maximum value. Contact factory for further details.
Undefined Option (s)	Q	Used for any option not already defined
Non-standard regulation range	R	For any regulation ranges other than the nominal input voltage +10%/-25% and nominal output voltage +/-3%. Contact factory for further details.

Unit Input & Output Lug Sizes												
Voltage	2kVA		3kVA		5kVA		7.5kVA		10kVA		15kVA	
	#	Size	#	Size	#	Size	#	Size	#	Size	#	Size
120	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	4AWG-300kcmil
208	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0
240	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0
380	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0
400	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0
480	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0	1	14AWG-1/0



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## OVERVIEW

The MiniEVR™ is an industrial-grade, microprocessor-controlled, electronic tap switching voltage regulator using a non-full power semiconductor design. The unit continuously monitors the output voltage, and very quickly switches transformer taps when the voltage falls outside of the regulation range. The MiniEVR™ works automatically to regulate voltage and condition power with no operator effort or programming required. In the event of a malfunction, the automatic bypass actuates to isolate the power electronics and controls while maintaining power to the load and all other functionality except voltage regulation.

Industrial-grade means the MiniEVR™ is compatible with all load types and load power factors and provides a minimum 1,000% fault clearing capability. Unlike computer-grade products, the MiniEVR™ is designed for frequent high inrush current and low power factor loads without the need to over-size the product or to sacrifice reliability.

The MiniEVR™ provides the following features:

- Highest overload capacity available for compatibility with all load types
- Highest fault clearing capacity available for reliable operation of protective devices
- 99% efficiency for all but the lowest end of the load range
- Continuous load current – no load current interruption on tap switching
- Very fast response to quickly correct under/over voltage, sags, and swells
- Automatic failsafe electronic bypass eliminates load current interruption in the event of a malfunction
- Zero moving parts and fan-free design for increased reliability and no scheduled maintenance
- Surge suppression and input circuit breaker are standard

The standard MiniEVR™ uses natural convection cooling, solid state components and has no fans or other moving parts. No regularly scheduled maintenance is required.

Installation of the MiniEVR™ is simple. The unit arrives completely assembled and requires no programming, testing measuring, setting of switches, or internal wiring. It installs much like a dry-type transformer – placing the unit and making the input and output wiring connections.



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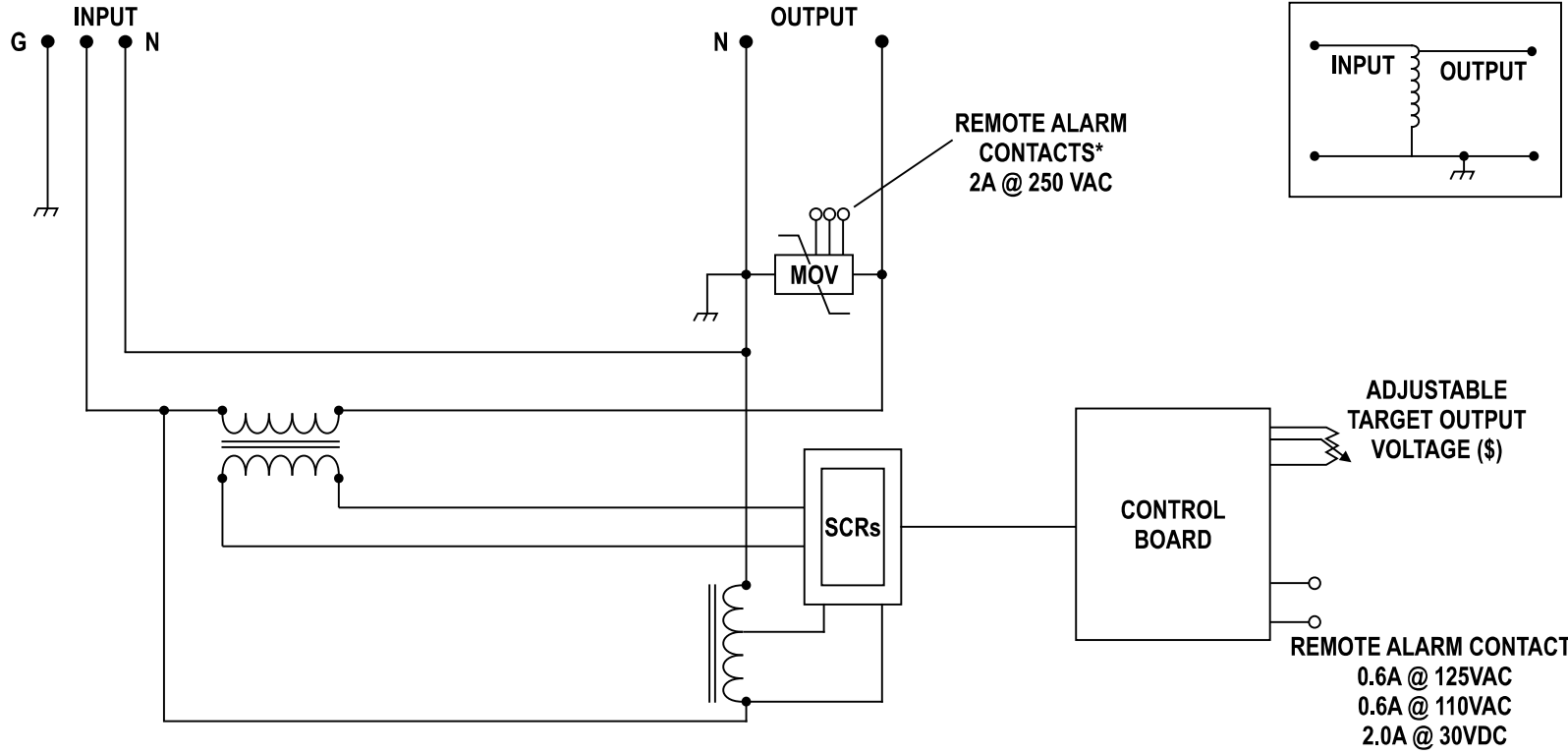
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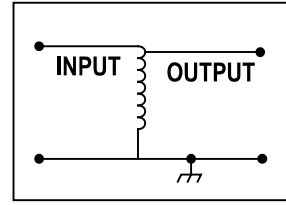
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REMOTE ALARM CONTACTS\*  
2A @ 250 VAC



ADJUSTABLE TARGET OUTPUT VOLTAGE (\$)

REMOTE ALARM CONTACT\*  
0.6A @ 125VAC  
0.6A @ 110VAC  
2.0A @ 30VDC

● POWER WIRING INTERFACE POINTS  
○ CONTROL WIRING INTERFACE POINTS  
\* ALL CONTROL WIRING IS DISCRETIONARY  
ITEMS MARKED (\$) ARE EXTRA COST OPTIONS

Utility Systems Technologies, Inc.  
PO Box 110, Latham New York 12110

TITLE:  
MINI-EVR POWER CONDITIONER  
ELECTRICAL SCHEMATIC WITH OPTIONS

REV: 2 DATE: January 22, 2009  
REV: 1 DATE: AUGUST 15, 2008  
REV: 0 DATE: DECEMBER 03, 2007

SIZE: <b>A</b>	DWG NO.: <b>MEVR-000-000-00</b>	REV: <b>0</b>
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SCALE: NONE	SHEET: 1 OF 1
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