

# TRUE-POWER® POWER CONDITIONING TRANSFORMER



Acme Electric Constant Voltage Regulators filter incoming power and reduce the risk of power sags, surges, and spikes.



## WHAT IS A CONSTANT VOLTAGE REGULATOR

The Acme True-Power Constant Voltage Regulator consists of a ferroresonant transformer with a pair of magnetic shunts and a filtering winding. Together they develop a regulated low distortion sinusoidal output. The circuit is designed so the segment of the core under the secondary winding will saturate and ferroresonant with the AC capacitor once each half cycle, regulating the output voltage to a fixed value. The primary-to-secondary leakage reactance and AC capacitor are tuned to achieve ferroresonant regulation of the output over a broad range of input voltage. The second pair of shunts and filter winding are incorporated to soften the secondary core saturation effect, canceling the harmonic voltages that are present in conventional constant voltage transformers. The filtering winding is connected in series with the AC capacitor to form an LC trap to filter out the low order of harmonics generated by the ferroresonant action.

For example, typical ferroresonant transformers have an input limited to 100-132 V. Acme's True-Power® units have an input range of +10/-20% around input voltage nominals of 120/208/240 and 480 volts. At 120 volt input, this relates to 95-132 volts.

The typical ferroresonant transformer has limited electrical noise suppression capability. True-Power power line conditioners have the following noise attenuation capability:

- Common Mode: 120 db
- Transverse Mode: 60 db

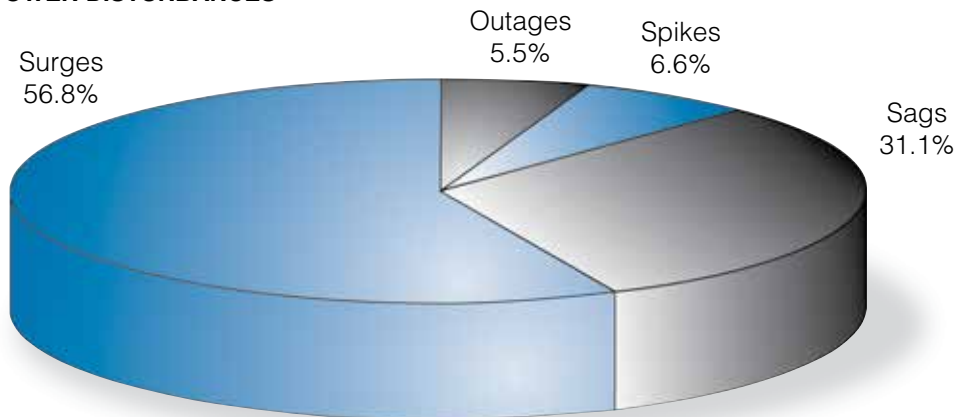
The typical ferroresonant transformer has an audible hum that can be objectionable in most offices. Acme's True-Power® power line conditioners are encapsulated in epoxy to lower sound levels to meet NEMA ST-20 Standard.

The typical ferroresonant transformer has an output regulation of  $\pm 3\%$  for input line changes only. Acme's True-Power® power line conditioners have an output regulation of  $\pm 3\%$  for input line and load changes, making them suitable for operation at any load condition.

## WHO'S AT RISK?

Buildings that were constructed over 15 years ago were not designed for the electrical demands of today's office equipment. If office equipment is overloaded, this presents a major power problem. In 1997, over \$30 billion was lost in production, equipment damage and lost revenue due to power problems. Unprotected computer equipment is subject to more than 120 power problems per month. These problems are generated by lightning (15%), problems generated by your own equipment, such as copiers and fax machines (60%), and problems generated by the office next door or HVAC systems (20%).

## FREQUENCY OF POWER DISTURBANCES



### SAGS (BROWNOUTS)

A drop or dip in voltage that lasts at least a half cycle. Temporary in nature, it is usually associated with a sudden increase in load such as the starting of a large electric motor.

### SPIKES

Spikes are electrical transients or impulses that usually are short lived in duration (lasting a few milliseconds) but of relatively high magnitude (up to tens of thousands of volts).

### SURGES

When high power equipment is turned off, the extra power is often dissipated to other power lines. This quick increase in voltage will usually last more than one cycle and can cause component fatigue and burnout. Frequent surges are especially damaging to systems.

### OUTAGES (BLACKOUTS)

A total loss of power lasting up to hours or more.

## Features

- Epoxy encapsulated for operation in harsh environment locations and to lower sound levels.
- Output regulation  $\pm 3\%$  for input line and load changes.
- Response time to line and load changes—5% variation in 8m sec, 10% variation in 16m sec.
- Noise attenuation—effectively suppresses transient spikes and surges—120 db common mode and 60 db transverse mode.
- Regulated output voltage when input voltages vary from +10% to -20%.
- Hold-up time of 3m sec for complete loss of power.
- Sinusoidal output features, less than 3% harmonic distortion, improves input wave forms which have total harmonic distortions of greater than 5%.
- Inherent overload and short circuit protection, without thermal protectors, fuses or circuit breakers, for immediate recovery when the overload is removed.
- Extended operation to 65% of nominal when operated at 60% of full load.

- Illuminated ON/OFF switch, multiple output receptacles and six foot input power cord on portable units.
- UL Listed & CSA Certified
- Ten-year limited warranty (capacitors, 1-yearwarranty).

## Applications

- Computers and Data Processing Equipment
- Point of Sale Terminals
- Electronic Test Equipment
- X-ray Equipment
- Critical Lighting Applications
- Programmable Controllers
- Security Systems
- Microprocessor Controls
- Communications Equipment
- Photographic Equipment
- Regulated DC Power Supplies
- Electronic Cash Registers
- Robotics
- Numerical Controls

## CONSTANT VOLTAGE REGULATORS HARDWARE MODELS

All Acme CVR's feature a fully encapsulated core and coil design. They are enclosed in a rugged steel enclosure which has provisions for floor or wall mounting, making them an ideal choice for commercial and industrial applications.

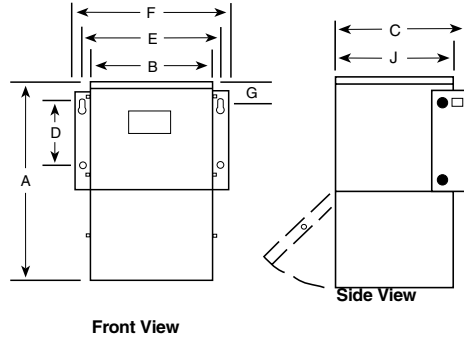
### HARDWIRED MODELS — CONSTANT VOLTAGE REGULATORS

95-132 X 166-228 X 192-264 X 384-528 VOLT PRIMARY — 120/208/240 VOLT SECONDARY — 1Ø, 60 Hz

kVA Size	Catalog Number	APPROXIMATE DIMENSIONS (Inches)(Cm.)									Mounting Type (Wall)(Floor)	Weight (Lbs.)(Kg.)	Figure	Wiring Diagrams
		A	B	C	D	E	F	G	H	J				
0.25	T169430	15.50	6.30	5.80	5.63	8.13	9.30	1.2	.41 x .81	5.00	F&W	37	II	16
		(39.4)	(16.0)	(14.7)	(14.3)	(20.7)	(23.6)	(3.0)	(1.0 x 2.1)	(12.7)				
0.35	T169431	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	51	II	16
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)				
0.50	T169432	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	53	II	16
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)				
0.75	T169433	17.00	7.00	7.30	5.63	8.13	9.40	2.3	.41 x .81	6.50	F&W	65	II	16
		(43.2)	(17.8)	(18.5)	(14.3)	(20.7)	(23.9)	(5.8)	(1.0 x 2.1)	(16.5)				
1.00	T169434	18.50	6.50	8.55	5.63	8.13	9.50	2.3	.41 x .81	7.75	F&W	82	II	16
		(47.0)	(16.5)	(21.7)	(14.3)	(20.7)	(24.1)	(5.8)	(1.0 x 2.1)	(19.7)				
2.00	T169435	19.00	10.50	10.20	6.00	12.00	13.25	2.3	.44 x .63	9.40	F&W	142	III	16
		(48.3)	(26.7)	(25.9)	(15.2)	(30.5)	(33.7)	(5.8)	(1.1 x 1.6)	(23.9)				
3.00	T169436	19.00	10.50	10.20	6.00	12.00	13.25	2.3	.44 x .63	9.40	F&W	176	III	16
		(48.3)	(26.7)	(25.9)	(15.2)	(30.5)	(33.7)	(5.8)	(1.1 x 1.6)	(23.9)				
5.00	T169437	22.00	12.54	12.20	6.00	14.00	15.25	2.3	.44 x .63	11.40	F&W	295	III	16
		(55.9)	(31.9)	(31.0)	(15.2)	(35.6)	(38.7)	(5.8)	(1.1 x 1.6)	(29.0)				
10.00	T169438	23.06	27.31	24.06	18.00	25.50	—	—	.56	—	F&W	605	IV	16
		(58.6)	(69.4)	(61.1)	(45.7)	(64.8)				(1.4)				
15.00	T169439	23.06	40.13	24.06	18.00	38.31	—	—	.56	—	F	880	IV	16
		(58.6)	(101.9)	(61.1)	(45.7)	(97.3)				(1.4)				

**CONSTANT VOLTAGE REGULATORS DIMENSIONAL DRAWINGS**

**Figure II and III**



**Input Connections Insulate**

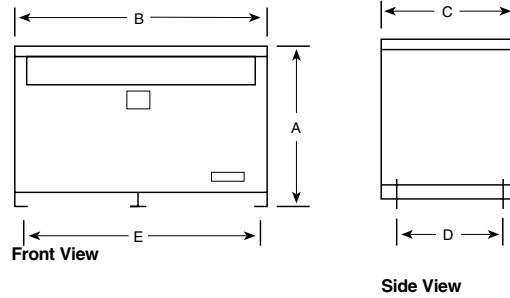
Volts	Connect	Isolate
120	1, 3, 6, 8 to A 2, 5, 7, 10 to B	4, 9
208	1, 6 to A 4, 9 to B 2, 3 to C 7, 8 to D	5, 10
240	1, 6 to A 5, 10 to B 2, 3 to C 7, 8 to D	4, 9
480	1 to A 10 to B 2, 3 to C 5, 6 to D 7, 8 to E	4, 9

**Output Connections**

Volts	Connect	Output Lines To
120	11 to F 12 to G 14 to H	F, G
208	11 to F 12 to G 14 to H	F, G, H
240	11 to F 12 to G 13 to H	F, H
480	11 to F 12 to G 14 to H	F, H

**NOTE:** To prevent externally shorting, all leads marked "INSULATE" must be individually capped with wire nuts or equivalent. Insulate leads individually!

**Figure IV**



**CROSS REFERENCE CHART — True-Power Hardware Models**

SIZE	ACME	SOLA	GE	TOPAZ
.250	T169430	63-23-125-4	9T91L1143	68025-08
.350	T169431	—	—	68050-08
.500	T169432	63-23-150-8	9T91L1153	68100-08
.750	T169433	63-23-175-8	9T91L1163	68200-08
1.00	T169434	63-23-210-8	9T91L1173	
2.00	T169435	63-23-220-8	9T91L1183	
3.00	T169436	63-23-230-8	9T91L1193	
5.00	T169437	63-23-250-8	9T91L1203	
10.00	T169438	63-28-310-8	9T91L2226	
15.00	T169439	63-28-315-8	9T91L2246	



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