AUTOMATIC VOLTAGE REGULATOR (STABILIZER)

TRIAC1 Series 8K-20KVA (Solid-state TRIAC AVR with Isolation Transformer)

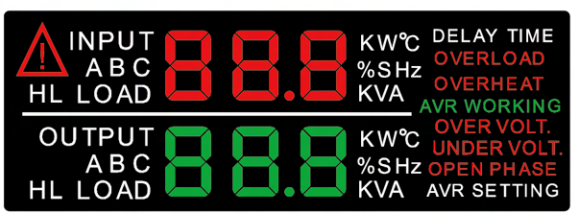
- An intelligent microprocessor-controlled loop enabling precise TRIAC switching operation, compatible with inductive, capacitive, and resistive load types.
- Various functional parameters - including rated voltage, delay time, voltage regulation rate, and input range can be configured through the LCD interface.
- Built-in 4-steps boost and 3-steps buck regulation, achieving a voltage regulation rate of ±2% to ensure stable output voltage.
- The fully electronic circuit design enables spark-free and noise-free voltage regulation with no transfer time, ensuring rapid response and extended service life.
- The built-in delay time setting can be configured through the LCD interface for 2/30/60/180/300 seconds to protect equipment.
- The color LCD provides a variety of status displays and indicates abnormal conditions, aiding in equipment maintenance.
- Voltage regulation is achieved using TRIAC components with fully low-frequency design, eliminating electromagnetic interference.
- Equipped with lightning and power surge protection to prevent damage to equipment from electrical shocks.
- The system includes built-in environmental temperature monitoring, which ensures proper fan operation and protection functions.
- Isolation Transformer: Effectively isolates harmonic issues and power quality problems.

Product Appearance

Front

Rear

LCD Display



What is an Isolation Transformer?

An Isolation Transformer is a type of transformer used to electrically isolate a part of a power system.
There is no direct electrical connection between the primary and secondary windings; instead, energy is transferred solely through electromagnetic induction.
This design offers numerous advantages in terms of safety and performance, making it widely used in fields such as medical equipment, industrial applications, and telecommunications.

Advantages of Isolation Transformers	Description	Applications of Isolation Transformers
Electrical Safety	**Shock Protection:** The primary and secondary windings are electrically isolated, so the secondary side has no direct path to ground, reducing the risk of electric shock.	Medical equipment / Laboratories and test instruments / Repair workstation / Educational facilities / Telecommunications & data centers
	Equipment Protection: Protects sensitive equipment from harmful surges and spike caused by the power source disruptions.	
Noise Filtering / Electromagnetic Interference Reduction	Effectively suppresses high-frequency noise and surges from the power source.	Audio Systems / Sensitive test instruments Medical equipment / Telecommunications & data centers / Industrial Control Systems
	Reduce EMI noise from external sources.	
Ground Loop Elimination	Isolation breaks ground loops that can cause humming or noise due to differences in ground potential.	Audio Systems / Recording studio
Voltage Conversion	In addition to isolation, it can convert the voltage to match the requirements of the equipment.	Industrial Control Systems

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Specifications

MODEL	TRIAC1-I821-8K	TRIAC1-I821-10K	TRIAC1-I821-12K	TRIAC1-I821-15K	TRIAC1-I821-20K
Rated Capacity	8KVA/6.4KW	10KVA/8KW	12KVA/9.6KW	15KVA/12KW	20KVA/16KW
Technology	Fully electronic TRIAC-controlled voltage regulator(neither servo motor type, nor relay type)				
INPUT					
Rated Voltage	220Vac/230Vac/240Vac, 1P2W+G				
Voltage Range	± 25%(default) ; ± 20%, or ± 30%, or ± 35%(configured via LCD interface)				
Voltage Tolerance Range	± 15%				
Frequency	50/60Hz ± 5%				
Power Factor	More than 0.98 (with resistive load)				
OUTPUT					
Rated Voltage	With isolation transformer: 110/220Vac or 115/230Vac or 120/240Vac, 1P3W+G				
Regulation Rate	± 2%				
Transfer Time	0ms				
Distortion	No distortion(same as input waveform)				
Response Time	Less than 20ms				
Efficiency	More than 96% under full load				
Power Factor	More than 0.8				
Overload Capability	105%-125%, buzzer beeps twice per second, AVR does not shut down				
	125%-150%, buzzer beeps four times per second, AVR shuts down 3 minutes later				
	150%-300%, buzzer beeps continuously, AVR shuts down 10 seconds later				
	Over 300%, buzzer beeps continuously, AVR shuts down in 1.5 seconds				
STATUS INDICATION					
Alarm	Buzzer beeps upon over input voltage, under input voltage, high temperature, overload				
LCD Display	Input voltage, output voltage, load, temperature, data of various operating states and abnormal conditions				
PROTECTION					
Surge Tolerance	600 joules surge protection, inrush current capacity 12000Amp(8/20us)				
Protection Device	Soft start device, allows for automatic startup with configurable time				
	Electronic circuit: Over input voltage, under input voltage, overload, high temperature, short circuit protection				
SAFETY STANDARD					
CE	CE certified				
ENVIRONMENT					
Operating Temperature	0-40°C				
Operating Humidity	0-95%				
Noise Level	Less than 40dB at 1M				
PHYSICAL					
Dimension (D*W*H)	500*300*600mm				

*Product specifications are subject to change without further notice.

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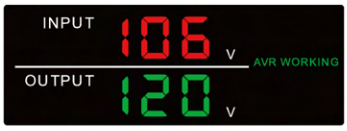
LCD Interface Introduction

Display panel with various information

Input and output voltage



Load capacity and current

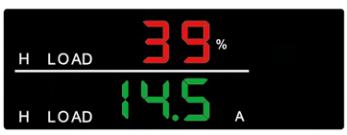
Input frequency and rated output voltage

Temperature of autotransformer

Temperature of compensation transformer

Temperature of TRIAC components

Peak load of AVR operation
(data updated every 10 minutes)



Rated capacity and max. inrush current

Configurable parameter values

OFF: AVR off mode

A1: configuration of output delay time - 2S/30S/60S/180S/300S

A2: configuration of rated output voltage - 100V/110V/115V/120V or 200V/220V/230V/240V

A3: configuration of output regulation rate - 2%(default) or 3%/4%/5% (Energy-saving is achieved when output regulation rate is high.)

A4: configuration of input voltage range - 25%(default) or 20%/30%/35%

EE: Press On/Off button for 2 seconds, configuration parameter will be saved and exit "AVR SETTING" mode.

Error code

E01: Output short circuit

E02: Temperature of autotransformer is high

E03: Temperature of compensation transformer is high

E04: Temperature of TRIAC components is high

E05: Mode setting error

E06: Phase error

E07: NTC1 component abnormal

E08: NTC2 component abnormal

E09: NTC3 component abnormal

E10: Overload

*For more and detailed information about LCD interface, please check manual!

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AVR Comparison: Solid-State TRIAC and Servo Types

DUST

TRIAC AVR
With no mechanical elements, it maintains reliable operation even when exposed to dust.

Servo AVR
Dust accumulation affects the moving brush mechanism, causing increased electrical noise and interruptions in voltage regulation.

DURABILITY

TRIAC AVR
The design is entirely solid-state, incorporating no mechanical or moving components. Under normal usage conditions, the product has a lifespan of over 10 years.

Servo AVR
Mechanical components are subject to wear over time, requiring maintenance and leading to downtime that diminishes the performance of the voltage regulator.

NOISE

TRIAC AVR
The system utilizes microprocessor control to achieve rapid switching at zero voltage, thereby eliminating transient noise.

Servo AVR
In environments with dust or debris, the brush movement over the toroidal transformer may introduce noise, increasing the risk of operational faults or incorrect data in control systems.

POWER BACK SURGE

TRIAC AVR
The AVR is designed to automatically reset and restore a suitable output voltage when mains power is interrupted.

Servo AVR
When mains power fails, the servo boosts voltage by spinning the motor. If power comes back suddenly, it might over-boost and damage sensitive electronics.

TECHNOLOGY

TRIAC AVR
It uses a microprocessor and strong solid-state switches that can handle inrush currents hundreds of times higher than normal.

Servo AVR
As servo motor systems become increasingly outdated, transitioning to modern technology provides greater protection for your investment.

OPERATING COST

TRIAC AVR
The use of sophisticated technology increases the AVR's initial cost; however, it requires minimal maintenance and operating costs.

Servo AVR
While the servo AVR has a lower initial cost, its mechanical components require frequent maintenance and replacement parts, which increase operating expenses.

SPEED

TRIAC AVR
The use of triacs and thyristors allows ultra-fast switching, typically within microseconds, which supports immediate voltage adjustment when needed.

Servo AVR
Because motors respond more slowly than solid-state components, corrections are delayed. Fast reaction times are critical to safeguard electronics from voltage damage.

ACCURACY

TRIAC AVR
The Triac AVR delivers output voltage accuracy within ±5%, meeting the requirements of most electrical devices.

Servo AVR
Servo AVRs offer 0.5-1% accuracy, but most equipment doesn't need such tight control. Their mechanical parts also wear out faster due to constant use.