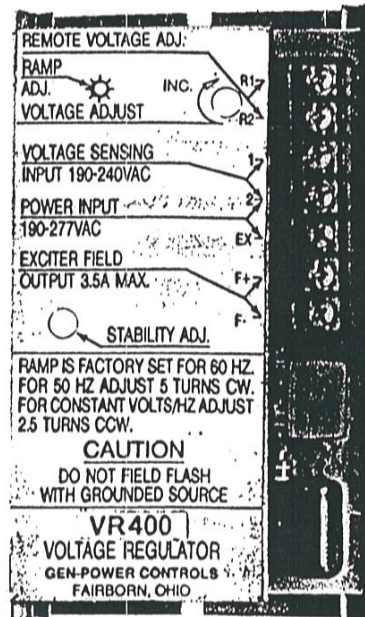


GEN-POWER



VR400

Series Voltage Regulators

VR400 Series Voltage Regulators use all solid state electronics and are designed to be used on AC generators with brush or brushless rotary exciters requiring up to 3.5 amperes continuous current.

ELECTRONIC SERVICES has incorporated expertise and 'state-of-the-art' electronic components into a Voltage Regulator to fulfill the needs of the generator industry for reliable voltage regulation.

PERFORMANCE

- $\pm 3/4\%$ Voltage Regulation
- Response to Load Change—Less than 12 Milliseconds
- $\pm 10\%$ Generator Output Voltage Adjustment Range
- Sensing Input—Single Phase, 50/60 Hz, 190-240 Volts
- Power Input—Single Phase, 50/60 Hz, 190-277 Volts

OUTPUT POWER TO EXCITER FIELD		
POWER INPUT VOLTAGE	240 VAC	277 VAC
Voltage-Continuous (VDC)	74	85
Voltage-Forcing (VDC)	105	121
Current-Continuous (A)	3.5	3.5
Current-1 Min. Forcing (A)	8	8
Min. Field Res. (Ohms)	10	10
Max. Field Res. (Ohms)	100	100

BENEFITS

- Versatility
- Underspeed Protection
- Increased Reliability of Generator Voltage Buildup
- EMI Suppression
- Adjustable Anti-Hunt
- Built-In Paralleling Provisions
- Elimination of Mechanical Failure
- Vibration Resistant
- Environmental Protection
 - Moisture-Proof Conformal Coating

MODEL	FREQUENCY Hz	SENSING VOLTAGE	POWER INPUT VAC	AVCR RHEOSTAT FOR REMOTE MOUNTING
VR400	50/60	190-240	190-277	No
VR400R	50/60	190-240	190-277	Standard

PERFORMANCE

VOLTAGE REGULATION

The voltage regulation is $\pm 3/4\%$, average, inclusive of variation in all of these factors within the limits shown:

FACTOR	LIMITS
Load	No Load to Full Load
Power Factor	0.8 (lag) to 1.0 P.F.
Speed	$\pm 5\%$
Ambient Temperature	$\pm 15^{\circ}\text{C}$ Band-Range -40°C to $+60^{\circ}\text{C}$

RANGE OF ADJUSTMENT

The Voltage Regulator will permit generator output voltage adjustment from 10% below the low voltage rating of the generator (190V) to 10% above the high voltage rating of the generator (240V).

REGULATOR RESPONSE

The Voltage Regulator will initiate a change in the exciter field current within 12 milliseconds after a load change.

BENEFITS

VERSATILITY

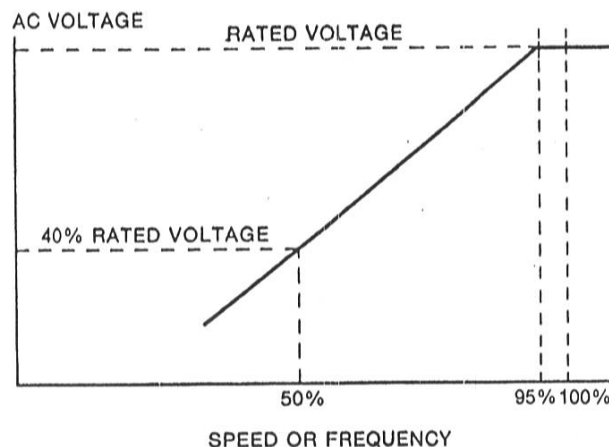
The VR400 Series Voltage Regulator has been designed to provide up to 3.5 amperes continuous exciter field current by utilizing a separate line-to-line or line-to-neutral single-phase power input while operating from a wide range of line-to-line single-phase input sensing voltages at 50 or 60 Hz.

This broad range of voltage selection within the regulator makes it readily available for most applications. Should a voltage system not match the voltage requirement of the voltage regulator, a voltage matching transformer may be purchased to match the voltage regulator to the system voltage.

UNDERSPEED PROTECTION

This regulator includes a built-in circuit to protect the generator from operation at less than nameplate speed. The circuit, preset at factory, allows normal, flat regulation down to about 5% below rated speed for 60 Hz. At this point, the voltage will decrease proportionally to speed. The reduced voltage and speed combination will automatically protect the regulator-exciter-generator combination from the otherwise harmful effects of underspeed operation.

The Voltage Regulator frequency circuit is easily adjustable for 50 Hz with normal flat regulation down to about 5% below rated speed. Constant volts per Hz on 50 or 60 Hz operation is also an adjustable feature. The relationship between the voltage and speed is shown in the following graph:

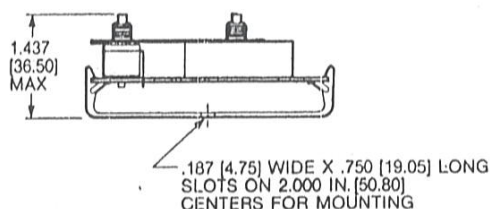


TYPICAL CURVE OF VOLTAGE VS SPEED
FOR AUTOMATIC UNDERSPEED PROTECTION

INCREASED RELIABILITY OF GENERATOR VOLTAGE BUILD-UP

Another important feature of the all solid state voltage build-up circuit in the Voltage Regulator is the sensitivity. The regulator will automatically initiate generator voltage build-up with as low as 4 volts from the generator residual voltages.

INCHES
[MILLIMETERS]



CONNECTION DIAGRAMS

