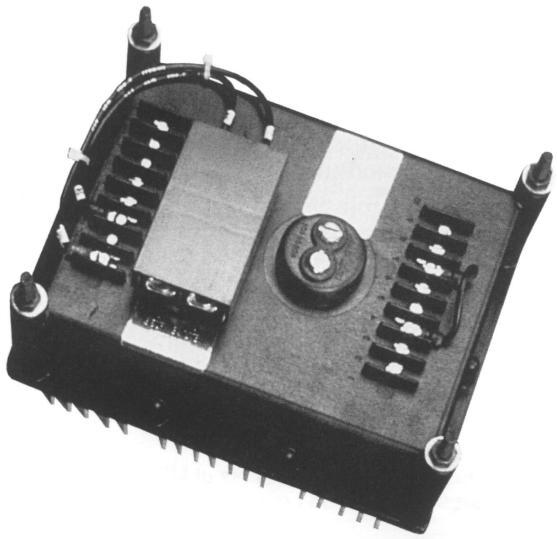
CATERPILLAR®

Automatic Voltage Regulators VR3



CATERPILLAR ENGINE FACILITIES ISO 9001 CERTIFIED

FEATURES

- **Self Excited (SE) and Permanent Magnet Excited (PM) versions available**
- **Regulation better than ±1.0%**
- **Frequency compensated**
- **Overexcitation shutdown**
- **Solid state voltage buildup**
- **Three phase sensing – standard**
- **Compact package size**
- **Moistureproof assembly**
- **Mechanically rugged**
- **Fast response time**
- **Applicable to 50 and 60 Hz systems**
- **Complete line of accessories available**

SPECIFICATIONS

Regulation
Less than ±1% no load to full load
Regulator drift
Less than ±1/2% steady state
Temperature drift
Less than ±1% for any 40° C change over the operating temperature range
Regulator response
Maximum of one electrical cycle (i.e., less than 16.6 milliseconds at 60 Hz, or 20 milliseconds at 50 Hz)
Regulator sensing
Three phase sensing is standard. Single phase sensing can be selected on SE regulators only.
Regulator stability
Regulator responds to the fundamental component of the sensed voltage and remains stable for total harmonic distortion of the generator output voltage waveform up to 20%.
Regulator filtering
Telephone Influence Factor (TIF) less than 50. Optional filtering packages available to comply with MIL STD 461B Part 9 and VDE 85 level N.
Harmonic tolerance
The AVR will maintain precise control of the generator output with up to 20% harmonic distortion in the generator output voltage.
Voltage adjust range
-25% to 10% of nominal
Regulator gain
Minimum of +5% to compensate for speed droop governors or line losses (voltage droop) between generator and load.
Regulator build-up voltage
SE regulators will build up with the generator output voltage as low as 6 vac. No minimum requirement for PM regulators.
Regulator start-up voltage
Voltage overshoot at full throttle engine starting will not exceed 5% of rated value.
Volts/Hz characteristic
Linearly proportional to frequency (8 Volts/Hz on 480 Volt/60 Hz basis) over the frequency range of 30 Hz to 70 Hz provides matched engine/generator performance for improved block load performance.
Reactive droop adjustment
Minimum of 8% droop at full load and 0.8 pf

SPECIFICATIONS / continued

Overexcitation protection
Shuts off generator output when excitation exceeds the nominal values shown below for approximately 10-16 seconds:

Excitation Type	Shutoff Value
SE PM	Excitation voltage > 63 vdc Excitation current > 14 amp

Fault protection
Two fast-acting, high-interrupting capacity fuses are provided to protect the AVR and excitation system components against potentially damaging electrical faults.

Ambient operating temperature . . -40° C to +70° C
Storage temperature range. . . . . -40° C to +85° C
Power dissipation . . . . . 50 watt (max)
Shock . . . . . Withstands up to 20 g's
Vibration
Withstands 4.5 g's at frequencies between 18 and 2000 Hz in three mutually perpendicular planes.
Salt spray: . . . Meets MIL-STD-810C, method 509.1
Sealing:. . . . . Withstands up to 35 kPa (5.08 psi)
Weight: . . . . . 1.8 Kg

STANDARD ACCESSORIES AVAILABLE

Series boost
Able to sustain the generator output at 300% rated current for a minimum of ten seconds. Not required for PM.

KVAR/PF controller
Provides KVAR or Power Factor control when generator is paralleled with utility.

Remote voltage adjust
Controls voltage level with a 10 kΩ, 1 watt remotely mounted rheostat.

Manual voltage control
Permits manual regulation of the generator output in the event of a regulator failure.

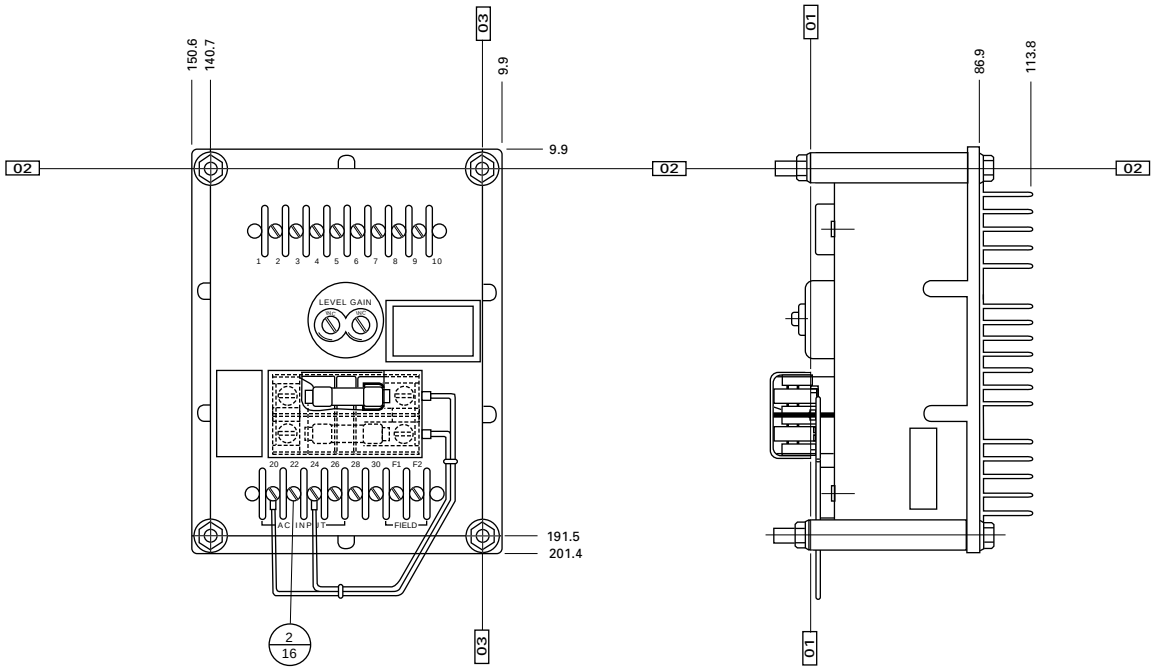
Paralleling
A reactive droop network consisting of a current transformer, 8Ω 25 watt rheostat, and control circuit allows generator to be paralleled with other generators either in reactive droop or cross current compensation (zero droop) modes.

Filtering
Complies with requirements of MIL-STD 461B Part 9, VDE 875 Level N, EN50081-2 and EN50082-2.

SUMMARY OF OPERATING PARAMETERS

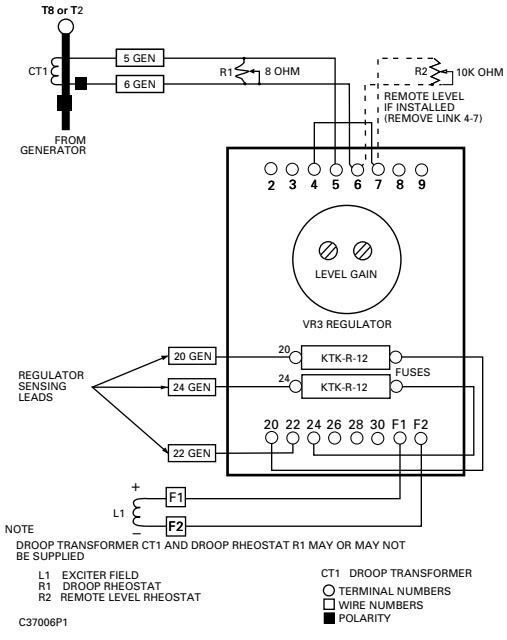
		Power Input			Output Rating				Sensing		Reactive Droop Input		Exciter Field Resistance	
					Max. Continuous		Min. Forcing							
Voltage Rating	Type	V	Freq Hz	VA	V	A	V	A	V	Max VA Burden Per ø	Amps	VA Burden	Min. Ohms	Max. Ohms
240 volt	SE	200/240 1ø	50/ 60	1500	50	10	90	15	200/ 240	1	0.5	3	3	10
480 volt	SE	200/240 1ø	50/ 60	1500	50	10	90	15	400/ 480	1	0.5	3	3	10
120 volt	PM	70-110 3ø	200/ 240	1500	50	10	90	15	100/ 120	1	0.5	3	3	10
240 volt	PM	70-110 3ø	200/ 240	1500	50	10	90	15	200/ 240	1	0.5	3	3	10
480 volt	PM	70-110 3ø	200/ 240	1500	50	10	90	15	400/ 480	1	0.5	3	3	10

OUTLINE DRAWING

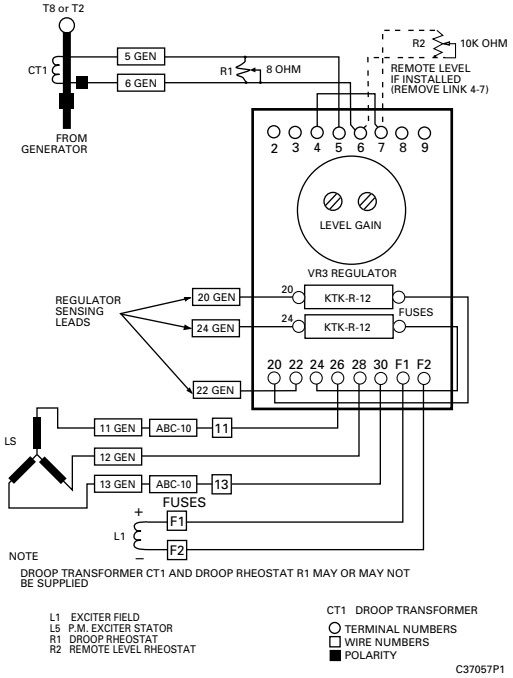


CONNECTION DIAGRAMS

SELF EXCITED WITH DIRECT CONNECTION TO GENERATOR
(240 VAC Sensing)



P.M. EXC WITH DIRECT CONNECTION TO GENERATOR
(240 or 480 VAC Sensing)



For a complete listing of connection diagrams, see Caterpillar publication SENR4794-01 entitled "CONNECTION DIAGRAMS: SR4 GENERATORS VR3 & VR4 VOLTAGE REGULATOR OPTIONS"

LEHX7054
Supersedes LEHX3239