



# SX460 AUTOMATIC VOLTAGE REGULATOR (AVR)

## Technical specification

### INPUT

Voltage Jumper selectable  
95-132V ac or  
190-264V ac

Frequency 50-60 Hz nominal

Phase 1

### OUTPUT

Voltage max 90V dc at 207V ac input

Current continuous 4 A dc  
Intermittent 6 A for 10 secs

Resistance 15 ohms minimum

### REGULATION

+/- 1.0%

### THERMAL DRIFT

0.05% per deg. C change in AVR ambient

### TYPICAL SYSTEM RESPONSE

AVR response 20 ms

Filed current to 90% 80 ms

Machine Volts to 97% 300 ms

### EXTERNAL VOLTAGE ADJUSTMENT

+/-10% with 1 k ohm 1 watt trimmer

### UNDER FREQUENCY PROTECTION

Set point 95% Hz

Slope 170% down to 30 Hz

### UNIT POWER DISSIPATION

10 watts maximum

### BUILD UP VOLTAGE

4 Volts @ AVR terminals

### ENVIRONMENTAL

Vibration 20-100 Hz 50mm/sec

100Hz – 2kHz 3.3g

Operating temperature -40 to +70°C

Relative Humidity 0-70°C 95%

Storage temperature -55 to +80°C

### NOTES

1. With 4% engine governing
2. After 10 minutes.
3. Applies to Mod status F onwards. Generator de-rate may apply. Check with factory.
4. Factory set, semi-sealed, jumper selectable
5. Non condensing.

## SUMMARY OF AVR CONTROLS

CONTROL	FUNCTION	DIRECTION
VOLTS	TO ADJUST GENERATOR OUTPUT VOLTAGE	CLOCKWISE INCREASES OUTPUT VOLTAGE
STABILITY	TO PREVENT VOLTAGE HUNTING	CLOCKWISE INCREASE THE DAMPING EFFECT
UFRO	TO SET THE UFRO KNEE POINT	CLOCKWISE REDUCES THE KNEE POINT

## ADJUSTMENT OF AVR CONTROLS

### VOLTAGE ADJUSTMENT

The generator output voltage is set at the factory, but can be altered by careful adjustment of the VOLTS control on the AVR board, or by the external hand trimmer if fitted. Terminals 1 and 2 on the AVR will be fitted with a shorting link if no hand trimmer is required. Terminals 3 and 4 are linked only for special low voltage applications.

**CAUTION** Do not increase the voltage above the rated generator voltage. If in doubt, refer to the rating plate mounted on the generator case.

**CAUTION** Do not ground any of the hand trimmer terminals as these could be above earth potential. Failure to observe this could cause equipment damage.

If a replacement AVR has been fitted or re-setting of the VOLTS adjustment is required, proceed as follows:

### CAUTION

1. Before running generator, turn the VOLTS control fully anti-clockwise.
2. Turn remote volts trimmer (if fitted) to midway position.
3. Turn STABILITY control to midway position.
4. Connect a suitable voltmeter (0-300V ac) across line to neutral of the generator.
5. Start generator set, and run on no load at nominal frequency e.g. 50-53Hz or 60-63Hz.
6. If the red Light Emitting Diode (LED) is illuminated, refer to the Under Frequency Roll Off (UFRO) adjustment.
7. Carefully turn VOLTS control clockwise until rated voltage is reached.
8. If instability is present at rated voltage, refer to stability adjustment, then re-adjust voltage if necessary.
9. Voltage adjustment is now completed.

### STABILITY ADJUSTMENT

The AVR includes a stability or damping circuit to provide good steady state and transient performance of the generator.

The correct setting can be found by running the generator at no load and slowly turning the stability control anti-clockwise until the generator voltage starts to become unstable.

The optimum or critically damped position is slightly clockwise from this point (i.e. where the machine volts are stable but close to the unstable region).

### UNDER FREQUENCY ROLL OFF (UFRO) ADJUSTMENT

The AVR incorporates an underspeed protection circuit which gives a volts/Hz characteristic when the generator speed falls below a presettable threshold known as the "knee" point.

The red Light Emitting Diode (LED) gives indication that the UFRO circuit is operating.

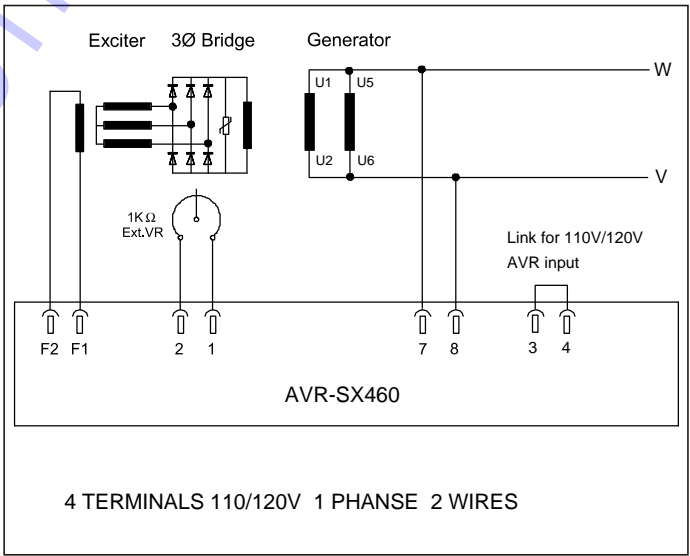
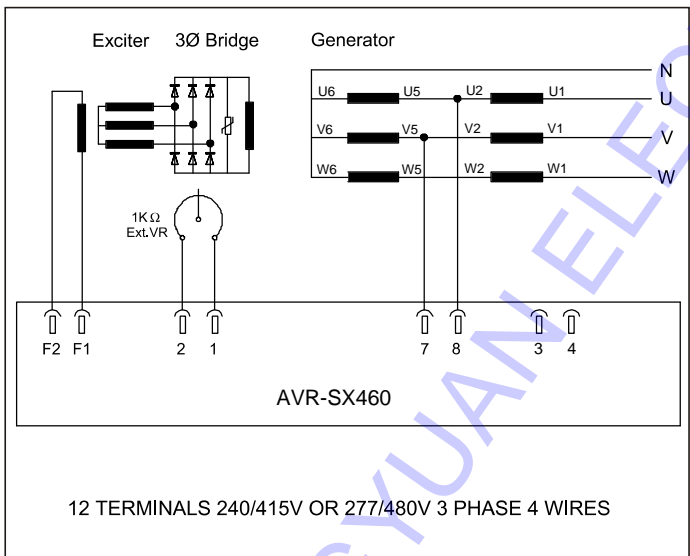
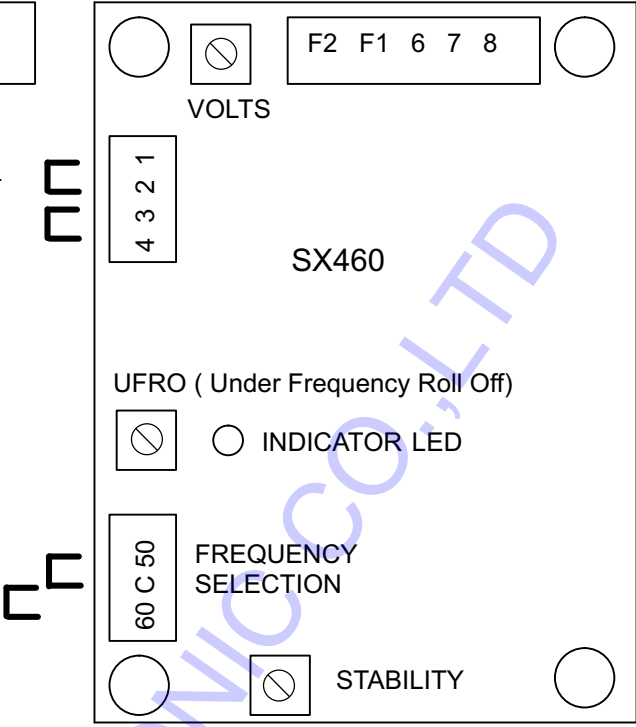
The UFRO adjustment is preset and sealed and only requires the selection of 50 / 60Hz using the jumper link.

For optimum setting, the LED should illuminate as the frequency falls just below nominal, i.e. 47Hz on a 50Hz system or 57Hz on a 60Hz system.

# FITTING AND OPERATING

REFER TO GENERATOR WIRING DIAGRAM FOR CONNECTION DETAILS

Remove link to connect a remote voltage trimmer  
Link for 110V/120V AVR input



**Note :**

1. When there is no connection to VR, 1 and 2 must be joined.
2. When LED lamp is light on, it means the frequency isn't enough ,The output voltage will decrease to prevent over load exciting current to damage the exciter field winding.