Introduction

WT-2/WT-3 Automatic Voltage Regulator (AVR) is alternator output voltage regulating equipment, its design is based on half-wave phase-controlled rectifier principles and our company generator excitation characteristics. It can be used for the auxiliary winding, phase power Excitation Generator. The feature is high stability, fast response, easy installation and maintenance, etc.

Specifications

Output(DC)
Volatage: Max 90V @220Vac
Continual current :8A
Max transient current:10A,≤10 second
Field winding resistance
Min. 8Ω
Power input voltage (AC)
180~250Vac,50/60Hz
Power :Max 1000VA (240 Vac)
Sense voltage (AC)
180~250Vac (220Vac System) single phase, 50/60 Hz;
350~480Vac (400Vac System) single phase, 50/60 Hz;
Power consumption: 5 VA
Voltage adjustment range
180~300 Vac ;350~480Vac
Regulation ?%
Thermal drift <0.05% /℃
Response time 1.5s
Build voltage
The generator remaining excitation voltage will build voltage automatically,5Vac、25Hz
Power consumption: Max 40W
Quadrature droop input
CT:rated current ratio is 5A, Droop 0 ~6%,0.8 power factor
Operating temperature
-30°C ~ +80°C
Relative humidity 95%
Vibration
12 Gs,5~26 Hz;
0.036 inch amplitude,27~52 Hz;
5.0 Gs,53~1000 Hz
Impugnable
Above three orthogonal planes is 20 Gs
Weight
Net weight : 0.62 kg
Installation
Use M4 bolts installed in the
generator terminal box (Dimensions in the Picture 1)

Switch function choose

Sw2 frequency selection	ON	50HZ
	OFF	60HZ
Sw1 stability time choose	ON	00KW above
	OFF	50KW below

Voltage(VOLT)---Adjust the generator output voltage
The generator output voltage can be adjusted according to the characteristics of the generator set, usually, the built-in voltage adjustment potentiometer **"VOLT"** can adjust a big range of voltage (350~480 V or 180 ~300V),If you want to adjust the voltage from the control panel or screen,you can connect a suitable potentiometer to **VR1** and **VR2** terminal (Mini power 2W,Resistance is 10 KΩ-100KΩ) .

⇒ Voltage rise

Stability (STAB)
The voltage regulator provides a built-in stable adjustment circuit,wide range of applications,This operation can set the field winding's react, to meet the characteristics of the factories and different engines. (Such as diesel engine, turbine), get the best voltage response, change the stability characteristics of the regulator needs to be set by **STAB** potentiometer on the regulator.

⇒ Increase response time, improve stability

LF protection(UFRO)---low-speed protection settings
Usually, the factory's setting is in order to reduce the generator excition current when the generator speed is lower than 95% rated speed of the generator,Adjust the protection point's speed via adjust the potentiometer **UFRO**.Such as:Rated frequency 50Hz set the LF protection point 47Hz,Rated frequency 60Hz set the LF protection point 57Hz

⇒ Reduce the protection point's speed

Parallel compensation (DROOP)
The voltage regulator is suit for two similar generators operating in parallel, provide the total reactive power to all generators in parallel running, and makes correct allocation, can achieved it via a external 5A current transformer to sense the generator U-phase current and a build-in voltage regulator **DROOP** circuit.
The voltage regulator provides two inputs **S1** and **S2** are connected to the current transformers. When the generator is running in stand-alone, these terminals are usually shorted. Clockwise increases the amount of C.T. signal injected into the AVR and increases the droop with lagging power factor (cos Ø). With the control fully anti-clockwise there is no **DROOP**. CT detection signal and the voltage regulator phase sequence must be correct, otherwise, the generator would not normally work in parallel. CT must be installed in different phases and the detection of the detection voltage.

⇒ Increase DROOP sensitivity

Over excitation current protection (AMP)
When the exciting current exceeds the set value, and the duration of more than 10 seconds, the regulator will automatically close the excitation output, O/L indicator light up. Factory default settings in 5A, 10 seconds.

⇒ Increasing the excitation current protection threshold

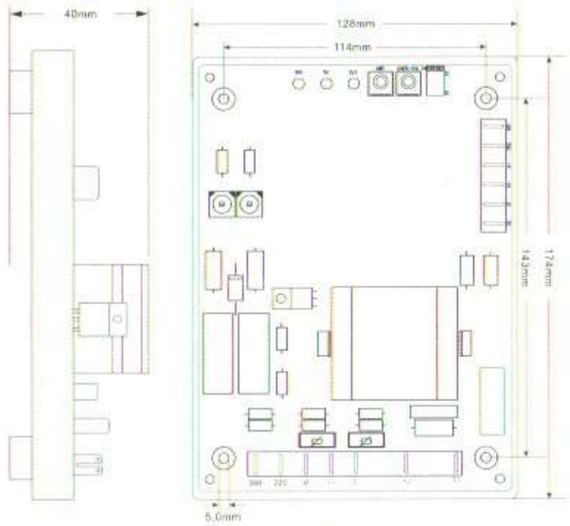
Sensing voltage losing protection (SLI)
When the AVR detects that the sensing voltage is lost, in order to avoid the excitation lost control, quick shutdown excitation output in 0.5-1 seconds, and the SLI indicator lights up.

Over voltage protection (OVER-VOL)
When the input detection voltage exceeds this threshold, and lasted for more than 5 seconds, voltage regulator will automatically turns off the output. O/V indicator lights up. The factory default settings in 480V.

⇒ Increase the overvoltage protection threshold

Level of sensitivity (TRIM)
An analogue input (A1 A2) is provided to connect to the Newage Power Factor Controller or other devices.
It is designed to accept dc signals up to +/- 5 volts.

⇒ Increase sensitivity



Picture 1.

Wiring

Such as **Picture 2, 3,4**

1、**VR1**、**VR2** is remote voltage adjustment terminal. When you need to adjust the voltage remotely,can connect a 10KΩ-100KΩ 2W potentiometer between **VR1**、**VR2**;otherwise,must be shorted.

2、**F+**、**F-** is excitation outputs, connect the field winding inputs please pay attention to the polarity, otherwise can not start

3、**X1**、**V** is power supply inputs,can connect an auxiliary winding, phase power supply, etc.

4、V, V220, V380 as the detection signal input, the output line voltage and motor. Note: V is a public input, it is both a power input, but also a test input
The generator output line voltage of the 400VAC system is connected to V and V380 (Fig. 2); the output line voltage of the 220VAC system is connected to V and V220 (Figure 3).

5、S2, S1 for the current compensation input. When the machine is connected, the output current is 5A, the capacity is 5VA, and the output of the current transformer (CT) is connected. Note: do not have any grounding transformer line.

6、A-, A+ for analog voltage regulator input. Can be connected to the external + 5Vdc adjustable voltage source, each 1Vdc can adjust the 5% generator terminal voltage, the connection should pay attention to polarity

Build-up excition

When the first start of the regulator and generator, maybe the residual magnetism can't reach the start-up requirement of the regulator, we need to do as following steps:

a、stop operation of the generator set, remove from the regulator board field connection line +、 -, and use a set of DC power supply (3 ~ 12VDC) cathode received generator field + negative on a resistor (current limiting) 3 to 5Ω 20WATT (available battery as DC power supply).

b、Build-up excition about 2s after power ups;

c、Demolition of adjusting plate on the AC power connection line and generator (to the rated speed) detection remanence voltage generator output initiator) is greater than 5VAC, such as is, restore all adjusting plate connection and opening and restart the generator can successfully establish voltage. Such as remanence is still less than 5VAC repeat such as a~ b.

d、Such as remanence voltage greater than 5VAC but is still unable to establish the voltage regulator board, please change another plate

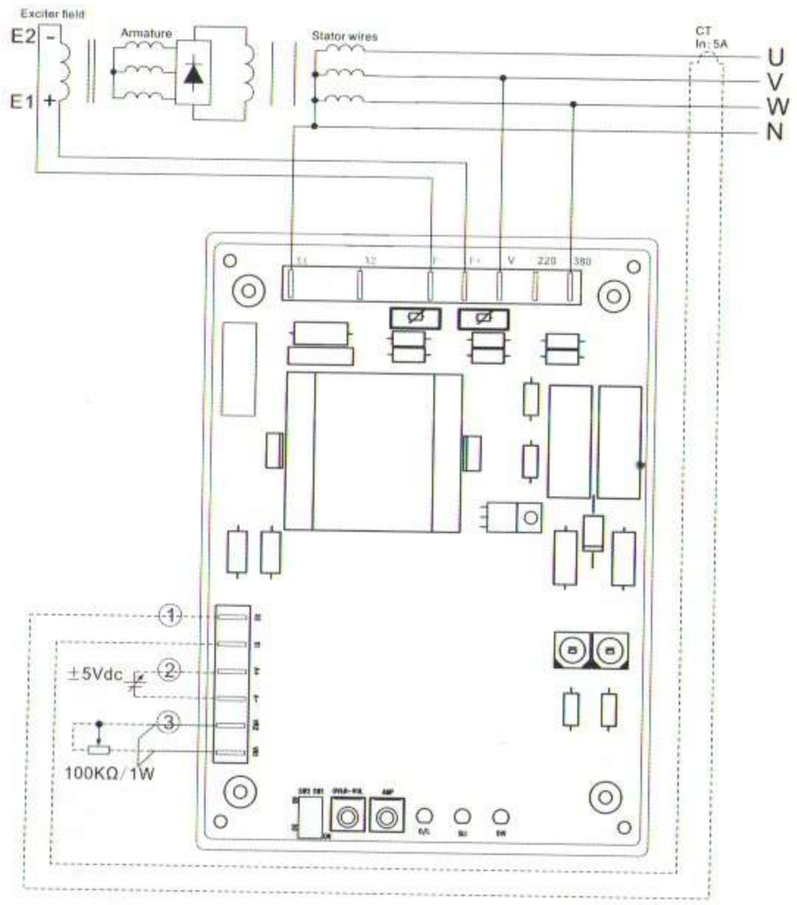
Test

WT-2/WT-3 Performance tests and operation steps(Picture 4 for reference)

1、Adjust the VOLT potentiometer clockwise to the MAX, the bulb should be bright;

2、Adjust the VOLT potentiometer counterclockwise to the Min, the bulb should be off;

3、VOLTpotentiometer,can control the bulb just beginning to shine.

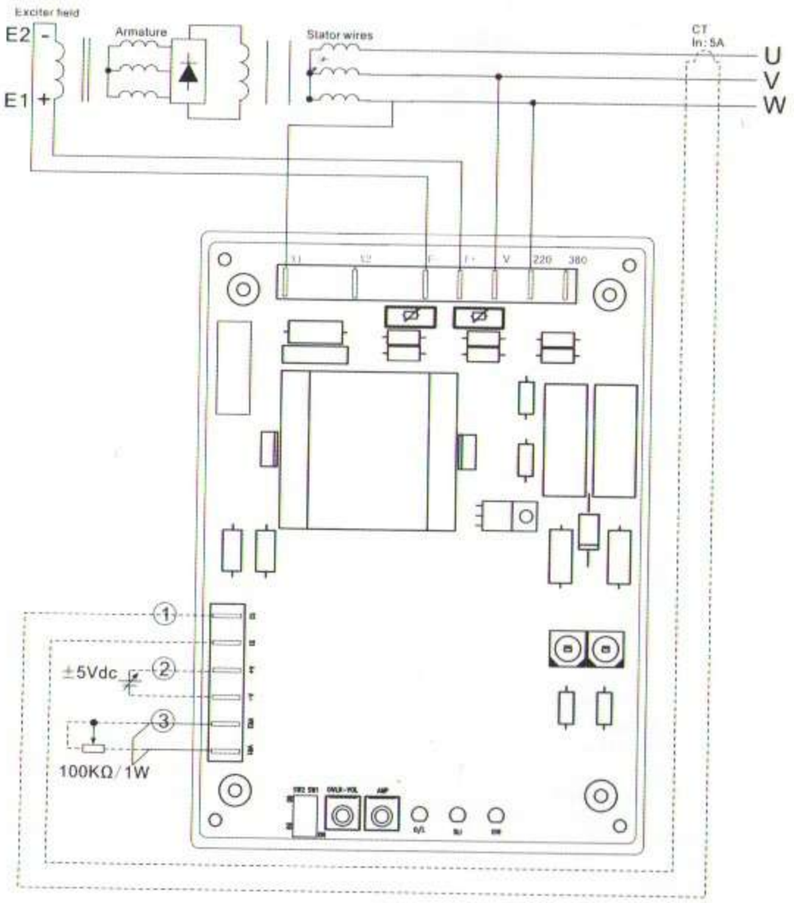


1、S1, S2 is the input end of the current compensation, and machine, ratio In/5A capacity regulator for 5VA difference and the output end of the current transformer (CT).

2、**A+**、**A-** voltage regulator inputs,can connect the external ?Vdc.

3、If the need for remote voltage regulation, can be in VR2, VR1 can be connected between the /1~2W and the 10~100K of a potentiometer, otherwise, must be shorted!

Picture 2. 400V system self-motivation wiring diagram



1、S1, S2 is the input end of the current compensation, and machine, ratio In/5A capacity regulator for 5VA difference and the output end of the current transformer (CT)

2、**A+**、**A-** voltage regulator inputs,can connect the external ?Vdc.

3、If the need for remote voltage regulation, can be in the VR2, VR1 can be connected between a 10~100K /1~2W of the potentiometer, or else must be shorted!

Picture 3. 200V system self-motivation wiring diagram