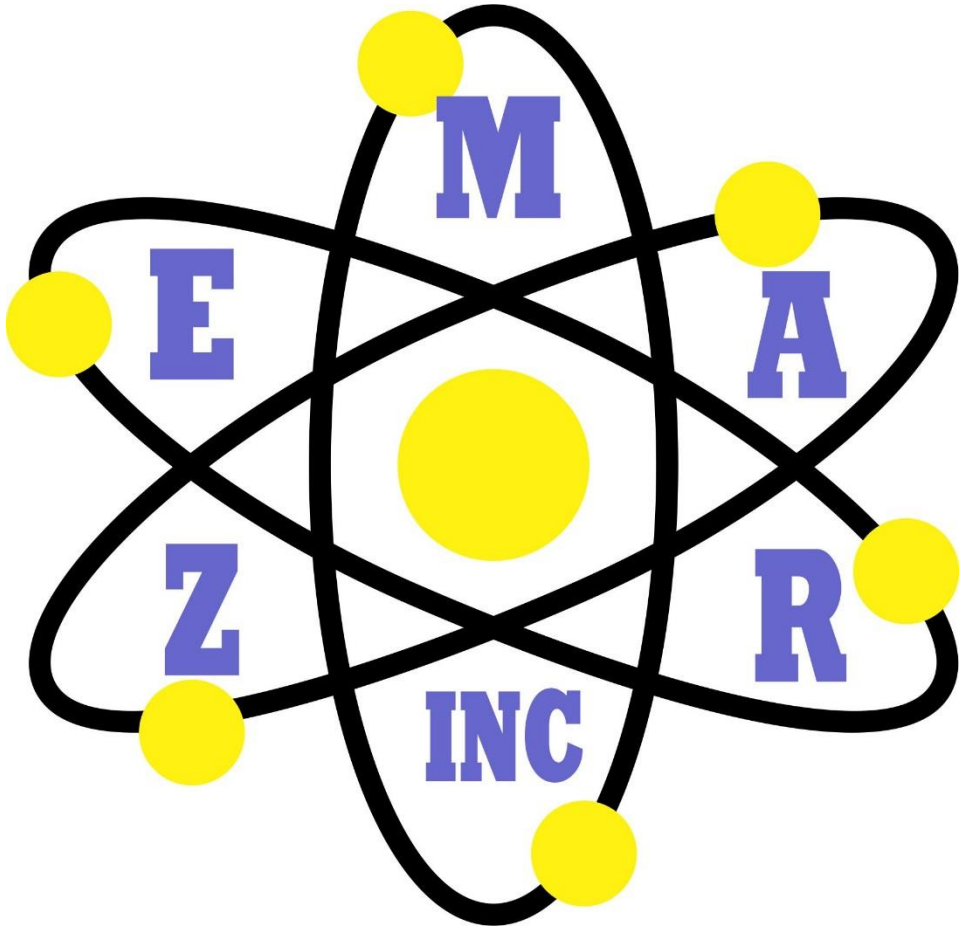
Voltage Regulator Testing, Training, Trouble Shooting, & Repair



Written by Joe Robb

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Dictionary

DICTIONARY

Band width BW High and low voltage that will cause the regulator to start timing. Example set voltage 120 BW 2, will start timing below 119 and above 121.

Control power switch CPS this switch applies power to the control panel either internal, external or off.

Control selector switch CSS used to raise and lower regulator, place regulator in auto or manual position or in the off position. This function was controlled on older panels with one rotary selector switch. Newer panels use a series of switches Auto Off or Manual, Remote or Local, Raise or Lower.

Current Transformer CT A doughnut CT on the load side measures load current. Ratio is not the same as the amp rating of the regulator. Example 219-amp regulator CT ratio would be 200-.2 all secondary current going to control panel at full load is .2 amps. LTC is usually 5 amps then uses a ratio correction transformer to reduce it to .2 amps.

Drag hand reset DHR resets the maximum and minimum position indicator hands on the position indicator.

Drag hands DH tracks the position of regulator position indicator and will remain at the maximum raise and lower position until re-set with the drag hand reset button on the control panel.

Exciting winding Is connected S to SL or L to SL phase to neutral or phase to phase on a delta system. Also called a shunt winding on some brands.

External Voltage source EVS these terminals are used to apply 120 volts to the control. This will operate the control and tap changer. Use caution observe the polarity, and make external.
Jumper the Source, Load and Source Load bushings together.

Inverted regulator the exciting or shunt winding is connected to the L and SL bushing also known as a type B regulator.

Limit switches LS has a limit switch at position Raise 16 and Lower 16 also known as RLS & LLS.

Line Drop Compensation LDC as the word implies, compensates for the resistance and reactance of the conductor. If the regulator is 7200 to 120 volts ratio would be 60-1, if line resistance is 60 ohms resistance you would dial in 1 on your resistance knob on the front control panel. If line reactance is 60 ohms you would dial in 1 ohm on your reactance knob on your front panel.

Moveable contacts MC The contacts that move across the stationary, they are connected to the reactor.

Neutral light NL should only be lighted when the tap changer is on the neutral position.

Neutral light test switch NLTS some manufacturers have this switch located on their control panel. This is for testing the neutral light bulb only, does not indicate the regulator is on neutral.

Position indicator PI Indicates present tap changer position, max lower and raise position, also activates the raise and lower limit switches.

Potential Transformer PT Reduces the primary regulator voltage to 120 volts, operates the motor and control panel, some regulators have 2 one for motor and one for control.

Preventive Auto is connected to the moveable contacts. Maintains continuity during tap changes and limits circulating current on odd steps. Also called a bridging reactor on some brands.

Reactance This setting is used to set LDC

Reactor Is connected to the two moveable contacts, maintains continuity during tap changes, and limits circulating current on the odd steps.

Series winding is connected to the stationary contacts.

Set voltage SV This setting is set for the voltage you want the regulator to deliver +or- your bandwidth.

Stationary Contact SC the contacts that are attached to the tap changer board, quantity of 8 in addition to the neutral contact, also 2 reversing switch stationaries'.

Straight regulator the exciting or shunt winding is connected to the S and the SL bushing, also known as a type A regulator.

Tap changer TC Consists of moveable's, stationary contacts, reversing contacts, drive motor and capacitor.

Time delay TD This setting is the timing of the control on auto, starts timing for the time delay you have set then will operate the tap changer.

Volt meter test terminals VTT Hook your voltmeter to these terminals to read out put voltage.

Regulator Purpose

PURPOSE OF A VOLTAGE REGULATOR

- **To maintain a constant and reliable voltage to your customers.**
- **Increase revenues by maintaining acceptable voltage.**
- **Prevent high and low voltage from burning up customers equipment.**
- **Motors running at low voltage will start heating up.**
- **High voltage will shorten the life of heating elements, clothes dryer, electric furnace coils, water heaters, electric ranges.**
- **Prevent brown outs.**
- **Goal to maintain voltage 5% plus or minus from 120 volts set point. Range 114 to 126 volts.**