RIPPLE METER

MODEL: THIS MANUAL APPLIES TO ALL MODELS:

290-RPL-BATT 290-RPL1 290-RPL2 290-RPL2-N 290-RPL3

CONTENTS:

Section	Screen	290-RPL1 290RPL-BATT	290-RPL2	290-RPL2-N	290-RPL3
1.	**RELAY ENABLE**		▪	▪	▪
2.	**LOW RIPPLE**		▪	▪	▪
3.	**HIGH RIPPLE**		▪	▪	▪
4.	**LOW DC VOLT**		▪	▪	▪
5.	**HIGH DC VOLT**		▪	▪	▪
6.	**MINIMUM DC VOLT**		▪	▪	▪
7.	**ALARM DELAY**		▪	▪	▪
8.	**AVERAGING FILTER**	▪	▪	▪	▪
9.	**NETWORK**			▪	
10.	**BOX W /AUDIO & LIGHT ALARMS**				▪

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I. OVERVIEW FOR THE RIPPLE METER

JP Tech's Ripple meters incorporate several setup screen options in the Menu designed for ease of operation, information gathering, and programming. All models incorporate a main display screen that shows DC voltage, AC voltage, percent of ripple, and alarm conditions.

All models use a two (2) button keypad to cycle through the Menu displays available and to set the parameters of the meter:

- The **SELECT** key, when pressed and released, cycles through the different screens available to the specific model. In all screens (except the Main display screen), holding the **SELECT** key for about 3 seconds will enable the flashing cursor; releasing and pressing again will position the cursor for a change to be made. Holding the **SELECT** key again for about 3 seconds will stop the flashing cursor. *The **SELECT** key will not change any existing information. It only provides a way to move through the menu or move the flashing cursor.*

- The **CHANGE** key is used to change a value or option related to the specific flashing display chosen with the SELECT key (for example to change the value of the LOW RIPPLE % or to ENABLE or DISABLE the RELAY). NOTE: Pressing and releasing BOTH the **SELECT** and the **CHANGE** keys together once the flashing cursor stops, will take you back to the MAIN DISPLAY default screen.

- **EXAMPLE FOR USING THE SELECT AND CHANGE KEYS:**

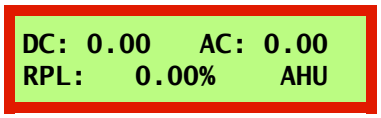
  SETTING HIGH RIPPLE: From the SETUP screen, PRESS/RELEASE the **SELECT** key three (3) times. This will bring you to the HIGH RIPPLE screen. To enter any value or reset existing values, PRESS/HOLD the **SELECT** key for about 3 seconds until the *LEFT MOST DIGIT* begins to flash. When it flashes, release the **SELECT** key. If you want the digit that is flashing to stay the same, PRESS/RELEASE the **SELECT** key *ONCE*. This will move the flashing cursor over to the right one digit. **[This is the method used to move the flashing cursor over for all screens.]**

  If you want to change the value of the flashing digit, PRESS/RELEASE the **CHANGE** key *ONCE*. Each time the **CHANGE** key is pressed and released, the value of the digit increases by one (1) and cycles from 0 through 9. **[This is the method used to change the value of the flashing cursor for all screen.]**

  Once you have set the values you want, PRESS/HOLD the **SELECT** key until the flashing cursor disappears (about 3 seconds).

II. RIPPLE METER OPERATION

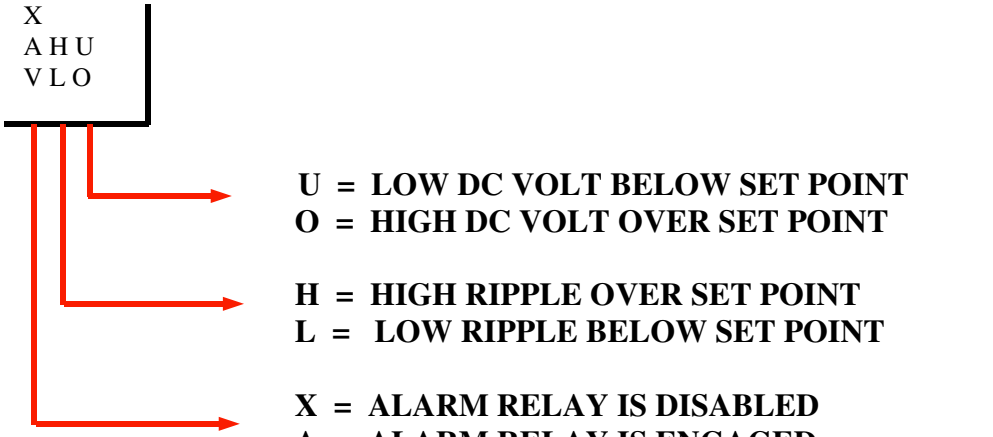
A. MAIN DISPLAY SCREEN



To the right is the **Main Display** Screen. This screen shows DC voltages, AC voltages, and the amount of ripple currently present. This screen auto-ranges from 0-600V with the DC and AC readouts auto-ranging separately. Percent ripple maximum is 999.99%. The lower right corner indicates the alarm status. Below is a list of the status symbols and their meaning.

ALARM STATUS SYMBOLS: (Some Symbols not on every model)

ALARM SYMBOLS:



U = LOW DC VOLT BELOW SET POINT
O = HIGH DC VOLT OVER SET POINT

H = HIGH RIPPLE OVER SET POINT
L = LOW RIPPLE BELOW SET POINT

X = ALARM RELAY IS DISABLED
A = ALARM RELAY IS ENGAGED
V = DC VOLT BELOW MINIMUM SET POINT

The enabled ALARM engages when one or more of the set points are out of range. The ALARM disengages when all set points are within their ranges.

II. RIPPLE METER OPERATION (Cont.)

B. SETUP

To the right is the **SETUP** screen. Behind this screen are the screens that enable/disable the alarm relay, program the set points for activating the alarm, sets the amount of delay before the Alarm condition is acknowledged, and enables/disables the averaging filters. To acquire these screens, PRESS/HOLD the **Select** key for about 3 seconds. Toggle to each subsequent screen with the **Select** key as well. **NOTE: To get back to the main screen any time while in SETUP, press/release BOTH keys at once.**

Programming: SEE "OVERVIEW"

1. RELAY ENABLE

To the right is the **RELAY ENABLE** screen. This screen ENABLES or DISABLES the Alarm relay. This must be set to ENABLE for the relay to function. *The Alarm conditions (H,L,O,U, and V) seen on the **MAIN DISPLAY** screen will appear whether the relay is enabled or disenabled but instead of an "A" indicating that the Alarm relay is enabled, there will be an "X" indicating that the relay is disabled.*

Programming: See "OVERVIEW"

2. LOW RIPPLE

To the right is the **LOW RIPPLE** screen. This screen sets the lower limit of ripple before the Alarm condition is engaged. Normally this is set to 0% ripple which disables this alarm condition (as the screen above is set = default setting). In some cases, however, when the ripple parameters are known, setting this screen to a value may be helpful to alert you to a potential problem with your rectifier. If the amount of ripple goes below this set point, an "L" will appear in the lower right hand corner of the MAIN DISPLAY screen.

Programming: See "OVERVIEW"

II RIPPLE METER OPERATION (Cont.)

3. HIGH RIPPLE

To the right is the **HIGH RIPPLE** screen. This screen sets the upper limit of ripple before the Alarm condition is engaged. This setting should be set high enough so that slight fluctuations due to AC power variations, barrel movement, etc. can take place without setting off the alarm. If the amount of ripple goes above this set point, a "H" will appear in the lower right hand corner of the MAIN DISPLAY screen. Setting this screen to 999.99v disables this alarm condition.

Programming: See "OVERVIEW"

4. LOW DC VOLTS

To the right is the **LOW DC VOLTS** screen. The alarm condition will be enabled when a voltage is encountered that is lower than what is set in this screen. For example, if this screen is set for 6 volts, any voltage below this value will engage the alarm condition. When this happens, a "U" would appear in the lower right hand corner of the MAIN DISPLAY screen. Setting this screen to 000.00V disables this alarm.

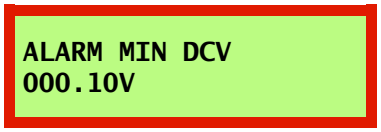
Programming: SEE "OVERVIEW"

5. HIGH DC VOLTS

To the right is the **HIGH DC VOLTS** screen. The alarm condition will be enabled when a voltage is encountered that is above what is set in this screen. For example, if this screen is set for 6 volts, any voltage above this value will engage the alarm condition. When this happens, an "O" will appear in the lower right hand corner on the MAIN DISPLAY screen. Setting this screen to 999.00v disables this alarm.

Programming: SEE "OVERVIEW"

6. ALARM MIN DCV



To the right is the **ALARM MIN DCV** screen. The alarm will be <u>disabled</u> when the meter's voltage is below the set point entered into this screen. For example, if this screen is set for 1 volt, any voltage <u>below</u> this amount will inhibit the alarm condition. When this happens, a "V" will appear in the lower right hand corner on the MAIN DISPLAY screen. To disable all the Alarm conditions, set this screen to 999.00v. **Keep this value to a least 0.10 DCV.**

Programming: SEE "OVERVIEW"

II RIPPLE METER OPERATION (Cont.)

7. ALARM DELAY

To the right is the **ALARM DELAY** screen. This screen sets the amount of time, in seconds, before an alarm condition is reported to the MAIN DISPLAY screen. This function is used to prevent slight variations in ripple that happen over a short period of time from engaging the Alarm condition. A typical setting would be 4 to 6 seconds but may need to be longer depending on your rectifier's performance. **Need to set the Alarm Delay for a Min of 1 seconds.**

Programming: SEE "OVERVIEW"

8. AVERAGING FILTER

To the right is the **AVERAGING FILTER** screen. When enabled, this screen allows the ripple to be averaged over a period of time in order to smooth out peaks and valleys that may occur due to voltage fluctuations, barrels rolling, etc. The ripple percent will become more stable on the MAIN DISPLAY screen when this function is enabled.

Programming: SEE "OVERVIEW"

J P TECH: RIPPLE METER

SPECIFICATIONS

FUNCTION	RANGE	RESOLUTION	ACCURACY
DC VOLTAGES	6.00 V	0.01V	+/- (1.0% + 2dgt)
	60.0V	0.1V	+/- (1/0% + 2dgt)
	600V	1V	+/- (1.0% + 2dgt)
AC VOLTAGES	6.00V	0.01V	+/- (1.0% + 2dgt)
	60.0V	0.1V	+/- (1/0% + 2dgt)
	600V	1V	+/- (1.0% + 2dgt)

Accuracy is given as +/- (% of reading + number of least significant digits)
At 20 degrees C to 24 degrees C for a period of six months after calibration.

OPERATION AND BATTERY INSTULLATION

OPERATION:

NOTE: COULD BE EXPOSED TO HIGH VOLTAGES AND AMPERAGES. USE EXTREME CAUTION WHEN USING THIS INSTRUMENT.

1. Place the RED booted clamp on the POSITIVE output bus and the BLACK booted clamp on the NEGATIVE output bus.
2. Turn on the meter. ["0" = OFF and "l" = ON]
3. Read the DC and AC voltages and the Ripple on the LCD screen.

BATTERY REPLACEMENT:

1. Unscrew the four (4) screws holding the faceplate in place.
2. From the bottom of the faceplate, pry up and rotate forward.
3. Remove battery from holder and replace with the new one.
4. Replace lid back onto the enclosure and secure with the four screws.

TYPICAL INSTULLATION
(NOT BATTERY POWERED)

1. Connect the RED lead to the Positive Bus bar on the Rectifier or at the Positive Bus bar at the tank.
2.. Connect the BLACK lead to the Negative Bus bar on the rectifier or at the Nega tive bus at the tank.
3. Power the Ripple meter from a 110VAC source. Please Note: No off/on switch; disable by un-plugging the unit.

NOTE: MAY NEED ADDITIONAL WIRE AND TERMINAL STRIP TO MAKE THE CONNECTIONS TO THE BUS BAR OR TANK. IF SO, MAKE SURE WIRE IS HEAVY ENOUGH FOR TOTAL VOLTAGE POSSIBLE.

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