

RIPPLE METER

USER MANUAL

MODELS	290-RPL-BATT	290-RPL-2	290-RPL-3
	290-RPL-1	290-RPL-2-N	

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INSTALLATION

Step-by-Step Guide

1. Read Manual to familiarize yourself with the operation of the meter.
2. Mount Unit.
3. Connect the RED lead to the positive bus bar on the rectifier or tank. Connect the BLACK lead to the negative bus bar on the rectifier or tank. **NOTE: You may need additional wire or terminal strip to make the connections to the bus bar or tank. If so, make sure the wire is heavy enough for the total voltage possible.**
4. Apply power to the meter using a 110VAC source. There is no switch on the meter; disable the meter by unplugging.

Battery Installation

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 old battery from holder and replace with the new one.
4. Replace lid and secure with the four screws.

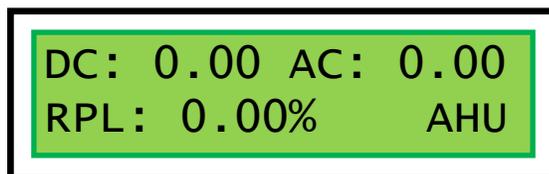
NOTE: YOU COULD BE EXPOSED TO HIGH VOLTAGES AND AMPERAGES. USE EXTREME CAUTION WHEN USING THIS INSTRUMENT.

QUICK START

USING THE METER

JP Tech's Ripple meters are designed for measuring DC voltages, AC voltages, and the amount of ripple present.

JP Tech's Ripple meters incorporate a simple menu design featuring a two (2) button keypad. Pressing the **SELECT** key once cycles through different menu screens. Holding the **SELECT** key for about three (3) seconds will enable changes to be made on the menu screen chosen (not applicable on all screens; see the *Menu Operation* section for information on which values are editable).



The default menu screen

After holding the **SELECT** key for three (3) seconds, a flashing cursor will appear, allowing for changes to be made. In this mode, the **SELECT** key moves your cursor right, and the **CHANGE** key advances the selected value by one. Once you have set the values you want, hold the **SELECT** key to return to the menu.

NOTE: The **SELECT key will not change any values by itself! It only provides a way to move through menu screens or move the flashing cursor.**

When the cursor is not flashing, pressing both the **SELECT** and **CHANGE** keys together will take you back to the default 'SECONDS' screen (as shown above). However, while editing values (cursor is flashing), pressing both the **SELECT** and **CHANGE** keys together will reset the value to zero.

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.

MENU OPERATION

Menu Hierarchy

1. Main Display Screen (**Default Screen**)
2. Setup
 - 2.1. Relay Enable
 - 2.2. Low Ripple
 - 2.3. High Ripple
 - 2.4. Low DC Volts
 - 2.5. High DC Volts
 - 2.6. Alarm Min DCV
 - 2.7. Alarm Delay
 - 2.8. Averaging Filter (**290-RPL-BATT & 290-RPL-1 ONLY**)

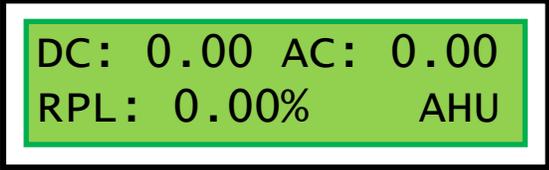
MENU OPERATION

Main Menu Screens

1. MAIN DISPLAY SCREEN

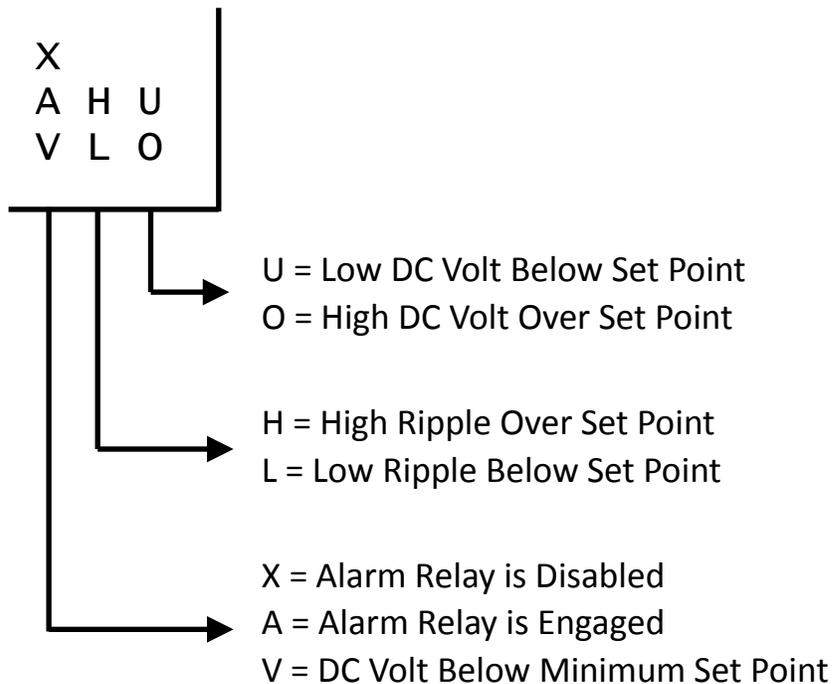
To the right is the Main Display Screen. This screen shows DC voltages, AC voltages, and the amount of ripple currently present. This screen automatically ranges from 0-600V with the DC and AC readouts automatically ranging separately. The maximum percentage ripple the meter can display is 999.99%.

The lower right corner indicates the alarm status.



DC: 0.00 AC: 0.00
RPL: 0.00% AHU

ALARM SYMBOLS:



2. SETUP

After holding down the SELECT key for about 3 seconds, this screen allows you to enable/disable the alarm relay, program the set points for activating the alarm, set the amount of delay before the alarm activates, and enable/disable the averaging filters.



SETUP

MENU OPERATION

Setup Options

2.1. RELAY ENABLE

This menu screen allows you to ENABLE or DISABLE the alarm relay.

If the alarm relay is enabled, an "A" will appear on the main screen. If the alarm relay is disabled, an "X" will appear on the main screen.

A green rectangular box with a black border containing the text "RELAY ENABLED" in black, uppercase letters.

2.2. LOW RIPPLE

This menu screen allows you to set the lower limit of ripple before the alarm condition is engaged. Normally (and by default) this is set to 0% ripple, which disables the alarm condition. 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 setpoint, an "L" will appear on the main screen.

A green rectangular box with a black border containing the text "LOW RIPPLE" and "000.00%" in black, uppercase letters.

2.3. HIGH RIPPLE

This menu screen allows you to set the upper limit of ripple before the alarm condition is engaged. This setting should be set high enough that slight fluctuations in power can take place without setting off the alarm. Setting this screen to 999.99% disables this alarm condition.

If the amount of ripple goes above this setpoint, a "H" will appear on the main screen.

A green rectangular box with a black border containing the text "HIGH RIPPLE" and "000.00%" in black, uppercase letters.

2.4. LOW DC VOLTS

This menu screen allows you to set the lower DC voltage limit. The alarm condition will be engaged if a voltage is encountered that is lower than this value. Setting this screen to 000.00V disables this alarm

If a voltage under this setpoint is encountered, a "U" will appear on the main screen.

A green rectangular box with a black border containing the text "LOW DC VOLTS" and "000.00V" in black, uppercase letters.

2.5. HIGH DC VOLTS

This menu screen allows you to set the high DC voltage limit. The alarm condition will be engaged if a voltage is encountered that is higher than this value. Setting this screen to 999.00V disables this alarm

If a voltage over this setpoint is encountered, an "O" will appear on the main screen.

A green rectangular box with a black border containing the text "HIGH DC VOLTS" and "000.00V" in black, uppercase letters.

2.6. ALARM MIN DVC

The alarm will be DISABLED when the meter's voltage is below the setpoint entered into this screen. For example, if this screen is set for 1 volt, any voltage below this amount will inhibit the alarm condition.

If the meter's voltage drops below this setpoint, the alarm will DISABLE, and a "V" will appear on the main screen. KEEP THIS VALUE TO AT LEAST 0.10V.

A green rectangular box with a black border containing the text "ALARM MIN DCV" and "000.10V" in black, uppercase letters.

MENU OPERATION

Setup Options

2.7. ALARM DELAY

This screen allows you to set the amount of time, in seconds, before an alarm condition is reported to the main display. 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 value would be 4 to 6 seconds, but may need to be longer depending on the performance of your rectifier.

The value must be set to a minimum of 1 second.

2.8. AVERAGING FILTER

This screen allows you to engage the averaging filter. The averaging filter allows the ripple to be averaged over a period of time in order to smooth out peaks and valleys that occur due to voltage fluctuations, barrels rolling, etc. The ripple percentage will become more stable on the main display when this function is enabled.



ALARM DELAY
01 SECONDS



AVERAGING FILTER
ENABLED

PARTS LIST

<u>ITEM</u>	<u>PART NUMBER</u>
ELASTIC SQUEEZE TUBE <i>(Standard with unit. Good for weak to strong alkalis, weak to medium acids.)</i>	245-4-ELSQZTUB
THERMISTANT SQUEEZE TUBE <i>(Has superior acid-resistant and alkali-resistant qualities.)</i>	245-4-TMSQZTUB
FLUORO-VITON SQUEEZE TUBE <i>(Good for strong solvents and acids.)</i>	245-4-FVSQZTUB
SQUEEZE TUBE LUBRICANT	245-4-SQZLUBE
100 RPM/24 VDC PERISTALTIC GEARMOTOR	245-4-GEARMOTOR-FV
ROLLER FOR PERISTALTIC UNITS	245-4-ROLLER
FACEPLATE FOR PERISTALTIC UNITS	245-4-FACEPLATE
ROLLER / TUBE PUMP HOUSING	245-4-PMPBODY
RED/BLACK TWISTED PAIR SIGNAL WIRE	210-1-TWPR22RD
DELIVERY TUBING—20' ROLL <i>(Polyethylene 1/4' OD, rigid wall tubing)</i>	245-4-PLYTB20
DELIVERY TUBING—50' ROLL	245-4-PLYTB50
DELIVERY TUBING—100' ROLL	245-4-PLYTB100
PERISTALTIC HINGE	245-4-HINGE

NOTE: CHECK YOUR SQUEEZE TUBES PERIODICALLY FOR INTEGRITY (ABLE TO EXPAND AFTER BEING SQUEEZED BY THE ROLLERS).

ORDER PARTS

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- This warranty applies only if the product is defective under normal use. It does not apply to breakage or defect from accident, alteration, misuse, or abuse of the product or component. In addition, this warranty is effective only if the product or component is installed in a location and manner prescribed by JP Tech's instructions and only if it is so maintained. This warranty becomes null and void if the product or component is altered by anyone other than JP Tech, its authorized representatives, or by expressed written authorization for a specific situation.
- If JP Tech elects to send a service technician to a customer site to repair a defect, the cost of transportation and/or living expenses will be paid for by the customer. Should the defect turn out to be the result of the customer's misuse, improper installation, or maintenance of the product or component, the customer will be responsible for the full cost of the service call including labor charges plus the aforementioned travel and living expenses.
- JP Tech will repair or replace any defective part within a product at the sole discretion of JP Tech. If JP Tech should choose to supply a part to the customer as a no-charge warranty replacement, the customer assumes all cost of installation associated with the replacement part. If the product needs to be returned for warranty service, a Returned Material Authorization (RMA) must be issued by JP Tech prior to such return. All returned material must be sent freight prepaid or it will not be accepted by JP Tech irrespective of warranty issues.
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This warranty may be modified, wholly or in part, at any time by JP Tech without notice to past or future customers. The warranty revision in effect at the time of shipment shall prevail in any claims rendered.

JP TECH, INC.

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- Certain products may require initial and progress payments before the commencement and continuation of design, engineering, component procurement, and manufacture. These products will not be shipped until all progress payments have been made. Cancellation of any orders in progress will necessitate the forfeitures of any payments received to date as well as payment of any costs accrued in excess of paid amounts.
- Orders must be accepted by JP Tech at their home office. Acceptance of any purchase order, regardless of the method, is conditioned on assent of buyer to the terms and conditions contained herein.
- Sales are FOB point of shipment. Sales terms are net 30 days from date of shipment. Present or future sales, use, or other taxes on sales, installation or use shall be paid by purchaser. Purchaser shall pay 1% interest per month on all outstanding amounts due to JP Tech. Interest accrual shall begin on the 31st day after shipment for all outstanding amounts.
- All sales are final. Any decisions to accept return of product after shipment and receipt by purchaser shall be at the sole discretion of JP Tech and not until payment has been made and agreement by purchaser to pay all shipping, cancellation, and restocking charges that may accrue.
- Shipping dates given prior to shipment are estimated, actual delivery will be based on factory and engineering loading at the time of manufacture as well as the availability of parts required for manufacture. JP Tech shall not be liable for any costs or damages arising out of or related to any delays in shipment or delivery, including but not limited to liquidated damages, unless otherwise agreed in writing.
- JP Tech may change design or construction of any product or component in any way they see fit. Upgrades for previously purchased products may be available for certain products for a price that will be determined when appropriate.
- Except as provided herein, any controversy, claim or dispute arising out of or related to any order or sale or breach thereof, including but not limited to any breach of warranty claims, shall be litigated in state court, Walworth or Waukesha Counties, Wisconsin, and shall be governed by the laws of Wisconsin. If JP Tech is the prevailing party, JP Tech shall be entitled to collect all reasonable fees and costs, including court costs and attorney fees.