



***AC Voltage Interface Unit (VIU)
for the Galaxy/Millennium
Controller
With L50 – L55 Interface Units***

Operation, Installation and Maintenance Manual
WP-93497
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HELP!

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WARNING
 OPENING ENCLOSURES EXPOSE HAZARDOUS VOLTAGES.
 ALWAYS REFER SERVICE TO QUALIFIED PERSONNEL ONLY.

WARNING
 THE TRANSDUCER UNIT IS INTENDED FOR CONNECTION TO BUILDING ENTRANCE PANELBOARDS PROTECTED BY A SECONDARY SURGE ARRESTOR INTENDED FOR LOCATION CATEGORY "B" OR "C" AS DEFINED IN ANSI/IEEE C62.41-1991. THESE ARRESTORS SHOULD BE RATED FOR A MINIMUM OF 50 KA PER PHASE, WITH A CLAMPING VOLTAGE OF 1500V MAXIMUM AT 20 KA. THE ARRESTOR MUST BE CONNECTED TO ALL PHASES OF THE AC LINE AND THE NEUTRAL CONDUCTOR. THE SURGE ARRESTOR IS TO BE GROUNDED WITH THE SHORTEST AND THICKEST WIRE POSSIBLE PER APPLICABLE CODES.

WARNING
 THE TRANSDUCER UNIT IS NOT INTENDED FOR USE IN OUTDOOR APPLICATIONS.

NOTE 1: The VIU is not intended to be a Power Quality Analyzer. It is intended only to provide a “snapshot” view of AC current peak amplitude scaled to a sinusoidal RMS-equivalent (e.g. $V_{\text{peak}} \times 0.707$) DC voltage value. The user should be aware that true RMS values of non-sinusoidal waveforms are not calculated by this unit, and that no phase, harmonic, or conduction angle information is provided. The Galaxy or Millennium controller can be programmed to provide a history of the AC voltage monitored by the transducer, but the sampling interval is not “real time” and events of short duration (between sampling intervals) may not be captured.

NOTE 2: The VIU is powered by an external DC source (24V with internal jumper connected, or 48V with the jumper disconnected). The input is protected against reverse polarity by a series diode (e.g. the unit will not sustain damage when it is connected with the polarity reversed, but will not operate until the correct DC supply polarity is connected). The VIU can operate with either + or - grounded, since the DC circuitry is totally floating from ground (e.g. there is no internal DC ground connection in the transducer). The RPM module wires which connect to the VIU are also isolated from ground.

1. GENERAL

The Voltage Interface Unit transducer kit is designed to provide a simple to install, pre-packaged solution for AC voltage monitoring applications using external monitoring systems such as the Lineage Power Galaxy based products. The VIU is designed to provide a flexible solution for applications that require single or three phase voltage monitoring. The VIU converts AC signals from a single or three phase (leg-leg or leg/neutral – depending on List Number) voltage source to accurate, isolated low voltage DC outputs which can be transmitted to monitoring systems. The VIU is equipped with all components factory mounted and pre-wired in a single enclosure. This greatly simplifies the installation process, since the installer only has to:

- Provide DC input from a overcurrent protected source, typically Alarm Battery Supply (ABS). Put the internal zener bypass jumper in place if a 24VDC (VS 48VDC) input is required.
- Connect AC voltage monitoring point inputs (from a 10A or 15A circuit breaker protected source – normally a branch distribution panel or the building AC mains panel) to the measurement points on TB1.
- Connect a monitoring system capable of measuring 0-3VDC to an easy access connection point on the VIU (Such as the Galaxy Peripheral Monitoring System “RPM” module) to permit interface with the Galaxy controller system.
- Calibrate the VIU to measure specific AC voltage values using easy to turn trim pots.

1.1 Revision Status of Units

The Revision status of the VIU can be determined by looking at the front panel label. Units with no revision status are “Pre-rev. B” units. Units with a revision status are “Rev. B and later units”. Revision B was first shipped in May, 2000. Revision B status does not involve a change in operating functionality for the VIU.

2. INTRODUCTION

AC voltage transducers are used in applications where direct measurement of the AC voltage by other monitoring equipment is not possible. The voltage transducer consists of a voltage transformer(s) and additional circuitry which converts the measured waveform into proportional DC signals (one per phase) that can be read by the monitoring unit. Both the transformers and signal conditioning circuitry are conveniently housed in a metal enclosure which can be mounted adjacent to the measurement points. The AC inputs are physically separated and transformer isolated from the DC outputs.

WARNING
IT IS STRONGLY RECOMMENDED THAT THIS ENTIRE MANUAL BE READ BEFORE INSTALLING THIS UNIT. OBSERVE ALL CAUTIONS AND WARNINGS TO AVOID PERSONAL INJURY OR EQUIPMENT DAMAGE.

2.1 Standard Products

Check the model list number of your unit to make sure it is the type you need. Standard options are as follows.

WP-93497 AC Voltage Interface Unit (VIU) List Numbers and Comcodes: (See Note A below)

List #	Comcode	Phase	Volts	Description
<i>WP-93497 L50</i>	<i>407 618 198</i>	<i>1</i>	<i>120 line to neutral</i>	<i>120V, single-phase, voltage interface unit</i>
<i>WP-93497 L51</i>	<i>407 618 180</i>	<i>1</i>	<i>240 line to line</i>	<i>240V, single-phase, voltage interface unit</i>
<i>WP-93497 L52</i>	<i>407 618 172</i>	<i>3</i>	<i>208 line to line</i>	<i>208V, three-phase delta, voltage interface unit</i>
<i>WP-93497 L53</i>	<i>407 618 164</i>	<i>3</i>	<i>240 line to line</i>	<i>240V, three-phase delta, voltage interface unit</i>
<i>WP-93497 L54</i>	<i>407 618 156</i>	<i>3</i>	<i>480 line to line</i>	<i>480V, three-phase delta, voltage interface unit</i>
<i>WP-93497 L55</i>	<i>407 618 131</i>	<i>3</i>	<i>120 line to neutral</i>	<i>208V, three-phase, four-wire, voltage interface unit</i>

Note A: Each transducer requires either one or three channel connections from a 3VDC peripheral monitor module that is not furnished with the interface unit. If no spare monitor channel is available, a 3VDC peripheral monitor module should be ordered separately.

3. VIU KIT CONTENTS

The VIU kit consists of the following:

- 1 - Single or Three phase AC voltage transducer kit in a metal enclosure
- 3 – ½ “ Conduit Opening Grommets (use bottom conduit openings only, See Section 7.1) if conduit not used.
- 1 - Product Manual (Programming, Installation, Troubleshooting, etc)

4. EQUIPMENT REQUIRED

For AC measurements with the Galaxy/Millennium Controllers, and for installation, the following components are required:

- Galaxy Intelligent Option card
- Galaxy Remote Peripheral Monitoring Option Card
- 0-3VDC Galaxy Remote Peripheral Monitoring Module and Current Limiting Resistors, as required
- Butt splices to connect current limiting resistors to RPM module input
- Crimp tool for resistor butt-splices (See crimp tool specification in plastic package with the connectors)
- Remote Peripheral monitoring module bus cable (Reference J85501G-1) as required
- Bus termination resistor (Only if the 0-3VDC module is the last device on the bus)
- Maximum 15A AC branch circuit over-current protection device (usually a thermal circuit breaker) rated for the voltage and number of phases monitored by the VIU. This device is mounted in the AC panel being monitored.
- Max 14 AWG wire for connecting the AC voltage source to the VIU input (consult local codes). Wire must be rated to handle branch circuit protection device current rating.

NOTE 3: Unit Grounding may be provided through the grounded metallic conduit, or by a separate wire from the CO GRD Bar to the identified location on the VIU (per applicable local codes).

- DC power over current protection device (usually a 1A fuse at the Alarm Battery Supply (ABS) fuse panel).
- 1 Small Jeweler’s Flathead Screwdriver and 1 Philips Screwdriver.
- Digital Voltmeter.

5. APPLICATIONS

The VIU provides accurate monitoring of:

- Commercial AC Load Circuits (PDUs)
- Engine/Generator Outputs
- UPS Outputs
- Inverter Outputs
- General Purpose AC Monitoring

The Galaxy/Millennium controller can be programmed to provide accurate AC monitoring and alarm reporting. Examples are:

- UPS output Voltage too High/Low
- Inverter output Voltage too High/Low
- Commercial AC Failure
- Loss of Phase Voltage
- Transfer to Engine/Generator
- Engine/Generator Voltage too High/Low

6. SAFETY

6.1 Safety Statements

Please read and follow all safety instructions and warnings before installing, maintaining, or repairing the VIU.

The VIU is listed by Underwriters Laboratories Inc. to the requirements of UL Subject 1801, requirements for DC Power Distribution Centers for Communications Equipment, as a peripheral device for use with DC Power Distribution controllers. The Listing is based on the items noted below.

Install only in restricted access areas (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17, and 110-18 of the U.S. National Electric Code (NEC), ANSI/NFPA No. 70, and pursuant to applicable local codes.

UL Listing does not include evaluation of device performance (i.e. measuring functions or for use as any safety control/monitoring device).

This equipment is to be used in controlled environments (an area where the humidity is maintained at levels that can not cause condensation on the equipment, the contaminating dust is controlled, and the steady-state ambient temperature is within the range specified).

This equipment has been evaluated for use in a continuous ambient temperature of up to 50 degrees Celsius (125 F).

The DC input power is to be connected to 48 or 24 VDC (Put zener bypass jumper in place for 24VDC operation) nominal supply that is electrically isolated from the AC mains and reliably earth grounded or, to 48 or 24 VDC power supplies evaluated to UL1950 and identified as Safety Extra Low Voltage (SELV) outputs. The DC input can be provided from a DC distribution or Alarm Battery Supply (ABS) panel using a minimum 1A overcurrent protection device (maximum 2A) at the panel, and wired per local codes. Either polarity of the DC supply can be grounded, since the VIU does not have an internal ground reference on the DC circuitry. Accidental reversal of the DC polarity will temporarily prevent the VIU from operating, and will not cause permanent damage.

The DC input and output shall not be run in the same raceway as the AC wiring. See Section 7.1 for details.

AC input from the source must be protected by a maximum 15A overcurrent branch circuit protector at the monitored source and wired per local codes.

NOTE 4: Unit Grounding may be provided through the grounded metallic conduit, or by a separate wire from the CO GRD Bar to the identified location on the VIU (per applicable local codes).

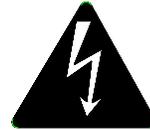
6.2 Warning Statements and Safety Symbols



The above symbol identifies the need to refer to the equipment instructions for important information.



This symbol (or equivalent) is used to identify the presence of hazardous AC mains voltages.

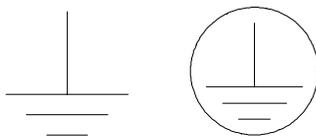


This symbol is used to identify the presence of hazardous AC or DC voltages. It may also be used to warn of hazardous energy levels.

The symbols may sometimes be accompanied by some type of statement - for example: “Hazardous voltage/energy inside. Risk of injury. This unit must be accessed only by qualified personnel.”

When working on or using this type of equipment, the following precautions should be noted:

- This unit must be installed, serviced, and operated only by skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.
- Hazardous energy and/or voltages may be present in the unit and on the interface cables that can shock or cause serious injury. Follow all safety warnings and practices when servicing this equipment.
- The AC line voltage input side of terminal block (TB-1) contains hazardous AC voltages. Before making any connections to or accessing this connector, disconnect the voltage at the source. (Follow all safety lockout and tagging procedures)



The above symbols (or the “GND” symbol) are used to identify the safety earth ground or bonding point for the equipment.

7. MOUNTING

The VIU can be wall mounted on any flat, smooth surface using the 4 mounting holes (1/4" diam., use #12 or 3/16 hardware) provided in the rear of the unit. Correct securing hardware for the installation surface is to be used in mounting this product, and mounting is to be per appropriate industry practices. Securing hardware capable of supporting at least 4 times the weight of the product (48 lb) should be chosen to mount the product. Suitable fasteners or wall anchors should be used when mounting on masonry or drywall. The VIU weighs approximately 12 lbs.

7.1 Conduit Considerations

WARNING

Use the bottom Knockouts for all wiring and conduit entry. Keep wires from the AC voltages being monitored separate from the wires to the Remote Peripheral Module (RPM) and the DC power supply wires. Either grommet(s) or conduit entry fittings must be used at these holes to avoid insulation chafing.

The AC line voltage monitoring wires can be routed to the VIU via a single 1/2" conduit. The Data wires to the Galaxy Remote Peripheral Monitor must be routed through a separate conduit. Likewise, the DC power wires to the VIU should be separated from the AC wires. There are 3 knockout holes (1/2") on the bottom of the unit. The wires must be routed either through the grommets included in the kit, or through the appropriate conduit fittings. For safety, the AC voltage monitoring wires and the DC and Data wires should be kept separated from each other within the VIU box.

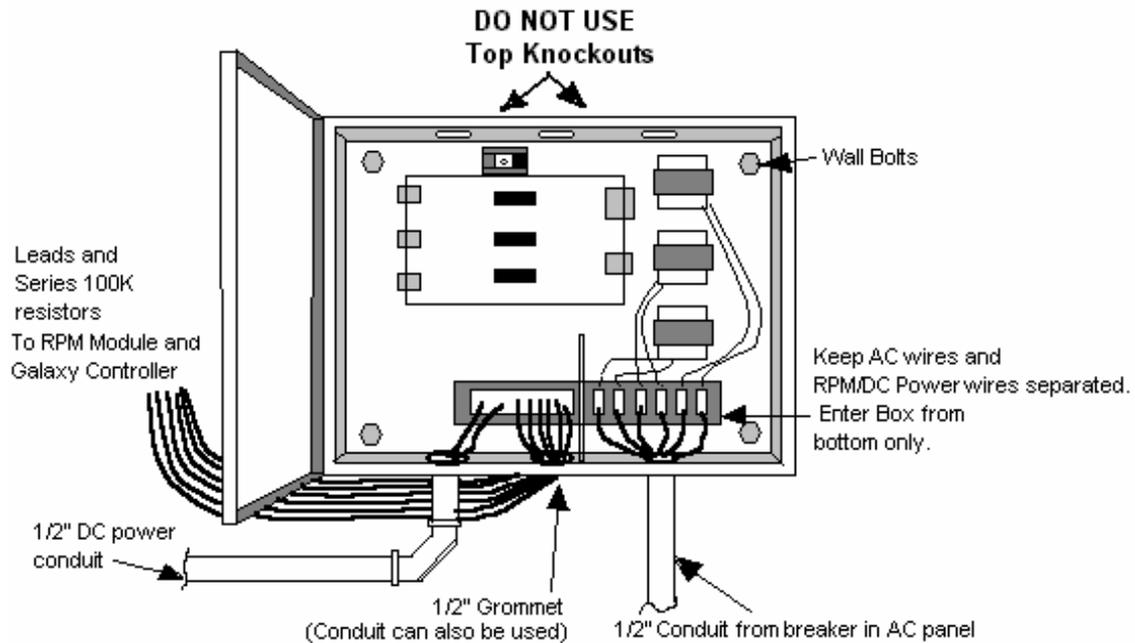


Figure 1 – Conduit and Wire Routing, Typical

8. WIRING

8.1 DC Power Input

The DC Power Input can be either from a 24 or 48VDC nominal system. If 24 VDC is used, the Zener bypass jumper must be connected within the unit.

NOTE 5: connection of the 24VDC jumper in a 48VDC system will cause damage to the unit.

The DC input power to the unit must be protected by a 1A (Max 2A) overcurrent protection device at the DC distribution panel. Use 14 AWG stranded (maximum diameter allowed by terminals in the unit) or smaller wire capable of handling the maximum fused DC source current. Insulation should be either RHH or RHW.

8.2 Lineage Power Remote Peripheral Monitoring Module Channel Wiring

Before connecting the VIU to the Galaxy Remote Peripheral Monitoring (RPM) Module, set the module address.

Caution: No two modules can have the same address. All addresses are valid except 00.

Use the far left knockout with a grommet (if conduit is not used) for the DC wiring. See Section 7.1.

Connect the Galaxy Remote Peripheral Monitoring Module using 20-22 AWG twisted pair wire and 100K current limiting resistors to TB1 (the area marked as DC output). See Note below, and Figures 2-5.

*Note: Current Limiting Resistors are not provided with the VIU. These resistors are normally furnished as part of the Remote Peripheral Monitoring Module kits.

8.3 AC Voltage Measurement Points

Electrical knockouts in the area of the AC “Line Voltage Input” are provided on the bottom of the VIU for AC conduit connections. Use this knockout for the AC input to keep the wiring separated from the DC side. Use a sufficient length of wire to connect to the AC input terminal block and dress/secure wires neatly to keep separated from the DC side and the PWB. See section 7.1.

The sense leads for measuring voltage are to be originated from the load side of a maximum 15A branch circuit protector (not provided with this kit) located within an installed panelboard (the voltage point being monitored). Consult the National Electric Code for recommended wiring sizes and details on connections. The TB1 terminal block can accept wires up to 14 AWG stranded. Insulation should be type THHN or better, rated for conduit useage. The branch circuit protector must be appropriate for the panelboard being monitored.

Note: All GND references in the figures for AC inputs are ACEG points.

WARNING!!

follow appropriate job safety procedures when working with all electrical equipment.

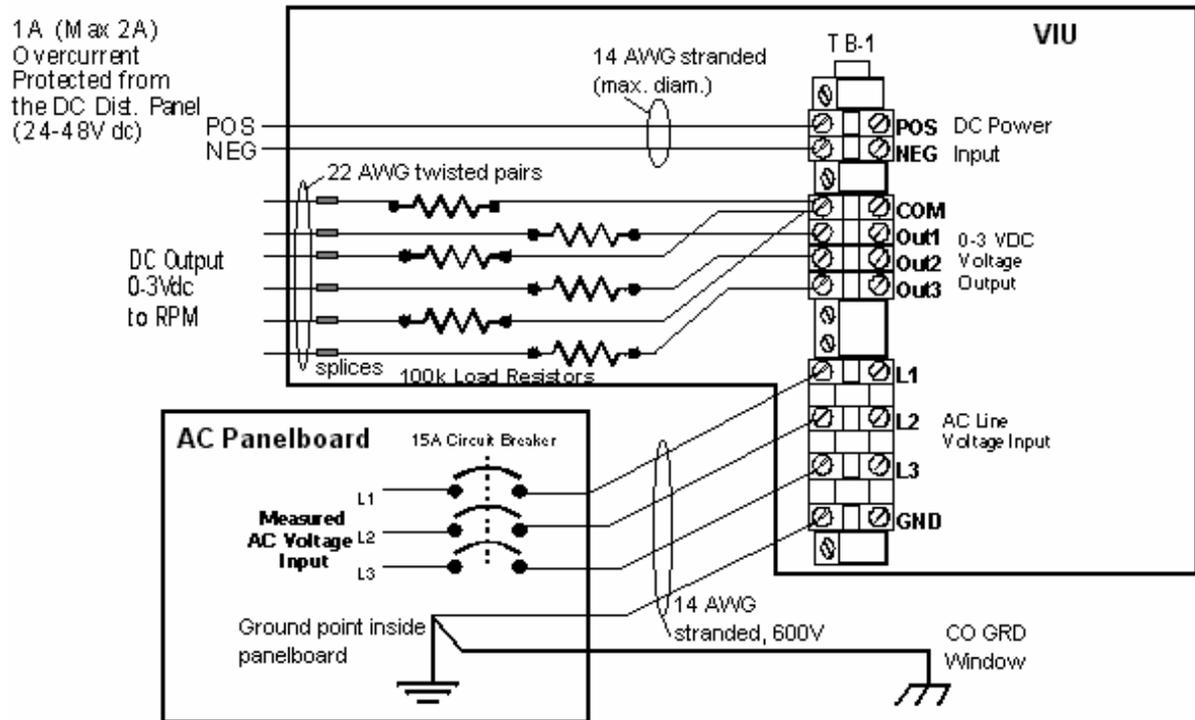


Figure 2 – 3 Phase Delta Configuration (WP-93497 L52, L53, L54)

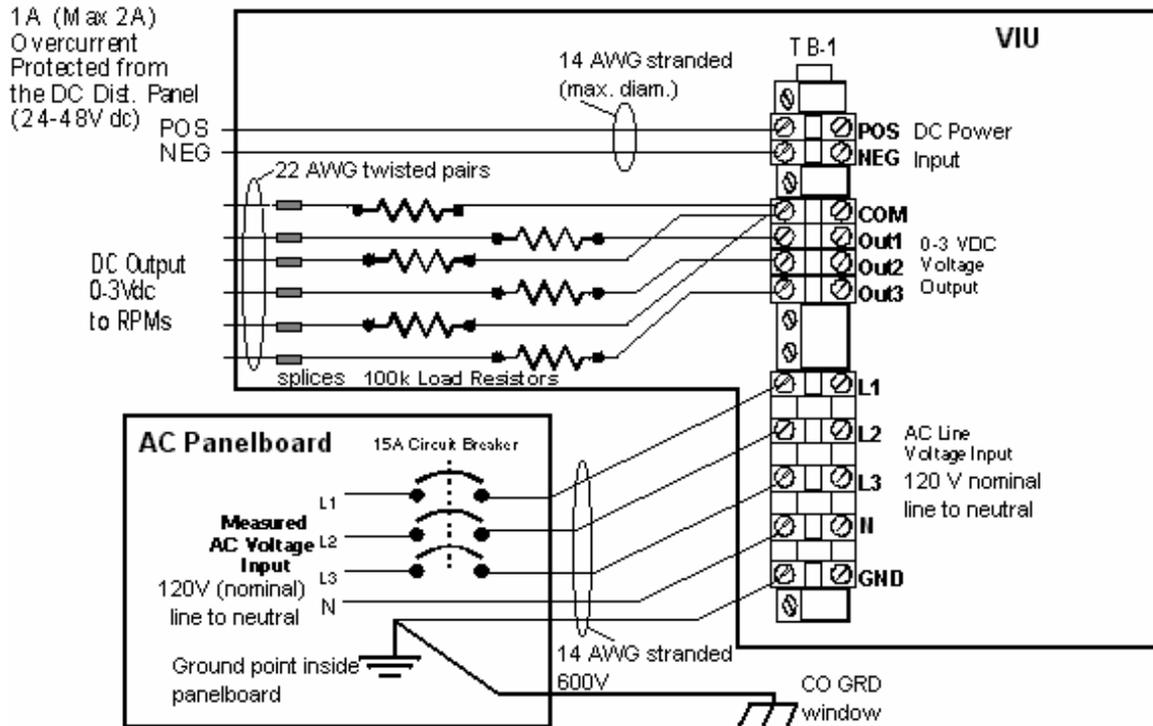


FIGURE 3 – 3 Phase 4 Wire configuration (WP-93497 L55)

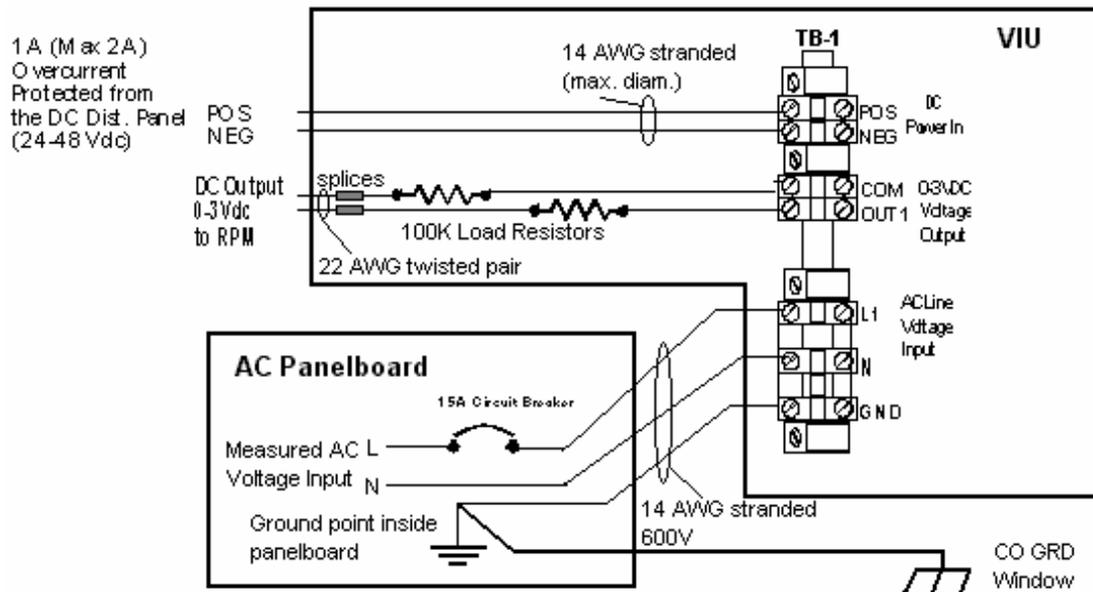


FIGURE 4 – One Phase Configuration (WP-93497 L50)

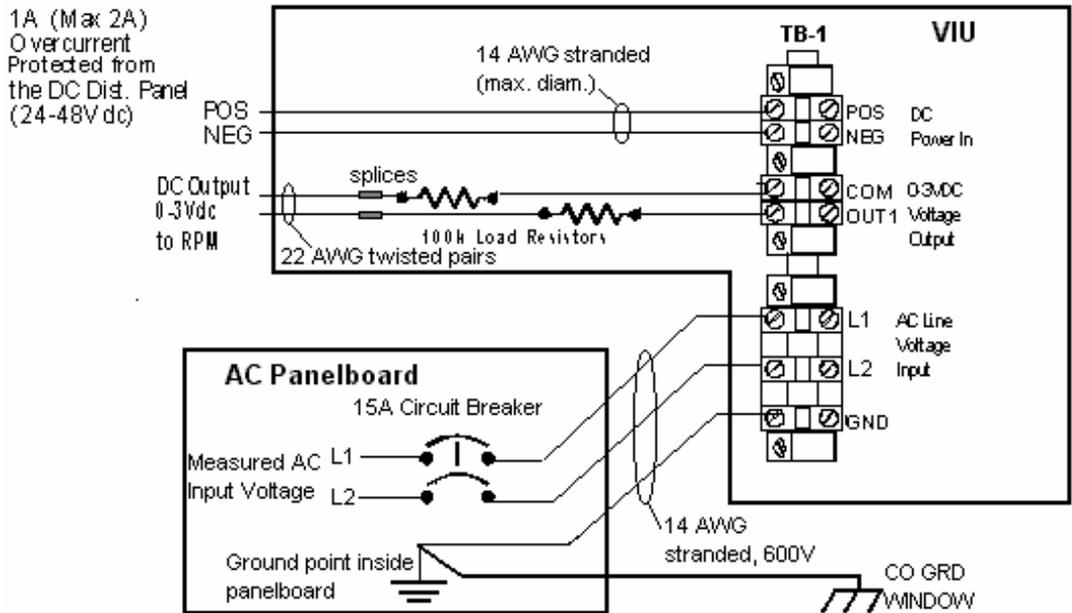


FIGURE 5 – Two Phase Configuration (WP-93497 L51)

9. TECHNICAL SPECIFICATIONS

VIU SPECIFICATIONS

Model Number	WP-93497
Configurations	
VOLTAGE CONFIG.	Single/Three Phase, Line to Line or Line to Neutral
MEASURED AC VOLTAGE	3 @ 0-600 VAC
VIU	Choose From: 120, 208, 240, or 480 Nominal
Accuracy	2% for +/- 25% of Calibrated point
Electrical Ratings	
DC Input Power	
Nominal	24VDC or 48 VDC
Operating Range	16 to 36VDC or 40 to 60 VDC
Current	50 mA max.
Output Signal Voltage	1 or 3 @ 0-3 VDC
Environmental	
Temperature	0-125 °F (-17°C to 51 °C)
Humidity	5 - 95 % RH Non-Condensing
Size	13.25"W x 10.375"H x 4.0"D
Weight	12 lbs
Safety Agency	Underwriters Laboratories (UL) Listed

10. PROGRAMMING THE GALAXY CONTROLLER

Before beginning, if you are an experienced EasyView programmer, you may want to bypass this detailed section, and go to the *EasyView Quick Configuration Table*.

10.1 EasyView Graphical User Interface (GUI) (Microsoft Windows® Based)

The address **MUST BE SET** by the user, using the rotary hex switches on each remote monitoring module.

Procedure

1. Verify that the VIU unit is connected to a 0-3VDC Remote Peripheral Monitoring module.
2. Login to the Galaxy using the EasyView program.
3. Select **Configure** menu.
4. Under the **Configure** menu, select **Monitoring**.
5. Under **Monitoring**, select **Voltage Channels**. Reference *Illustration A*.
6. A screen similar to *Illustration B* shall be shown.
7. Locate the address and channels of the transducer module used. Each channel must be modified.

Channel 1 Configuration (Voltage #1)

Click on the **Modify** button located in the lower left hand corner of the screen. A screen similar to *Illustration C* will now be displayed.

Description field

Type in a text description of the channel. (Note that the following fields are automatically configured by the Galaxy and can not be changed: *Value, Identifier, Type, Address, TL1, Status, Channel, and Voltage Range*)

Scale Factor, Offset, Units

Input Voltage	Scale Factor	Offset	Units
110	50	0	Vac
208-240	100	0	Vac
480	200	0	Vac

Create User Defined Event for Alarming

For the Galaxy to generate an alarm when the monitored AC voltage for phase 1 is above or below a threshold, a user defined event must be created.

For each channel, using the mouse, select the *Create New User Defined Event And Modify* button in the lower left corner of the screen. *Illustration C*.

Select **OK** to confirm changes. A screen similar to *Illustration D* will now be seen.

The *Description* field is used to define the alarm condition when the AC voltage increases or decreases from the desired value being measured. An example would be *AC Voltage #1 Out of Range*.

Select the *Severity* of the alarm. *Illustration D*.

(Optional Step) Select the *LED* to be illuminated on front panel of the controller when the AC voltage is out of range. *Illustration D*.

(Optional Step) Select the alarm *Relay* that will become active when the AC voltage is out of range. *Illustration D*.

Configuration of the *Callout on Alarm* fields is beyond the scope of this manual. Refer to the Galaxy Product Manual.

To configure this user defined event as a *Latched* alarm event, *Enable* the *Latched* field. (*Latched* implies that once the alarm condition retires, the alarm will remain active until it is cleared by the user)

The final step is the *Program Line* definition. The *Program Line* should be the following:

(C1XX > Upper Threshold) | (C1XX < Lower Threshold)
XX = Module Address

The “|” symbol is the symbol for **OR**. It is usually above the ENTER key on your keyboard.

Channel 2 Configuration (Voltage #2)

Click on the **Modify** button located in the lower left hand corner of the screen. A screen similar to *Illustration C* will now be displayed.

Description field

Type in a text description of the channel. (Note that the following fields are automatically configured by the Galaxy and can not be changed: *Value, Identifier, Type, Address, TLI, Status, Channel, and Voltage Range*)

Scale Factor, Offset, Units

Input Voltage	Scale Factor	Offset	Units
110	50	0	Vac
208-240	100	0	Vac
480	200	0	Vac

Create User Defined Event for Alarming

For the Galaxy to generate an alarm when the monitored AC voltage phase 2 is above or below a threshold, a user defined event must be created. *Illustration C*.

For each channel, using the mouse, select the *Create New User Defined Event And Modify* button in the lower left corner of the screen.

Select **OK** to confirm changes. A screen similar to *Illustration D* will now be seen.

The *Description* field is used to define the alarm condition when the AC voltage increases or decreases from the desired value being measured. An example would be *AC Voltage #2 Out of Range*.

Select the *Severity* of the alarm. *Illustration D*.

(Optional Step) Select the *LED* to be illuminated on front panel of the controller when the AC voltage is out of range. *Illustration D*.

(Optional Step) Select the alarm *Relay* that will become active when the AC voltage is out of range. *Illustration D*.

Configuration of the *Callout on Alarm* fields is beyond the scope of this manual. Refer to the Galaxy Product Manual.

To configure this user defined event as a *Latched* alarm event, *Enable* the *Latched* field. (*Latched* implies that once the alarm condition retires, the alarm will remain active until it is cleared by the user)

The final step is the *Program Line* definition. The *Program Line* should be the following:

(C2XX > Upper Threshold) | (C2XX < Lower Threshold)
XX = Module Address

The “|” symbol is the symbol for **OR**. It is usually above the ENTER key on your keyboard.

Channel 3 Configuration (Voltage #3)

Click on the **Modify** button located in the lower left hand corner of the screen. A screen similar to *Illustration C* will now be displayed.

Description field

Type in a text description of the channel. (Note that the following fields are automatically configured by the Galaxy and can not be changed: *Value, Identifier, Type, Address, TLI, Status, Channel, and Voltage Range*)

Scale Factor, Offset, Units

Input Voltage	Scale Factor	Offset	Units
110	50	0	Vac
208-240	100	0	Vac
480	200	0	Vac

Create User Defined Event for Alarming

For the Galaxy to generate an alarm when the monitored AC voltage phase 3 is above or below a threshold, a user defined event must be created. *Illustration C.*

For each channel, using the mouse, select the *Create New User Defined Event And Modify* button in the lower left corner of the screen.

Select **OK** to confirm changes. A screen similar to *Illustration D* will now be seen.

The *Description* field is used to define the alarm condition when the AC voltage increases or decreases from the desired value being measured. An example would be *AC Voltage #3 Out of Range.*

Select the *Severity* of the alarm. *Illustration D.*

(Optional Step) Select the *LED* to be illuminated on front panel of the controller when the AC voltage is out of range. *Illustration D.*

(Optional Step) Select the alarm *Relay* that will become active when the AC voltage is out of range. *Illustration D.*

Configuration of the *Callout on Alarm* fields is beyond the scope of this manual. Refer to the Galaxy Product Manual.

To configure this user defined event as a *Latched* alarm event, *Enable* the *Latched* field. (*Latched* implies that once the alarm condition retires, the alarm will remain active until it is cleared by the user)

The final step is the *Program Line* definition. The *Program Line* should be the following:

(C3XX > Upper Threshold) | (C3XX < Lower Threshold)
XX = Module Address

The “|” symbol is the symbol for **OR**. **It is usually above the ENTER key on your keyboard.**

This completes the VIU unit programming with EasyView. Galaxy is now ready to monitor AC voltage.

11. MAINTENANCE

The VIU should be checked on a semi-annual basis to ensure the VM-1 board is calibrated properly. To perform the maintenance test, use a standard DVM to measure the input line voltage at TB1 L1-L2(for 2 phase), L1- N(for 1 phase), and L1-L2, L1-L3 and L2-L3(for 3 phase). Record these manual readings. Compare the measured readings with the display of the Galaxy controller. If the measured voltage is more than 2% +/- difference the VM-1 should be field calibrated. Follow the instructions below to calibrate the analog outputs of the VM-1. No other maintenance is required for the VIU.

12. CALIBRATION

To calibrate the VIU’s VM-1 analog outputs, use a standard DVM to measure the input line voltage at TB1 L1-L2, L1-L3 and L2-L3 (L1-N, L2-N, L3-N for 4-wire units). Record these manual readings. Use the DVM to measure the DC analog voltage outputs from the VM-1 Board by placing the black probe on “COM” and the red probe on “OUT 1”, “OUT 2” and “OUT 3”. The OUT 1 output corresponds to Phase A, OUT 2 to Phase B, OUT 3 to Phase C. For Single and Two-phase units, simply calibrate the potentiometers for the channels actually connected to the VM1 board.

To adjust the analog output voltage for each phase use a suitable screwdriver to turn the corresponding adjustment trim pot for the phase being calibrated. Slowly turn the trim pot until the Galaxy displays an accurate reading. After calibrating each phase, recheck all phases. See Fig. 6 and Table A below.

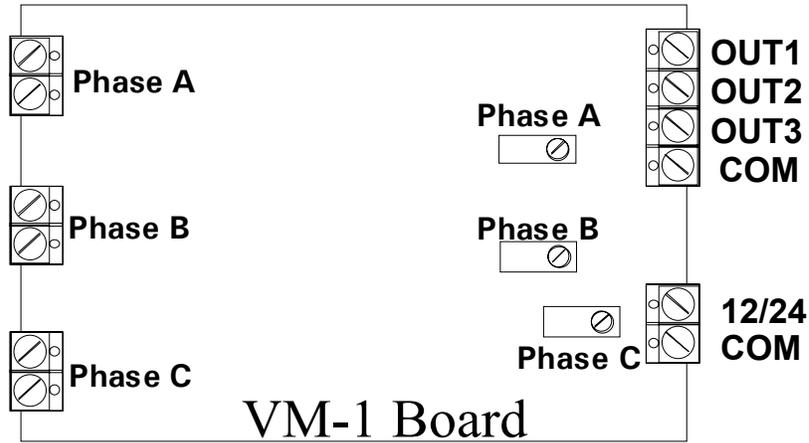


Figure 6 – VM1 Board Detail

Table A – Potentiometer Calibration

VIU LIST NUMBER	Adjust Phase M (where M = A, B, or C) Pots for:
L51 – L53	DC Volts on OUT N (where N = 1, 2, or 3) = Line to Line AC Volts \div 100
L54	DC Volts on OUT N (where N = 1, 2, or 3) = Line to Line AC Volts \div 200
L50, L55	DC Volts on OUT N (where N = 1, 2, or 3) = Line to Neutral AC Volts \div 50

13. TROUBLESHOOTING

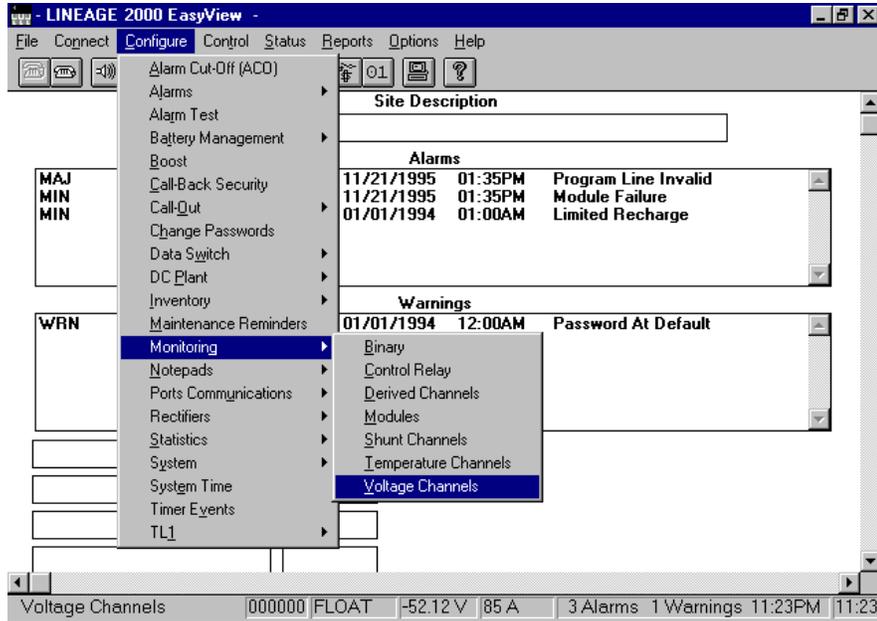
PROBLEM	Possible CAUSE	SOLUTION
No AC voltage Reading at the Galaxy, but the voltmeter has a reading.	There may be a bad connection from the source to the VIU input.	Verify that a solid connection exists between the source and the VIU input.
When a low voltage alarm is present, no LED on Galaxy Front Panel.	The User Defined Event and/or severity LED for the voltage transducer is not configured.	Modify User Defined Event for the voltage channel. (See Galaxy Product Manual)
The Alarm LEDs and conditions stay active after a low AC voltage condition is no longer present.	The channel is configured as a latched event.	Disable the Latched event feature under the modify screen.
The Voltage values reported by Galaxy are out of the specified accuracy range.	The Scale Factor and Offset values may have been changed.	Change the Scale Factor and Offset values.
No alarms are generated when the alarm thresholds are exceeded.	The User Defined Event for AC Voltage Reporting may have been changed.	Verify that the Alarm configuration for the User Defined Event is correct.

14. EASYVIEW QUICK CONFIGURATION TABLE (XX=MODULE ADDRESS)

	Required	Optional	Entry for Required Values; Example for Optional Values
Channel 1- Voltage #1			
Description		Yes	AC Voltage #1
Scale Factor	Yes		50 (110 Vac), 100 (208-277 Vac), 200 (480 Vac)
Offset	Yes		0 for all AC inputs
UDE Description		Yes	AC Voltage #1 Out of Range
Severity		Yes	Major
LED		Yes	AC
Alarm Relay		Yes	AC
Program Line	Yes		(C1XX > Upper Threshold) (C1XX < Lower Threshold)
Latched		Yes	Disable
Channel 2- Voltage #2			
Description		Yes	AC Voltage #2
Scale Factor	Yes		50 (110 Vac), 100 (208-277 Vac), 200 (480 Vac)
Offset	Yes		0 for all AC inputs
UDE Description		Yes	AC Voltage #2 Out of Range
Severity		Yes	Major
LED		Yes	AC
Alarm Relay		Yes	AC
Program Line	Yes		(C2XX > Upper Threshold) (C2XX < Lower Threshold)
Latched		Yes	Disable
Channel 3- Voltage #3			
Description		Yes	AC Voltage #3
Scale Factor	Yes		50 (110 Vac), 100 (208-277 Vac), 200 (480 Vac)
Offset	Yes		0 for all AC inputs
UDE Description		Yes	AC Voltage #3 Out of Range
Severity		Yes	Major
LED		Yes	AC
Alarm Relay		Yes	AC
Program Line	Yes		(C3XX > Upper Threshold) (C3XX < Lower Threshold)
Latched		Yes	Disable

15. APPENDIX 1

15.1 Illustration A



15.2 Illustration B

ID#	Addr	Chan	Description	Range	Value	State
C130	30	1	0mV-110mV Chan 1 Addr 30	-10.0mV - 110.0mV	-0.03 mV	OK
C230	30	2	0mV-110mV Chan 2 Addr 30	-10.0mV - 110.0mV	-0.01 mV	OK
C330	30	3	0mV-110mV Chan 3 Addr 30	-10.0mV - 110.0mV	-0.13 mV	OK
C430	30	4	0mV-110mV Chan 4 Addr 30	-10.0mV - 110.0mV	0.01 mV	OK
C530	30	5	0mV-110mV Chan 5 Addr 30	-10.0mV - 110.0mV	-0.02 mV	OK
C630	30	6	0mV-110mV Chan 6 Addr 30	-10.0mV - 110.0mV	-0.01 mV	OK
C135	35	1	0V-3V Chan 1 Addr 35	-0.0V - 3.0V	2.17 V	OK
C235	35	2	0V-3V Chan 2 Addr 35	-0.0V - 3.0V	-0.00 V	OK
C335	35	3	0V-3V Chan 3 Addr 35	-0.0V - 3.0V	-0.00 V	OK
C435	35	4	0V-3V Chan 4 Addr 35	-0.0V - 3.0V	-0.00 V	OK
C535	35	5	0V-3V Chan 5 Addr 35	-0.0V - 3.0V	-0.00 V	OK
C635	35	6	0V-3V Chan 6 Addr 35	-0.0V - 3.0V	-0.00 V	OK
C136	36	1	0V-3V Chan 1 Addr 36	-0.0V - 3.0V	2.17 V	OK
C236	36	2	0V-3V Chan 2 Addr 36	-0.0V - 3.0V	-0.00 V	OK
C336	36	3	0V-3V Chan 3 Addr 36	-0.0V - 3.0V	0.00 V	OK
C436	36	4	0V-3V Chan 4 Addr 36	-0.0V - 3.0V	-0.00 V	OK
C536	36	5	0V-3V Chan 5 Addr 36	-0.0V - 3.0V	-0.00 V	OK
C636	36	6	0V-3V Chan 6 Addr 36	-0.0V - 3.0V	-0.00 V	OK
C13A	3A	1	0V-16V Chan 1 Addr 3A	-0.1V - 16.0V	2.20 V	OK
C23A	3A	2	0V-16V Chan 2 Addr 3A	-0.1V - 16.0V	4.40 V	OK
C33A	3A	3	0V-16V Chan 3 Addr 3A	-0.1V - 16.0V	6.61 V	OK
C43A	3A	4	0V-16V Chan 4 Addr 3A	-0.1V - 16.0V	8.81 V	OK
C53A	3A	5	0V-16V Chan 5 Addr 3A	-0.1V - 16.0V	11.02 V	OK
C63A	3A	6	0V-16V Chan 6 Addr 3A	-0.1V - 16.0V	13.21 V	OK
C13C	3C	1	0V-70V Chan 1 Addr 3C	-0.5V - 70.0V	52.13 V	OK
C23C	3C	2	0V-70V Chan 2 Addr 3C	-0.5V - 70.0V	-0.00 V	OK
C33C	3C	3	0V-70V Chan 3 Addr 3C	-0.5V - 70.0V	-0.00 V	OK
C43C	3C	4	0V-70V Chan 4 Addr 3C	-0.5V - 70.0V	0.00 V	OK

Buttons at the bottom: Modify, Refresh, Write to File, Close.

15.3 Illustration C

The 'Peripheral Monitor' dialog box is titled 'Monitoring Channels (Voltage)'. It contains the following fields and controls:

- Description:** [Empty text box]
- Value:** 0.03 mV
- Identifier:** C130
- Type:** Voltage
- Address:** 30
- TL1:** [Empty text box]
- Status:** ATTACHED
- Channel:** 1
- Units:** [Empty text box]
- Offset:** [Empty text box]
- Scale Factor:** [Empty text box]
- Voltage Range:** 0-3VDC

At the bottom, there is a formula: $(\text{RAW} - \text{OFFSET}) \times (\text{SCALE FACTOR}) = \text{Channel Value UNITS}$. Below the formula are three buttons: 'Create New User Defined Event And Modify', 'OK', and 'Cancel'.

15.4 Illustration D

The 'Alarms' dialog box shows configuration for an alarm with the following details:

- Description:** AC Voltage Out of Range
- Identifier:** U0001
- LED:** RM
- Severity:** MAJ
- Relay:** [Empty dropdown]
- TL1:** [Empty text box]

Call Out On Alarm:

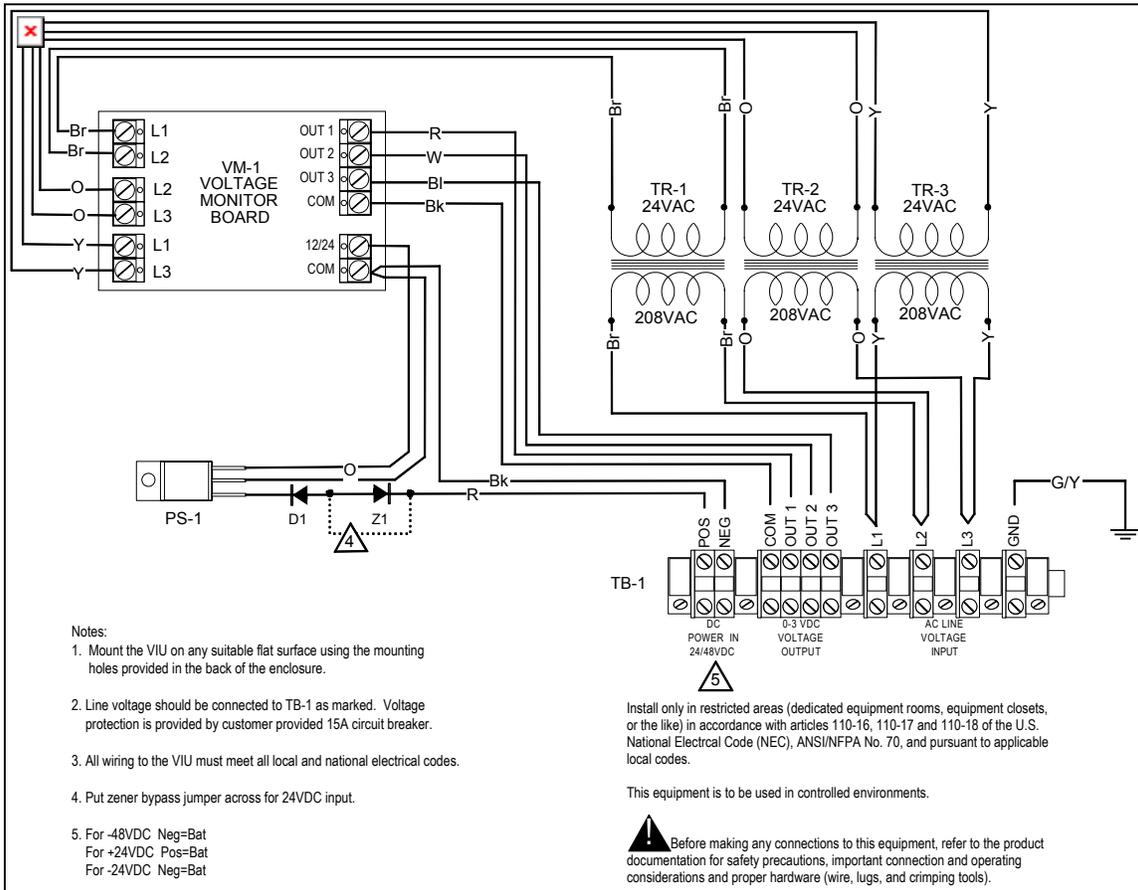
- Notify On Occur: DISABLE
- Notify On Retire: DISABLE
- NAG On Occur: DISABLE
- Notify Delay: 0 seconds (range 0-540)
- Notify Destination(s): P1 P2 P3 P4
-

Latched: DISABLE

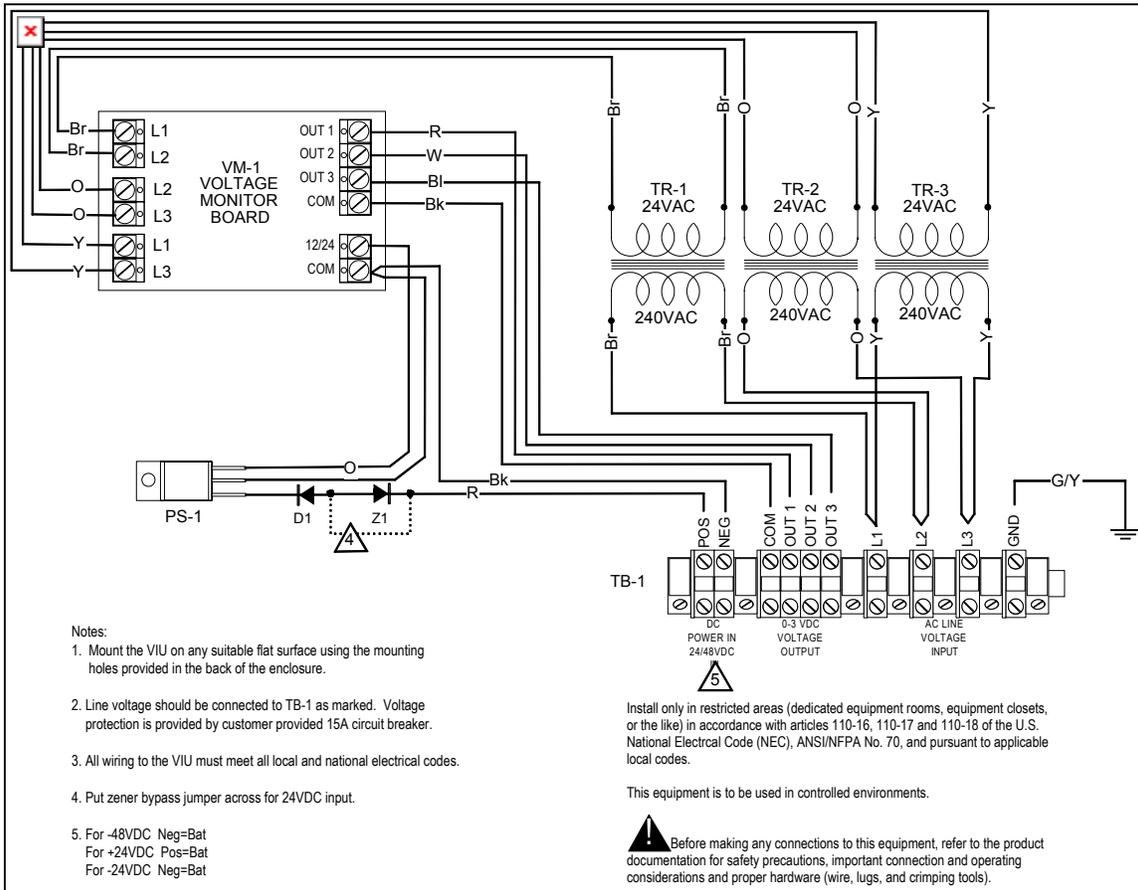
Program Line: C130 < 100

Buttons: 'OK' and 'Cancel'.

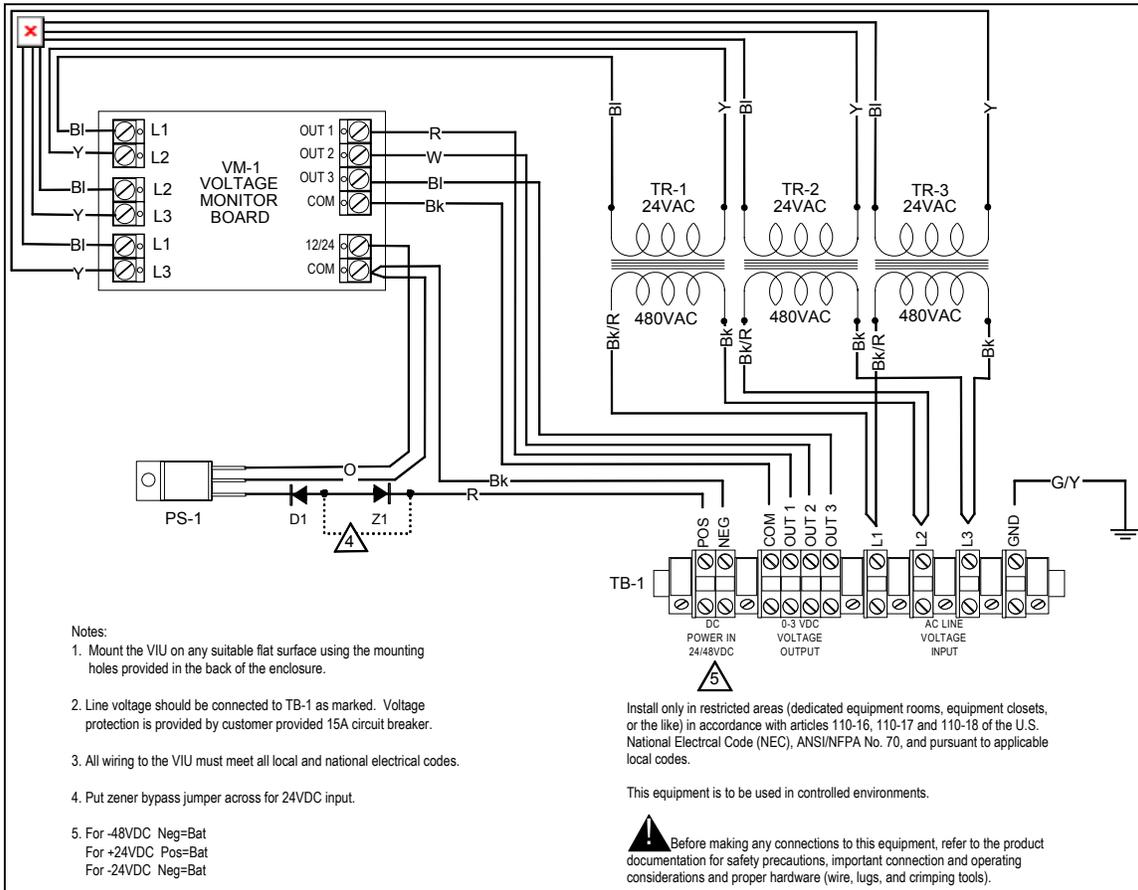
15.5 VIU Internal Wiring Diagram / 208VAC 3Phase Delta (Phase-Phase) (WP-93497 L52)



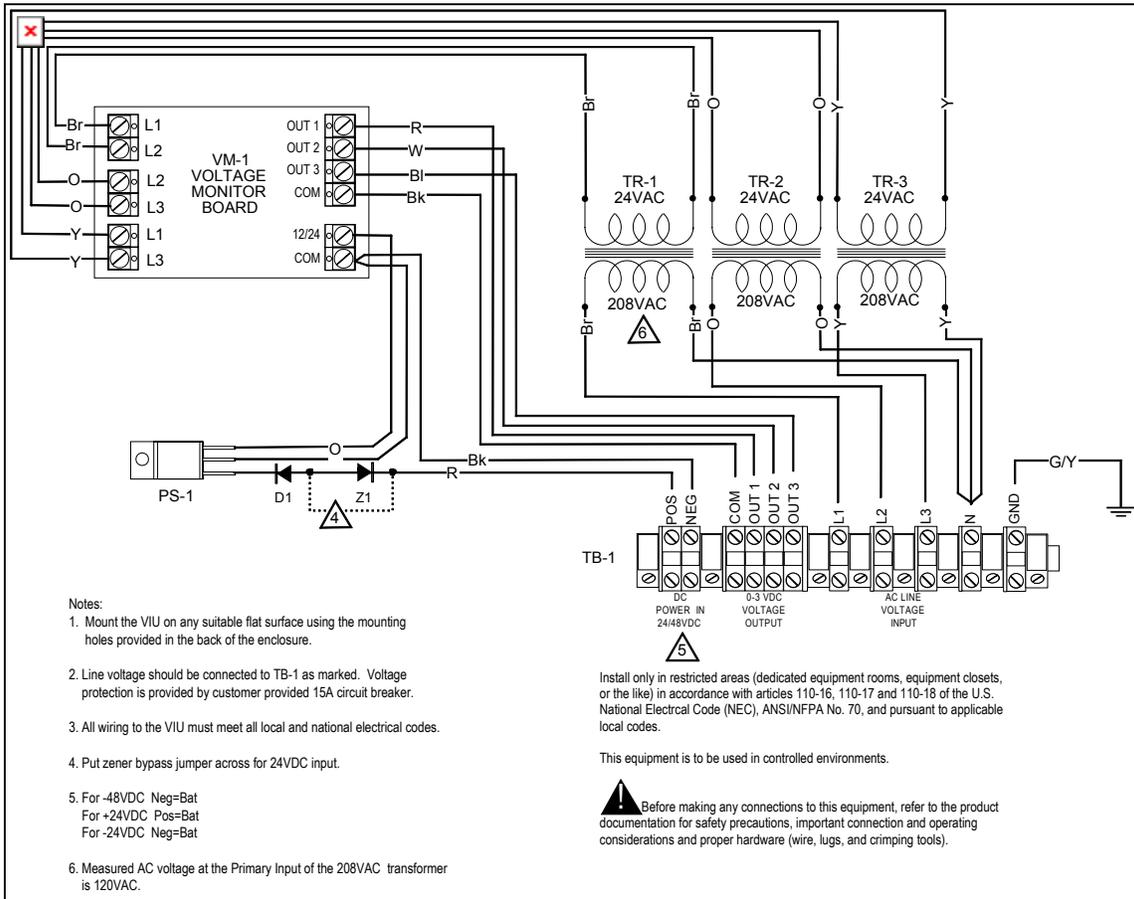
15.6 VIU Internal Wiring Diagram / 240VAC 3Phase Delta (Phase-Phase) (WP-93497 L53)



15.7 VIU Internal Wiring Diagram / 480VAC 3Phase Delta (Phase-Phase) (WP-93497 L54)

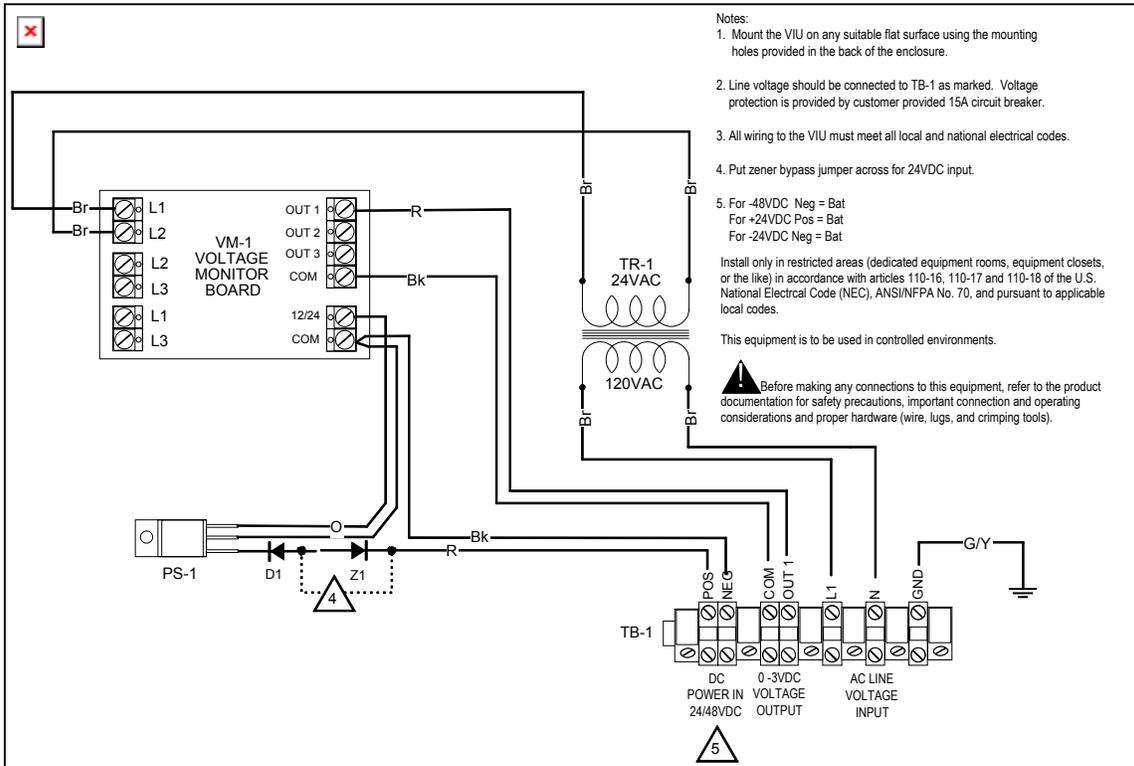


15.8 VIU Internal Wiring Diagram / 120/208VAC 3Phase 4Wire (Phase-Neutral) (WP-93497 L55)

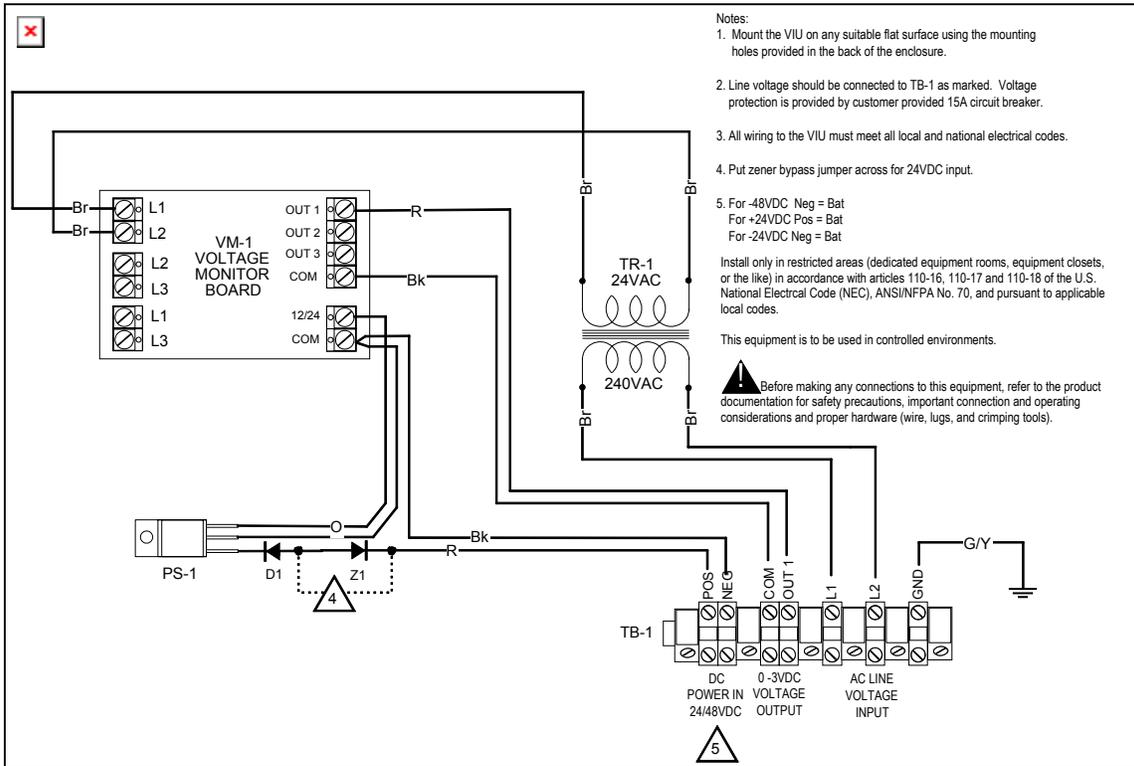


NOTE: Transformers are wired and rated to accept 208VAC line to neutral, even though they are used at 120VAC line to neutral in the actual application. The voltage scaling factor in the Galaxy section takes this transformer ratio into account.

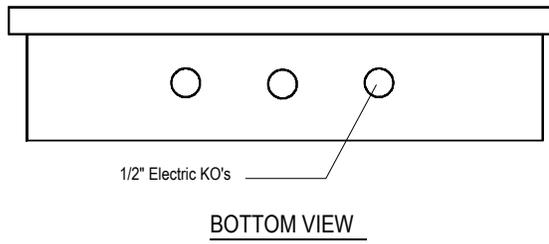
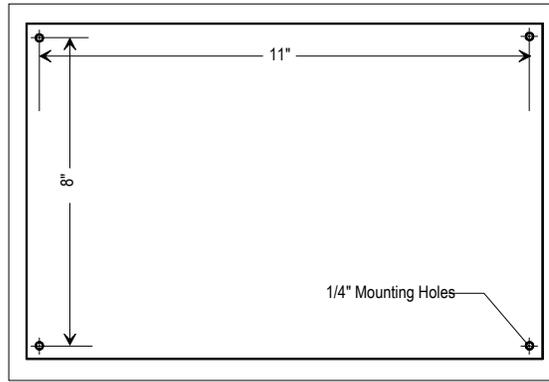
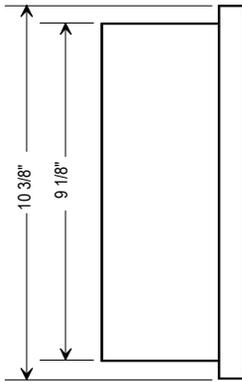
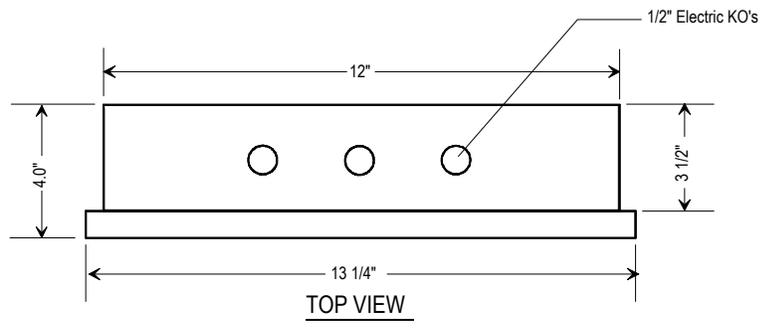
15.9 VIU Internal Wiring Diagram / 120VAC 1Phase (WP-93497 L50)



15.10 VIU Internal Wiring Diagram / 240VAC 1Phase (WP93497 L51)



15.11 VIU Dimensions



15.12 VIU Parts List

Comcode	Used On List #	Part Number	Description	Qty
408270817	50	WP-93497-50-MA	Major Assembly - Transformer section - includes backplate and all components (transformers, terminal blocks etc.)	1
408270916	50	WP-93497-PS24	Power Regulator 48/24VDC harness assembly(includes IN004 diode, 20V Zener diode harnessed as a one assembly)	1
408270924	50	WP-93497-TR120	Isolation Transformer 120VAC Pri / 24VAC Sec.(TR-)	1
408270932	50	WP-93497-50-TB1	Terminal Block (TB1)	1
408270965	50	WP-93497-VM120	Printed Wiring Board (PCB VM-1) Calibrated for 120VAC	1
408270999	51	WP-93497-51-MA	Major Assembly - Transformer section - includes backplate and all components (transformers, terminal blocks etc.)	1
408270916	51	WP-93497-PS24	Power Regulator 48/24VDC harness assembly(includes IN004 diode, 20V Zener diode harnessed as a one assembly)	1
408271013	51	WP-93497-TR240	Isolation Transformer 240VAC Pri / 24VAC Sec(TR-).	1
408271021	51	WP-93497-51-TB1	Terminal Block (TB1)	1
408271039	51	WP-93497-VM240	Printed Wiring Board (PCB VM-1) Calibrated for 240VAC	1
408271047	52	WP-93497-52-MA	Major Assembly - Transformer section - includes backplate and all components (transformers, terminal blocks etc.)	1
408270916	52	WP-93497-PS24	Power Regulator 48/24VDC harness assembly(includes IN004 diode, 20V Zener diode harnessed as a one assembly)	1
408271054	52	WP-93497-TR208	Isolation Transformer 208VAC Pri / 24VAC Sec.(TR-)	3
408271062	52	WP-93497-52-TB1	Terminal Block (TB1)	1
408271070	52	WP-93497-VM208	Printed Wiring Board (PCB VM-1) Calibrated for 208VAC	1
408271104	53	WP-93497-53-MA	Major Assembly - Transformer section - includes backplate and all components (transformers, terminal blocks etc.)	1
408270916	53	WP-93497-PS24	Power Regulator 48/24VDC harness assembly(includes IN004 diode, 20V Zener diode harnessed as a one assembly)	1
408271013	53	WP-93497-TR240	Isolation Transformer 240VAC Pri / 24VAC Sec(TR-)	3
408271153	53	WP-93497-53-TB1	Terminal Block (TB1)	1
408271039	53	WP-93497-VM240	Printed Wiring Board (PCB VM-1) Calibrated for 240VAC	1
408271112	54	WP-93497-54-MA	Major Assembly - Transformer section - includes backplate and all components (transformers, terminal blocks etc.)	1
408270916	54	WP-93497-PS24	Power Regulator 48/24VDC harness assembly(includes IN004 diode, 20V Zener diode harnessed as a one assembly)	1
408271138	54	WP-93497-TR480	Isolation Transformer 480VAC Pri / 24VAC Sec.(TR-)	3
408271161	54	WP-93497-54-TB1	Terminal Block(TB1)	1
408271146	54	WP-93497-VM480	Printed Wiring Board (PCB VM-1) Calibrated for 480VAC	1
408271120	55	WP-93497-55-MA	Major Assembly - Transformer section - includes backplate and all components (transformers, terminal blocks etc.)	1
408270916	55	WP-93497-PS24	Power Regulator 48/24VDC harness assembly(includes IN004 diode, 20V Zener diode harnessed as a one assembly)	1
408270924	55	WP-93497-TR208	Isolation Transformer 120VAC Pri / 24VAC Sec.(TR-)	3
408271179	55	WP-93497-55-TB1	Terminal Block (TB1)	1
408271070	55	WP-93497-VM208	Printed Wiring Board (PCB VM-1) Calibrated for 208VAC	1
108040890	AS Needed	WP-93497-LUC221A	Galaxy Peripheral Monitoring Module (listed for ordering purposes only, if req'd)	1
847635851	AS Needed	WP-93497-LUC221TB	Terminal Block – Monitoring Module (listed for ordering purposes only, if req'd)	1

16. REVISION HISTORY

Issue 8

Corrected voltage transducer comcode in parts list.