



Instruction Leaflet for Cutler-Hammer Enclosed IQ



**WARNING**

READ AND UNDERSTAND THE INSTRUCTIONS CONTAINED HEREINAFTER BEFORE ATTEMPTING TO UNPACK, ASSEMBLE, OPERATE, OR MAINTAIN THIS EQUIPMENT.

HAZARDOUS VOLTAGES ARE PRESENT INSIDE ENCLOSURES THAT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY. FOLLOW PROPER INSTALLATION, OPERATION, AND MAINTENANCE PROCEDURES TO AVOID THESE VOLTAGES.

ALL POSSIBLE CONTINGENCIES WHICH MAY ARISE DURING INSTALLATION, OPERATION, OR MAINTENANCE, AND ALL DETAILS AND VARIATIONS OF THIS EQUIPMENT DO NOT PURPORT TO BE COVERED BY THESE INSTRUCTIONS. IF FURTHER INFORMATION IS DESIRED BY PURCHASER REGARDING HIS PARTICULAR INSTALLATION, OPERATION, OR MAINTENANCE OF PARTICULAR EQUIPMENT, CONTACT A CUTLER-HAMMER REPRESENTATIVE.

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SECTION 1: INTRODUCTION

1.1 PRELIMINARY COMMENTS AND SAFETY PRECAUTIONS

This technical document is intended to cover most aspects associated with the installation, application, operation, and maintenance of Enclosed IQ equipment. It is provided as a guide for authorized and qualified personnel only.

1.2 WARRANTY AND LIABILITY INFORMATION

No warranties, expressed or implied, including warranties of fitness for a particular purpose of merchantability, or warranties arising from course of dealing or usage of trade, are made regarding the information, recommendations, and descriptions contained herein. In no event will Cutler-Hammer be responsible to the purchaser or user in contract, in tort (including negligence), strict liability, or otherwise for any special, indirect, incidental, or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information and descriptions contained herein.

1.3 SAFETY PRECAUTIONS

All safety codes, safety standards and/or regulations must be strictly observed in the installation, operation, and maintenance of this device.



CAUTION

COMPLETELY READ AND UNDERSTAND THE MATERIAL PRESENTED IN THIS DOCUMENT BEFORE ATTEMPTING INSTALLATION, OPERATION, OR APPLICATION OF THE EQUIPMENT. IN ADDITION, ONLY QUALIFIED PERSONS SHOULD BE PERMITTED TO PERFORM ANY WORK ASSOCIATED WITH THE EQUIPMENT. ANY WIRING INSTRUCTIONS PRESENTED IN THIS DOCUMENT MUST BE FOLLOWED PRECISELY. FAILURE TO DO SO COULD CAUSE PERMANENT EQUIPMENT DAMAGE.

REFER ALSO TO IQ DEVICE INSTRUCTION BOOKS. REFER TO INSTRUCTION BOOK TD17530 IF YOUR ENCLOSURE IS EQUIPPED WITH AN IQ ANALYZER. REFER TO INSTRUCTION BOOK TD17548 IF YOUR ENCLOSURE IS EQUIPPED WITH AN IQ DP-4000.

SECTION 2: DESCRIPTION

2.1 CATALOG NUMBER IDENTIFICATION

The Enclosed IQ catalog number provides a description of the features provided with your device. The catalog number is included on labels both on the shipping carton and on the equipment enclosure.

The first set of characters identifies the type of monitoring device mounted in the enclosure. (Refer to Analyzer or DP-4000 instruction books TD17530 or TD17548, respectively, for detailed information on the monitoring device.)

- IQA6010* = IQ ANALYZER WITH SEPARATE SOURCE POWER MODULE
- IQA6030* = IQ ANALYZER WITH SELF-POWERED POWER MODULE
- IQA6210* = IQ ANALYZER WITH SEPARATE SOURCE POWER MODULE AND GRAPHICS DISPLAY
- IQA6230* = IQ ANALYZER WITH SELF-POWERED POWER MODULE AND GRAPHICS DISPLAY
- IQDP4010* = IQ DP-4000 WITH SEPARATE SOURCE POWER MODULE
- IQDP4030* = IQ DP-4000 WITH SELF-POWERED POWER MODULE
- IQDP4110* = IQ DP-4000 WITH SEPARATE SOURCE AND I/O MODULE
- IQDP4130* = IQ DP-4000 WITH SELF-POWERED POWER MODULE AND I/O MODULE

The second set of characters denotes the type of enclosure.

ENC12 = NEMA 12 TYPE ENCLOSURE.

ENC3R = NEMA 3R TYPE ENCLOSURE

The third set of characters denotes additional features, when provided.

-*P* = PONI MODULE

-*U* = UNINTERRUPTABLE POWER SUPPLY

-*A* = TYPE ARII ADDRESSABLE RELAY

2.2 CATALOG NUMBER EXAMPLE

The catalog number ***IQDP4110ENC3R-UA*** denotes an IQDP4110 monitoring device mounted in a NEMA 3R enclosure with an uninterruptable power supply and an addressable relay.

SECTION 3: RECEIVING, HANDLING, AND STORAGE

3.1 RECEIVING AND HANDLING

Every effort is made to ensure that the Enclosed IQ equipment arrives at its destination undamaged and ready for installation. Crating and packing is designed to protect internal components as well as the enclosure. Do not remove protective packing until the equipment is ready for installation.

When the equipment reaches its destination, the customer should inspect the shipping container for any obvious signs of rough handling and/or external damage that occurred during transportation. Record any external

and internal damage for reporting to the transportation carrier and Cutler-Hammer, once a thorough inspection is complete. All claims should be specific as possible and include general order numbers.

A plastic bag of instruction booklets will be found in the shipping container. Store these documents in a safe place.

3.2 STORAGE

Although well packaged, this equipment is not suitable for storage outdoors. If the equipment is to be stored indoors for any period of time, it should be stored with its protective packaging in place. Refer to the IQ monitoring device catalogs TD17530 or TD17548 for suitable conditions of these devices.

SECTION 4: INSTALLATION AND WIRING

4.1 GENERAL

Enclosed IQ devices are factory wired and tested. Installation requires solidly mounting the enclosed unit and connecting field wiring. **ALL FIELD WIRING SHOULD BE #14 AWG MINIMUM.** Included in this booklet are diagrams of the factory wiring and various field wiring options. Review and understand the appropriate diagrams for the catalog number of the unit you have ordered.

4.2 MOUNTING LOCATION

Choose a location that offers a flat, rigid mounting surface capable of supporting the weight of the equipment. Units without an uninterruptable power supply will weigh 82 lbs (47 kg) maximum. Units equipped with an uninterruptable power supply will weigh 102 lbs (37.5 kg) maximum. Mount the equipment in a suitable environment. These enclosures are designed for either NEMA 3R or NEMA 12 environments. The catalog number identifies the enclosure. If there are any doubts as to location suitability, discuss them with your Cutler-Hammer representative. Check to make certain that there are no pipes, wires, or other mounting hazards in the immediate mounting area that could create a problem. Carefully remove all packing material from the unit. Even though an equipment inspection was made when the equipment was received, make another careful inspection of the enclosure and the devices inside as packing material is removed. Be especially alert for distorted metal, loose wires, or damaged components.

4.3 MOUNTING PROCEDURE

The enclosures are provided with four elongated mounting holes, two at the top mounting flange and two at the bottom.



CAUTION

EXTREME CARE SHOULD BE TAKEN TO PROTECT THE EQUIPMENT FROM DRILL CHIPS, FILINGS, AND OTHER CONTAMINANTS WHEN MAKING THE WIRE ENTRY HOLES AND MOUNTING THE ENCLOSURE TO PREVENT COMPONENT DAMAGE OR A FUTURE MALFUNCTION.

IF YOUR EQUIPMENT WAS ORDERED WITH THE UNINTERRUPTABLE POWER SUPPLY OPTION, IT WAS SHIPPED SEPARATELY. IT MUST REMAIN IN AN UPRIGHT ORIENTATION. PLACE THE UPS ON ITS MOUNTING BRACKET AFTER THE ENCLOSURE HAS BEEN INSTALLED.

STEP 1: Install required mounting bolt anchors and the two upper mounting bolts in the mounting surface.

STEP 2: Gently lift the enclosure and guide the elongated holes in the upper mounting flange over the upper mounting bolts, but do not completely tighten the bolts.

STEP 3: While still supporting the enclosure, install the two lower mounting bolts in the lower mounting flange, but do not completely tighten. Use shims, if required, to prevent deformation of the enclosure when tightening the bolts, if the mounting surface is distorted.

STEP 4: Tighten all four mounting bolts after any required shimming is completed.

4.4 WIRING



WARNING

CONTROL WIRING MAY HAVE VOLTAGE PRESENT THAT CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. DE-ENERGIZE ALL CONDUCTORS BEFORE BEGINNING TO PERFORM ANY WIRING ACTIVITY TO OR WITHIN THE ENCLOSED IQ DEVICE.

THE DISCONNECT SWITCHES IN THIS UNIT DISCONNECT CONTROL OR SENSING VOLTAGE TO THE IQ METER. WHEN THESE DISCONNECTS ARE IN THE 'OFF' POSITION, THE CURRENT TRANSFORMER CIRCUIT, FUSES, WIRING, RECEPTACLE, ARII AND INPUT/OUTPUTS ARE ENERGIZED. A DISCONNECTING MEANS AND UPSTREAM PROTECTION SHOULD BE INSTALLED FOR ALL CIRCUITS. A SHORT CIRCUIT TYPE TERMINAL BLOCK IS PROVIDED FOR THE CURRENT TRANSFORMER CIRCUIT.

A DEVICE EQUIPPED WITH A SEPARATE SOURCE POWER SUPPLY MODULE CAN BE WIRED FOR 96-

264 VAC OR 100-350 VDC. THE ADDITION OF AN ARII RELAY LIMITS CONTROL POWER TO A RANGE OF 96-144VAC OR 100-125VDC. AN ENCLOSURE EQUIPPED WITH THE UNINTERRUPTABLE POWER SUPPLY OPTION IS SUITABLE FOR USE WITH 120VAC ONLY. SEE FIGURE 21.

Figures 1 through 9 show factory wiring and relative device location for all catalog numbers and options.

UNDERSTAND THE DIAGRAM(S) THAT PERTAIN TO YOUR ORDER BEFORE YOU BEGIN THE FIELD WIRING.

REFER TO INSTRUCTION BOOKLET TD17530 OR TD17548 FOR MORE INFORMATION REGARDING THE IQ ANALYZER OR THE IQ DP-4000, RESPECTIVELY.

4.5 FIELD WIRING

NOTE: ALL FIELD WIRING MUST BE #14 AWG MINIMUM.

Figures 10 through 25 show the field wiring options available. Not all these diagrams will pertain to your order. Understand your system and use the appropriate figures.

FACTORY WIRING IS SHOWN SOLID, FIELD WIRING IS SHOWN DASHED.

FIG 10 - DIRECT VOLTAGE CONNECTION, 3-WIRE – UP TO 600 VOLTS ONLY

FIG 11 - DIRECT VOLTAGE CONNECTION, 4-WIRE – UP TO 600 VOLTS ONLY

FIG 12 - EXTERNAL VOLTAGE CONNECTION, OPEN DELTA

FIG 13 - EXTERNAL VOLTAGE CONNECTION, WYE

FIG 14 - ANALYZER CURRENT CIRCUIT – 2-CTs

FIG 15 - ANALYZER CURRENT CIRCUIT – 3-CTs

FIG 16 - ANALYZER CURRENT CIRCUIT – 3-CTs – RESIDUAL GROUND MONITORING

FIG 17 - ANALYZER CURRENT CIRCUIT – 4-CTs – RESIDUAL GROUND MONITORING

FIG 18 - ANALYZER CURRENT CIRCUIT – 5-CTs

FIG 19 - DP-4000 CURRENT CIRCUIT – 2-CTs

FIG 20 - DP-4000 CURRENT CIRCUIT – 3-CTs

FIG 21 - CONTROL POWER CONNECTIONS – NOTE VOLTAGE ON DIAGRAMS

FIG 22 - ANALYZER I/O

FIG 23 - DP-4000 I/O

FIG 24 - IPONI MODULE OPTION

FIG 25 - ARII RELAY OPTION

NOTE: WHEN UNIT IS EQUIPPED WITH OPTIONAL UNINTERRUPTABLE POWER SUPPLY, NO ADDITIONAL FIELD WIRING IS NEEDED. THE UPS MOUNTS TO A BRACKET IN THE FLOOR OF THE ENCLOSURE AND CONNECTION IS MADE VIA TWO 3-PRONG PLUGS.

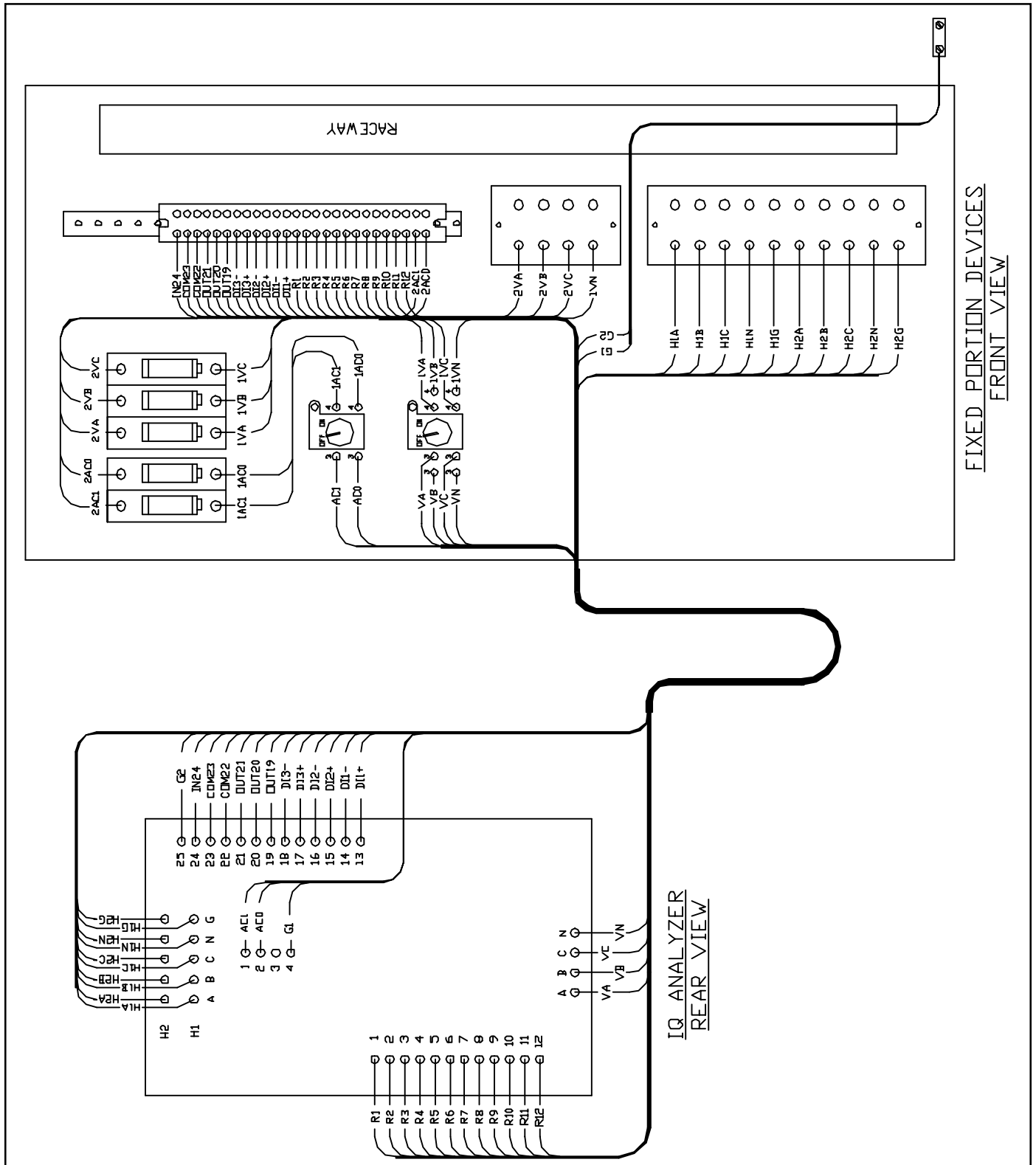


Figure 1 Catalog Numbers: IQA6010ENC3R, IQA6010ENC12, IQA6210ENC3R, IQA6210ENC12
With separate source. With or without graphics

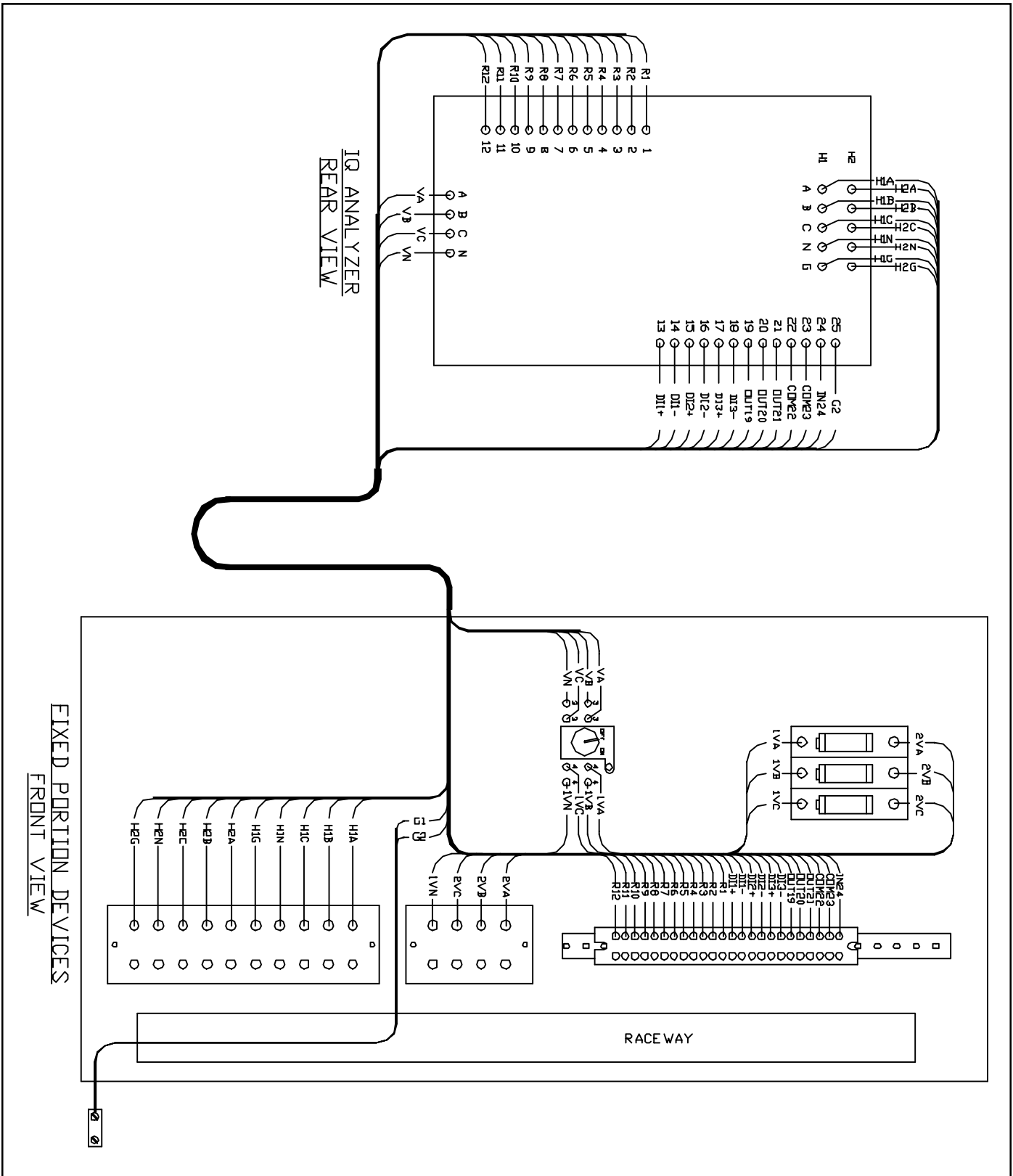


Figure 2 Catalog Numbers: IQA6030ENC3R, IQA6030ENC12, IQA6230ENC3R, IQA6230ENC12
With line power. With or without graphics

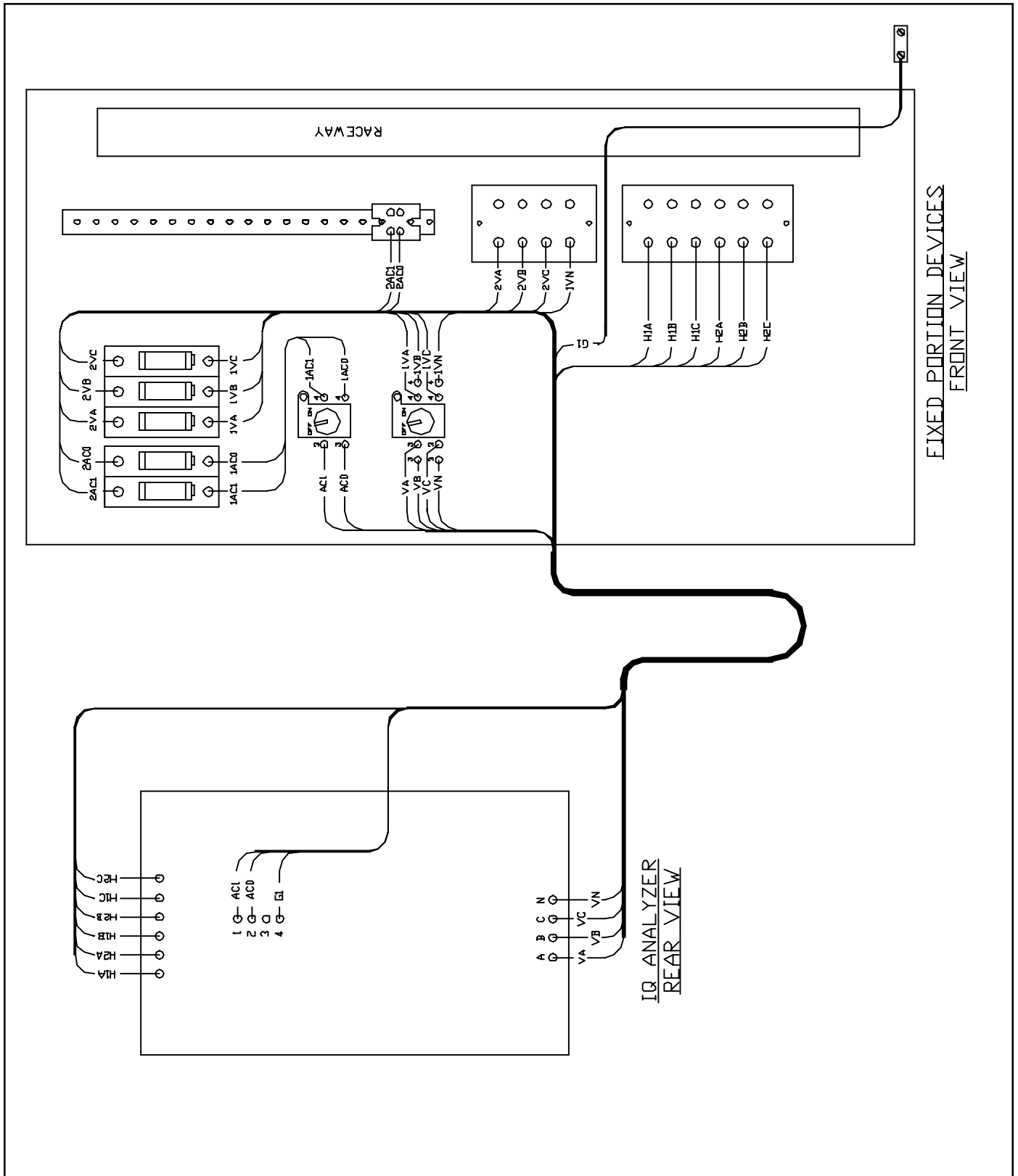


Figure 3 Catalog Numbers: IQDP4010ENC3R, IQDP4010ENC12
With separate source. Without I/O

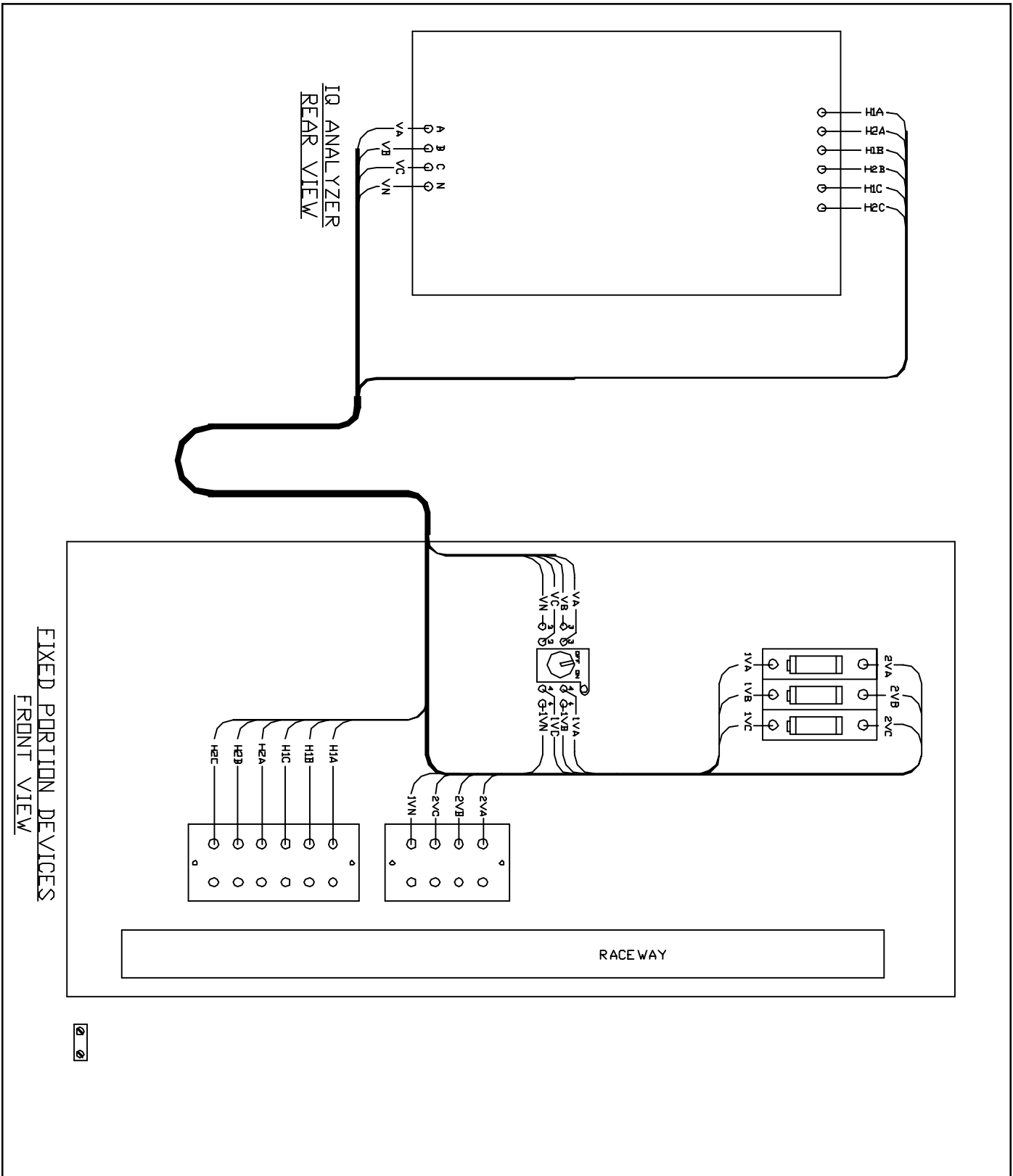


Figure 4 Catalog Numbers: IQDP4010ENC3R, IQDP4010ENC12
With line power. Without I/O

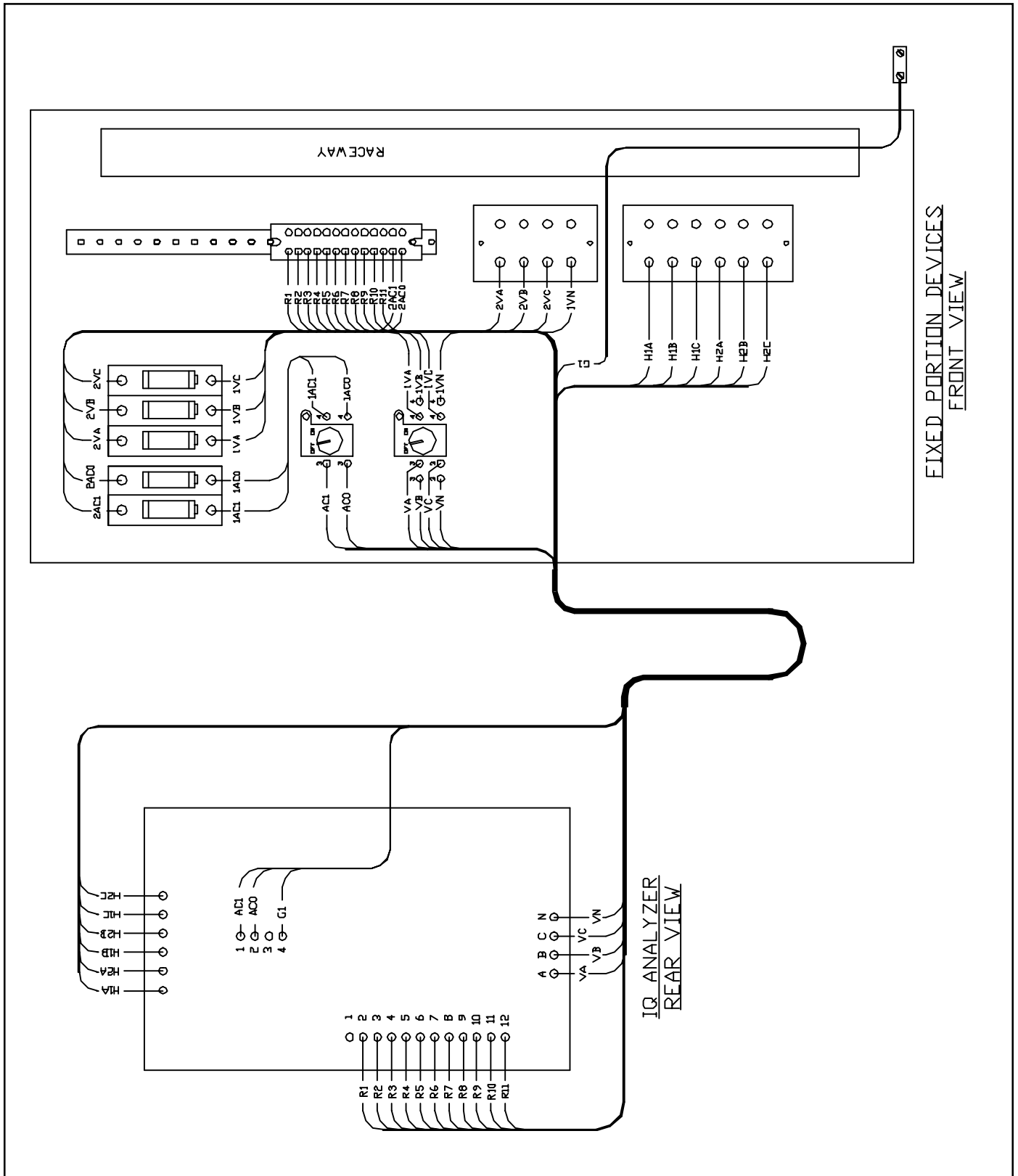


Figure 5 Catalog Numbers: IQDP4010ENC3R, IQDP4010ENC12
With separate source. With I/O

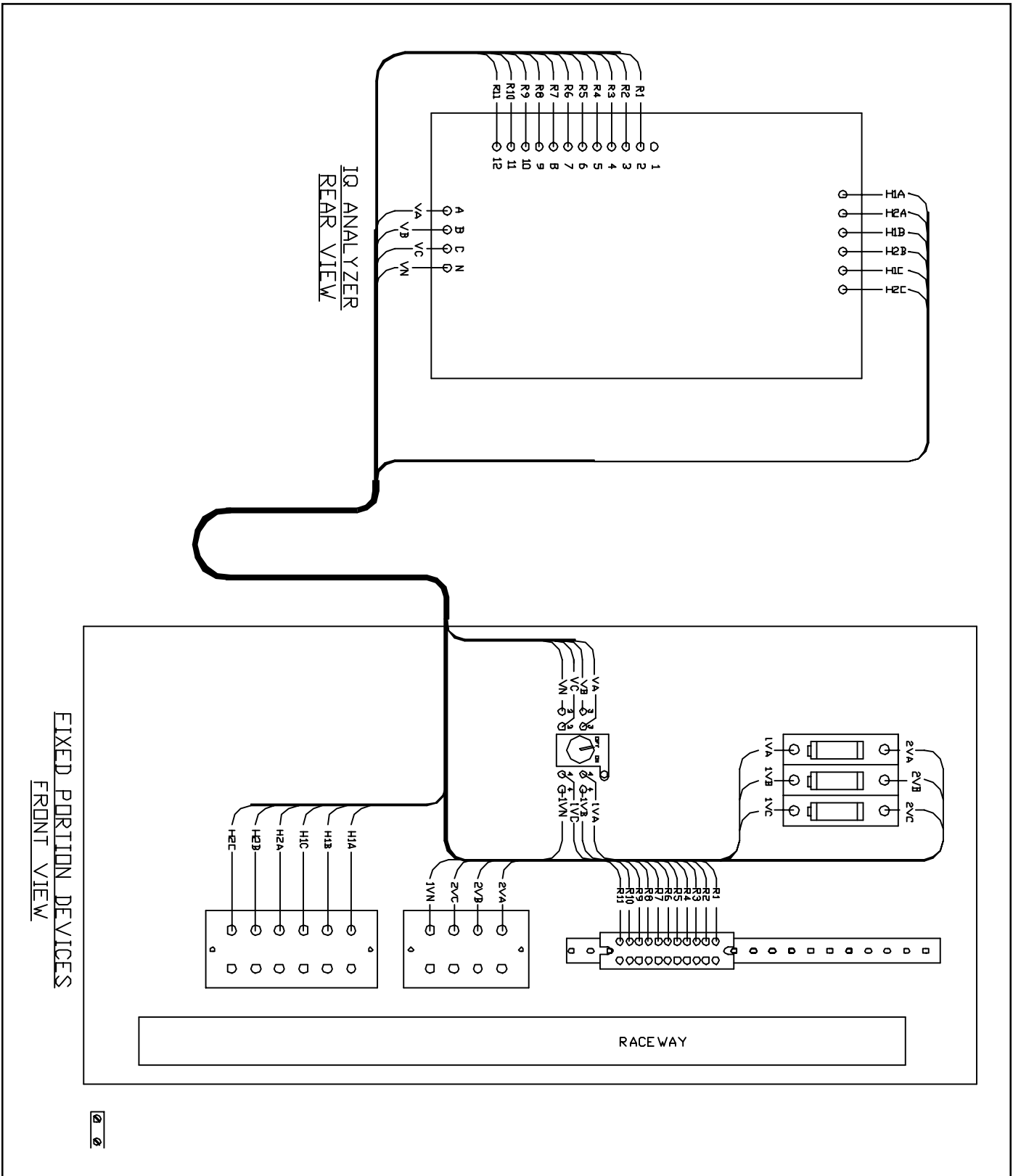


Figure 6 Catalog Numbers: IQDP4010ENC3R, IQDP4010ENC12
With line power. With I/O

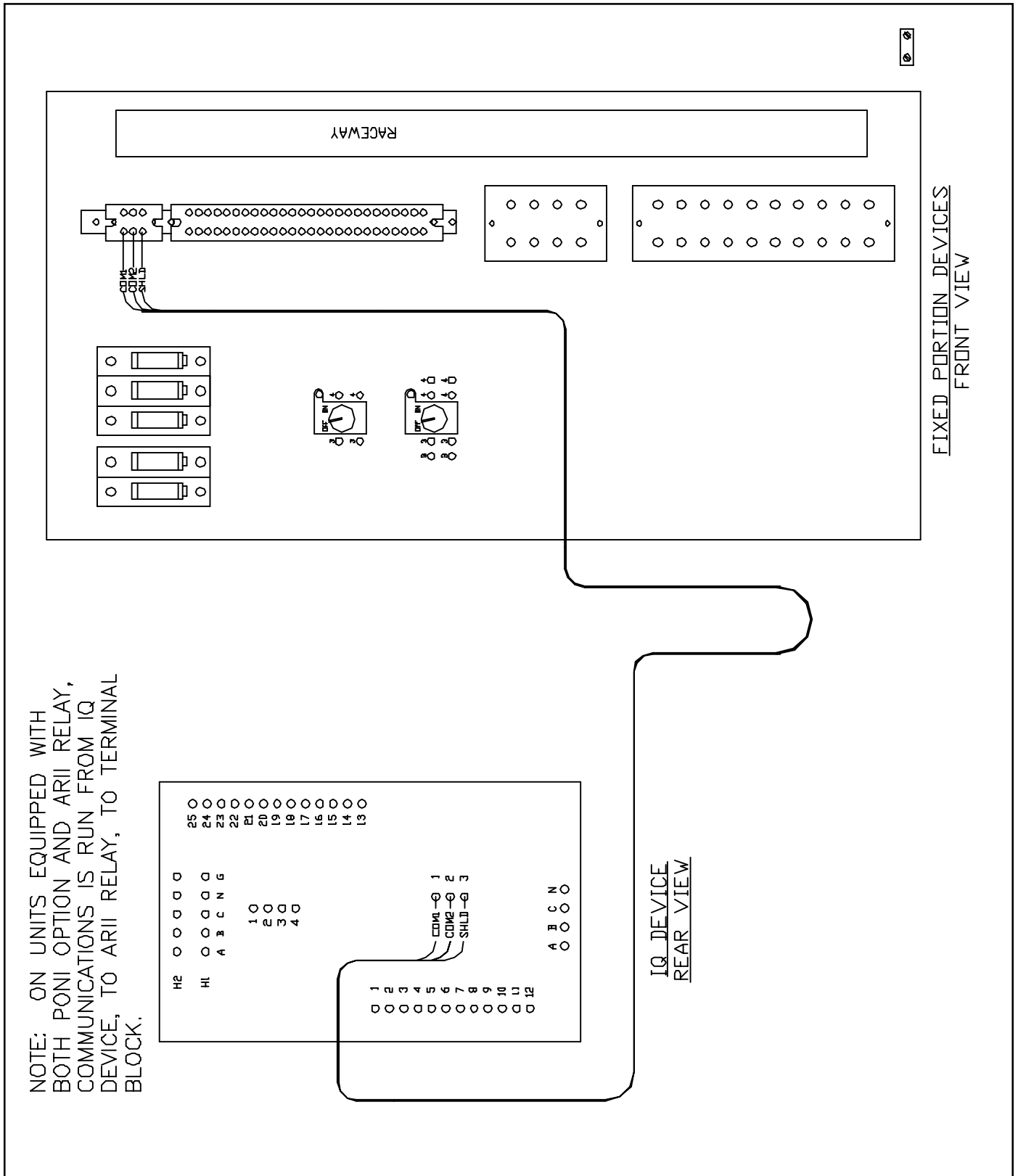


Figure 7 Catalog Numbers: -P PONI option

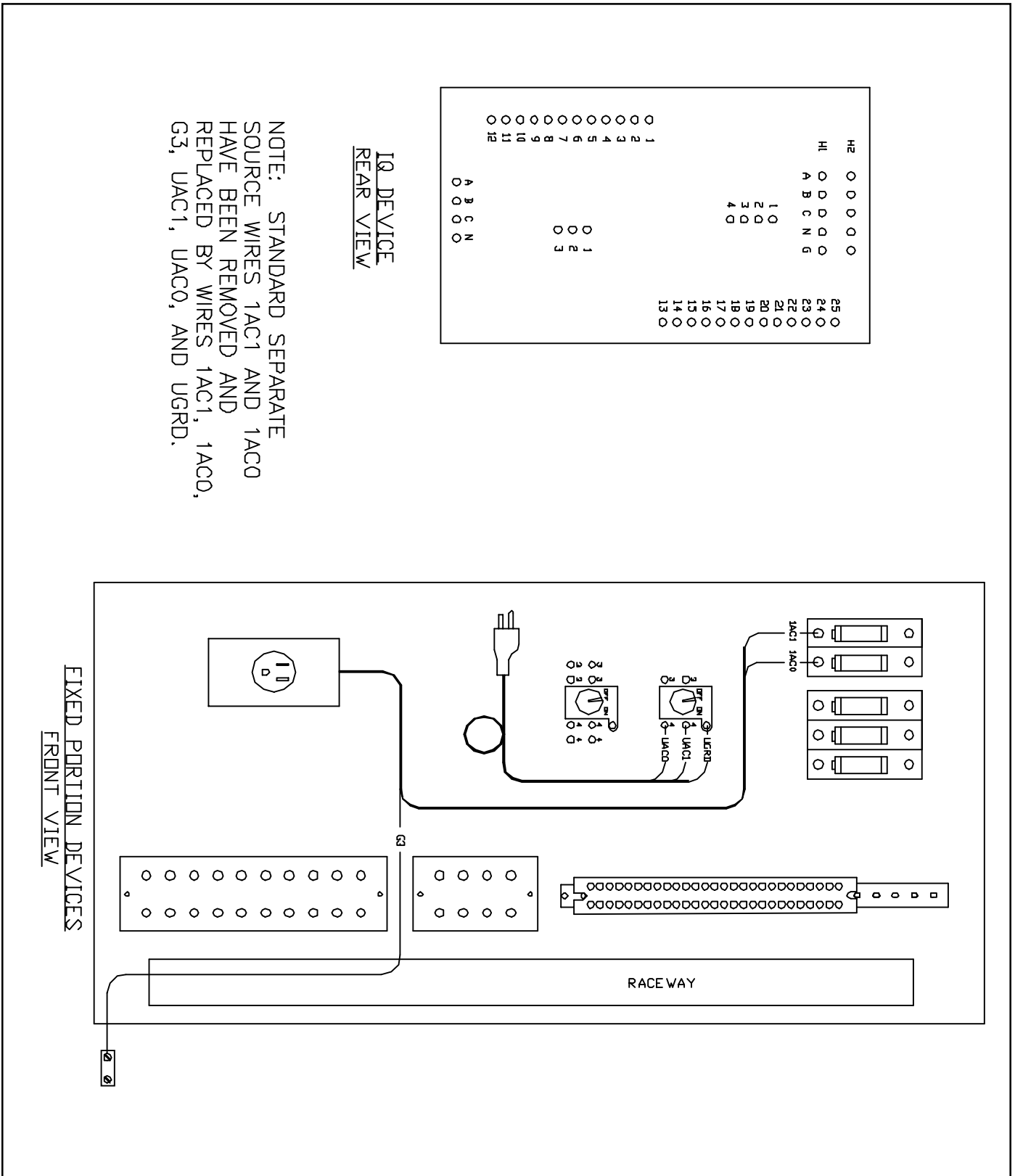
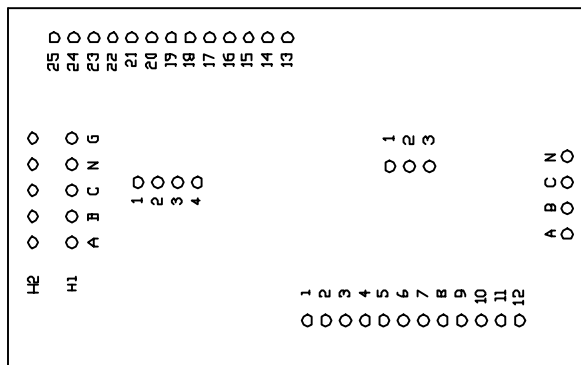


Figure 8 Catalog Numbers: -U
UPS option

NOTE: ON UNITS EQUIPPED WITH BOTH PONI OPTION AND ARII RELAY, COMMUNICATIONS IS RUN FROM IQ DEVICE, TO ARII RELAY, TO TERMINAL BLOCK.



IQ DEVICE
REAR VIEW

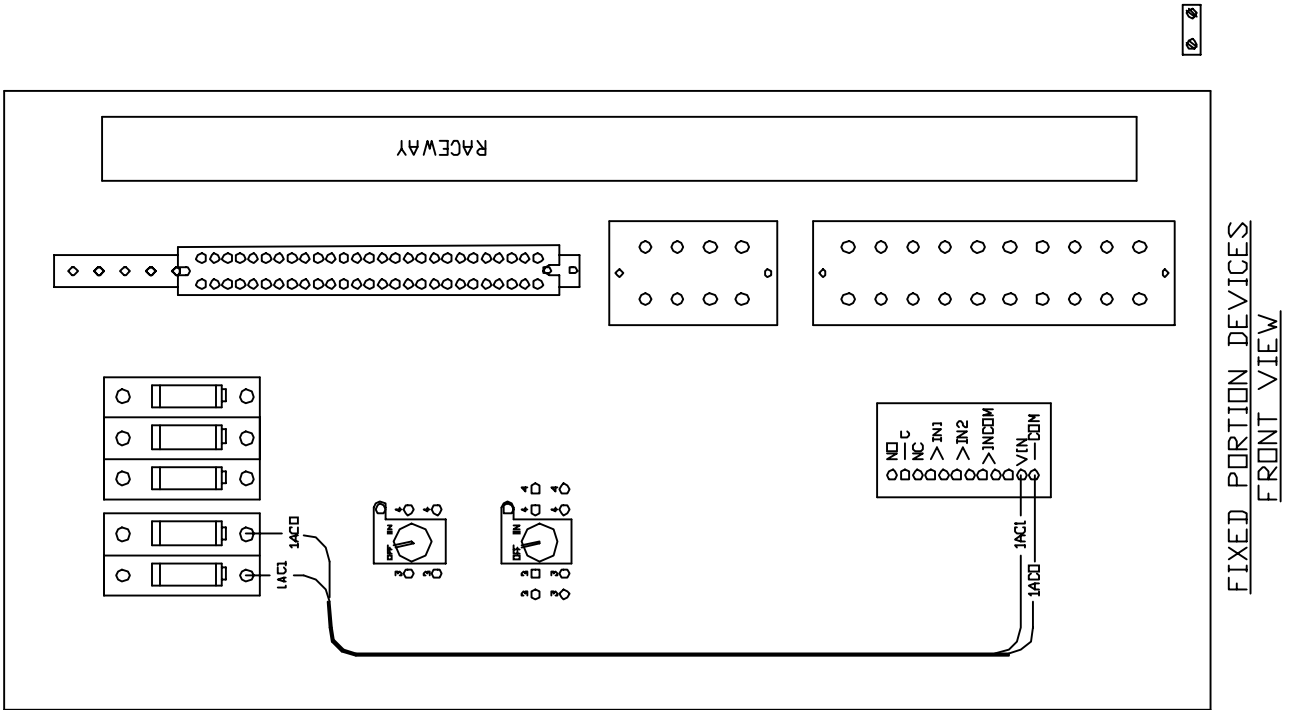


Figure 9 Catalog Numbers: -A
ARII option

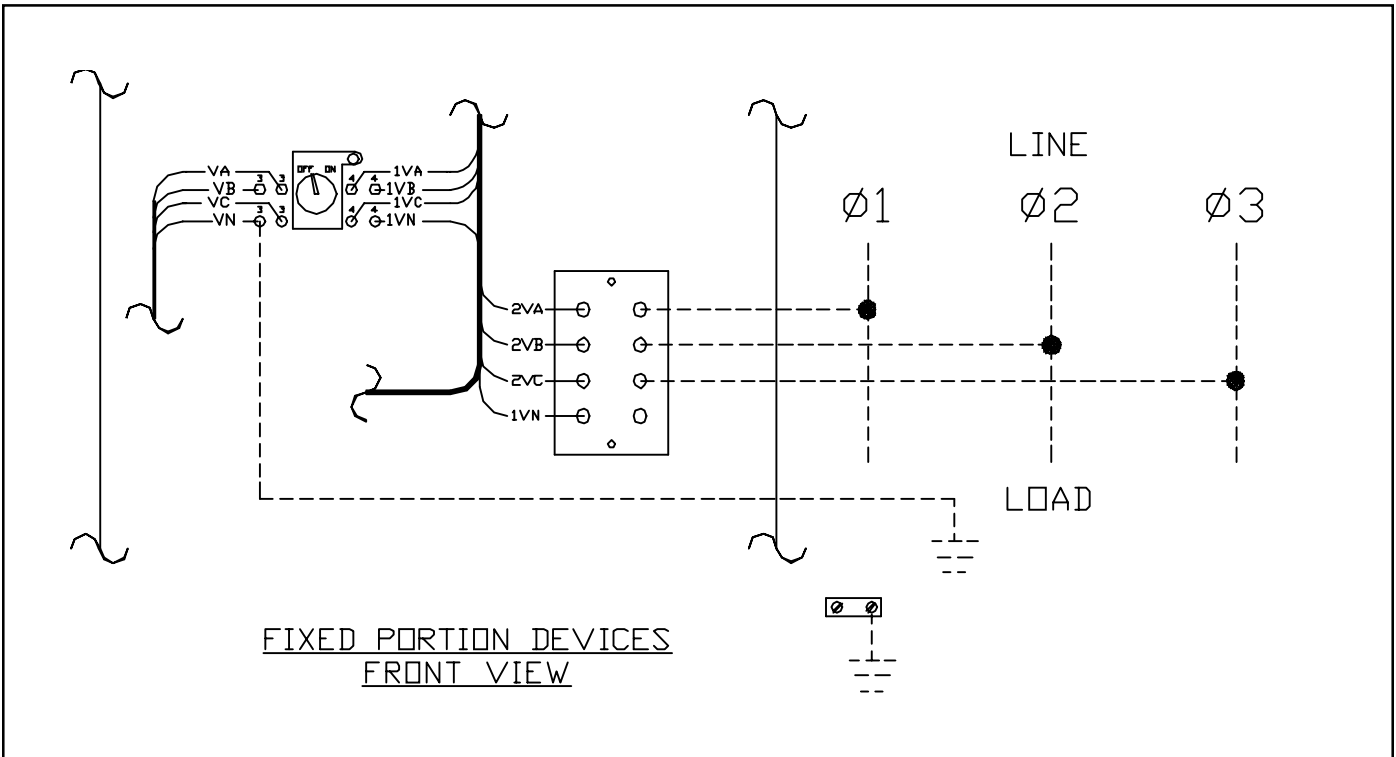


Figure 10 Direct Voltage Connection 3-wire (up to 600 volts only)

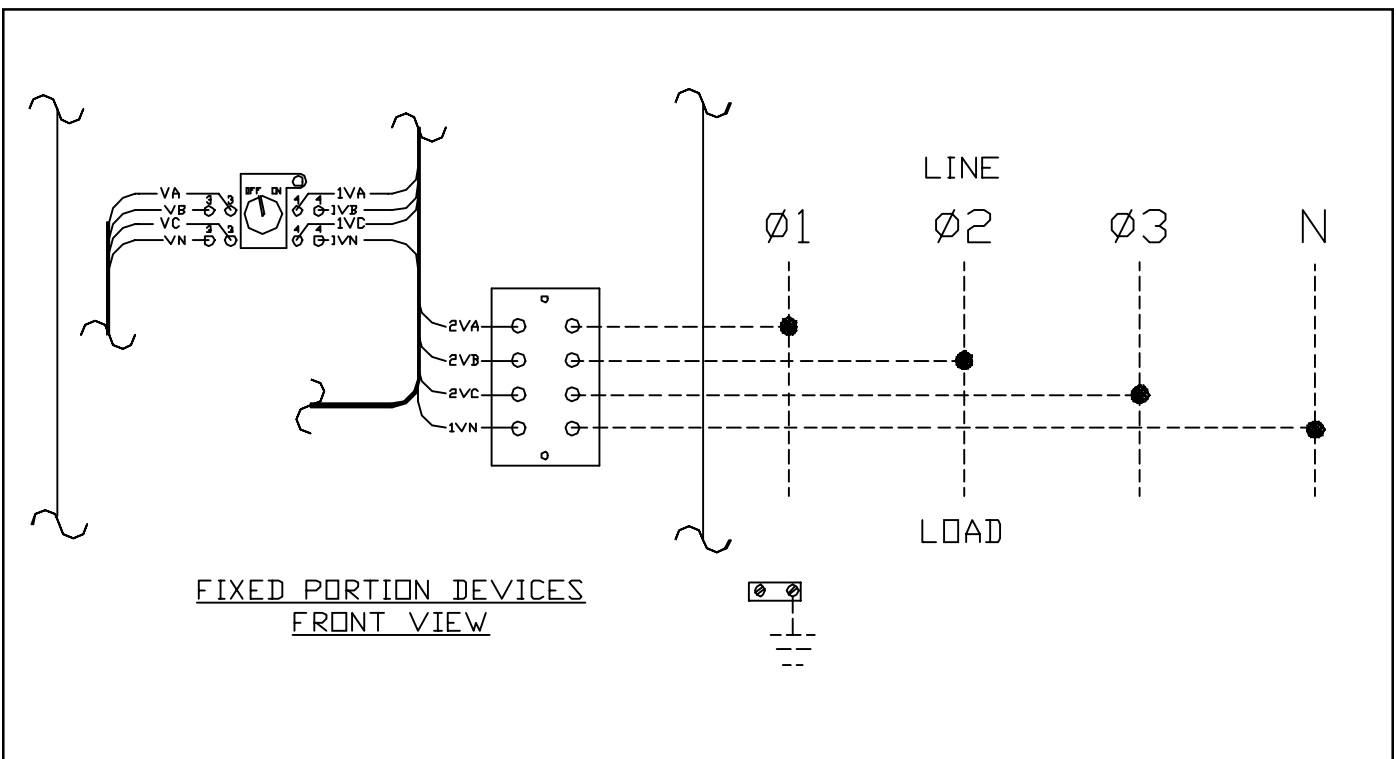


Figure 11 Direct Voltage Connection 4-wire (up to 600 volts only)

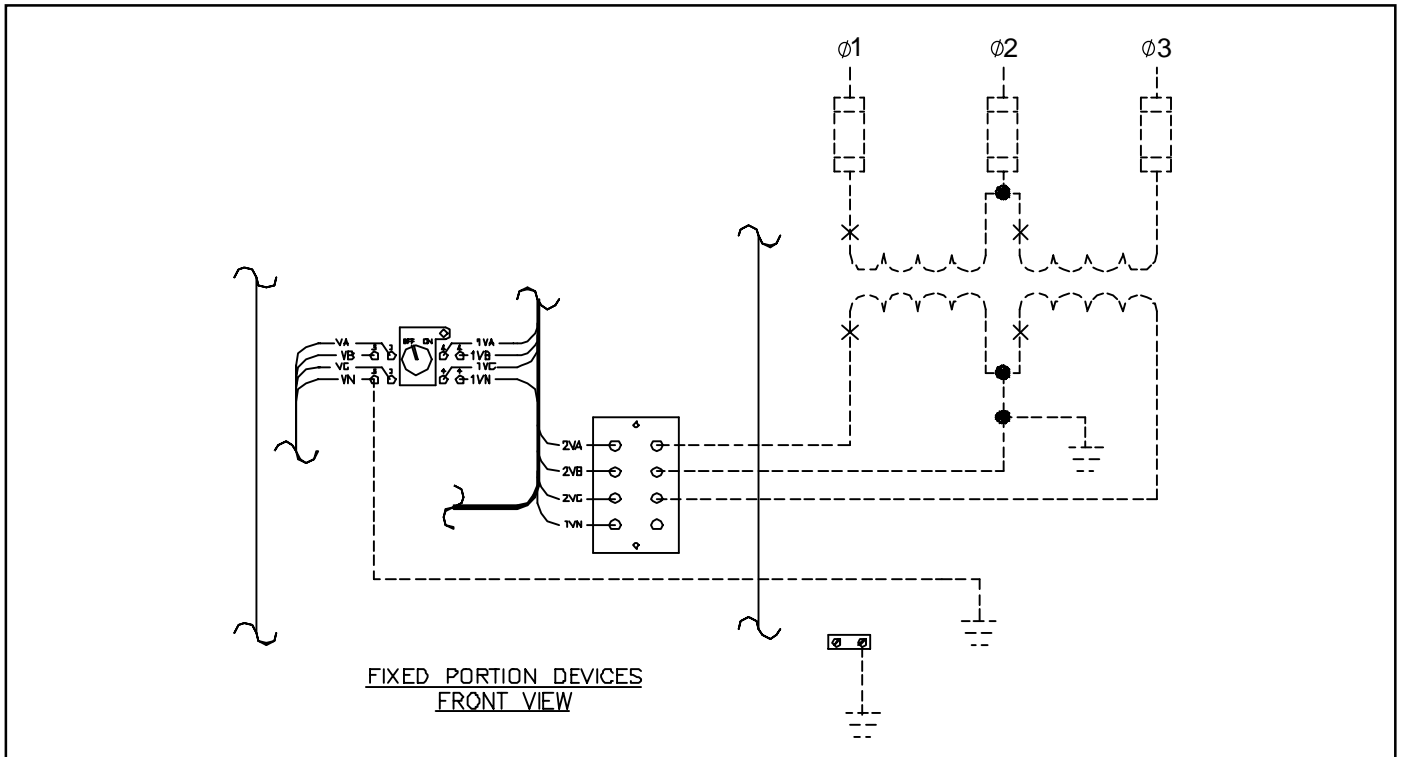


Figure 12 External voltage connection, open delta

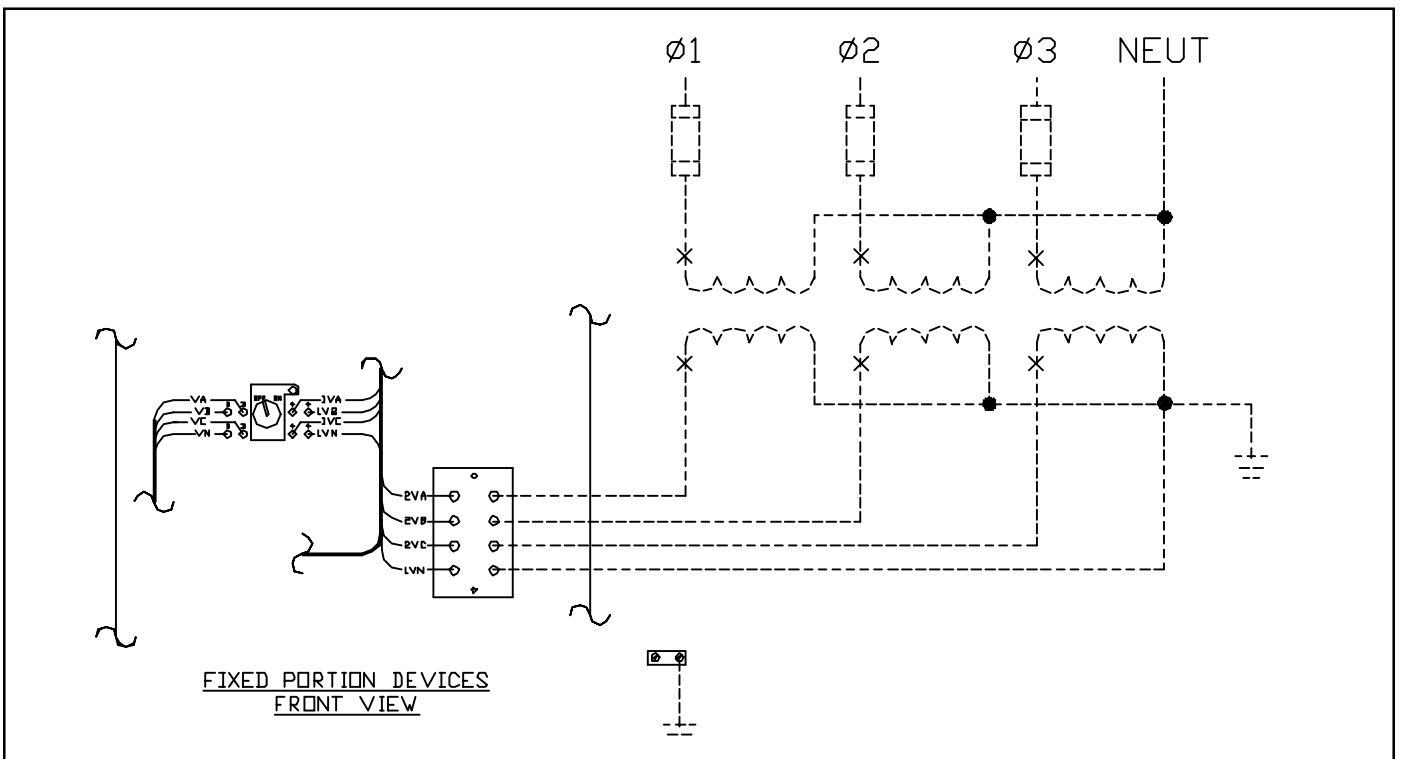


Figure 13 External voltage connection, WYE

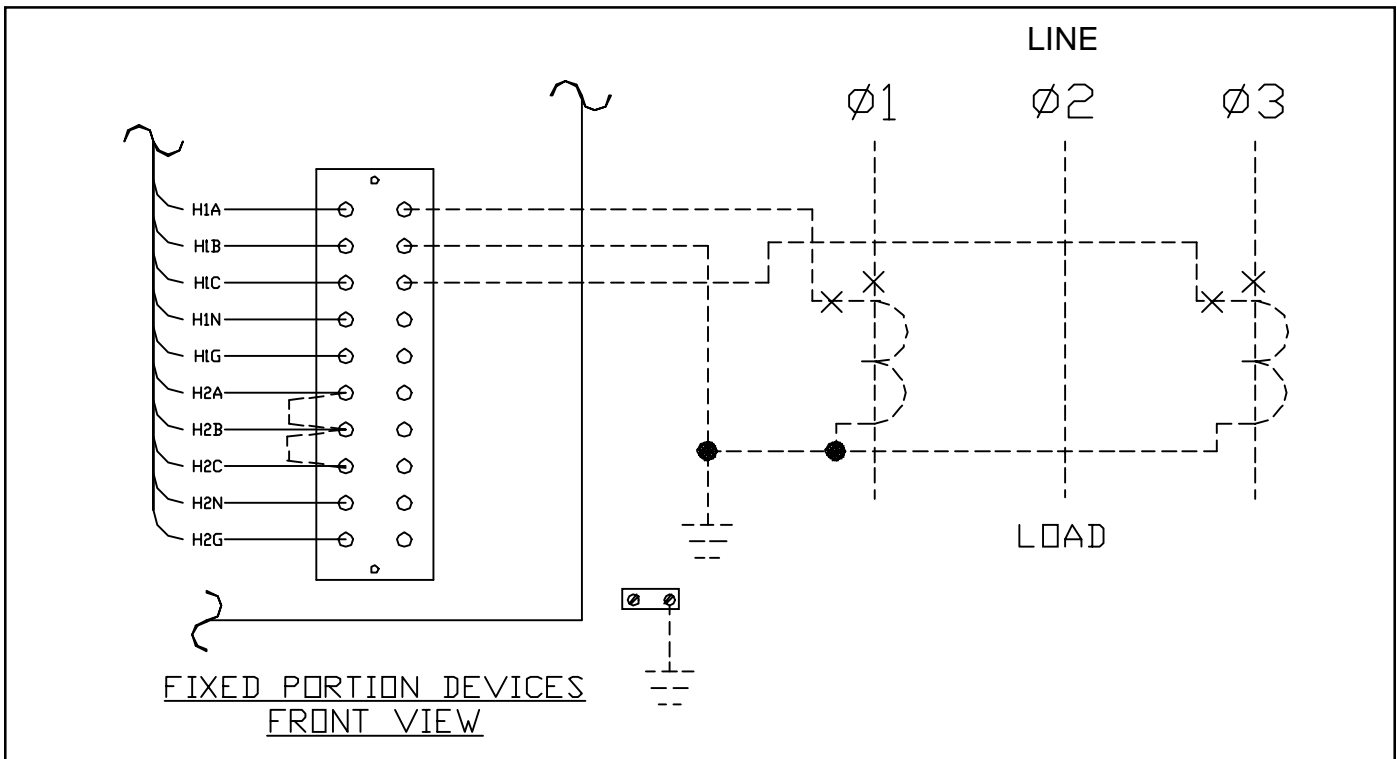


Figure 14 Analyzer current circuit (2-CTs)

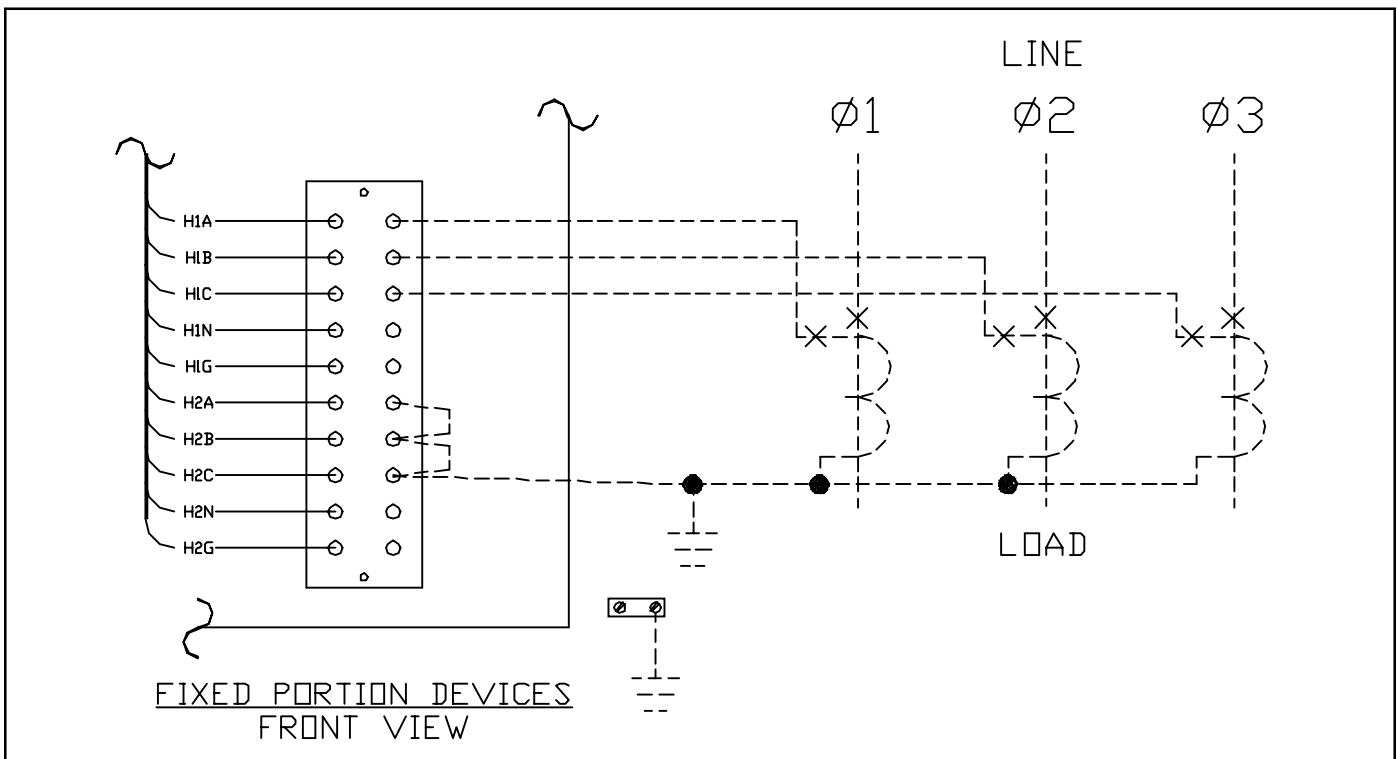


Figure 15 Analyzer current circuit (3-CTs)

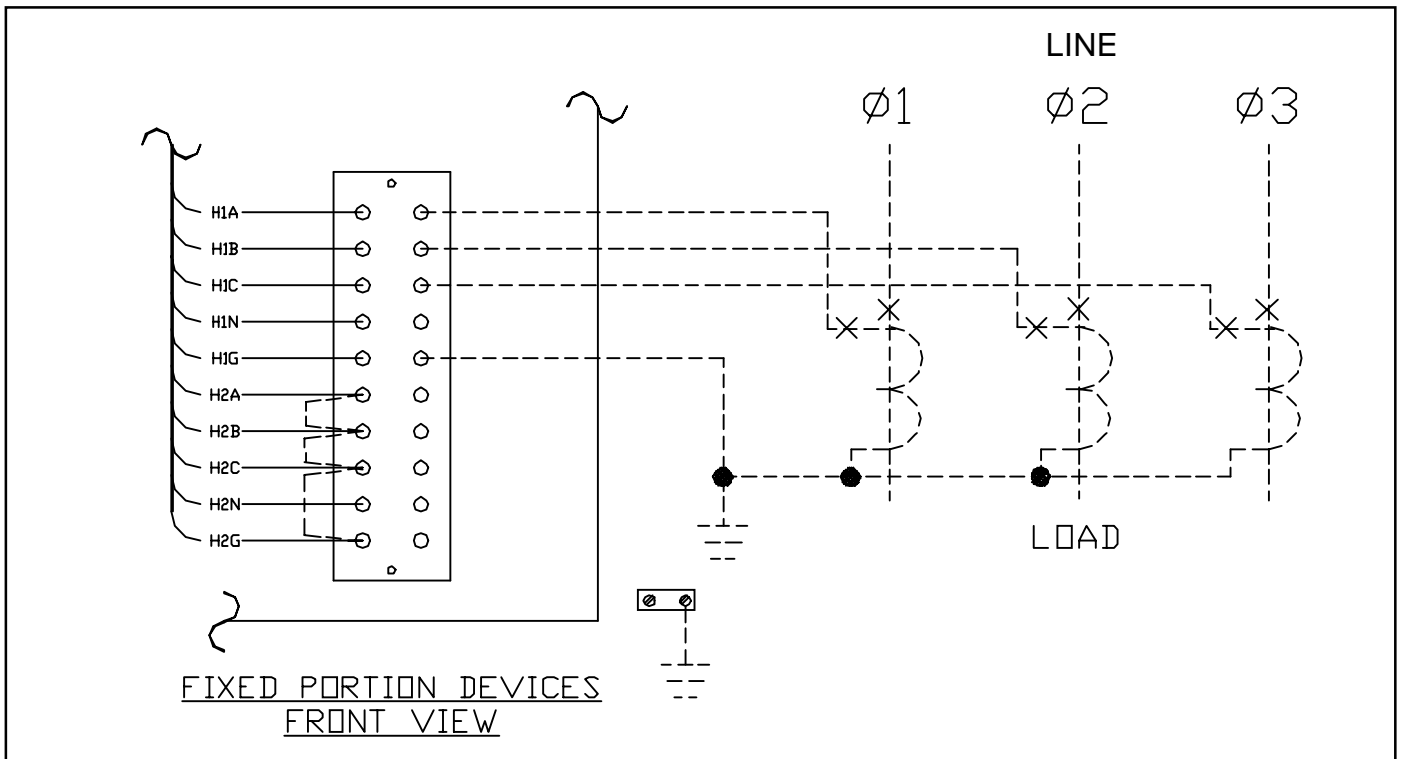


Figure 16 Analyzer current circuit (3-CTs, residual ground monitoring)

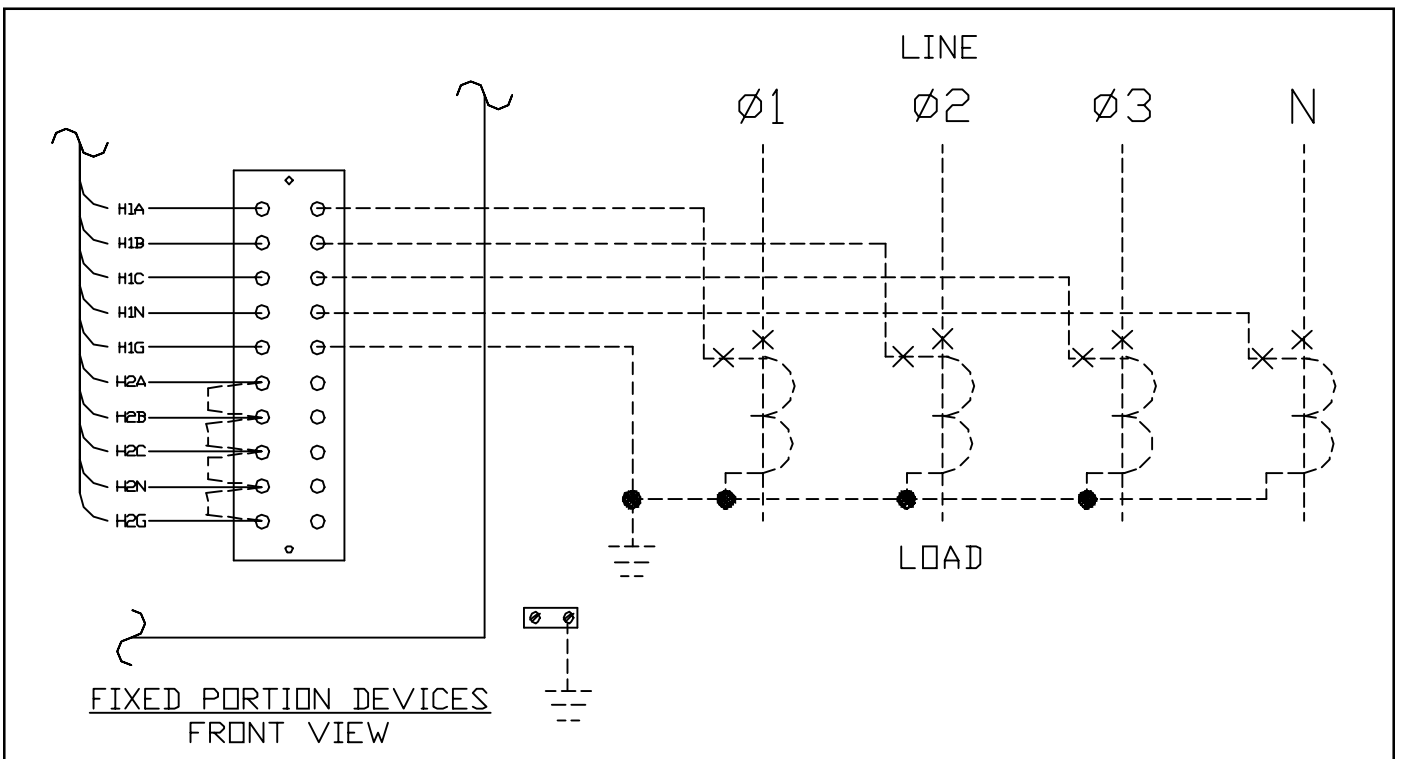


Figure 17 Analyzer current circuit (4-CTs, residual ground monitoring)

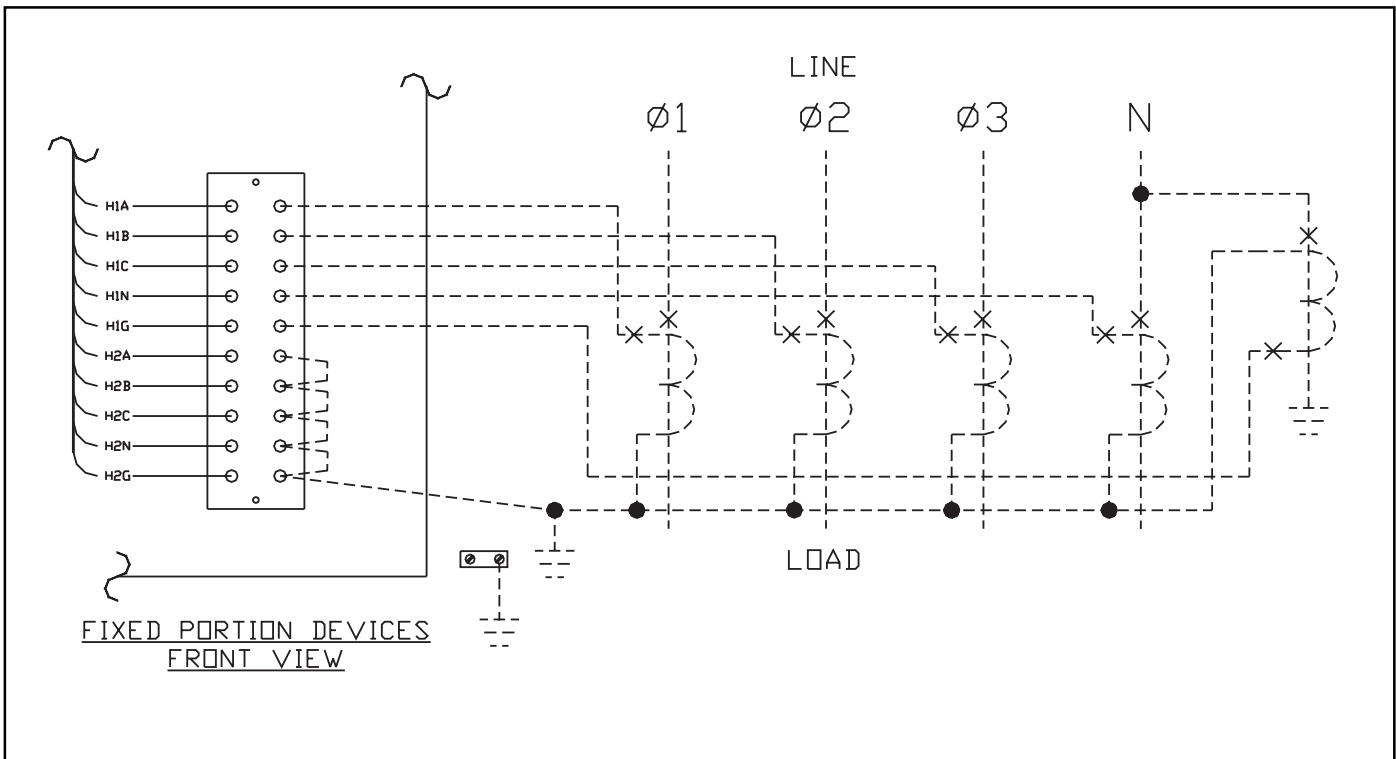


Figure 18 Analyzer current circuit (5-CTs)

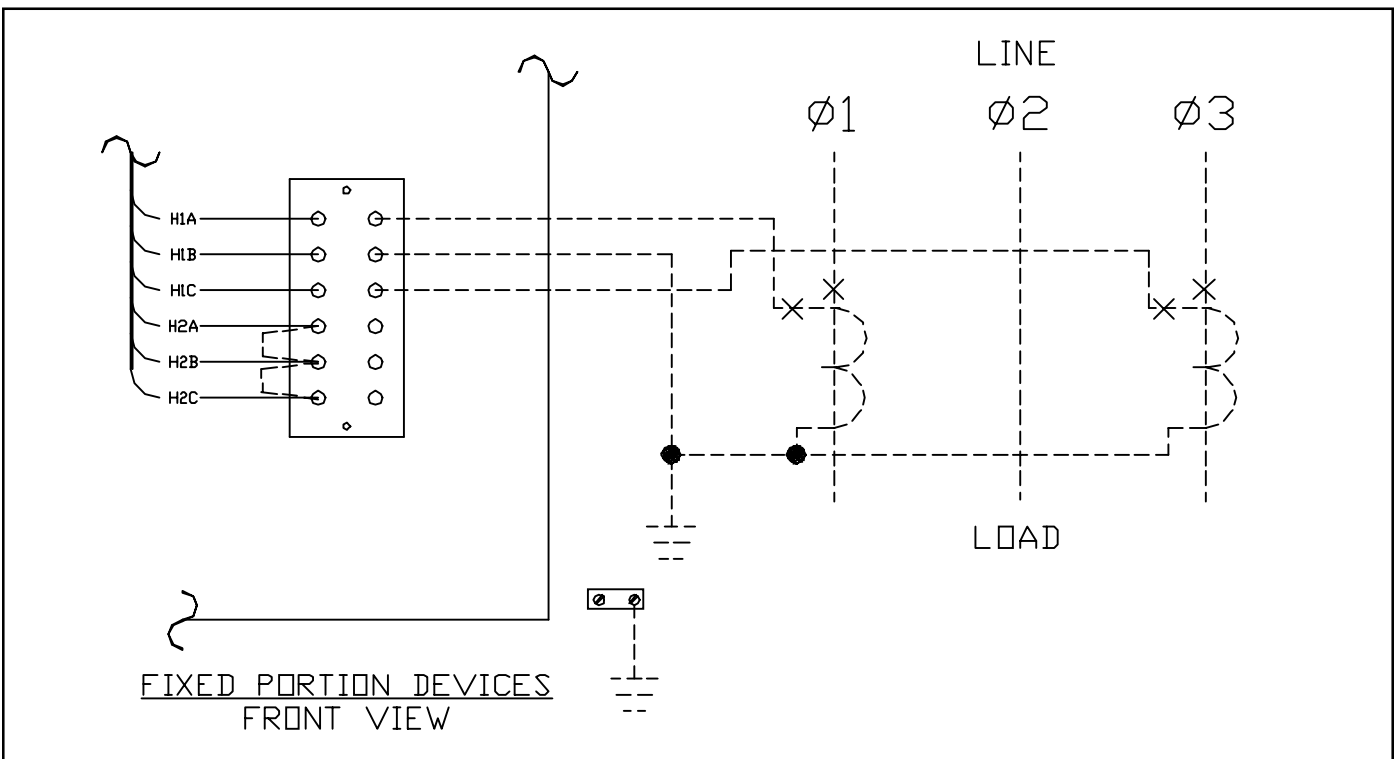


Figure 19 DP-4000 current circuit (2-CTs)

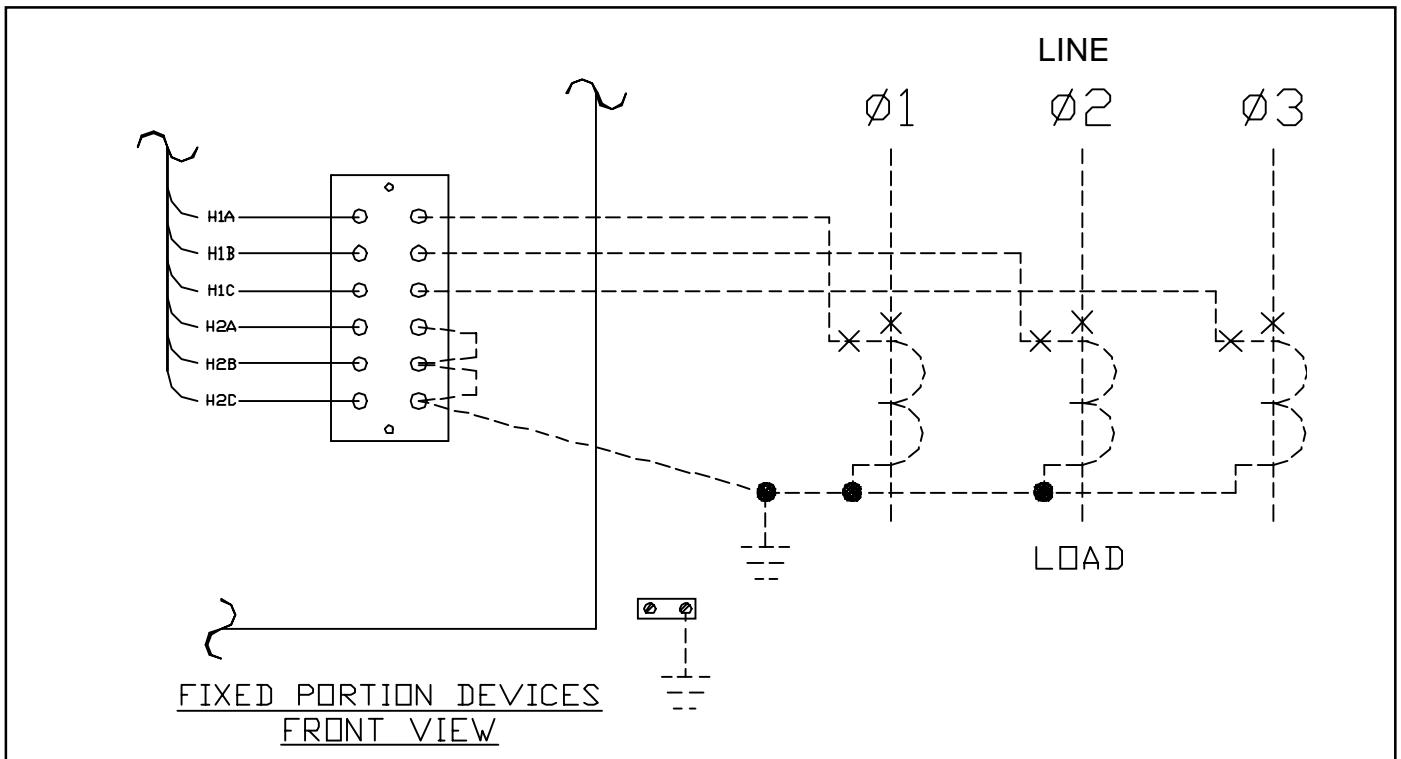


Figure 20 DP-4000 current circuit (3-CTs)

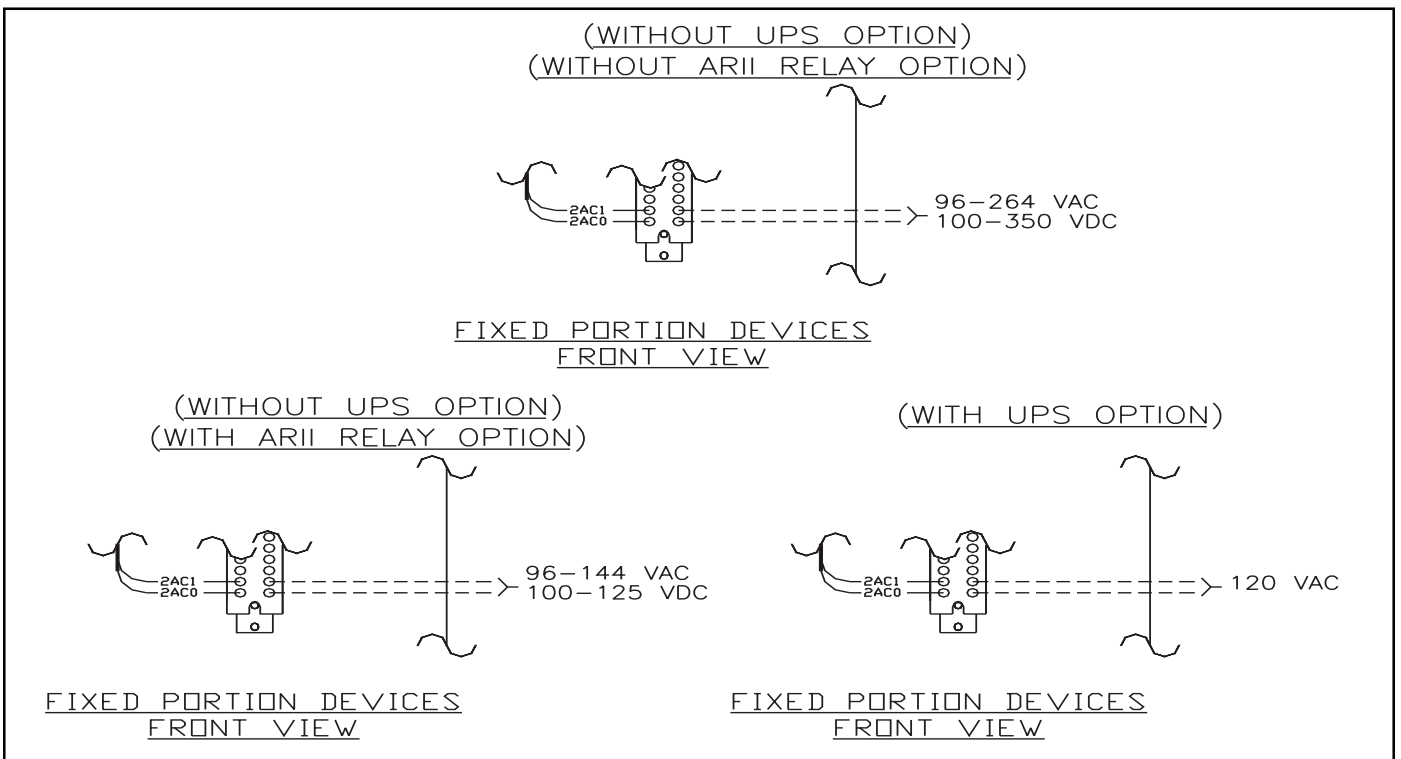


Figure 21 Control power connections (note voltage on diagrams)

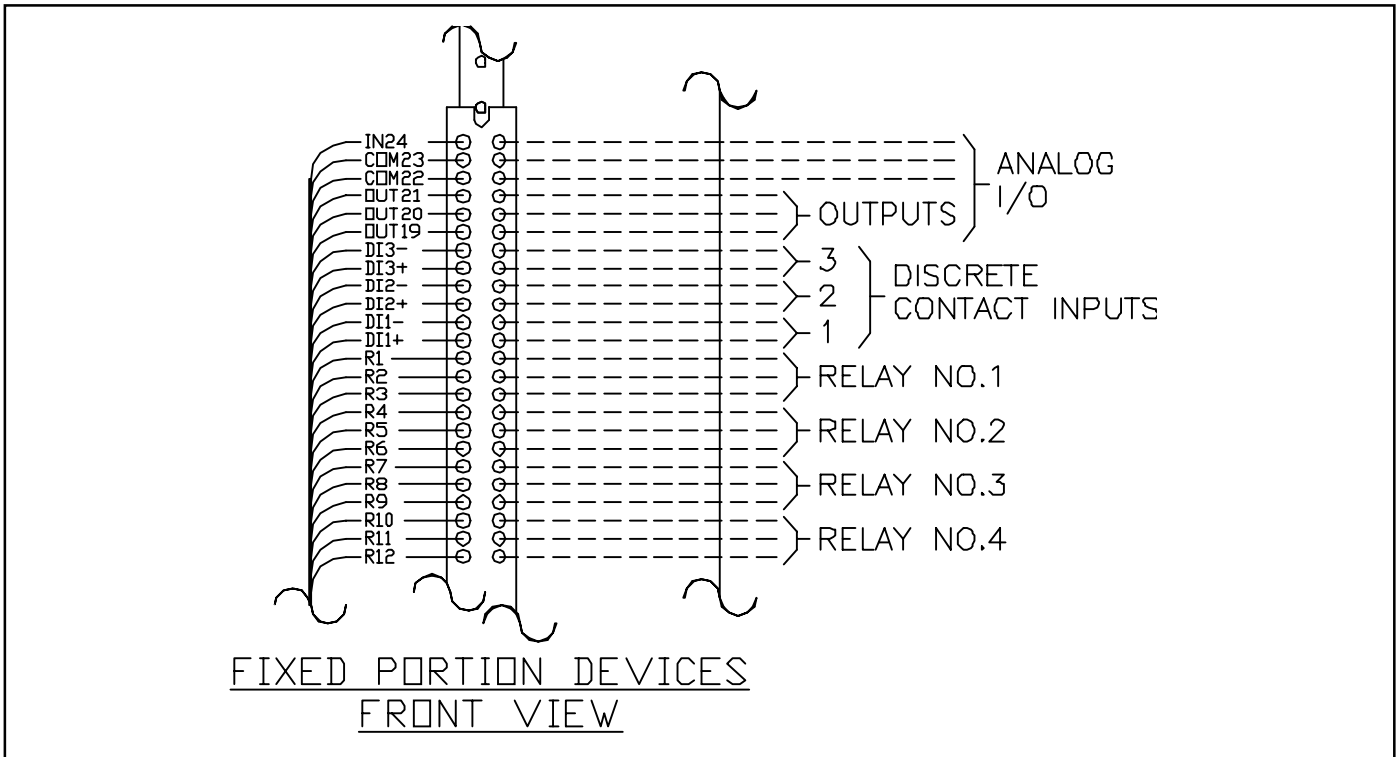


Figure 22 Analyzer I/O

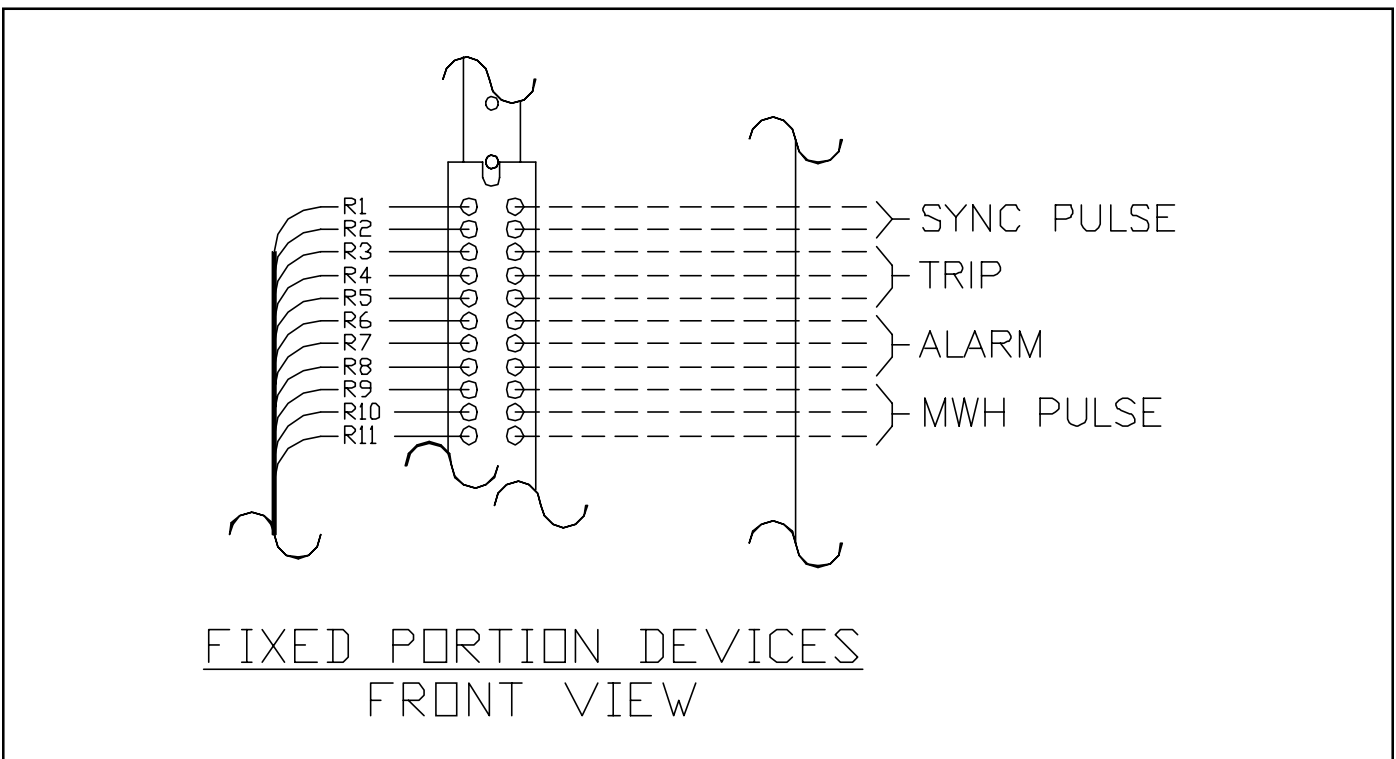


Figure 23 DP-4000 I/O

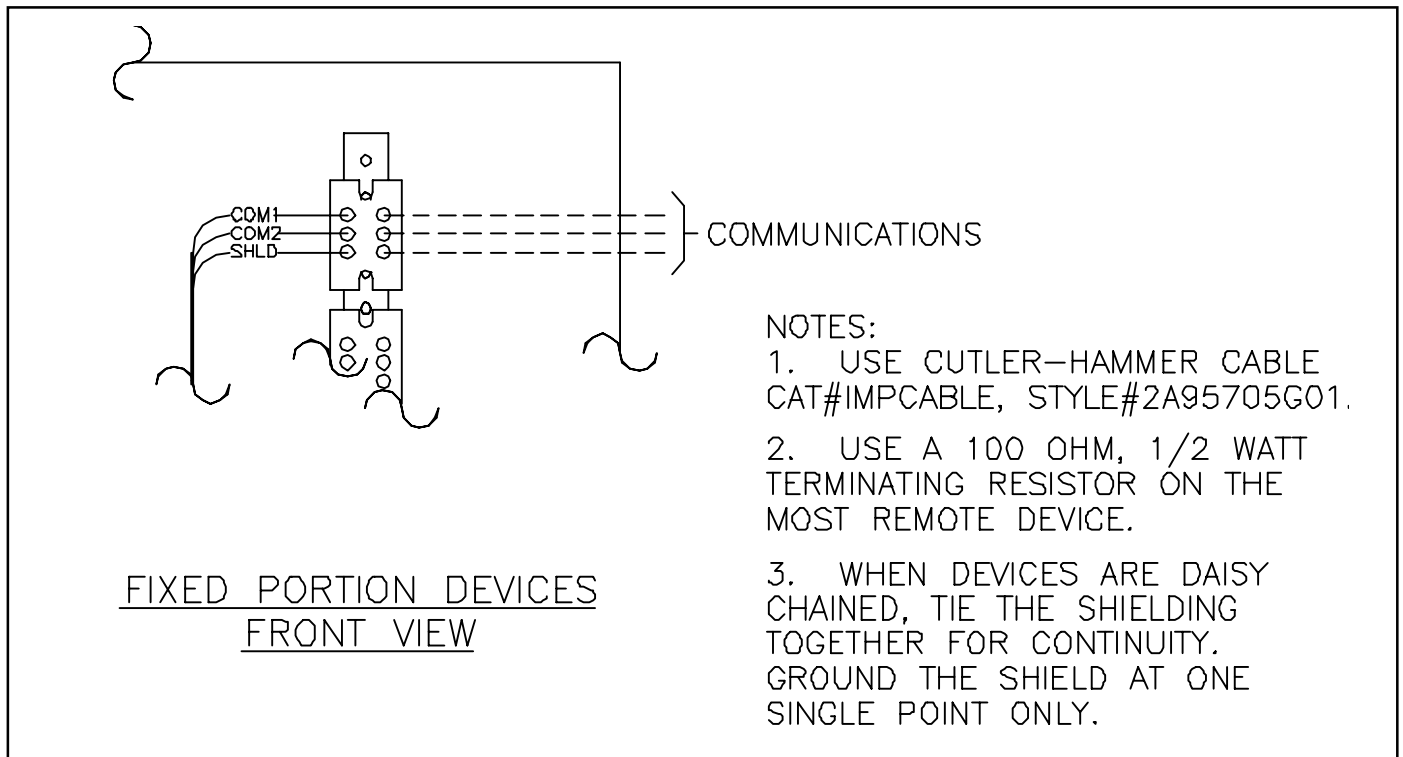


Figure 24 IPONI module option

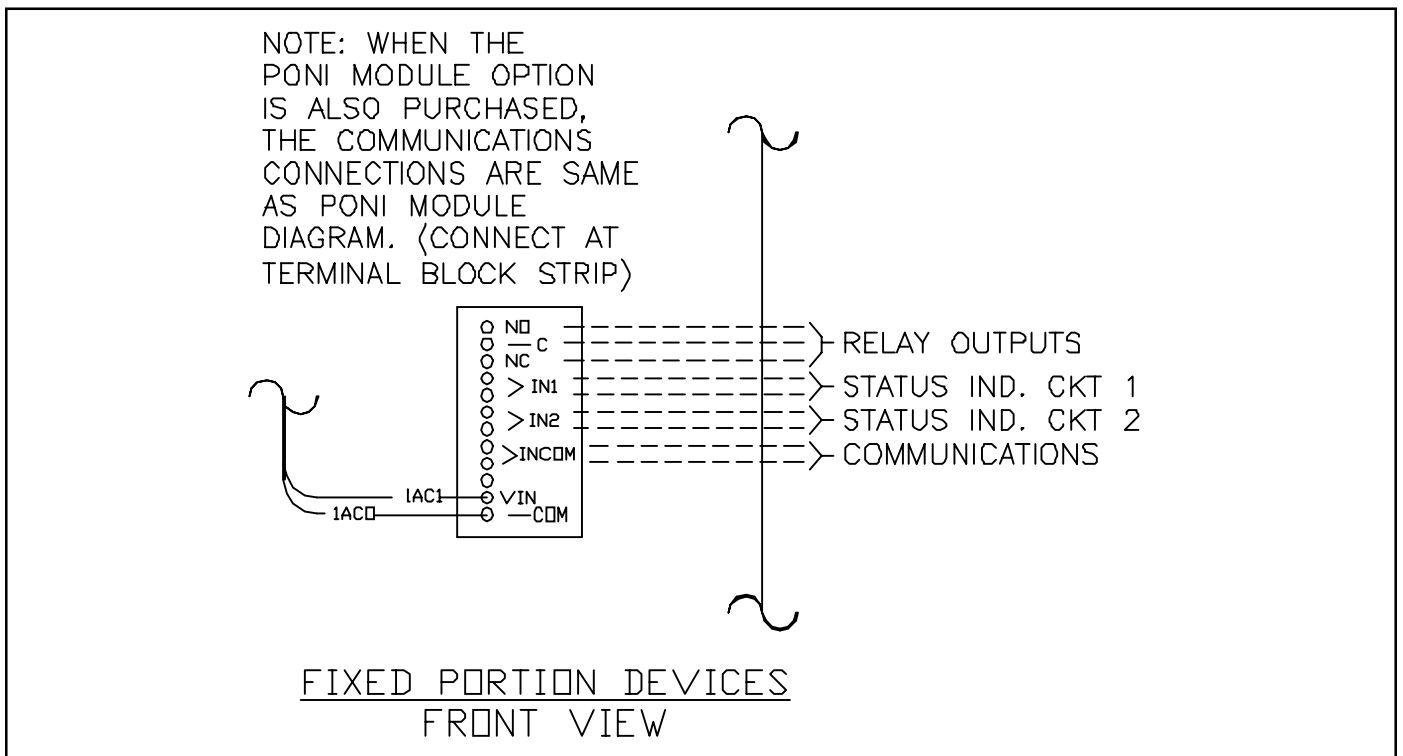


Figure 25 AR11 Relay Option

SECTION 5: OPERATION

5.1 OPERATION

REFER ALSO TO IQ DEVICE INSTRUCTION BOOKS. REFER TO INSTRUCTION BOOK TD17530 IF YOUR ENCLOSURE IS EQUIPPED WITH AN IQ ANALYZER. REFER TO INSTRUCTION BOOK TD17548 IF YOUR ENCLOSURE IS EQUIPPED WITH AN IQ DP-4000.

REFER TO INSTRUCTION BOOKS FOR THE UNINTERRUPTABLE POWER SUPPLY AND THE ARII ADDRESSABLE RELAY WHEN YOUR UNIT IS EQUIPPED WITH THESE DEVICES.

The Enclosed IQ is equipped with a two-position ON/OFF switch to enable switching voltage on and off to the IQ device. This switch is marked SERVICE DISCONNECT.

Enclosed IQ units supplied with Separate Power Source Modules on the IQ devices are also equipped with a two-position ON/OFF switch to enable switching control power on and off to the IQ device. This switch is marked CONTROL POWER DISCONNECT.

The terminal blocks for the current circuits are short-circuit type. Shorting screws are included.

THE DISCONNECT SWITCHES IN THIS UNIT DISCONNECT CONTROL OR SENSING VOLTAGE TO THE IQ METER. WHEN THESE DISCONNECTS ARE IN THE 'OFF' POSITION, THE CURRENT TRANSFORMER CIRCUIT, FUSES, WIRING, RECEPTACLE, ARII AND INPUT/OUTPUTS ARE ENERGIZED. A DISCONNECTING MEANS AND UPSTREAM PROTECTION SHOULD BE INSTALLED FOR ALL CIRCUITS. A SHORT CIRCUIT TYPE TERMINAL BLOCK IS PROVIDED FOR THE CURRENT TRANSFORMER CIRCUIT.

SECTION 6: MAINTENANCE

6.1 MAINTENANCE



WARNING

HAZARDOUS VOLTAGE CAN CAUSE SEVERE INJURY OR DEATH. MULTIPLE SUPPLY SOURCES ARE PROVIDED. DISCONNECT EACH BEFORE SERVICING.

REFER ALSO TO IQ DEVICE INSTRUCTION BOOKS. REFER TO INSTRUCTION BOOK TD17530 IF YOUR ENCLOSURE IS EQUIPPED WITH AN IQ ANALYZER.

REFER TO INSTRUCTION BOOK TD17548 IF YOUR ENCLOSURE IS EQUIPPED WITH AN IQ DP-4000.

REFER TO INSTRUCTION BOOKS FOR THE UNINTERRUPTABLE POWER SUPPLY AND THE ARII ADDRESSABLE RELAY WHEN YOUR UNIT IS EQUIPPED WITH THESE DEVICES.

In general, the Enclosed IQ unit is designed to be relatively maintenance free under normal usage. However, because of the variability of application conditions and the importance placed on dependable operation, inspection and maintenance checks should be made on a regularly scheduled basis. Visually inspect for loose parts, wires, and/or hardware. Inspect for discoloration of insulation and damaged or discolored components. Be alert for accumulation of dirt and/or moisture on structure. Check operation of disconnect switch(es) and continuity of fuses, where applicable.

This instruction leaflet is published solely for information purposes and should not be considered all inclusive. If further information is required, you should consult Cutler-Hammer.

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Cutler-Hammer

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