



# **GASBOY**

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**CFN SERIES**

**ISLANDER II**

**INSTALLATION MANUAL**

**C35963**

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**GASBOY INTERNATIONAL LLC**

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**CFN SERIES**

**ISLANDER II**

**INSTALLATION MANUAL**

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**Rev. 03/07/03**

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**GASBOY INTERNATIONAL LLC LANSDALE, PA**



## **FCC AND DOC CUSTOMER INFORMATION**

Both the US Federal Communications Commission (FCC) and the Canadian Department of Communication (DOC) require specific information be supplied to the users of any equipment which may emit radio frequency energy. Please read the following information.

### **FCC PART 15**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the device is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at his own expense.

### **FCC PART 68**

#### **GENERAL REQUIREMENTS FOR ALL EQUIPMENT**

1. This equipment complies with Part 68 of the FCC rules. The GASBOY Internal Modem is contained within a GASBOY Fuel Management System. On the outside of the rear access door of the Fuel Management System is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.
2. The GASBOY Internal Modem should be connected to a USOC RJ-11C jack.
3. An FCC compliant telephone cord and modular plug is provided with the equipment. This equipment is designated to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant. See Installation Instructions for details.
4. The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the device not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.
5. If the GASBOY Internal Modem causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
6. The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.
7. If trouble is experienced with the GASBOY Internal Modem, for repairs or warranty information, please contact GASBOY International LLC at 1-800-444-5529. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

8. The GASBOY Internal Modem does not have any easily repairable or replaceable parts. If you are experiencing trouble please contact GASBOY International LLC.
9. The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. (Contact your state Public Utility Commission, Public Service Commission or Corporation Commission for information.)

## **DOC CERTIFICATION**

### **The Industry Canada Ringer Equivalence Number Notice**

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations.

Repairs to some certified equipment should be made by an authorized maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the ground connections of the power utility, telephone lines and internal metallic water pipe system, are connected together. This precaution may be particularly important in rural areas.

*CAUTION Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.*

The RINGER EQUIVALENCE NUMBER (REN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the REN of all devices does not exceed 5.

The REN for the GASBOY Internal Modem is 0.8B.

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## INTRODUCTION

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### PURPOSE

The *GASBOY CFN Islander II Installation Manual* is provided to assist you in installing your CFN Islander System. This manual should be supplied to the electrician prior to the installation of conduit and wiring to ensure your Islander System is installed properly. Faulty installations are the major cause of system malfunctions. The system must be installed as described in this manual to ensure the reliability and proper operation of your Islander System. Please read this entire manual before starting installation.



**GASBOY provides a toll-free number for customers and installers having any questions pertaining to the installation:**

**1-800-444-5529**

### SYSTEM OVERVIEW

The CFN Islander II is a microprocessor-based automated fueling system. Consisting of modular components and configurable software, the CFN Islander System can be tailored to meet the needs of government and private fleet owners and retail petroleum marketers. System flexibility allows for debit, credit, club, and fleet cards as well as cash operation through the optional console.

System application determines the components required, therefore, your system may consist of several or all of the following components:

- Islander System
- RS-485 junction box(es)
- Pump control unit(s)
- Satellite Islander Reader(s)
- Console(s)
- Standalone receipt printer(s)
- Cash drawer(s)
- PIN pad(s)
- Data terminal
- Modem
- Power conditioner

Section 2, **System Layout**, provides a brief description of each component.



## **SYSTEM LAYOUT**

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### **PURPOSE**

Use this section for detailed planning of the installation of your system. This section covers a basic description, location requirements, and the environmental requirements of the CFN components. A dimensional drawing is included for components manufactured by GASBOY. This section also covers conduit requirements and gives conduit layout examples for three basic system configurations. Careful planning for the layout of the site will help eliminate possible problems with the start-up of your system and will help ensure continued, reliable system operation.

### **CFN ISLANDER**

#### **Description**

The CFN Islander II is the heart of the CFN System at the fueling site. The Islander consists of a Site Controller II, which controls and allows interaction between all your automated fueling equipment including pump control devices and satellite Islander readers. In the Islander, the Site Controller II comes standard with two PCMCIA card slots and two PCMCIA SRAM cards for mass storage of data and loading in of operating system programs. The Islander II can be ordered to provide magnetic or optical card or cardless operation. A built-in keyswitch can be used to limit access to specified commands. The Islander can control up to 32 hoses and up to 7 satellite readers (Islander readers).

The Islander comes in two post configurations, a standard post and a receipt printer post.

If pump control units are required, the standard pedestal can accommodate two pump control units controlling up to eight hoses. The receipt printer pedestal can accommodate one pump control unit controlling up to four hoses. Remote wall-mount pump control unit(s) can also be used.

The Islander contains four asynchronous ports for terminals, modems and/or computer communications. The ports can be set for either RS-232 or RS-422 communications to meet individual requirements. Port 0 is used for communications to a data terminal (logger). Port 2 is used for communication through a modem or to a computer. Ports 1 and 3 are additional ports which can be programmed according to the application.

Two RS-485 ports are provided for communications with other CFN devices at the fueling site.

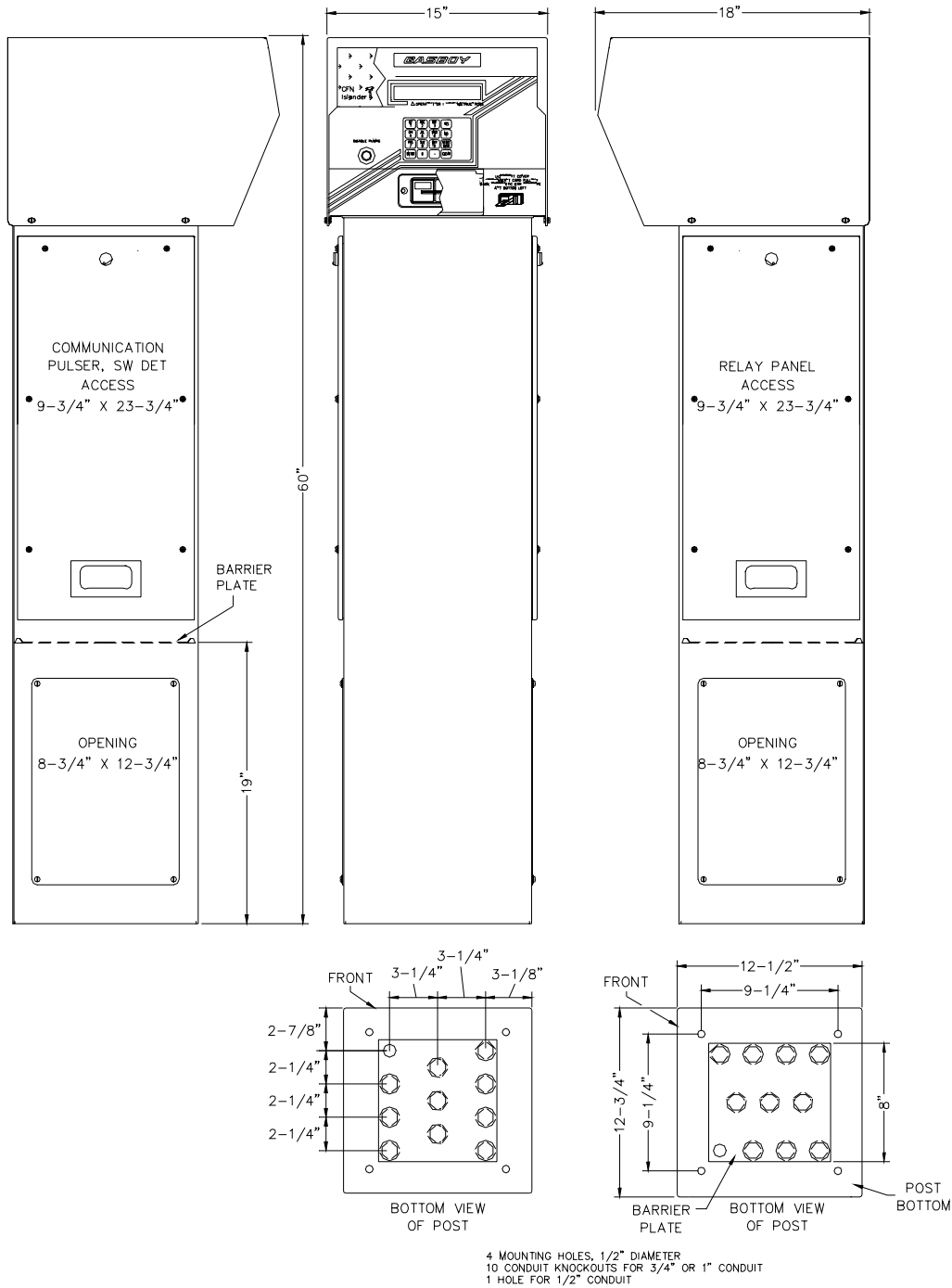
#### **Location**

The Islander should be located on the fuel island. The unit has been designed for an operating temperature range of -40°F to 104°F with a relative humidity of 2% to 99% non-condensing. Adequate clearance must be provided to allow easy access to the post's access covers.

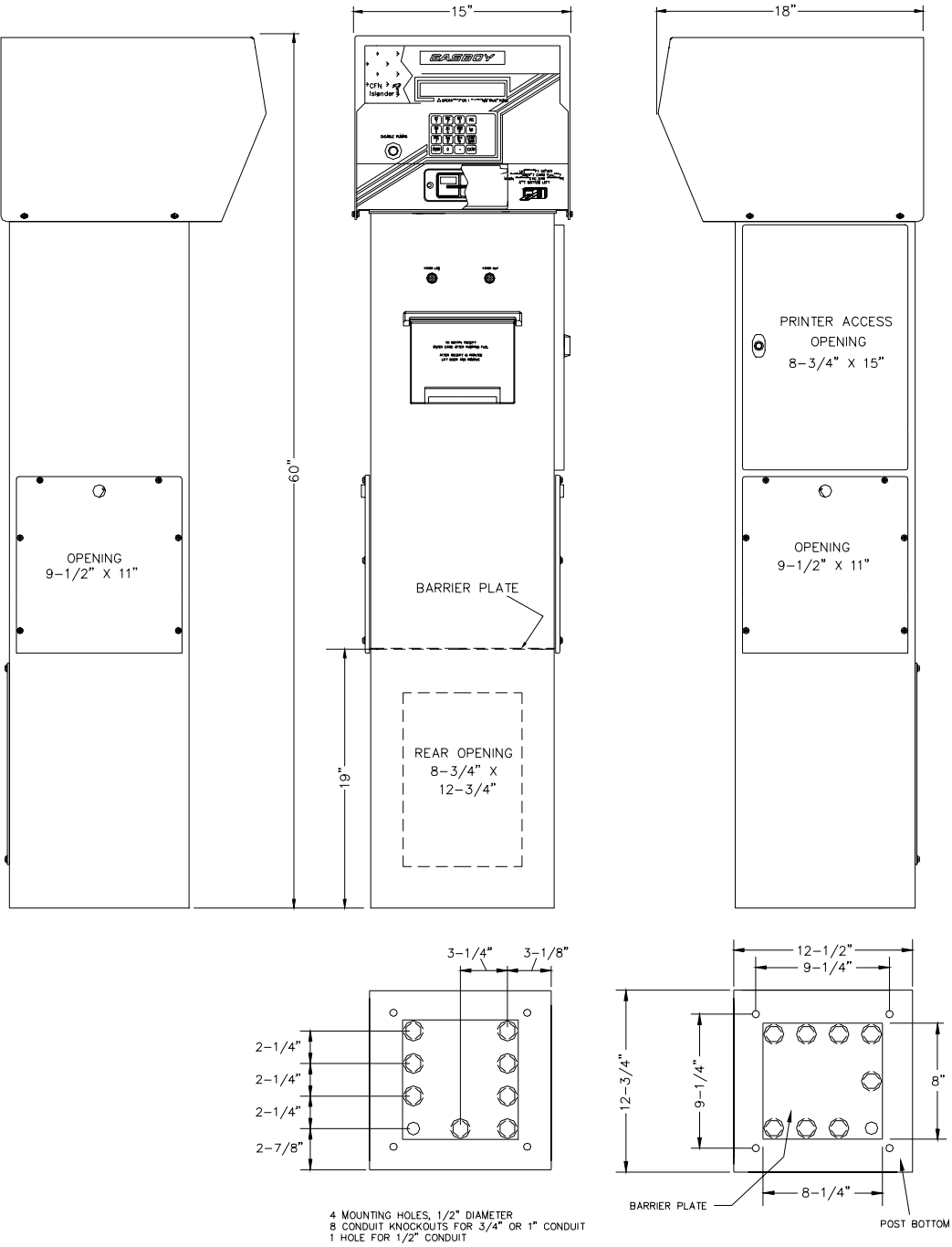
The Islander requires a minimum of 18 inches clearance between the post and any of the pumps/remote dispensers on the island.

## ISLANDER WITH STANDARD POST OR ISLAND-MOUNT STANDALONE PUMP CONTROL UNIT

*NOTE: Drawing shows standard Islander II unit. Island-Mount Standalone unit has the same footprint, but does not have a head. Pedestal height is 48 inches.*



ISLANDER WITH RECEIPT PRINTER POST



## **PUMP CONTROL UNIT (PCU) (OPTIONAL)**

### **Description**

The pump control unit (PCU) controls most mechanical pumps and some electronic pumps. The unit is controlled by a microprocessor and communicates to the Islander via the RS-485 loop. Each pump control unit can control up to four pumps or remote dispensers.

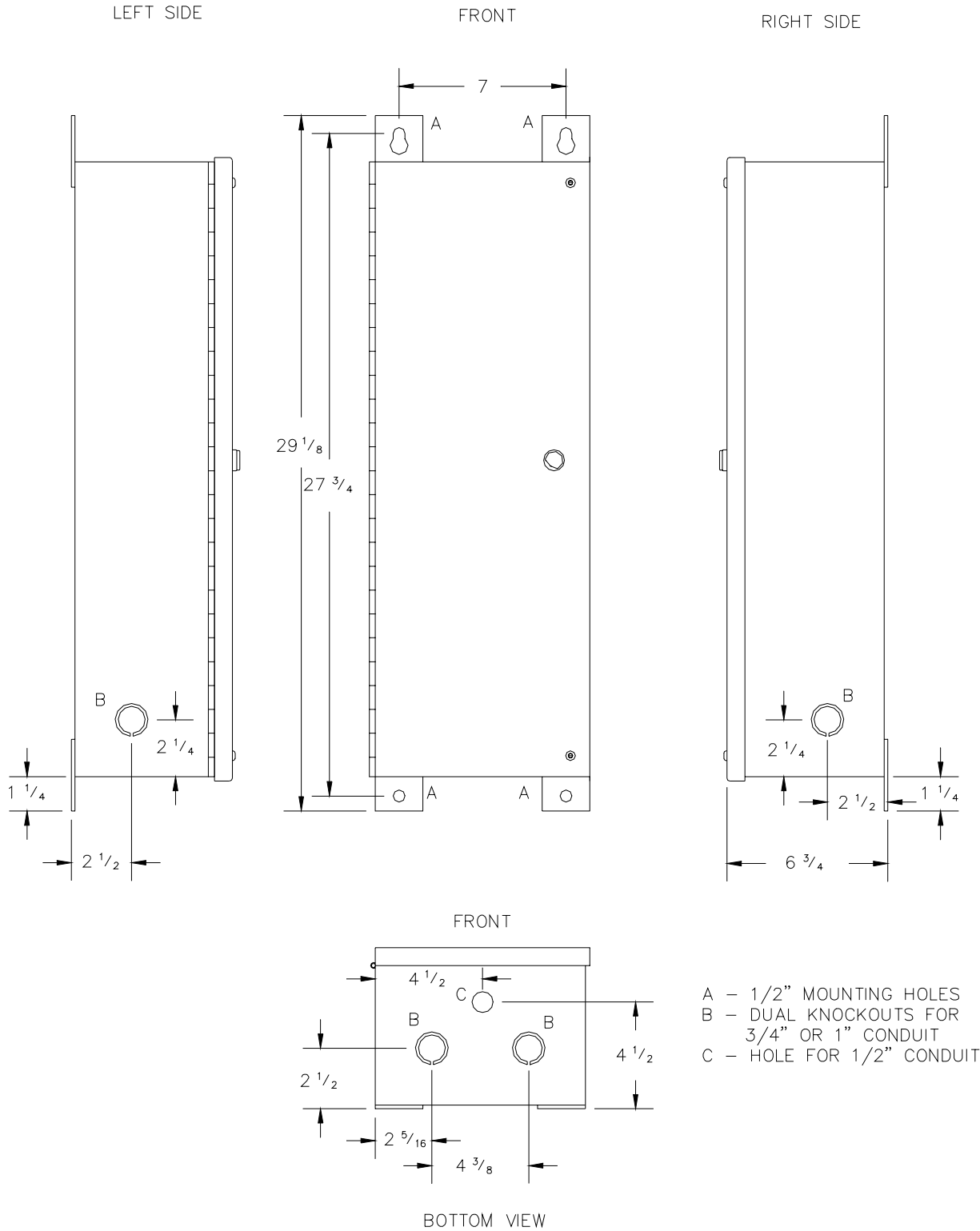
Hardware features include a battery backup for Weights and Measures requirements, three solid state relays for each pump or remote dispenser (slow flow, fast flow and pump), manual override switches, and diagnostic capabilities. Field wiring connections are made to the unit via easy-to-wire terminal blocks.

Pump control units, can be accommodated within the pedestal of the Islander (a standard pedestal can accommodate two pump control units, a receipt printer pedestal can accommodate only one), can be remote from the Islander (wall-mount), or can be a standalone unit located on the island.

### **Location**

The pedestal version of the pump control unit is located within the Islander. The wall mount version of the pump control unit must be located in an area protected from direct contact with weather. The standalone version is located on the island. Do not install over a hazardous location. All pump control units are designed for an operating temperature of -40°F to 104°F with a relative humidity of 2% to 99% non-condensing.

WALL-MOUNT PUMP CONTROL UNIT (PCU) DIMENSIONS





## CONSOLE (OPTIONAL)

### Description

The Checkpoint console is used in retail applications to initiate and monitor sales at the Islander. The unit is controlled by a microprocessor and communicates to the Islander via a direct RS-485 connection that requires an RS-485 junction box. The RS-485 junction box provides a means for hard-wire connection while incorporating protection circuitry to prevent electrostatic surges (which may occur on the field wiring) from reaching the console.

Each Checkpoint console can control up to 16 pumps or remote dispensers. A 20-character alphanumeric display along with pump status LEDs are used to provide the operator with current information regarding the site. Full-travel keys are used in the operation of the unit. An ABA Track 2 magnetic stripe reader is provided for use in reading magnetic stripe cards for credit or club card purchases.

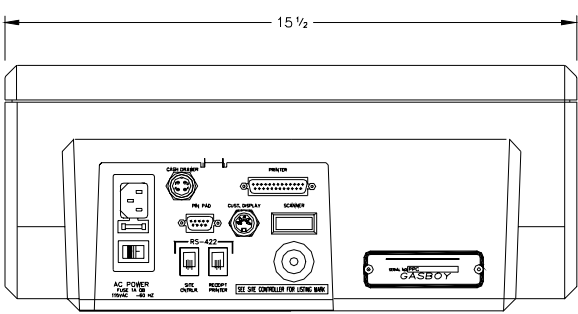
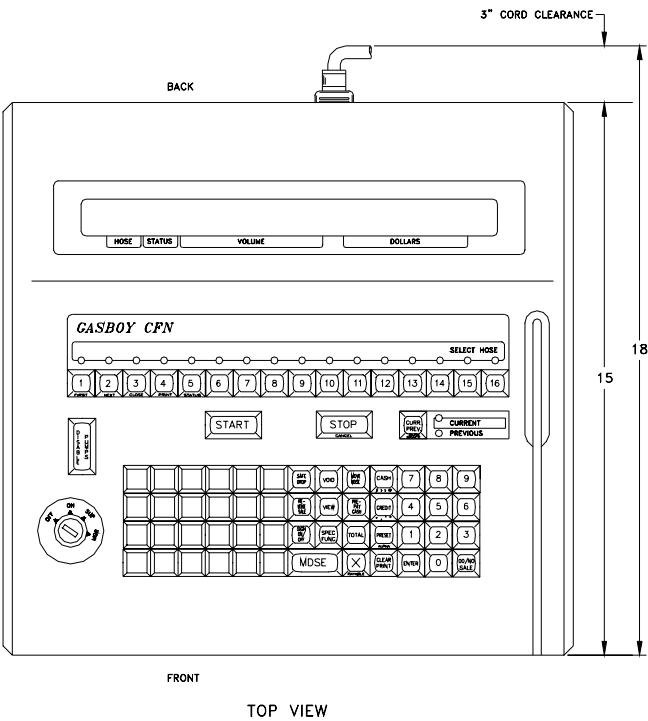
An optional standalone receipt printer, a PIN (personal identification number) pad, a cash drawer, and a customer display are available for use with the console. The optional standalone receipt printer is used for generating receipts in the building where the console is located. The optional PIN pad can be used to allow customers to secretly enter their PINs for console transactions. The optional cash drawer is used for storage of cash at the site. The customer display allows you to display console sales so they are visible to the customer.

### Location

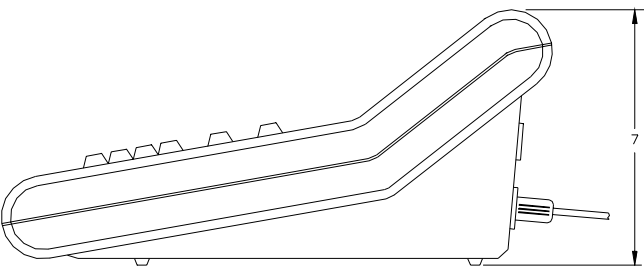
The console and optional equipment should be located in an office-type environment. The unit must be located in an area protected from direct contact with the weather. Do not install over a hazardous location. The unit is designed for an operating temperature range of 4°F to 120°F with a relative humidity of 5% to 95% non-condensing. The operative temperature range for the optional standalone receipt printer is 40°F to 104°F.

You can locate the console in a location up to 1000 feet away from the Islander. The RS-485 junction box must be located within eight feet of the console. See **Console Wiring** in Section 3.

CONSOLE

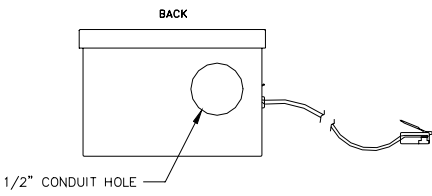
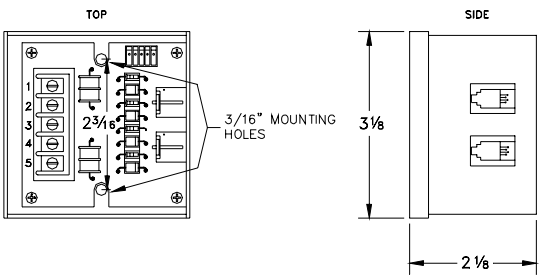


BACK VIEW



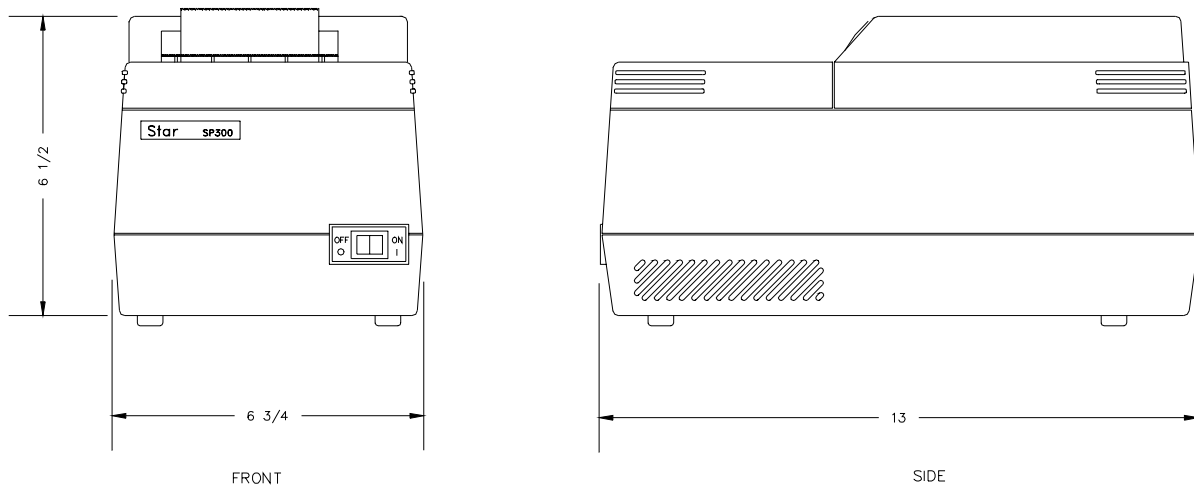
SIDE VIEW

RS-485 JUNCTION BOX

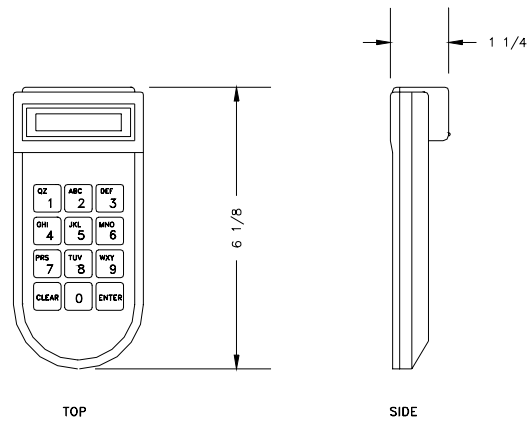


## CONSOLE OPTIONS

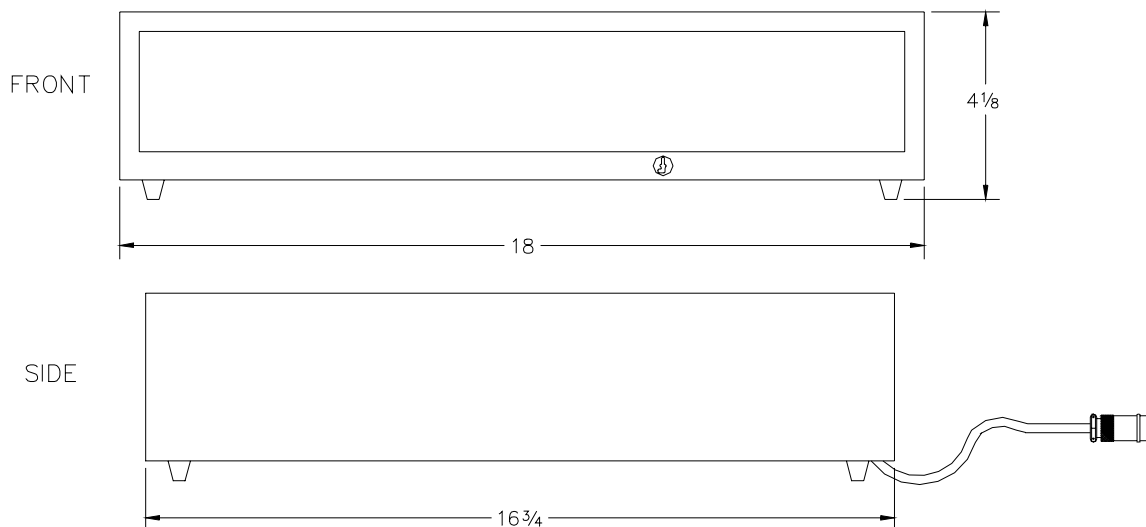
### Standalone Receipt Printer



### PIN Pad



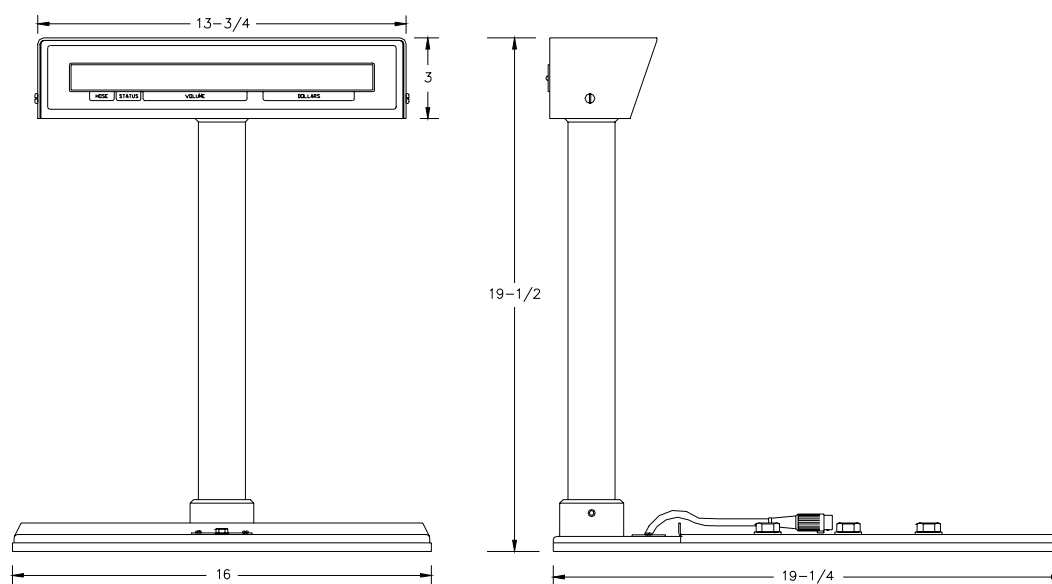
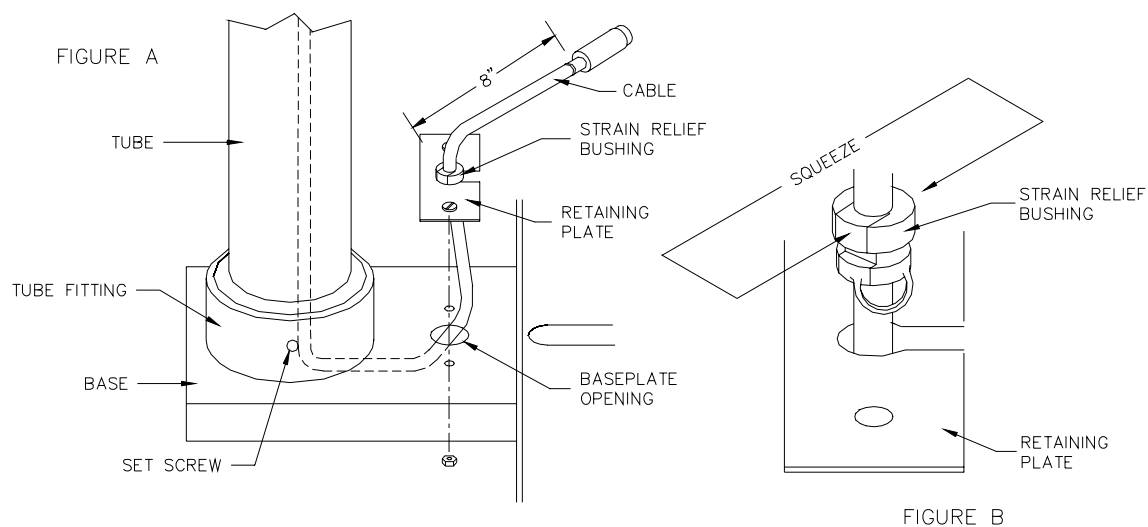
### Cash Drawer



## CUSTOMER DISPLAY (OPTIONAL)

Install the customer display as follows:

1. Remove the protective tape holding the connecting cable to the tube.
2. Thread the connecting cable from the tube down through the tube fitting in the base, under the base and up through the opening in the base plate (Figure A). Be careful not to drop display.
3. Install the tube in the tube fitting, position the display, and tighten the set screw in the tube fitting.
4. Take the strain relief bushing and, using pliers, squeeze the bushing onto the wire. Snap the bushing into the retaining plate (Figure B).
5. Screw the retaining plate to the base as shown in Figure A.



## **CRT/PRINTER (OPTIONAL)**

### **Description**

The CRT terminal is used for communication to and from the Islander. A CRT/printer combination can be used as a logger for providing hard-copy printouts of action at the site or as an interrogation device to extract information from the system via the system's commands. A CRT can be directly connected to the Islander, connected via short haul modems, or connected via telephone modems.

### **Location**

The CRT/printer should be located in a clean, office-type environment. Do not install over a hazardous location. CRT/printer combinations supplied by GASBOY have an operating temperature range of 32°F to 104°F, 10% to 95% relative humidity, non-condensing. Locating the CRT/printer in a dirty environment may cause premature failures.

## **MODEMS (OPTIONAL)**

### **Description**

There are two types of modems (internal and external) that can be used for communication to the Islander where distance or conditions will not permit direct connection to the unit. When an internal modem is installed, remote port communication is routed through the modem in place of being wired at the terminal block in the post. See Section 3, **Phone Modems** for details. Modems to be used for dial-out to a bank network require a dedicated phone line.

### **Location**

When an external modem is used with the system, it is recommended the modem be located in an office-type environment. However, if this is not possible, it should be housed in a protective enclosure. Do not install over a hazardous location. External modems supplied by GASBOY have an operating temperature range of 32°F to 104°F.

When ordered, the internal modem is mounted inside the Islander at the factory. Power for the modem is supplied by the Islander.

## **POWER CONDITIONER (OPTIONAL)**

### **Description**

A Listed power conditioner should be used when there is an unstable source of power. Poor power conditions are a key cause to system malfunction or failure. When used, the power conditioner helps provide clean power to the Islander and other CFN devices. The power conditioner provides transient and common mode protection for the CFN system, although it cannot totally compensate for extremely poor power conditions.

### **Location**

The power conditioner should be located near (within 50 feet of) the Islander, but not in or above a hazardous area. It must be located in an area protected from direct contact with weather (typically near the system circuit breakers). The unit is designed for an operating temperature range of 0°F to 104°F.

## CONDUIT REQUIREMENTS

The conduit requirements outlined in this section are relevant to all components making up the GASBOY system including, but not limited to, CFN system units, pumps, remote dispensers, submersible pumps, submersible starter relays and the circuit breaker panels. The GASBOY Warranty will not apply to any system deviating from the requirements outlined in this section.

All wiring and conduit runs must conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.

All wiring (AC and DC) connecting the different components of the CFN System and all communication equipment signal wires must be installed underground in **threaded, rigid, metal conduit**. **PVC IS NOT ACCEPTABLE**. It is recommended that high voltage AC power wires be installed in separate conduit from the low voltage DC signal wires. However, if AC and DC wires share conduit, DC wiring must use the cable specified in Section 3, **Communication Requirements (RS-485), Short Haul Modems (RS-422)**, and Section 4, **Pulser Wiring and Configuration**. When AC and RS-485 or RS-422 wires **are** combined in the same conduit, only AC wires for the system and pumps may be in that conduit.

All conduit must be connected to the CFN components through the holes and knockouts provided by the factory. Do not make any other holes in these units. If alternate holes are required, contact GASBOY for approval first.

Use the charts below as a guideline to determine the proper conduit sizes for the GASBOY CFN Series system. When planning the orientation of the wiring runs, follow the applicable GASBOY wiring diagram and consider the layout of the components at the site. Long runs or a large number of bends may require you to increase conduit size over what is listed.

| THHN/THWN Wire Areas |          |       |                 |      |
|----------------------|----------|-------|-----------------|------|
| Gauge                | Diameter |       | Area (Sq units) |      |
|                      | in       | mm    | in              | mm   |
| 18                   | .090     | 2.29  | .007            | 4.1  |
| 16                   | .104     | 2.64  | .009            | 5.5  |
| 14                   | .118     | 2.95  | .011            | 6.8  |
| 12                   | .135     | 3.43  | .014            | 9.2  |
| 10                   | .169     | 4.29  | .022            | 14.5 |
| 8                    | .216     | 5.49  | .037            | 23.7 |
| 6                    | .259     | 6.60  | .053            | 34.2 |
| 4                    | .331     | 8.41  | .086            | 55.5 |
| 3                    | .359     | 9.14  | .102            | 65.6 |
| 2                    | .394     | 10.01 | .122            | 78.7 |
| 1063A                | .417     | 10.59 | .137            | 88.4 |

| Areas of Trade Size Conduit |               |    |                 |      |                               |     |
|-----------------------------|---------------|----|-----------------|------|-------------------------------|-----|
| Trade Size                  | Int. Diameter |    | Area (Sq units) |      | Fill Area (sq units) 25% Fill |     |
|                             | in            | mm | in              | mm   | in                            | mm  |
| 1/2                         | .629          | 16 | .303            | 196  | .076                          | 49  |
| 3/4                         | .826          | 21 | .532            | 343  | .133                          | 86  |
| 1                           | 1.063         | 27 | .862            | 556  | .215                          | 139 |
| 1-1/4                       | 1.378         | 35 | 1.50            | 968  | .375                          | 242 |
| 1-1/2                       | 1.614         | 41 | 2.04            | 1314 | .509                          | 329 |
| 2                           | 2.087         | 53 | 3.36            | 2165 | .839                          | 541 |

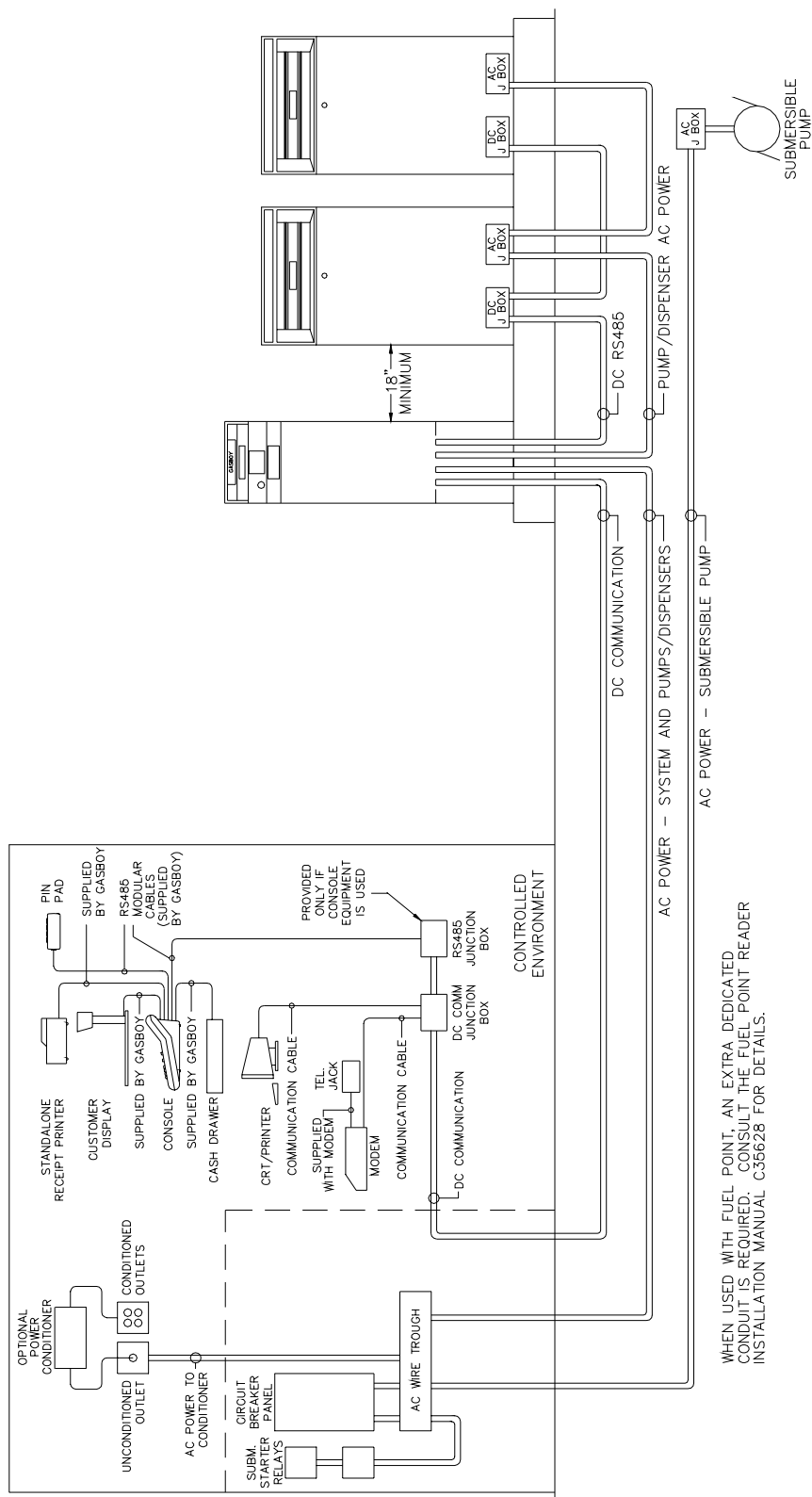
To determine conduit size needed, use the THHN/THWN Wire Areas table (left) to find the area for each wire gauge. Add up all wire areas. Use the Areas of Trade Size Conduit Table (right) to select the smallest number in the 25% fill area (based on NEC 501-1) that comes closest without exceeding the total wire area.

## CONDUIT LAYOUT/INSTALLATION SPECIFICATIONS

1. All wiring is to be installed and used in accordance with all building/fire codes, all Federal, State, and Local codes, National Electrical Code (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.
2. All peripheral equipment connected to the RS-232 ports must be Listed, have an Electronics Industrial Association (EIA) standard RS-232 communications protocol and not be installed over a hazardous location.
3. Power for the system components, data terminal, and modem must come from a separate dedicated circuit breaker rated at no less than 10 AMPS.
4. All conduit **must** be metal to provide the necessary shielding.
5. All conduit **must** be run underground, not overhead.
6. DC pulser and DC RS-485 and RS-422 communication wires can be combined in the same conduit. It is recommended that the DC pulser, RS-485 and/or RS-422 wiring be in a separate metal conduit from any AC wires. However, the DC pulser, RS-485 and/or RS-422 wires can share conduit with AC wires if shielded cable is used as specified in Section 3, **Communication Requirements (RS-485), Short Haul Modems (RS-422)**, and/or Section 4, **Pulser Wiring and Configuration**.
7. Use the wire size chart (Table 4-1) to determine the wire gauge.
8. Use the conduit size charts to determine the size according to the number of wires and wire gauge.
9. RS-232 communication must not exceed 100 feet. RS-232 communication wires must be in a metal conduit separate from any AC wires.
10. For communication distances exceeding 100 feet, you **must** use a GASBOY short haul modem.
11. In submersible applications, starter relays are always recommended; however, the system can directly drive motors up to 3/4 HP at 120/240 VAC or 1-1/2 HP at 240 VAC.
12. Suction pumps over 3/4 HP at 120/240 VAC or 1-1/2 HP at 240 VAC must use a starter relay. Wire the starter relay in place of the motor in the applicable pump wiring drawing.
13. A minimum distance of 18 inches must be maintained between the Islander post and any of the pumps/remote dispensers.
14. Disregard the submersible pump in the drawing if the hose outlets are suction pumps.
15. Consult the applicable section of this manual for specific system installation requirements.
16. When used with Fuel Point, an extra dedicated junction box is supplied to be installed in the pump/dispenser. A separate dedicated conduit is to be run between the junction box and the Fuel Point Reader. Consult the *Fuel Point Reader Installation Manual C35628* for details.

## CONDUIT LAYOUT-PUMP CONTROL POST

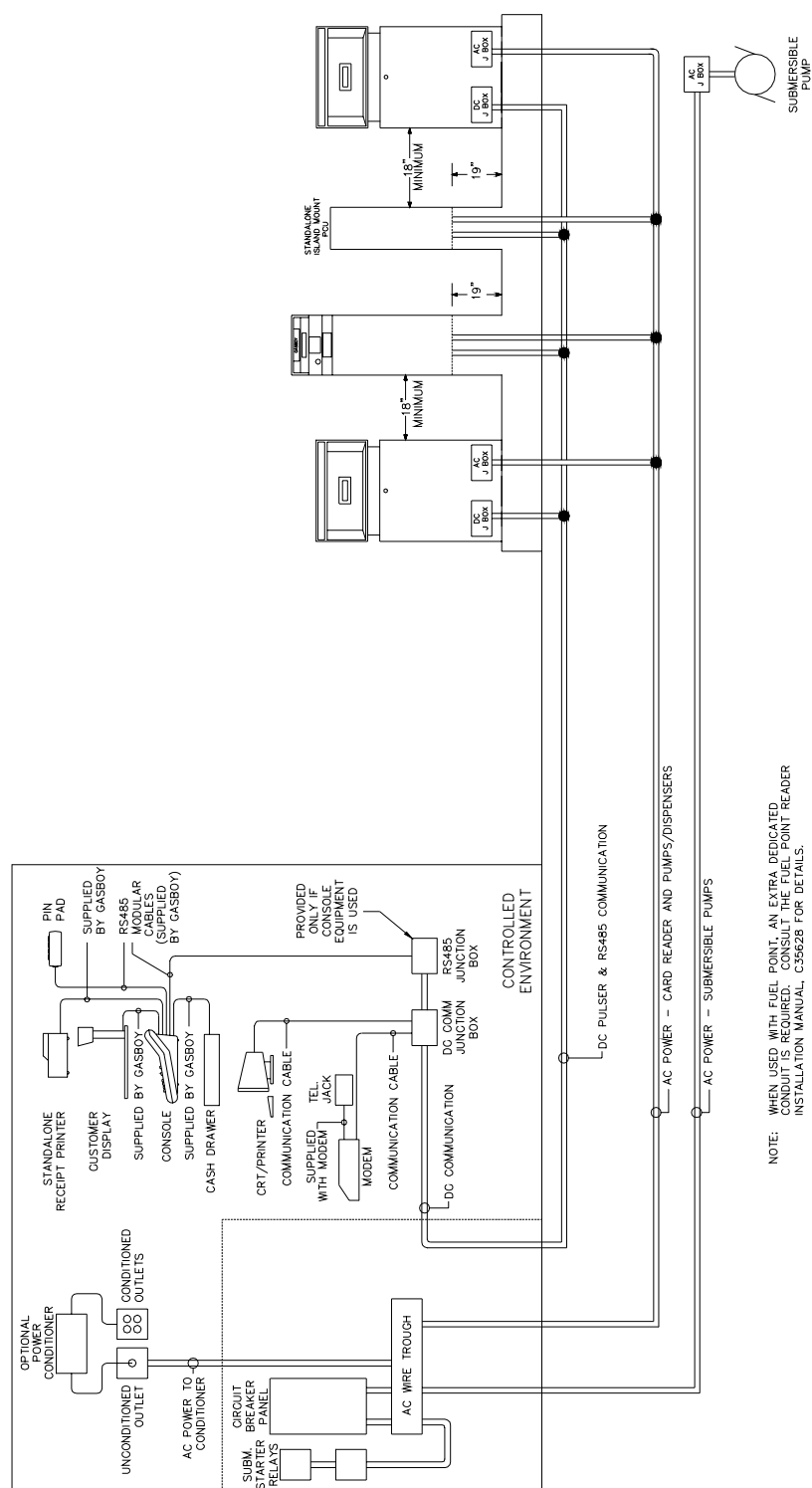
## Mechanical Hose Outlets



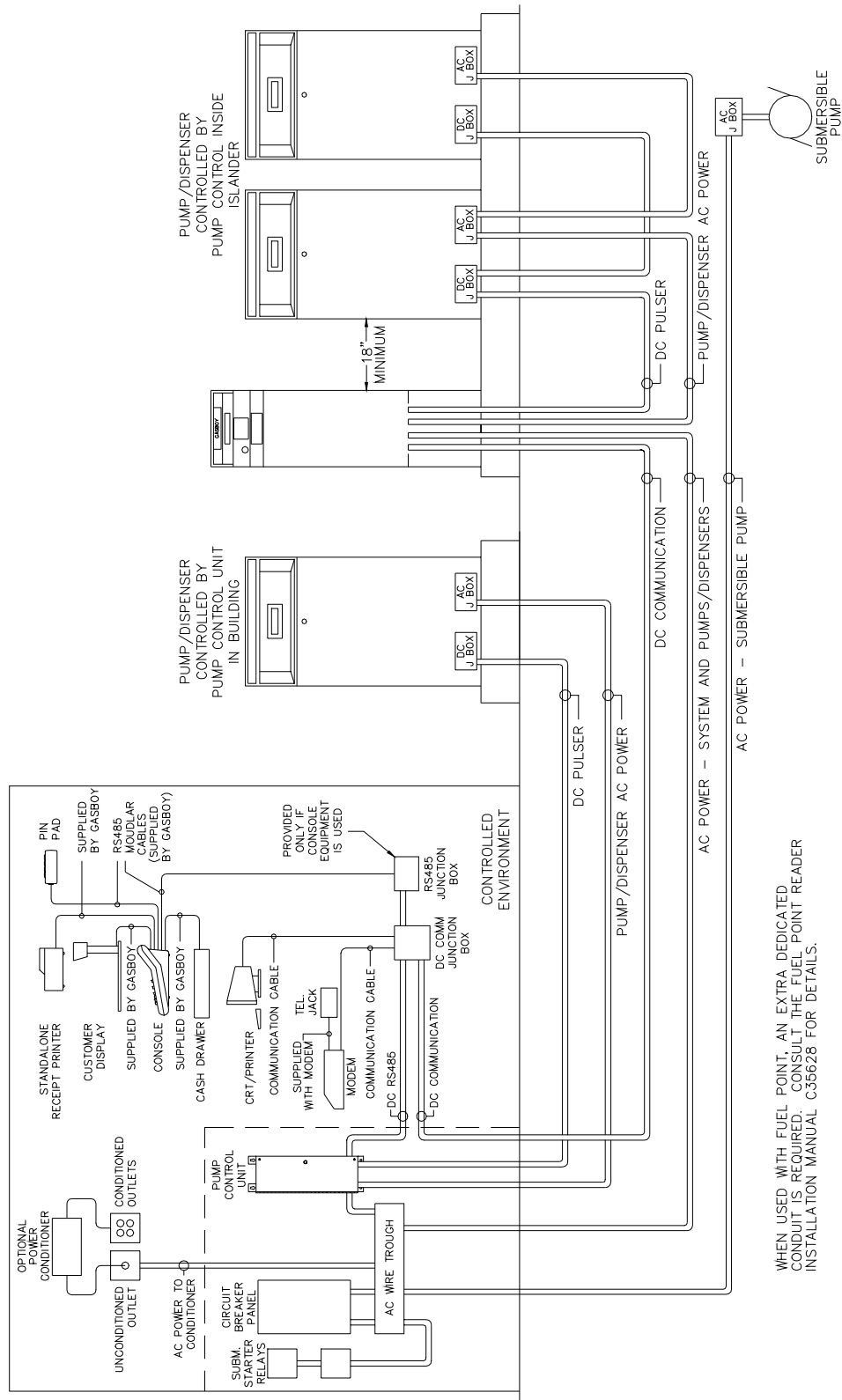


## CONDUIT LAYOUT-ISLAND-MOUNT STANDALONE PUMP CONTROL

### Mechanical Hose Outlets

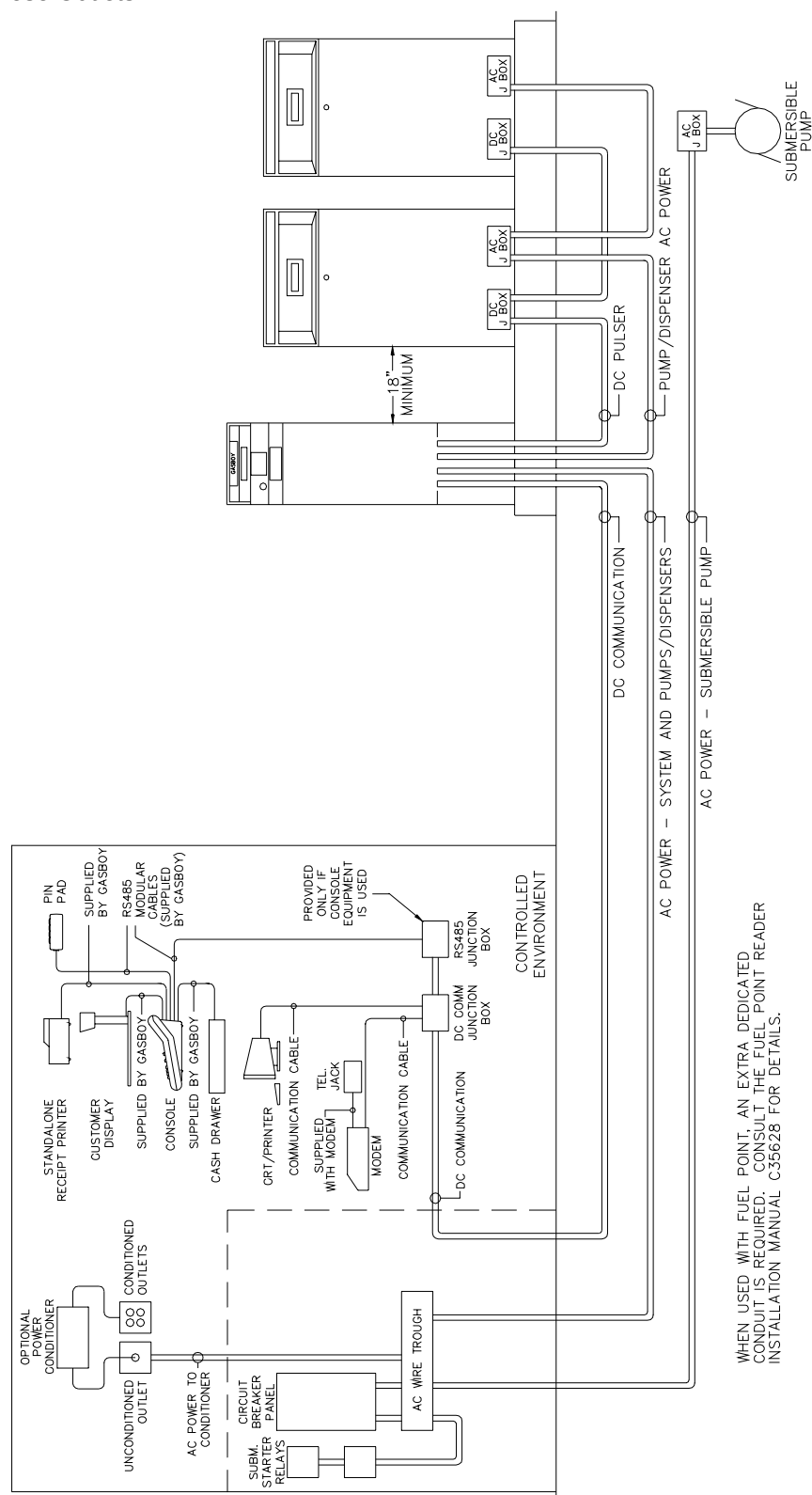


CONDUIT LAYOUT-WALL MOUNT PUMP CONTROL  
Mechanical Hose Outlets



## CONDUIT LAYOUT-GASBOY ELECTRONIC PUMPS/REMOTE DISPENSERS

### Electronic Hose Outlets



## SYSTEM COMPONENTS WIRING

### GENERAL WIRING PRECAUTIONS

The quality of the electrical installation is a major factor in maintaining proper safety levels and providing trouble-free operation of your GASBOY CFN System. To ensure a quality installation, follow these rules:

1. All wiring is to be installed and used in accordance with all building/fire codes, all Federal, State, and Local codes, National Electrical Code (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code. Wiring must also conform to the wiring diagram supplied with the pump/remote dispenser.
2. Use approved conduit and insulated gasoline- and oil-resistant wiring of the proper size.
3. Wire connections must be tightly spliced and secured with a wire nut; close off the open end of the wire nut with electrical tape.
4. Install an emergency power cutoff. In addition to circuit breaker requirements of NFPA 70, NFPA 30, NFPA 30A, and the Canadian Electrical Code (Canadian users only), a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes.

In a fuel management system application, the DISABLE PUMPS button on the Islander and/or the DISABLE PUMPS and STOP keys on the console do not remove AC power from equipment and under certain conditions, will not stop product flow.

In order to provide the highest level of safety to you, your employees, and customers, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system.

#### WARNING

*To reduce the risk of electrical shock when servicing, turn off all power to the pump/remote dispenser. In submersible pump applications, turn off all power to the submersible pump and any other dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when dispensers share a common submersible pump or starter relay.*

#### AVERTISSEMENT

*Pour réduire le risque de choc électrique lors de l'entretien/révision, coupez totalement le courant à la pompe/distributeur. Dans les applications de pompe immerisible, coupez totalement le courant à la pompe immerisible et tous autres distributeurs qui utilisent la pompe immerisible. Le courant alternatif peut alimenter de nouveau un distributeur à l'arrêt quand les distributeurs partagent une pompe immerisible commune ou un relais de démarrage.*

## POWER REQUIREMENTS

### System/Peripheral Equipment

AC power for the CFN system components, data terminal, and external modem must come from a separate, dedicated circuit breaker. No other equipment, including the system's pumps or remote dispensers, may be powered from this breaker. Whenever possible, one breaker should be used to supply the CFN system components, data terminal, and modem. However, it is acceptable to supply the power to the different CFN system components and accessories from multiple **breakers within the same breaker panel** and the same phase of power. When necessary, power for the data terminal or modem may be supplied from a separate, dedicated breaker located in a different breaker panel.

The system requires 120 VAC  $\pm$  10% 47-63 HZ for power. An unstable power source may require the use of a power conditioner. See Section 2, **Power Conditioner** for installation information.

Proper system grounding is an extremely important part of the system installation. As with the AC power, the grounds for all CFN system components should return to the same breaker panel. This helps to assure a common ground throughout the system which is necessary for protection of the RS-485 data loop circuitry. Grounds for all system devices should be wired to the breaker panel ground bus bar which in turn should be grounded to a ground rod. A conduit ground does not provide a sufficient ground. It is recommended that the neutral and ground bus bars be bonded together when it is not prohibited by local codes.

## WIRE SIZE

The AC wire size for power of the CFN system components must be 14 AWG or larger. This gauge of wire will be sufficient for runs of up to 300 feet from the breaker panel to the system. Components with distances over 300 feet must use 12 AWG wire or larger. All wire should be stranded.

The specifications for the RS-485 data loop and RS-232 and RS-422 communication wire/cable size can be found in **Communication Requirements (RS-485)** and/or **Short Haul Modems (RS-422)** later in this section.

## COMMUNICATION REQUIREMENTS

The CFN System utilizes RS-485, RS-232, and RS-422 modes of communication for communicating to other CFN system components and peripheral equipment. The Islander has six ports: two are RS-485 and are dedicated to communicating with other CFN components; the other four can be individually set up for use with a terminal, modem, or PC and can be RS-232 or RS-422. Phone line (modem) communication may also be used when remote communication to the site is desired. In cases where an Islander internal modem is used, the port connected to the internal modem is not available for external communication wiring. The specific requirements for each of these modes of communication are listed below.

### RS-485

RS-485 wiring is used for communication between the CFN system components. This communication takes place over the RS-485 modular cables provided with the system components and the RS-485 data loop field wiring. The following installation requirements must be followed when installing the CFN RS-485 communication lines:

1. All wiring is to be installed and used in accordance with all building/fire codes, all Federal, State, and Local codes, National Electrical Code (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.
2. **Cable:** Twisted pair shielded cable is highly recommended for RS-485 wiring and is required for distances over 100 feet. Although it is recommended that wires be run in a conduit separate from AC wires, they can be combined in the same conduit with AC wires providing UL-Listed cable with the following specifications is used:

Conductor: 18 AWG stranded wire. 2 twisted-pairs.  
Shield: Foil-wrapped 100% coverage and/or tinned copper braid 90% coverage  
Drain Wire: Stranded, tinned copper, 20 AWG or larger/or braided shield  
Voltage Rating: Maximum operating voltage of 600V  
Environmental: Gas- and oil-resistant; suitable for wet or dry locations.

GASBOY can supply Belden 1063A (P/N C09655) which is a UL-Listed, 4-conductor cable that meets the requirements listed above. *NOTE: Belden 1063A is UL-Listed but not CSA listed.*

Cable with a voltage rating of less than 600V must be installed in a conduit separate from all AC wires.

3. **Conduit:** When using the recommended shielded, twisted-pair cable described above, the cable can be run with AC wires in metal conduit. The shield drain wire must be connected to the system AC ground. Only AC wires for the system and pumps can be installed in the AC conduit. Do not run the cable outdoors without the use of metal conduit. Do not run this cable overhead, outdoors.

The cable can be run indoors without the use of metal conduit. The shield drain wire must be connected to the system AC ground.

If using cable other than that recommended above, the RS-485 field wires must be installed in a metal conduit separate from any AC wires.

4. **Distance:** The following distances must be adhered to when installing the RS-485 field wiring.
  - The distance from the Islander to the farthest CFN component is limited to 1000 feet.
  - The total length of the RS-485 field wiring to all the CFN components cannot exceed 1500 feet.

5. **RS-485 Modular Cable:** The RS-485 modular cables required are supplied with the system. These cables are not compatible with standard phone cables that can be obtained from other sources.

GASBOY-supplied cables are eight feet long. If you need to connect a CFN component with a modular connector (i.e., console) to the Islander, you must use an RS-485 junction box to connect the device to the RS-485 communication wiring.

6. **Connections:** See the **System Components Wiring Diagram** later in this section for proper connection of the RS-485 field wiring to the CFN system components.

### RS-232

RS-232 wiring can be used for communication between the CFN Islander and EIA RS-232 compatible peripheral devices (CRT/printer, modem, etc.). The remote end of the wiring can be terminated with either an RS-232D connector or a GASBOY termination box. You must follow these installation requirements when installing the CFN RS-232 communication lines:

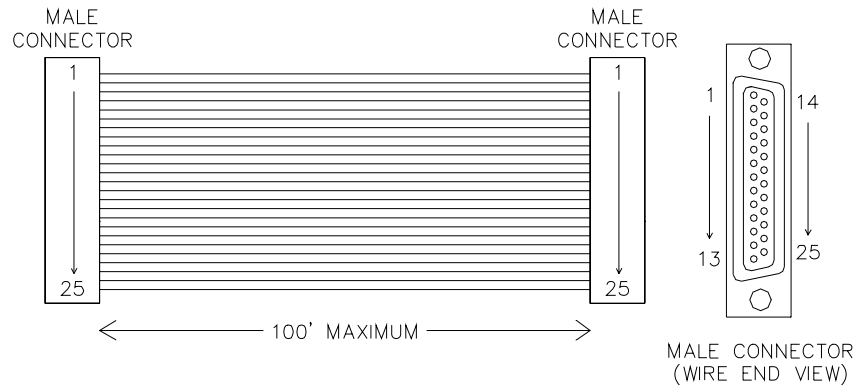
1. All peripheral equipment connected to the RS-232 ports must be UL-listed, have an Electronics Industry Association (EIA) standard RS-232 communication protocol and not be installed over a hazardous location.
2. **Distance:** The following distances must be adhered to when installing the RS-232 communication lines:
  - **1 - 100 feet:** RS-232 can be directly connected to a peripheral device.
  - **101 - 1500 feet:** RS-422 and GASBOY short haul modems (SHM) are required. See **Short Haul Modems** later in this section.
3. **Conduit:** All direct connect RS-232 cables over 15 feet must be in a metal conduit separate from any AC wires. For conduit requirements of short haul modems, see the installation sheet that applies to the device being used.
4. **Cables:** RS-232 cables can either be purchased from GASBOY or made by the installer. The type of cable needed will vary according to the devices it connects. When making cables, wire used must be stranded, not solid core and may be 18 to 22 gauge.

### RS-422

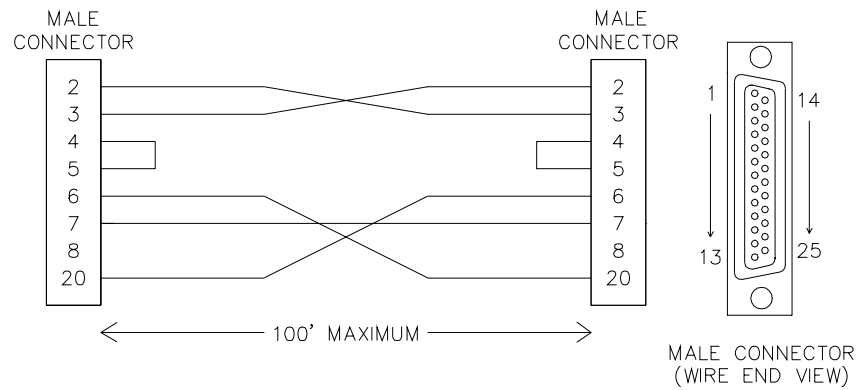
For guidelines and restrictions on RS-422 wiring, see **Short Haul Modems (RS-422)** later in this section.

## RS-232 CABLES

### RS-232 11 Cable (P/N C04549 8-foot M/M)



### RS-232 DTE Cross Cable (P/N C07514)

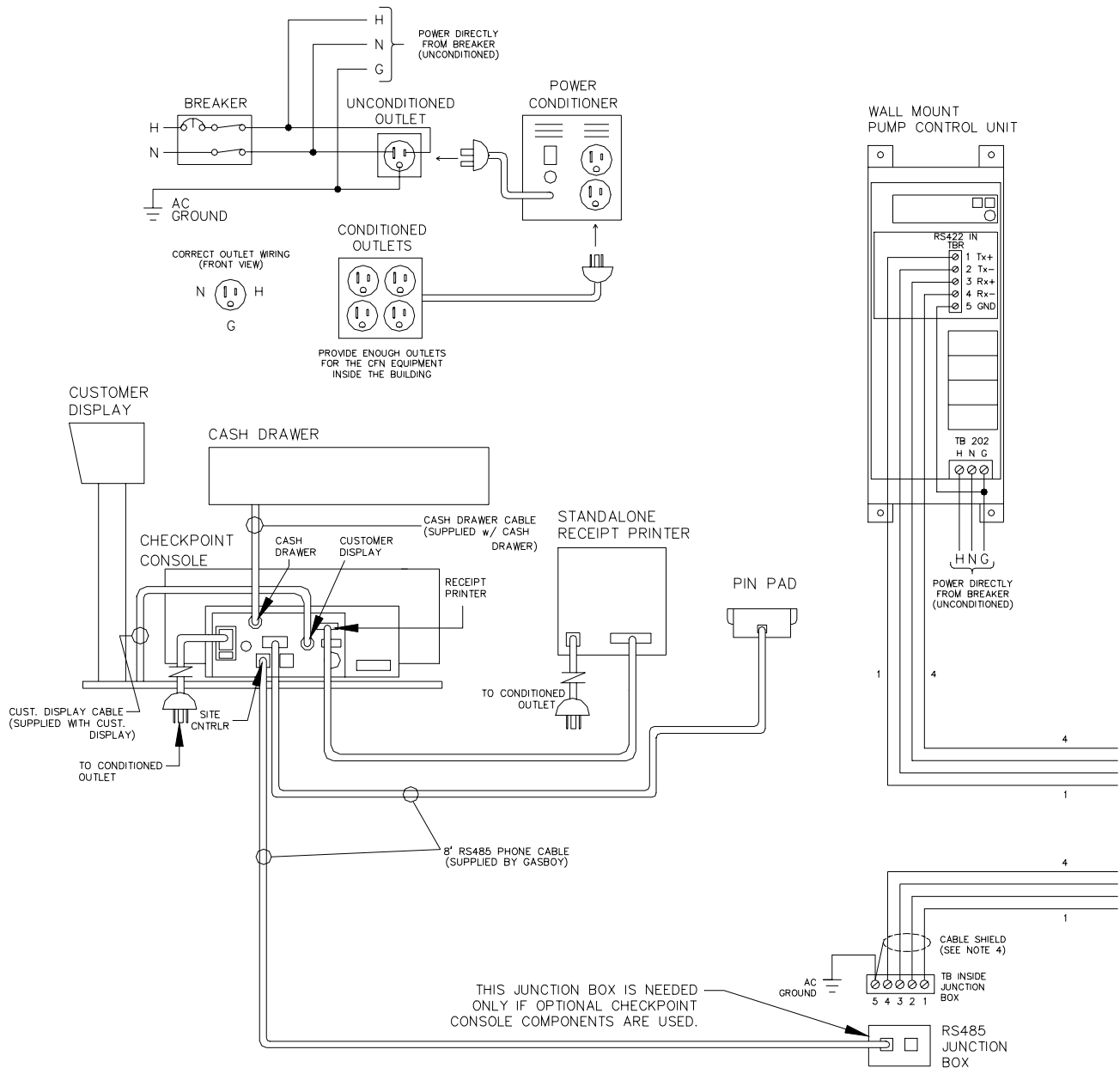


### Termination Box

A termination box can be purchased from GASBOY and provides the installer with an easy-to-wire terminal block connected to the proper pins on an RS-232D female connector. The terminal block will accept up to 18 AWG wire.

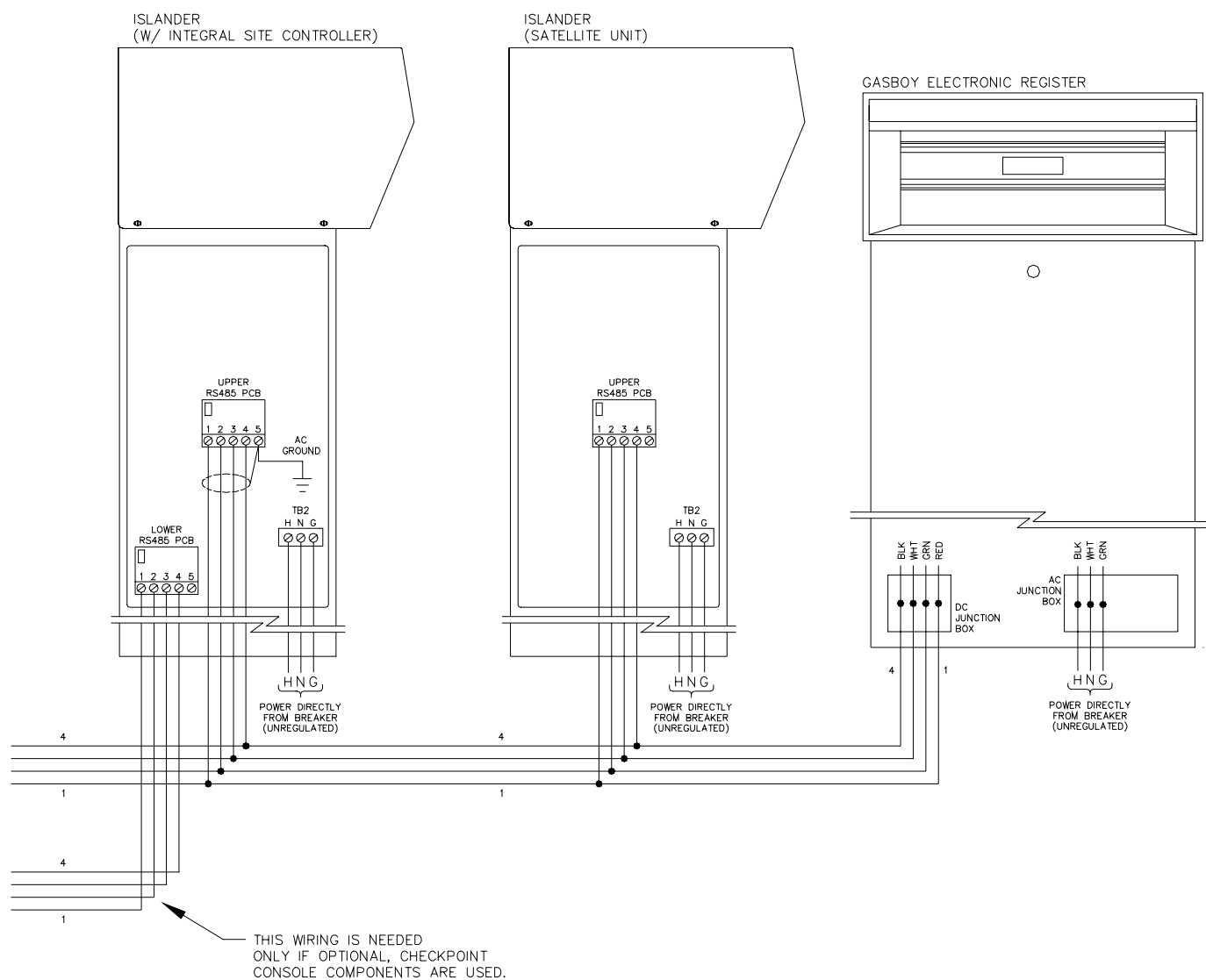


## SYSTEM COMPONENTS WIRING DIAGRAM



## NOTES:

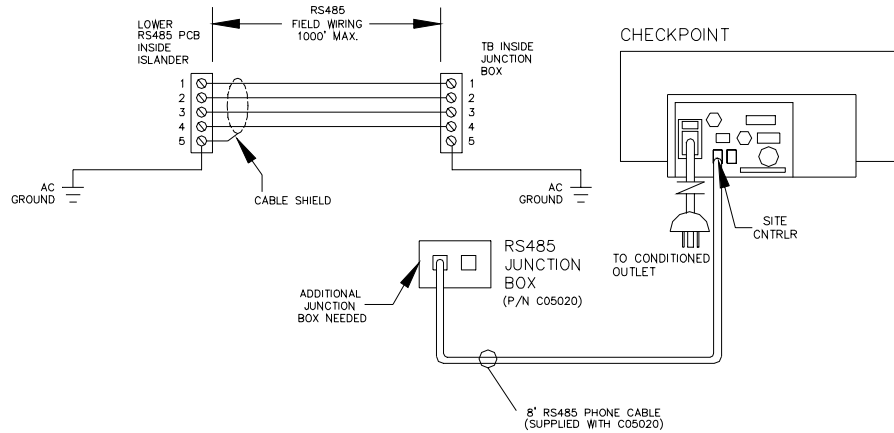
1. All wiring is to be installed and used in accordance with all building/fire codes, all Federal, State, and Local codes, National Electrical Code (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code. Wiring must also conform to the wiring diagram supplied with the pump/remote dispenser.
2. All peripheral equipment connected to the RS-232 ports must be UL-listed, have an Electronics Industry Association (EIA) standard RS-232 communications protocol and not be installed over a hazardous location.



3. The above wiring diagram illustrates a CFN System with every component to indicate how they are interconnected. Components that are not a part of your system should be ignored.
4. When using shielded cable for the RS-485 communication wiring, ground the shield to the AC ground used for the system components (on one end only).
5. CFN island card readers (ICR's) are interchangeable with satellite Islanders in your configuration.
6. Consult the applicable section of this manual for specific system installation requirements.

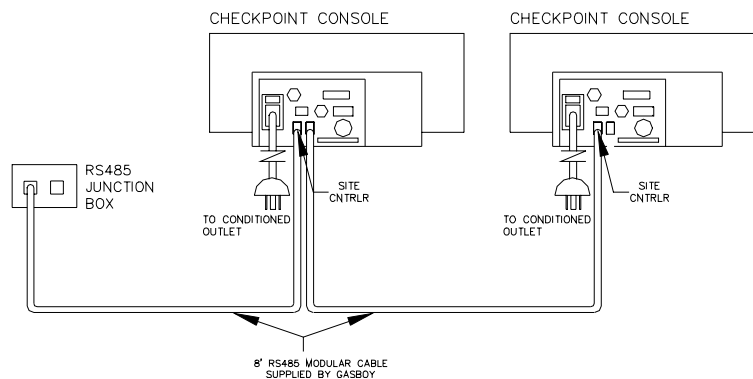
## CHECKPOINT CONSOLE WIRING

The Checkpoint console(s) can be located up to 1000 feet from the Islander. You must use an RS-485 junction box and wire the site as shown below. Remember to mount the junction box within eight feet of the console as the supplied cables are only eight feet long.



## MULTIPLE CHECKPOINT CONSOLE WIRING

The following diagram illustrates how to connect multiple Checkpoint consoles. All wiring must be installed according to the RS-232 and RS-485 wiring specifications discussed previously.



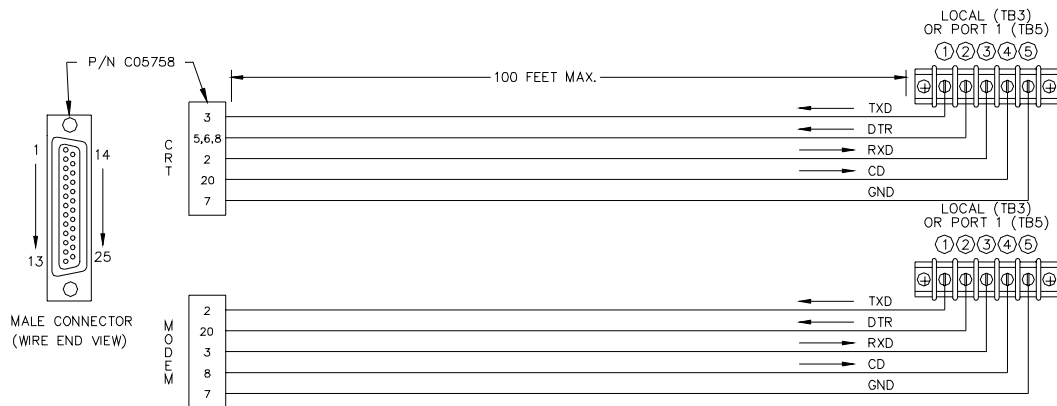
## PORT COMMUNICATION WIRING

The following diagrams show the pin-to-pin layout of the possible wiring schemes for the Islander ports. Each port may be wired for any of the wiring schemes provided the installation requirements are met as outlined at the beginning of this section in the **Communication Requirements**. In the drawings below, the LOCAL terminal block (TB3) is connected to Port 0 of the Islander II.

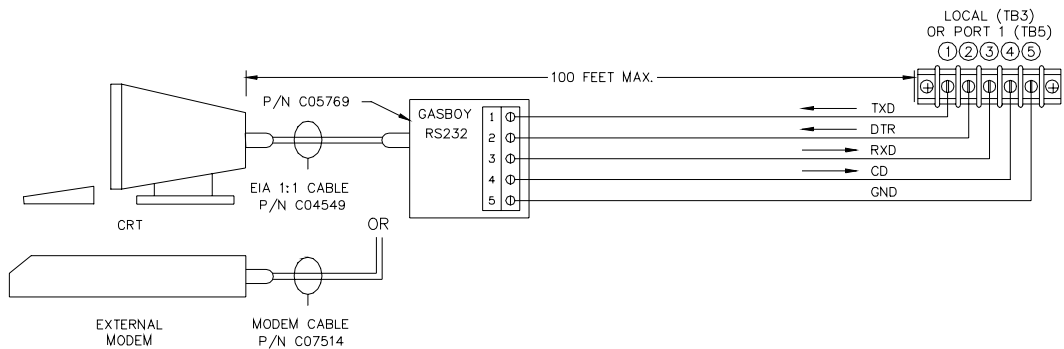
**NOTE:** To insure the necessary signals and proper operation, external modems used in dial-out or bank network applications must use the remote or Port 2 terminal block (TB4).

### Local Port Wiring

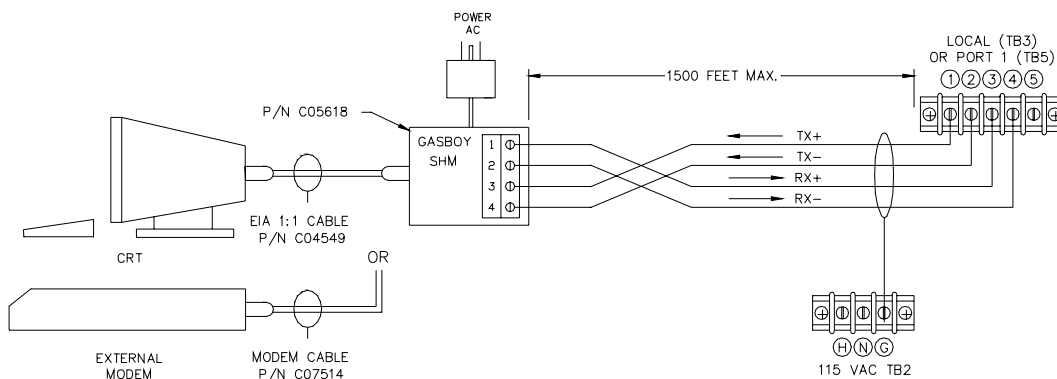
#### RS-232 - D Connector



#### RS-232 - GASBOY Termination Box



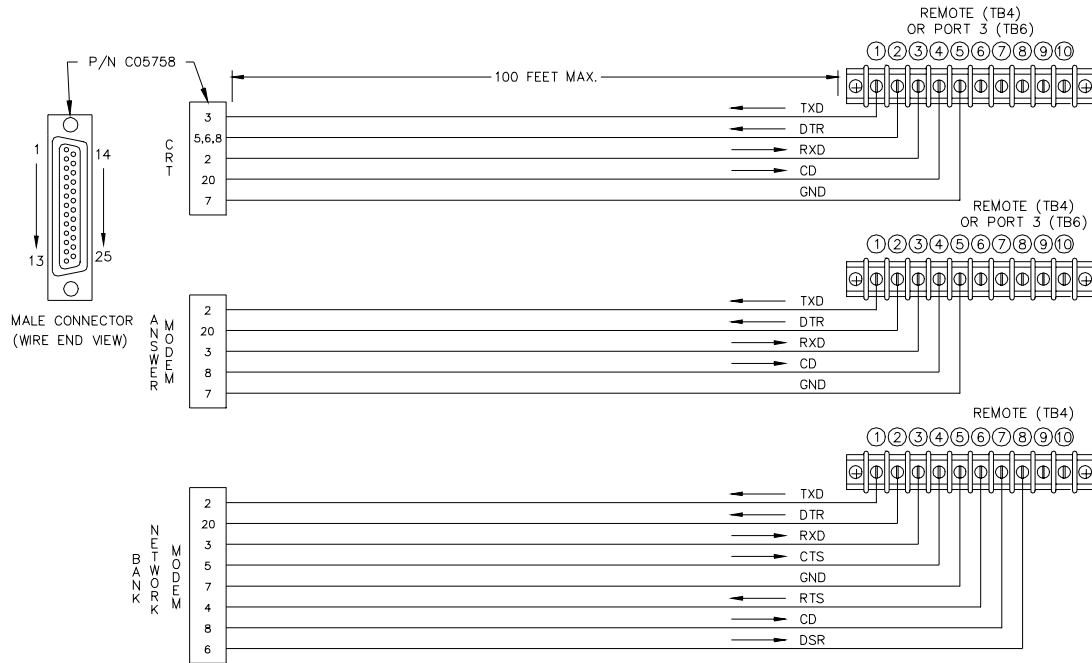
#### RS-422 - GASBOY Short Haul Modem



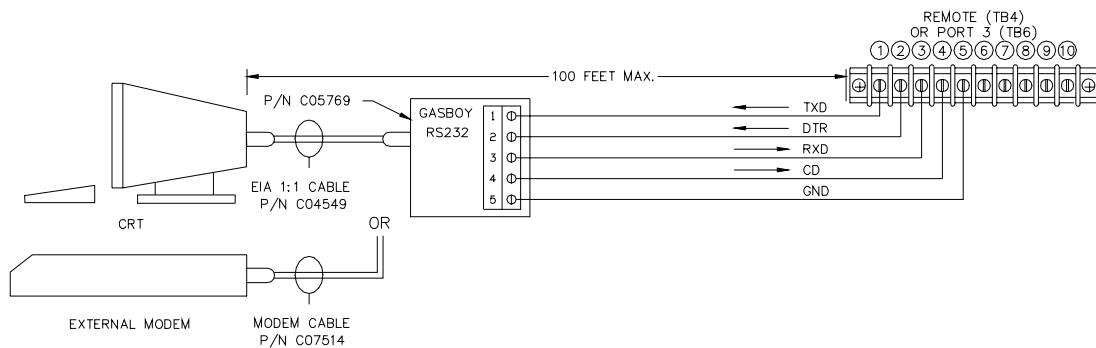
## Remote Port Wiring

In the drawings below, the remote terminal block (TB4) is connected to port 2 of the site controller. Port 3 terminal block (TB6) is a five-position terminal block. The wiring to TB6 will still be the same as that shown for the first five positions of TB4.

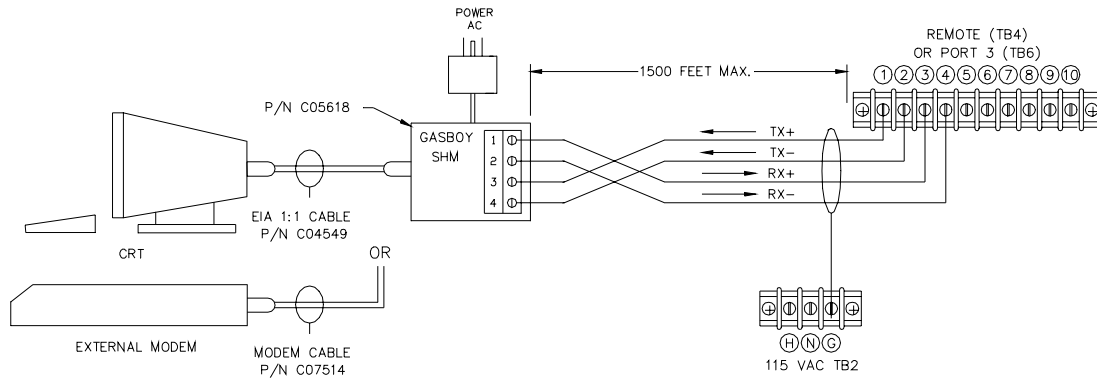
### RS-232 - D Connector



### RS-232 - GASBOY Termination Box



RS-422 - GASBOY Short Haul Modem



## SHORT HAUL MODEMS (RS-422)

A GASBOY short haul modem and the appropriate interconnect cable must be used when the RS-422 communication mode is being used to communicate to one of the ports of the CFN Islander. It should be used for distances between 100 and 1500 feet. It can be used for distances under 100 feet in place of RS-232 wiring. One SHM is required at the remote end of the communication wiring. See **Port Communication Wiring** earlier in this section for local and remote wiring diagrams.

### Installation Requirements

1. All wiring is to be installed and used in accordance with all building/fire codes, all Federal, State, and Local codes, National Electrical Code (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Wiring must also conform to the wiring diagram supplied with the pump/remote dispenser. Canadian users must also comply with the Canadian Electrical Code.
2. **Power:** The AC power for the short haul modem should come from the same breaker that supplies the peripheral device or the system.
3. **Cable:** Twisted pair shielded cable is highly recommended for RS-422 wiring. Although it is recommended that wires be run in a conduit separate from AC wires, they can be combined in the same conduit with AC wires providing UL-Listed cable with the following specifications is used:

Conductor: 18 AWG stranded wire. 2 twisted-pairs.  
Shield: Foil-wrapped 100% coverage and/or tinned copper braid 90% coverage  
Drain Wire: Stranded, tinned copper, 20 AWG or larger/or braided shield  
Voltage Rating: Maximum operating voltage of 600V  
Environmental: Gas- and oil-resistant; suitable for wet or dry locations.

GASBOY can supply Belden 1063A (P/N C09655) which is a UL-Listed, 4-conductor cable that meets the requirements listed above. *NOTE: Belden 1063A is UL-Listed but not CSA listed.*

Cable with a voltage rating of less than 600V must be installed in a conduit separate from all AC wires.

These modems must be connected with private lines and will not work if connected into a telephone network.

4. **Conduit:** When using the recommended shielded twisted-pair cable described previously, RS-422 wires can be run with AC wires in metal conduit. The shield drain wire must be connected to the system AC ground. Only AC wires for the system and pumps can be installed in the AC conduit. Do not run the cable outdoors without the use of metal conduit. Do not run this cable overhead, outdoors.

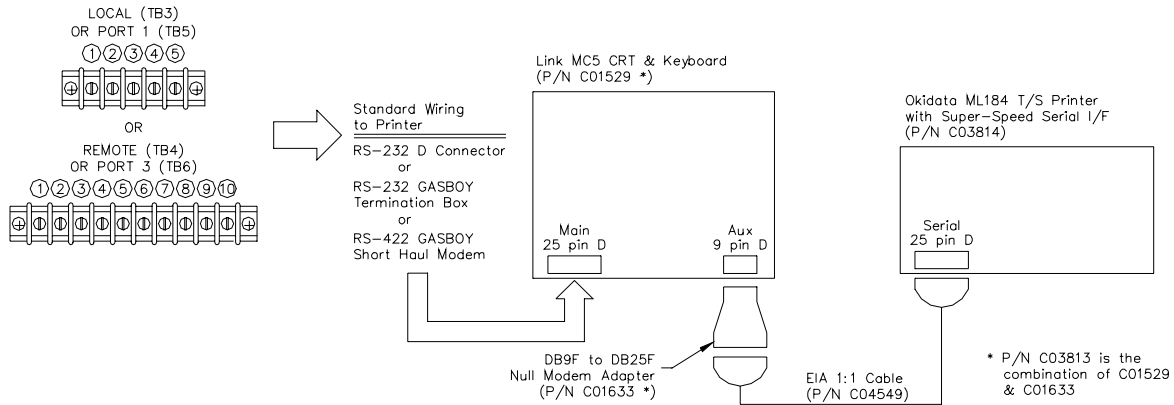
The cable can be run indoors without the use of metal conduit. The shield drain wire must be connected to the system AC ground.

If using cable other than that recommended previously, the RS-422 field wires must be installed in a metal conduit separate from any AC wires.

5. **Distance:** The maximum field wiring cable length is not to exceed 1500 feet.

## WIRING FOR A LINK CRT TERMINAL AND OKIDATA PRINTER

The following diagram shows the connections between the Islander port and the Link CRT terminal and Okidata printer.



## PHONE MODEMS

### External Modems

The type of phone line required for communication via an external modem is contingent upon the type of modem used and the method of communication desired. Consult the manual that comes with the modem for specific requirements.

### Internal Modem

The Islander is available with an optional internal modem. When this modem is installed, remote port communication is routed through the modem in place of being wired at the terminal block in the post. The phone line for the internal modem must not be installed in the DC conduit. Check with your local phone company for proper installation of the phone line.

The 2400 baud modem is designed for 300, 1200, or 2400 baud, full duplex, asynchronous communication. The modem is mounted inside the Islander at the factory. Power for the modem is supplied by the Islander.

The modem is designed to meet or exceed the direct connection registration requirements of the FCC rules. This means the modem will connect directly with a jack supplied by the phone company. The customer is required to order this jack and have it installed. To order this equipment from the phone company, specify:

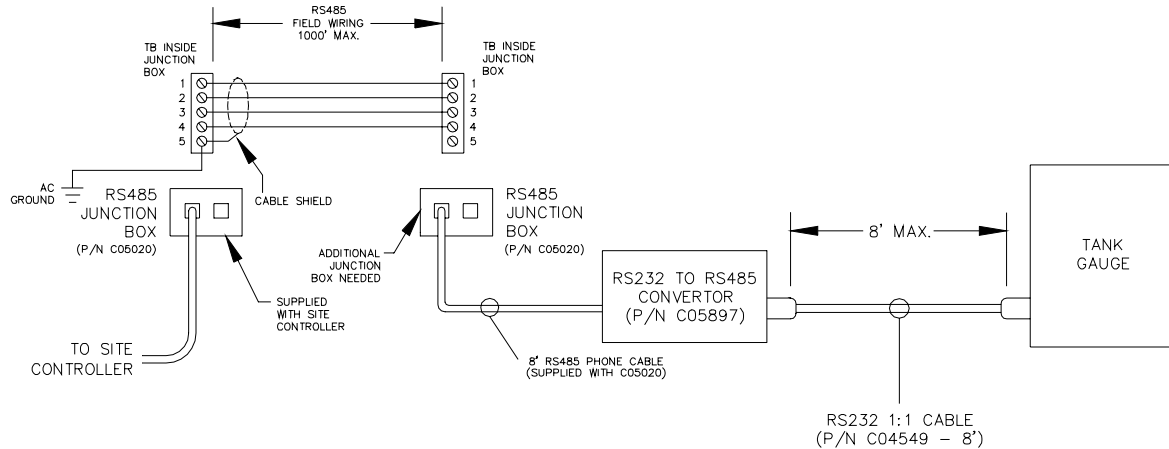
1. Any one of the following jacks: RJ11C or RJ41S, OR RJ45S.
2. The registration number of 6BHUSA-24793-DT-E.
3. The data transmission rate of 300 baud, 1200 baud, or 2400 baud.
4. The Bell equivalent of 103J/212A.



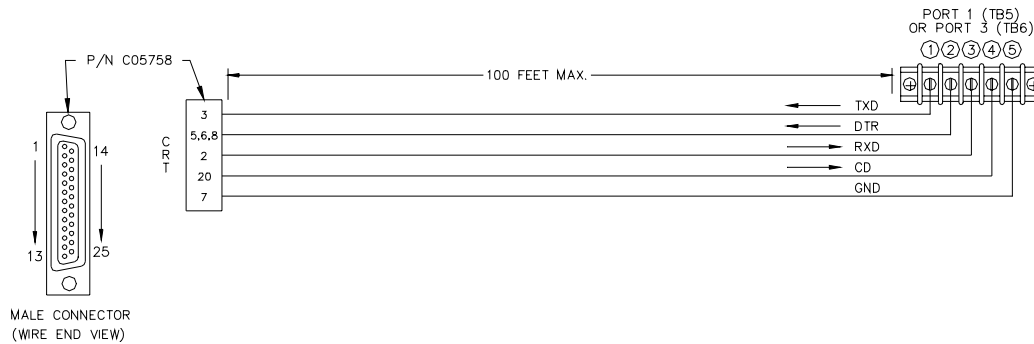
## WIRING FOR A TANK MONITORING SYSTEM

The following diagrams show the wiring schemes for connecting the Islander to a tank monitoring system. All wiring must be installed according to the RS-485, RS-232 and RS-422 wiring specifications discussed previously. Consult manufacturer's documentation for installation instructions before connecting a tank gauge to your CFN system. For EECO monitors, use a C07476 cable in place of the C04549.

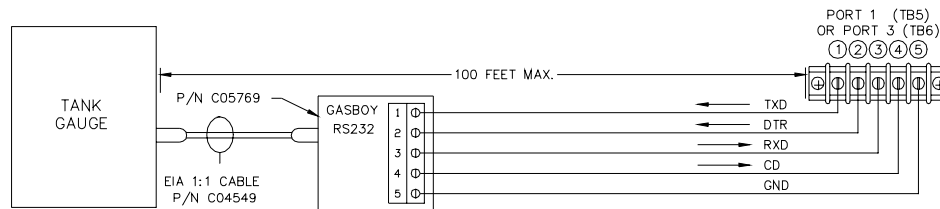
### RS-485 Loop Connection



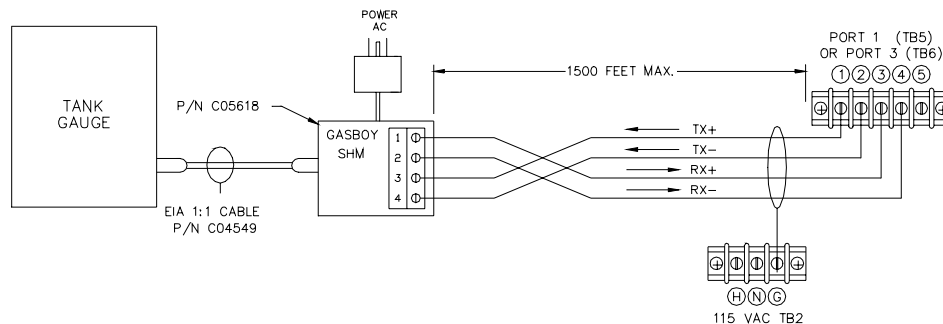
### RS-232 D Connector



### RS-232 GASBOY Termination Box

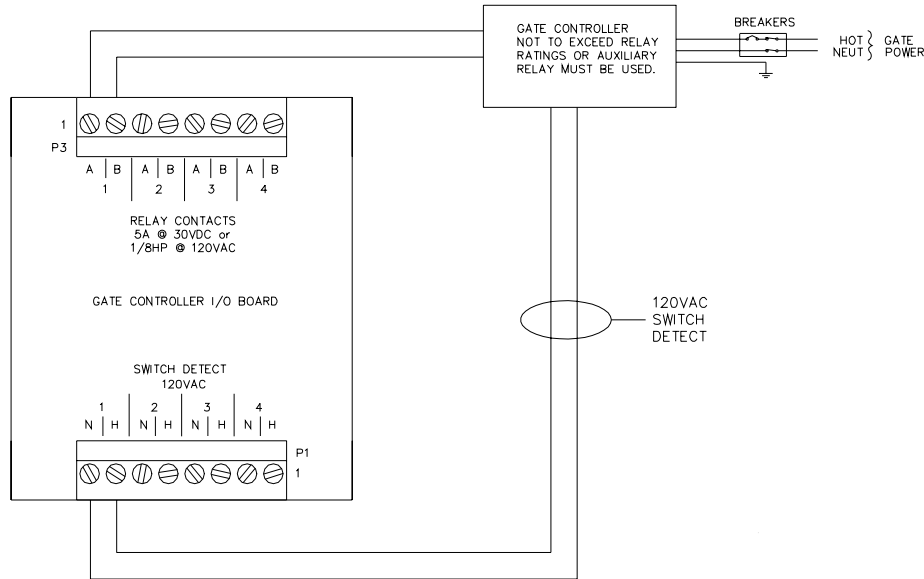


### RS-422 GASBOY Short Haul Modem



## GATE CONTROLLER WIRING USING GATE READER

The CFN system can activate a gate controller by using the CFN Gate Island Reader or Gate Satellite Reader. Either of these Gate Readers allows activation by card, Fuel Point, or terminal command, but not via console or POS terminal.



1. The CFN Gate ICR can directly switch power to a gate controller. The maximum ratings of the switched power is not to exceed 5A @ 30VDC or 1/8HP @ 120VAC. If the gate controller switch control exceeds those ratings, an auxiliary relay must be installed to handle the load. The auxiliary relay coil is not to exceed the ratings mentioned above.
2. The CFN system allows a loadable timeout value up to two minutes during which time the relays are energized. The selected time depends on the gate controller manufacturer's specification.
3. Instead of a timed closure, the system also allows the relays to stay energized indefinitely until a signal comes back to turn them off. The signal is 120VAC only, and is connected to the I/O Board's Switch Detect connector.



## Section 4

# PUMP/REMOTE DISPENSER WIRING

## WIRING PRECAUTIONS

The quality of the electrical installation is a major factor in maintaining proper safety levels and providing trouble-free operation of your GASBOY CFN System. To ensure a quality installation, follow these rules:

1. All wiring is to be installed and used in accordance with all building/fire codes, all Federal, State, and Local codes, National Electrical Code (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code. Wiring must also conform to the wiring diagram supplied with the pump/remote dispenser.
2. Use approved conduit and insulated gasoline- and oil-resistant wiring of the proper size.
3. Wire connections must be tightly spliced and secured with a wire nut; close off the open end of the wire nut with electrical tape.
4. The line to the motor should be on a separate circuit and fused to carry 20 to 30 AMPS depending on the motor size and/or the voltage setting.
5. Install an emergency power cutoff. In addition to circuit breaker requirements of NFPA 70, NFPA 30A, and the Canadian Electrical Code (Canadian users only), a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes.

In a fuel management system application, the DISABLE PUMPS button on the Islander and/or the DISABLE PUMPS and STOP keys on the console do not remove AC power from equipment and under certain conditions, will not stop product flow.

In order to provide the highest level of safety to you, your employees, and customers, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system.

### WARNING

*To reduce the risk of electrical shock when servicing, turn off all power to the pump/remote dispenser. In submersible pump applications, turn off all power to the submersible pump and any other remote dispensers which use that submersible pump. AC power can feed back into a shut-off remote dispenser when dispensers share a common submersible pump or starter relay.*

### AVERTISSEMENT

*Pour réduire le risque de choc électrique lors de l'entretien/révision, coupez totalement le courant à la pompe/distributeur. Dans les applications de pompe immerisible, coupez totalement le courant à la pompe immerisible et tous autres distributeurs qui utilisent la pompe immerisible. Le courant alternatif peut alimenter de nouveau un distributeur à l'arrêt quand les distributeurs partagent une pompe immerisible commune ou un relais de démarrage.*

## POWER REQUIREMENTS

### Suction Pumps

The CFN pump control unit is capable of directly driving pump motors up to 3/4 HP at 120/240 VAC or 1-1/2 HP at 240 VAC. A starter relay must be used with pump motors exceeding these limitations. A separate circuit breaker should be supplied for each pump to meet the current requirements and to allow for isolated control with the circuit breaker panel in case of problems.

### Remote Dispensers

The CFN pump control unit is capable of directly driving submersible pumps up to 3/4 HP at 120/240 VAC or 1-1/2 HP at 240 VAC. A remote dispenser with a submersible pump rated over these limitations will require the use of a submersible starter relay. A separate circuit breaker should be supplied for each remote dispenser in cases where it will directly drive the submersible pump. Remote dispensers may be grouped together on a single breaker when the submersible pump has its own breaker. It is recommended that no more than two remote dispensers be powered from one breaker to maintain isolated control with the circuit breaker panel in case of problems.

### GASBOY 9800 Pumps/Remote Dispensers

GASBOY 9800 Series pumps and remote dispensers do not use the CFN Pump Control Unit. They are wired as standalone units. Refer to the *9800 Pumps and Dispensers Installation/Operation Manual*, 035235 for wiring diagrams and instructions.

## WIRE SIZE

Table 4-1 shows the required AC wire size for suction and submersible pumps based on the HP rating of the pump motor and the distance from the circuit breaker to the pump/remote dispenser for both 120 and 240 volt units. Use this table as a guide for selecting the proper size wire for your installation. All wire should be stranded.

The wire size for the switch detect from the pump should be 14 AWG. The wire size for the control lines of a remote dispenser should be 12 AWG. These control lines are used to supply power for the reset mechanism, solenoid valve, and submersible starter relay (when the submersible pump is not directly powered by the remote dispenser). The wire size for DC pulsers should be 18 AWG. This size exceeds the current requirements of the pulser and is primarily used for its strength.

**Table 4-1. Wire Size**

| 115 VOLT WIRE GAUGE SIZES PER FEET OF RUN |     |     |      |      |      |      |      |                                          |
|-------------------------------------------|-----|-----|------|------|------|------|------|------------------------------------------|
| MOTOR<br>H.P.                             | 25' | 50' | 100' | 150' | 200' | 250' | 300' | OVER 300' USE RELAY<br>AT MOTOR LOCATION |
| 1/4                                       | 14  | 14  | 12   | 10   | 10   | 8    | 8    |                                          |
| 1/3                                       | 14  | 14  | 12   | 10   | 8    | 8    | 8    |                                          |
| 1/2                                       | 14  | 12  | 10   | 8    | 8    | 8    | 8    |                                          |
| 3/4                                       | 14  | 12  | 10   | 8    | 6    | 6    | 4    |                                          |
| 230 VOLT                                  |     |     |      |      |      |      |      |                                          |
| 1/4                                       | 14  | 14  | 14   | 12   | 12   | 12   | 12   |                                          |
| 1/3                                       | 14  | 14  | 12   | 12   | 12   | 12   | 12   |                                          |
| 1/2                                       | 14  | 12  | 12   | 12   | 10   | 10   | 10   |                                          |
| 3/4                                       | 14  | 12  | 12   | 10   | 10   | 10   | 8    |                                          |
| 1-1/2                                     | 12  | 12  | 10   | 10   | 8    | 8    | 6    |                                          |

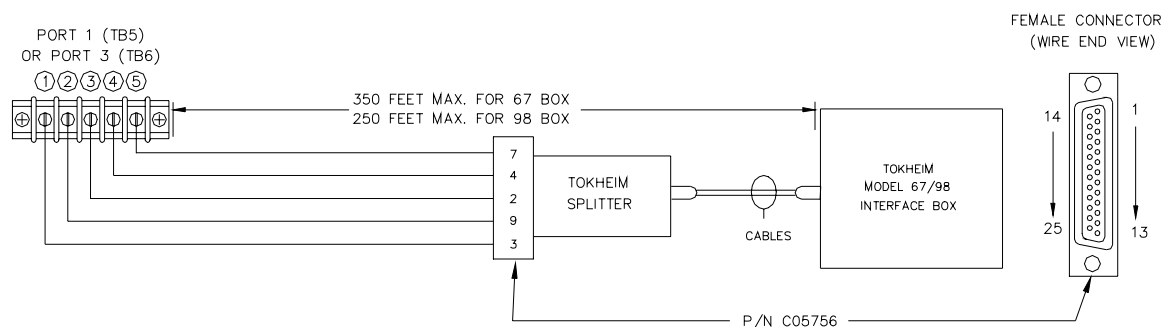
## WIRING ELECTRONIC OR MECHANICAL PUMPS

The remainder of this section shows wiring schematics for electronic and mechanical pumps. All electronic and mechanical pumps must be installed according to the manufacturer's instructions. Depending on the type of electronic pump to which you are connecting, you may require additional information. Refer to the *Pump Interface Manual, C09146* or contact Gasboy Technical Service for information on various pump interfaces.

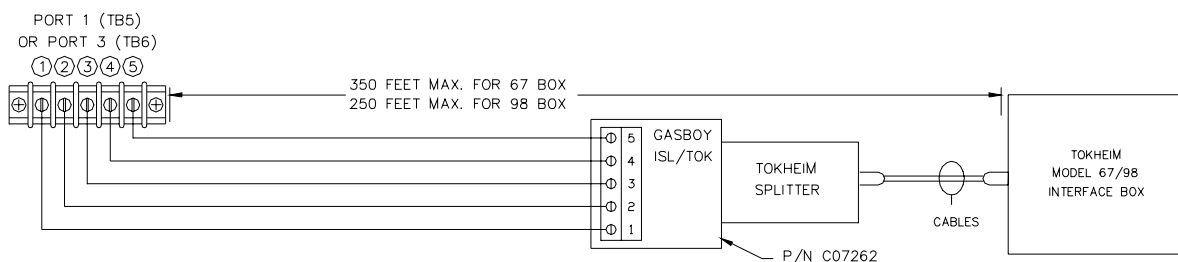
### Connection of Tokheim Pumps

The following diagrams show the interconnection for the Islander II and the Tokheim interface.

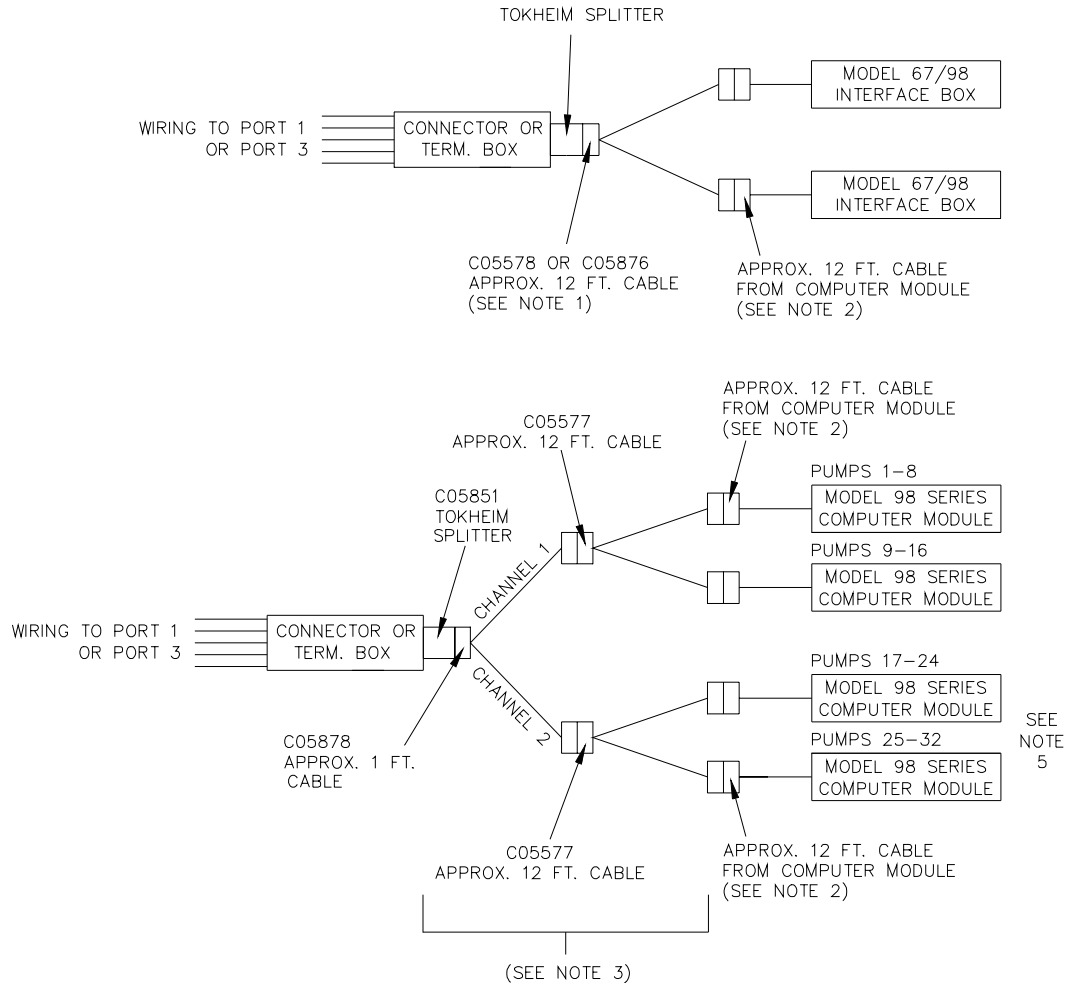
#### D Connector



#### GASBOY ISL/TOK Termination Box



## Tokheim Splitter Cabling

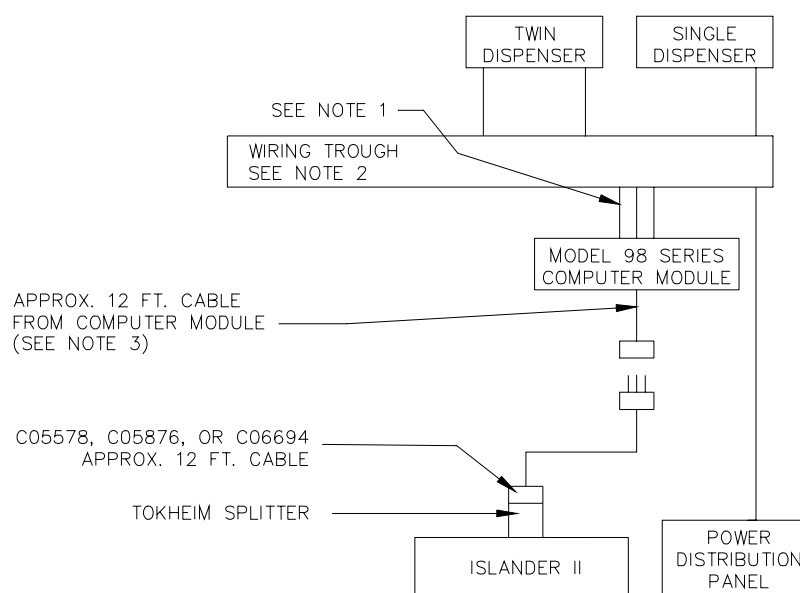


## NOTES:

1. Use a C05578 cable for connection to a single 67 or 98 Interface box. Use a C05876 cable for connection to two 67 or 98 Interface boxes. Both cables include the Tokheim Splitter.
2. A Model 180 signal cable extension is available as an accessory from Tokheim. The maximum distance of the combined cables and field wiring should not exceed 350 feet. The maximum distance for a 98 Interface box is 250 feet.
3. Use part number C06694 for connection to three or more 98 Interface boxes. C06694 is the combination of one C05878 cable, two C05577 cables and a Tokheim Splitter.
4. Communication for pumps 1-32 may be provided through port1 or 3 of the Islander II.
5. The second two 98 boxes must be connected to channel 2 of the splitter. Address the third 98 box (first 98 box on channel 2) as pumps 1 to 8; address the fourth 98 box (second 98 box on channel 2) as pumps 9 to 16.

## Tokheim 162 Interface, Electronic Interface Basic System

- |                |                                                                                                                    |
|----------------|--------------------------------------------------------------------------------------------------------------------|
| 1 to 8 Hoses   | System consists of one Islander II, one computer module, and one C05578 cable and Tokheim Splitter combination.    |
| 9 to 16 Hoses  | System consists of one Islander II, two computer modules, and one C05876 cable and Tokheim Splitter combination.   |
| 17 to 24 Hoses | System consists of one Islander II, three computer modules, and one C06694 cable and Tokheim Splitter combination. |
| 25 to 32 Hoses | System consists of one Islander II, four computer modules, and one C06694 cable and Tokheim Splitter combination.  |



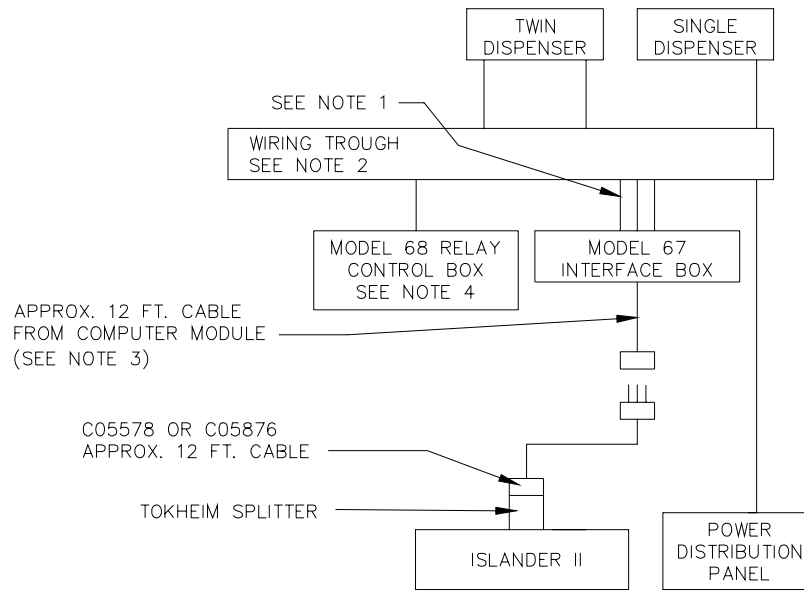
### NOTES:

1. All Tokheim equipment should be installed per Tokheim specifications.
2. Wiring trough, conduits, and wire are furnished by the installer.
3. A Model 180 signal cable extension is available as an accessory from Tokheim. The maximum distance of the combined cables should not exceed 350 feet. The maximum distance for a 94 or 98 interface box is 250 feet.
4. Communication for pumps 1-32 may be provided through port 1 or 3 of the Islander II.
5. The second two 98 boxes must be connected to channel 2 of the splitter. Address the third 98 box (first 98 box on channel 2) as pumps 1 to 8; address the fourth 98 box (second 98 box on channel 2) as pumps 9 to 16.



### **Tokheim 262 and 262A Interface, Electronic Interface Basic System**

- 1 to 16 Hoses System consists of one Islander II, one interface box, and one C05578 cable and Tokheim Splitter combination.
- 17 to 32 Hoses System consists of one Islander II, two interface boxes, and one C05876 cable and Tokheim Splitter combination.

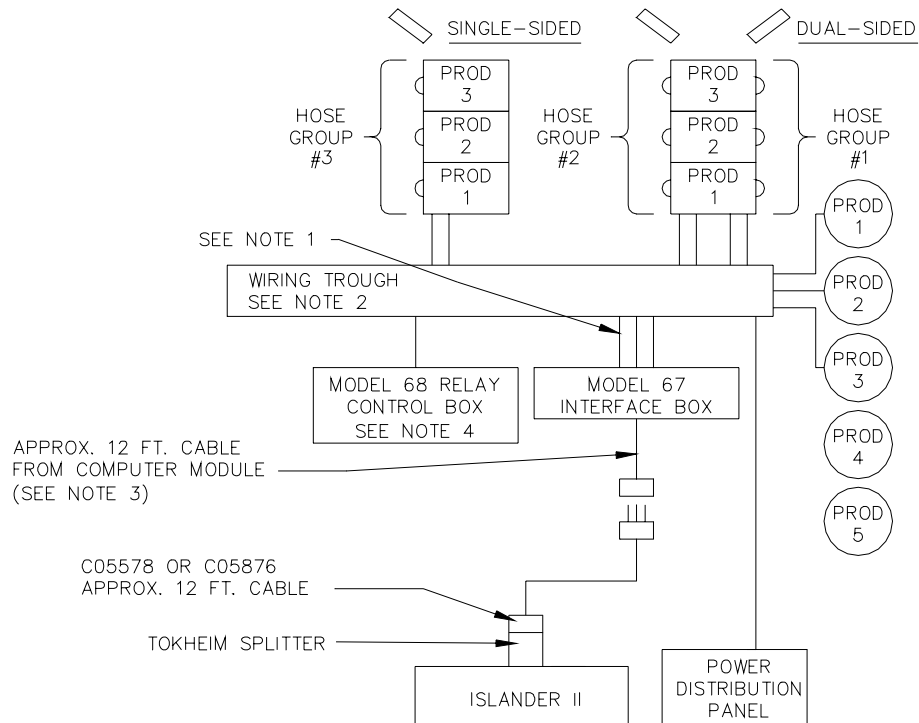


#### **NOTES:**

1. All Tokheim equipment should be installed per Tokheim specifications.
2. Wiring trough, conduits, and wire are furnished by the installer.
3. A Model 180 signal cable extension is available as an accessory from Tokheim. The maximum distance of the combined cables should not exceed 350 feet. The maximum distance for a 94 or 98 interface box is 250 feet.
4. A Model 68 Box is recommended for emergency shut-off applications.
5. Communication for pumps 1-32 may be provided through port 1 or 3 of the Islander II.

**Tokheim 330B, 333B-SA, TCS, and Premier Interface, Electronic Interface  
Basic System**

- |                |                                                                                                                 |
|----------------|-----------------------------------------------------------------------------------------------------------------|
| 1 to 16 Hoses  | System consists of one Islander II, one interface box, and one C05578 cable and Tokheim Splitter combination.   |
| 17 to 32 Hoses | System consists of one Islander II, two interface boxes, and one C05876 cable and Tokheim Splitter combination. |



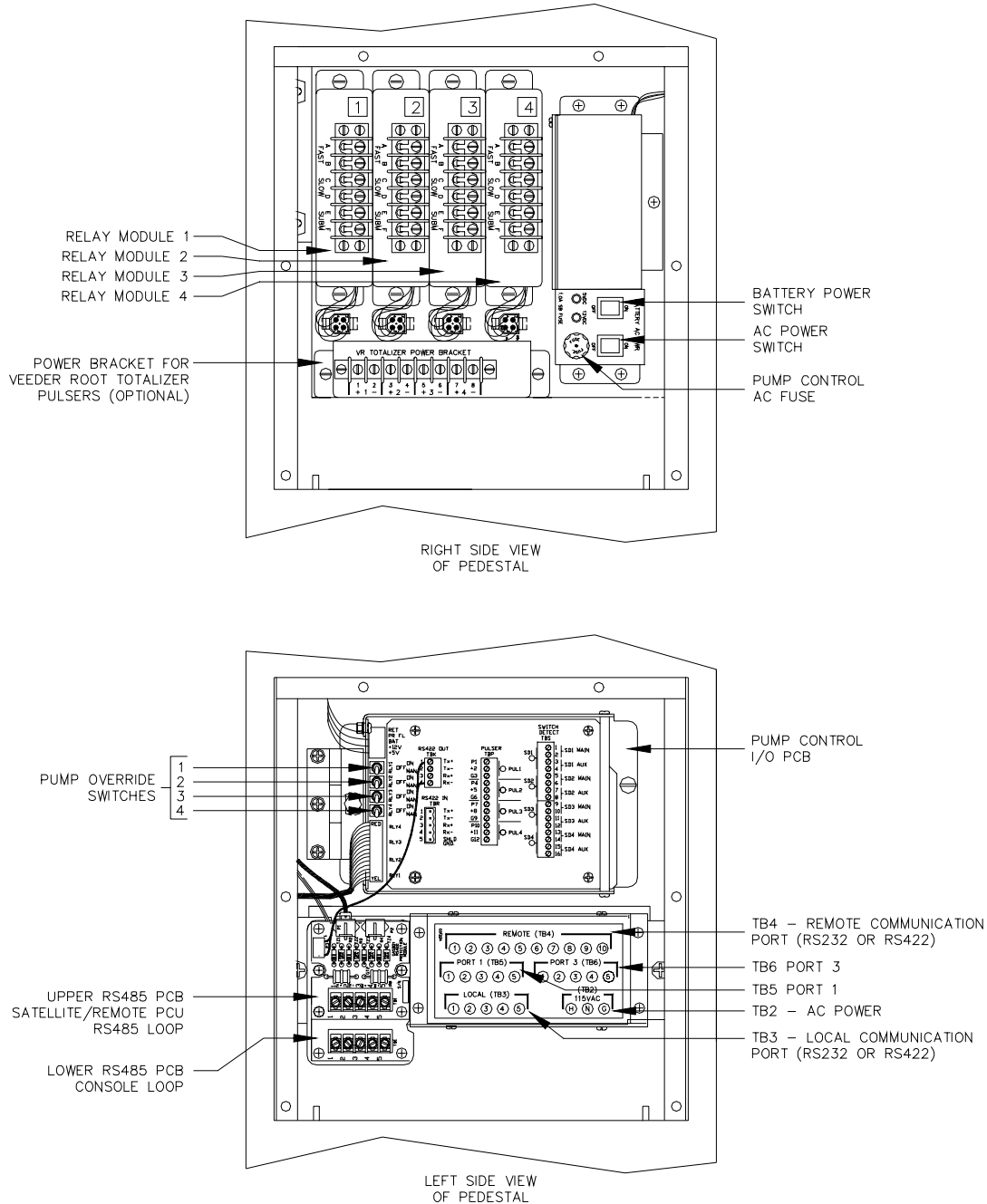
**NOTES:**

1. All Tokheim equipment should be installed per Tokheim specifications.
2. Wiring trough, conduits, and wire are furnished by the installer.
3. A Model 180 signal cable extension is available as an accessory from Tokheim. The maximum distance of the combined cables should not exceed 350 feet. The maximum distance for a 94 or 98 interface box is 250 feet.
4. A Model 68 Box is recommended for emergency shut-off applications.
5. Communication for pumps 1-32 may be provided through port 1 or 3 of the Islander II.

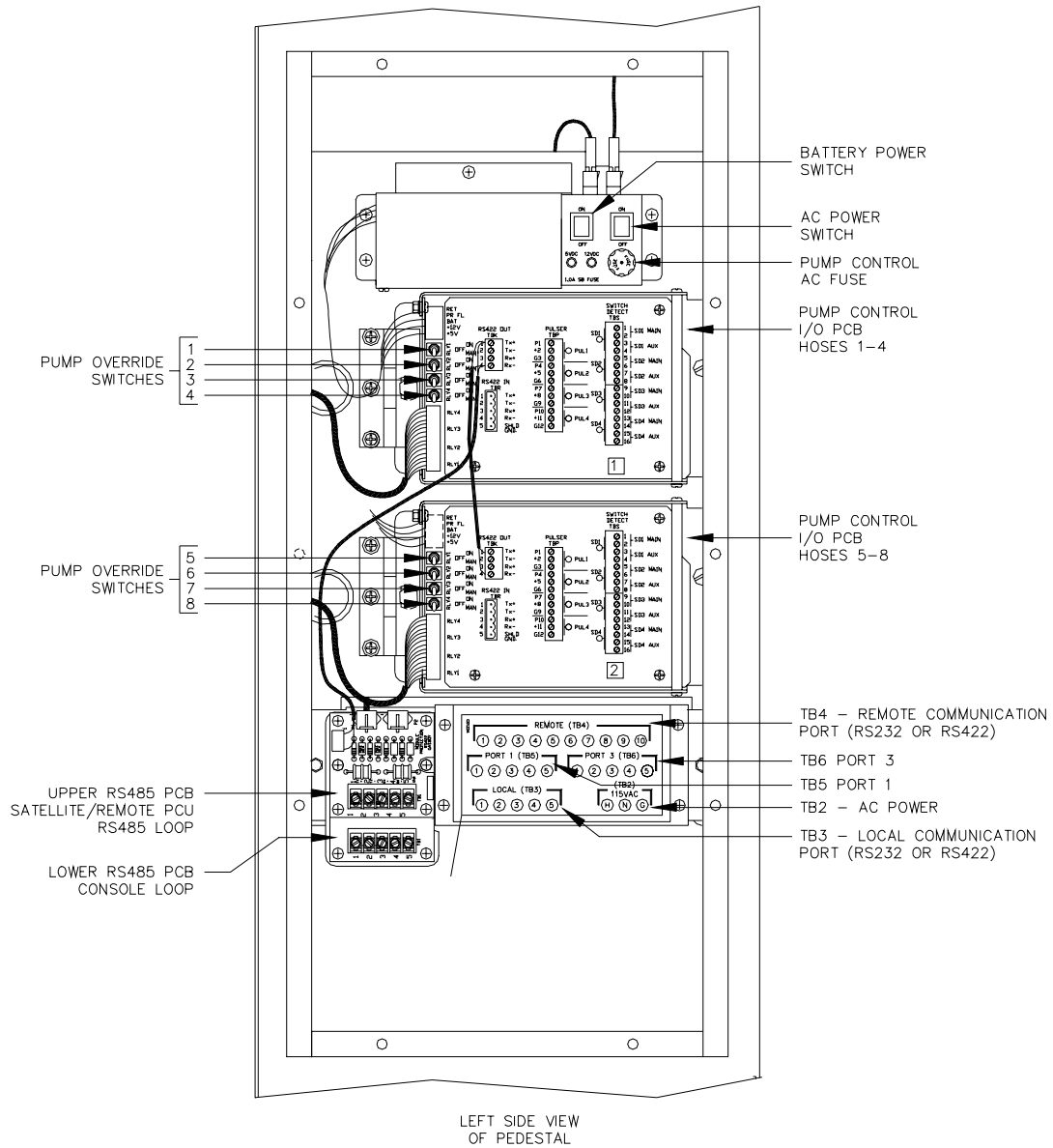
## TERMINAL BLOCK ID

All mechanical pump/remote dispenser wiring for the CFN System is terminated in the pump control unit. Terminal connectors should be used on stranded wire when connecting to the pump power and power input terminal blocks of the system. Connections made to the smaller screw terminal blocks (Pump Control I/O PCB Assembly) do not require terminal connectors. The wire to these connectors must not be any larger than 14 AWG. This page and the following pages show terminal block locations for the receipt printer pedestal, the standard pedestal (left and right views) and the wall mount pump control unit.

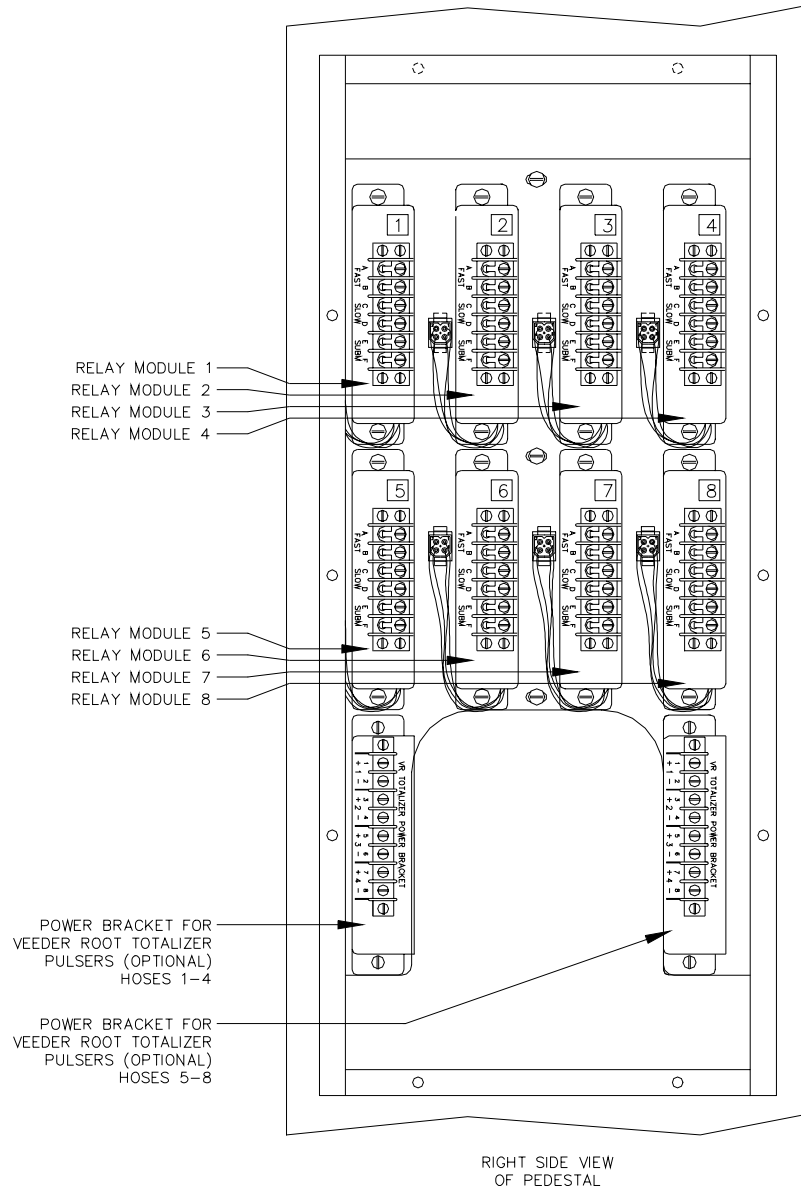
### Receipt Printer Pedestal



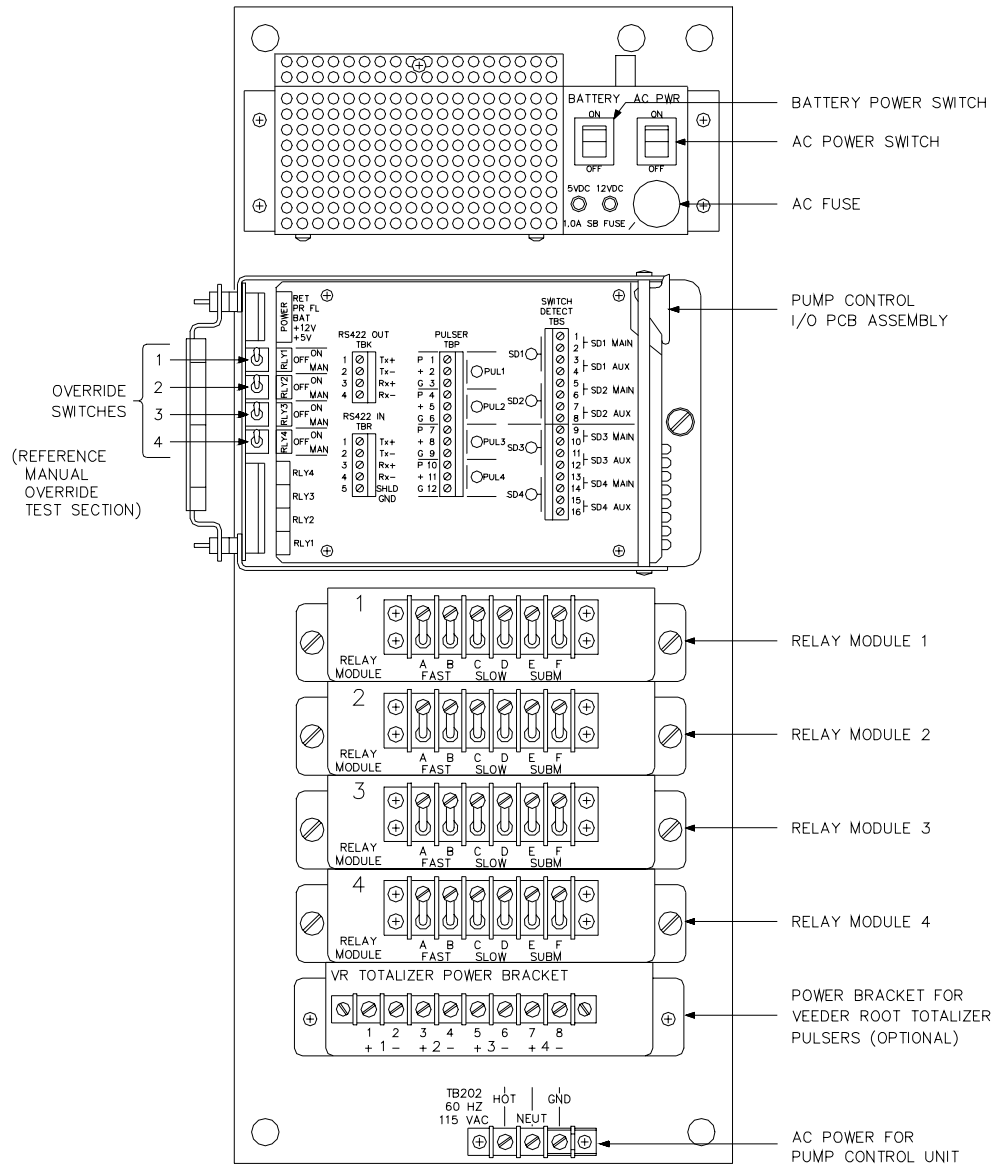
# Standard Pedestal - Left Side



## Standard Pedestal - Right Side



# Wall Mount Pump Control Unit



## CONTROL LINES

Descriptions of the control lines are provided to familiarize the installer with the control inputs and outputs that are used to control a mechanical pump/remote dispenser. It is recommended the installer read these descriptions to obtain a better working knowledge of the system in order to guide him in planning the site wiring.

### Grounding

To ensure proper operation of the equipment and provide the necessary safety factors, this unit must be grounded. A ground wire (preferably green) must be connected between the unit's AC junction box ground lug and the main electrical service panel. One (1) earth ground connection is required per unit. A ground rod must be installed at the main electrical panel in accordance with the National Electrical Code. This ground rod is to be a solid, corrosion-resistant conductor. It should be properly tied into the ground bus strip of the panel. We recommend the neutral and ground bus strips be bonded together (unless prohibited by local codes).

### Reset Motor Feed

This is a 120VAC input which is supplied through the pump handle switch to activate the reset motor. This line should be switched through the CFN System and only be on when the pump/remote dispenser is authorized or in manual mode. Without power supplied to this line, the pump/remote dispenser will not reset when the pump handle is turned on. Two feed lines are provided for twins. This feed is also connected to the input of one of the internal switches of the electric reset. When the reset finishes its cycle, the 120VAC input to the switch will be passed through as an output causing the solenoid valve (optional in some models) to open and the Reset Complete line to indicate 120VAC.

*NOTE: This line is also used to sense the closing of the pump handle for console operation. A low current 120VAC is supplied through this line in order to sense the condition of the handle. This low current voltage is not capable of driving the reset motor or operating a solenoid valve.*

### Pump Motor Feed

This is a 120VAC input which is supplied to the input side of one of the internal switches of the electric reset. This line should be switched through the CFN System and only be on when the pump/remote dispenser is authorized or in manual mode. When the reset finishes its cycle, the 120VAC input to the switch is passed through as an output causing the pump motor to receive power and begin running. Without power to this line, the unit would reset, but be unable to fuel. Two feed lines are provided in twins which contain two motors. The gauge of this wire (and its neutral wire) should be determined according to the size of the motor, the voltage at which the motor will be powered (120VAC or 240VAC), and the distance from the breaker panel to the pump. It is possible to combine the pump motor feeds for twins and supply them from one breaker; however, the gauge of the wire must be adjusted to handle the load of two motors. (NOTE: 240 VAC is developed across a motor when the other leg of the motor is connected to a Phase 2 Feed.)

### Neutral Feed

This is the AC current return line back to the breaker panel for all attached devices (pump motor, reset motor, solenoid valves). The gauge of this wire must be equal to that of the pump motor feed (suction pumps) or submersible feed (remote dispensers).

### **Submersible Feed, Submersible Drive**

This is a 120VAC input which is supplied to the input side of one of the internal switches of the electric reset. This line should be switched through the CFN System and only be on when the pump/remote dispenser is authorized or in manual mode. When the reset finishes its cycle, the 120VAC input to the switch is passed through as an output (submersible drive) to drive a starter relay or to directly drive a submersible motor up to 3/4 HP at 120/240 VAC or 1-1/2 HP at 240 VAC. Any submersible motor exceeding these limitations must use a starter relay. *(NOTE: 240 VAC is developed across a motor when the other leg of the motor is connected to a Phase 2 Feed.)*

### **Reset Complete (Switch Detect)/Slow Flow**

This is a 120VAC output which is used to indicate the reset is complete and the pump/remote dispenser is ready to dispense product. Two lines are provided for twins. This line should only be used when monitoring of the pump/remote dispenser is desired (such as with a fuel management system). This line must be capped when not in use. This line is connected to the slow flow stage of the solenoid in the pump.

### **Fast Flow**

This is a 120VAC input which controls the fast flow valve of the pump/remote dispenser (when a slow/fast flow valve is available). If slow/fast flow control is not desired, this line should be tied to the reset complete/slow flow line. This line should be switched through the CFN System and only be on when the pump/remote dispenser is authorized and the pump/remote dispenser should be in the fast flow mode. This line will also be switched on when the pump/remote dispenser is in the manual mode.

### **Light Feed**

This is a 120VAC input required to power optional fluorescent lights that may be available in a pump/remote dispenser. In a site configuration using multiple remote dispensers (or pumps), the power for the lights of up to 8 units can be supplied by one breaker. The light feed is not controlled by the CFN System.

### **Light Neutral**

This is a return line for AC current from the lights to the breaker panel.

### **Phase 2 Feed**

This is a hot feed which is the opposite phase of the pump motor feed. This line and the pump motor feed are used for 240VAC motor applications.

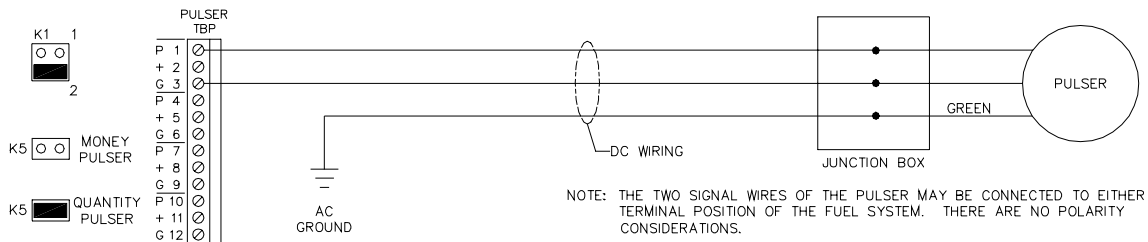
### **Pulser**

This supplies a DC output which is provided to indicate the quantity dispensed. This line must be capped when not in use. DC pulser and DC RS-422 and RS-485 communication wires can be combined in the same conduit. DC wires must be in separate metal conduit from AC wires unless shielded cable is used as specified in Section 3, **RS-485, Short Haul Modems (RS-422)**, and **Pulser Wiring and Configuration**.

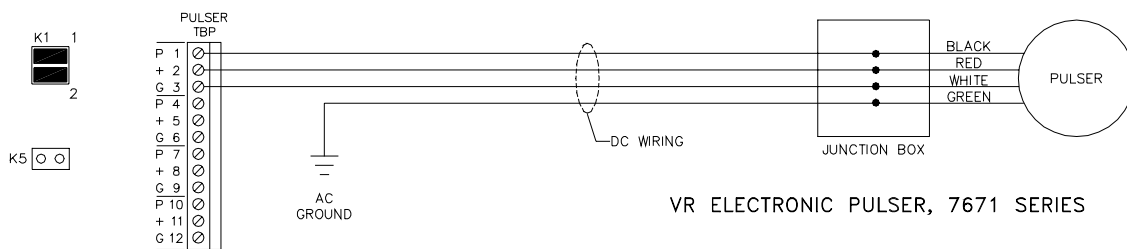


## PULSER WIRING AND CONFIGURATION

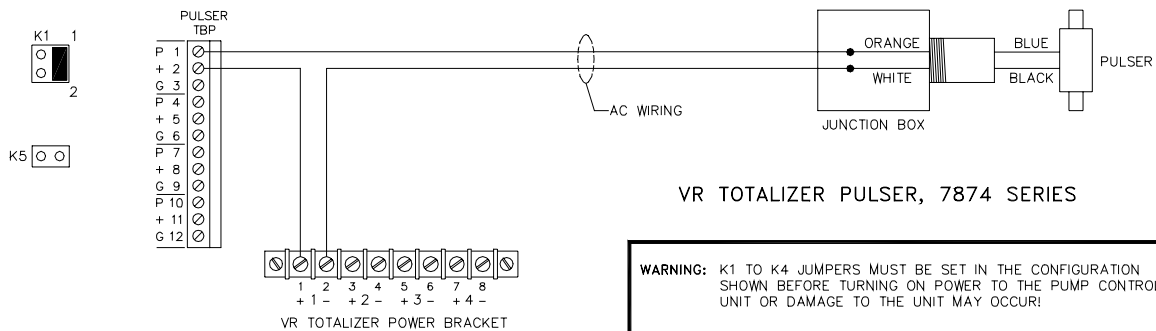
Pulser wiring diagrams appear below. Pulser wiring requirements are detailed on the following page.



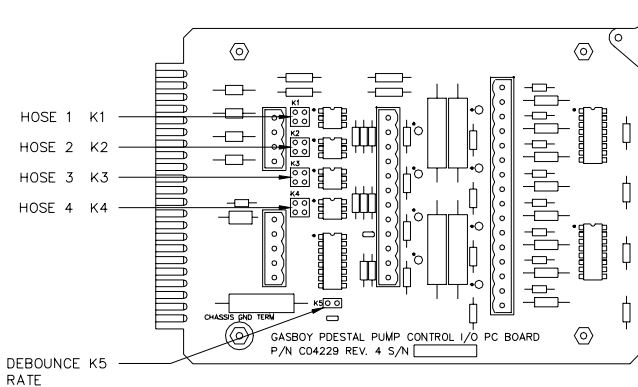
VR REED SWITCH PULSER, 1871 SERIES



VR ELECTRONIC PULSER, 7671 SERIES



VR TOTALIZER PULSER, 7874 SERIES



I/O PCB OF PUMP CONTROL UNIT SHOWN WITHOUT COVER PLATE AND TERMINAL BLOCK CONNECTORS (SEE TERMINAL BLOCK ID, PAGE 4-2 FOR LOCATION OF I/O PCB)

NOTE: ALL PULSERS SHOWN ABOVE ARE SHOWN CONNECTED TO THE HOSE #1 POSITION. THE K1 JUMPER PINS ARE USED TO CONFIGURE THE CIRCUITRY FOR HOSE #1. THE JUMPER PINS ASSOCIATED WITH THE OTHER HOSES ARE INDICATED ABOVE.

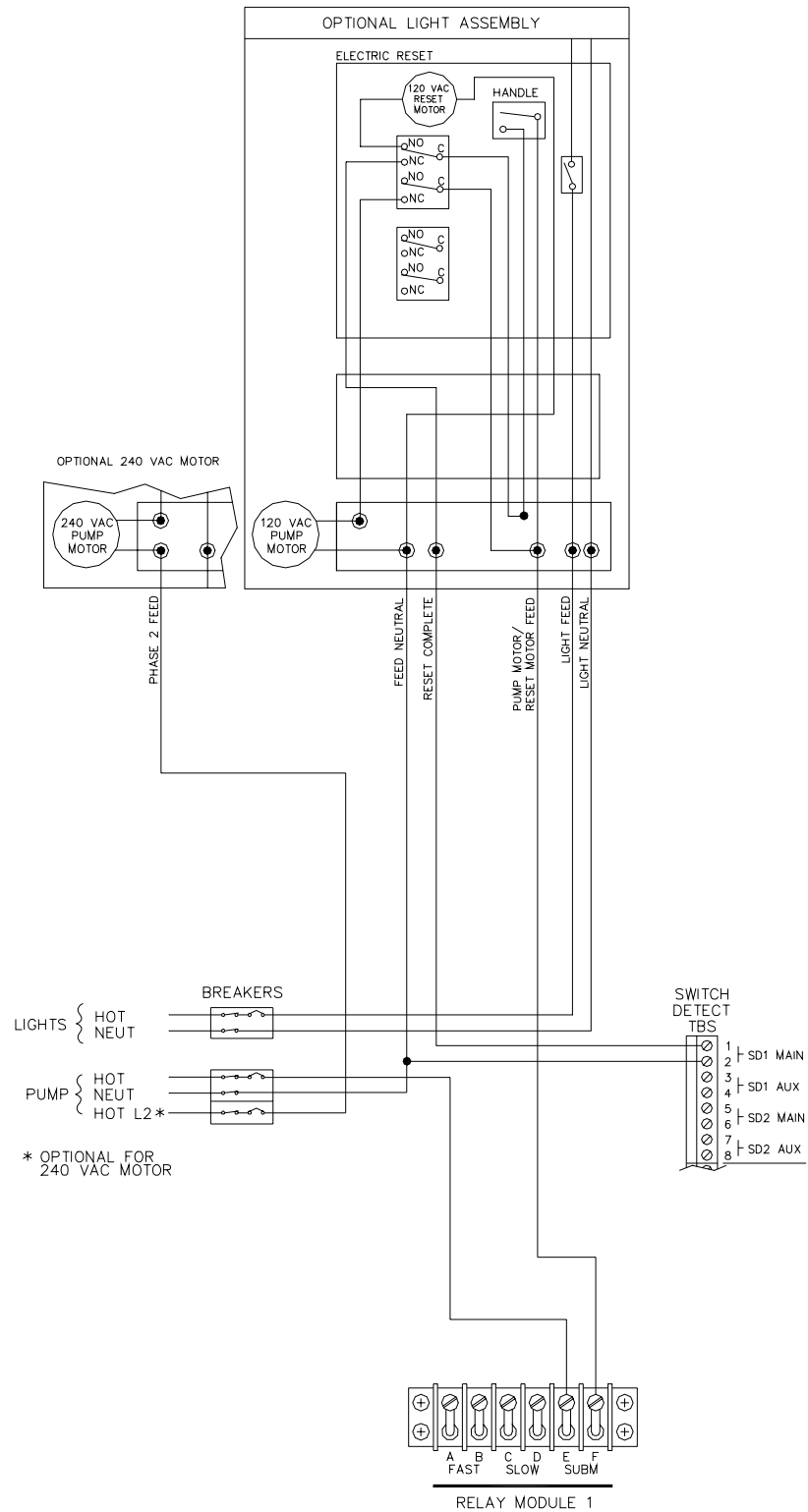
### **Pulser Wiring Requirements**

When installed in a separate DC conduit, 18 AWG wires are required for installation. Although it is recommended that DC pulser wires be run in a conduit separate from AC wires, they can be combined in the same conduit with AC wires providing UL-Listed cable with the following specifications is used:

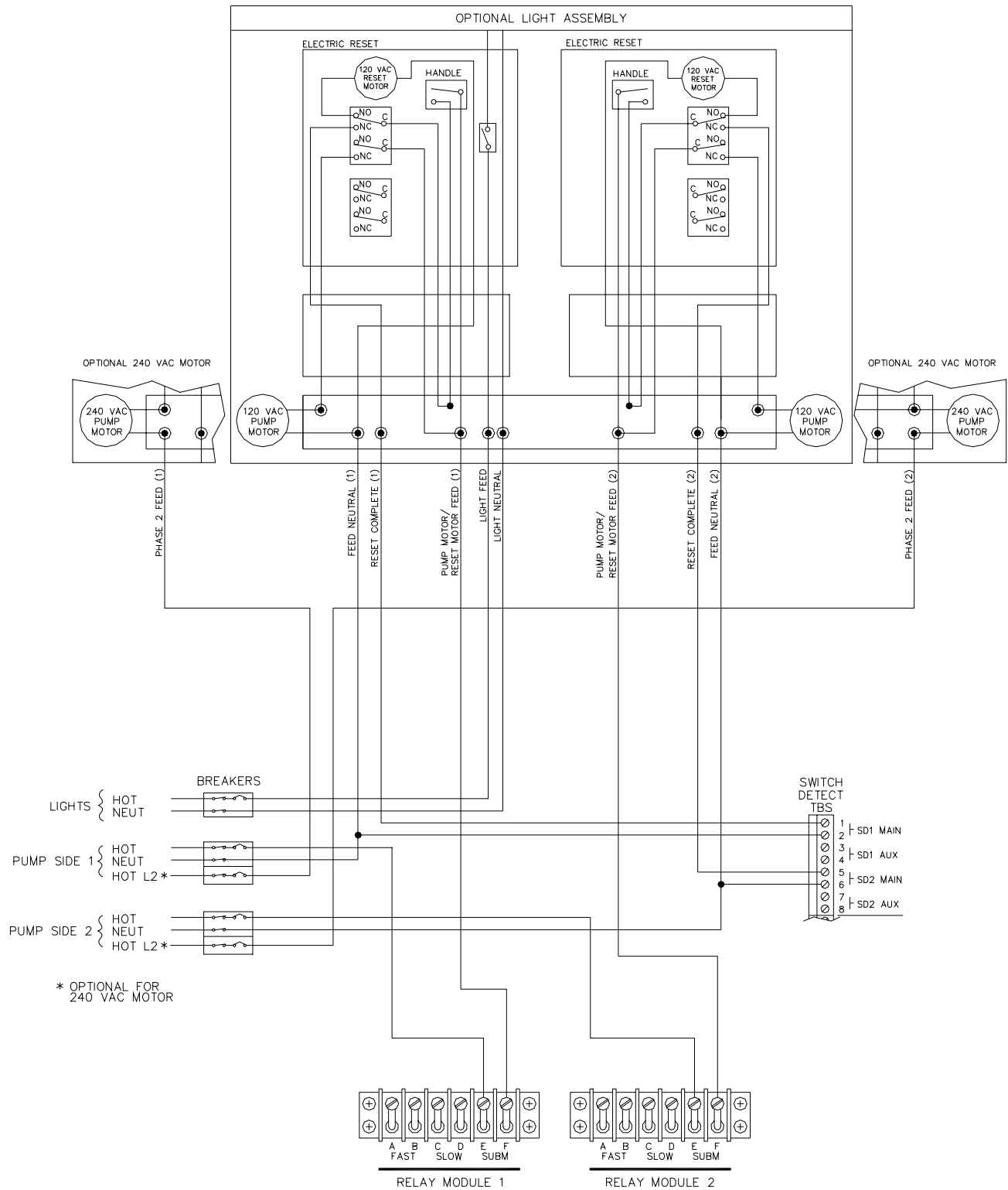
Conductor: 18 AWG stranded wire. Number of conductors to be determined by pulser  
Shield: Foil-wrapped 100% coverage and/or tinned copper braid 90% coverage  
Drain Wire: Stranded, tinned copper, 20 AWG or larger/or braided shield  
Voltage Rating: Maximum operating voltage of 600V  
Environmental: Gas- and oil-resistant; suitable for wet or dry locations.

GASBOY can supply Belden 1063A (P/N C09655) which is a UL-Listed, 4-conductor cable that meets the requirements listed above. *NOTE: Belden 1063A is UL-Listed but not CSA listed.*

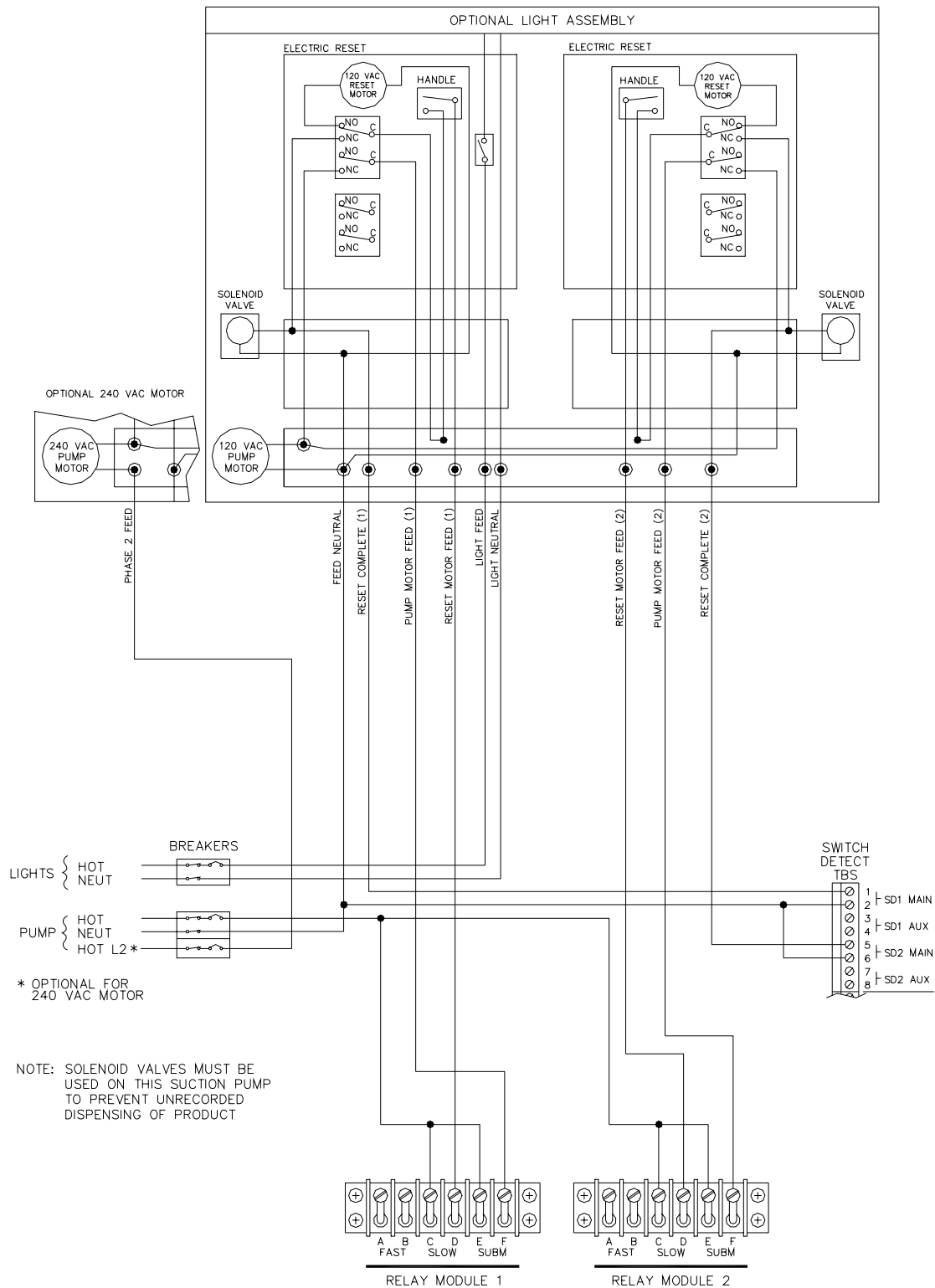
## SINGLE SUCTION PUMP, V/R RESET



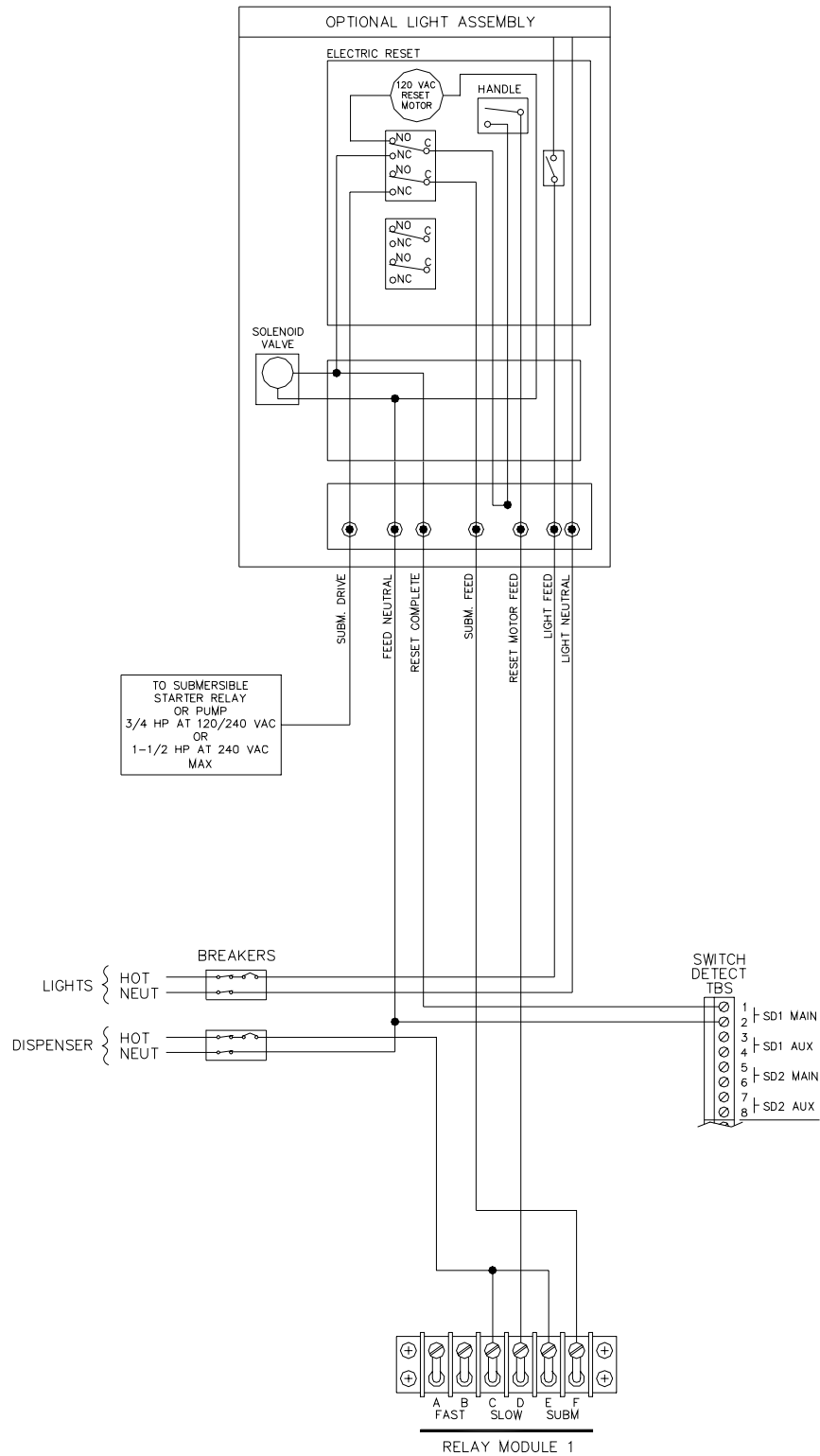
# TWIN SUCTION PUMP, V/R RESET



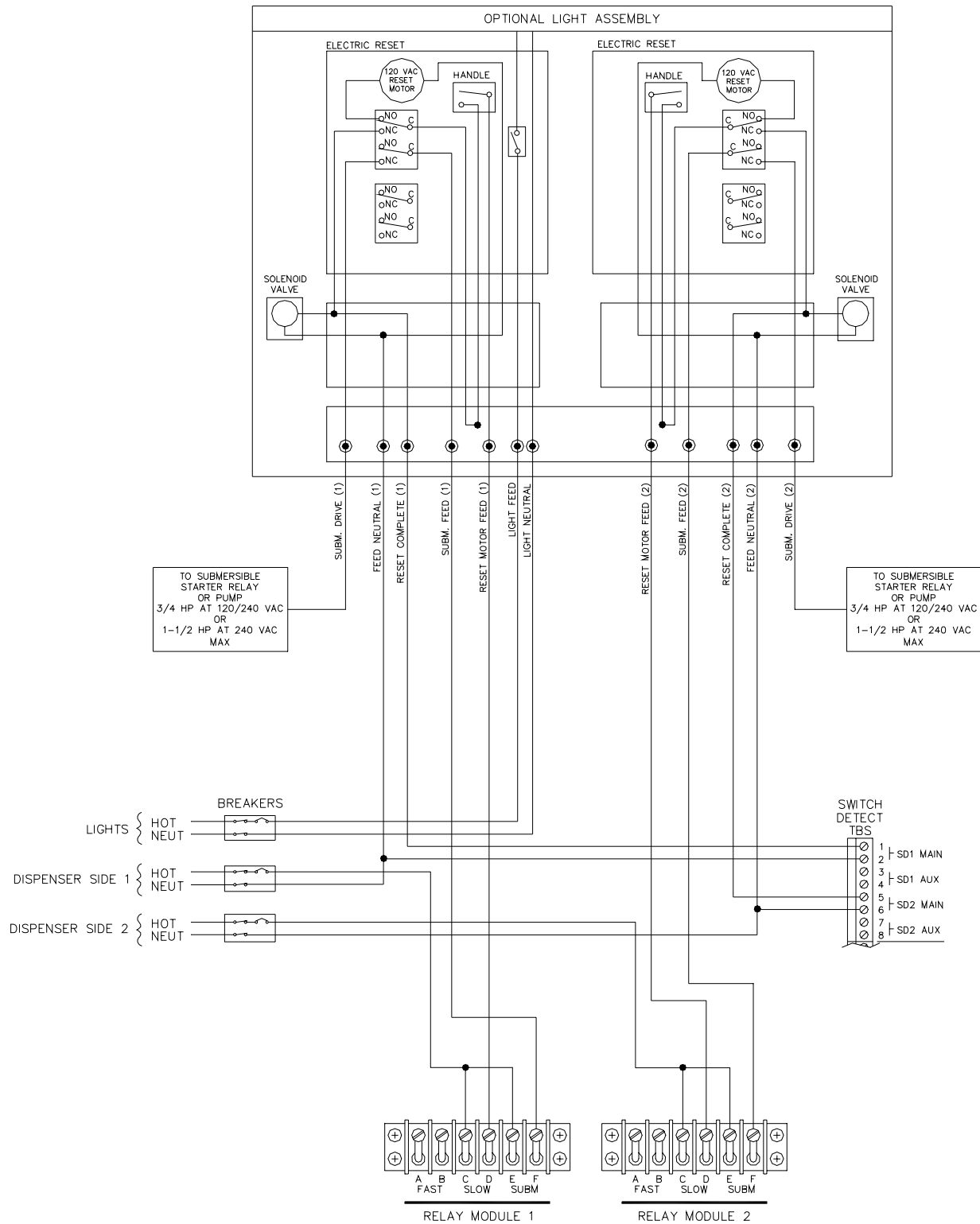
## TWIN SUCTION PUMP, SINGLE MOTOR, V/R RESET



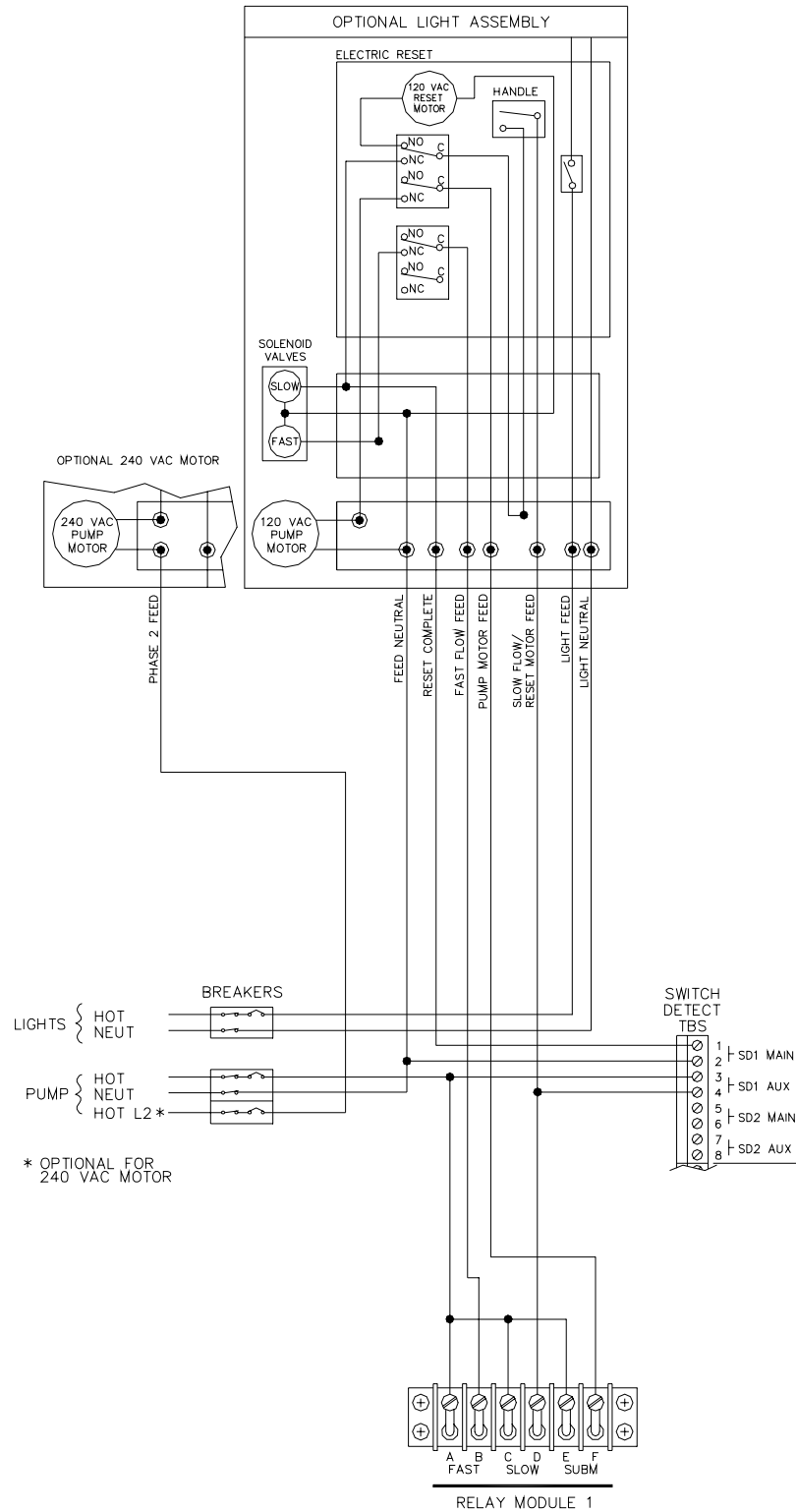
# SINGLE REMOTE DISPENSER, V/R RESET



## TWIN REMOTE DISPENSER, V/R RESET

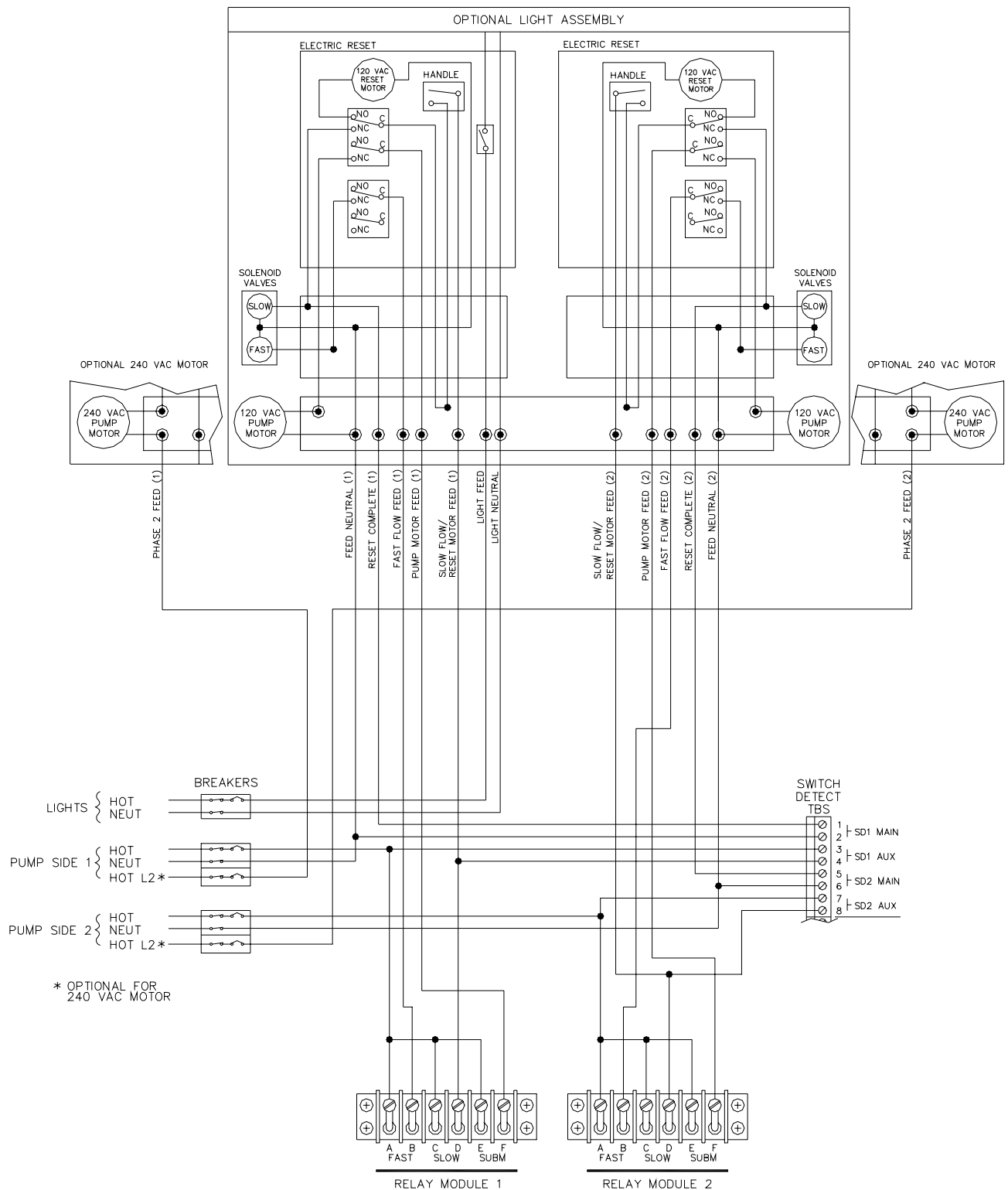


# SINGLE SUCTION PUMP WITH CONSOLE, V/R RESET

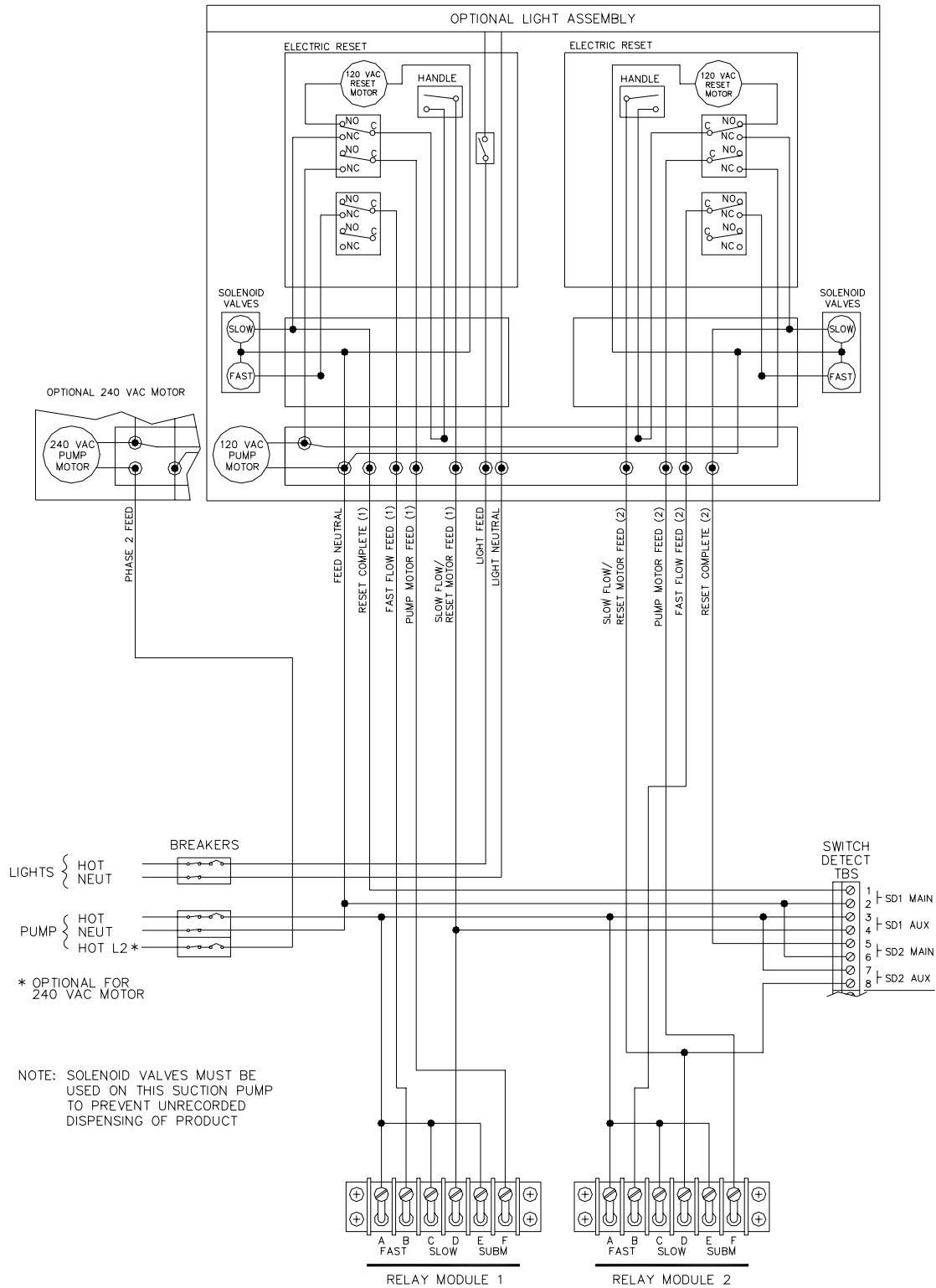




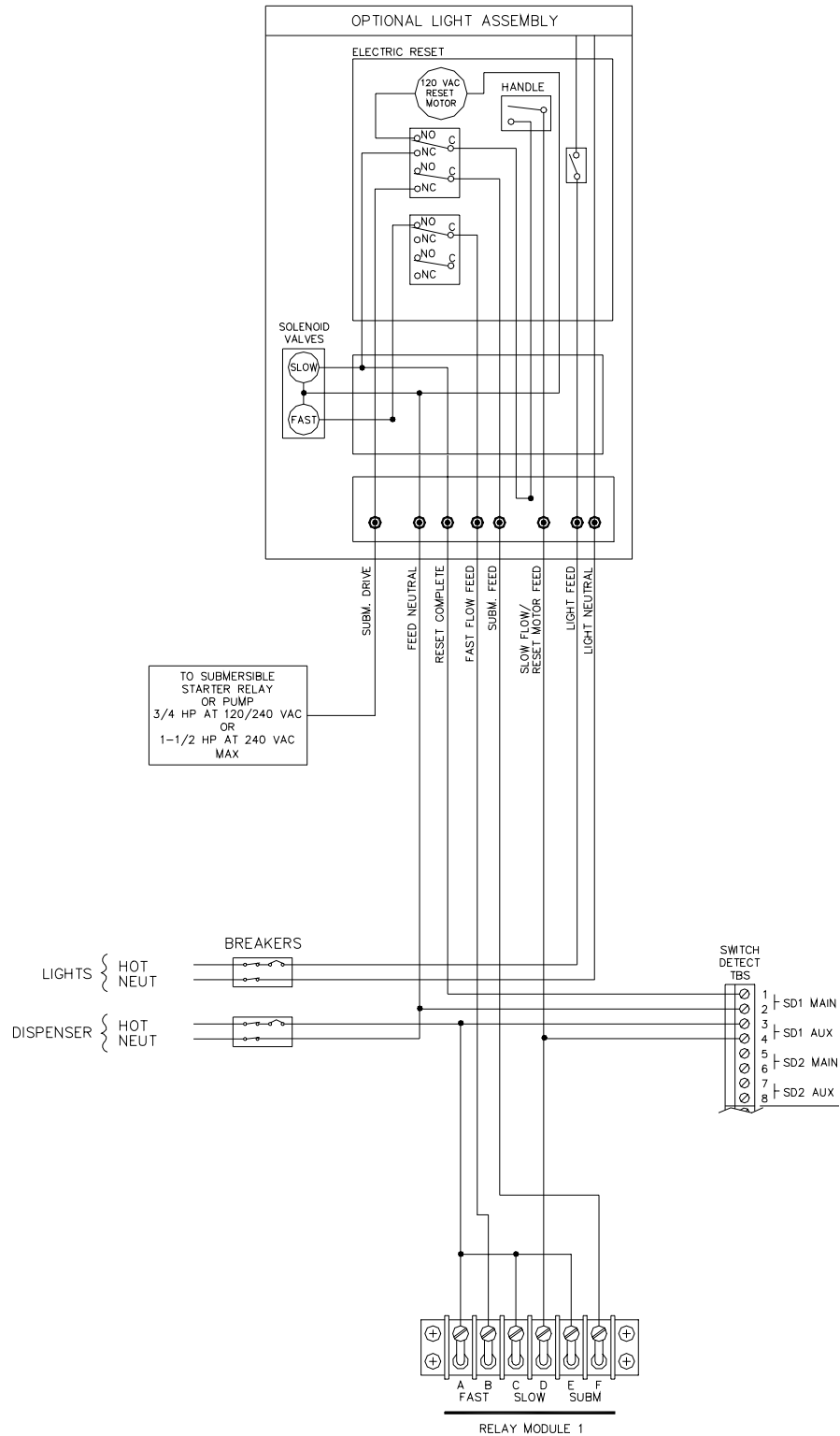
## TWIN SUCTION PUMP WITH CONSOLE, V/R RESET



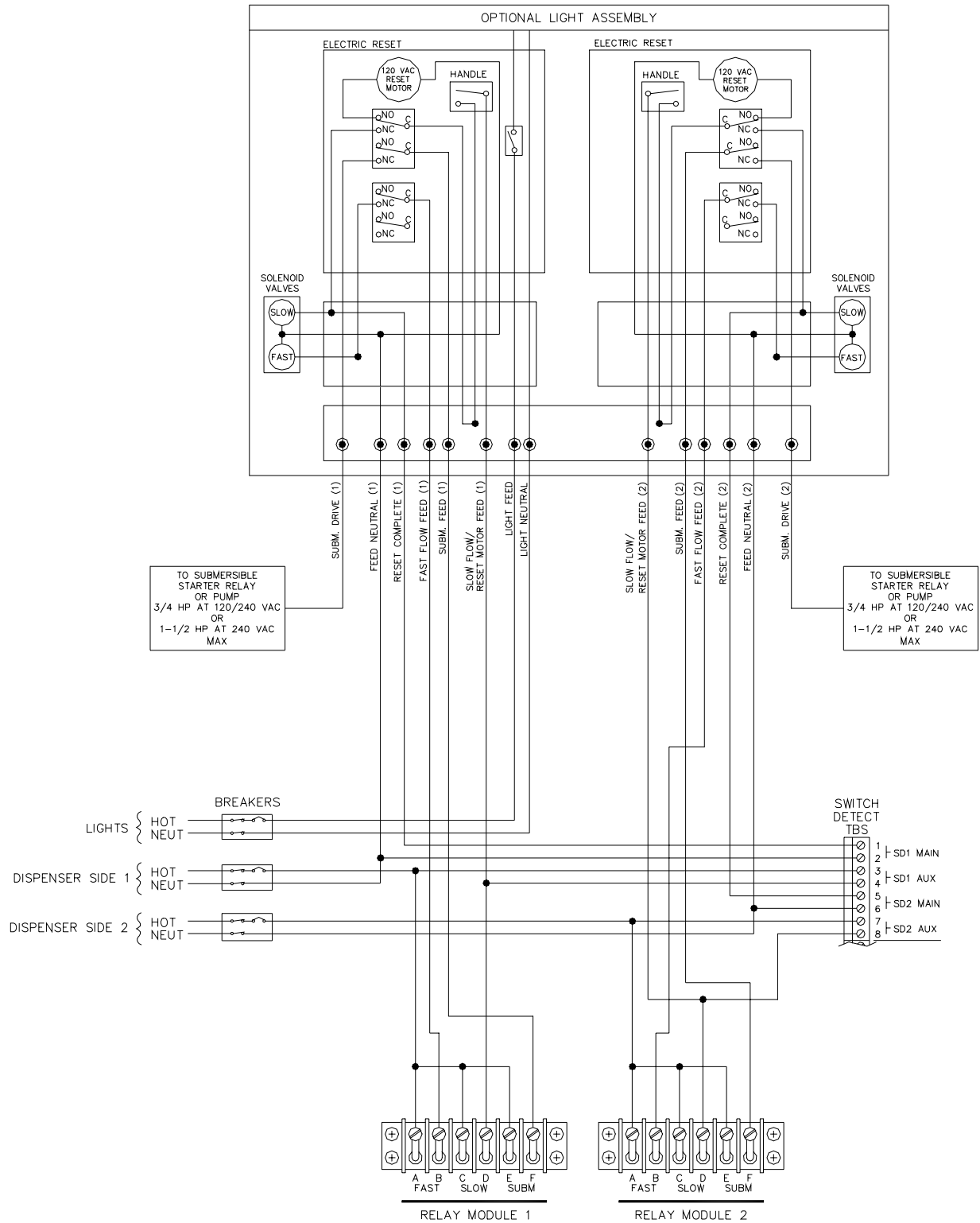
# TWIN SUCTION PUMP, SINGLE MOTOR WITH CONSOLE, V/R RESET



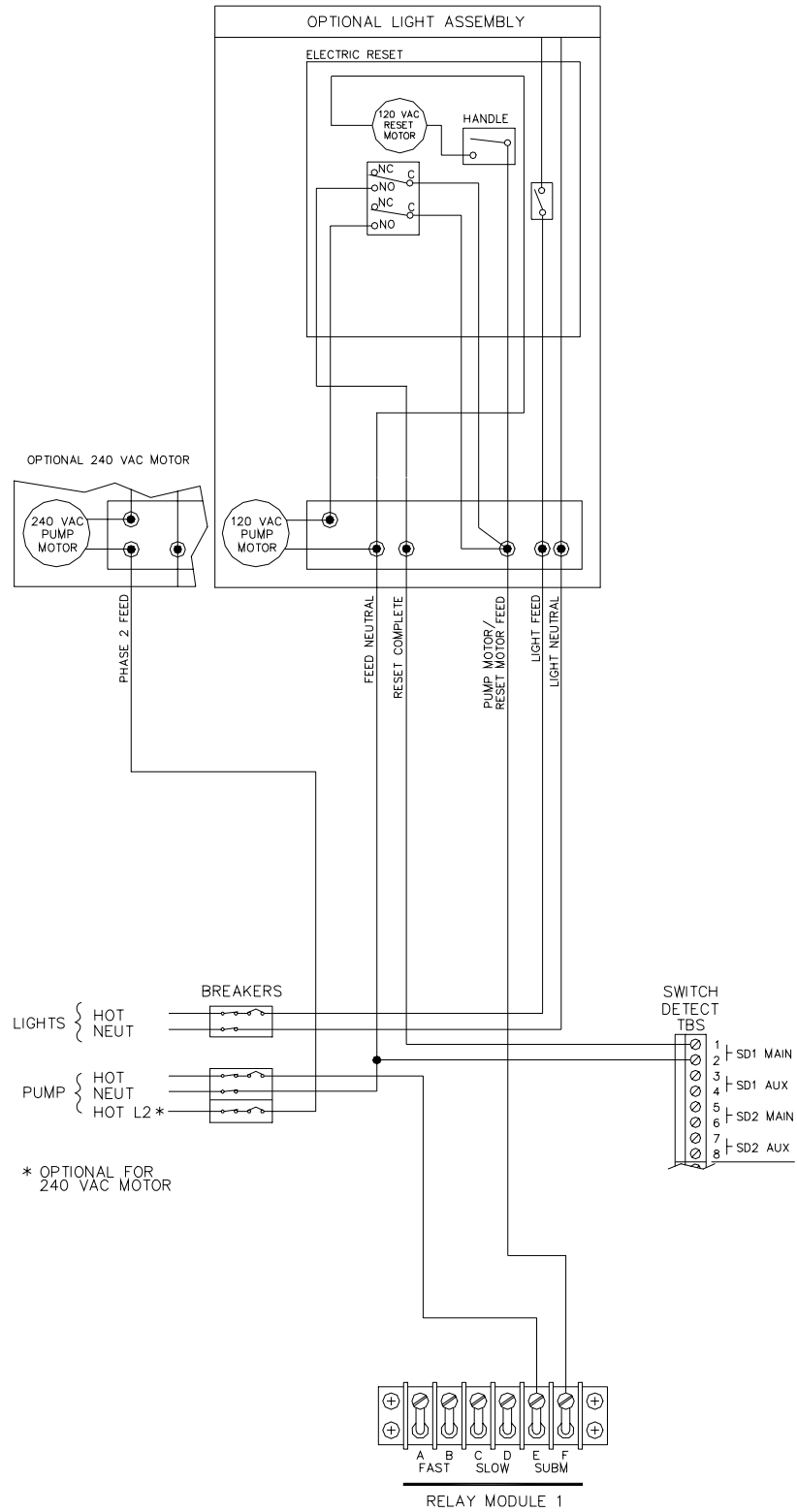
## SINGLE REMOTE DISPENSER WITH CONSOLE, V/R RESET



## TWIN REMOTE DISPENSER WITH CONSOLE, V/R RESET

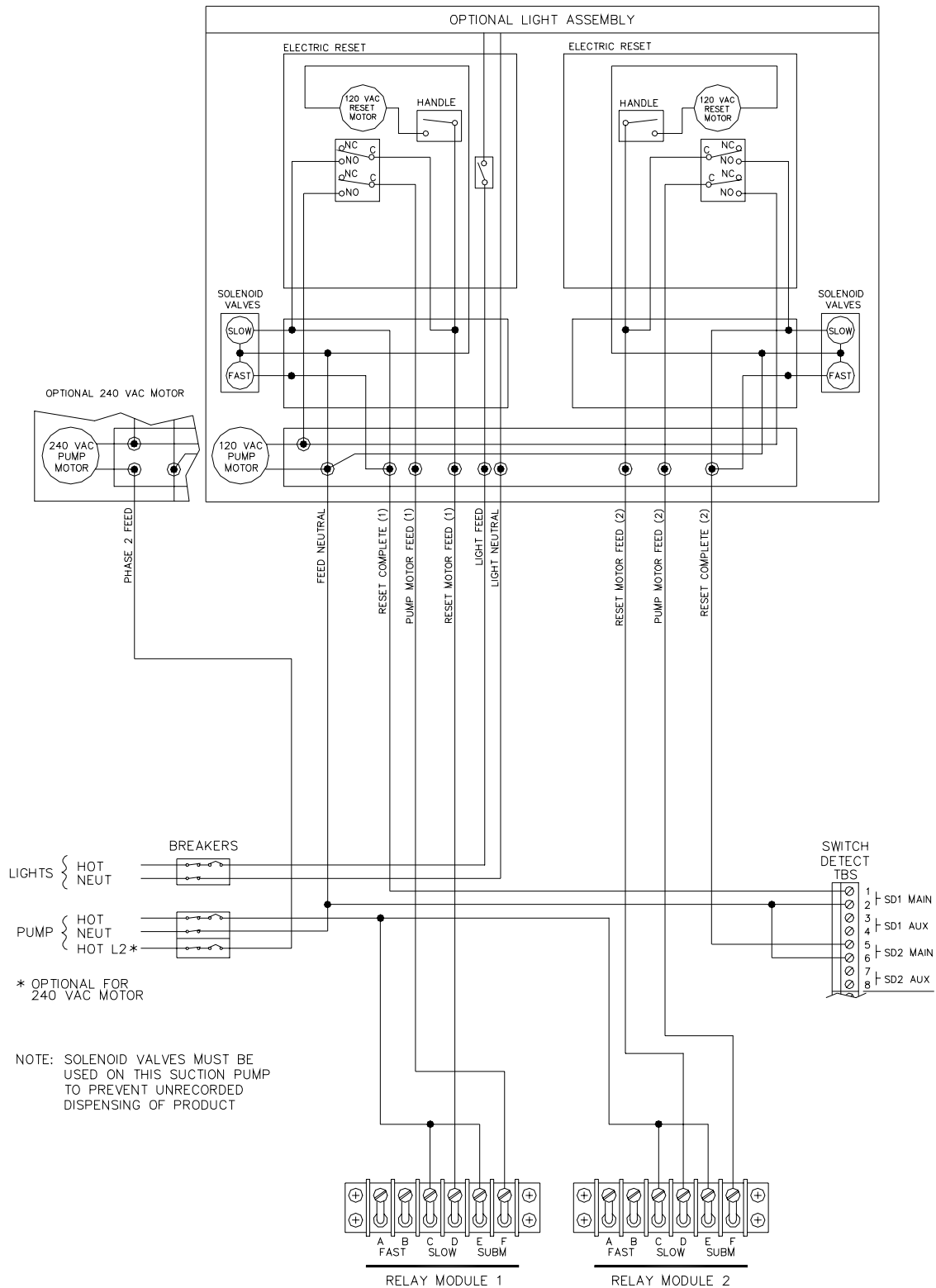


## SINGLE SUCTION PUMP, GASBOY RESET

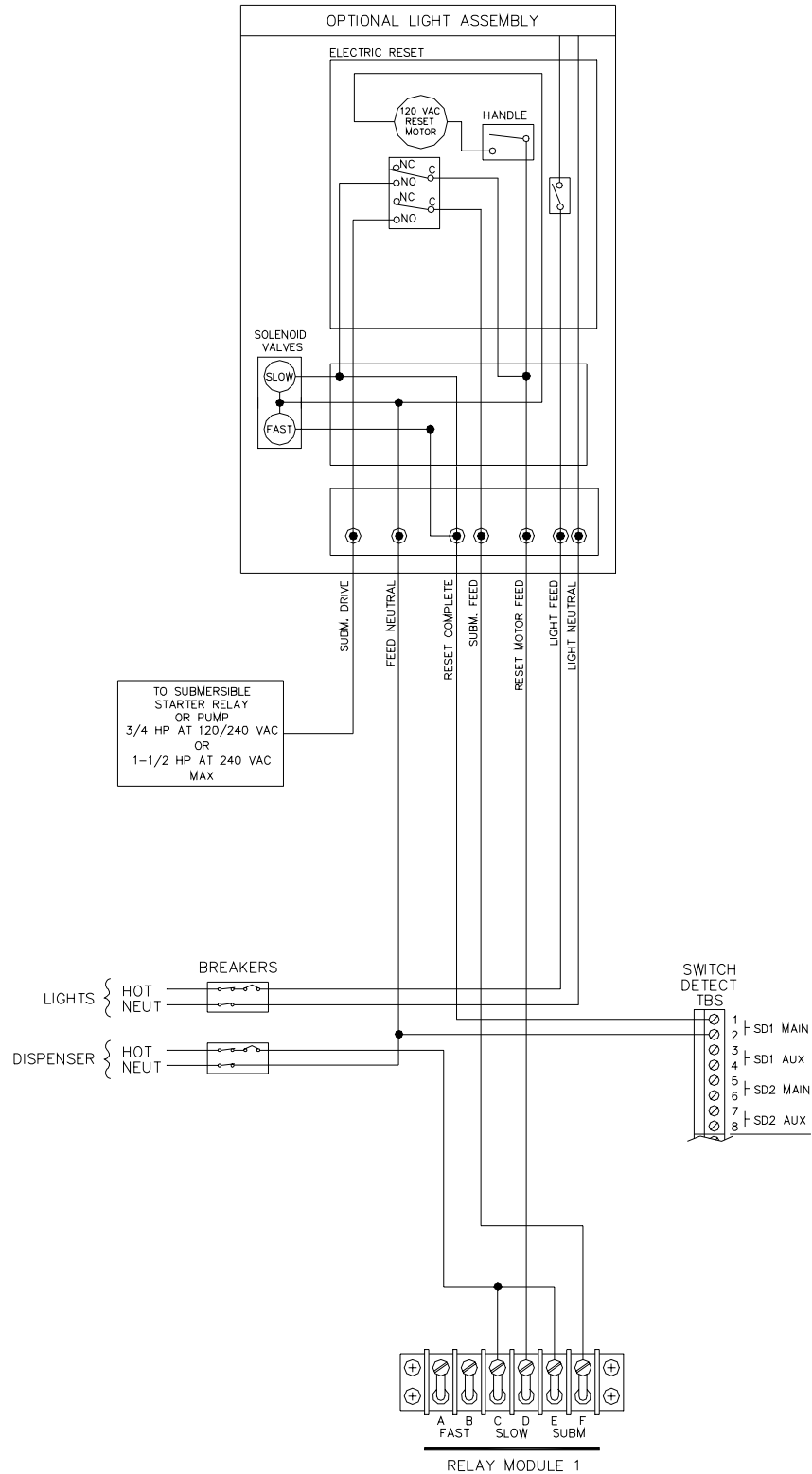




## TWIN SUCTION PUMP, SINGLE MOTOR, GASBOY RESET

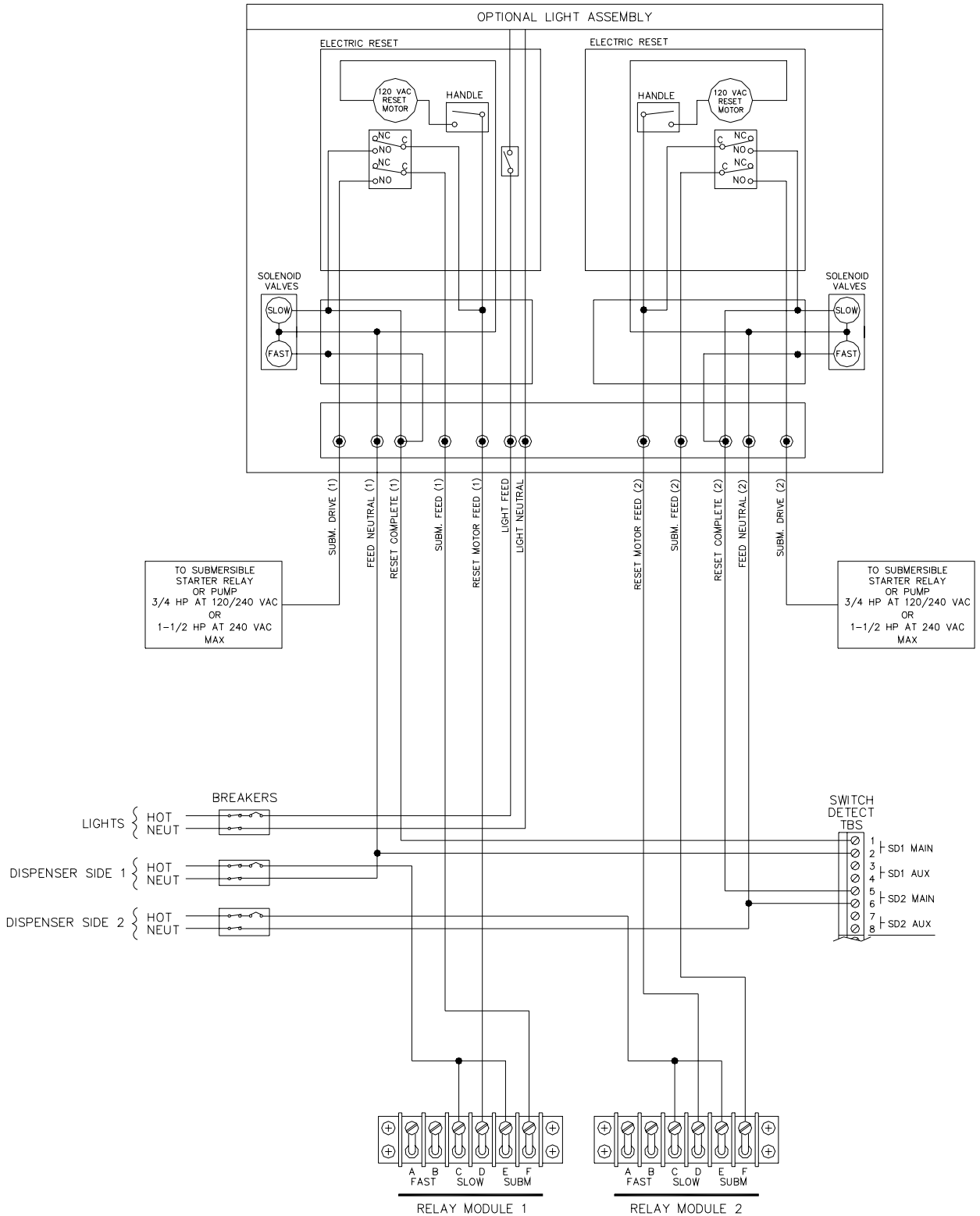


# SINGLE REMOTE DISPENSER, GASBOY RESET

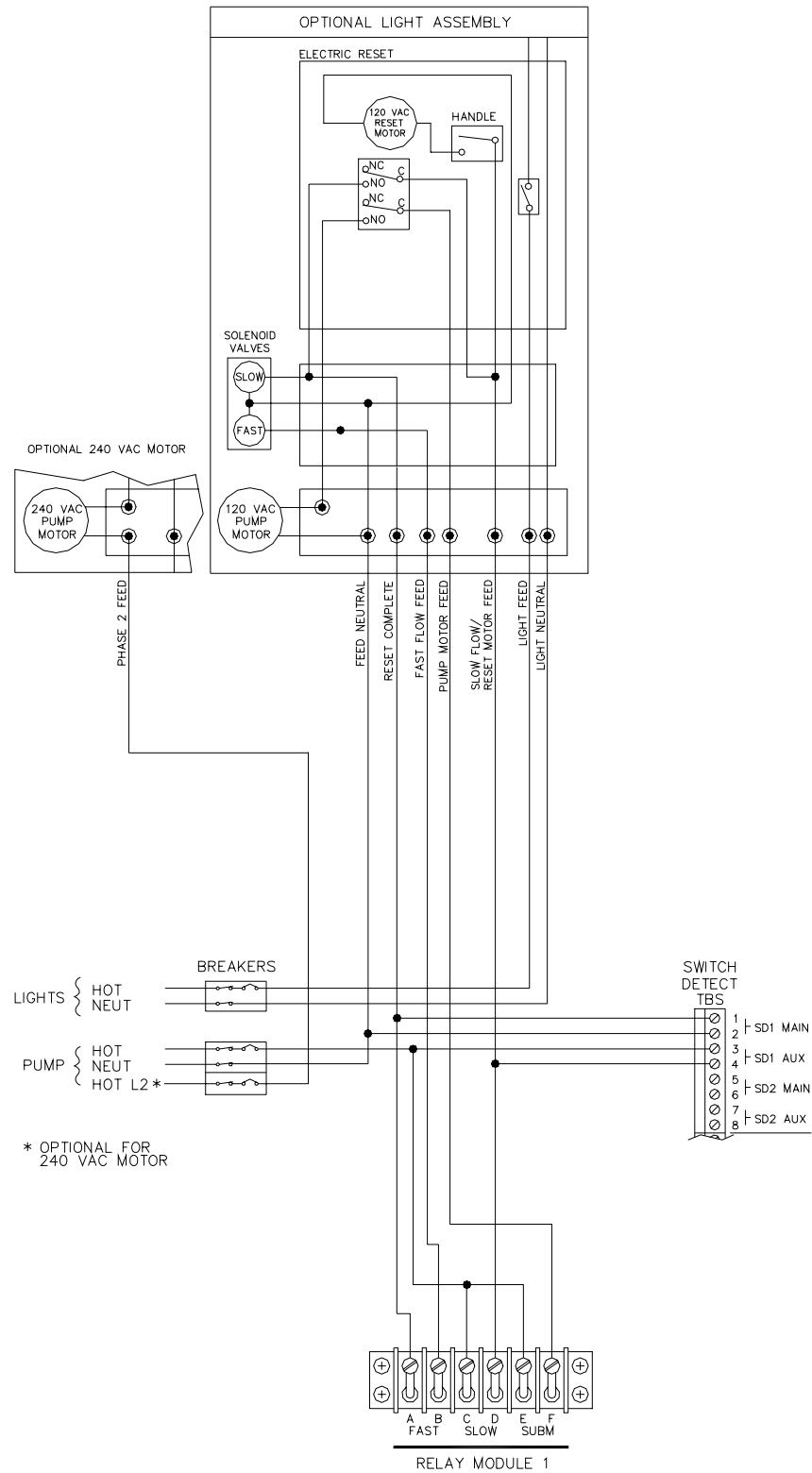




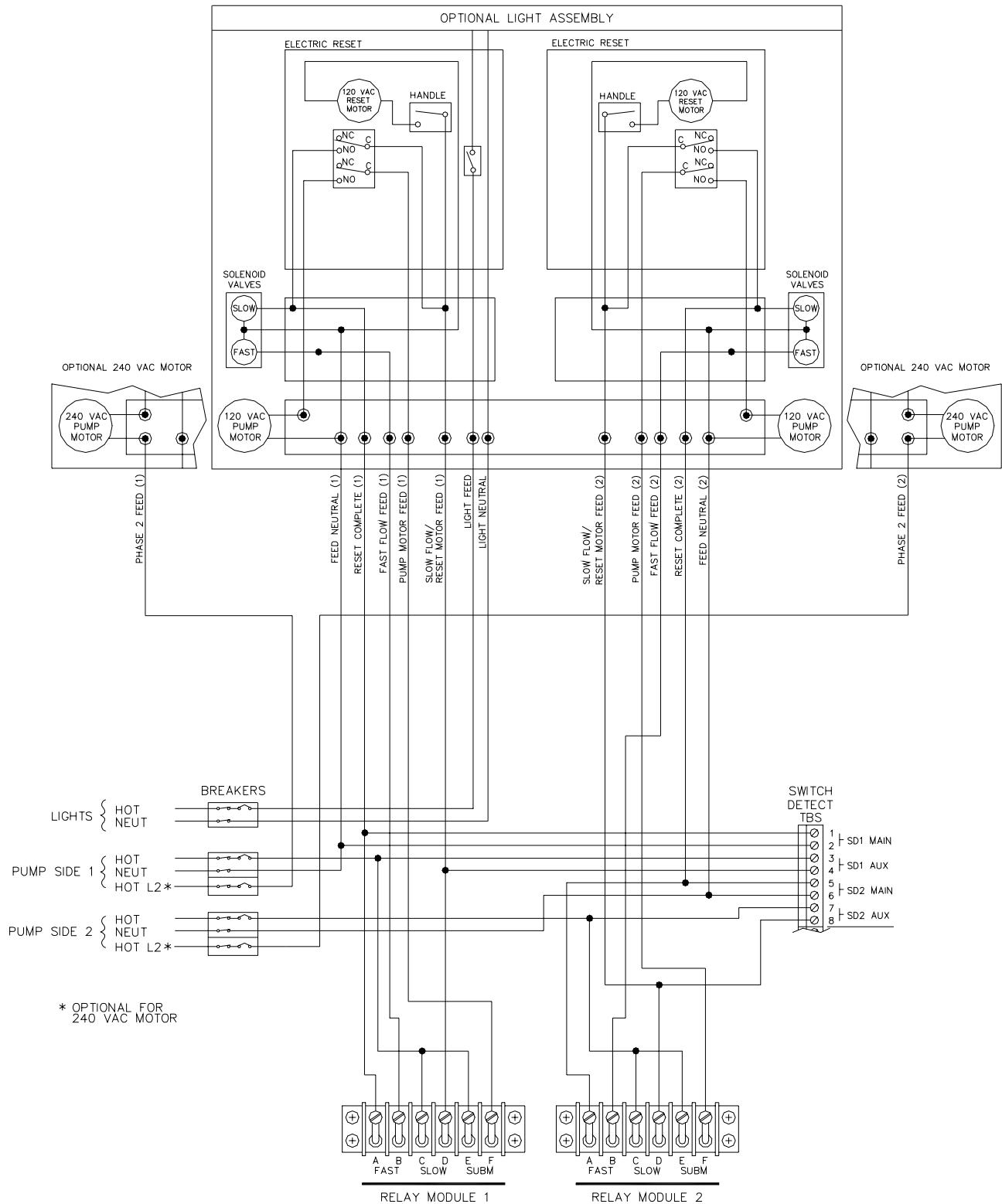
## TWIN REMOTE DISPENSER, GASBOY RESET



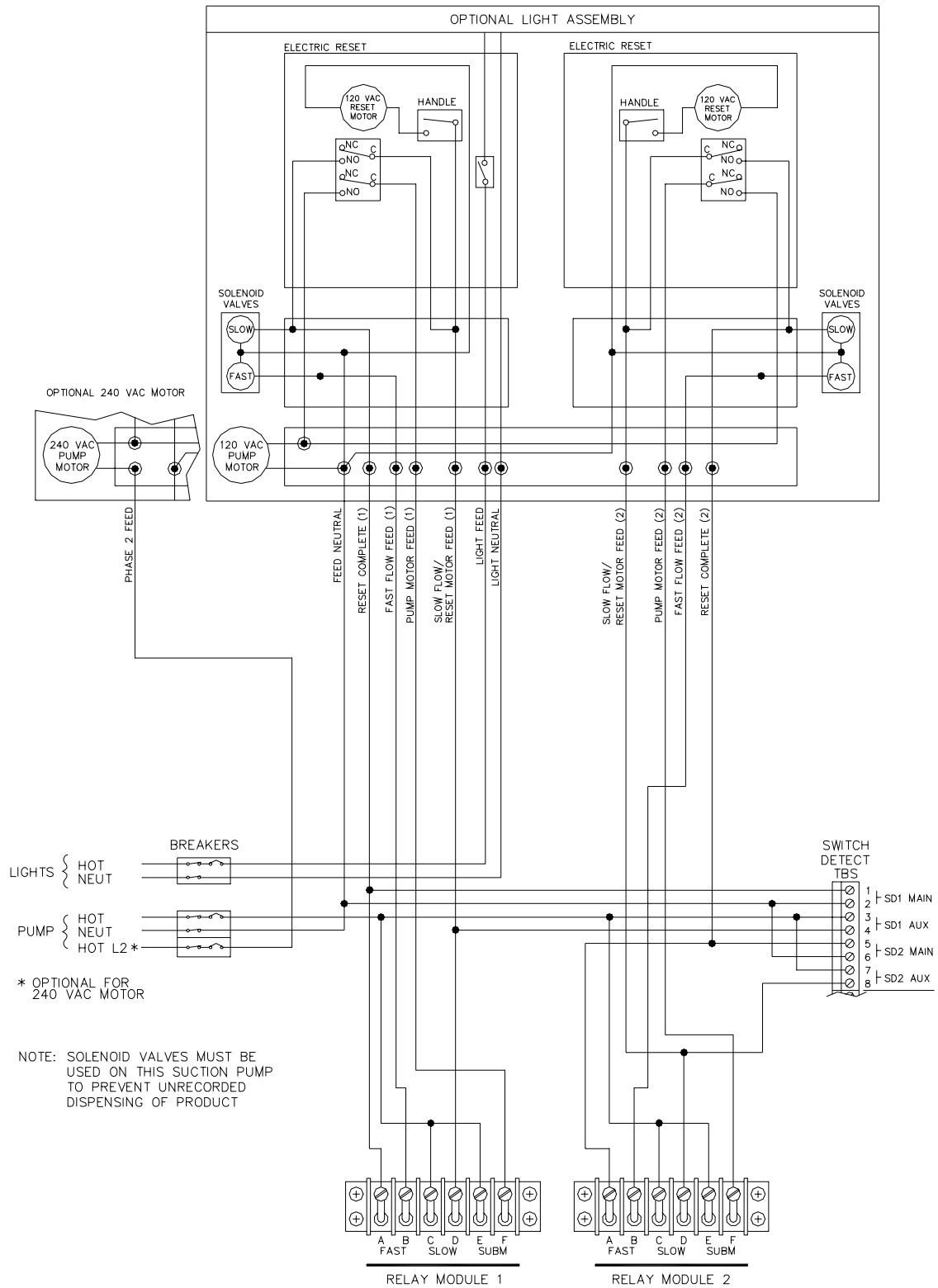
# SINGLE SUCTION PUMP WITH CONSOLE, GASBOY RESET



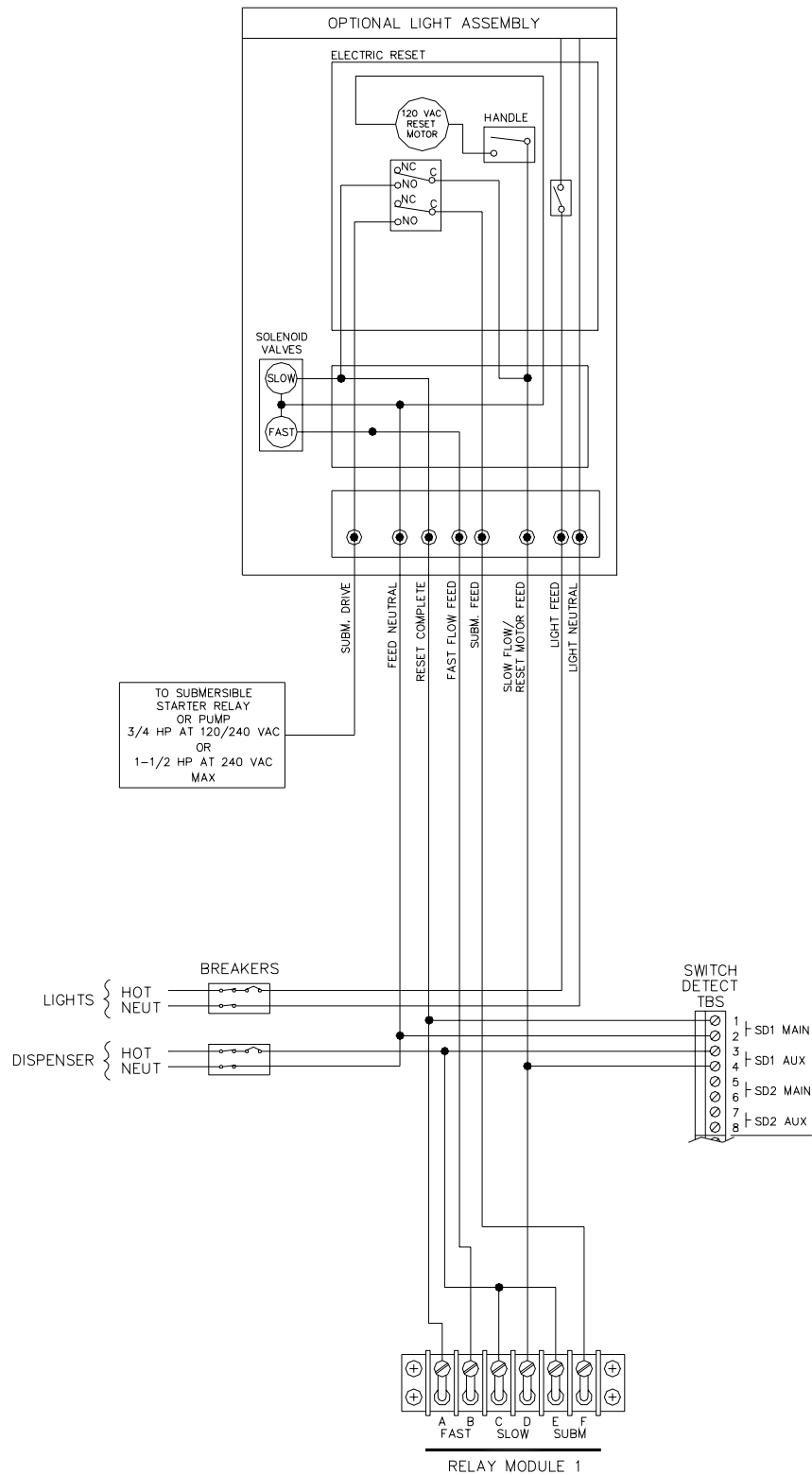
## TWIN SUCTION PUMP WITH CONSOLE, GASBOY RESET



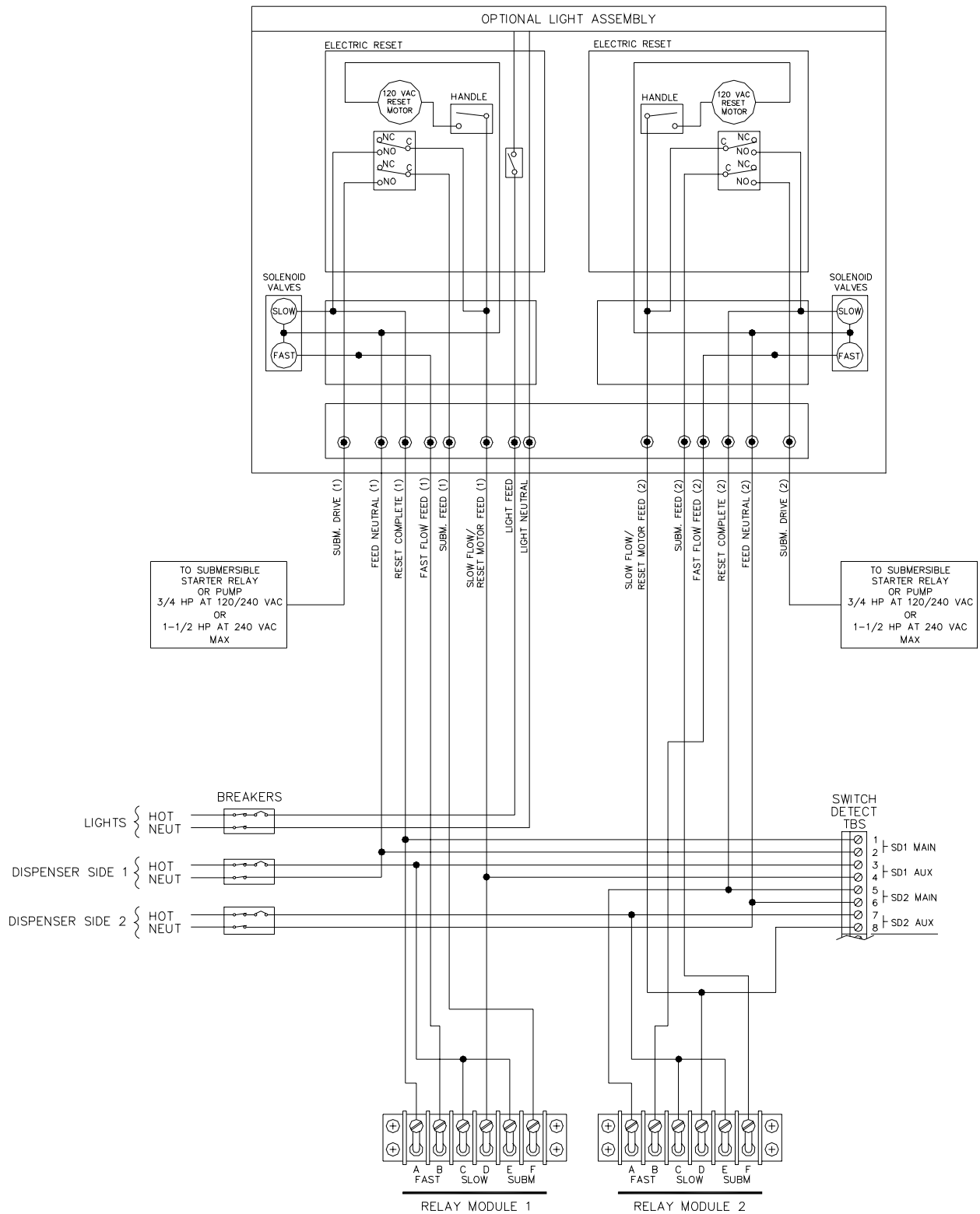
# TWIN SUCTION PUMP, SINGLE MOTOR WITH CONSOLE, GASBOY RESET



## SINGLE REMOTE DISPENSER WITH CONSOLE, GASBOY RESET

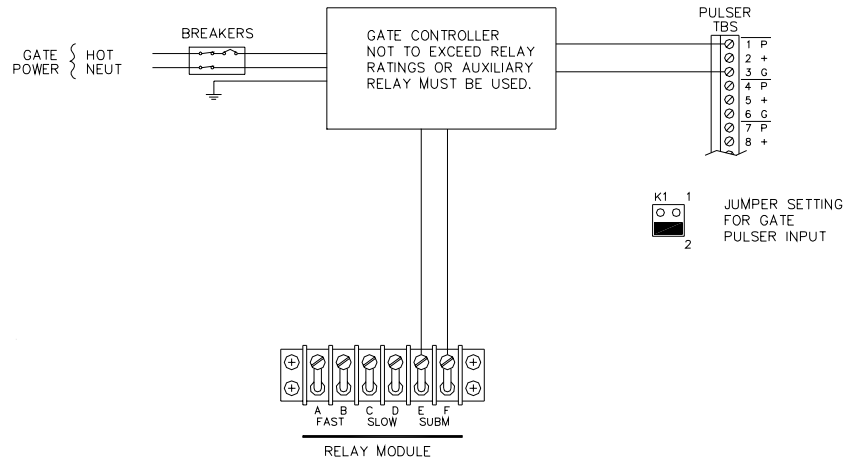


## TWIN REMOTE DISPENSER WITH CONSOLE, GASBOY RESET



## USING THE PCU TO ACTIVATE A GATE CONTROLLER

You can use a relay position in the CFN Mechanical PCU to activate a gate controller. This is only available as a Fuel Point transaction, not via card, console, POS terminal, or terminal command.



1. The CFN PCU can directly switch power to a gate controller. The maximum rating of the PCU relay is 3/4HP @ 120VAC. If your gate controller uses a different control voltage or exceeds the 3/4HP rating, use an auxiliary mechanical relay with a 120 VAC coil to handle the load.
2. Up to 4 gate controllers can be accessed per PCU. You can also combine pumps and gates within the same PCU.
3. Once the relay is closed, it will remain closed until one pulse is received on the PULSER input, or until the switch timeout is reached, or the Fuel Point rings are separated, whichever comes first. If the transaction ends by the pulse, the transaction is stored in memory. If the transaction ends by timeout or ring separation, a message is logged but nothing is stored in memory.
4. The PULSER signal can come from a dry-contact switch with no other voltage or circuits connected, or it can be a 12VDC signal. Be sure to set the appropriate pulser input jumper as shown. The jumpers are K1 through K4 and correspond to gates 1 through 4, respectively.
5. Receipts are not available for these transactions.

## Section 5

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# TESTING

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### COMPLETION CHECKLIST

The information below should be reviewed to help verify proper installation of the Islander prior to testing the pumps and/or remote dispensers in the manual override position.

1. Are the CFN system components located in the proper environment as described throughout Section 2?
2. Is there adequate clearance around the Islander. (See Section 2, **Islander**)?
3. Is all the wiring in metal conduit except as noted in the **Short Haul Modem** section?
4. Is the AC and DC wiring in separate conduits, troughs, etc.? If not, and AC and DC wires share conduit, shielded cable must be used as specified in Section 3 **Communication Requirements, RS-485, Short Haul Modem - RS-422**, or Section 4, **Pulser Wiring and Configuration**.
5. Are the CFN system components on a separate dedicated breaker (see Section 3)?
6. Are the CFN system components grounded properly (see Section 3)?
7. Are pumps over 3/4 HP at 120/240 VAC or 1-1/2 HP at 240 VAC equipped with a starter relay (Section 4)?
8. Is the correct gauge wire installed for the:
  - system (Section 3)?
  - pumps (Section 4)?
  - remote dispensers (Section 4)?
  - pulsers (Section 4)?
  - short haul modem (Section 3)?
9. Are the communication lines under the maximum allowable distance:
  - RS-485 1000/1500 feet (Section 3)
  - RS-422 (short haul modem) 1500 feet (Section 3)?
  - RS-232 100 feet (Section 3)?
10. If the system has a modem, is the phone line installed (See **Phone Modems**, Section 3)?
11. Is there fuel in the tanks?



## MANUAL OVERRIDE TEST

*NOTE: The manual override test can only be performed on pumps/remote dispensers that are connected to CFN pump control units (PCUs).*

The pumps and/or remote dispensers should be tested to verify AC wiring. **Power up only the pump control unit(s) during these tests!** The steps below indicate the proper procedure for testing and the expected results. If any of these tests fail, correct the wiring and re-do the test. See the **Terminal Block ID** diagrams in Section 4 for the location of the override switches.

1. Remove all wiring connectors (green) from the Pump Control I/O PCB assembly located in the front of the card cage. This will prevent any damage to the PCBs if the wiring is incorrect. Make sure the connectors are not touching any metal surfaces.
2. Turn on the breakers for all pumps and/or remote dispensers. If the Islander and other components are powered from the same breaker as the pump control unit (PCU), **be sure that they are switched off** before proceeding

### CAUTION

**AC power is present on the terminal blocks of the relay modules. Electrical shock may occur if the operator comes in contact with these connections.**

### ATTENTION

**Le courant alternatif est sous tension sur les bornes des modules de relais. Un choc électrique peut se produire si l'opérateur entre en contact avec ces connexions.**

3. In the PCU, turn the AC power and battery power switches to the **ON** position (up). These switches are located in the upper righthand corner of the power supply.
4. Place the system override switch for hose #1 in the **MAN** position.
5. Turn on hose 1. After completing reset, the hose should be able to dispense product.
6. Turn on all other hoses. No other hoses besides hose 1 should activate.
7. Turn off all hoses.
8. Place the system override switch for hose 1 in the **ON** position.
9. Repeat Steps 4 through 8 for all remaining hoses. Substitute the hose under test for hose 1.
10. Turn off the AC power and battery power switches in the PCU.
11. Turn off the breakers for all pumps and/or remote dispensers and the Islander and other components.
12. Replace all wiring connectors (green) previously removed from the Pump Control I/O PCB assembly.

*NOTE: The manual override test will uncover most point-to-point AC wiring mistakes that can occur. The automatic test performed during the system start-up will complete the verification of correct AC wiring to the pump/remote dispensers. The automatic test should only be performed at the start-up.*

# WARRANTY

## General Statements:

Gasboy International LLC. warrants all new equipment manufactured by Gasboy against defective material and/or workmanship, for the warranty period specified below, when the equipment is installed in accordance with specifications prepared by Gasboy.

This warranty does not cover damage caused by accident, abuse, Acts of God, lack of surveillance of automatic recording systems, negligence, mis-application, faulty installation, improper or unauthorized maintenance, installation or use in violation of product manuals, instructions, or warnings. Under no circumstance shall Gasboy be liable for any indirect, special, or consequential damages, losses, or expenses to include, but not limited to, loss of product, loss of profits, litigation fees, or the use, or inability to use, our product for any for any purpose whatsoever.

Parts Only - During the warranty period, Gasboy will, at its option, repair or replace defective parts returned transportation prepaid to its factory.

On-Site Labor Included - Gasboy will also provide, within the Continental United States and during the warranty period, the services of an Authorized Service Representative (ASR) for on-site repair or replacement of defective parts.

Replacement Parts - Any system components that are not part of the original system order, including Island Card Readers, Pump Control Units, etc., are considered replacement parts.

| Equipment                                                                                                                                      | Term                                                                                                                                                                                                                                                                                                                                                                                                                              | Coverage                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Commercial Pumps and Dispensers<br>Full-Cabinet Consumer Pumps                                                                                 | One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.                                                                                                                                                                                                                                                                                                | Parts and Labor.                                                                                                                                                                                            |
| Small Transfer Pumps, Meters,<br>Pressure Regulators                                                                                           | One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.- Excepting the Model 2020 Hand Pump, which has a 90-day warranty from date of GASBOY International's invoice.                                                                                                                                                                                  | Parts Only.                                                                                                                                                                                                 |
| Keytrol                                                                                                                                        | One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.                                                                                                                                                                                                                                                                                                | Parts and Labor.                                                                                                                                                                                            |
| Fuel Management Systems:<br>- CFN/ Profit Point<br>- Series 1000/Fleetkey<br>- TopKAT<br>- Fuel Point Readers<br>(sold with new systems)       | One year from date of start-up or 15 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.- The basic warranty only applies to systems which have been started up by a Gasboy Authorized Service Representative (ASR).                                                                                                                                                                        | Parts and Labor.                                                                                                                                                                                            |
| Additional Fuel Point Items:<br>- Fuel Point Readers sold for retrofitting existing systems.<br>- Fuel Point vehicle and dispenser components. | One year from date of start-up or 15 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.                                                                                                                                                                                                                                                                                                    | Parts Only.                                                                                                                                                                                                 |
| Encoders, Embossers, Modems,<br>CRTs, and Logger Printers                                                                                      | Purchased with Fuel Management System (Encoders, Embossers only):<br>90 days from the date of start-up by a Gasboy ASR, or 180 days from date of Gasboy International's invoice, whichever occurs first.<br><br>Purchased with Fuel Management System (Modems, CRTs, and Logger Printers only):<br>Matches system warranty.<br><br>Purchased Separately:<br>90 days from date of Gasboy International's invoice to the purchaser. | Purchased with System (Encoders, Embossers only):<br>Parts only.<br><br>Purchased with System (Modems, CRTs, Logger Printers only):<br>Matches system warranty.<br><br>Purchased Separately:<br>Parts Only. |
| Air Diaphragm Pumps                                                                                                                            | Three years from date of purchase (for full warranty description, see Price List).                                                                                                                                                                                                                                                                                                                                                | Parts Only.                                                                                                                                                                                                 |
| Items not manufactured by Gasboy<br>(ex. automatic nozzles, hoses, swivels, etc.)                                                              | Not warranted by Gasboy International (consult original manufacturer's warranty).                                                                                                                                                                                                                                                                                                                                                 | Not Applicable.                                                                                                                                                                                             |
| Replacement Parts                                                                                                                              | One year from date of Gasboy International's invoice to the purchaser.                                                                                                                                                                                                                                                                                                                                                            | Parts Only.                                                                                                                                                                                                 |

To the extent permitted by law, this warranty is made in lieu of all other warranties, expressed or implied, including warranties of freedom from patent infringement, or merchantability, or fitness for a particular purpose, or arising from a course of dealing or usage of trade. No one is authorized to vary the terms of the warranty nor may anyone make any warranty of representation, or assume any liability other than that herein stated, in connection with the sale described herein. The acceptance of any order by Gasboy International is expressly made subject to the purchaser's agreement to these conditions.



**GASBOY INTERNATIONAL LLC**

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