

INSTALLATION OPERATION

3/Vista Series Blending
and Non-blending
Suction Pumps and
Remote Dispensers





DANGER

READ THIS MANUAL BEFORE YOU BEGIN

Dispensers have both electricity and a hazardous, flammable and potentially explosive liquid. Failure to follow the below precautions and the Warning and Caution instructions in this manual may result in serious injury. Follow all rules, codes and laws that apply to your area and installation.

SAFETY PRECAUTIONS - INSTALLATION AND MAINTENANCE

Always make sure ALL power to the dispenser is turned OFF before you open the dispenser cabinet for maintenance. Physically lock, restrict access to, or tag the circuit breakers you turn off when servicing the dispenser. Be sure to trip (close) the emergency valve(s) under the dispenser BEFORE beginning maintenance.

Make sure that you know how to turn OFF power to the dispenser and submersible pumps in an emergency. Have all leaks or defects repaired immediately.

EQUIPMENT PRECAUTIONS

Be sure to bleed all air from product lines of remote dispensers and prime suction pumps before dispensing product, otherwise, damage to the equipment may occur. Always use the approved method for lifting the dispenser. Never lift by the nozzle boot, sheet metal, valance, etc., otherwise equipment damage or personal injury may occur.

HOW TO CONTACT WAYNE

Trouble with the installation and operation of the dispenser should be referred to your authorized Wayne service personnel or Wayne Technical Support (1-800-926-3737).

INDICATORS AND NOTATIONS



DANGER

Danger indicates a hazard or unsafe practice which, if not avoided, will result in severe injury or possibly death.



WARNING

Warning indicates a hazard or unsafe practice which, if not avoided, may result in severe injury or possibly death.



CAUTION

Caution indicates a hazard or unsafe practice which, if not avoided, may result in minor injury.

NOTE:

Important information to consider, otherwise, improper installation and/or damage to components may occur.

3/Vista Series
Blending and Non-Blending
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Installation & Operation

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1 INTRODUCTION

1.1 Dispensers Covered

This manual describes the installation and operation of blending and non-blending 3/Vista series suction pumps and dispensers.

Non-blending dispensers included in this manual are the 3/V387, 3/V388, 3/V389, 3/V390, 3/V399, and 3/V490 models. Non-blending dispensers do not combine base products. These dispensers are multi-grade dispensers, except for the 3/V387 single grade model.

Blending dispensers included in this manual are the 3/V580, 3/V585, 3/V590, 3/V591 and 3/V595 models. Blending dispensers combine the base products to provide a blended grade or grades. Blending dispensers have two base products labeled LO and HI. These base products may be dispensed individually and/or combined into one or more blended grades. The 3/V591 and 3/V595 models also have an additional single product (nonblended) grade, however, the 3/V595/U does not.

3/Vista series dispensers have different computer base than the previous Vista model series. 3V model dispensers incorporate the use of the iGEM computer. This new computer controls the iMeter Module and the Intelligent Pulser introduced in the 2/Vista series. The iMeter module is two meters in one assembly and contains the Intelligent Pulser

The iGEM computer uses software that is uploaded by a laptop. Computer function settings necessary for dispenser startup are included in this manual. If additional information on function settings and statistics is required, refer to the 3/Vista Service manual, part number 920525.

Table 1-1 gives a description of each 3V model.

Table 1-1 MODEL DESCRIPTIONS

Model	Type	Inlets	Products Dispensed	Hoses per Side
3/V387	non-blender	1	1	1
3/V388	non-blender	2	2	1
3/V389 & 3/V399	non-blender	2	2	2
3/V390	non-blender	3	3	3
3/V390/U	non-blender	3	3	1
3/V490	non-blender	4	4	4
3/V490/U	non-blender	4	4	2
3/V580	blender	2	3	1
3/V585	blender	2	5	1
3/V590	blender	2	3	3
3/V590/U	blender	2	3	1
3/V591	blender	3	3 blend, 1 nonblend	4
3/V595	blender	3	3-4 blend, 1 nonblend	2
3/V595/U	blender	2	4-5	1

The Vista series dispenser may be operated as a stand-alone unit or as a component part of a Wayne[®] Management Control System. This manual provides installation and operation for the dispenser. Information concerning Wayne control systems has been included where appropriate in this manual, however, for complete installation and operation of the control system, refer to the manuals provided with the control system.

Any questions concerning installation and operation of the dispenser that are not covered in this manual should be referred to your authorized Wayne service personnel or Wayne Technical Support (1-800-926-3737).

1.2 Local, State, and Federal Codes

All tanks (both underground and above ground), piping and fittings, foot valves, leak detectors, corrosion protection devices, wiring, venting systems, etc., must be installed in accordance with the manufacturer's instructions and in compliance with local and regional building codes and requirements pertaining to service stations (or other locations where the dispenser may be installed).

These requirements may include references to the National Electrical Code (NFPA 70), the Automotive and Marine Service Station Code (NFPA 30A); the Flammable and Combustible Liquids Code (NFPA 30); the Code of Federal Regulations, Title 40, Section 280 (40 CFR 280); United States Environmental Protection Agency (U.S. EPA) Technical Regulations of 9-23-88 and U.S. EPA Financial Responsibility Regulations of 10-26-1988; and various other codes.

Where local requirements do not specify applicable codes, Wayne recommends using the codes listed above. These codes are comprehensive and detailed, often requiring interpretation to cover unusual situations, and, therefore, the associated handbooks (where applicable) should also be consulted. (The handbooks are also available from the same sources.)

Due to the variety of locations encountered, further information on installation cannot be dealt with in this document except as the codes relate directly to the installation of the dispenser. Therefore, it is strongly recommended that **a qualified engineer or contractor familiar with local regulations and practices be consulted before starting installation.**

Pertinent information and codes are available from the following sources:

Association for Composite Tanks (ACT)

North State Street
Suite 720
Chicago, IL 60602
(301) 355-1307 (for information requests)

Fiberglass Petroleum Tank and Pipe Institute

One SeaGate, Suite 1001
Toledo, OH 43604
(419) 247-5412

National Fire Protection Association (NFPA)

One Batterymarch Park
Quincy, MA 02269-9101
(617) 770-3000

Petroleum Equipment Institute (PEI)

Box 2380
Tulsa, OK 74101
(918) 494-9696

Underwriters Laboratories Inc.

333 Pfingsten Road
Northbrook, IL 60062
(312) 272-8800

United States Environmental Protection Agency

Office of Underground Storage Tanks
401 M St., SW (05-400WF)
Washington, DC 20640
(703) 308-8850 (Underground Storage Tanks)

U. S. Department of Labor,

Occupational Safety and Health Administration (OSHA)
Washington, DC 20402

- Call OSHA at (202) 523-8148 to determine specific needs; OSHA rules are covered by Title 29 of the Code of Federal Regulations (29 CFR.)
- Order OSHA publications from:
Government Printing Office (GPO)
Washington, DC 22304
(202) 783-3238

American Petroleum Institute (API)

1220 L Street, N.W.
Washington, DC 20005
(202) 682-8000

National Assoc. Corrosion Engineers (NACE)

Box 218340
Houston, TX 77218
(713) 492-0535

National Leak Prevention Association (NLPA)

685 Fields Ertel Road
Cincinnati, OH 45241
(513) 489-9844 or 1-(800) 543-1838

Steel Tank Institute

P. O. Box 4020
Northbrook, IL 60065
(312) 498-1980

Underwriters Laboratories of Canada

7 Crouse Road
Scarsborough, Ontario, Canada N1R3A9
(416) 757-3611

Western Fire Chiefs Association

5360 South Workman Mill Road
Whittier, CA 90601
(213) 699-0541

NOTE: Other regulatory codes may apply. Consult your local and regional code requirements to determine which codes are applicable for your location.

1.3 SAFETY PRECAUTIONS

NFPA 30A states that:

“When maintenance to Class I dispensing devices becomes necessary and such maintenance may allow the accidental release or ignition of liquid, the following precautions shall be taken before such maintenance is begun:

- Only persons knowledgeable in performing the required maintenance shall perform the work.
- All electrical power to the dispensing device and pump serving the dispenser shall be shut off at the main electrical disconnect panel.
- The emergency shut-off valve at the dispenser, if installed, shall be closed.
- All vehicle traffic and unauthorized persons shall be prevented from coming within 20 feet (6 m) of the dispensing device. ”



WARNING

Electric shock hazard! More than one disconnect switch may be required to de-energize the dispenser for maintenance and servicing. Use a voltmeter to make sure ALL circuits in the dispenser are de-energized. Failure to do so may result in serious injury.

‘Lockout/Tagout’ requirements of the U. S. Dept. of Labor, Occupational Safety and Health Administration (OSHA) may also apply. Refer to Title 29, Part 1910 of the Code of Federal Regulations (29CFR1910), *Control of Hazardous Energy Source (Lockout/Tagout)*.

1. Reprinted with permission from NFPA 30A-90, *Automotive and Marine Service Station Codes*, Copyright ©1990, National Fire Protection Association, Quincy MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association on the referenced subject, which is represented only by the standard in its entirety.

2 INSTALLATION

2.1 Inspect the Equipment

Examine the shipment immediately upon arrival to make certain there has been no damage or loss in transit. Damaged or lost equipment must be reported to the carrier. Any damage or loss that may occur in transit is not covered under the Wayne/Dresser Warranty.

Make sure that all the component parts, including keys and optional equipment (if any), are accounted for. Check and save the Packing Slip, Bill of Lading, Invoice, and all other documents included in the shipment.

2.2 Island Construction, Dispenser Anchoring, and Piping

Product lines must avoid the creation of vapor in the lines and deliver a minimum pressure of 25 psi at the dispenser inlet when all dispensers at the station dispensing the same product are operating.

A concrete foundation must be provided for the dispenser. Do not pour concrete around product lines or electrical conduit risers.

Anchor bolts must be installed in the island to allow the dispenser to be bolted down in accordance with NFPA requirements. The base of the dispenser contains six bolt hole slots (5/8 inch by 2 inch) for anchoring the dispenser to the island. Position the anchor bolts in accordance with the dimensions given on the appropriate Installation Instruction in Appendix C.

Vertical supply risers and electrical conduits must be located per the Installation Instruction for the appropriate model. Proper height must be maintained to avoid undue stress on the dispenser.



WARNING

For remote dispensers, a Listed¹, rigidly anchored emergency shut-off valve must be installed, in accordance with the manufacturer's instructions, in each supply line at the base of each dispenser. For a typical emergency valve installation see Figure 2-1. Failure to install the proper emergency shut-off valve will present a hazardous condition that could result in serious injury.

2.3 Vapor Return Piping

NFPA 30A Section 4-3-7² states that a vapor return pipe inside the dispenser housing shall have a shear section or flexible connector so that the liquid emergency shut-off valve will function properly. Wayne's vapor connections are secured to the chassis allowing for the use of a shear section.

Wayne dispensers provide 1" NPT pipe connections at the base of the dispenser for vapor return connections. (See the installation foot print for location in Appendix C.) A minimum 1" riser at each dispenser is connected to a minimum 2" return piping to the underground tank. If more than six (6) fueling points are connected, then underground piping must be a minimum of 3". All lines should be sloped at a minimum of 1/8" per foot (1/4" per foot preferred) from the dispenser to the tank to avoid liquid traps.

-
1. "Listed" means published on a list by a nationally recognized testing laboratory (NRTL) which is responsible for product evaluation and is acceptable to the authority having jurisdiction. Underwriters Laboratories, Inc. is one example of a Nationally Recognized Testing Laboratory. For more information on NRTL's, see Title 29, Parts 1907 and 1910 of the Code of Federal Regulations, Safety Testing or Certification of Certain Workplace Equipment and Materials.
 2. Reprinted with permission from NFPA 30A-90, *Automotive and Marine Service Stations Codes*, Copyright 1990, National Fire Protection Association, Quincy MA 02269. This material is not the complete and official position of the National Fire Protection Association on the referenced subject, which is represented only by the standard in its entirety.

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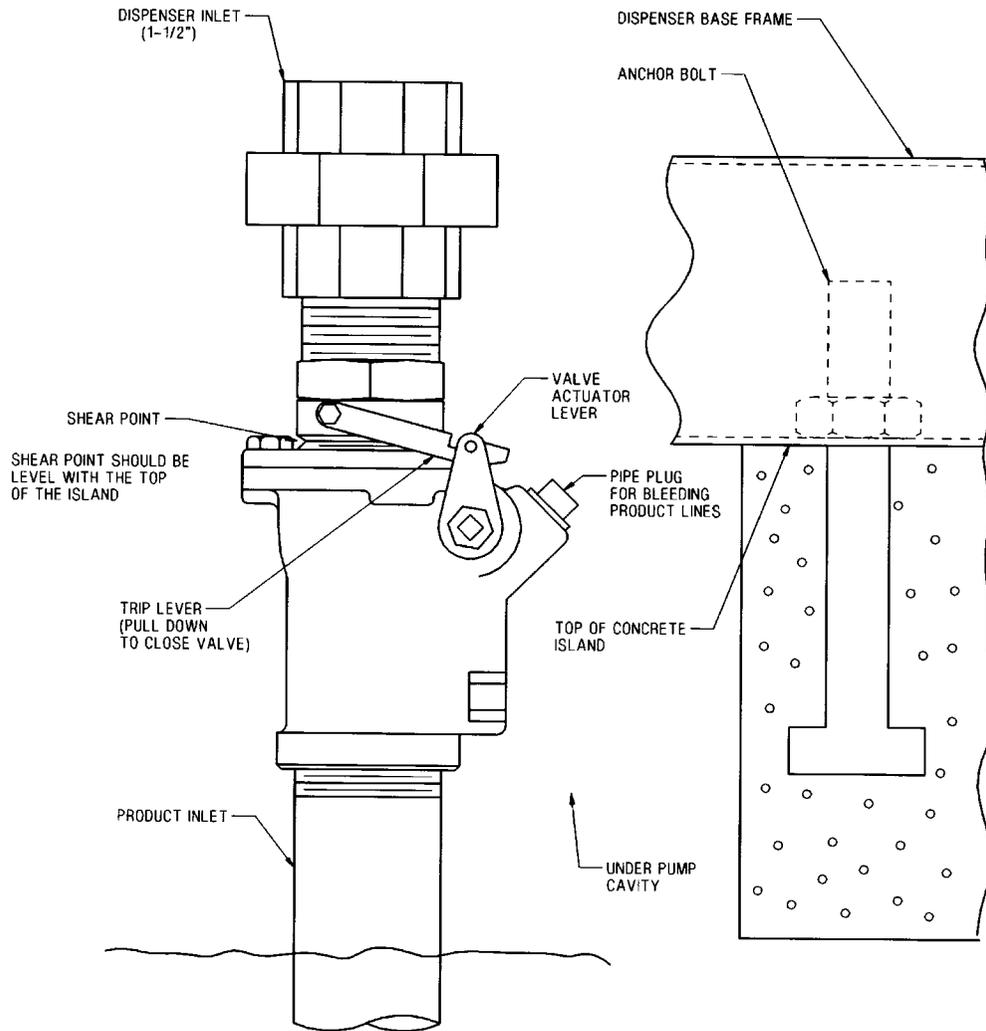


Figure 2-1 Typical Emergency Valve Installation. *The Emergency valve is designed to close the product line due to shock or fire. The shear section, shown above, functions if the dispenser is knocked out of position.*

2.4 CHECK VALVES (SUCTION PUMPS ONLY)

Suction pumps require a check valve in the product lines to stop product from draining back to the tank. Wayne recommends double poppet foot valves inside the underground tank. The foot valves should be the same size as the suction lines. Foot valves designed for handling petroleum products are equipped with a coarse mesh strainer screen. The bottom of this screen is blocked off so that the product enters the valve from the side.

Some installers prefer a double poppet check valve in the line just above the tank. If a check valve is installed at the top of the tank, the end of the suction line in the tank should be equipped with a suction pipe strainer. The suction pipe strainer is similar in construction to the bottom of the foot valve and serves the same purpose.

A spring-loaded valve of any kind is not recommended. A good valve does not require a spring to hold properly. Springs increase pumping resistance and may cause erratic operations. The valve used should be one designed for use with petroleum products.

Examine the valve carefully and remove any blocks or other means used by the manufacturer for protecting the valve in shipping. Clean the valve thoroughly with mineral spirits, because any dirt, lint, or foreign matter between the poppet and the seat will cause it to leak. The valve should be handled carefully, not dropped or thrown around. Never clamp the body of a check valve in a vise or apply a wrench to any part other than the hexagonal end of the valve. If done, it may spring or distort the valve, causing leakage or valve sticking.

Establish the length of the suction pipe in the tank to which the check valve will be attached, keeping in mind that the bottom of the suction stub must be at least four inches (4") off the bottom of the tank. The type of connection at the tank opening will have some bearing on the length of this pipe. Sometimes, a tank reducing plug (double tapped bushing) is used. Wayne recommends the use of an extractable foot valve for easy and quick removal of the check valve in the tank. (See installation drawings in Appendix C.) The importance of keeping the end of the line in the tank at least four inches (4") off the bottom of the tank cannot be overemphasized. Condensation is constantly occurring inside the tank and creating water on the bottom. Checking tanks regularly and keeping them clean reduces the risk of drawing water and debris into the lines and dispenser.

It is a good idea to test for leaks in both the check valve and the pipe as an assembly before installing them in the tank. Before installing the valve, pour petroleum into the check valve and pipe assembly and let it stand for an hour or two to make sure the check valve seals properly.

2.5 CONNECTING MORE THAN ONE PUMP TO A TANK (SUCTION PUMPS)

If you intend to connect more than one suction pump to a tank, it is best to obtain a tank with enough openings to provide each pump with a separate suction line. Tanks used in remote systems normally require only one (submersible) pump to supply several dispensers; tanks designed specifically for suction pumps will have additional openings.

If a tank with only one opening is unavoidable, it is important that a check valve be used in each suction line branch, and that each valve be placed in the line as close as possible to the connection leading to the main suction line coming from the tank. This is necessary to prevent a pump from emptying the line leading to another pump instead of pulling the product out of the tank.

2.6 Lifting and Installing the Dispenser

Remove the dispenser from its shipping carton. Survey the site and determine if any special installation requirements, such as a canopy, will affect the installation.

If the dispenser is equipped with an optional valance, survey the site to determine if it should be installed before or after the dispenser is set on the island. Wayne recommends installing the valance after the dispenser is installed, if practical, to protect it from installation damage.

3/Vista series dispensers must be lifted onto the island as per Lifting Instructions 1-7196-C and installed as per the appropriate Installation Instruction drawing in Appendix C.

When handling 3/Vista dispensers, lift only as per the Lifting Instructions drawing contained in this manual. Do not lift by the computer enclosure, nozzle boot, hose outlet, operating lever, or any external panels.

After the concrete has hardened, the dispenser can be set on the island and firmly bolted into place and the product lines connected. To gain access to the bottom section of the dispenser, unlock and remove the doors by pulling out and over the nozzle boots. See Figure 2-2 for an illustration of the dispenser doors.

When installing a blender dispenser, make sure the HI and LO product inlets (and, if applicable, the single product inlet) are correctly located. Refer to the appropriate Installation Instructions in Appendix C.

Remove the shipping discs from the inlet unions and connect the product piping. When making piping connections, to ensure tight, leak-proof connections, wash all cutting oils off the threads and use a UL-classified pipe joint sealing compound, rated for use with petroleum-based products.



WARNING

Explosive or flammable vapors may accumulate within the dispenser housing. All piping connections in the final installation must be accurately fitted and all threaded joints tightly made up with a Listed gasoline-resistant pipe joint compound. Put the compound on male threads only, being careful not to get excess inside the pipe or fittings. Failure to perform the above will present a hazardous condition that could result in serious injury.

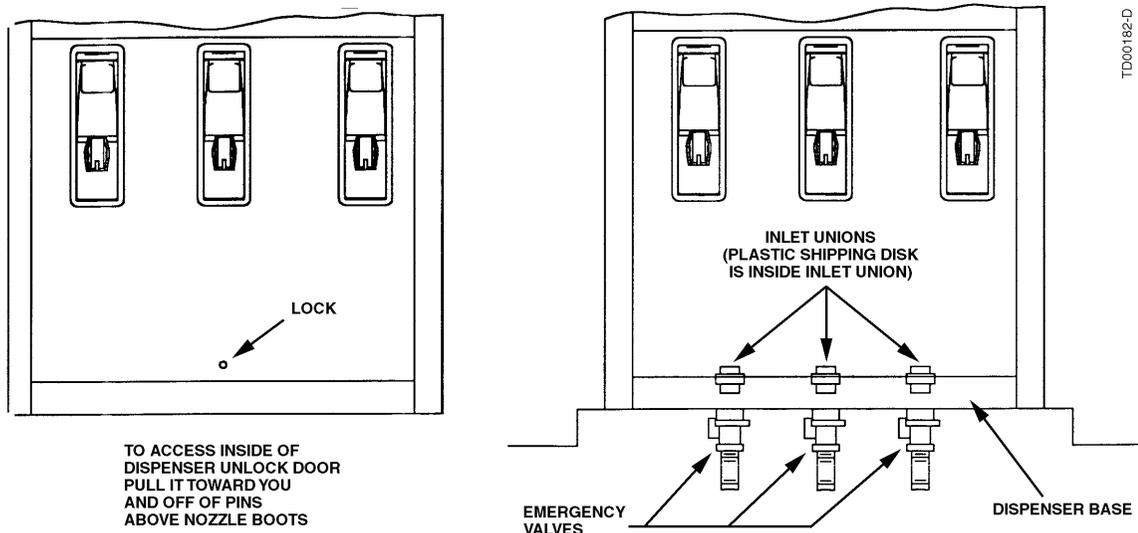


Figure 2-2 Removal of Dispenser Doors. After removing, place doors in an area where they will not be damaged.

2.7 Electrical Wiring

2.7.1 General

Wayne recommends employing a qualified electrician for all wiring. A hazardous liquid is being handled, so it is important to ensure that all wiring is in accordance with the National Electrical Code (NFPA 70) as well as all federal, state and local regulations. Note that U.L. requires that all electrical connections to the dispenser be made with threaded, rigid conduit and properly sealed conductors.

NOTE: All dispensers and electrical connection boxes must be grounded per NFPA 70.

Review the location of the dispenser junction box, see Figure 2-3, as well as other parts of the dispenser that may need to be accessed during dispenser installation and start-up.

2.7.2 Full Service (Stand-Alone) Dispenser Wiring

For full service operation, make electrical connections as shown on the appropriate Installation Wiring Diagram in Appendix C. The electrical connections illustrated are typical when additional like model dispensers are used.

In addition to the required connections for full service operation, the Installation Wiring Diagrams also show four optional DATA wires for connecting the dispenser to the Data Distribution Cabinet and the Site Controller Cabinet in a Wayne Control System. **These optional data wires are not required for the full service (stand-alone) dispenser.** If a control system may be installed at a later time, the optional data wires should be pulled at initial installation.

NOTE: If the optional data wires are run, they should not be physically connected to the data terminals in the dispenser junction box. Instead they should be properly terminated individually using wire nuts.

2.7.3 Submersible Pump Control Relays

Remote dispensers require a relay to control the submersible pump motor. These relays are available as an option with the 2400 MCS and Wayne Plus systems. If the dispenser is not connected to a 2400 MCS or Wayne Plus system, a UL Listed magnetic motor controller assembly, constructed with Potter and Brumfield Relay No. PRD7AYO (120) or equivalent, shall be used.

A maximum of 12 dispensers (24 fueling points) may be connected to a single PRD7AYO (120) relay; other relays may have different limitations. All dispensers operating the same pump control relay must be connected to the same circuit breaker; this may require multiple control relays for a submersible pump.

Ensure that the submersible pump receives its power from its own separate circuit breaker as illustrated in the Typical Site Wiring Diagram 7151-C in Appendix C.

2.7.4 Multiple Dispenser Wiring

A primary requirement in dispenser installation wiring is to provide a means for disconnecting all power connections, including the neutral, to the dispensers for safe shutdown and servicing of the units. Each dispenser could be provided with a separate control Power Circuit Breaker. If this is not desirable or practical, several dispensers can be grouped together and tied to the same Control Power Circuit Breaker as illustrated in Typical Site Wiring Diagram 7151-C in Appendix C. A group of dispensers would then consist of all the dispensers and associated Submersible Pump Control Relay coils supplied by the same Control Power Circuit Breaker.

When more than one dispenser within the group activates the same submersible pump, the Relay Select lines may be commoned at the Submersible Pump Control Relay Coil terminal up to a maximum of 12 connections (24 fueling points). Where more than 12 connections activate the same submersible pump, additional relays should be used and the contacts paralleled as illustrated in 7151-C.

In larger installations, dispensers can be separated into multiple groups.

2.7 Electrical Wiring, continued

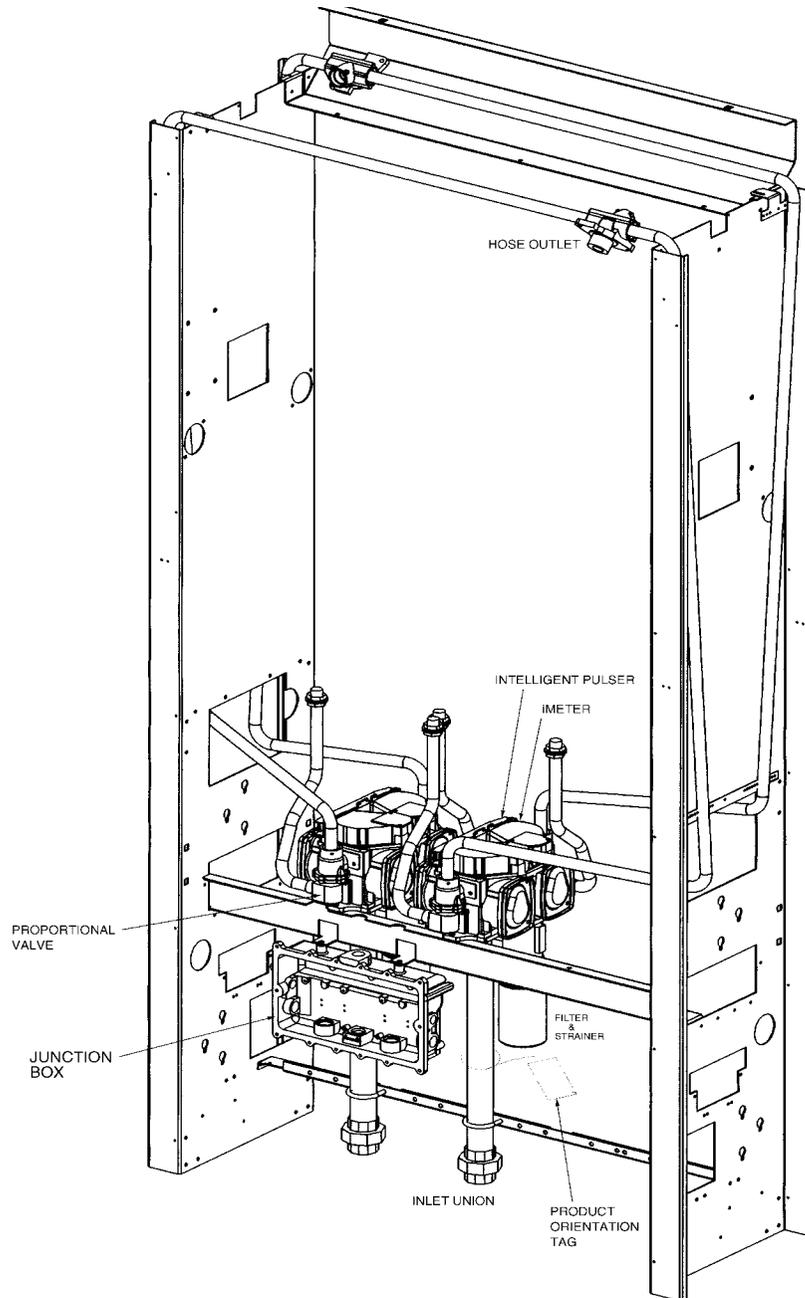


Figure 2-3 Location of Components in the Dispenser (Typical). *Location may vary slightly by model.*



WARNING

Electric Shock Hazard! No connections (including neutral) may be shared between groups of dispensers. A separate Control Power Circuit Breaker must be provided for each group. Failure to do so may result in serious injury.

2.7 Electrical Wiring, continued

2.7.5 Dispenser to Wayne Control System Interconnection

For connection to a 2400 MCS or Wayne Plus follow the installation wiring diagrams supplied with that system. However, the installation wiring diagrams in Appendix C show two DATA wires to the Data Distribution Cabinet required for the 2400 MCS or Wayne Plus Console operation, and two additional DATA wires to the Site Controller for Card Processing and/or cash acceptor operation. In addition, a set of system interconnection wiring diagrams is supplied in Appendix D for reference purposes. These diagrams can be used as a group to provide installation wiring information when laying out the system wiring requirements for a new site or when making changes to an existing one.

A UL Listed magnetic controller assembly shall be used to control the remote pumping units.

NOTE: Data wires from the Wayne Control System may be installed in the same conduit containing the AC power wiring to the dispenser (NEC Class 1).

2.7.6 Optional Equipment

Installation wiring diagrams for optional dispenser equipment such as an intercom or lighted valance are provided in Appendix C. All dispensers contain a pair of data wires for Wayne TRAC.

The letter “I” in the suffix of the dispenser model number indicates an intercom call button. As shown in Figure 2-4, Yellow wires are call button connections, Blue wires are speaker connections. Both circuits are low voltage NEC class 2 only.

NOTE: Intercom/Speaker (NEC Class 2) must be installed via a separate conduit to the dispenser junction box. The underground wiring for the intercom is terminated with wire nuts in the main junction box.

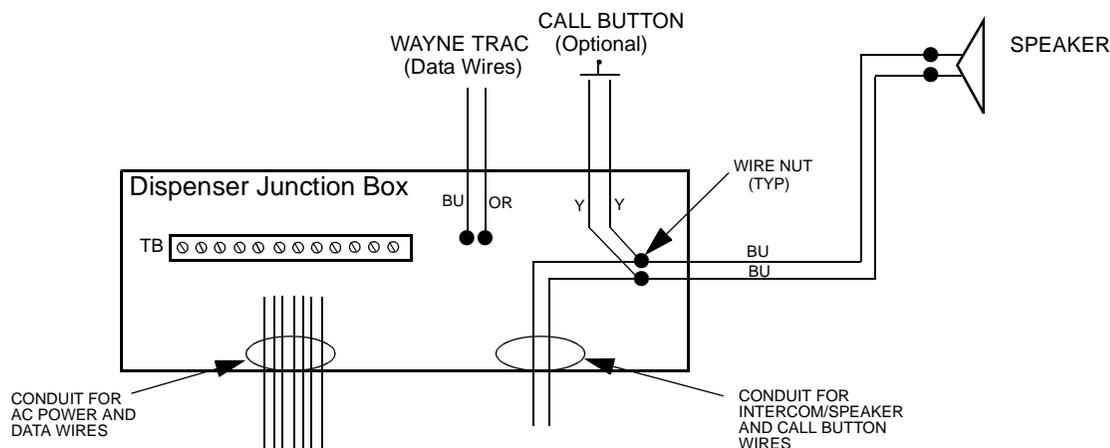


Figure 2-4 Intercom and Call Button Wiring. Intercom and Call Button wiring must run in a separate conduit to the dispenser junction box.

2.7.7 Non-Dispenser Equipment

Do not run wiring for any non-dispenser equipment, such as canopy lights, etc. in the same conduit as the dispenser wiring; this wiring must be run in a separate conduit.

2.8 Sale Display Lights

The dispenser is delivered with the sale display lighting circuit connected to the control power circuit at the terminal strip in the dispenser junction box. The sale display lighting may be connected to a separate circuit breaker by making a wiring change at the terminal strip in the junction box; refer to the appropriate Installation Wiring Diagram in Appendix C.

2.9 Hose Installation

Hose assemblies should be U.L. Listed and installed in accordance with the manufacturer's instructions. To ensure a proper joint, wash all cutting oil off the threads and use a U.L. classified gasoline-resistant pipe joint sealing compound. Place the compound on male threads only; be careful not to get any excess compound inside fittings. Install the fixed end of the hose to the dispenser outlet; secure according to the instructions of the sealing compound and hose manufacturers. Install the swivel end of the hose or other swivels to the nozzle according to the manufacturer's instructions.

Exception: Do not use the sealant on balanced or inverted hoses (used with vapor recovery).

NFPA code requires a Listed emergency breakaway device, designed to retain liquid on both sides of the breakaway point, must be installed on each hose dispensing Class I liquids; these devices must be installed and maintained per the manufacturer's instructions. Refer to your state and local codes for breakaway device requirements that apply to your installation.

All hoses, nozzles, and breakaways, etc., must be CARB certified for use on Wayne vapor recovery dispensers.



WARNING

Use only Listed hoses and nozzles. Continuity must be present between the dispenser outlet and nozzle spout to prevent static discharge while fueling. Continuity must be checked for each outlet/hose assembly to insure that the nozzle is grounded. Failure to do so may result in a hazardous condition that could cause serious injury.

2.10 Bleeding Product Lines (Remote Dispensers)

NOTE: To avoid severe damage to the dispenser, all air and air pockets must be bled from the product trunk lines before attempting to dispense product.

- Step 1** Make sure the power to the appropriate submersible pump is OFF.
- Step 2** To bleed air from a trunk line, remove the pipe plug from the safety impact valve on the dispenser farthest from the storage tank. For pipe plug location see Figure 2-1 earlier in this section.
- Step 3** Attach a flexible hose to the pipe plug opening in the safety impact valve. Energize the appropriate submersible pump and allow the air to bleed out of the trunk line into a test can until product flows into the test can. De-energize the submersible pump and replace the pipe plug. Repeat the procedure for each product and each trunk line.

2.11 Priming Suction Pumps

Suction pumping units must be primed before their initial operation; it is not advisable to run any type of internal gear pump dry during the priming process. Insert a small quantity of light-grade oil (1/2 pint or 1/4 liter) through the priming plug in the pumping unit before starting the pump for the first time.

2.12 Above Ground Storage Tanks

When installing Wayne suction pumps in locations with above ground tanks and a pressure regulator valve, a pipe plug with an orifice (Wayne part number 129881) must be added into the pumping unit for optimum performance. Figure 2-5 shows where to add the pipe plug.

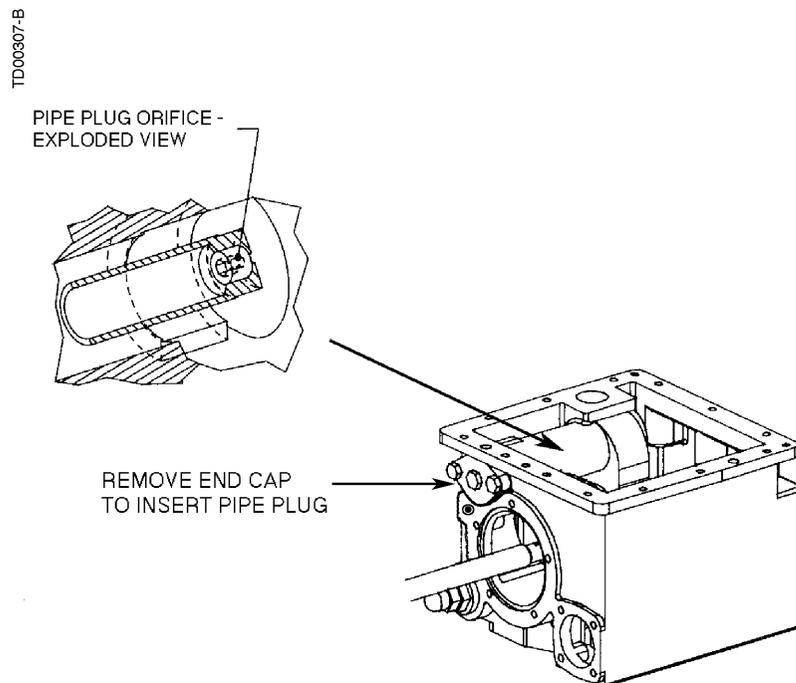


Figure 2-5 Location of Pipe Plugs in Pumping Unit. *The pipe plug is only required for above ground storage tanks.*

2.13 iMeter Calibration

All iMeters are tested, calibrated and sealed at the factory before a dispenser is shipped. Local codes and regulations may require verification of meter accuracy at Start-up. If verification or calibration is required, sufficient product must be run through each meter to thoroughly flush out all air and completely fill the system prior to the calibration process.

Each iMeter module contains two meters. The Intelligent pulser contains two sets of sensors, one set for each meter. On the front of the pulser, there are two calibration doors, one for each meter in the iMeter module. The door closest to the front of the dispenser controls calibration of the front meter and the other door controls calibration of the rear meter. It is important to verify the product grade for each module to assure the correct door is opened during the calibration process, see Figure 2-6.

iMeter dispensers have an operation mode setting that establishes the pulser's calibration mode. The operation mode is set at the factory when the meters are calibrated and sealed, and does not require resetting at Installation/Start-up.

Verification Accuracy:

1. Dispense Product into test measure and empty to wet container.
2. Dispense product into test measure until exactly 5 gallons (20 liters) are shown on dispenser display. See Note 1.
3. Compare reading on site glass of test measure to dispenser display. Volume in test measure should be within +/- 3 cu. in. (+/- 50 ml). See Note 2.
4. If values are out of range, calibrate as described below.

Calibration:

1. Identify calibration door for meter in need of calibration.
2. Remove seal wire and pin to allow access to door.
3. Dispense product into test measure and empty to wet container.
4. Open calibration door of meter to be calibrated. (Only one door can be opened at a time during the calibration process).
5. Dispense exactly 5 gallons (20 liters) into the test measure exactly to the "0" mark on the sight glass (read the bottom of the meniscus).
6. Close the calibration door. (This now redefines the calibration factor in the pulser).
7. Empty test measure (drain for 10 seconds) and verify accuracy as described above.
8. Seal calibration door.

Note 1: In the LITER mode, in addition to 20 liters, a 10 liter or 5 liter test measure may be used if required by the application. However, you should check with your jurisdiction on Weights & Measures tolerance requirements.

Note 2: For the U.S. and Canada, acceptance tolerance of ± 3 cu.in. for a 5 gallon measurement and ± 50 ml for a 20 liter measurement is only required for newly installed, newly placed in service devices for 30 days. After 30 days, the tolerance is increased to ± 6 cu.in. for 5 gallons and ± 100 ml for 20 liters.

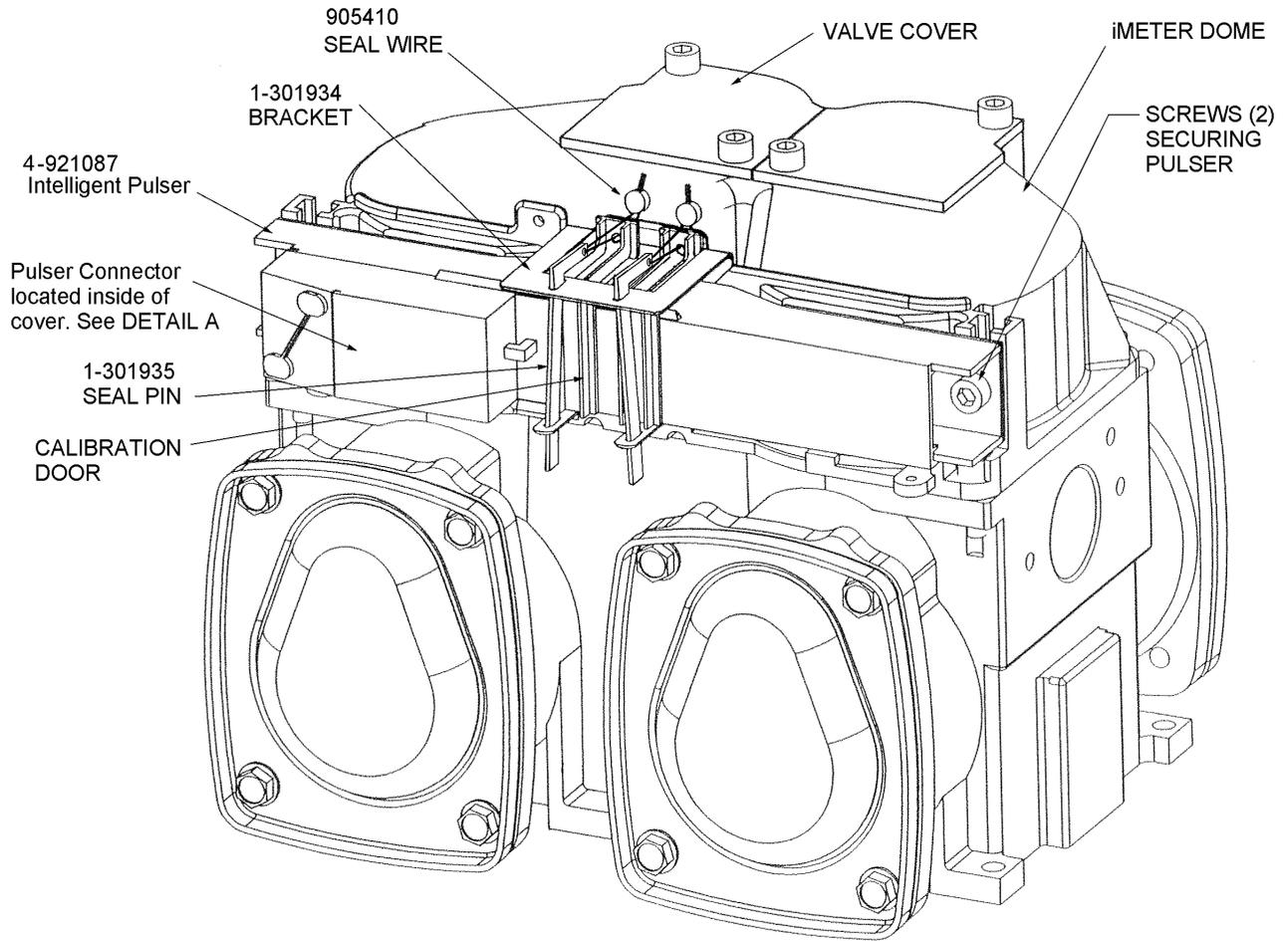


Figure 2-6 iMeter Module. *The Intelligent Pulser has two calibration doors - one for each meter. Only one door may be opened at one time during meter calibration.*

2.14 Balance Vapor Recovery System Installation Requirements

2.14.1 Dynamic Back Pressure Testing

At initial installation, balance vapor recovery dispensers should have a dynamic back pressure test performed at each nozzle to ensure there are no blockages in the vapor recovery system.

The dispenser should be connected to the underground and the hanging hardware (hoses, nozzles, breakaways, etc.) should be installed.

The following test methods or equivalent methods can be used:

“ST-27 Gasoline Dispenser Facility Back Pressure.” Available from the California Bay Air Management District via the Internet at <http://www.baaqmd.gov/mop/vol4/v4index.htm>

“TP201.4” Determination of Dynamic Pressure Performance of Vapor Recovery Systems of Dispensing Facilities.” Available from the California Air Resources Board.

Maximum allowable dynamic back pressure for an individual dispenser nozzle using either test procedure is listed below:

20 cu. ft. per min.	0.15 in. of water
60 cu. ft. per min.	0.45 in. of water
100 cu. ft. per min.	0.95 in. of water

Note: Very low numbers for back pressure results may indicate a leak in the system and it should be checked.

2.14.2 Back Pressure System Check List

Note: Check test equipment for up-to-date calibration stickers. Normal use of rotameters and pressure gauges necessitates yearly calibration; calibration is also required if this equipment has been dropped or mishandled.

1. Check test equipment for leaks prior to use. Pressurize with nitrogen supply (plug nozzle end of the fill pipe). Adjust nitrogen until 50% on pressure gauge is reached. Close off supply. A pressure decay must not be more than 0.2 in. of water in five minutes.
2. If facility has a vapor pod (condensate pot), drain prior to testing.
3. Open dry break poppets.
4. Completely drain hoses and nozzles prior to test. A pulsating needle indicates fluid in the lines. Re-drain if necessary.
5. The following information should be included on the field data sheet:
 - Facility address and ID
 - Pump number and grade ID
 - Nozzle make and model
 - Back pressure in inches of water
 - Nitrogen flow rate

2.14 Balance Vapor Recovery System Installation Requirements, continued

6. If back pressure readings are very low (less than .02 @ 20 CFH; 0.18 @ 60 CFH; 0.4 @ 100 CFH):
 1. Check test fixture for tight seal at nozzle entry point.
 2. Check bellows and face seal for tears.
 3. Check vapor piping for leaks.

7. If back pressure readings are high:
 1. Check hoses and nozzle bellows are completely drained.
 2. Check dry break is open. (If only allowed to have one dry break open during the test, try all.)
 3. Check vapor pod.
 4. Check vapor impact valve to be open.
 5. Check piping under dispenser. Should be a minimum of 1 inch diameter piping and fitting.
 6. Check dispenser back pressure, disconnected from the underground and compare to dispenser base line data.
 7. Check hanging hardware separate from dispenser and compare to balance hardware matrix base line data.
 8. Check outlets, hose, and underground, for suspect blockage problems due to fitting bottomed out or casting flashing. Flashing is aluminum edges left over when the casting was made. This should be your last resort to diagnosing high back pressure readings since piping will have to be removed to look inside the casting for flashing. A large amount of flashing would be required to affect readings.

2.15 Wayne Vac Vapor Recovery System Installation Requirements

2.15.1 Dispenser Vacuum Decay

At initial installation, Wayne Vac vapor recovery dispensers should have a 27" decay test performed on each point to ensure there are no vapor leaks in the dispenser/hanging hardware - hose, nozzle, breakaway, etc. This test is used to verify the dispenser/hanging hardware integrity so the vapor assist system will operate at its peak performance.

The test should be performed with the proper hanging hardware installed on the dispenser and the dispenser disconnected from the underground piping.

Connect the test equipment to the discharge of the vapor piping in the dispenser and apply 27" of water vacuum to the vapor line. Then close off the vapor line and determine if the closed vapor system can maintain the 27" of water vacuum.

The system should hold the vacuum for one minute. If it does not, apply 10" of water pressure to the system, soaping all connections to find the leak. Use a light soap solution; a heavy soap solution could mask leaks. If the system piping is tight, check hanging hardware by bagging the nozzles and doing a vacuum test again, while looking for the bags to deflate. The Wayne vacuum tester, as discussed below, is also used to test nozzles for leaks.

2.15.2 Wayne Pressure/Vacuum Tester

The Wayne Pressure/Vacuum Tester, part number 1-921168-KIT, is available from Wayne to perform this test. The Operation manual, part number 920372 included in the kit, explains the various tests that can be performed using both vacuum and pressure.

Additional information on these tests is contained in the Compliance Testing and Preventative Maintenance manual, part number 917947, supplied with each Wayne Vac equipped dispenser.

3 START-UP

3.1 Initial Checkout

For new installations, the start-up and adjustment procedures in this section should be performed in sequential order to ensure proper operation of the dispenser.

Before applying power to the dispenser, double-check the wiring to make sure the wires are correctly routed and terminated; refer to the safety precautions in Section 1.3.

Turn on the dispenser control power circuit breaker, the lights circuit breaker (if equipped) and the submersible pump or suction pump motor circuit breakers. Make sure the dispenser comes on and all lights work. The dispenser displays will show some numbers, usually the last sale run during factory test.

NOTE: To prevent damage to moving parts located in the hydraulic cabinet, dispenser doors should be in place during rainy and/or icy weather conditions. At start-up, if ice has formed on components requiring movement, such as the nozzle boot, it must be cleared to prevent unnecessary damage. Check internal moving parts of the nozzle boot for freedom of movement.

3.2 Hose Position Coding for Blenders

When setting up the dispenser, Unit Prices and Totals are displayed in hose position order, such as 1, 2, 3, 4, etc. When setting up blending dispensers, keep in mind that the physical number of hoses on the side of the dispenser is not necessarily the same as the number of electronic hose positions on that side. As shown in Figure 3-1, a 3/V590 has three hoses and three positions (2, 3, and 4), however, a 3/V580 has only one hose and three positions (3, 5, and 7). See Figure 3-1 and the list below for each blending model's hose position per side.

- 3/V595 models have two hoses per side and five positions.
- 3/V595/U models have one hose per side and five positions.
- 3/V580 models have one hose per side and three positions.
- 3/V585 models have one hose per side and five positions.
- 3/V590 models have three hoses per side and three positions.
- 3/V590/U models have one hose per side and three positions.
- 3/V591 models have four hoses per side and four positions.

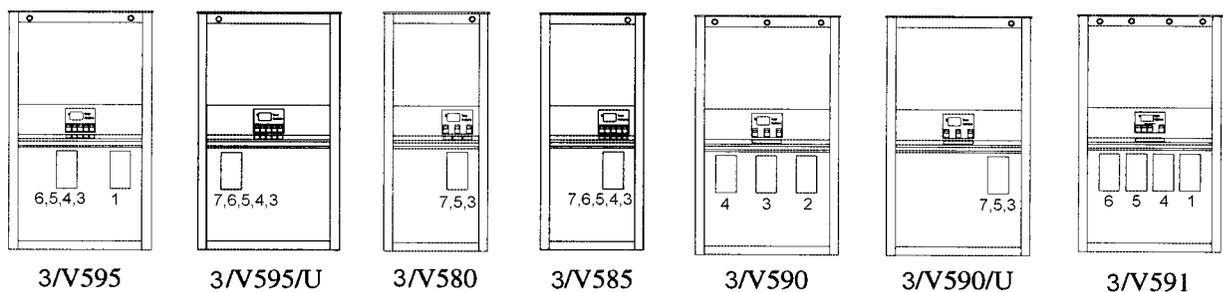


Figure 3-1 Hose Position Coding for 3/Vista Blenders. *Hose position numbers are critical for unit price setting. The product order, right to left, is identical on both sides.*

3.3 Hose Position Coding for Non-Blenders

When setting up the dispenser, as discussed in the following sections, Unit Prices and Totals are displayed in hose position order, such as, 1, 2, 3, etc. You may be accustomed to referring to these as the X, Y, or Z positions or products, so for clarity, both are shown in the text and in Figure 3-2 below.

- 3/V387 and 3/V388 models have only one position, referred to as position 1 or X.
- 3/V389 and 3/V399 models have two hoses positions referred to as positions 1 and 2, or X and Y.
- 3/V390 models have three hose positions referred to as positions 1, 2, and 3 or X, Y, and Z.
- 3/V390/U models have only one hose per side which dispenses three products from three positions; these positions are referred to as 1, 2, and 3 or X, Y, and Z. Prices are set and totals are read in the same manner as the standard 3/V390 models.
- 3/V490 models have four hoses per side; the hose positions are 1, 2, 3 and 4 or X, Y, Z, and AA with 4 (AA) on the extreme left.
- 3/V490/U models have two hoses per side. The right hose dispenses three products from three positions referred to by the letters X, Y and Z. The left hose dispenses a separate product referred to by the letter S. The inlet positions, from left to right, are Z, Y, X, and S.

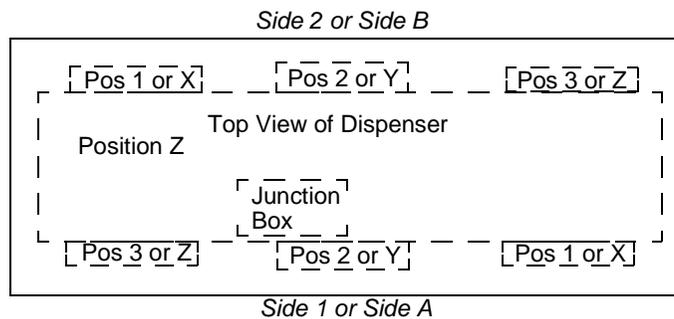


Figure 3-2 Position Coding for 3/V390 model series shown. Hose position numbers are critical for unit price setting. The product order, right to left, is identical on both sides. The junction box side of the dispenser is Side 1 or Side A and the opposite side is Side 2 or Side B.

3.4 IR Remote Control

The Infrared Remote (IR) Control shown in Figure 3-3 is similar to a television remote control. It has 16 buttons and, when held close to the infrared eye (Figure 3-5) on the display board, is used to access dispenser functions and diagnostics (statistics). The IR remote also, as discussed in the following sections, is used to set unit prices, set fueling point IDs, set blend ratios, and read electronic totalizers.



Figure 3-3 IR Remote Control. Use the remote within 12 inches of the display to set unit prices, blend ratios and fueling point ID, read totals, view error codes and other dispenser diagnostic functions.

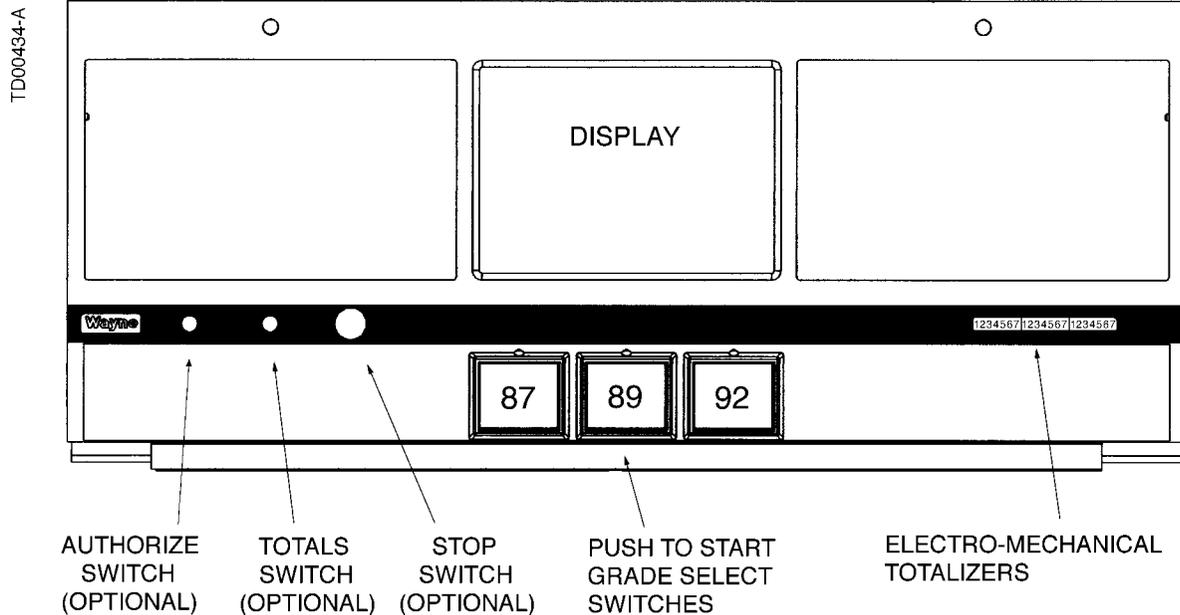


Figure 3-4 Typical Vista Bezel, Switch and Display Locations. 3/Vista dispensers may have either a Push-to-Start switch or Grade Select switches depending on the dispenser model. Totals are read on the display using the remote control, however, the totals switch on the bezel is available as a dispenser option.

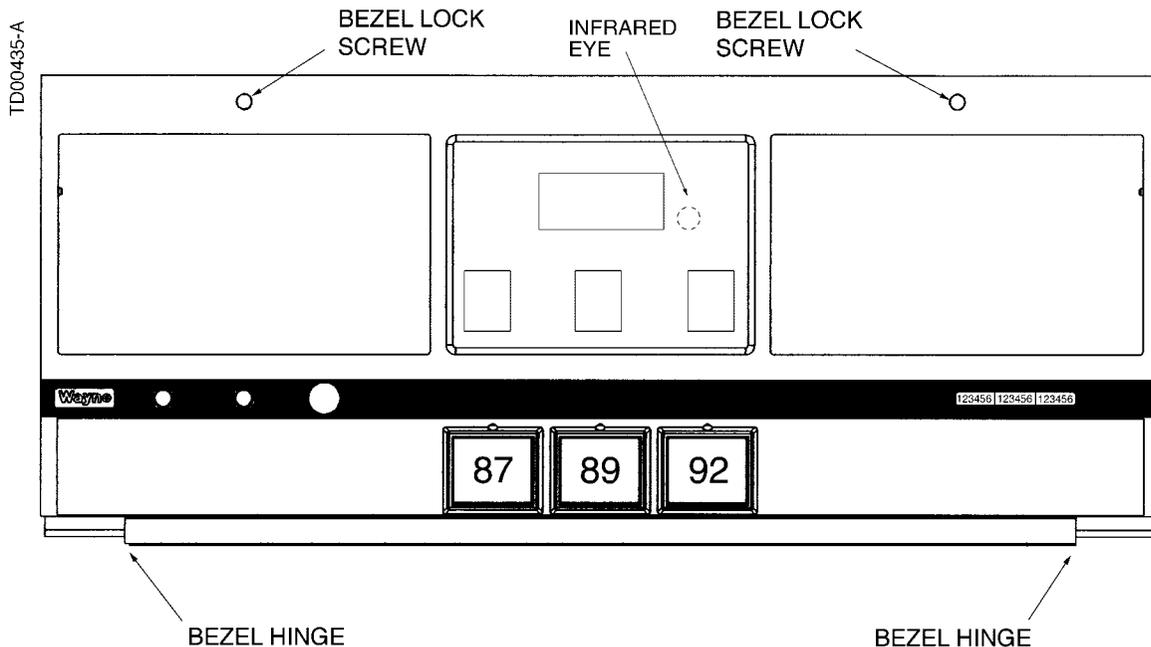


Figure 3-5 Infrared Interface Location. The dispenser infrared eye is located behind the sales display on each side of the dispenser.

3.5 Setting Unit Prices

The procedure below is used to set the dispenser unit prices when operating in stand alone mode or when communication with the POS system is disabled. When communication with the POS system is enabled, the system will not allow unit price setting at the dispenser.

The pump computer recognizes code stored in memory that defines a dispenser model and assigns logical nozzle numbers to the hose positions as shown in Figure 3-1 and Figure 3-2. To set unit prices on side 1 and side 2, functions **F03** and **F04** are accessed using the remote control interface. Credit prices on side 1 are set using sub-functions **F03.0N** while cash prices are set using sub-functions **F03.1N**, where *N* is the logical nozzle number. Active values of *N* are given in Table 3-1. For side 2, the corresponding sub-functions are **F04.0N** and **F04.1N**, respectively.

To set the unit price, the correct sub-function is accessed, the unit price is changed to its new value and the data is saved. To access the desired sub-function, perform the following steps using the remote control. **Bold** type denotes remote control function; *italicized* type denotes dispenser response.

Accessing the Unit Price Sub-function for Side 1

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F—* (indicating it needs a function number to proceed)
4. Press **03** to access F03
5. Press **ENTER**. The unit price display will show *F03* (indicating the function has been accessed)
6. Press **ENTER** to access the sub-functions of F03. The unit price display will show *3.01*

At this point, pressing of **NEXT** will advance the sub-function to the next sub-function, incrementing the value of *N* by (.01). For example, to access F3.02, press **NEXT**. The unit price display will show *3.02*, *press NEXT*. The desired sub-function depends on the dispenser type. Table 3-1 shows the values of *N* that define the desired sub-functions for the dispensers shown. Once the desired sub-function is accessed, the price display will show “— — — —” and the volume display will show the current value of the unit price. The following procedure must then be followed to set the unit price.

Changing the Value of the Unit Price

Type in the new unit price with at least three digits for three money display digits to be shown after the decimal point.¹ For example, to set the new unit price to **\$1.50**, **type in 1500. Type in 1509 for \$1.509 unit price.**

1. Press **#** key. The volume display will show the unit price with the correct number of digits after the decimal point. Again, for the example above, the volume display will show **1.500**.
2. Press **NEXT** to input the next unit price, and repeat steps 1 and 2. Continue until all the unit prices are input. Note that while inputting the unit prices, the unit price display continues to show the sub-function and not the unit price itself.

Save the unit price as follows:

1. This is the default mode. The number of digits after the decimal points is set in function F14.02.

Saving the New Unit Prices

1. Press **ENTER**. The price display will show “-----“, the volume display will be blank and the unit price display will show the last sub-function accessed.
2. Press **00** (to access F00)
3. Press **ENTER**. The unit price should now display *F00*, the price display will show “-----“ and the volume display will be blank.
4. Press **ENTER** and the volume display will show a *1*.
5. Press **UP** twice to change the value in the volume display from *1* to *3*.
6. Press **ENTER**. The volume display should show a *3*.
7. Press **ENTER**. *CHANGE STORED* should appear on the display momentarily. The display should return to normal in a few seconds. When it does, the unit price displays will show the new prices.

DISPENSER TYPE	N=7	N=6	N=5	N=4	N=3	N=2	N=1
3/V595 (4+1)		Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock		Single Grade
3/V595 (3+1)		Lo Feedstock	BL	HI Feedstock			Single Grade
3/V595/U	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
3/V595/U (4)	Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock			
3/V580	Lo Feedstock		BL		HI Feedstock		
3/V585	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
3/V590				HI Feedstock	BL	Lo Feedstock	
3/V590/U	Lo Feedstock		BL		HI Feedstock		
3/V591	Lo Feedstock		BL		HI Feedstock		Single Grade
3/V490/U				AA	Z	Y	X
3/V490				AA	Z	Y	X
3/V390					Z	Y	X
3/V399						Y	X
3/V389						Y	X
3/V387							X

Table 3-1 Hose Positions Defined by Values of N.

3.6 Blend Ratio Setting

The procedure below is used to set the dispenser blend ratios. When enabled, the POS system verifies and confirms that its blend ratio data corresponds to the manually set blend ratios. The POS system will not allow fuel to be dispensed if this set of numbers do not match.

The pump computer recognizes code stored in memory that defines a dispenser model and assigns logical nozzle numbers to the hose positions as shown in Figure 3-1 and Figure 3-2. Once this is done, the function **F18** is accessed to set the blend ratios, using the remote control interface. The sub-function **F18.1N**, where *N* is the logical nozzle number, is used to set the blend ratios for side 1 and the sub-function **F18.2N** is used to set the blend ratios for side 2. Active values of *N* are given in Table 3-2, which is the same as Table 3-1 but repeated again for convenience.

To set the blend ratio, the correct sub-function is accessed, the blend ratio is changed to its new value and the data is saved. To access the desired sub-function, the following steps must be performed using the remote control (**Bold** type denote remote control function and *italicized* type represents dispenser response):

Accessing the Blend Ratio Sub-function for Side 1

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F—* (indicating that it needs a function number to proceed)
4. Press **18** to access *F18*
5. Press **ENTER**. The unit price display will show *F18* (indicating that the function has been accessed)
6. Press **ENTER** to access the sub-functions of *F18*. The unit price display will show *18.11* (here *N=1*)

The volume display will indicate the value of the blend ratio corresponding to logical nozzle #1(*N=1*). If there is no data for this logical nozzle, the number “**101**” will be displayed. This applies to all logical nozzles. To access the blend ratio for the next logical nozzle, press **NEXT**. The unit price display will show *18.12* and the volume display will show whatever the value of the blend ratio is for logical nozzle #2. Successive presses of **NEXT** will advance the unit price display to *18.17*, the last logical nozzle. Pressing **NEXT** again will advance the unit price display to *18.21*. The “**2**” in “*18.21*” indicates Side 2 and the “*1*”, logical nozzle #1. The volume display will show the blend ratio assigned to *logical nozzle #1 of Side 2*.

Changing the Value of the Blend Ratio

1. When the desired logical nozzle is shown on the unit price display, enter the desired value of the blend ratio by using **UP** and **DOWN** keys on the remote control interface or by typing the # sign followed by the value of the blend ratio, followed by **ENTER**. For example, to change the value of the blend ratio from **101** to **89**, press the **DOWN** button until **89** shows up on the price display, then press **ENTER**, or type in **#89, ENTER**.
2. Continue until all the blend ratios are entered for Side 1 and Side 2.

Saving the New Blend Ratio

1. Press **ENTER**. The price display will show “-----“, the volume display will be blank and the unit price display will show the last sub-function accessed.
2. Press **00** (to access F00)
3. Press **ENTER**. The unit price should now display *F00*, the price display will show “-----“ and the volume display will be blank.
4. Press **ENTER** and the volume display will show a *1*.
5. Press **UP** twice to change the value in the volume display from *1* to *3*.
6. Press **ENTER**. The volume display should show a *3*.
7. Press **ENTER**. *CHANGE STORED* should appear on the display momentarily. The display should return to normal in a few seconds. When it does, the unit price displays should show the new prices. If they do not show the desired unit prices, access the appropriate sub-function to make sure that the unit price data is correct.

DISPENSER TYPE	N=7	N=6	N=5	N=4	N=3	N=2	N=1
3/V595 (4+1)		Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock		Single Grade
3/V595 (3+1)		Lo Feedstock	BL	HI Feedstock			Single Grade
3/V595/U	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
3/V595/U (4)	Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock			
3/V580	Lo Feedstock		BL		HI Feedstock		
3/V585	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
3/V590				HI Feedstock	BL	Lo Feedstock	
3/V590/U	Lo Feedstock		BL		HI Feedstock		
3/V591	Lo Feedstock		BL		HI Feedstock		Single Grade
3/V490/U				AA	Z	Y	X
3/V490				AA	Z	Y	X
3/V390					Z	Y	X
3/V399						Y	X
3/V389						Y	X
3/V387							X

Table 3-2 Hose Positions Defined by Values of N. This table is identical to Table 3-1. The information is repeated here for convenience.

3.7 Setting the Fueling Point ID

The procedure below is used to set the dispenser fueling point address. The dispenser FPID should be input and saved before control is transferred to the POS system.

Functions **F05** and **F06** are accessed to set the FPID on Side 1 and Side 2, respectively. To set the FPID, the desired FPID must be input and saved.

Accessing the FPID Function for Side 1

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F—* (indicating that it needs a function number to proceed)
4. Press **05** to access *F05*
5. Press **ENTER**. The unit price display will show *F05* indicating the function has been accessed and the volume display will show the current FPID or a “**0**” when no FPID has been assigned to that dispenser side.
6. Input the desired FPID by using the **UP** and **DOWN** keys on the remote control interface followed by **ENTER**, or by typing the # sign followed by the value of the FPID followed by **ENTER**.
7. Repeat the procedure for Side 2.

Saving the New FPID

1. Press **ENTER**. The price display will show “— — — — —”, the volume display will be blank and the unit price display will show the last sub-function accessed.
2. Press **00** (to access *F00*)
3. Press **ENTER**. The unit price should now display *F00*, the price display will show “— — — — —” and the volume display will be blank.
4. Press **ENTER** and the volume display will show a *1*.
5. Press **UP** twice to change the value in the volume display from *1* to *3*.
6. Press **ENTER**
7. The volume display should show a *3*.
8. Press **ENTER**. *CHANGE STORED* should appear on the display momentarily. The display should return to normal in a few seconds. When it does, the unit price displays should show the new prices. If they do not show the desired unit prices, access the appropriate sub-function to make sure that the unit price data is correct.
8. Repeat the procedure for Side 2.

3.8 Authorizing the dispenser

The dispenser must be authorized before it will dispense product.

In stand-alone operation (not connected to a control system), the dispenser is always authorized, unless the dispenser is equipped with the (optional) Authorize keyswitch on the bezel as shown in Figure 3-4. This momentary contact keyswitch can be used for one time authorizations.

When connected to a control system, the system programming determines authorization.

3.9 Initial Delivery

To dispense product from a newly installed dispenser, make sure unit prices are set (as previously described) and proceed as follows:

1. Authorize the dispenser.
2. Remove the nozzle, start the reset sequence and observe the reset cycle; make sure all sales display and unit price display elements operate.
3. Check that when reset is started, the correct submersible pump motor is activated, and at the end of the display reset (approximately three seconds) the solenoid valve(s) opens (listen for the audible click of the valve(s)).

NOTE: Make sure the product lines are properly bled (refer to Section 2.10) before dispensing any product through a remote dispenser. Make sure suction pumps are primed (refer to Section 2.11) before dispensing any product through a suction pump.

4. After verifying air is bled properly from each trunk line, **slowly** dispense product through each dispenser until free of air. Dispense enough product through each hose of each dispenser to ensure the dispenser and the lines are free of air, before checking the meters.
5. For dispensers equipped with Wayne Vac, verify that the correct vacuum pump motor is running when dispensing product. Verify by checking that air is being drawn through the vapor return hole(s) in each nozzle spout. See Section 2.15 for Wayne Vac Installation Requirements. If additional information on Wayne Vac testing is required, see the Compliance Testing and Preventative Maintenance manual, p/n 917947.

3.10 Totalizer Readings

3.10.1 Totalizer Readings by Hose (Product) Position

Each fueling point of the dispenser maintains electronic totalizers for both money and volume. Dispensers equipped for Cash/Credit operation also keep separate cash and credit totalizers by grade. Rather than mechanical totalizers, each position has an electro-mechanical totalizer for each feedstock. See Figure 3-6 for totalizer locations.

Electronic totals are stored in statistical functions that are accessed using the remote control interface. The totals for Side 1 are stored in statistical function **S01** and those for Side 2 are stored in statistical function **S02**. The associated sub-functions define the type of totalizer desired. They take the format '**TN**', where active values of *N* are defined in Table 3-3, and *T* is the type of totals defined as:

T= totals type: 1=Volume
2=Total Money
3=Credit
4=Cash
5=Serial Filling Mode Count
6=Stand Alone Mode Filling Count

For example, volume totals by hose position for Side 1 are accessed by examining the contents of statistical function **S01.1N** while money totals are obtained by accessing **S01.2N**, where *N* is the hose position number. For Side 2, the corresponding functions for these variables are **S02.1N** and **S02.2N**, respectively.

Electronic totalizers are read by entering the Maintenance Mode and accessing the correct function and associated sub-functions. Perform the following steps using the remote control. **Bold** type denote remote control function; *italicized* type represents dispenser response:

Accessing the Totalizer Sub-function for Side 1

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F*
4. Press either **UP** or **DOWN** to enter the statistics viewing mode. The unit price display will show *S—* (indicating a number needs to be selected)
5. Press **01** to access *S01*
6. Press **ENTER**. The unit price display will show *S01* indicating the function has been accessed.
7. Press **ENTER** to access the sub-functions of *S01*. The unit price display will show *1.11* (note here that *N=1* for **Volume** totals).

Consecutive presses of **NEXT** will advance to the next sub-function, incrementing the value of *N* by *(.01)*. For example, pressing **NEXT** advances the statistical function to *S01.12* and the unit price display will show *1.12*. The least significant six (6) digits of the data value appear on the volume display, while higher order non-zero digits of the data value, if present, appear on the money display.

The desired sub-function depends on the dispenser model. Table 3-3 on the following page shows the values of *N* that define the sub-functions (product positions) for the dispenser models shown.

3.9 Totalizer Readings, continued

DISPENSER TYPE	N=7	N=6	N=5	N=4	N=3	N=2	N=1
3/V595 (4+1)		Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock		Single Grade
3/V595 (3+1)		Lo Feedstock	BL	HI Feedstock			Single Grade
3/V595/U	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
3/V595/U (4)	Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock			
3/V580	Lo Feedstock		BL		HI Feedstock		
3/V585	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
3/V590				HI Feedstock	BL	Lo Feedstock	
3/V590/U	Lo Feedstock		BL		HI Feedstock		
3/V591	Lo Feedstock		BL		HI Feedstock		Single Grade
3/V490/U				AA	Z	Y	X
3/V490				AA	Z	Y	X
3/V390					Z	Y	X
3/V399						Y	X
3/V389						Y	X
3/V387							X

Table 3-3 Hose Positions Defined by Values of N. This table is identical to Table 3-1. The information is repeated here for convenience.

3.10.2 Totalizer Volume Readings by Meter Position

Each position has an electro-mechanical totalizer for each feedstock dispensed. See Figure 3-6 for totalizer locations.

Meter volume totals are stored in statistical functions that are accessed using the remote control interface. The totals for Side 1 are stored in function **S05** and those for Side 2 are stored in function **S06**. The value of the meter totals are stored in the sub-functions that take the format **.M0**, where *M* is the meter number. Assigned values of *M* are shown in Table 3-4. For example, *M*=5 for the high feedstock iMeter located on Side 1 of a remote series blender. For Side 2 of the same meter, *M*=1.

Note: There is no relationship between meter position and hose position. For example, in Table 3-3, positions *N*=1 and *N*=5 **are not** the high feedstock of a remote series blender used in the example above.

Meter electronic totalizers are read by entering the Maintenance Mode and accessing the correct function and associated sub-functions. Perform the following steps using the remote control. **Bold** type denote remote control function; *italicized* type represents dispenser response.

Accessing the Meter Volume Totalizer Sub-function for Side 1

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F*
4. Press either **UP** or **DOWN** arrow to enter the statistics viewing mode. The unit price display will show *S—* (indicating that a number needs to be selected)
5. Press **05** to access *S05*
6. Press **ENTER**. The unit price display will show *S05* (indicating that the statistical function has been accessed)
7. Press **ENTER** to access the sub-functions of *S05*. The unit price display will show *5.10* (note here that *M*=1)

Consecutive presses of **NEXT** will allow access to the next sub-function, incrementing the value of *M* by (.1). For example, to access *S05.20*, press **NEXT**. The unit price display will show *5.20*. The value of the meter volume totals is shown in a format such that the least significant six (6) digits of the data value appear on the volume display, while higher order non-zero digits of the data value, if present, appear on the money display. Leading zeros appear as blanks.

Values for *M* are given in Table 3-4 for the dispenser models shown.

Quick Exit

1. Press the **CLEAR** key until the unit price display window shows “S - - “.
2. Press **ENTER** three times. This causes the maintenance mode task to immediately terminate.

Low	High	Single	
2	1	4	All Remote Blenders
M	M	M	
6	5	8	
Junction Box			

Low	High	Single	
6	5	8	All Suction Blenders
M	M	M	
2	1	4	
Junction Box			

AA	Z	Y	X	Remote Non-Blenders
	Z	Y	X	490
		Y	X	390
		Y	X	388, 389 399
			X	387
4	3	2	1	
M	M	M	M	
8	7	6	5	
Junction Box				

	Z	Y	X	Suction Non-Blenders
	Z	Y	X	390
		Y	X	388, 389 399
			X	387
7	6	5		
M	M	M		
3	2	1		
Junction Box				

Z	Y	X	Single	
3	2	1	4	490/U Remote
M	M	M	M	
7	6	5	8	
Junction Box				

Table 3-4 Meter Position Numbers by Dispenser Model

3.10.3 Electro-Mechanical Totalizer Operation

Electro-Mechanical totalizers are standard on 3/Vista model dispensers. See Figure 3-6 for location.

Electro-Mechanical totalizers are located on the junction box side of the dispenser. There is one totalizer for each meter. The totalizer positions on the bezel relate to the meter position numbers shown in Table 3-4 on the previous page. The physical position of the totalizers, left to right, on the bezel represent meter positions as defined in Figure 3-6.

The totalizer shows seven digits and reads in whole units (gallons or liters). Fractional amounts that are left over from a previous sale are stored in the dispenser computer. When the next sale of the same product ends, if the fractional amounts from the new sale and previous sale(s) combined are one (1) whole unit or greater, the Electro-Mechanical totalizer is adjusted one whole increment; i.e., if five consecutive sales end with a fractional amount of .2, the Electro-Mechanical totalizer will not account for the fractions until after the fifth sale.

Note: A loose sheet of decals, part number 1-300051, with both preprinted (Low, Middle, High, Single) and unprinted labels is supplied inside the electronic head of the dispenser for marking the totalizer positions).

ELECTRONIC TOTALIZER.

TOTAL MONEY
HOSE POSITION 1
IS \$1256.78



Non-Blender electro-mechanical totalizers physical positions

1 & 5 X	2 & 6 Y	3 & 7 Z	4 & 8 AA
------------	------------	------------	-------------

Blender electro-mechanical totalizers physical positions

1 & 5 High	2 & 6 Low	4 & 8 Single
---------------	--------------	-----------------

ELECTRO-MECHANICAL
TOTALIZERS

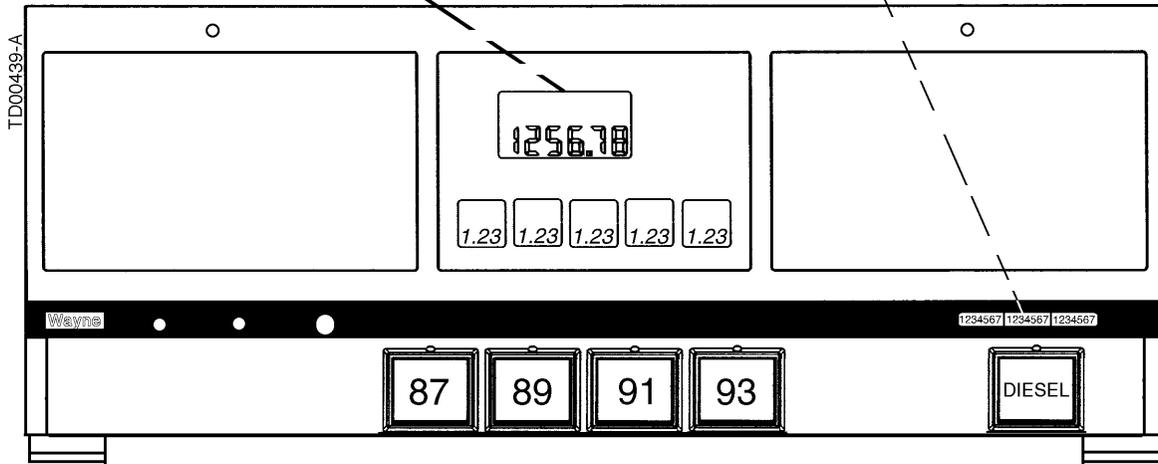


Figure 3-6 Totalizer Location. 1.23 in the unit price displays in this example indicates Statistical Function (01) Total Money (2) for Hose Position (3).

3.11 NOZZLE BOOT SWITCH CHECK

3.11.1 Lift-to-Start Version

Lift-to-start is standard on 3/6 hose 3/V590 models and 3/V591 models

The nozzle boot proximity “reed” switch assembly consists of a switch attached to the rear of the nozzle boot casting. A magnet is contained in the Lift-to-Start lever and when the lever is lifted to the on position the magnet is brought into alignment with the proximity switch, turning the switch on. There is no adjustment for the switch.

Check the operation of the nozzle switch as follows:

- Step 1** Authorize the dispenser and remove the nozzle from the nozzle boot. Lift the nozzle hook lever fully upward to make sure the switch turns on. An on switch will be indicated by the unit price displays of the unselected products going off or displaying dashes.
- Step 2** Lower the Lift-to-Start lever to the down position and check that the switch turns off. An off switch is indicated by the unit price displays of the unselected products coming back on.

3.11.2 Push-to-Start Version

Push-to-Start is standard on all blenders except 3/6 hose 3/V590 and 3/V591 models

The nozzle boot switch assembly consists of a proximity switch attached to the side of the nozzle boot casting and a magnetic actuator shaft is inserted into a spring-loaded flipper up inside the nozzle boot. When the nozzle is removed, the flipper rotates the magnetic shaft and aligns the magnetic shaft with the proximity (“Reed”) switch, turning the switch on. There is no adjustment for the switch.

Check the operation of the nozzle switch as follows:

- Step 1** Authorize the dispenser and remove the nozzle from the nozzle boot to make sure the switch turns on. An on switch will be indicated by the lighted Push-to-Start buttons and the unit price displays blinking.
- Step 2** Insert nozzle slowly into the nozzle boot and check that the switch turns off. An off switch is indicated by the lighted Push-to-Start buttons turning off and the unit price displays stop blinking.

3.12 V-link Belt

If adjustment or replacement of the V-Link belt is required on suction pump models, refer to manual entitled “Installation and Tensioning Specifications for Power Twist Plus V-Link Belt,” part number 920057.

3.13 Annunciator Operation

Check the operation of the dispenser keypads during start-up of the dispenser. Also check that the annunciator is operating properly on each side of the dispenser. When pressing the keys on the card processing (CAT) keypad or the Push-to-Start/Grade Select buttons on the bezel, you should hear the annunciator beep.

3.14 Wayne Vac Motor Operation

For dispensers equipped with Wayne Vac, verify that the correct vacuum pump motor is running when dispensing product. Verify by checking that air is being drawn through the vapor return hole(s) in each nozzle spout.

Also, see the Wayne Vac Compliance Testing and Preventative Maintenance manual, part number 917947.

3.15 Audit Report Display Mode (For Weights and Measures Officials & Service Purposes Only)

On the computer the Weights and Measures audit trail is accessed by the use of a hand held remote. By entering the Weights and Measure mode, one can view both the blend ratio audit trail and volume metering unit change counter required by Weights and Measures.

The Weights and Measures mode is side specific, therefore, it shows the blend ratio logs and volume metering unit logs for the side that your are facing.

Entering this mode is via a hand held remote. Remotes are available at the station. Both the audit trail data and gallons to liters conversion data is obtained by the use of the hand held remote. To use the remote, point at the sales display near the center of the area where the Totals and Volume valves are displayed. Keep the remote within 12 inches of the main sales display for proper operation.

To enter the Weights and Measures mode perform the following:

1. Press **Enter** and then press **Clear** twice.
If you do not press another button in 20 seconds, the computer will step through the values without interaction from the remote.
2. The sales display will show ***bLEnd rAtioS*** and the current blend ratios for all blended products.
3. Press **NEXT** to view the Blend Ratio Change Counter mode
4. Press **NEXT** will allow you to toggle through each blend ratio change counter and pressing **NEXT** button again will enter into the View Volume Metering Unit Change Counters mode.
5. The sale display will show ***n***, where ***n*** equals the Unit Change Event Number.
6. The volume display contains the metering unit that it was changed to with the following description:
LitErs Liters volume unit
US GAL U.S. Gallons volume unit
IP GAL Imperial Gallons volume unit
7. Press **CLEAR** and then **ENTER** three times to go out of the Weights and Measures mode.

4 OPERATION

4.1 Safety Items You Should Know

- Know how to turn OFF power to the dispenser and submersible pumps in an emergency.
- Inspect regularly, all external fuel carrying components such as, hoses, nozzles, breakaways, etc., for damage or leaks.
- Inspect regularly, the dispensers housing parts for damage or leaks.
- Have all leaks or defects repaired immediately.
- Test the Emergency (shear) valve, by opening and closing several times, at least once per year.
- Use of automatic safety nozzles prevents overfilling fuel tanks and avoids spilling fuel.
- Avoid tipping the nozzle downward spilling excess fuel.
- Sufficient lighting must be provided to allow safe use of the dispensers.
- A clearly visible and identifiable Station Emergency Stop Switch must be provided at the station to shut OFF power to all station dispensers and submersible pumps in case of an emergency.
- Portable tanks (containers) of 12 gallons (45 liters) or less shall not be filled while they are in or on a motor vehicle. See Warning information about this subject on the following pages.
- Hose retractor mechanisms are spring loaded and can pose a possible injury.
- Stow hoses to prevent tripping.
- Care should be taken to prevent fuel spillage. If spillage occurs, clean-up immediately.
- Avoid moving parts such as the V-belt on Suction pump models.
- Know the Hazardous Zone area around the dispenser as shown in Figure 4-1 and Figure 4-2.

4.1.1 Portable Tanks and Containers

Portable containers of 12 gallons (45 liters) or less shall not be filled while they are in or on a motor vehicle. Filling portable containers, especially when they are sitting on a non-conductive surface such as a floor mat or a plastic bedliner in the back of a pick-up truck, can present a possible safety hazard and should be avoided as so stated in the following WARNING:



WARNING

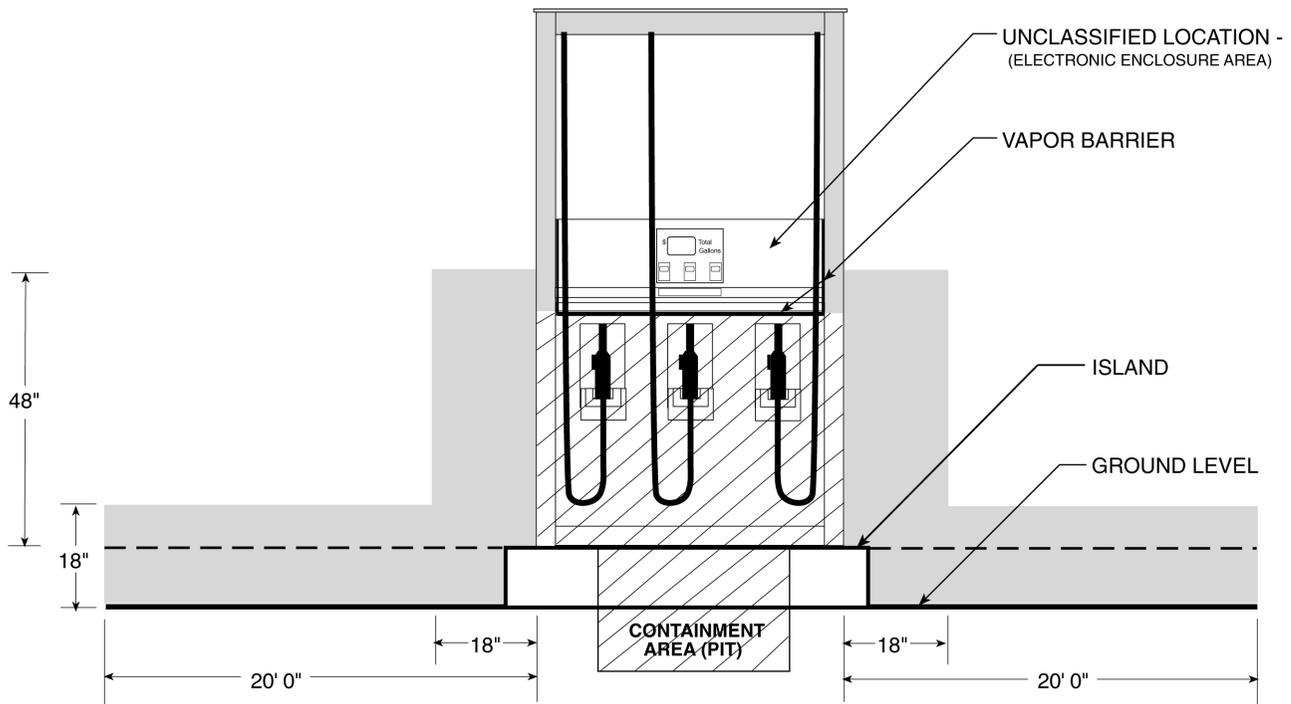
FIRE HAZARD!

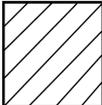
The flow of gasoline through the dispenser nozzle can produce static electricity, which can cause a fire if gasoline is pumped into an ungrounded gasoline container. To avoid static buildup and the possible resulting serious injury:

- Place approved container on the ground. Do not fill the container in the vehicle or truck bed.
- Keep the nozzle in contact with the can or container while filling. Do not use an automatic pump handle (latch-open) device.

4.1.2 Health Note

Be advised that petroleum fuel and fuel vapors can damage your health.




 U. S. Division 1
 Area where ignitable concentrations of flammable gases, vapors or liquids **can** exist all of the time or some of the time under normal operating conditions.


 U. S. Division 2
 Area where ignitable concentrations of flammable gases, vapors or liquids **are not likely** to exist under normal operating conditions.

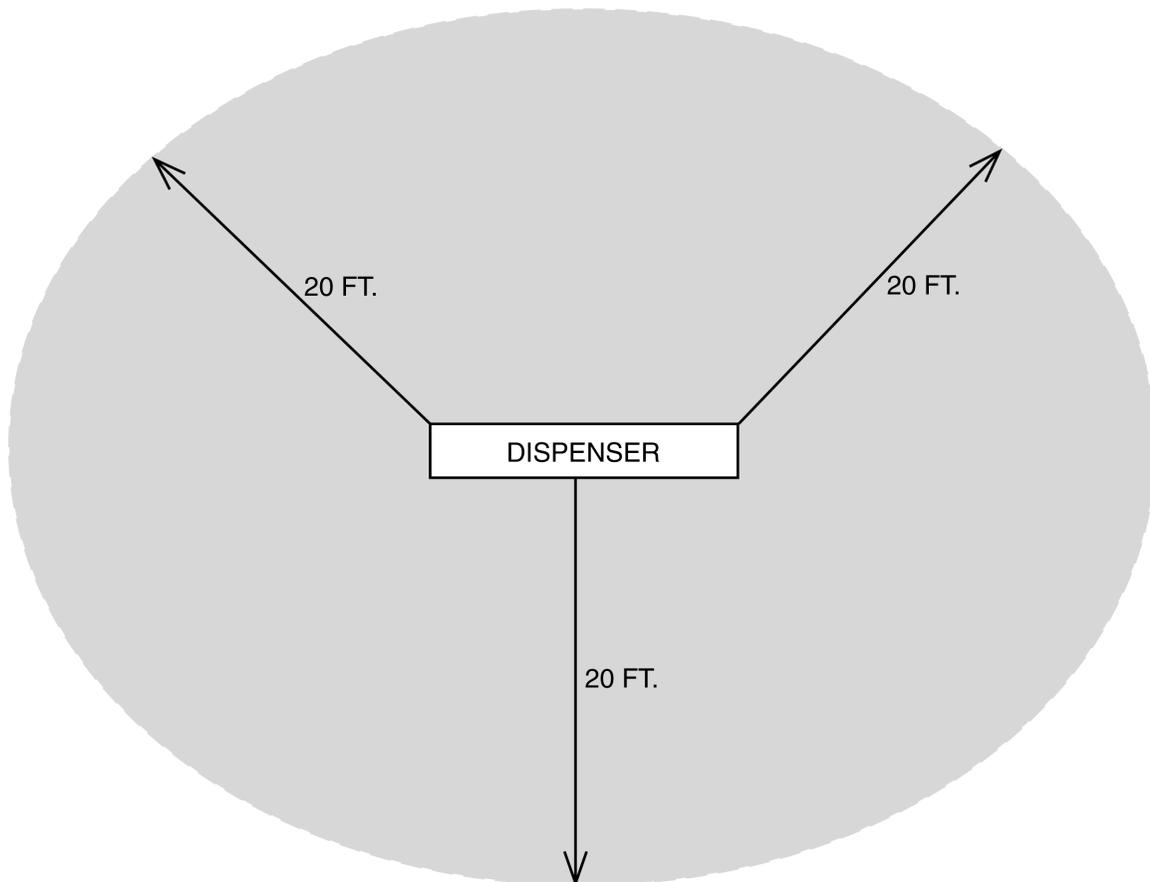


Figure 4-1 U.S. Hazardous Zone Diagram. *Front and Top views showing horizontal and vertical distances.*

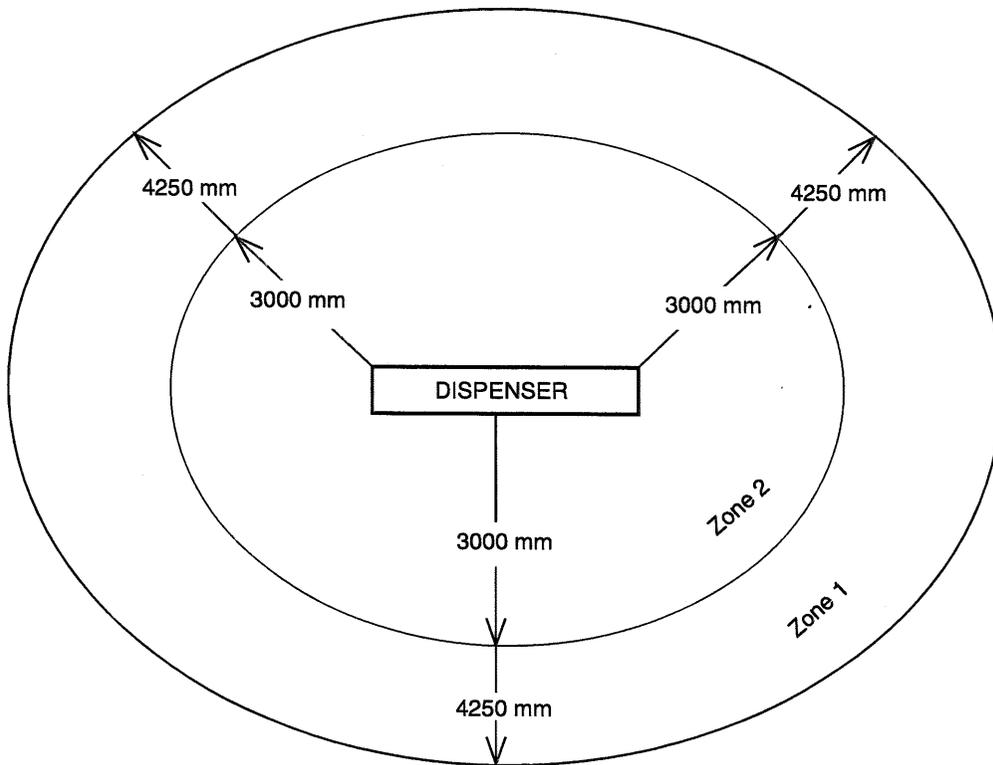
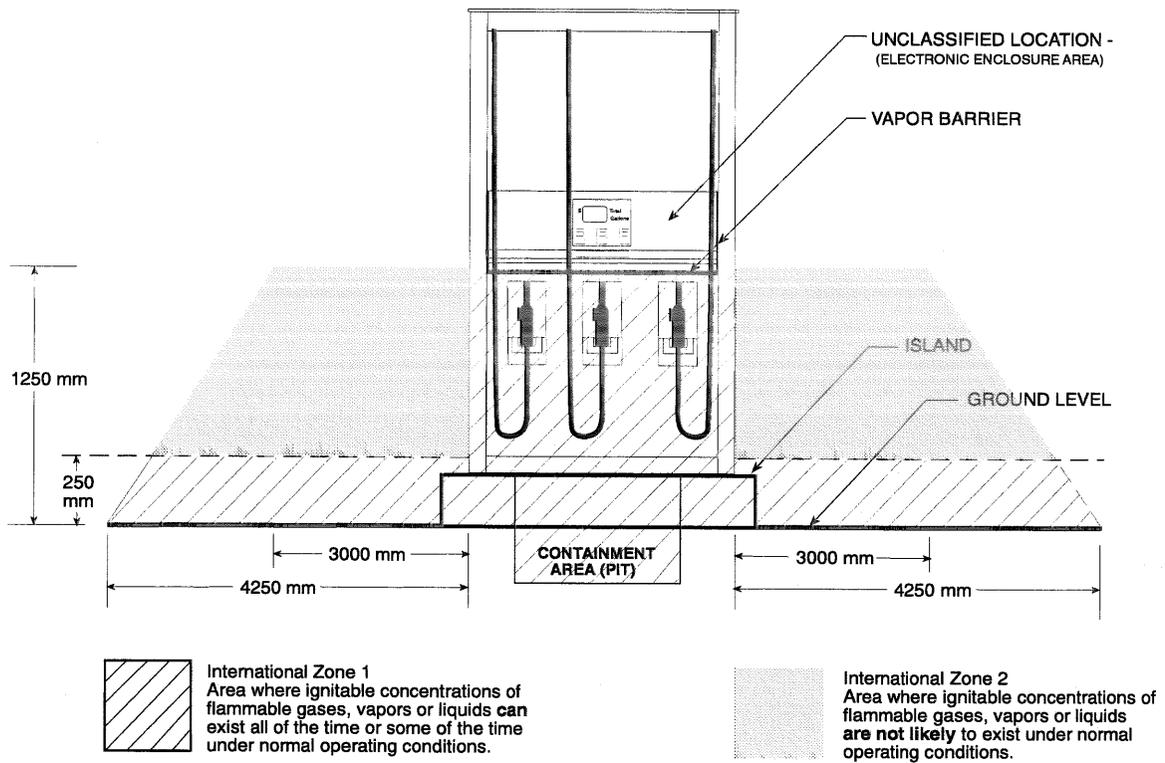
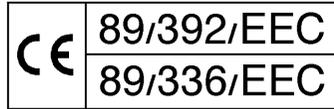


Figure 4-2 International Hazardous Zone Diagram. Front and Top views showing horizontal and vertical distances which are most common but may vary depending on country or jurisdiction.

4.1.3 European Community CONFORMITY Identification



4.2 Introduction to Operation

Unit prices must be set and the dispenser must be authorized for the dispenser to operate. If the dispenser is connected to a control system, each dispenser must have a unique fueling point number set for communication with the system as discussed in Section 3.

If the dispenser is connected to a 2400 MCS, Wayne Plus or Nucleus POS system and you want to operate the dispenser in the stand-alone mode, independently from the control system, perform the following steps:

1. In the Data Distribution Box, set the Auto/Bypass switch for the dispenser to the Bypass position. See Figure 4-3
2. Move the Authorize switch on the dispenser to the full service position (if it is not already in that position).
3. Turn the dispenser control power (circuit breaker) off, then on. See Figure 4-4.

TD00301-A

Inside of Data Distribution Cabinet

The 'Hose No.' inside the Data Distribution Box refers to the fueling point number of the dispenser side you want to control. Auto means the dispenser is controlled by the console; 'Bypass' means it is controlled by the dispenser.

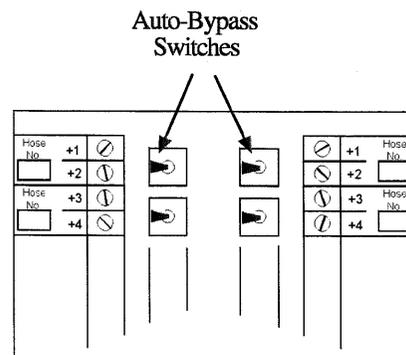


Figure 4-3 Location of Switches in the Data Distribution Box. *The Auto/Bypass switches connect or disconnect a dispenser from the control system.*

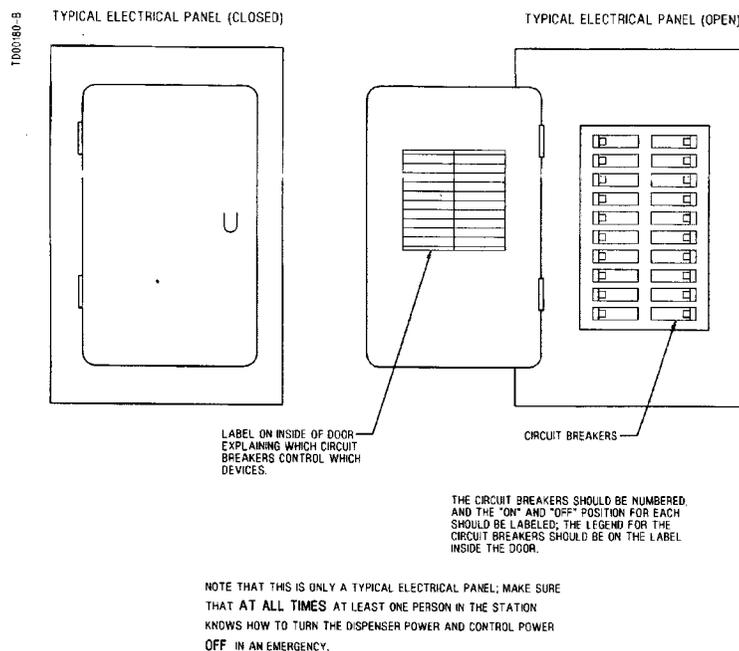


Figure 4-4 Typical Electrical Panel and Circuit Breakers. *The circuit breaker controls power to the dispenser junction box.*

NOTE: NFPA 30A requires the dispenser to be “manually activated.” This requires a separate intentional operation (Push to Start, Cash/Credit selection, or grade selection) after the nozzle is removed from its hang up position.

4.3 Operation of Non-Blenders - Single Unit Price Only

Dispensers with ‘D1’ or ‘D4’ in the main body of the model number (example 3/V390D1/) display one unit price per grade. The ‘D1’ and ‘D4’ models are identical, except that the ‘D4’ model has a Vista Card (CAT) terminal installed; see Appendix A.

To operate a ‘D1’ or ‘D4’ dispenser:

1. Authorize the dispenser, either using the Authorize switch on the dispenser, or via the control system.
2. Remove the nozzle for the desired product from the nozzle boot and lift the start lever. The nozzle boot switch will turn on. The unit price displays of the product(s) not selected will show dashes.
3. The dispenser will reset and prepare for delivery. The sale display will show all eights, then blanks, then the money and volume display will reset to zero. The unit price of the product that was selected will flash until product flow begins; the unit prices of products not selected will be blank or show dashes. The correct submersible or suction pump will start at the beginning of the reset cycle and the solenoid valves will open approximately three seconds later. Product selection can be changed any time before product flow is sensed by the computer.
4. Dispense product. Lowering the start lever or pressing the optional Stop switch will stop product flow. The nozzle boot switch must be cycled and the dispenser must then be re-authorized and reset before that side of the dispenser can continue operation.

NOTE: Single-hose multi-grade models require a grade to be selected from the push to start bar before dispensing can commence. The sale will be complete as soon as the nozzle is returned to the boot.

4.4 Operation of 3/V595 Models

3/V595 model (except 3/V595/U) dispensers are wide cabinet, variable grade blenders. Each side of the dispenser has two hoses, a single product hose on the right and a blending hose on the left, dispensing three to four grades. To operate this dispenser:

1. Authorize the dispenser via the Authorize switch on the dispenser or via the control system.
2. Remove the nozzle from the nozzle boot for either the blended hose or the single product hose. The nozzle boot switch will turn on. The unit price displays of the product(s) not selected will show dashes. If the blending hose is selected, the lighted grade selection buttons for the blending products will blink until a grade selection button is pressed; if the single product hose is selected, the lighted grade selection button for the single product will blink until it is pressed.
3. Push a grade selection button for the desired product to select one of the products from the blending hose, or the one product from the single product hose. The dispenser will reset and prepare for delivery. The sale display will show all eights, then blanks, then the money and volume portion of the display will reset to zero. The unit prices not selected will be blank or show dashes. The grade selection button that was pressed will be steadily lit; the others will be dark. The correct submersible pump(s) will start at the beginning of the reset cycle and the solenoid valve(s) will open approximately three seconds later. Product selection can be changed any time before product flow is sensed by the computer.
4. Dispense product. (Pressing the optional Stop button will stop product flow only. The nozzle boot switch must be cycled and the dispenser must then be reset before that side of the dispenser can continue operation.)
5. Return the nozzle to the nozzle boot. The nozzle boot switch will turn off; the sale will be complete and ready to pay.

4.5 Operation of 3/V580, 3/V590/U, 3/V585 and 3/V595/U Models

3/V580 and 3/V590/U model dispensers are fixed ratio blenders. They have one hose per side which dispenses three grades (HI, LO, and one BLended grade).

3/V585 and 3/V595/U model dispensers are variable grade blenders. They have one hose per side which dispense four or five grades (HI, LO, and two or three BLended grades).

Operation for these dispensers is very similar:

1. Authorize the dispenser via the Authorize switch on the dispenser or via the control system.
2. Remove the blending hose nozzle from the nozzle boot. The nozzle boot switch will turn on. The lighted grade selection buttons (or Cash and Credit buttons on 580 and 590/U with dual pricing) will blink until a grade selection button is pressed.
3. Push a grade selection button (or, for cash/credit pricing models, the Cash or Credit selection button and then push a grade selection button) for the desired product. The dispenser will reset and prepare for delivery. The sale display will show all eights, then blanks, then the money and volume portion of the display will reset to zero. The unit prices not selected will be blank or show dashes. The switch that was pressed will be steadily lit; the others will be dark. The correct submersible pump(s) will start at the beginning of the reset cycle and the solenoid valve(s) will open approximately three seconds later. Product selection can be changed any time before product flow is sensed by the computer.
4. Dispense product. Pressing the optional Stop button will stop product flow only. The nozzle boot switch must be cycled and the dispenser must then be reset before that side of the dispenser can continue operation.
5. Return the nozzle to the nozzle boot. The nozzle boot switch will turn off; the sale will be complete and ready to pay.

4.6 Operation of 3/V590 and 3/V591 Models

3/V590 models (except 3/V590/U) are wide cabinet, fixed ratio blenders. They have three hoses per side and dispense three grades (one HI feedstock grade outlet, one LO feedstock grade outlet and one blended grade outlet). 3/V591 models have an additional (fourth) single grade hose outlet. To operate these dispensers:

1. Authorize the dispenser via the Authorize switch on the dispenser or via the control system.
2. Remove the nozzle for the desired product from the nozzle boot and lift the start lever on the nozzle boot. The nozzle boot switch will turn on. The unit price displays of the products not selected will show dashes.
3. The dispenser will reset and prepare for delivery. The sale display will show all eights, then blanks, then the money and volume portion of the display will reset to zero. The unit prices not selected will be blank or show dashes. The correct submersible pump(s) will start at the beginning of the reset cycle and the solenoid valve(s) will open approximately three seconds later. Product selection can be changed any time before product flow is sensed by the computer.
4. Dispense product. Lowering the start lever or pressing the optional Stop button will stop product flow only. The nozzle boot switch must be cycled and the dispenser must then be reset before that side of the dispenser can continue operation.

4.7 Restarting After Power Failure or Shutdown

After loss of power, the display accurately displays the amount of the sale, in money and volume, for approximately 15 minutes. When power is restored, all sales information returns to the displays. Any sales in progress will be ended; old sales should be paid and the dispenser reauthorized if more product is to be dispensed.

If the dispenser does not operate properly when power is restored (does not deliver product, or does not reset), record both the money and volume shown on the display (so sales can be paid for) and do the following:

1. Ensure all nozzles on the side are in their nozzle boots.
2. Authorize the dispenser.
3. Remove the nozzle from the nozzle boot. The dispenser should operate normally. If the dispenser does not resume normal operation, try cycling power as described in the next section.

4.8 Cycling Power to clear faults

If a fault in the dispenser is detected by the computer, an error message will be displayed in the sale display as described in Section 4.9. **Record the displayed error message.** It may be possible to restart the dispenser by the following sequence:

1. Ensure all nozzles are properly seated in the nozzle boot.
2. Turn the control power circuit breaker off for approximately five seconds; the dispenser annunciator will sound. Turn the control power circuit breaker on; the dispenser annunciator will again sound.
3. Authorize the dispenser.
4. Remove the nozzle from the nozzle boot. The dispenser should operate normally.

If it is not possible to restart the dispenser using this procedure, or if an error message continues to be displayed, consult appropriate service personnel. Be certain to give the service personnel the amount at which the dispenser stopped and the exact error message.

4.9 Error Codes

Computer error codes are displayed on the side of the dispenser where the error occurred when any subsequent nozzle on signal is received on that side. The last sales data is retained and displayed with nozzle off. Product flow stops on that side only. That side will not dispense until reset by cycling power or the fault condition is corrected. Computer error codes are displayed sub-functions **S21.XX** for Side A and **S22.XX** for Side 2, where **XX** is between **01** and **50** and represents the error/events records maintained by the computer program - with 01 being the most recent. The computer can store up to 50 errors per side, continuing to store errors beyond the 50th by cycling the error buffer with new errors inserted at the top of the buffer. When this happens, an error is deleted at the bottom of the buffer for every new error that is inserted in the top of the buffer.

3/Vista errors are displayed in an alternating 2-page format. Information in the error pages is given below.

Page 1 Error Information

HH.MM
CC.DD.NN

Where:

HH = hour
MM = minute
CC = error code
DD = Device number
NN = logical nozzle number

Page 2 Error Information

MM.DD.YY
C

Where:

MM = month
DD = day
YY = year
C = filling count

The complete description of the error codes is given in the *3/Vista Service* manual, part number 920525.

Computer errors are read by entering the Maintenance Mode and accessing the correct statistical function and its sub-functions. Perform the following steps using the remote control. **Bold** type denote remote control function; *italicized* type represents dispenser response.

Accessing the error code Sub-function for Side A

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F*
4. Press either **UP** or **DOWN** to enter the statistics viewing mode. The unit price display will show *S—* indicating that a number needs to be selected.
5. Press **21** to access *S21* (error data for Side A)
6. Press **ENTER**. The unit price display will show *21.01*, the first and most recent error data for Side A. The data will be displayed in the 2-page format described earlier, in an alternating sequence, at a 1 second per page rate.
7. Pressing **NEXT** accesses *21.02* and the display shows information for the second error logged. By pressing **NEXT**, the error buffer can be viewed completely.
8. To exit, press **CLEAR**, then **UP** or **DOWN**. The unit price display will show *S—*.
9. Press **ENTER** three times to exit to the normal display.

4.10 Resetting After All Stop

This section only applies to models connected to a 2400 MCS or a Wayne Plus. Pressing the All Stop key on the 2400 MCS or Wayne Plus sends a signal to the dispenser computer to interrupt product flow. To resume product flow:

- **2400 MCS** - All of the **unpaid/stopped** indicators will be illuminated on the 2400 MCS console. Press Clear until the console display is totally blank. Press Pump Start. At this point all **unpaid/stopped** indicators will go out and fuel flow may resume.
- **Wayne Plus** - All fueling point numbers will be shown in reverse index (light fueling point numbers on a dark background) on the Wayne Plus. Press 0, Pump #, and Pump Start. At this point all operational fueling points will be shown in normal format (dark fueling point numbers on a light background) and fuel flow may resume.

4.11 Vista Card Processing Terminals

A Vista series dispenser may be equipped with a Vista Card terminal (CAT) for credit/debit card transactions at the dispenser. The CAT is one component of a Wayne Card Processing System. The CAT will not work without the rest of the components in a complete system. However, a CAT self-test procedure is provided in Appendix A; the self-test can be performed either with or without the rest of the system.

4.12 Stand-alone Operation For 3/Vista Series Dispensers

Note: All nozzles must be hung up before performing the following procedure.

A 3/Vista series dispenser may be placed in stand-alone operation - not operated by a control system. To set the dispenser in stand-alone, the correct function and its corresponding sub-function must be accessed. Next the filling mode is changed to its new setting and the data is saved. To access the desired sub-function, the following steps must be performed using the remote control. **Bold** type denote remote control function and *italicized* type represents dispenser response.

Accessing the filling mode Sub-function for Side A

1. Press **ENTER**
PASS 1 (enter password)
2. Press **ENTER**
PASS 2 (enter password)
3. Press **ENTER**. The unit price display will show *F—*, indicating that it needs a function number to proceed)
4. Press **01** to access *F01*
5. Press **ENTER**. The unit price display will show *F01*, indicating that the function has been accessed)
6. Press **ENTER** to access the sub-functions of *F01*. The unit price display will show *1.01* and the volume display will show a *1* indicating that the dispenser is in serial filling or that the dispenser is being controlled by the site controller via serial link.
7. Press **UP** to increment the value of function *1.02* by unity, followed by **ENTER**, or press **#** and type **2** followed by **ENTER** (note here that *2* means that the filling mode is Stand-alone Mode, dispenser not supervised by site controller)

Saving the new setting

1. Press **ENTER**. The price display will show “-----”, the volume display will be blank and the unit price display will show the last sub-function accessed.
2. Press **00** (to access *F00*)
3. Press **ENTER**. The unit price should now display *F00*, the price display will show “-----” and the volume display will be blank.
4. Press **ENTER** and the volume display will show a *1*.
5. Press **UP** twice to change the value in the volume display from *1* to *3*

6. Press **ENTER**. The volume display should show a 3.
7. Press **ENTER**
8. **CHANGE STORED** should appear on the display momentarily. The display should return to normal in a few seconds.

4.13 How To Get Service On Your Dispenser

Trouble with the operation of the dispenser should be referred to your local Wayne authorized service personnel or call the Wayne Help Desk at **1-800-289-2963**.

NOTE: Any modification, repair, or service to the dispenser not in accordance with the original design may invalidate compliance with the equipment certifications such as CE Marking, UL, etc. Consult manufacturer as necessary.

5 OPERATOR MAINTENANCE

5.1 Preventive Maintenance

The safety precautions described in Section 1.3 apply to the following preventive maintenance procedures. A correctly installed dispenser, given proper preventive maintenance attention, will seldom require emergency service. Perform the following checks on a regular basis:

- Check the dispenser for internal and external leaks regularly. Check nozzles, swivels, hoses, filters, and joints for leaks and wear. Have all defects repaired immediately.
- Do not abuse the hose by trying to stretch it to reach an automobile. This will cause early failure at the couplings.
- Keep the dispenser clean at all times. Use only mild soap and water with a soft cloth. Do not use gasoline or other petroleum-based products to clean the dispenser. Do not use abrasive cleaners on any part of the dispenser. All stainless steel surfaces require polishing with a non-abrasive silicone wax a minimum of three times per year to maintain a bright finish and prevent corrosion. If it is necessary to just wipe off the dispenser, use a damp cloth. See Section 5.3 for additional information on cleaning and corrosion prevention.

NOTE: Do not spray the dispenser with water.

- Before removing the bezel, wipe off any water lying along the top edge of the dispenser so it will not run inside when the bezel is removed.
- If the bezels must be removed during rainy weather, take care to prevent rain from getting inside the dispenser.
- Test the tank for water regularly. Water in petroleum is not only a source of engine trouble but will also cause damage to the dispenser.
- Check the nozzle boot switch operation. If this does not operate easily, too much force may be applied on the switch mechanisms, causing premature failure.
- Periodically check and lubricate all key lock cylinders and locking mechanisms.

5.2 Strainer/Filter

A dirty strainer screen and/or fuel filter will slow down the delivery of product. See Figure 2-3 for location. If the underground installation is new, it may be necessary to replace the filter and clean the strainer screen two or three times during the first few days of operation to remove installation debris and pipe sealant. After this, filter replacement and strainer cleaning should be performed periodically.



WARNING

Before removing the filter and strainer turn the power to the dispenser and submersible pump(s) off and close the emergency shut-off valves on the dispenser being serviced. Failure to do so may result in a hazardous condition that can result in serious injury. Loosen strainer cap or spin-on filter slightly and allow gasoline to drain into a plastic container until pressure is relieved. Return product to the appropriate underground tank.

5.1 Preventive Maintenance, continued

- The fuel filter is removed by unscrewing it (the same way an oil filter is removed from a car engine). Place a container under the filter to catch the product and sediment. To install the new filter, first apply a film of oil to the gasket and hand turn until gasket contacts base, then tighten one half turn. Open the emergency shut-off valve(s), turn the electrical power ON and check for leaks.
- Remove the strainer for cleaning by unscrewing the filter (or cap) and then pulling out the strainer. Place a container under the filter or cap to catch the petroleum and sediment. Wash the screen in gasoline and dislodge lint and other foreign particles with compressed air. Install the clean strainer and a new filter. Open the emergency shut-off valve(s), turn the electrical power ON and check for leaks.

NOTE: Replacement fuel filters must be UL recognized.

5.3 Cleaning And Corrosion Prevention Instructions

To properly care for your dispenser:

Step 1 Wash the dispenser frequently with a non-abrasive cloth and warm water mixed with a mild household cleaner (such as dishwashing liquid). The dispenser should then be wiped down with a clean damp cloth. Do not use a hose to rinse off the dispenser.

NOTE: Do not direct pressurized water (even from a garden hose) at the dispenser. Under no circumstances should power washers be used to clean the dispensers. This can force water into the electronic head and cause damage to the electronic components in the dispenser rendering it inoperative.

Do not use all-purpose cleaners on the surfaces of the dispenser. They may scratch the clear plastic, as well as break down the corrosion resistance of painted and stainless steel surfaces.

NOTE: Do not use gasoline or other petroleum-based products to clean the dispenser.

Step 2 Exposure to contaminants can cause a discoloration of the stainless steel panels (doors, column covers, etc.). If the discoloration persists after washing (as instructed above), the use of an abrasive powder cleaner is very effective in restoring the original shine.

Step 3 Two cleaners in particular are very effective and practical to use: *Zud Heavy Duty Cleaner* and *Bar Keepers Friend*. They can both be found in most hardware/grocery stores. Follow the manufacturers' instructions for use and always rub in the direction of the brush finish to prevent scratching the stainless steel.

Periodic waxing of the dispenser surfaces is essential to maintain the original finish and inhibit corrosion. Stainless steel surfaces should be polished with a non-abrasive silicone wax. Painted surfaces should be waxed with an automotive wax or polish. We recommend that these surfaces be waxed or polished at least three times a year.

5.4 Vapor Recovery

All hoses, nozzles, breakaways, etc., must be CARB certified for use on Wayne vapor recovery dispensers.

5.4.1 Wayne Vac

See Section 2.15 and the Compliance Testing and Preventative Maintenance manual, p/n 917947.

5.4.2 Balance

Tears and slits and the balance nozzle vapor bellows will cause the vapor system to be in non-compliance. Replace or repair the nozzles as necessary.

The bellows face-plate (where nozzle seals on vehicle fuel tank) must make a good seal when inserted into the fuel tank. Damaged or warped faces are not acceptable and will cause the system to be in non-compliance. Replace or repair as necessary.

Wire clamps at top of the bellows may have critical placement to requirement to maintain compliance. If clamp is loose or broken, it must be replaced or repaired according to the nozzle manufacturer instructions.

To ensure on-going compliance of the balance system, once per year checks of the pressure drop and tightness of the system are recommended. These test are discussed in Section 2.14.

5.5 Meter Maintenance Issue

It is recommended that Wayne Fuel Meters be periodically checked for acceptable accuracy based on NCWM Handbook 44 under the General Code, G-UR.4 Maintenance Requirements and Liquid Measuring Device Code, Section 3.30.

If adjustment need to be made, one would follow the prescribed procedure in the service manuals for the respective equipment. All adjustments shall be made in accordance with G-UR.4 Maintenance Requirements of Handbook 44.

APPENDIX A

CAT SELF-TEST PROCEDURE

The following are instructions for testing the CAT (Customer Activated Terminal) on the dispenser.

1. CAT SYSTEM SELF-TEST

The following paragraphs provide instructions for testing and setting the address of the CAT. During the self-test, the system is designed to pause 25 seconds for a response to self-test prompts. When the 25 second time limit expires, the system automatically advances to either the next self-test or returns to the on-line mode.

1.1. ENTERING SELF-TEST MODE

Step 1 Power down the CAT.

Step 2 Power up the CAT while holding down any key on the keypad until the alternating message below appears on the display.

Step 3 Press the indicated key or press ENTER to continue to the next screen prompt.

CONTRAST ADJUST PRESS NEXT TO EXIT

YES = DARKER NO = LIGHTER

1.2. SOFTWARE REVISION LEVEL AND DATA LINK ADDRESS

Step 1 Continue holding the key down until the “REV” message below appears on the display, then release. Once the system displays the “REV” message, the module has successfully entered the self-test mode.

REV XXX MM/DD/YY ADDRESS = YY

The top row of information in the “REV” message display represents the module software revision. The bottom row is the current terminal address for the data link. Data link addresses are assigned to the module using the same number as the fueling point.

Step 2 If the CAT’s data link address is correct, press the **ENTER** key. To change the address, enter the correct address number on the keypad and press **ENTER** (if the CAT is equipped with a DES keypad, the keypad revision will be displayed).

1.2 CAT SELF TEST, continued

Step 3 Verify that the Keypad revision and BCB revision levels are displayed on the screen. The BCB revision displayed will be the software revision of the BCB board or the QCAT board whichever applies.

Step 4 Press ENTER to continue.

KEYPAD REV __

BCB REV __

1.3. CONFIGURE CARD READER

When the system displays the prompt below, proceed as follows:

*CONFIGURE CARD READER
(Y/N)

Answering **YES** to the prompt causes the screen to display the prompt below

or

press **NO** on the keypad and the system automatically proceeds to the "Offline msg" prompt.

TRACK 1 OR 3
(1/3)

To answer the "Track 1 or 3" prompt, perform the following steps:

Step 1 Press **1** on the keypad.

Step 2 Press the **ENTER** key and the following prompt will be displayed.

1.3 Configure Card Reader, continued

Offline msg: of Service	Out (Y/N)
----------------------------	--------------

Step 3 Answer **NO** to the above prompt.

Step 4 Answer the following prompts as they appear:

Long Receipts? (Y/N)

Fixed Length Scanner? (Y/N)

Self Test? (Y/N)

Answering YES to the above prompt will begin the display, printer and card reader self test as discussed on the following pages.

Answering NO to the above prompt will display the Exit Prompt shown below.

Exit Test Mode? (Y/N)

Answer YES to the above prompt to exit and return the CAT to normal operation.

Answer NO to the above prompt to return to the beginning of the Self Test mode.

1.4. DISPLAY SELF-TEST

A series of actions appear on the screen for the display self-test. Two rows of black squares followed by numbers and letters scroll from right to left across the screen during the display self-test.

1.5. PRINTER SELF-TEST

The message shown below appears continuously on the display screen during the printer self-test.



The printer self-test performs the following actions in sequence:

1. Advance the paper one half inch.
2. Print CAT information (ROM version, processor type, etc.)
3. Print five rows of characters followed by five more rows of slashes (\ and /).
4. Advance the paper one inch and cut the paper.

Once the paper is cut, the system automatically activates the card reader self-test.

1.6. CARD READER SELF-TEST

Any type of valid credit card can be used for the card reader test. The card reader self-test begins with the screen prompt shown below.



- Step 1** Insert the card.
Once the credit card is inserted into the card reader, the CAT computer reads data from the card.



- Step 2** Remove the credit card in one smooth continuous motion when the above prompt appears on the display screen.

1.6. CARD READER SELF-TEST, continued

A series of digits appear on lines 1 and 2 of the display screen. This information is the card data.

Step 3 Press the **NEXT** key and continue to the keypad self-test.

If either of the following prompts appear on the display screen, “TRACK READ ERROR” or “CARD READ ERROR”, the credit card is invalid. Depending on the type of invalid credit card, one or two rows of digits may appear on the display screen. To complete the card reader self-test, select a different credit card and repeat procedure. If the error message continues to be displayed, the card reader may need replacing.



1.7. KEYPAD SELF-TEST

Testing the CAT keypad requires the operator to select keys on the keypad and verify the information on the display screen. Refer to the Keypad Test table on the following page.

Complete the following steps to test the keypad.

Step 1 Press a key listed under the column heading Native Mode Key.

Step 2 Verify the two digit number on the display screen with the number listed under the column heading Keypad Coordinate.

The screen does not display a two digit number when the **NEXT** key is pressed. This key remains functional during the keypad self-test.

Step 3 Repeat Steps 1 and 2 until all of the keys are tested.

Step 4 Press the **NEXT** key to proceed to the memory self-test.

1.7 KEYPAD SELF-TEST, continued

KEYPAD TEST

Native Mode Key	Keypad Coordinate
CLEAR	00
7	01
4	02
1	03
0	10
8	11
5	12
2	13
ENTER	20
9	21
6	22
3	23
CANCEL	30
NO	32
YES	33
NEXT	Proceed to memory test.

1.8. SYSTEM MEMORY SELF-TEST

A successful memory self-test will display the message below.



An unsuccessful memory self-test will display one of the following: "BIT 0" through "BIT 7". A BIT error message is an indication of a defective board in the CAT system. An example of a BIT error message that may appear on the display screen is shown below.



1.9. EXIT SELF-TEST MODE

Once the system successfully completes the memory self-test, the exit prompt shown below appears on the screen.

Complete one of the following steps:

Press the **YES** key to exit the self-test mode,

or

Press the **NO** key to begin the self-test mode again.

EXIT TEST MODE (Y/N)

APPENDIX A

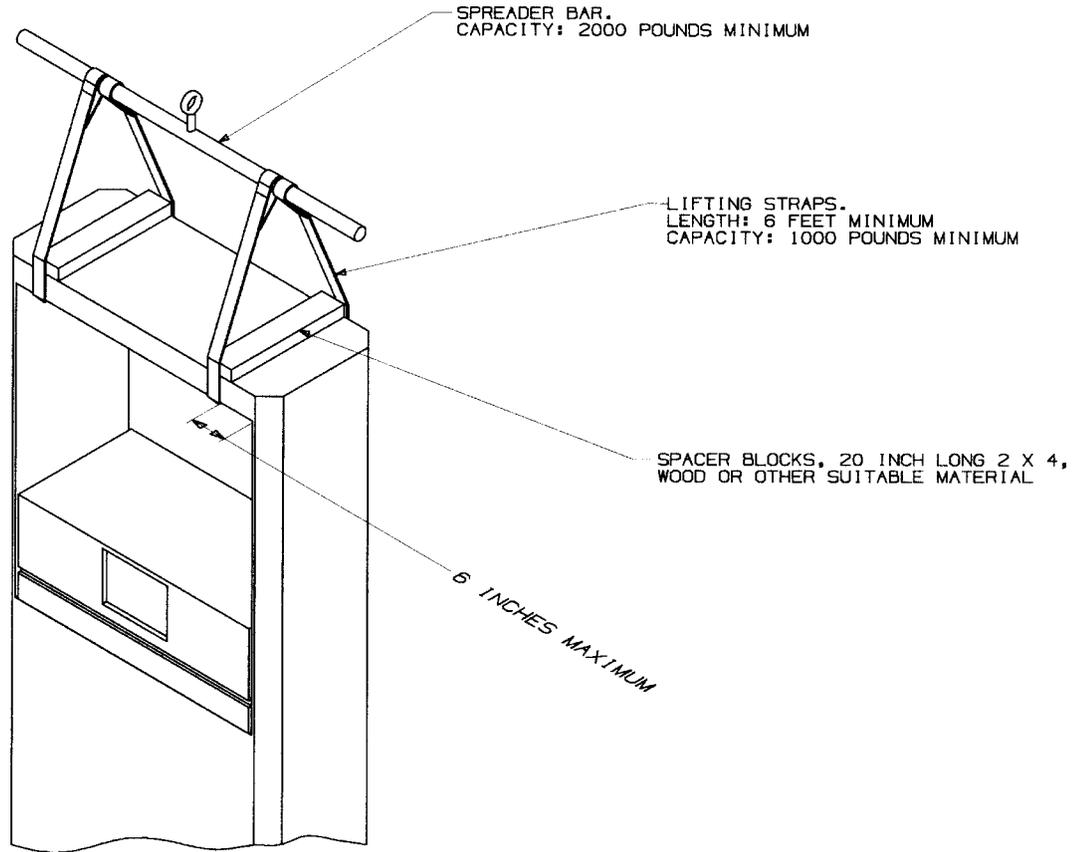
THIS SECTION RESERVED FOR FUTURE USE

APPENDIX C ENGINEERING DRAWINGS

3/Vista models have different base layouts (footprints) than previous Vista models. 3/Vista models use the same Installation Wiring Diagrams as previous Vista models.

Dispenser drawings appear in this section in the following order:

<u>Model Number</u>	<u>Type</u>	<u>Drawing Number</u>	<u>Description</u>
		1-7196-C	Lifting Instructions
3/V390D, 3/V390D/U	Remote	1-7243-C	Footprint
3/V590D/U, 3/V595D/U	Remote	2-7243-C	Footprint
3/V399D	Remote	3-7243-C	Footprint
3/V490D/U	Remote	4-7243-C	Footprint
3/V387D	Remote	5-7243-C	Footprint
3/V388D, 3/V389D	Remote	6-7243-C	Footprint
3/V580D, 3/V585D	Remote	7-7243-C	Footprint
3/V595D, except D/U	Remote	8-7243-C	Footprint
3/V490D, except D/U	Remote	9-7243-C	Footprint
3/V590D, except D/U	Remote	10-7243-C	Footprint
3/V591D	Remote	11-7243-C	Footprint
3/V590P/U, 3/V595P/U	Suction	9-7193-C	Footprint
3/V390P, 3/V390P/U	Suction	10-7193-C	Footprint
3/V399P	Suction	11-7193-C	Footprint
3/V591P, 3/V595P, except P/U	Suction	12-7193-C	Footprint
3/V387P	Suction	13-7193-C	Footprint
3/V389P	Suction	14-7193-C	Footprint
3/V580P, 3/V585P	Suction	15-7193-C	Footprint
3/V390D, except D/U	Remote	1-7157-C	Wiring Diagram
3/V389D, 3/V399D	Remote	2-7157-C	Wiring Diagram
3/V490D	Remote	3-7157-C	Wiring Diagram
Blenders, except 591D, 595D	Remote	4-7157-C	Wiring Diagram
3/V387D	Remote	5-7157-C	Wiring Diagram
3/V591D, 3/V595D, except D/U	Remote	10-7157-C	Wiring Diagram
3/V390D/U	Remote	13-7157-C	Wiring Diagram
3/V390P	Suction	6-7157-C	Wiring Diagram
3/V389P, 3/V399P	Suction	9-7157-C	Wiring Diagram
3/V590P/U, 3/V595P/U	Suction	19-7157-C	Wiring Diagram
		-7151-C	Typ Disp Site Wiring
		10196-B	Dimensional Drawing



APPROXIMATE WEIGHTS OF DISPENSERS:

V390 DISPENSER	-----	850 LB
V395 DISPENSER	-----	950 LB
V490 DISPENSER	-----	940 LB
V590 DISPENSER	-----	940 LB
V380 SERIES	-----	500 LB
V585 SERIES	-----	500 LB
V390 SUCTION DISPENSER	-----	1175 LB
V399 SUCTION DISPENSER	-----	910 LB

LETTER	NO.	DATE	CHANGE	REV BY
ER314B			REVISIONS	

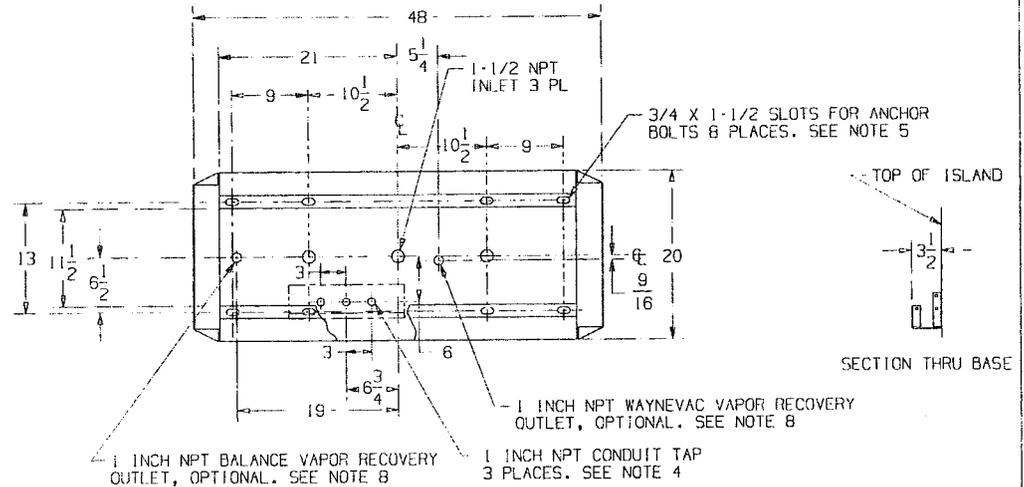
THIS DRAWING IS THE PROPERTY OF THE WAYNE DIVISION, DRESSER INDUSTRIES, INC. IT IS NOT TO BE USED OR REPLICATED WITHOUT THE WRITTEN PERMISSION OF THE COMPANY AND IT IS NOT TO BE USED IN ANY WAY INCONSISTENT WITH THE PURPOSE FOR WHICH IT IS ISSUED.

SH MET UNFOLD	REF SET	TITLE
NA	NA	LIFTING INSTRUCTIONS, VISTA DISPENSER
DATE	INITIALS	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		DESIGNED JDD
.X = ±.050 ANGLES		DATE 11DEC97
.XX = ±.025		SCALE NONE
.XXX = ±.010		CHECKED DAB
DO NOT SCALE DRAWING		APPROVED RGB
		1-7196-C

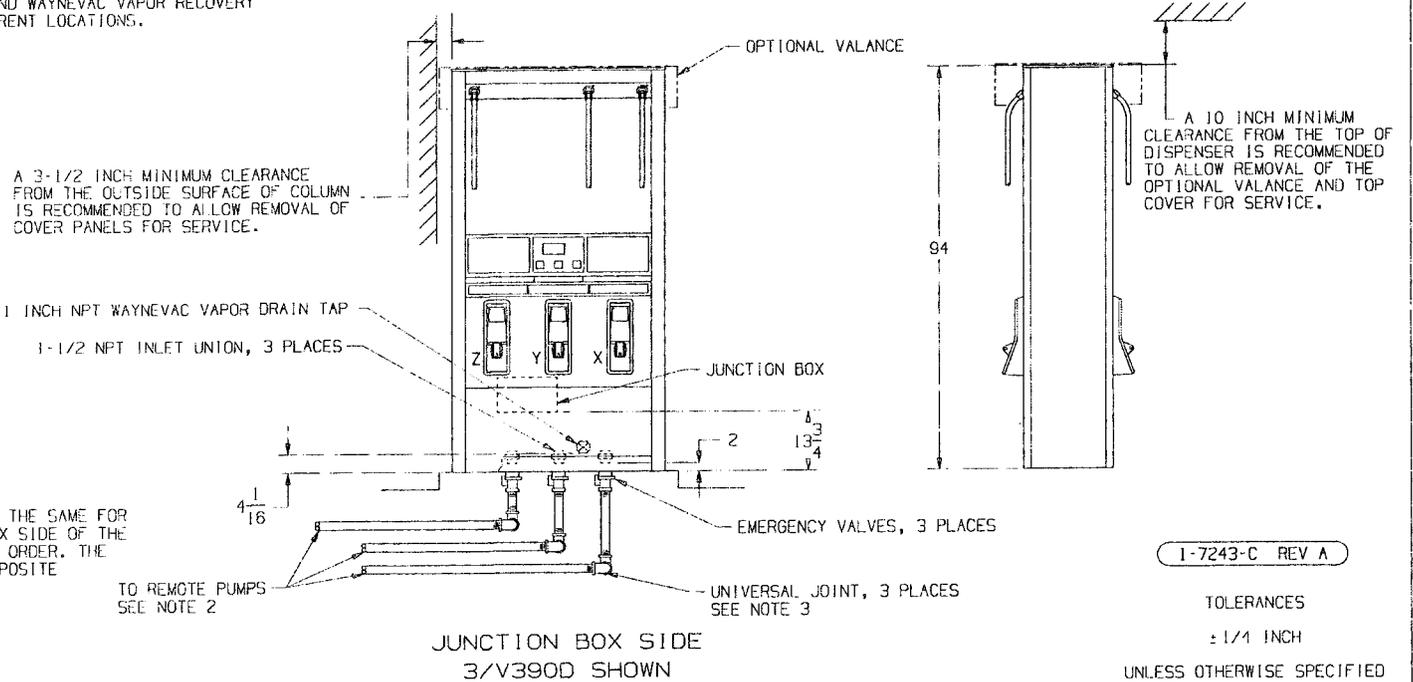
Figure C-1. 1-7196-C Vista Field Lifting Instruction

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS



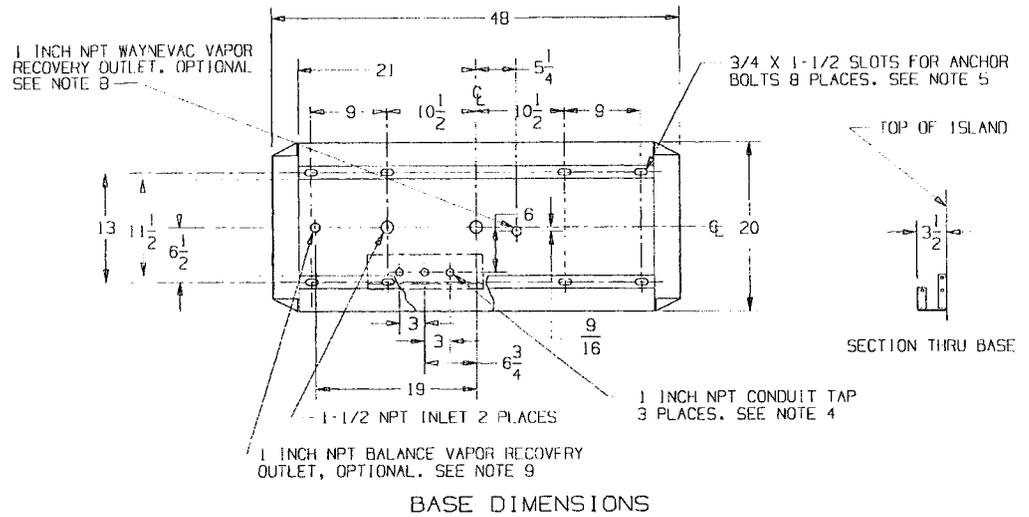
PRODUCT ORIENTATION:

THE NOZZLE PRODUCT ORDER IS THE SAME FOR BOTH SIDES. THE JUNCTION BOX SIDE OF THE DISPENSER MATCHES THE INLET ORDER. THE NON-JUNCTION BOX SIDE IS OPPOSITE THE INLET ORDER.

Figure C-2. 1-7243-C Installation Instructions - 3/V390D and 3/V390D/U (Remote)

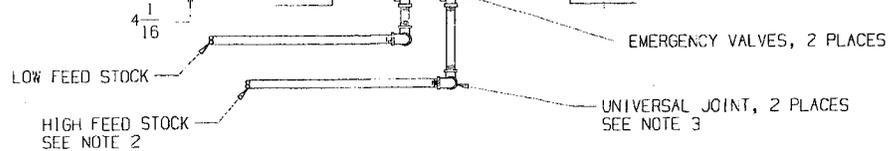
NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.
8. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
9. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



A 3 1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.

1 INCH NPT WAYNEVAC VAPOR DRAIN TAP
1-1/2 NPT INLET UNION, 2 PLACES



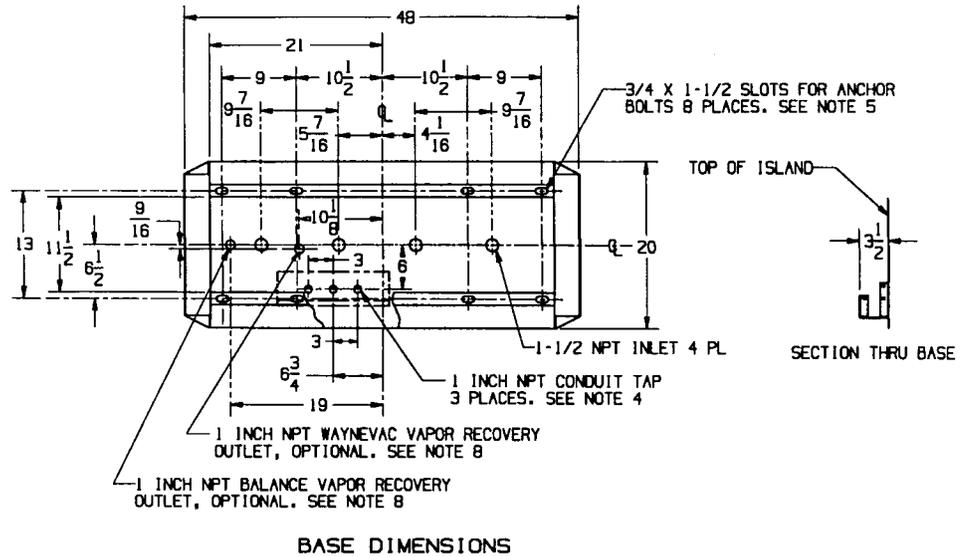
2-7243-C REV A

TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-3. 2-7243-C Installation Instructions - 3/V590D/U and 3/V595D/U (Remote)

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE, DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.

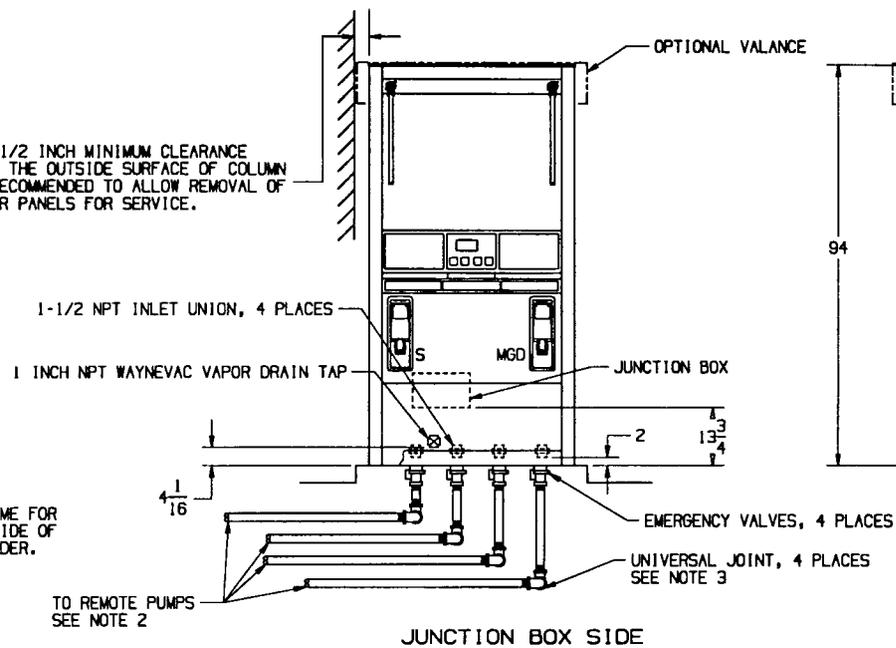


A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.

A 10 INCH MINIMUM CLEARANCE FROM THE TOP OF DISPENSER IS RECOMMENDED TO ALLOW REMOVAL OF THE OPTIONAL VALANCE AND TOP COVER FOR SERVICE.

PRODUCT ORIENTATION:

THE NOZZLE PRODUCT ORDER IS THE SAME FOR BOTH SIDES. THE NON-JUNCTION BOX SIDE OF THE DISPENSER MATCHES THE INLET ORDER. THE JUNCTION BOX SIDE IS OPPOSITE THE INLET ORDER.



4-7243-C REV B

TOLERANCES

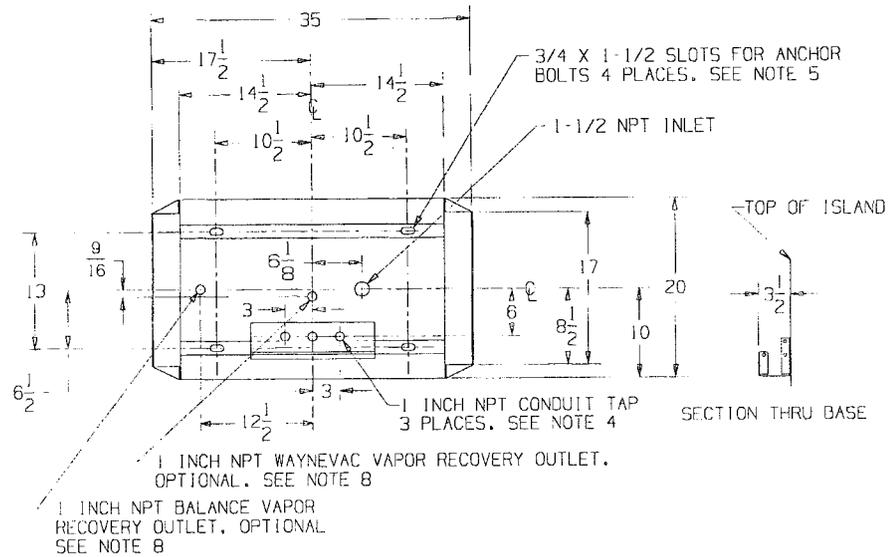
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

Figure C-5. 4-7243-C Installation Instructions - 3V/490D/U (Remote)

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE, DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS

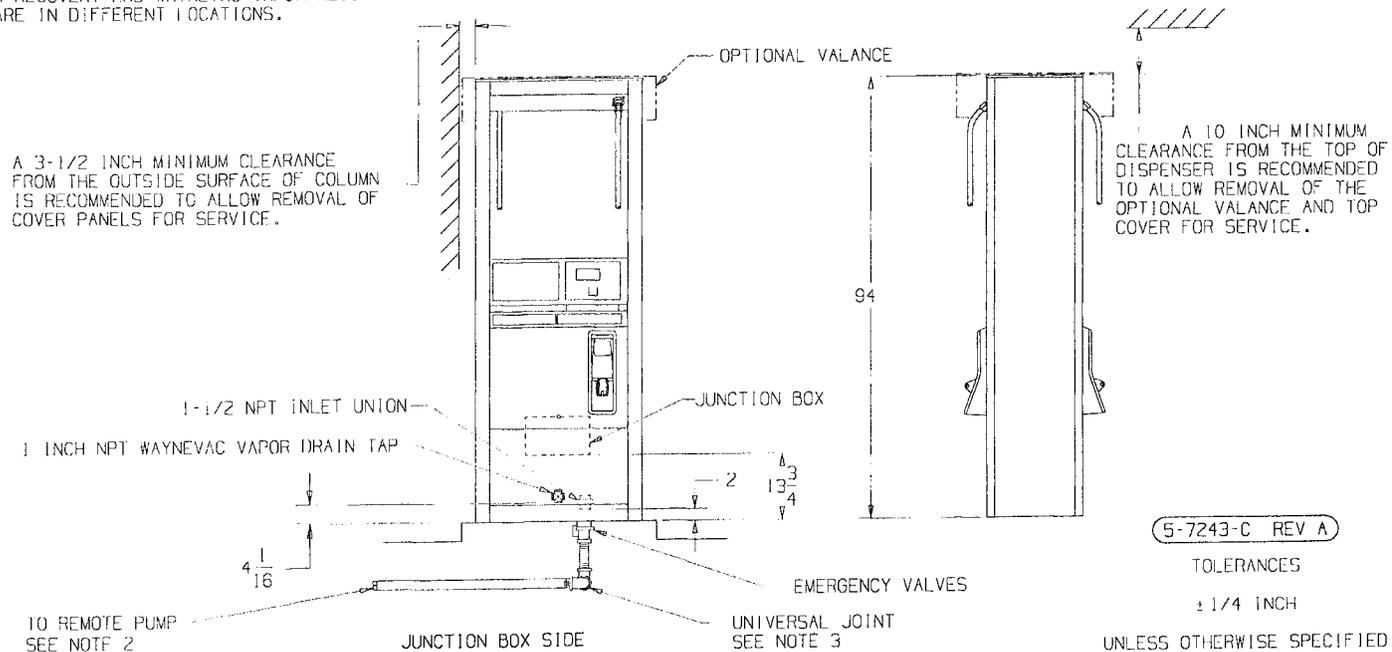
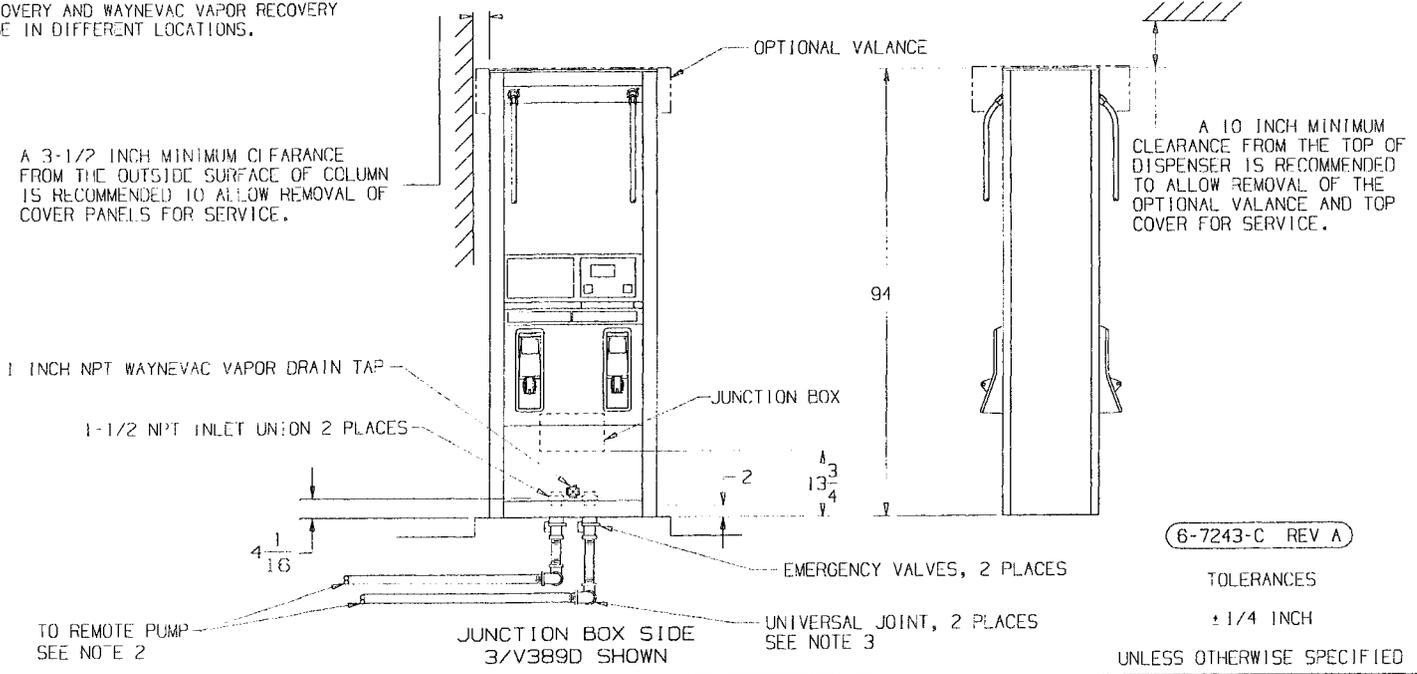
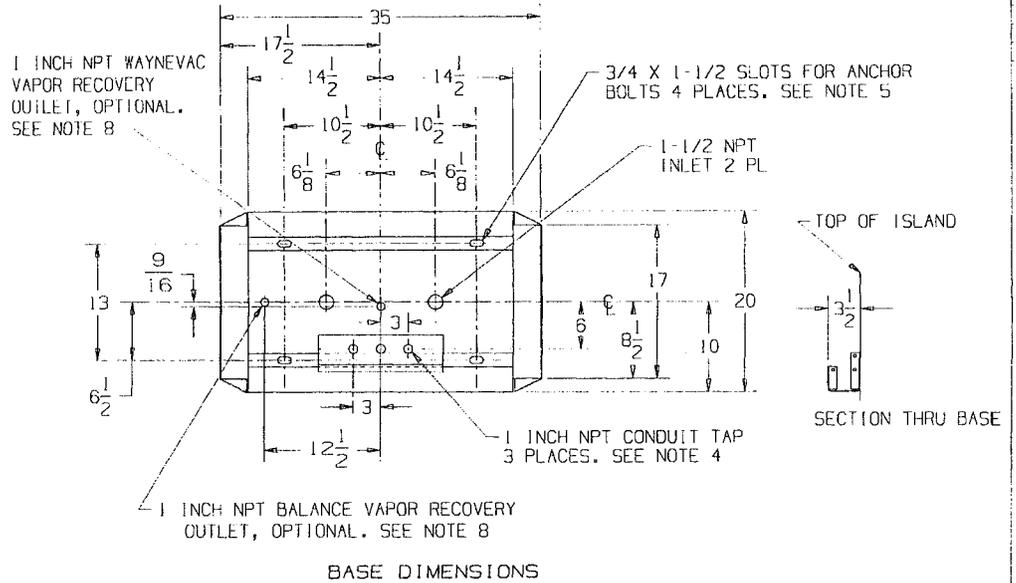


Figure C-6. 5-7243-C Installation Instructions - 3/V387D (Remote)

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS MAY BE IN DIFFERENT LOCATIONS.



6-7243-C REV A

TOLERANCES

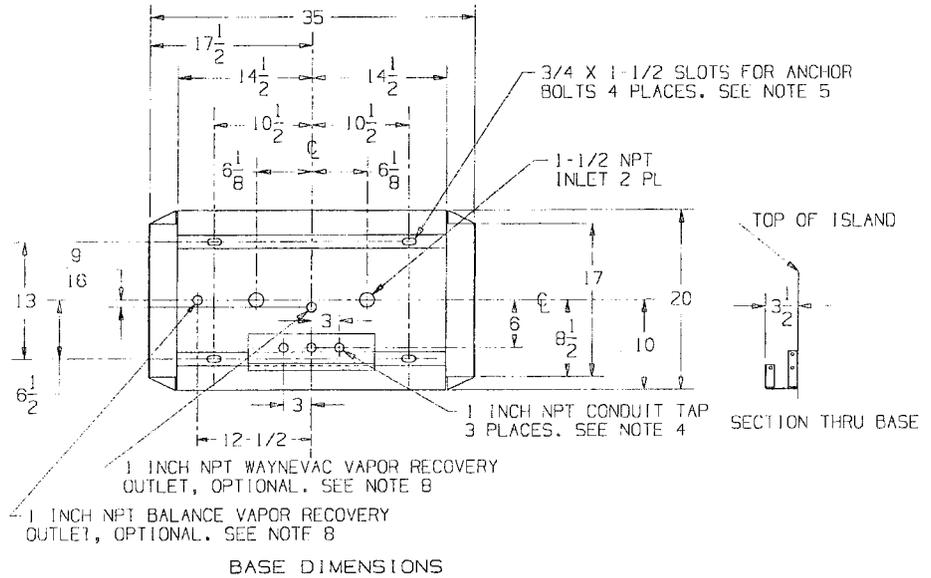
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

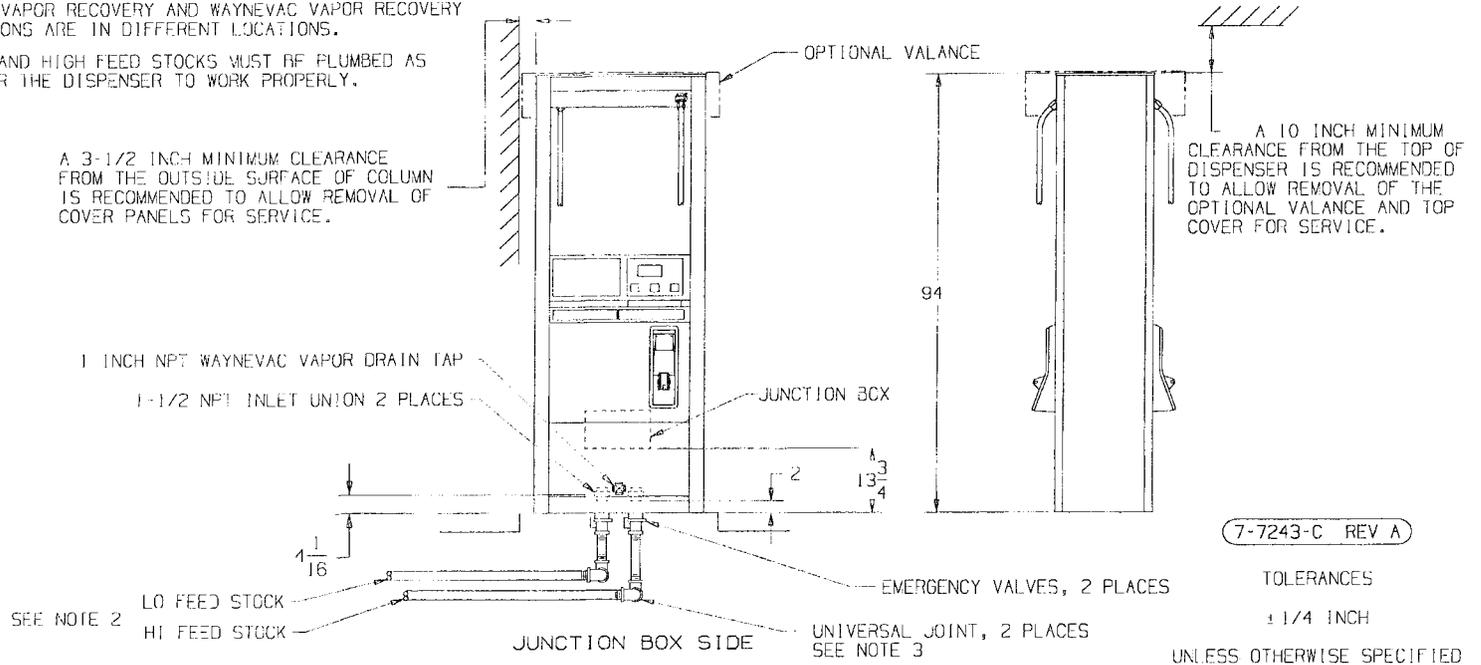
Figure C-7. 6-7243-C Installation Instructions - 3/V388D and 3/V389D (Remote)

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.
9. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.



A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.



7-7243-C REV A

TOLERANCES

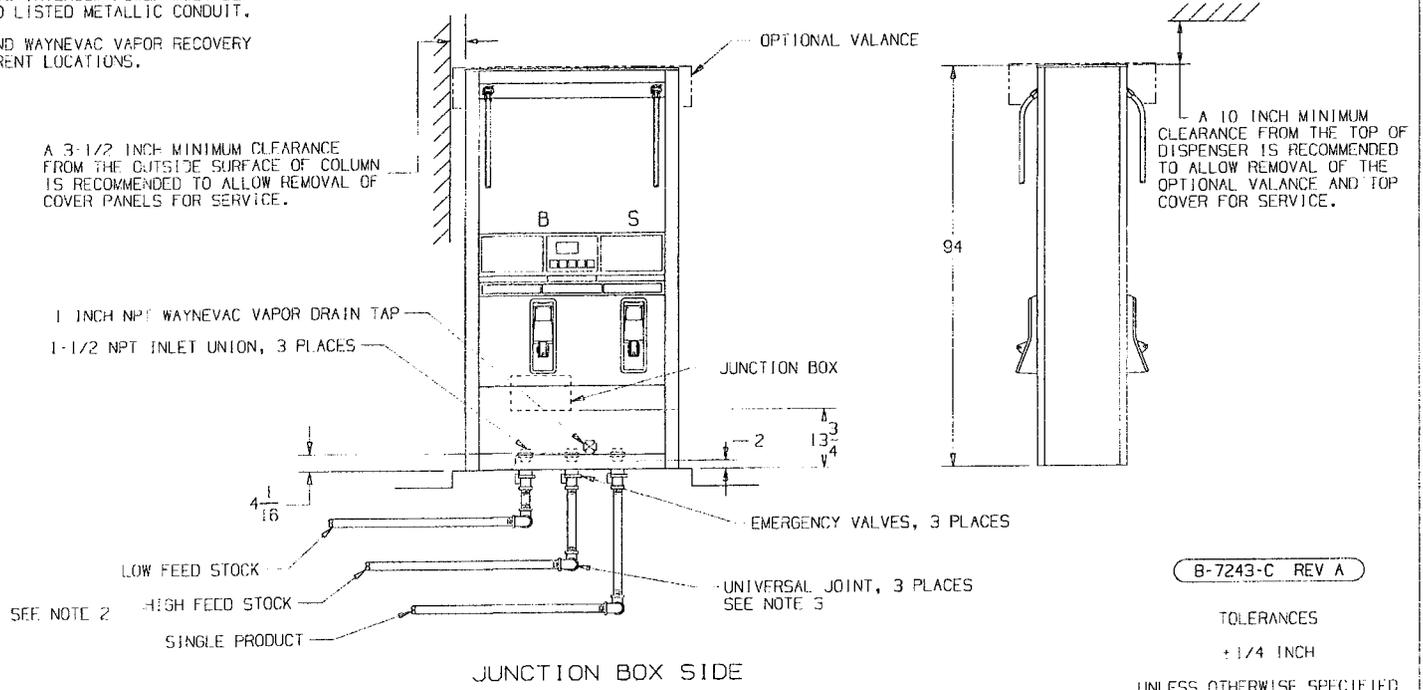
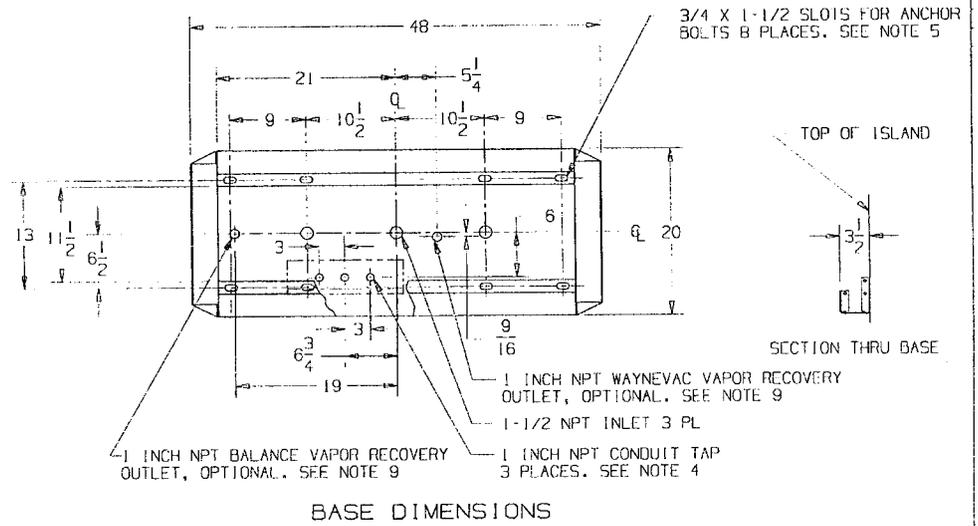
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

Figure C-8. 7-7243-C Installation Instructions - 3/V580D and 3/V585D (Remote)

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.
8. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 800 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
9. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



B-7243-C REV A

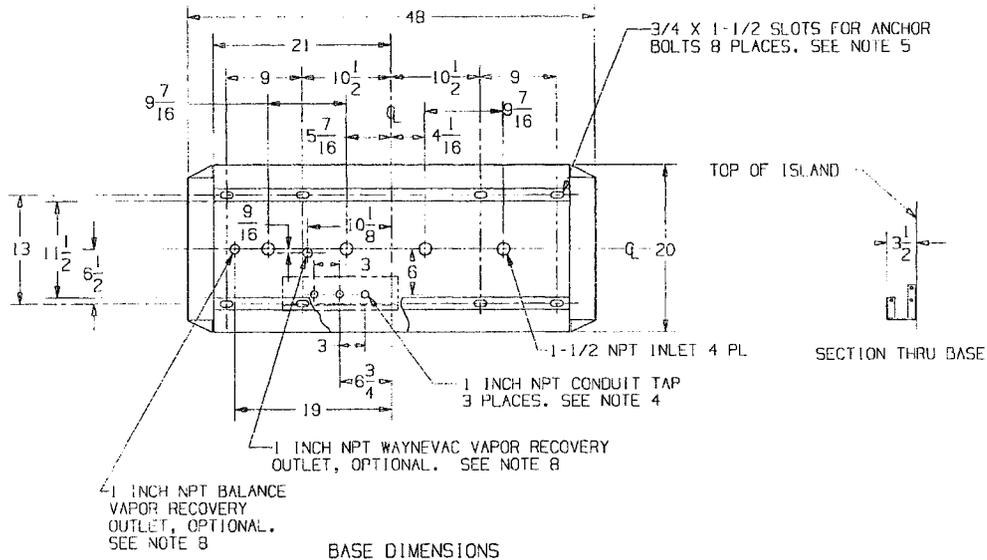
TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-9. 8-7243-C Installation Instructions - 3/V595D (Remote) - Except 3/V595D/U See 2-7243-C

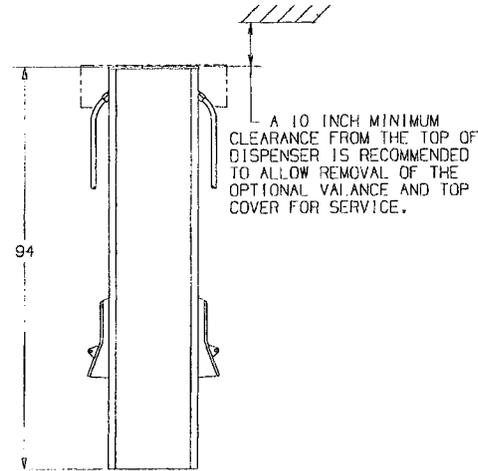
SHARED BY

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRC. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



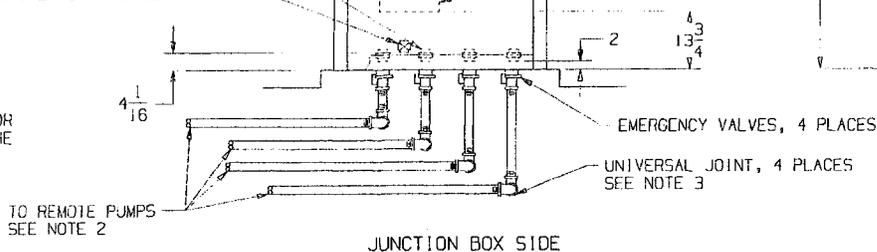
A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.



1-1/2 NPT INLET UNION, 4 PLACES
1 INCH NPT WAYNEVAC VAPOR DRAIN TAP

PRODUCT ORIENTATION:

THE NOZZLE PRODUCT ORDER IS THE SAME FOR BOTH SITES. THE JUNCTION BOX SIDE OF THE DISPENSER MATCHES THE INLET ORDER. THE NON-JUNCTION BOX SIDE IS OPPOSITE THE INLET ORDER.



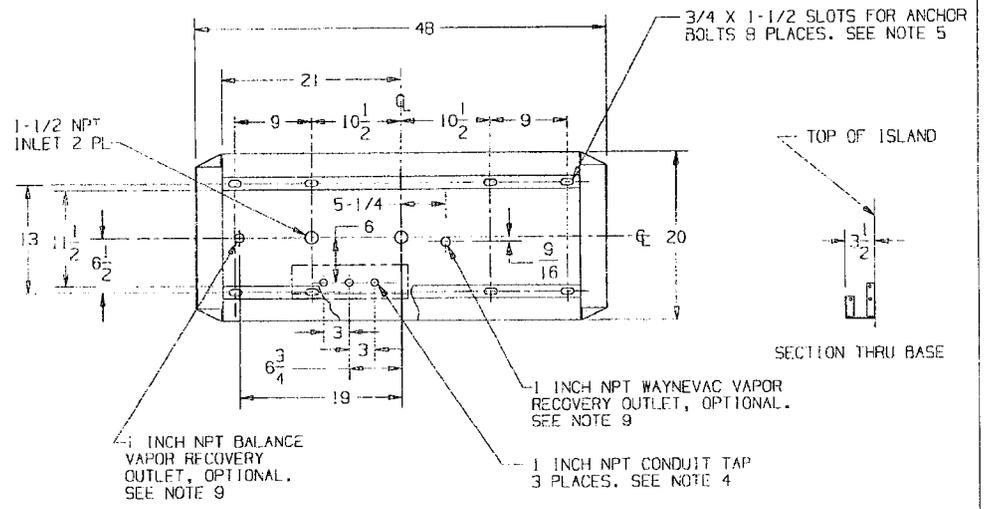
9-7243-C REV A

TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

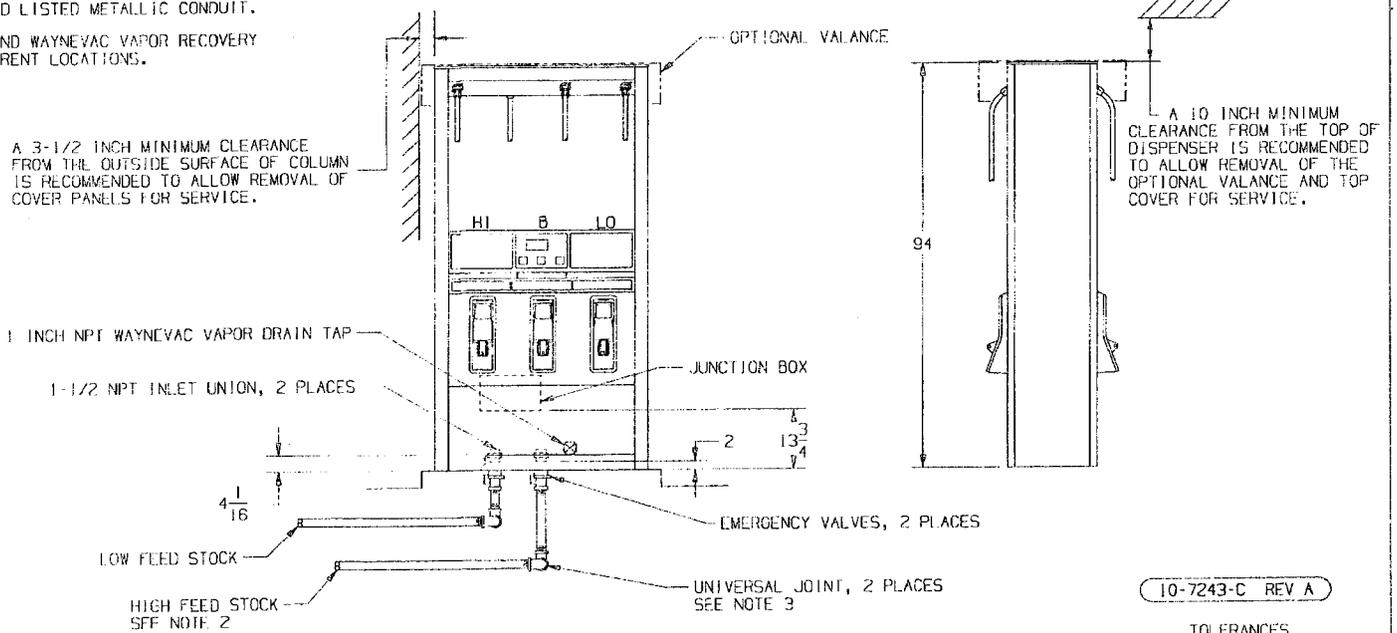
Figure C-10. 9-7243-C Installation Instructions - 3/V490D (Remote) - Except 3/V490D/U See 4-7243-C

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.
8. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
9. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS



JUNCTION BOX SIDE

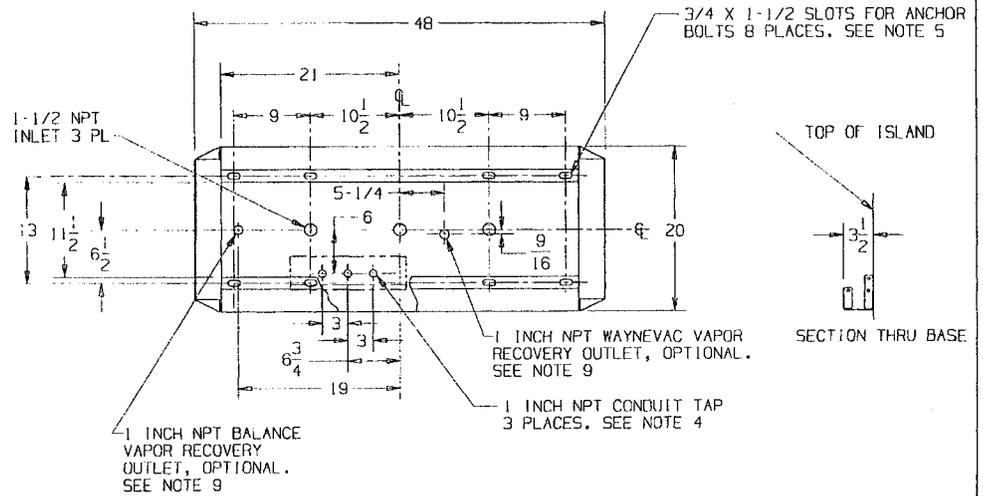
10-7243-C REV A

TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-11. 10-7243-C Installation Instructions - 3/V590D (Remote) - Except 3/V590D/U See 2-7243-C

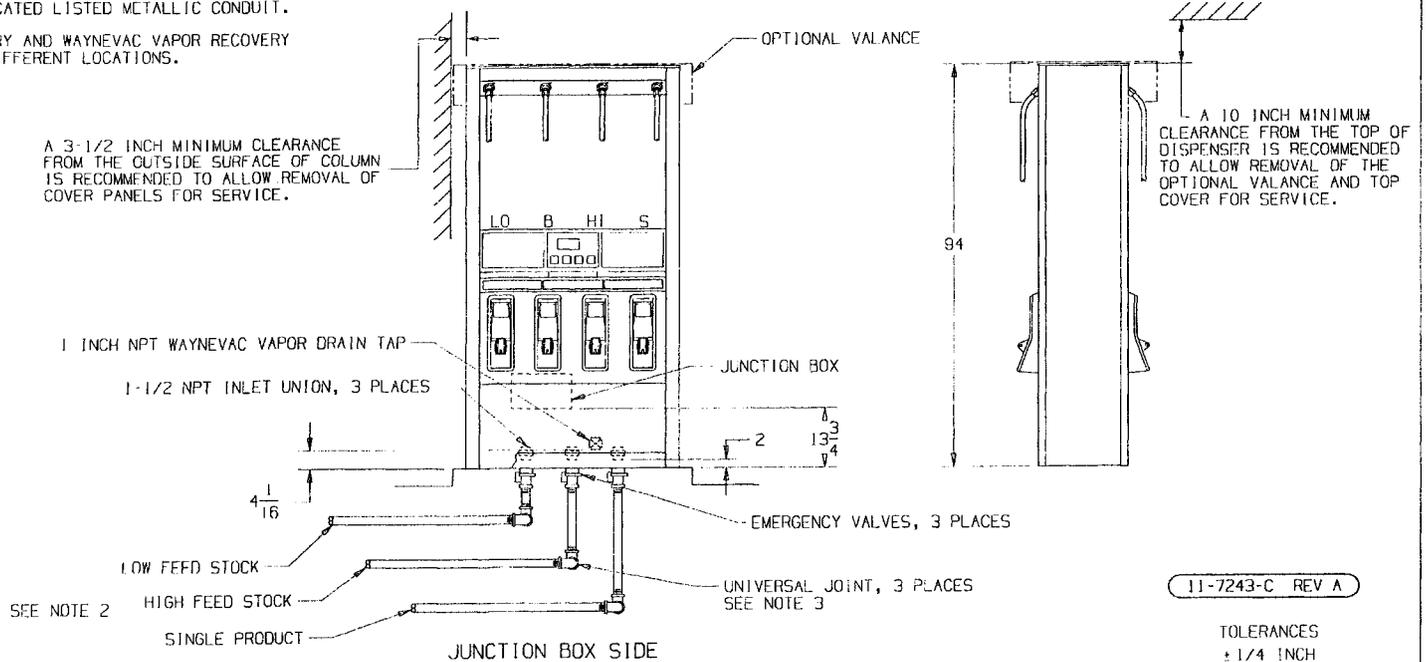
NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.
8. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
9. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS

A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.



11-7243-C REV A

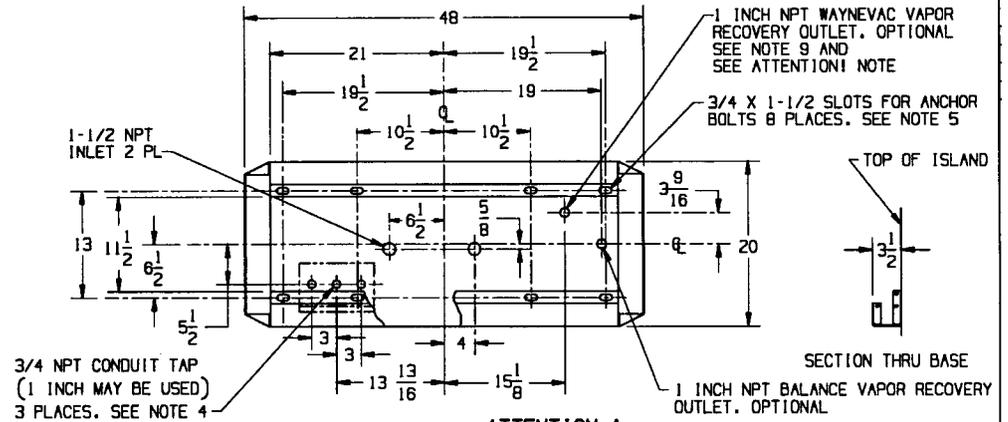
TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-12. 11-7243-C Installation Instructions - 3/V591D (Remote)

NOTES:

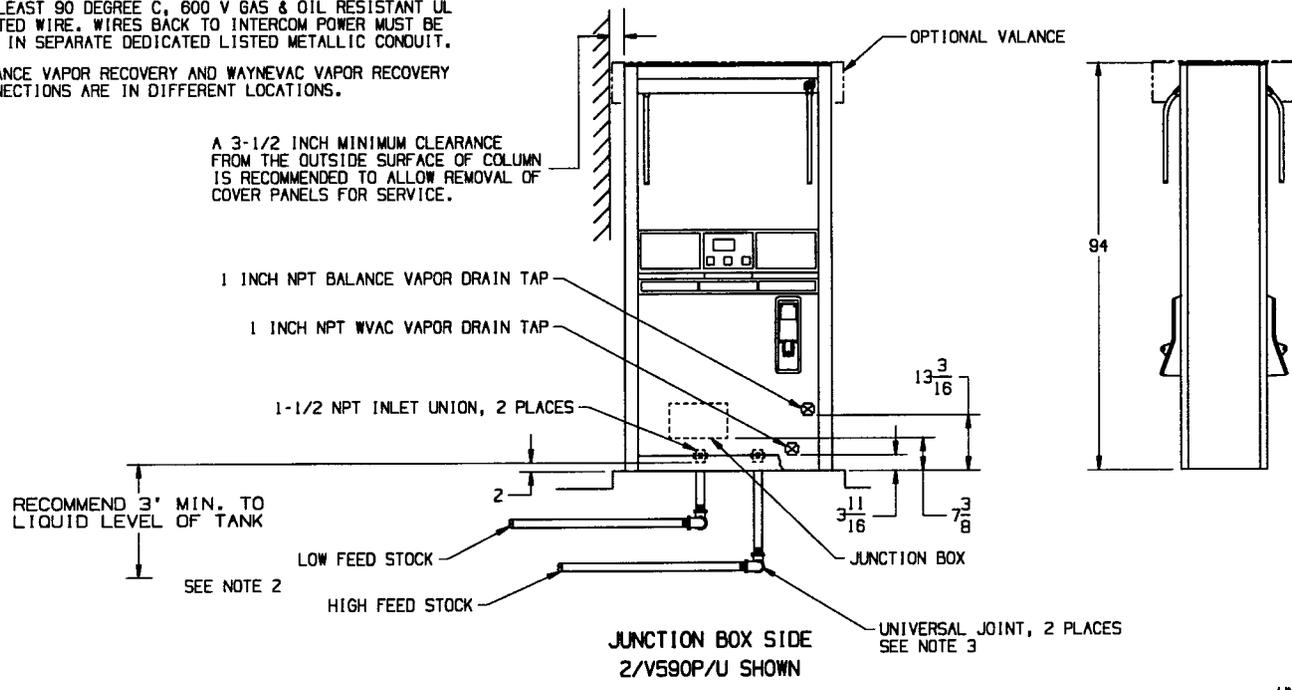
1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. SLOPE PIPING FROM TANK TO DISPENSER UPWARDS, AVOIDING AIR OR LIQUID TRAPS. RECOMMEND A 3 FT. MINIMUM BETWEEN THE INLET UNION TO UNDERGROUND TANK LIQUID SURFACE. IF NOT PROVIDED, WAYNE P/N 129881 MUST BE INSTALLED IN PUMPING UNIT AIR SEPARATOR FOR OPTIMUM PERFORMANCE. SEE INSTALLATION MANUAL.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.
8. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
9. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.

9-7193-C REV E



BASE DIMENSIONS

A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.



TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-13. 9-7193-C Installation Instructions - 3/V590P/U and 3/V595P/U (Suction)

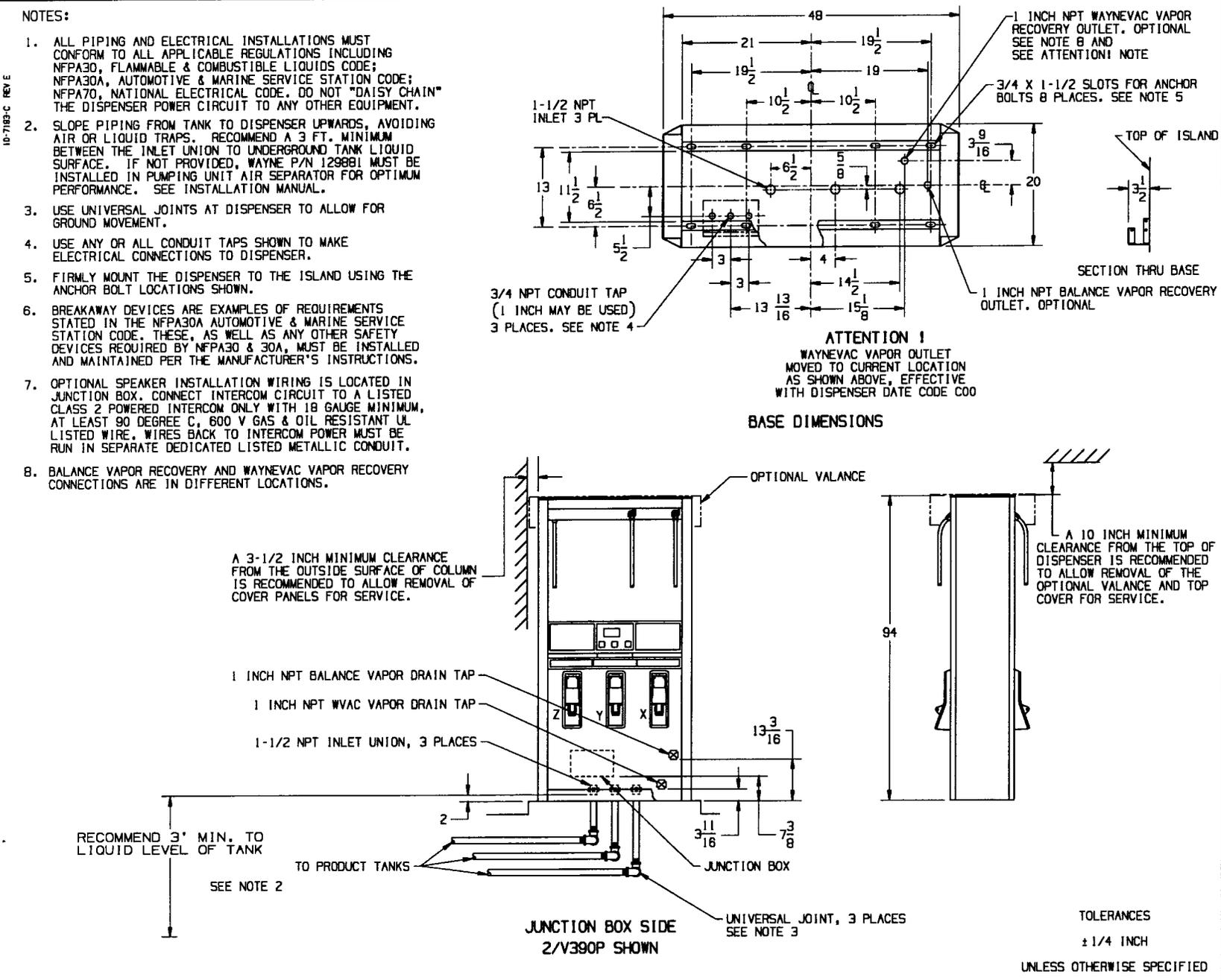


Figure C-14. 10-7193-C Installation Instructions - 3/V390P and 3/V390P/U (Suction)

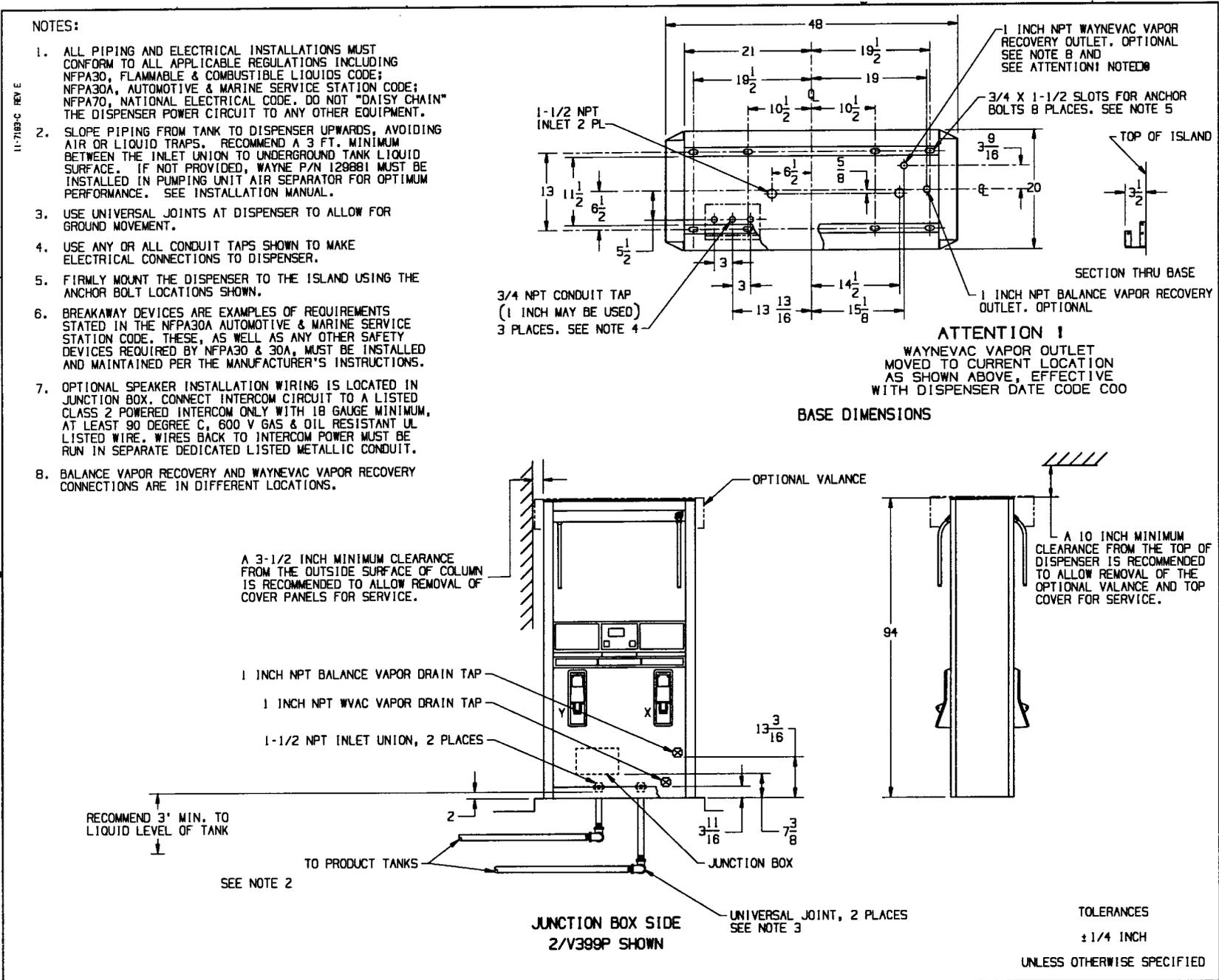


Figure C-15. 11-7193-C Installation Instructions - 3/V399P (Suction)

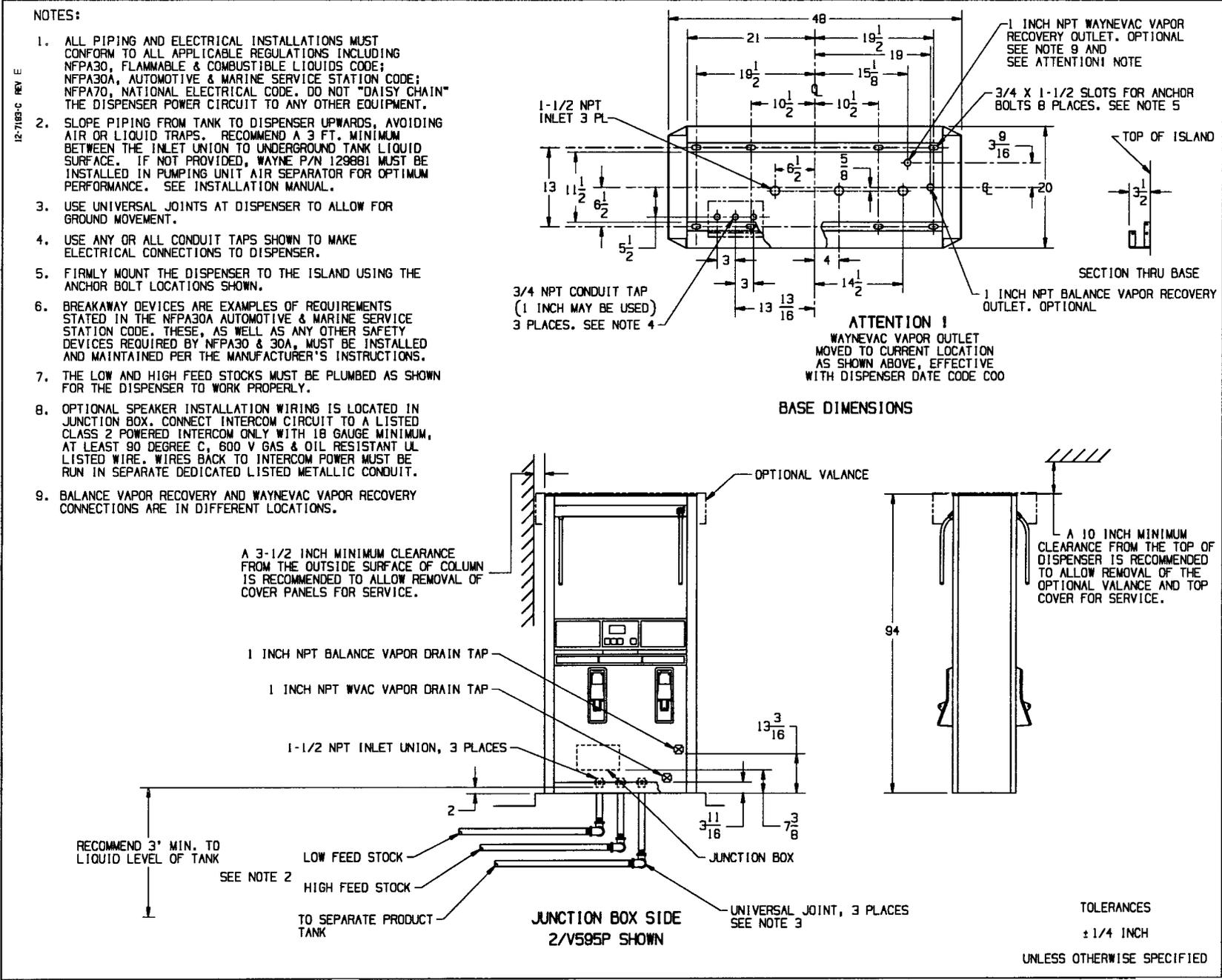


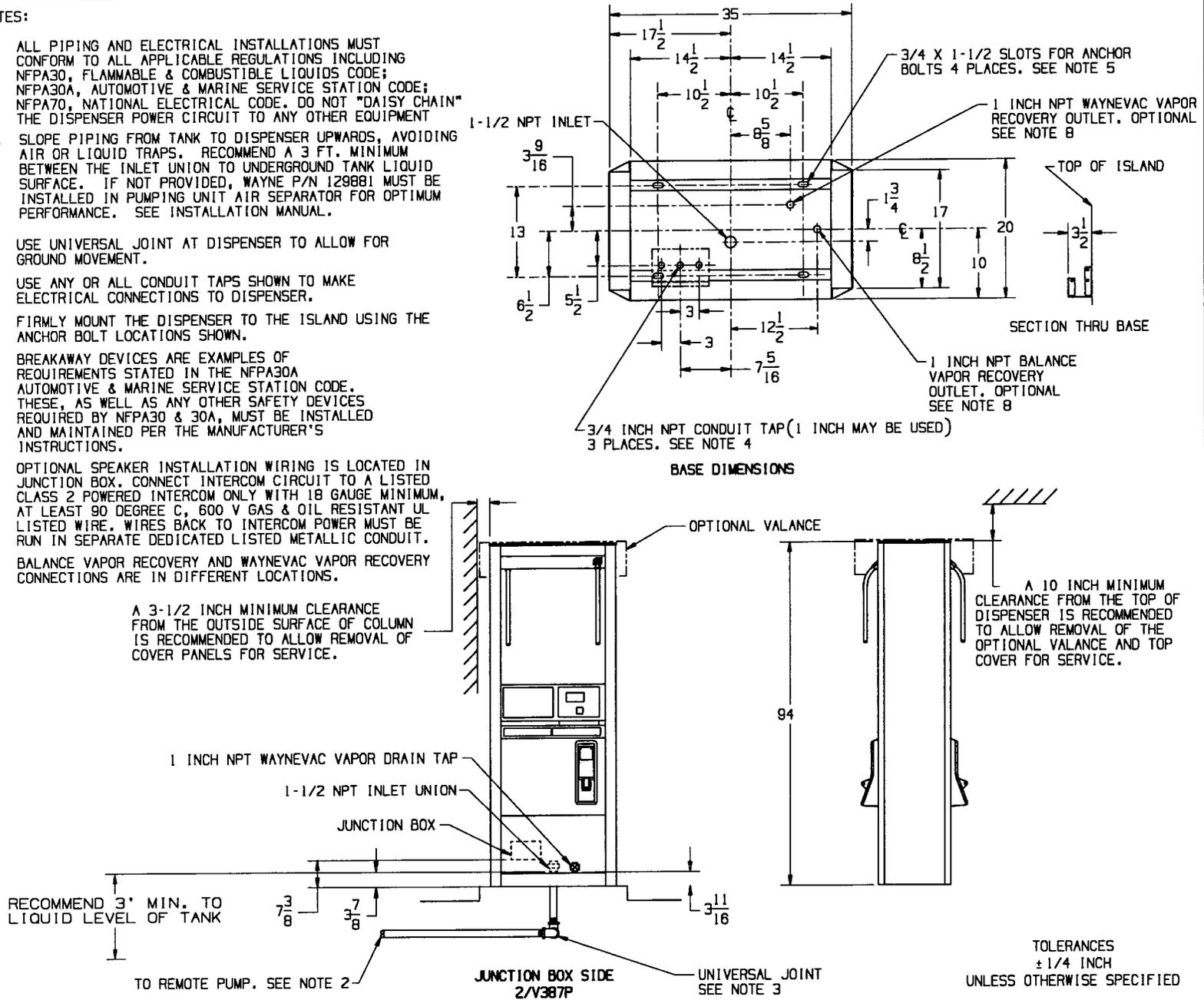
Figure C-16. 12-7193-C Installation Instructions - 3/V591P and 3/V595P (Suction) - Except 3/V595P/U See 9-7193-C

13-7193-C REV C

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT
2. SLOPE PIPING FROM TANK TO DISPENSER UPWARDS, AVOIDING AIR OR LIQUID TRAPS. RECOMMEND A 3 FT. MINIMUM BETWEEN THE INLET UNION TO UNDERGROUND TANK LIQUID SURFACE. IF NOT PROVIDED, WAYNE P/N 129881 MUST BE INSTALLED IN PUMPING UNIT AIR SEPARATOR FOR OPTIMUM PERFORMANCE. SEE INSTALLATION MANUAL.
3. USE UNIVERSAL JOINT AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.

A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.



TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-17. 13-7193-C Installation Instructions - 3/V387P (Suction)

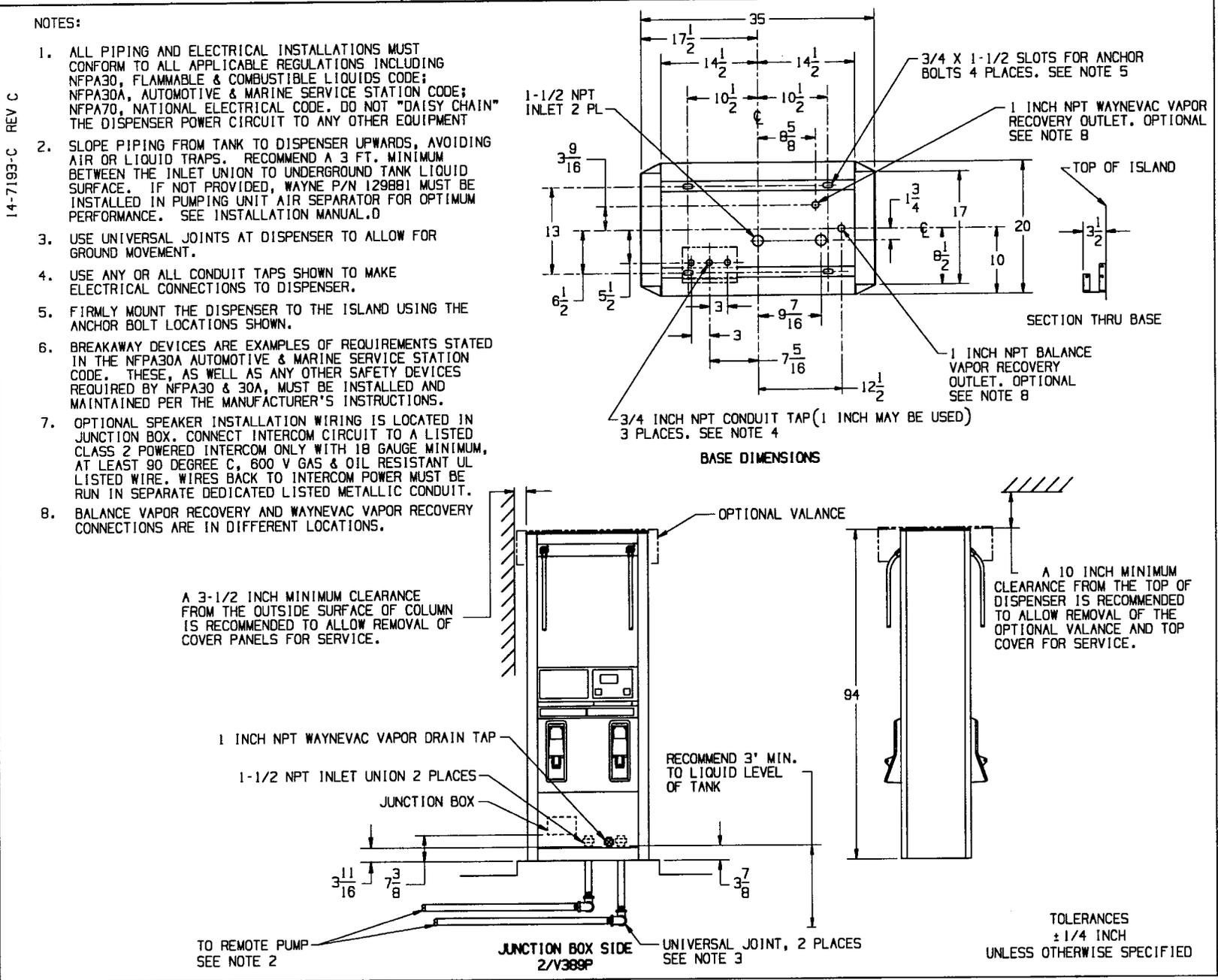
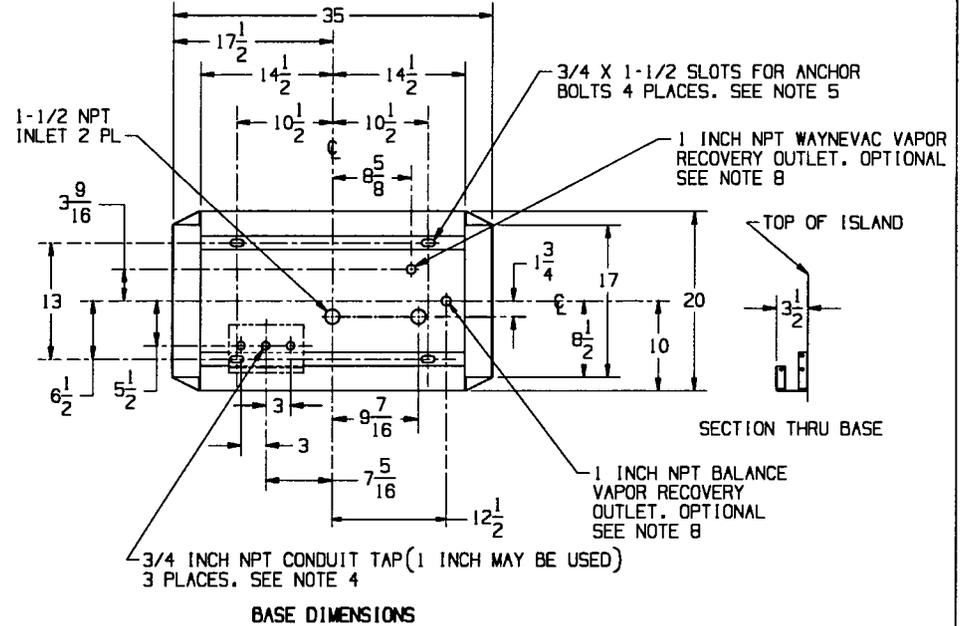


Figure C-18. 14-7193-C Installation Instructions - 3/V389P (Suction)

15-7193-C REV C

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT
2. SLOPE PIPING FROM TANK TO DISPENSER UPWARDS, AVOIDING AIR OR LIQUID TRAPS. RECOMMEND A 3 FT. MINIMUM BETWEEN THE INLET UNION TO UNDERGROUND TANK LIQUID SURFACE. IF NOT PROVIDED, WAYNE P/N 129881 MUST BE INSTALLED IN PUMPING UNIT AIR SEPARATOR FOR OPTIMUM PERFORMANCE. SEE INSTALLATION MANUAL.
3. USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
4. USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
5. FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN.
6. BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30A AUTOMOTIVE & MARINE SERVICE STATION CODE. THESE, AS WELL AS ANY OTHER SAFETY DEVICES REQUIRED BY NFPA30 & 30A, MUST BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS.
7. OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.
8. BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.
9. THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.



BASE DIMENSIONS

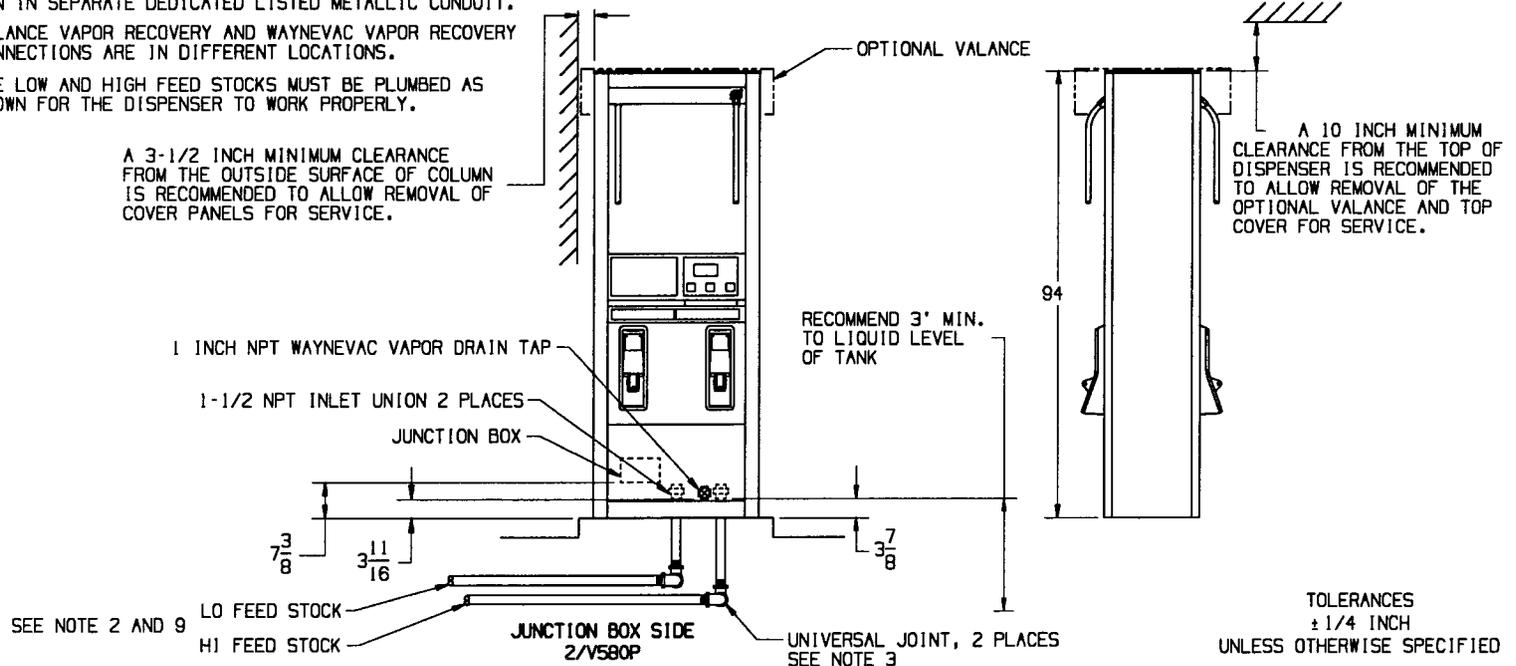


Figure C-19. 15-7193-C Installation Instructions - 3/V580P and 3/V585P (Suction)

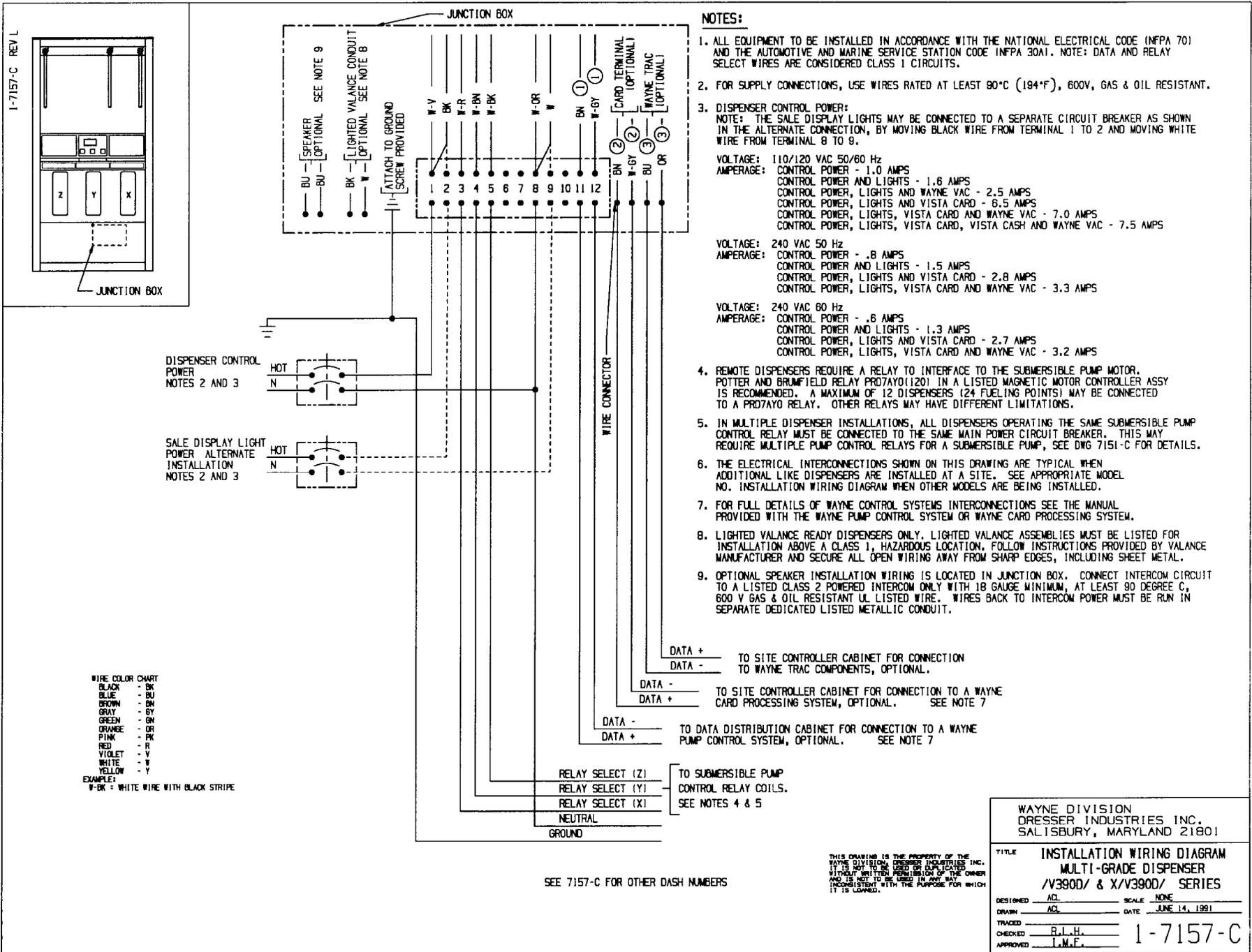


Figure C-20. 1-7157-C Installation Box Wiring - 3V390D (Remote) - Except 3V390D/U See 13-7157-C

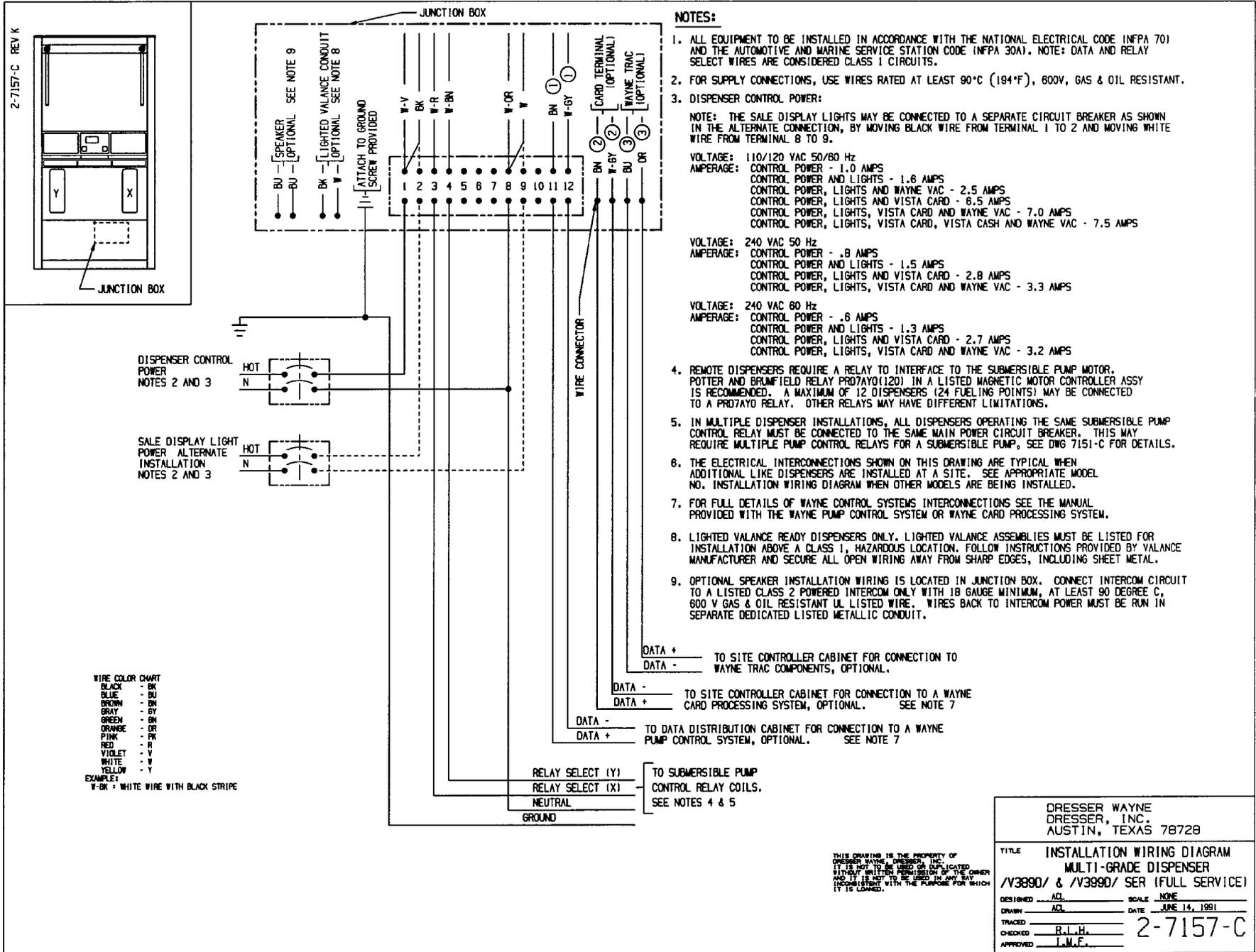


Figure C-21. 2-7157-C Installation Wiring - 3/V389D and 3/V399D (Remote)

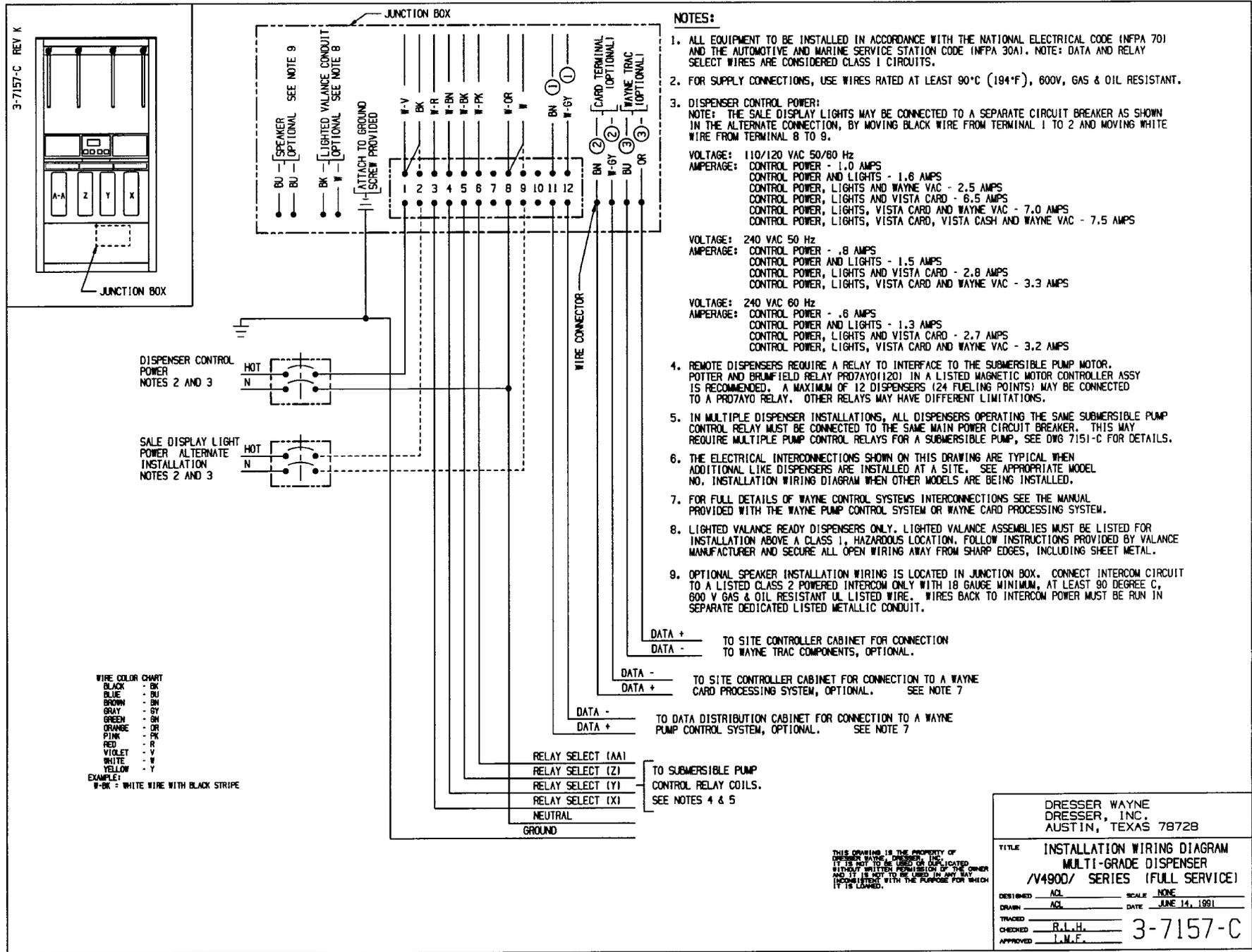
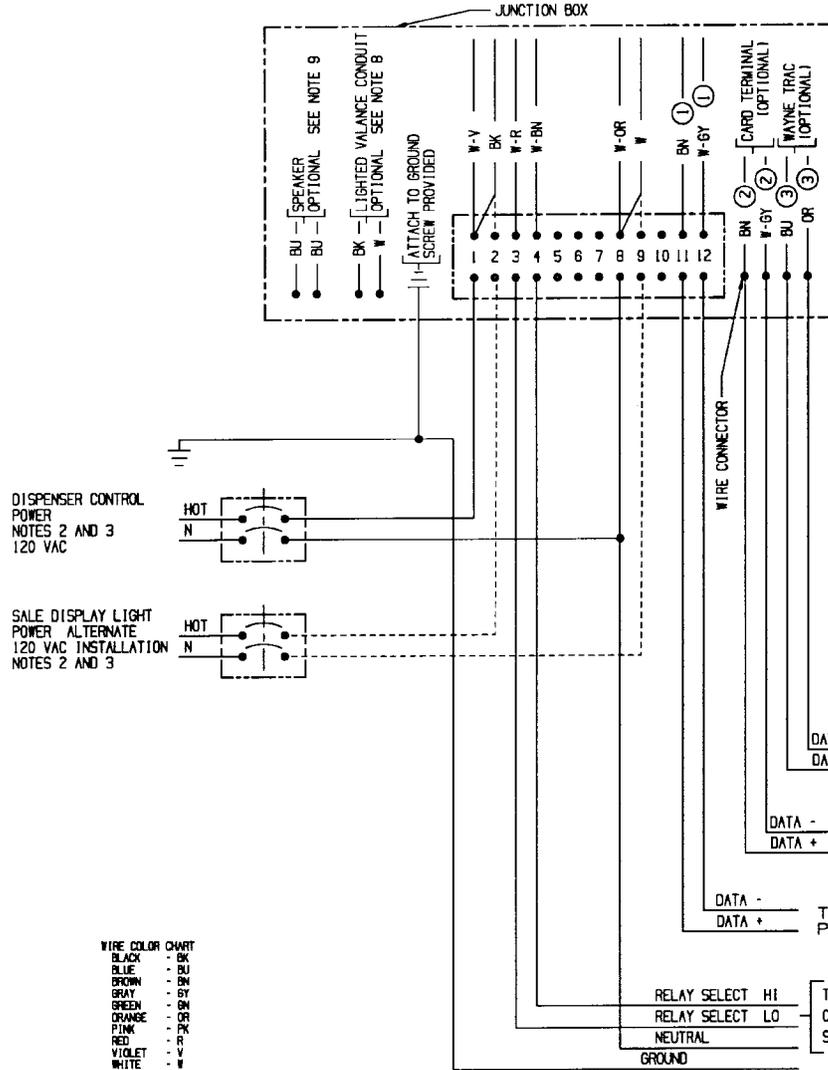


Figure C-22. 3-7157-C Installation Wiring - 3/V490D (Remote)



DISPENSER CONTROL POWER NOTES 2 AND 3 120 VAC

SALE DISPLAY LIGHT POWER ALTERNATE 120 VAC INSTALLATION NOTES 2 AND 3

- WIRE COLOR CHART
 BLACK - BK
 BLUE - BU
 BROWN - BN
 GRAY - GY
 GREEN - GN
 ORANGE - OR
 PINK - PK
 RED - R
 VIOLET - V
 WHITE - W
 YELLOW - Y
 EXAMPLE:
 W-BK = WHITE WIRE WITH BLACK STRIPE

NOTES:

- ALL EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA 70) AND THE AUTOMOTIVE AND MARINE SERVICE STATION CODE (NFPA 30A). NOTE: DATA AND RELAY SELECT WIRES ARE CONSIDERED CLASS 1 CIRCUITS.
- FOR SUPPLY CONNECTIONS, USE WIRES RATED AT LEAST 90°C (194°F), 600V, GAS & OIL RESISTANT.
- DISPENSER CONTROL POWER:
 NOTE: THE SALE DISPLAY LIGHTS MAY BE CONNECTED TO A SEPARATE CIRCUIT BREAKER AS SHOWN IN THE ALTERNATE CONNECTION, BY MOVING BLACK WIRE FROM TERMINAL 1 TO 2 AND MOVING WHITE WIRE FROM TERMINAL 8 TO 9.
 VOLTAGE: 120 VAC 60 Hz
 AMPERAGE: CONTROL POWER - 1.4 AMPS
 CONTROL POWER AND LIGHTS - 2.0 AMPS
 CONTROL POWER, LIGHTS AND WAYNE VAC - 3.0 AMPS
 CONTROL POWER, LIGHTS AND VISTA CARD - 7.0 AMPS
 CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 7.5 AMPS
 CONTROL POWER, LIGHTS, VISTA CARD, VISTA CASH AND WAYNE VAC - 8.0 AMPS
- REMOTE DISPENSERS REQUIRE A RELAY TO INTERFACE TO THE SUBMERSIBLE PUMP MOTOR. POTTER AND BRUMFIELD RELAY PRO7AY011201 IN A LISTED MAGNETIC MOTOR CONTROLLER ASSY IS RECOMMENDED. A MAXIMUM OF 12 DISPENSERS (24 FUELING POINTS) MAY BE CONNECTED TO A PRO7AY0 RELAY. OTHER RELAYS MAY HAVE DIFFERENT LIMITATIONS.
- IN MULTIPLE DISPENSER INSTALLATIONS, ALL DISPENSERS OPERATING THE SAME SUBMERSIBLE PUMP CONTROL RELAY MUST BE CONNECTED TO THE SAME MAIN POWER CIRCUIT BREAKER. THIS MAY REQUIRE MULTIPLE PUMP CONTROL RELAYS FOR A SUBMERSIBLE PUMP, SEE DWG 7151-C FOR DETAILS.
- THE ELECTRICAL INTERCONNECTIONS SHOWN ON THIS DRAWING ARE TYPICAL WHEN ADDITIONAL LIKE DISPENSERS ARE INSTALLED AT A SITE. SEE APPROPRIATE MODEL NO. INSTALLATION WIRING DIAGRAM WHEN OTHER MODELS ARE BEING INSTALLED.
- FOR FULL DETAILS OF WAYNE CONTROL SYSTEMS INTERCONNECTIONS SEE THE MANUAL PROVIDED WITH THE WAYNE PUMP CONTROL SYSTEM OR WAYNE CARD PROCESSING SYSTEM.
- LIGHTED VALANCE READY DISPENSERS ONLY. LIGHTED VALANCE ASSEMBLIES MUST BE LISTED FOR INSTALLATION ABOVE A CLASS 1, HAZARDOUS LOCATION. FOLLOW INSTRUCTIONS PROVIDED BY VALANCE MANUFACTURER AND SECURE ALL OPEN WIRING AWAY FROM SHARP EDGES, INCLUDING SHEET METAL.
- OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 800 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.

DATA +
DATA - TO SITE CONTROLLER CABINET FOR CONNECTION TO WAYNE TRAC COMPONENTS, OPTIONAL.

DATA -
DATA + TO SITE CONTROLLER CABINET FOR CONNECTION TO A WAYNE CARD PROCESSING SYSTEM, OPTIONAL. SEE NOTE 7

DATA -
DATA + TO DATA DISTRIBUTION CABINET FOR CONNECTION TO A WAYNE PUMP CONTROL SYSTEM, OPTIONAL. SEE NOTE 7

RELAY SELECT HI TO SUBMERSIBLE PUMP CONTROL RELAY COILS. SEE NOTES 4 & 5

RELAY SELECT LO

NEUTRAL

GROUND

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SH MET UNFOLD	REF SET	INSTALLATION WIRING DIAGRAM, FIXED-BLEND DISPENSER /V590D/X/V590D/, 1/V3950/U, 1/V590D/GU, X1/V590D/G, 1/V580-585D/G SERIES DISPENSERS	
NA	REV. --	DESIGNED A.C.L.	DATE JUNE 14, 1991
	DATE	DRAWN A.C.L.	SCALE NONE
	INITIALS	CHECKED R.L.H.	4-7157-C
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		APPROVED J.W.F.	
.X = ±.050	ANGLES ±1°		
.XX = ±.025			
.XXX = ±.010			
DO NOT SCALE DRAWING			

REMOVE BURRS AND BREAK SHARP EDGES

Figure C-23. 4-7157-C Installation Wiring - All Remote Blender Models - Except 3/V591D and 3/V595D See 10-7157-C.

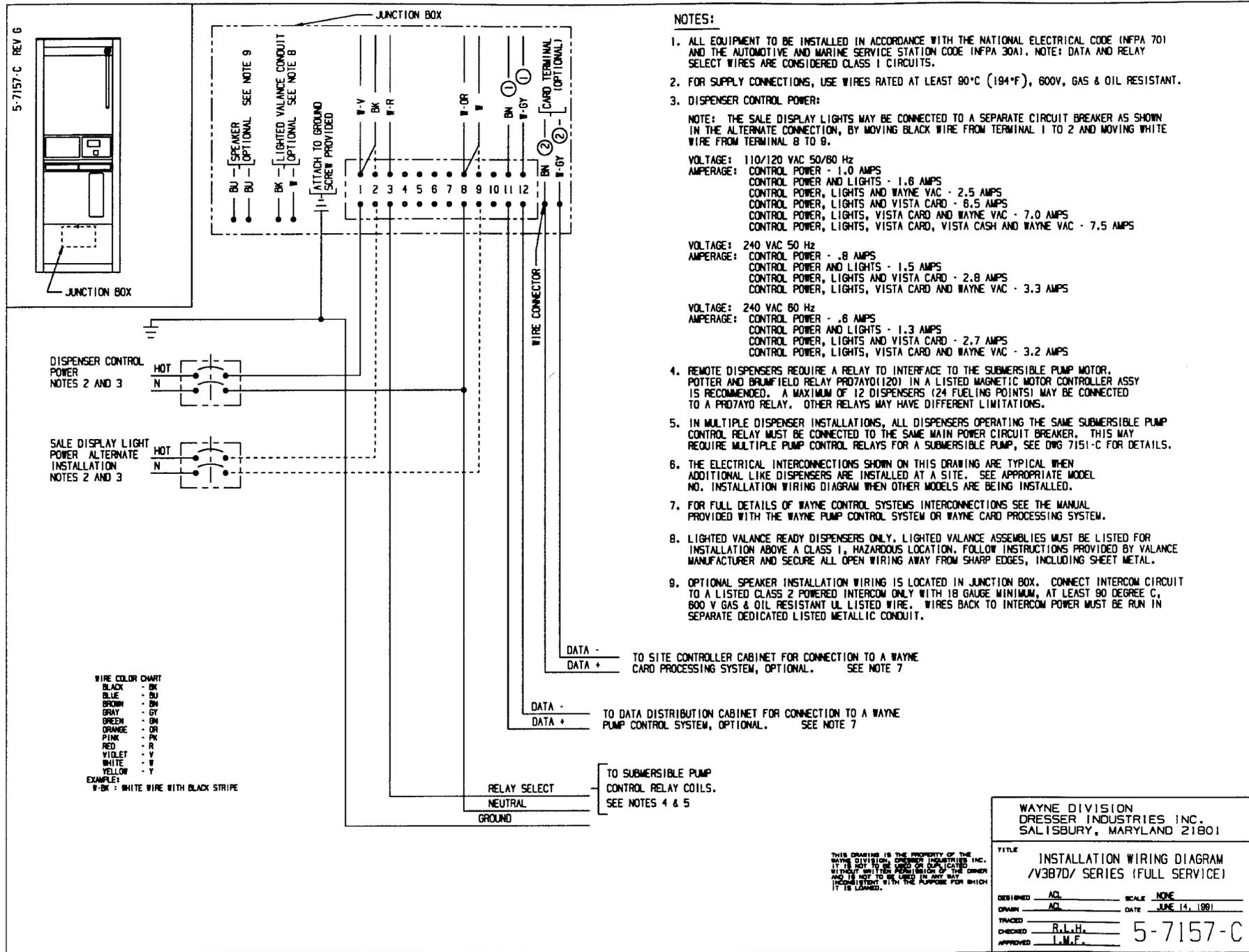
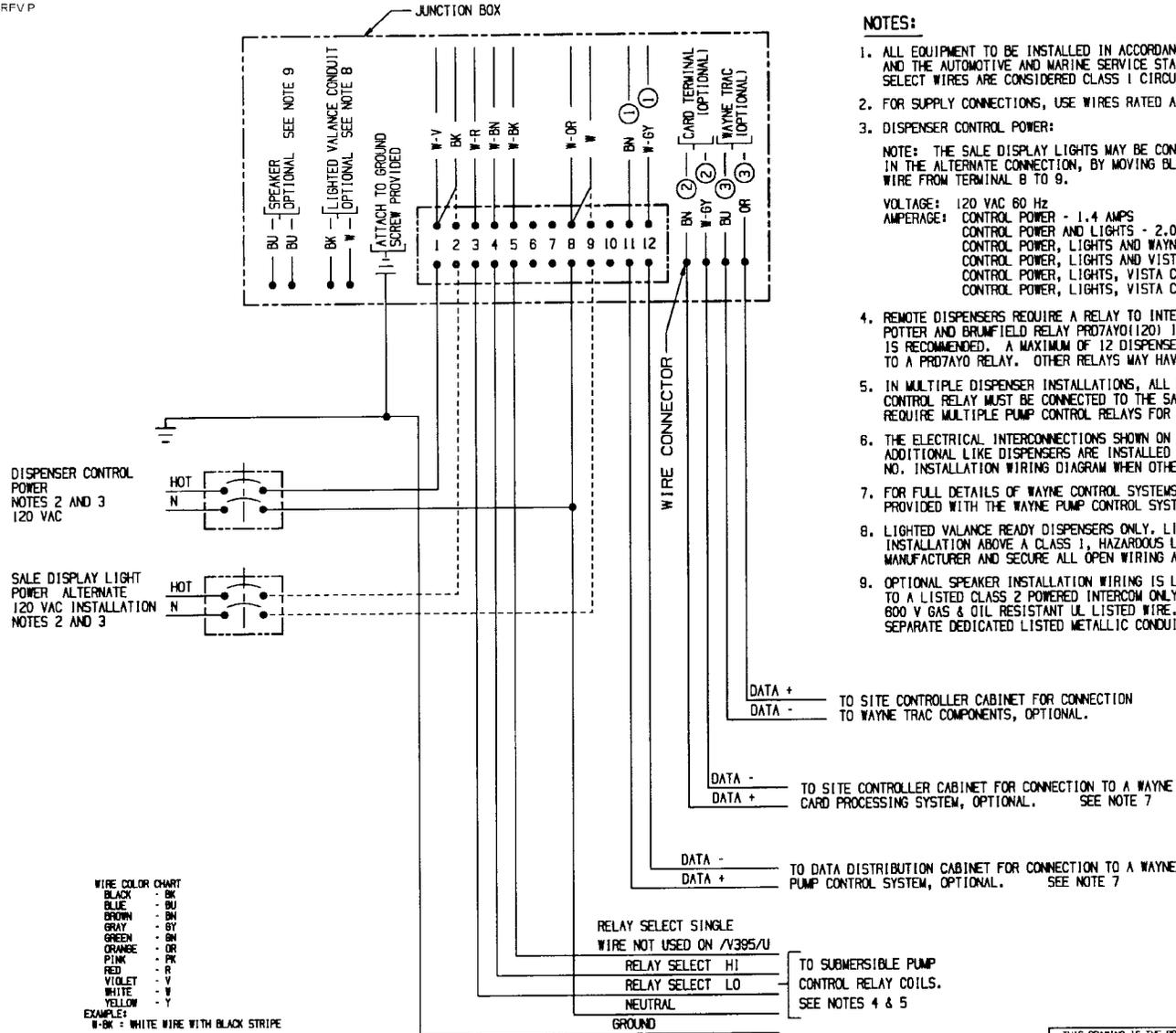


Figure C-24. 5-7157-C Installation Wiring - 3/V387D (Remote).

10-7157-C REV P



NOTES:

- ALL EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA 70) AND THE AUTOMOTIVE AND MARINE SERVICE STATION CODE (NFPA 30A1). NOTE: DATA AND RELAY SELECT WIRES ARE CONSIDERED CLASS 1 CIRCUITS.
- FOR SUPPLY CONNECTIONS, USE WIRES RATED AT LEAST 90°C (194°F), 600V, GAS & OIL RESISTANT.
- DISPENSER CONTROL POWER:
NOTE: THE SALE DISPLAY LIGHTS MAY BE CONNECTED TO A SEPARATE CIRCUIT BREAKER AS SHOWN IN THE ALTERNATE CONNECTION, BY MOVING BLACK WIRE FROM TERMINAL 1 TO 2 AND MOVING WHITE WIRE FROM TERMINAL 8 TO 9.
VOLTAGE: 120 VAC 60 Hz
AMPERAGE: CONTROL POWER - 1.4 AMPS
CONTROL POWER AND LIGHTS - 2.0 AMPS
CONTROL POWER, LIGHTS AND WAYNE VAC - 3.0 AMPS
CONTROL POWER, LIGHTS AND VISTA CARD - 7.0 AMPS
CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 7.5 AMPS
CONTROL POWER, LIGHTS, VISTA CARD, VISTA CASH AND WAYNE VAC - 8.0 AMPS
- REMOTE DISPENSERS REQUIRE A RELAY TO INTERFACE TO THE SUBMERSIBLE PUMP MOTOR. POTTER AND BRUMFIELD RELAY PROTAYO(120) IN A LISTED MAGNETIC MOTOR CONTROLLER ASSY IS RECOMMENDED. A MAXIMUM OF 12 DISPENSERS (24 FUELING POINTS) MAY BE CONNECTED TO A PROTAYO RELAY. OTHER RELAYS MAY HAVE DIFFERENT LIMITATIONS.
- IN MULTIPLE DISPENSER INSTALLATIONS, ALL DISPENSERS OPERATING THE SAME SUBMERSIBLE PUMP CONTROL RELAY MUST BE CONNECTED TO THE SAME MAIN POWER CIRCUIT BREAKER. THIS MAY REQUIRE MULTIPLE PUMP CONTROL RELAYS FOR A SUBMERSIBLE PUMP, SEE DWG 7151-C FOR DETAILS.
- THE ELECTRICAL INTERCONNECTIONS SHOWN ON THIS DRAWING ARE TYPICAL WHEN ADDITIONAL LIKE DISPENSERS ARE INSTALLED AT A SITE. SEE APPROPRIATE MODEL NO. INSTALLATION WIRING DIAGRAM WHEN OTHER MODELS ARE BEING INSTALLED.
- FOR FULL DETAILS OF WAYNE CONTROL SYSTEMS INTERCONNECTIONS SEE THE MANUAL PROVIDED WITH THE WAYNE PUMP CONTROL SYSTEM OR WAYNE CARD PROCESSING SYSTEM.
- LIGHTED VALANCE READY DISPENSERS ONLY, LIGHTED VALANCE ASSEMBLIES MUST BE LISTED FOR INSTALLATION ABOVE A CLASS 1, HAZARDOUS LOCATION. FOLLOW INSTRUCTIONS PROVIDED BY VALANCE MANUFACTURER AND SECURE ALL OPEN WIRING AWAY FROM SHARP EDGES, INCLUDING SHEET METAL.
- OPTIONAL SPEAKER INSTALLATION WIRING IS LOCATED IN JUNCTION BOX. CONNECT INTERCOM CIRCUIT TO A LISTED CLASS 2 POWERED INTERCOM ONLY WITH 18 GAUGE MINIMUM, AT LEAST 90 DEGREE C, 800 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.

DATA + TO SITE CONTROLLER CABINET FOR CONNECTION
DATA - TO WAYNE TRAC COMPONENTS, OPTIONAL.

DATA - TO SITE CONTROLLER CABINET FOR CONNECTION TO A WAYNE
DATA + CARD PROCESSING SYSTEM, OPTIONAL. SEE NOTE 7

DATA - TO DATA DISTRIBUTION CABINET FOR CONNECTION TO A WAYNE
DATA + PUMP CONTROL SYSTEM, OPTIONAL. SEE NOTE 7

RELAY SELECT SINGLE
WIRE NOT USED ON /V395/U
RELAY SELECT HI TO SUBMERSIBLE PUMP
RELAY SELECT LO CONTROL RELAY COILS.
NEUTRAL SEE NOTES 4 & 5
GROUND

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SH MET UNFOLDED | REF SET
NA | REV. ---
DATE ---
INITIALS ---

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
.X = ±.050 ANGLES
.XX = ±.025 31°
.XXX = ±.010



REMOVE BURRS AND BREAK SHARP EDGES

DRESSER WAYNE DRESSER, INC. AUSTIN, TEXAS 78728	
TITLE	INSTALLATION WIRING DIAGRAM MULTI-GRADE DISPENSER /V395D/ , X/V395D/ & X1/V591D/ SERIES (FULL SERVICE)
DESIGNED A.C.L.	DATE JUN 14, 1991
DRAWN A.C.L.	SCALE NONE
CHECKED B.L.H.	
APPROVED T.W.F.	10-7157-C

Figure C-25. 10-7157-C Installation Wiring - 3/V591D and 3/V595D (Remote) - Except 3/V595D/U See 4-7157-C

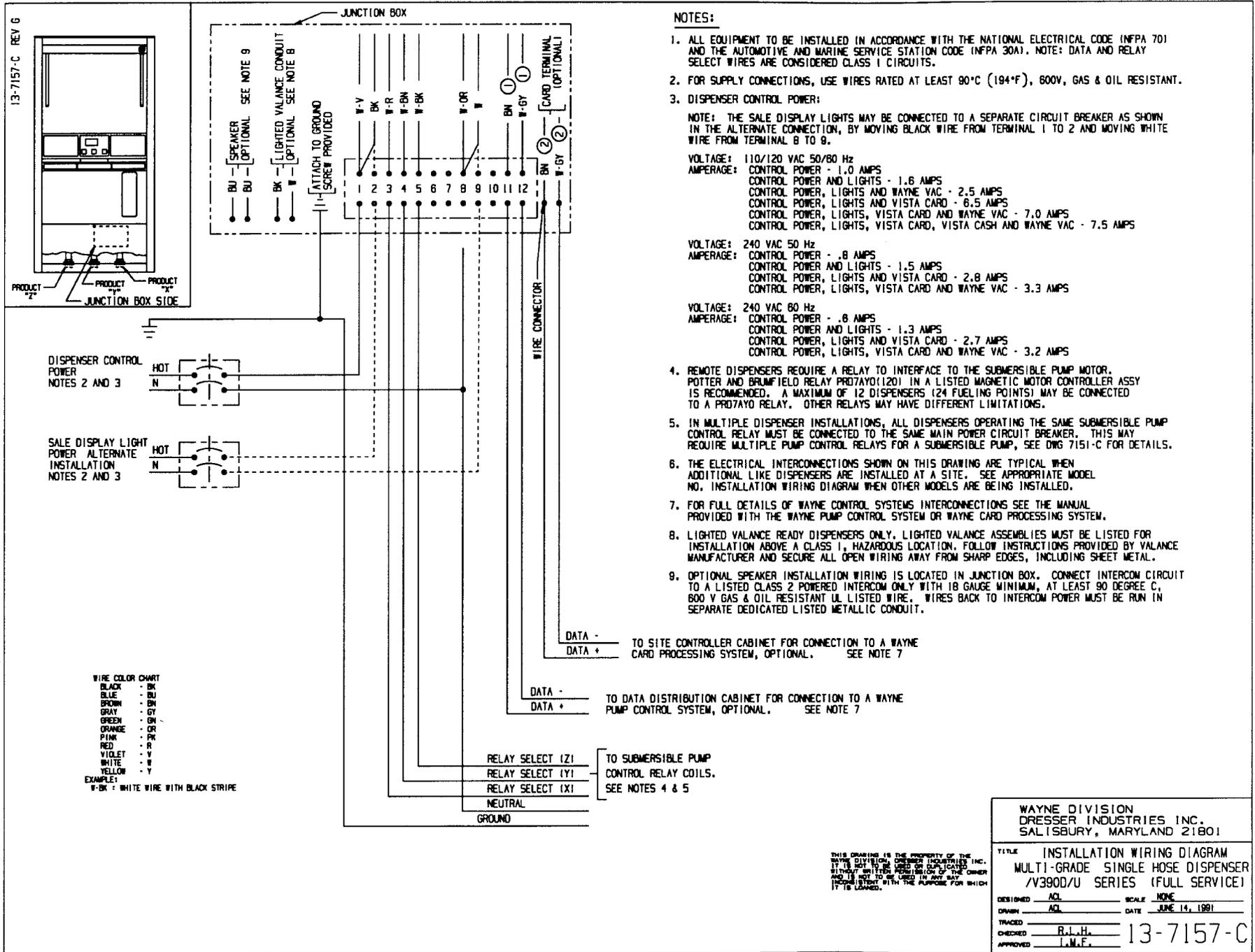


Figure C-26. 13-7157-C Installation Wiring - 3/V390D/U (Remote)

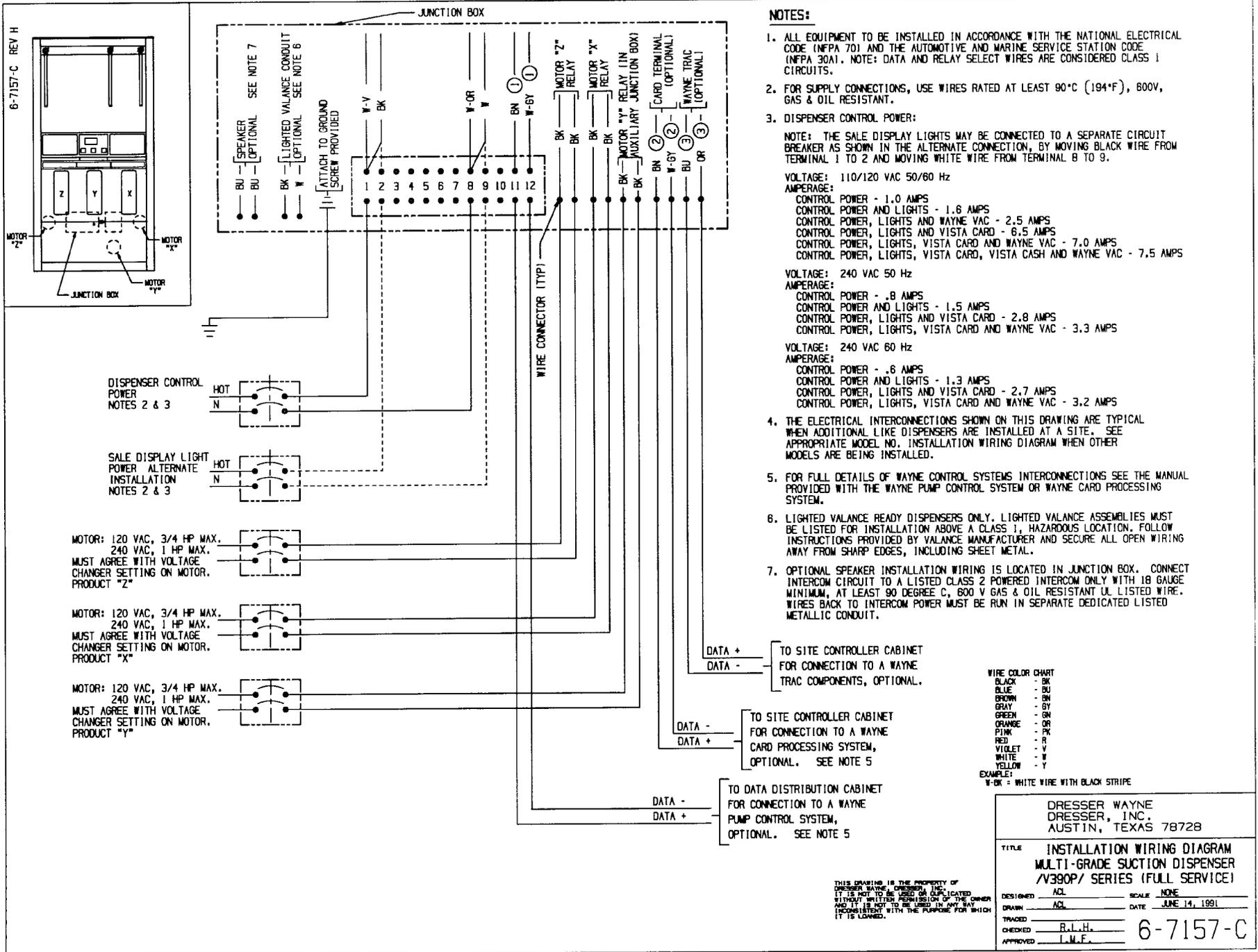


Figure C-27. 6-7157-C Installation Wiring - 3/V390P (Suction).

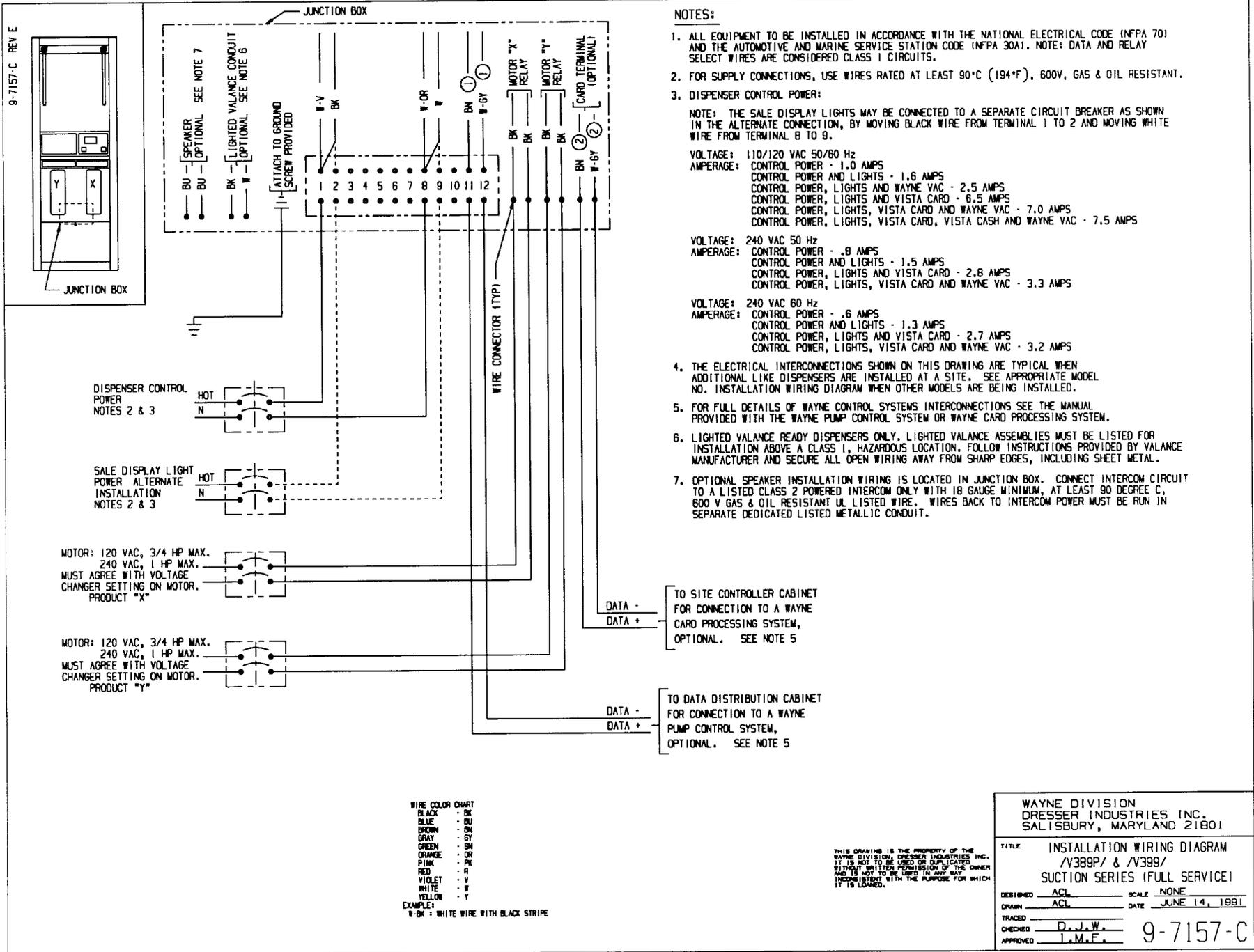


Figure C-28. 9-7157-C Installation Wiring - 3/V389P and 3/V399P (Suction).

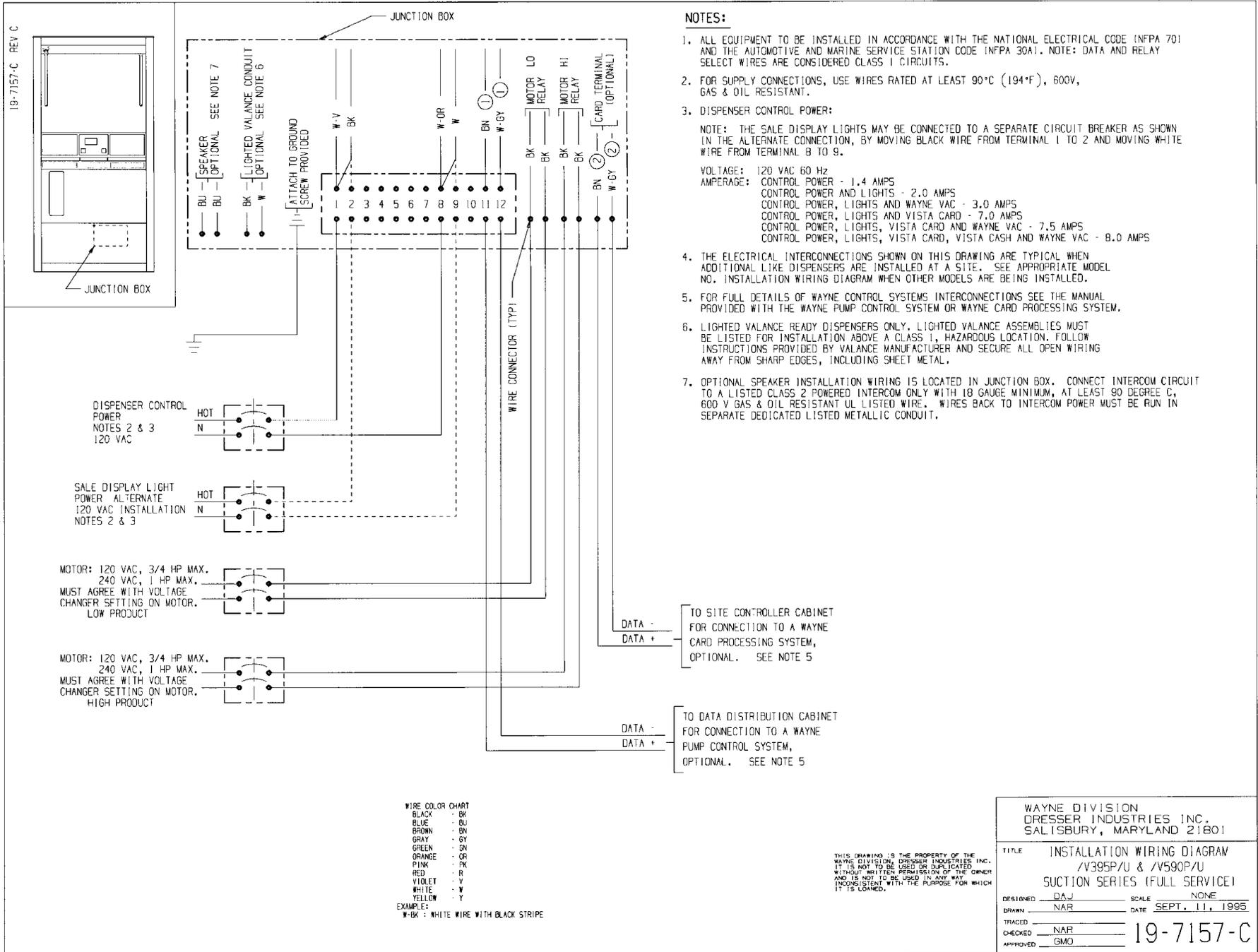
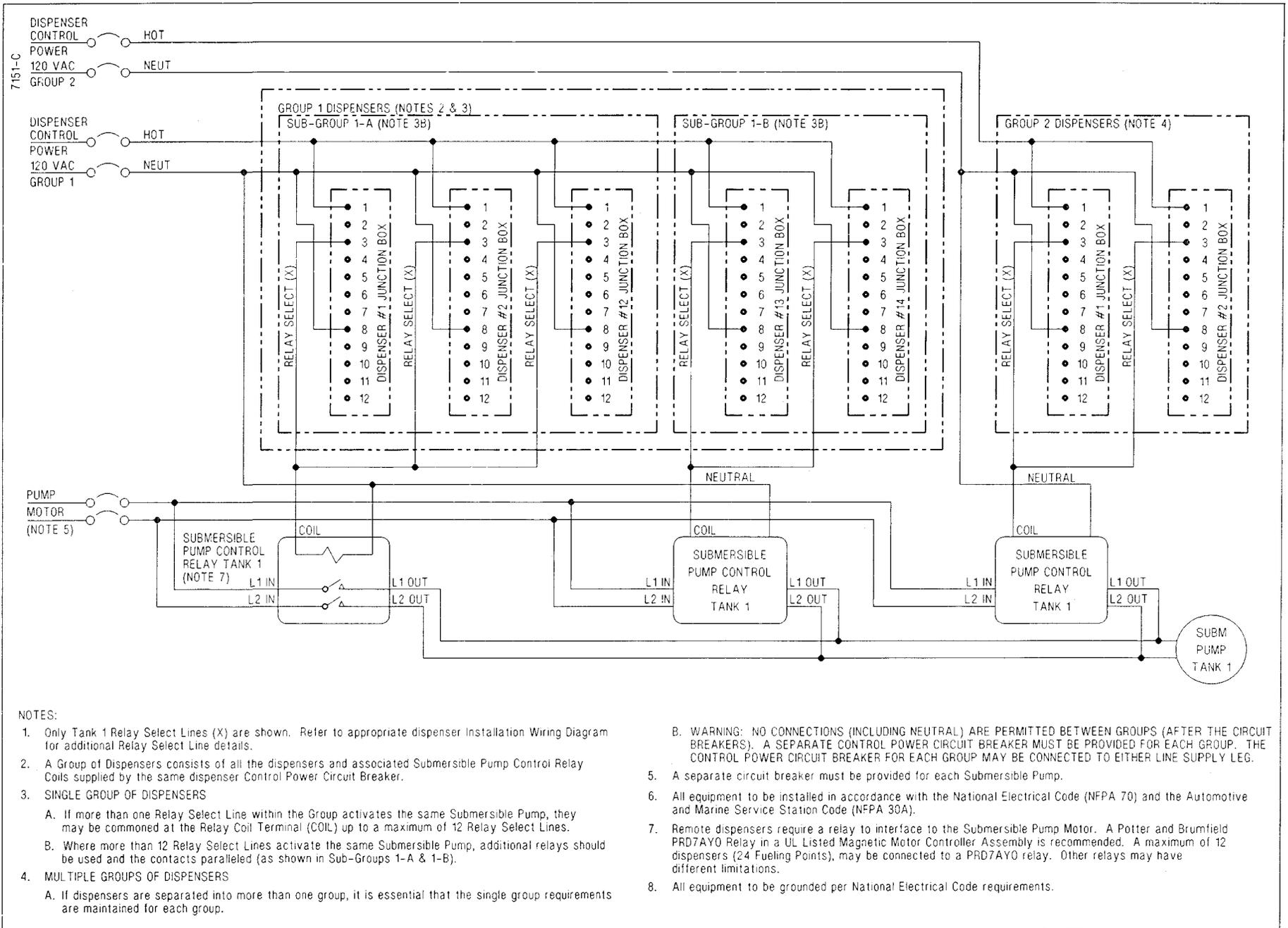


Figure C-29. 19-7157-C Installation Wiring - 3/V590P/U and 3/V595P/U (Suction)



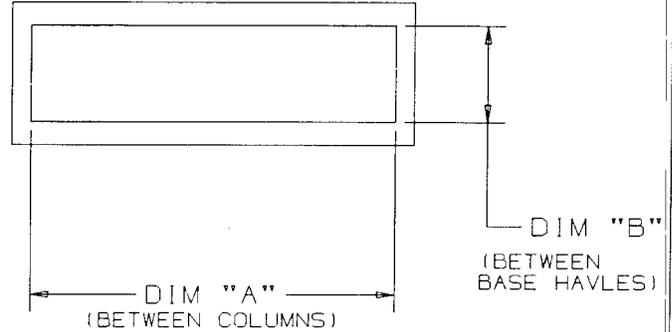
NOTES:

1. Only Tank 1 Relay Select Lines (X) are shown. Refer to appropriate dispenser Installation Wiring Diagram for additional Relay Select Line details.
2. A Group of Dispensers consists of all the dispensers and associated Submersible Pump Control Relay Coils supplied by the same dispenser Control Power Circuit Breaker.
3. SINGLE GROUP OF DISPENSERS
 - A. If more than one Relay Select Line within the Group activates the same Submersible Pump, they may be commoned at the Relay Coil Terminal (COIL) up to a maximum of 12 Relay Select Lines.
 - B. Where more than 12 Relay Select Lines activate the same Submersible Pump, additional relays should be used and the contacts paralleled (as shown in Sub-Groups 1-A & 1-B).
4. MULTIPLE GROUPS OF DISPENSERS
 - A. If dispensers are separated into more than one group, it is essential that the single group requirements are maintained for each group.
5. A separate circuit breaker must be provided for each Submersible Pump.
6. All equipment to be installed in accordance with the National Electrical Code (NFPA 70) and the Automotive and Marine Service Station Code (NFPA 30A).
7. Remote dispensers require a relay to interface to the Submersible Pump Motor. A Potter and Brumfield PRD7AY0 Relay in a UL Listed Magnetic Motor Controller Assembly is recommended. A maximum of 12 dispensers (24 Fueling Points), may be connected to a PRD7AY0 relay. Other relays may have different limitations.
8. All equipment to be grounded per National Electrical Code requirements.

Figure C-30. 7151-C Typical Dispenser Site Wiring Diagram

MODEL SERIES	DIMENSION "A"	DIMENSION "B"
350/360	25	9.500
370	25	9.500
380	27	9.500
390	42	11.500
490	42	11.500
585	27	9.500
590	42	11.500
V380	29	11.500
V390	42	11.500
V490	42	11.500
V580	29	11.500
V585	29	11.500
V590	42	11.500

Ⓐ



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TOLERANCES
 .XX : ± .050
 .XXX : ± .010
 UNLESS OTHERWISE SPECIFIED

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TITLE DIMENSIONAL DRAWING INSIDE FOOT PRINT	
DESIGNED GAH	SCALE NONE
DRAWN JDD	DATE JUNE 19, 1991
TRACED	
CHECKED D.J.W.	10196-B
APPROVED R.E.H.	

Figure C-31. 10196-B Dispenser Dimensional Drawing - Inside Footprint

APPENDIX D DISPENSER INTERCONNECTION WIRING DIAGRAMS

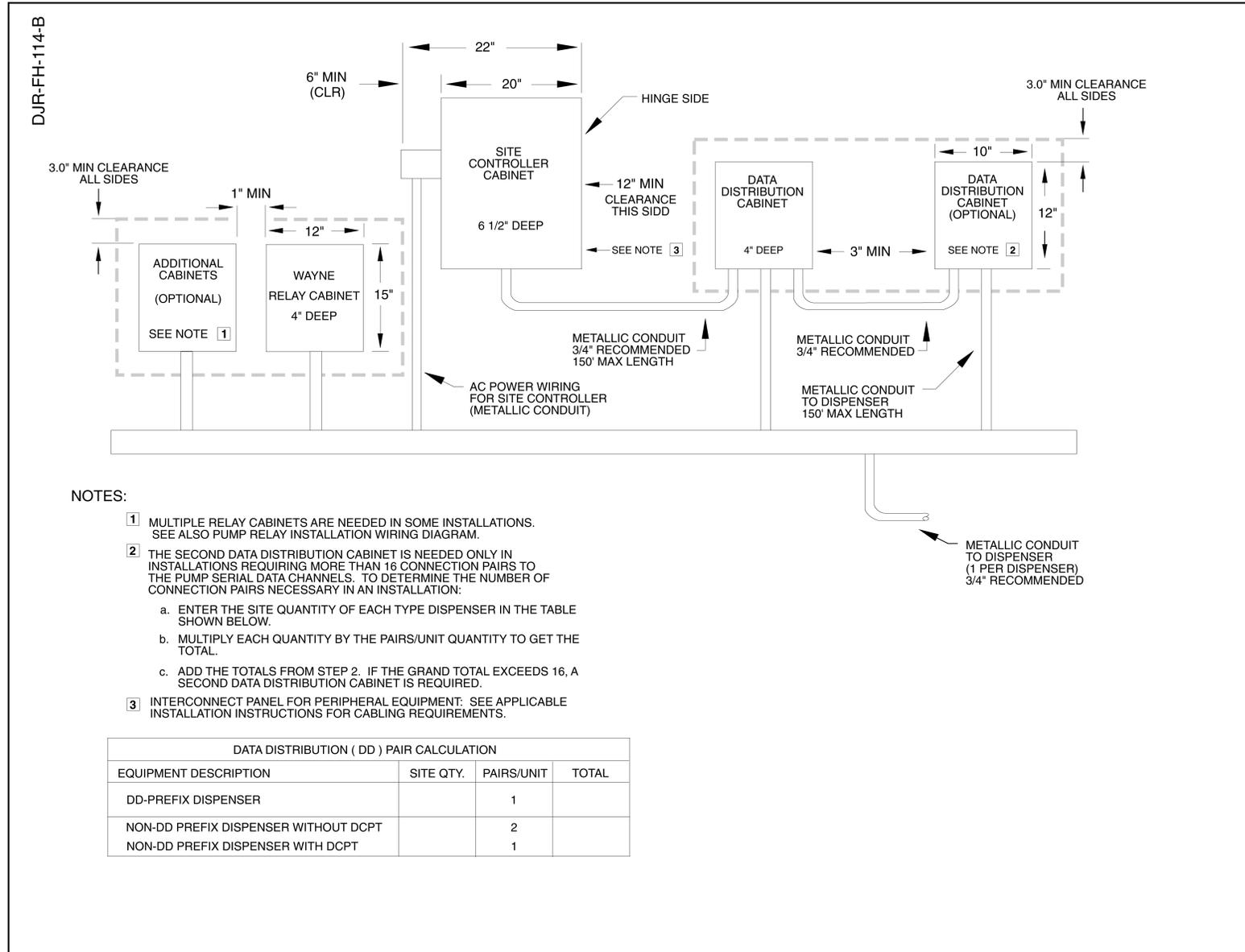
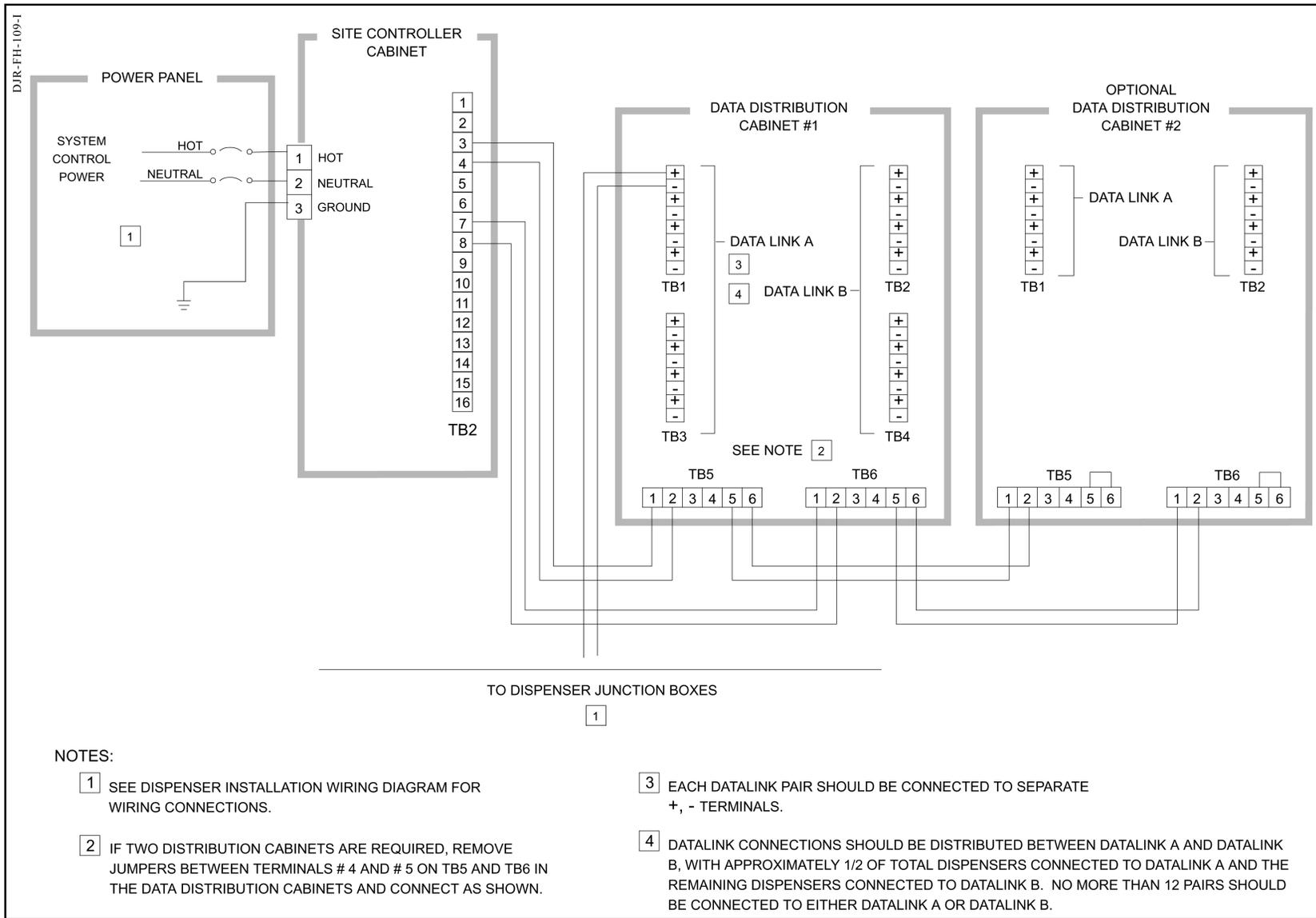


Figure D-1 Backroom Installation - Wayne Management Control System.

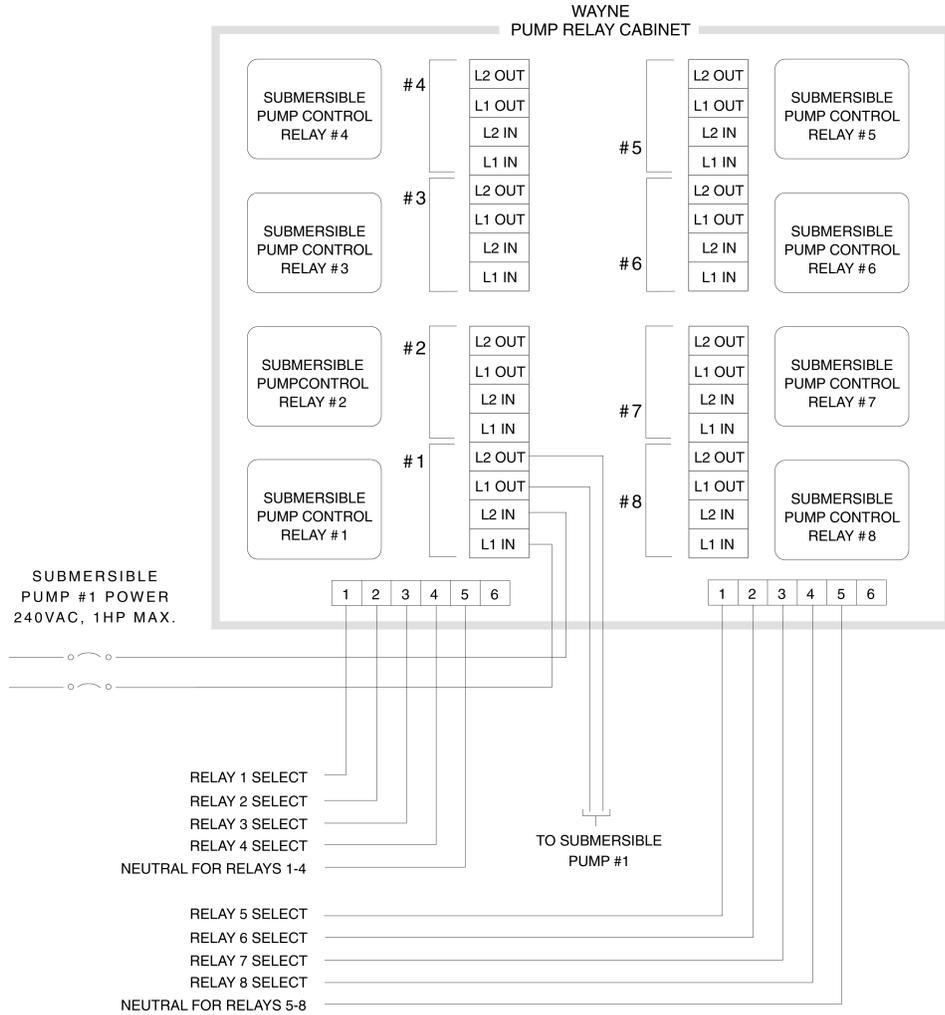


NOTES:

- 1 SEE DISPENSER INSTALLATION WIRING DIAGRAM FOR WIRING CONNECTIONS.
- 2 IF TWO DISTRIBUTION CABINETS ARE REQUIRED, REMOVE JUMPERS BETWEEN TERMINALS # 4 AND # 5 ON TB5 AND TB6 IN THE DATA DISTRIBUTION CABINETS AND CONNECT AS SHOWN.
- 3 EACH DATALINK PAIR SHOULD BE CONNECTED TO SEPARATE +, - TERMINALS.
- 4 DATALINK CONNECTIONS SHOULD BE DISTRIBUTED BETWEEN DATALINK A AND DATALINK B, WITH APPROXIMATELY 1/2 OF TOTAL DISPENSERS CONNECTED TO DATALINK A AND THE REMAINING DISPENSERS CONNECTED TO DATALINK B. NO MORE THAN 12 PAIRS SHOULD BE CONNECTED TO EITHER DATALINK A OR DATALINK B.

Figure D-2 Interconnection Wiring Diagram - Data Distribution Cabinet To Dispensers.

DJR-FH-123-C



NOTES:

1. RELAYS #5 AND #6 ARE PROVIDED ONLY IN 6 AND 8 RELAY CABINETS. RELAYS #7 AND #8 ARE PROVIDED IN AN 8 RELAY CABINET.
2. SEE DISPENSER INSTALLATION WIRING DIAGRAM FOR WIRING CONNECTIONS.

Figure D-3 Pump Relay Installation Wiring Diagram.

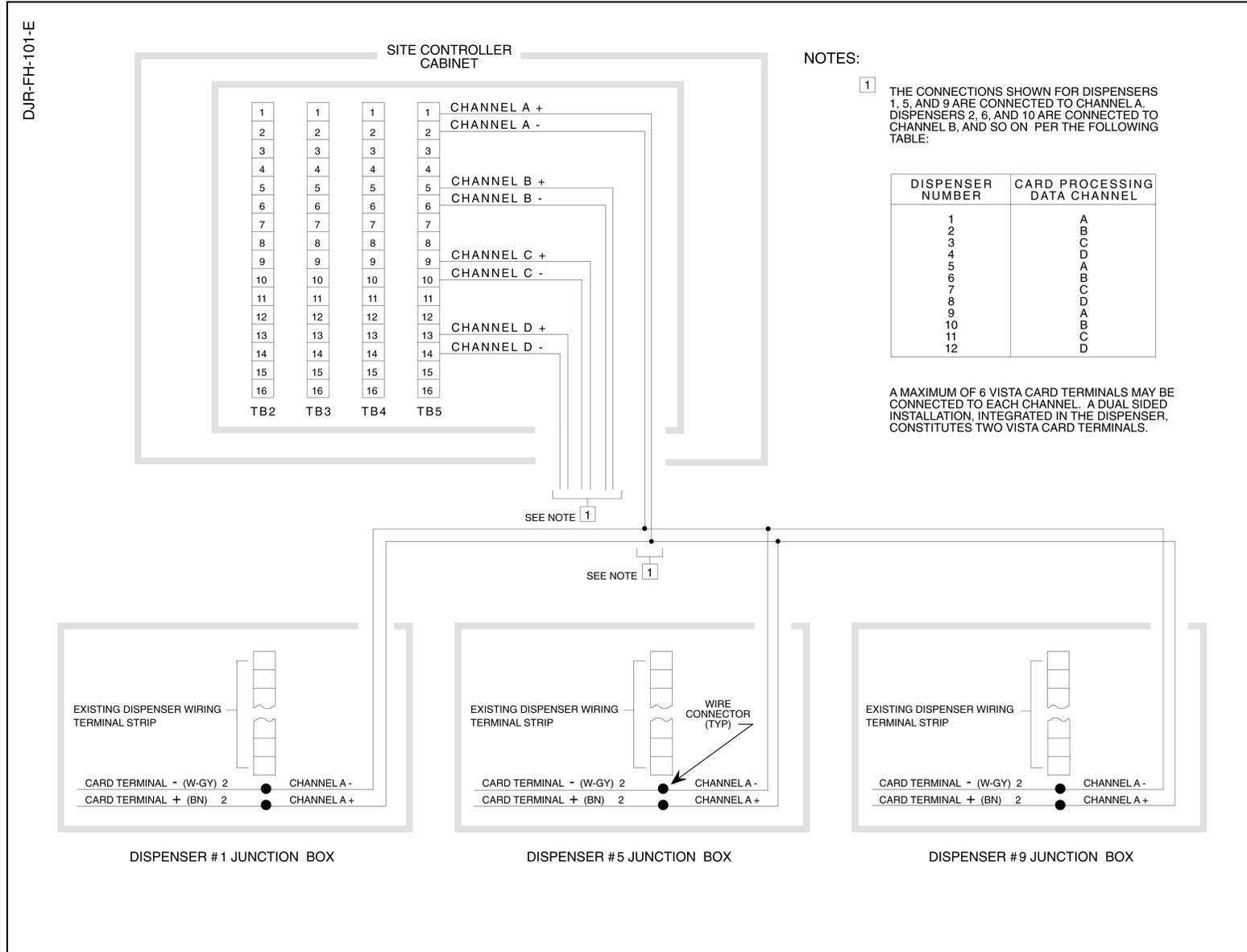


Figure D-4 Interconnection Wiring Diagram - Dispenser Card Processing (CATs) .

INSTALLATION & OPERATION MANUAL

3/Vista Series Blending and Non-blending Suction Pumps and Remote Dispensers

Written by S. G. Martin

This manual was produced on a personal computer using Adobe® FrameMaker® and Photoshop®

Page design uses Times New Roman and Arial Fonts

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