

INSTALLATION OPERATION

4/Vista Series
Suction Pumps and
Remote Dispensers
Including Ultra-High
Capacity Models



4/V387 Model Shown



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

Operational problems with the dispenser after installation and startup should be referred to your local authorized Wayne service personnel or the Wayne Help Desk at (1-800-289-2963).

Trouble with the installation and startup of the dispenser should be referred to 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.

4/Vista Series
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Installation & Operation

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1 INTRODUCTION

1.1 Dispensers Covered

This manual explains the installation and operation of all 4/Vista series blending and non-blending suction pumps and remote dispensers.

Non-blending dispensers included in this manual are the 4/V387, 4/V388, 4/V389, 4/V390, 4/V399, and 4/V490 models. These dispensers are multi-grade dispensers, except for the 4/V387 single grade model. The 80 series numbers in the models represent a narrow body dispenser, whereas, the 90 series numbers in the models represent a wide body dispenser.

This manual also covers the HS4/V Ultra High Capacity (UHC) models in the HS4/V387, HS4/V388 and HS4/V389 model series and associated satellites. See Appendix E for these models.

Blending dispensers included in this manual are the 4/V580, 4/V585, 4/V590, 4/V591 and 4/V595 models. Blending dispensers combine the Low and High base products (end grades) to provide one or more blended grades in addition to the end grades. The 4/V591 and 4/V595 models also have an additional single product (non blended) grade, whereas the 4/V595/U does not.

4/Vista dispensers, referred to as 4V dispensers, use the iGEM computer to control the iMeter and Intelligent Pulser (WIP). There is one iGEM computer for each dispenser and one iMeter module for each base product. The iMeter module consists of two meters in one assembly and the WIP pulser, where one of the meters is for side one of the dispenser and the other meter is for the same product on side two.

4V models incorporate many of the features and options available in the Ovation models. QCAT with QVGA display is standard on card reader equipped dispensers, while iX™CAT and iX™ Pay Secure Payment are optional.

Table 1-1 gives a brief description of each 4V model.

Table 1-1 MODEL DESCRIPTIONS

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

1.1 Dispensers Covered, continued

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 iGEM Service manual, part number 920525.

4/V series dispensers may be operated as stand-alone units or as a component part of a Wayne® Retail Control System or other pump controllers. This manual provides installation and operation procedures 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 startup 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). Operational problems with the dispenser after installation and startup should be referred to your local authorized Wayne service personnel or the Wayne Help Desk at (1-800-289-2963).

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, and often require 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:

1.2 Local, State, and Federal Codes, continued

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.¹”

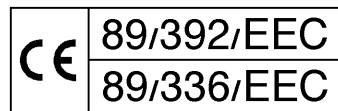


WARNING

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)*.

1.4 European Community Conformity Identification



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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, Piping and Emergency Valve

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 for securing the dispenser in accordance with NFPA requirements. Depending on the model, the base of the dispenser contains four to eight bolt hole slots (5/8 inch by 2 inch) for anchoring the dispenser to the island. **Wayne recommends using all available slots.** Install the anchor bolts in accordance with the dimensions shown on the Installation Instruction drawing for the dispenser model. Installation drawings are located 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. See Figure 2-1 and Figure 2-2 for a typical emergency valve. 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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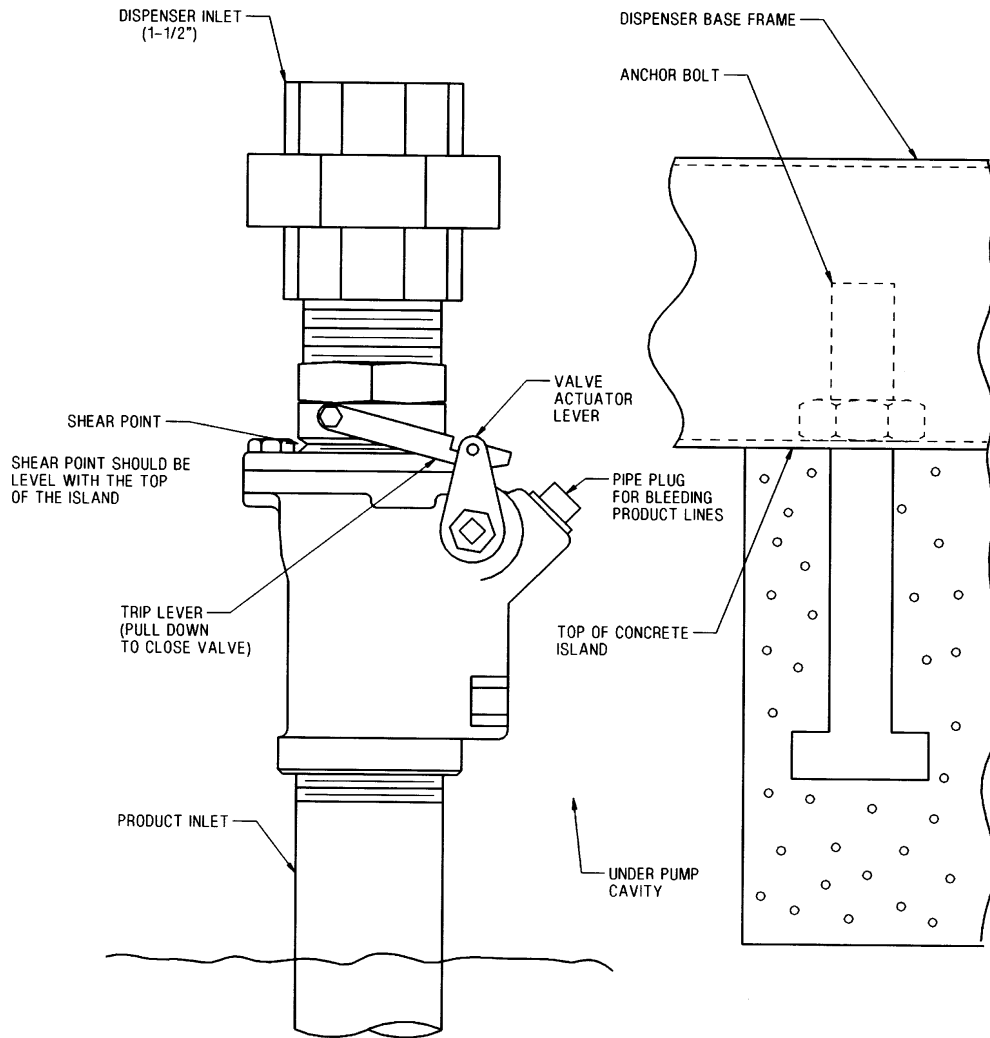


Figure 2-1 Typical Emergency Valve Installation. *The Emergency valve is designed to close the product line due to shock or fire. The shear section, shown above, functions if the dispenser is knocked out of position. Note: Shear valves and unions are not supplied with dispenser.*

2.4 Check Valves (Suction Pumps)

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.

4/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 4/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 door lock location. After removing, place the doors in an area where they will not be damaged.

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

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. Note that inlet unions and meter inlet pipe nipples are not supplied with the dispenser.



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.

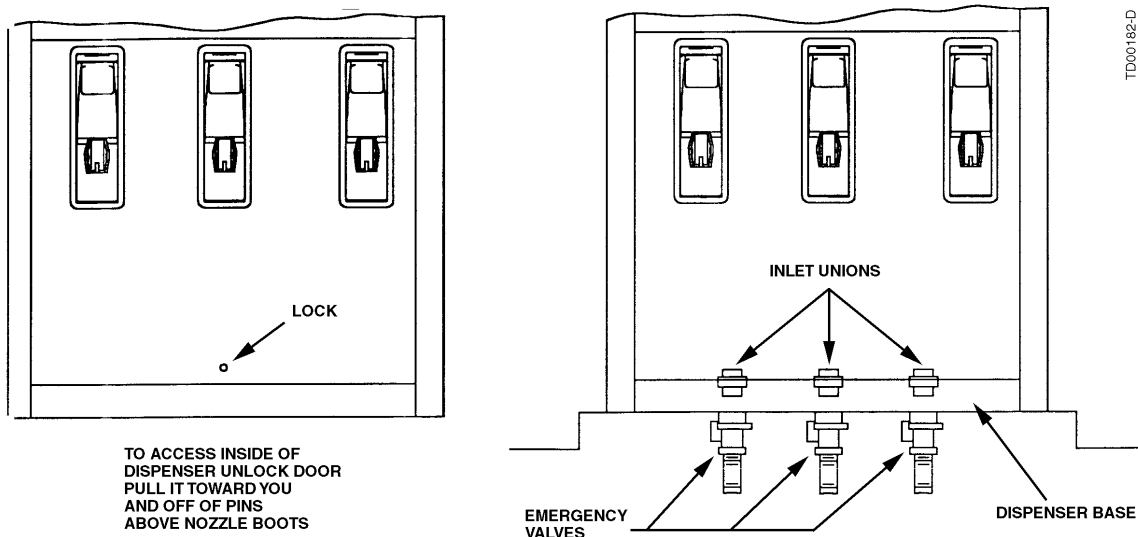


Figure 2-2 Dispenser Doors and Typical Emergency Shear Valve. Note: Shear valves and unions are not supplied with the dispenser.

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 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 full service (stand-alone) dispensers, however, if a control system may be installed at a later time, the optional data wires should be pulled at initial installation. See Section 2.7.5.

NOTE: If optional data wires are run for future use, 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, Wayne Plus and Nucleus 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

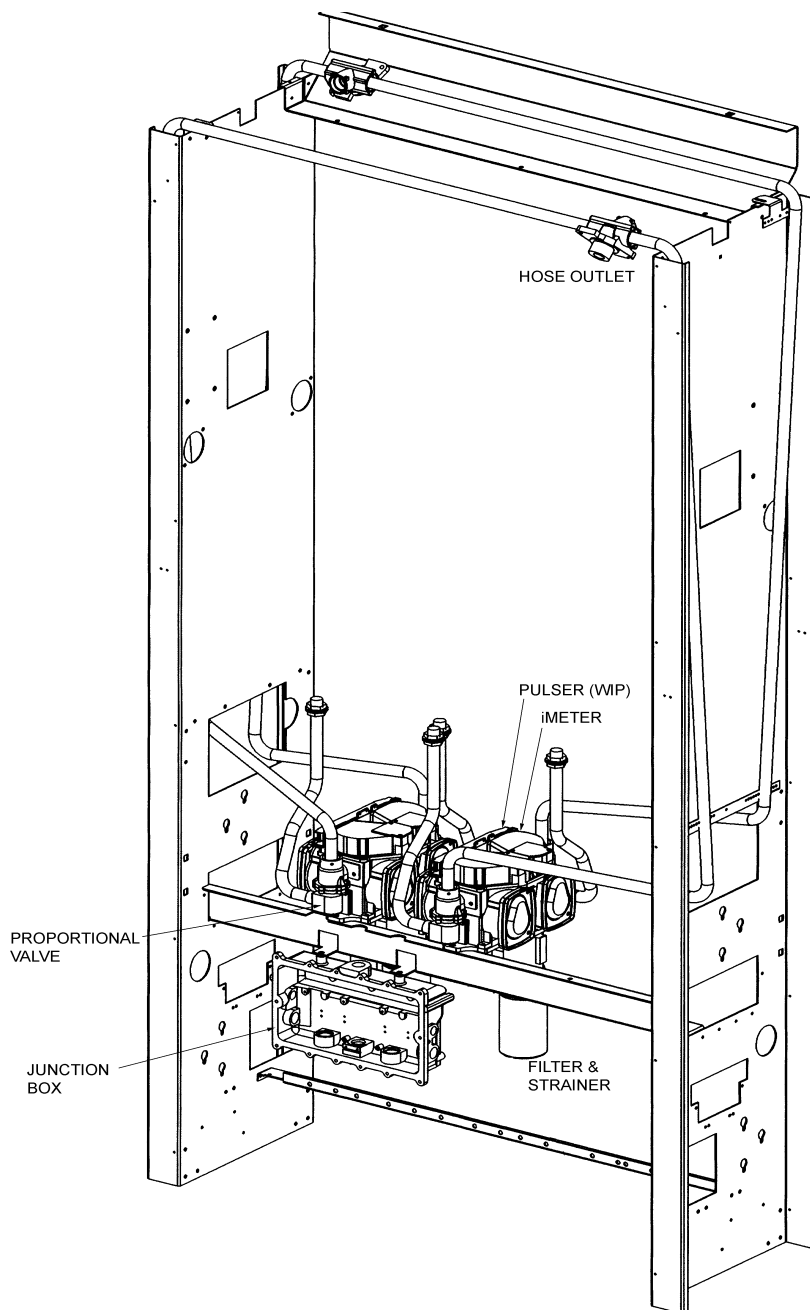


Figure 2-3 Location of Components in the Dispenser (Typical). *Locations may vary slightly with model.*

⚠ 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 Wiring

For connection to a 2400 MCS or Wayne Plus follow the installation instructions supplied with that system. The installation wiring diagrams in Appendix C show two Data wires to the Data Distribution Cabinet required for the 2400 MCS, Wayne Plus, or Nucleus pump control operation, and two Data wires to the Site Controller for Card Processing and/or cash acceptor operation. In addition, two Data wires are required for dispensers equipped with the Wayne TRAC option. System interconnection diagrams are supplied in Appendix D for reference. Use the diagrams in both Appendix C and D as a group when laying out the system wiring requirements for a new site or when making changes to an existing site.

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 Dispenser 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, the Yellow wires are call button connections and the Brown 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.

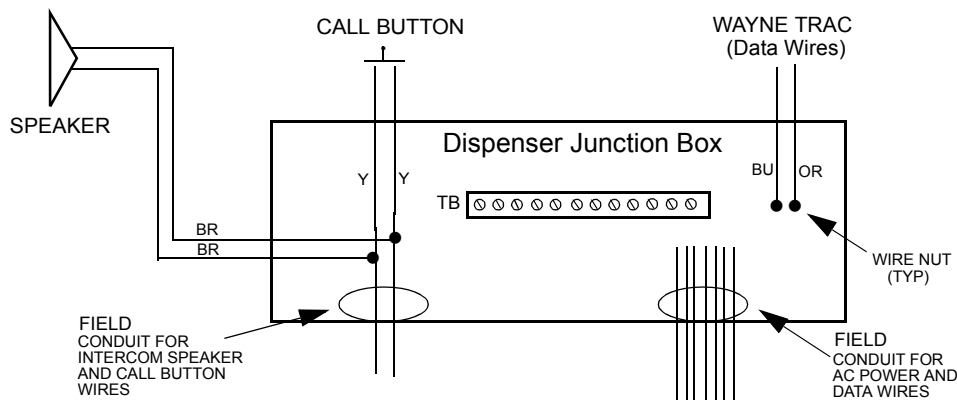


Figure 2-4 Intercom Speaker/Call Button and Ethernet Wiring. *Intercom speaker and Call Button wiring must run in a separate conduit to the dispenser.*

2.7.7 Sales Display Lights

The dispenser is delivered with the sales display lighting circuit connected to the control power circuit at the terminal strip in the dispenser junction box. The sales 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.

See Section 2.7.9, *Summary of Wiring and Conduits* on the following page for number of wires required for dispenser operation.

2.7 Electrical Wiring, continued

2.7.8 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.

2.7.9 Summary of Wiring and Conduits

The following is a list of field wires and conduits required for typical dispenser operation. This list includes wiring for the Wayne dispenser only and does not include additional conduits and wiring that may be required for other equipment or devices at the island. Be sure to read the complete electrical section on the previous pages for details and use the appropriate wiring diagram in the back of this manual for the specific dispenser model being installed, i.e., 4/V490 models will have 4 relay select wires.

Basic Dispenser:

2 Power wires (hot & neutral)
3 Relay select wires
1 Ground wire
2 Data wires (1pair) for iGEM
2 Data wires (1pair) for QCAT

Optional Equipment:

2 Intercom/Speaker wires
2 Call button wires
2 Data wires (1pair) for Wayne Trac
1 Ethernet cable for iXCAT or IDPOS

1 Primary conduit (Data and Power wires), 1 Secondary conduit (Intercom/Speaker/Call button wires)

2.8 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 sealant (pipe dope) on hoses used with vapor recovery vacuum assist systems, such as Wayne Vac or Healy systems. The sealant may become lodged in the vapor pump.

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.

2.9 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.

2.10 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.

2.11 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.

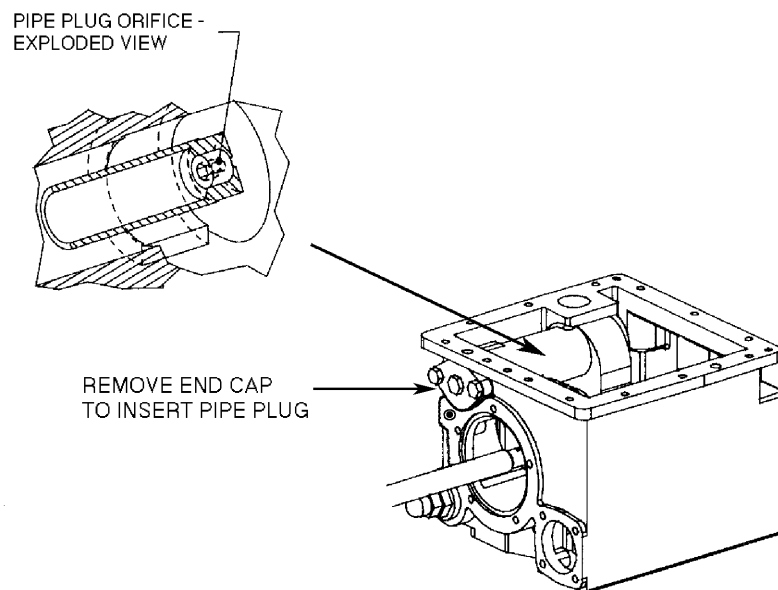


Figure 2-5 Location of Pipe Plugs in Pumping Unit. *The pipe plug is only required for above ground storage tanks.*

2.12 iMeter Calibration

All iMeters are tested 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.

Dispensers have an operation mode setting that establishes the pulser's calibration mode. This is set at the factory in the dispenser template (Read Only function F16)

Verification Accuracy:

1. Dispense some product into the test container to wet the container and then drain the container thoroughly, 10 seconds or more.
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 some product into the test measure to wet the container and then drain the container thoroughly, 10 seconds or more.
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 the test measure (drain completely, 10 seconds or more) 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.

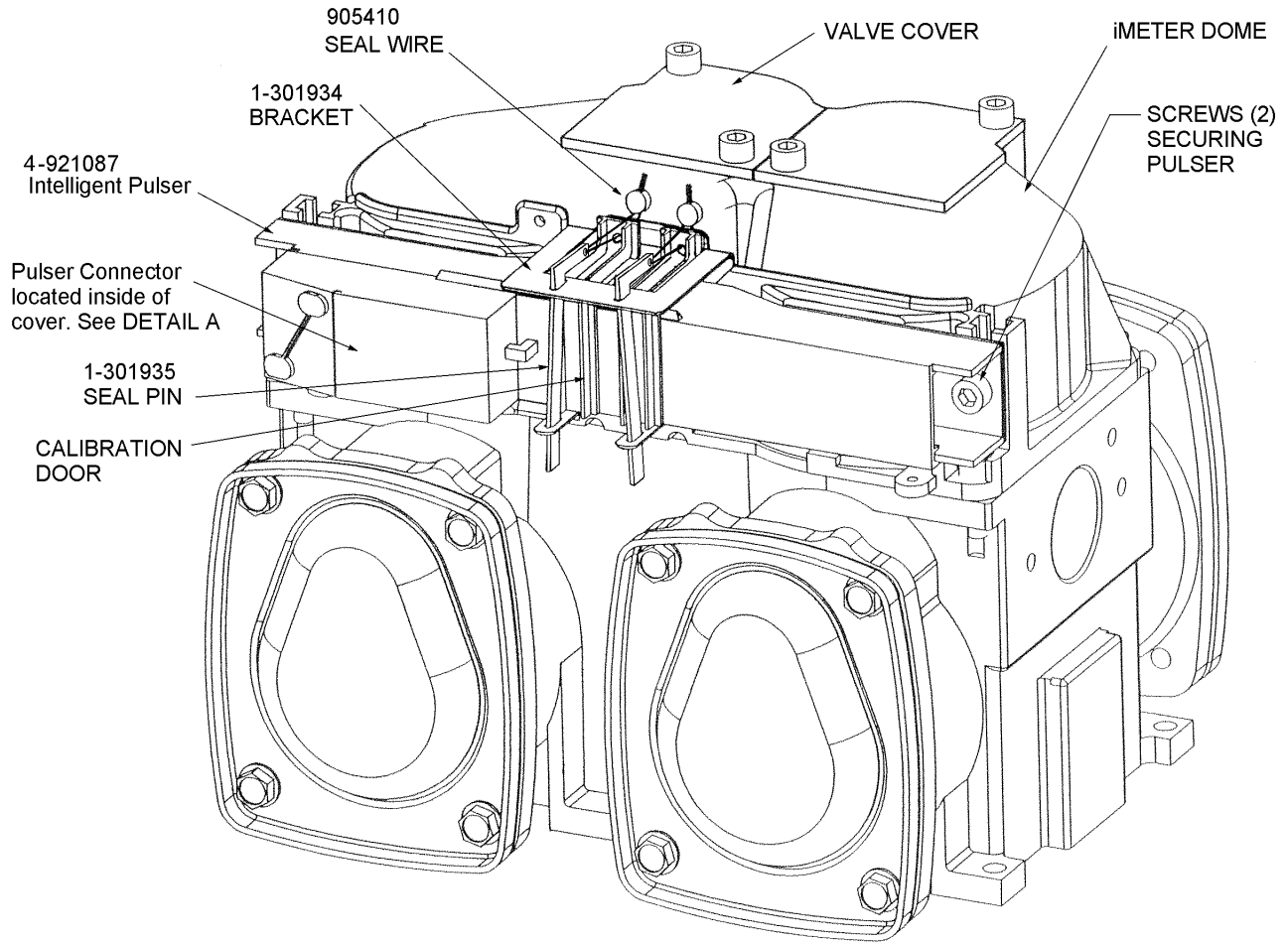


Figure 2-6 iMeter Module. *The Intelligent Pulser has two calibration doors - one for each meter. Only one door may be opened at one time during meter calibration.*

2.13 Balance Vapor Recovery System Installation Requirements

2.13.1 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.

2.13.2 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

2.13 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.

2.14 Wayne Vac Vapor Recovery System Installation Requirements

2.14.1 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.

2.14.2 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.

2.15 Healy Vapor Recovery System

Refer to the Installation procedures in the separate manual supplied with dispensers equipped with Healy vapor recovery.

3 START-UP

3.1 Initial Checkout

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

3.2 Set the Clock in Function F02

Function F02.00 displays the time HH.MM, F02.01 is the date MM.DD and F02.02 is the year YY.YY.

1. Press ENTER and key in the password when PASS 1 is displayed and press ENTER.
2. Press ENTER and key in password again when PASS 2 is displayed and then press ENTER. The unit price display will show F— (which indicates a function number is needed)
3. Key in 02 to access F02 and press ENTER. The unit price display will show F02 (indicating the function has been accessed).
4. Press ENTER and the unit price display will show 2.00 and the sales display shows the 24 hr clock.
5. Press # before keying in the HHMM time and press Enter, or press UP to go to the date or year.
6. Press CLEAR and NEXT to go to the next function. When done go to F00, enter 3 to Exit and Save.

3.3 Nozzle Positions for Blenders

Nozzle positions are critical for unit price setting. When setting up the dispenser, Unit Prices and Totals are displayed in hose (nozzle) position order, such as, 1, 2, 3, 4, etc. When setting up blending dispensers, keep in mind that the physical number of nozzles on the side of the dispenser is not necessarily the same as the number of electronic nozzle positions on that side. As shown in Figure 3-1, a 4/V590 has three nozzles and three positions (2, 3, and 4), however, a 4/V580 has only one nozzle and three positions (3, 5, and 7). See Figure 3-1 and the list below for each blending model's hose position per side. Note: The product order, right to left, is identical on both sides.

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

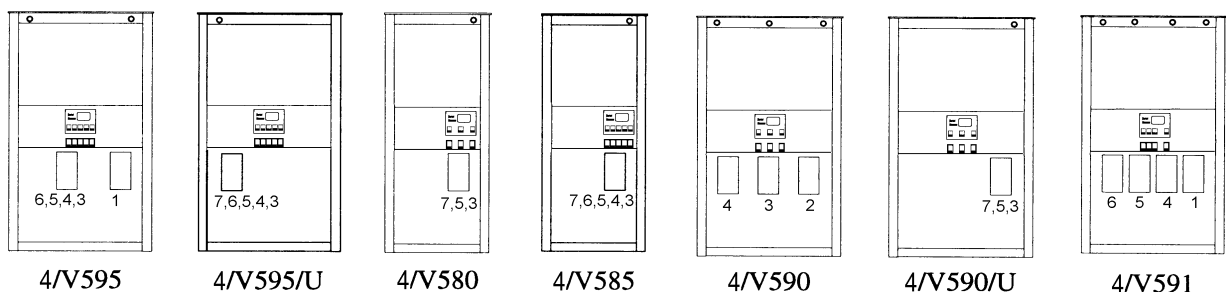


Figure 3-1 Nozzle Position Numbers for 4/Vista Blenders.

3.4 Nozzle Positions Per Side for Non-Blenders

Nozzle position numbers are critical for setting unit prices. When setting up the dispenser, as discussed in the following sections, Unit Prices and Totals are displayed in hose (nozzle) position order, such as, 1, 2, 3, etc., also referred to as the X, Y, or Z positions or products. These are shown below in Figure 3-2 .

- 4/V387 and 4/V388 models have only one position, referred to as position 1 or X.
- 4/V389 and 4/V399 models have two hose positions referred to as positions 1 and 2, or X and Y.
- 4/V390 models have three hose positions referred to as positions 1, 2, and 3 or X, Y, and Z.
- 4/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 4/V390 models.
- 4/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.
- 4/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.

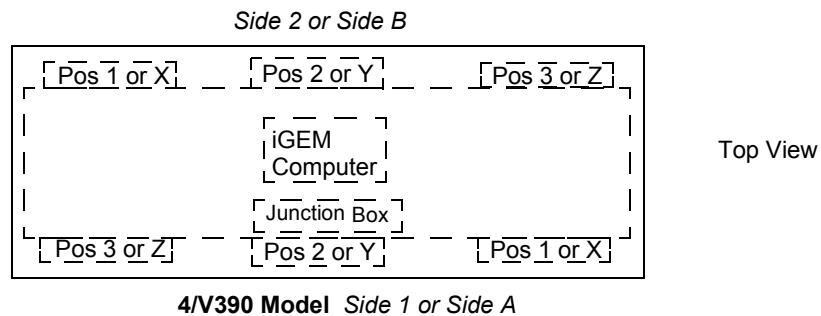


Figure 3-2 Position Coding for 4/V390. As standard on all models, the product order, right to left, is identical on both sides.

3.5 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 3-4) 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 4/V387 Bezel. Lift to Start nozzle boot. Totals are read on the display using the remote control. EM totalizers are available as a dispenser option.

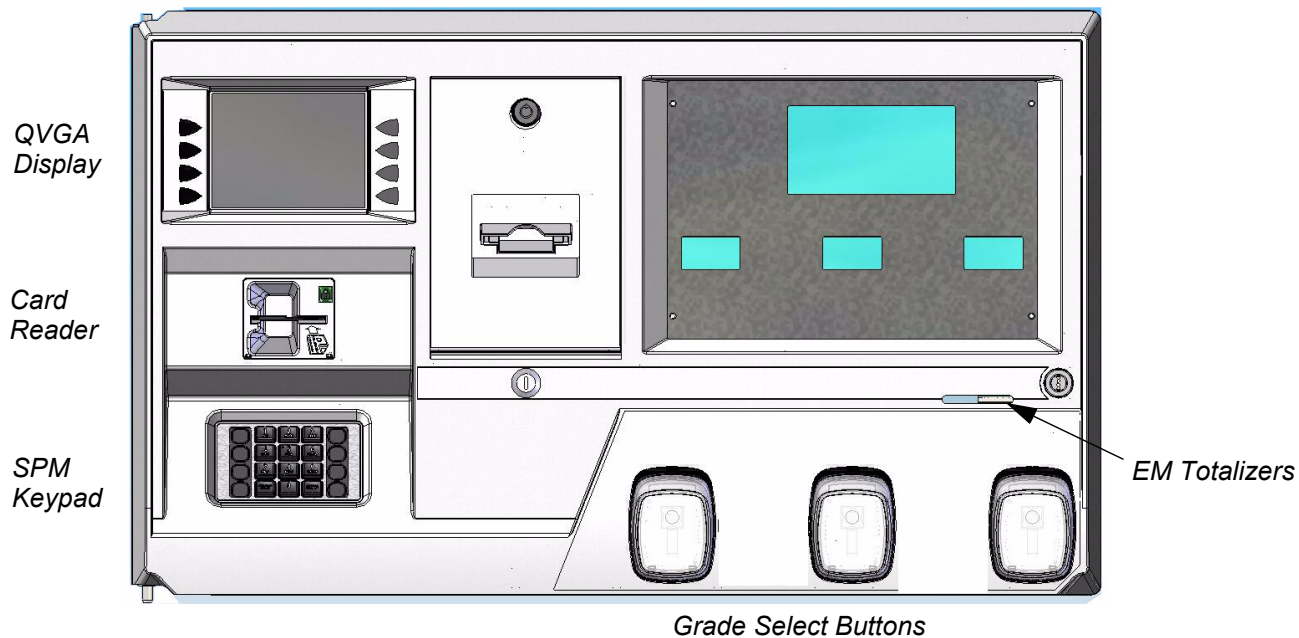


Figure 3-5 Typical 3 Grade Blender Bezel with iX Pay Secure Payment SPM. (Narrow Body Shown)

3.6 Setting Unit Prices

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

The dispenser template is code stored in memory that defines a dispenser model. The template 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
4/V595 (4+1)		Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock		Single Grade
4/V595 (3+1)		Lo Feedstock	BL	HI Feedstock			Single Grade
4/V595/U	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
4/V595/U (4)	Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock			
4/V580	Lo Feedstock		BL		HI Feedstock		
4/V585	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
4/V590				HI Feedstock	BL	Lo Feedstock	
4/V590/U	Lo Feedstock		BL		HI Feedstock		
4/V591	Lo Feedstock		BL		HI Feedstock		Single Grade
4/V490/U				AA	Z	Y	X
4/V490				AA	Z	Y	X
4/V390					Z	Y	X
4/V399						Y	X
4/V389						Y	X
4/V387							X

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

3.7 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 dispenser template 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
4/V595 (4+1)		Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock		Single Grade
4/V595 (3+1)		Lo Feedstock	BL	HI Feedstock			Single Grade
4/V595/U	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
4/V595/U (4)	Lo Feedstock	Lo-BL	Hi-BL	HI Feedstock			
4/V580	Lo Feedstock		BL		HI Feedstock		
4/V585	Lo Feedstock	Lo-BL	Mid-BL	Hi-BL	HI Feedstock		
4/V590				HI Feedstock	BL	Lo Feedstock	
4/V590/U	Lo Feedstock		BL		HI Feedstock		
4/V591	Lo Feedstock		BL		HI Feedstock		Single Grade

Table 3-2 Nozzle Positions Defined by Values of N. *This table is identical to Table 3-1 with the nonblender models removed. The information is repeated here for convenience.*

3.8 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 press the # key 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.
9. Repeat the procedure for Side 2.

3.9 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 also can be used for one time authorizations.

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

3.10 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 2.9) before dispensing any product through a remote dispenser. Make sure suction pumps are primed (refer to Section 2.10) 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 2.14 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.

3.11 CHECK NOZZLE BOOT SWITCH

3.11.1 Lift-to-Start

Lift-to-start nozzle boots are standard on 6 hose 4/V590 and 4/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 down to the Off position and check that the switch turns off. An off switch is indicated by the unit price displays of unselected products coming back on.

3.11.2 Push-to-Start

Except as noted above, Push-to-Start nozzle boots are standard on single hose multigrade dispensers and on all blenders.

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.

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, V-link belt, etc., it must be cleared to prevent unnecessary damage.

3.12 Check V-link Belt (Suction Pumps)

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 Check Annunciator Operation

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 Grade Select buttons on the bezel, you should hear the annunciator beep.

3.14 Check Totalizer Operation

3.14.1 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 feed-stock. 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.

3.14 Totalizer Readings, continued

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

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

3.14.2 Totalizer Volume Readings by Meter Position

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 iMeter, *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.

3.14 Totalizer Readings, continued

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			

				Remote Non-Blenders
AA	Z	Y	X	490
	Z	Y	X	390
		Y	X	388, 389, 399
			X	387 (also see Fig 3-2)

4	3	2	1
M	M	M	M
8	7	6	5
Junction Box			

Suction Non-Blenders
390
388, 389 399
387

	Z	Y	X
		Y	X
			X
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

3.14.3 Electro-Mechanical Totalizer Operation

Electro-Mechanical totalizers are optional equipment. One option is to have an electro-mechanical totalizer (EMT) for each product (feedstock) dispensed. With this option, electro-Mechanical totalizers are located on the junction box side of the dispenser and each totalizer represents the totals of both sides of the pump for that product. 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.

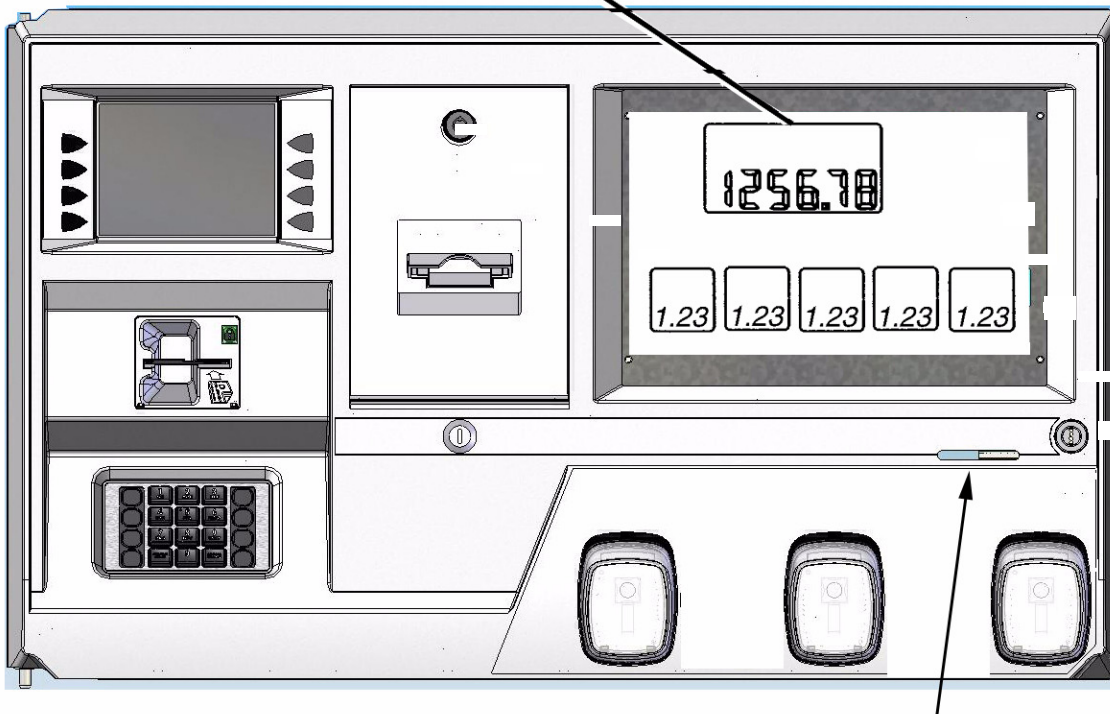
The totalizer shows seven digits and reads in whole units (gallons or liters). Fractional amounts that are left over from a previous sale are stored in the dispenser computer. When the next sale of the same product ends, if the fractional amounts from the new sale and previous sale(s) combined are one (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.

A second option offers the EMTs for each product (feedstock) dispensed on each side of the pump. With this option, electro-Mechanical totalizers are located on both sides of the pump.

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

ELECTRONIC TOTALIZER.

TOTAL MONEY
HOSE POSITION 3
IS \$1256.78



ELECTRO-MECHANICAL
TOTALIZERS

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
---------------	--------------	-----------------

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).

3.15 Check Wayne Vac Motor Operation

For dispensers equipped with Wayne Vac vapor recovery, 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.

3.16 Check Healy Vapor Recovery System

Additional startup testing procedures are required for dispensers equipped with the Healy vapor recovery system. Refer to the separate manual supplied with those dispensers.

3.17 Perform QCAT Self-Test

QCAT Board: Perform the QCAT self-test procedure in Appendix A of this manual. Check the card reader, all keys on the keypad, and the printer test.

3.18 iX CAT Equipped Dispensers

iX Board: Perform the 4V iX CAT self-test procedure in Appendix B of this manual. Additional startup procedures are required for iX CAT equipped dispensers. Refer to the appropriate iX CAT manual for these procedures.

3.19 iX™ Pay Secure Payment EPP

Additional startup procedures are required for the (Encrypted Pin Pad) EPP dispensers. Refer to the SPM Startup manual part number 940014 for these procedures.

3.20 IDPOS Equipped Dispensers

Additional startup procedures are required for IDPOS dispensers. Refer to the latest version of the IDPOS Support CD for these procedures.

3.21 Disable Stand-alone Operation

For Vista dispensers that do not have the Local Authorize Keyswitch option, stand-alone operation should not be required when the dispenser is switched over to the POS control system. As an extra security measure, the jumper that enables stand-alone operation should be removed and left in the dispenser electronic enclosure (verify with owner/operator). The jumper is located on the back lower right of the sales/volume display board. If the dispenser is equipped with the Local Authorize Keyswitch option, the jumper is not present, as the keyswitch takes the place of the jumper in the circuit.

To disable the stand-alone mode:

1. Access dispenser Filling Mode function F01 and change the sub-function from standalone .02 to .01 for serial mode. Exit and save changes.
2. Unlock and lower the bezel.
3. Remove the Local Authorize jumper (J5) from the lower right back side of the sales/volume display board.
4. Close and lock the bezel.

3.22 Check 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 IR 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

- 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. All attendants must know where the Emergency Stop Button is located.
- Know how to turn Off power to the dispenser at the Circuit Breaker Panel.
- Adhere to the safety precautions in Section 1.3 and the inside cover.
- 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.
- Care should be taken to prevent fuel spillage. If spillage occurs, clean-up immediately.
- 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.
- 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.
- Avoid moving parts such as the V-belt on Suction pump models.

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:

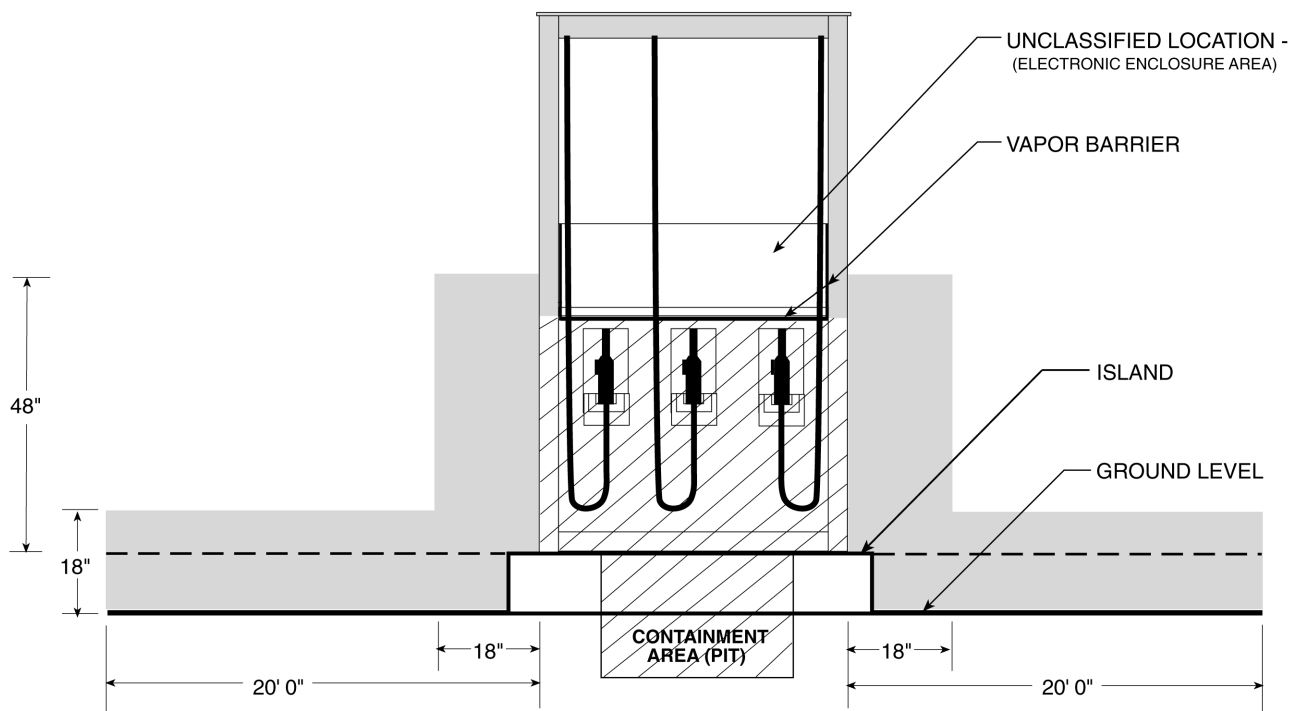
- Place approved container on the ground. Do not fill the container in the vehicle or truck bed.
- Keep the nozzle in contact with the can or container while filling. Do not use an automatic pump handle (latch-open) device.

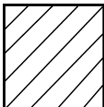
4.1.2 Health Note


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

4.1.3 U.S. and International Hazardous Zone Areas

Be familiar with the Division 1 and Division 2 areas around the dispensers. Hazardous areas are shown in Figure 4-1 and Figure 4-2.




 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.

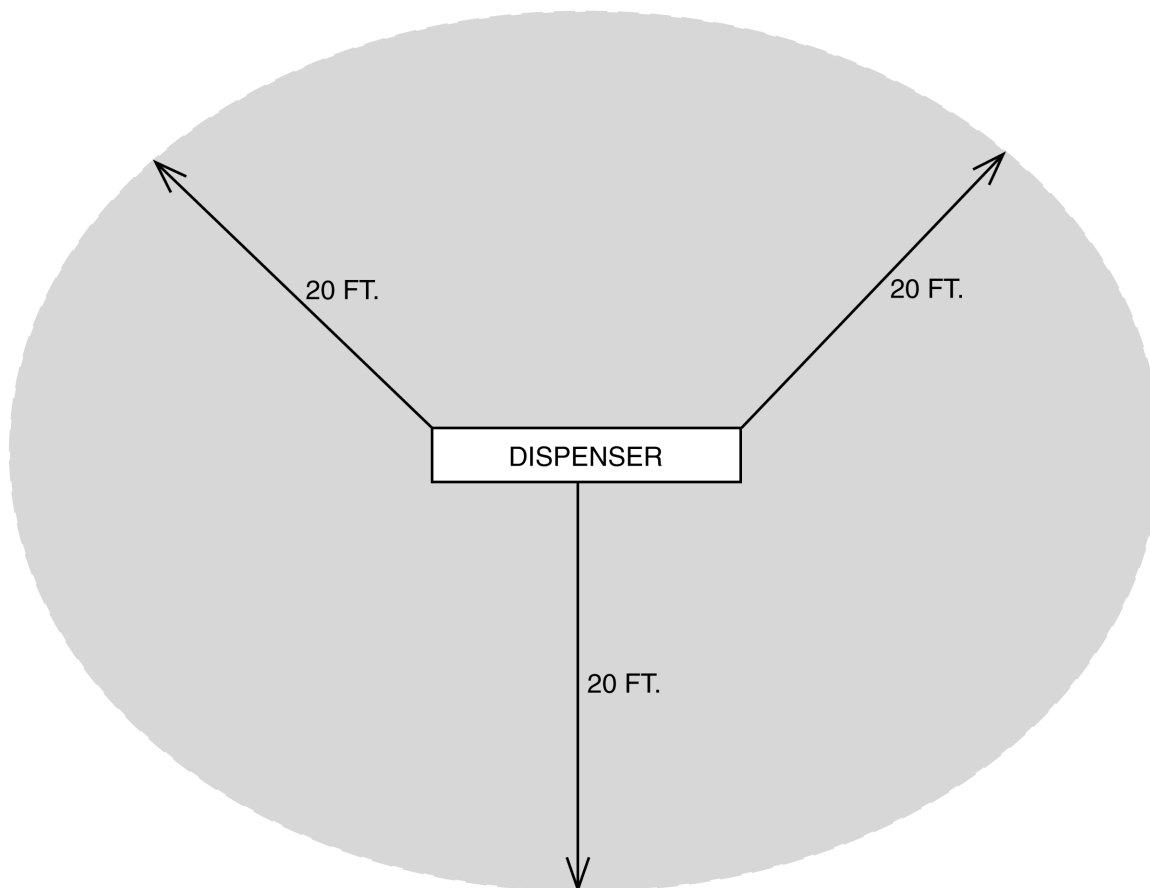


Figure 4-1 U.S. Hazardous Zone Diagram. *Front and Top views showing horizontal and vertical distances.*

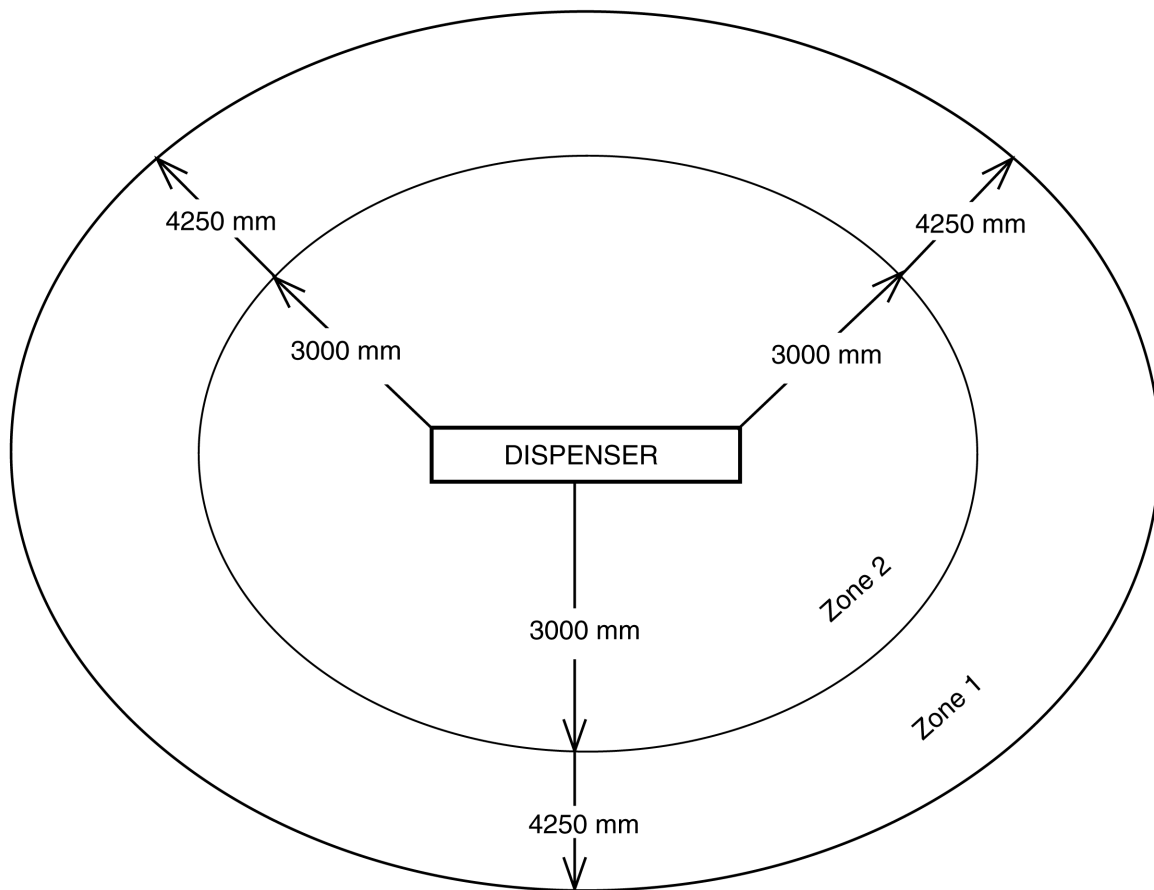
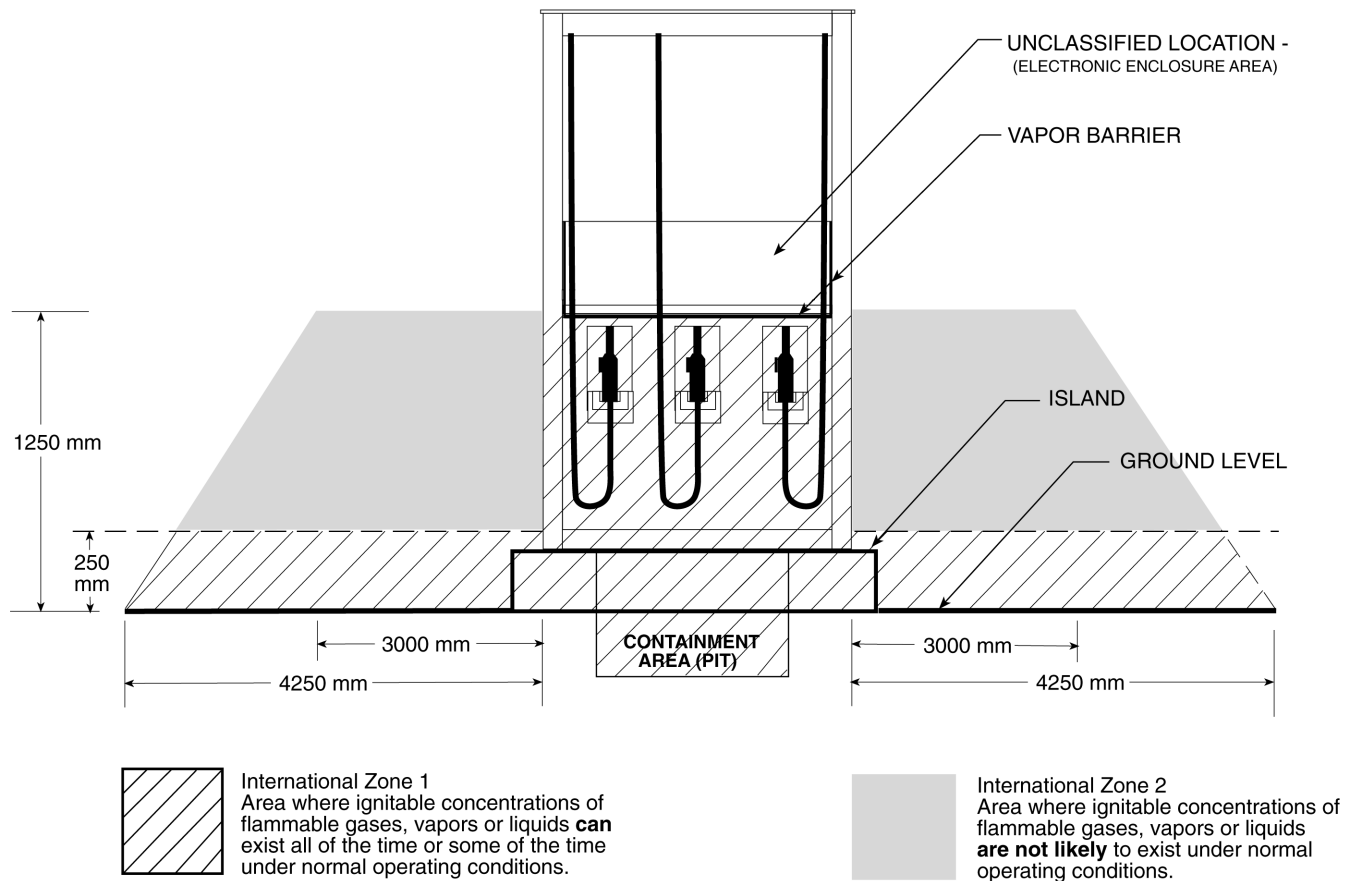


Figure 4-2 International Hazardous Zone Diagram. Front and Top views showing horizontal and vertical distances which are most common but may vary depending on country or jurisdiction.

4.2 Dispenser Functions

Unit prices must be set and the dispenser must be authorized for the dispenser to operate in stand-alone mode (not connected to a control system). If the dispenser is connected to a control system, unit prices and blend ratios are set in the control system, but each dispenser must have a unique fueling point number set at the dispenser for communication with the system. See the beginning of Section 3 for using the IR remote to set the clock and fueling point number, and for setting unit prices and blend ratios if necessary. See Section 3.14 for reading totalizers.

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 two steps for 4/Vista dispensers:

1. Move the optional Local Authorize keyswitch on the dispenser to the full service position. If the dispenser is not equipped with the keyswitch, a jumper must be in place at location J5 on the lower right back of the sales display board. This jumper may have been removed when the dispenser was switched over to the control system at initial installation/startup of the dispenser. Also, see Section 3.21 Disable Standalone Operation.
2. Using the IR remote control, enter Function Programming and change Function 01 sub-function from .01 (control system operation) to .02 (stand-alone).

Although not necessary for standalone operation, you can further isolate the pump from the console control by setting the Auto/Bypass switches for the fueling points in the DD box to the Bypass positions as shown in Figure 4-3.

To turn off power to the dispenser, turn the dispenser control power circuit breaker off in the breaker panel, Figure 4-4.

TD00301-A

Inside of DD Box

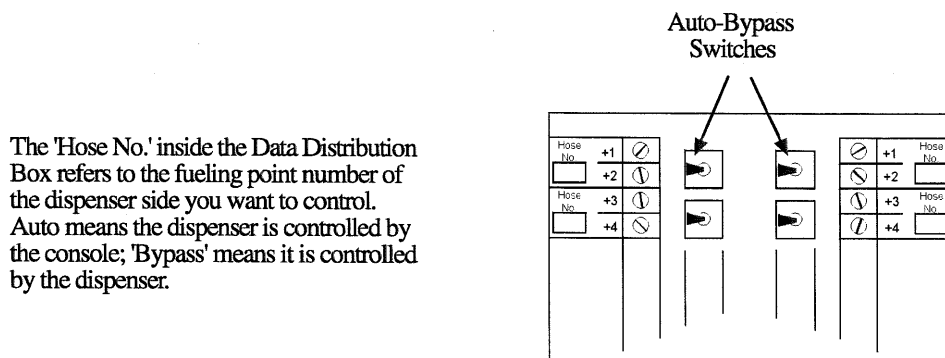


Figure 4-3 Location of Switches in the Data Distribution Box.

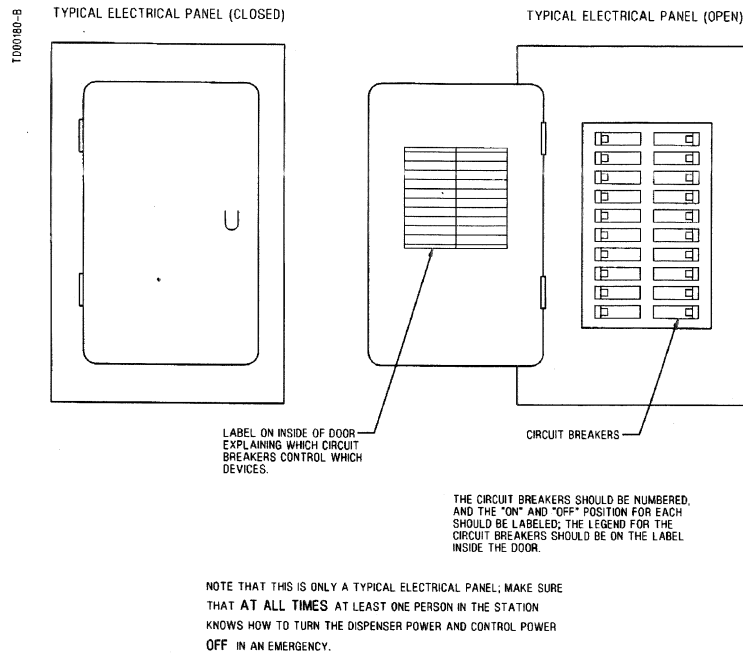


Figure 4-4 Typical Electrical Panel and Circuit Breakers. *The circuit breaker controls power to the dispenser junction box.*

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

4.3 Dispenser Operating Instructions

To operate the dispenser:

1. Authorize the dispenser, either using the Authorize switch on the dispenser, or via the control system. If the dispenser is equipped with the Customer Activated Terminal (CAT), insert and remove card, and the control system will authorize the dispenser once the card is approved.
2. Remove the nozzle from the nozzle boot and depending on model, lift the nozzle boot start lever or push the grade select button. The nozzle boot switch will turn on and the unit price displays of the product(s) not selected will show dashes.

The dispenser will reset. The sale display will show all eights, then blanks, then the money and volume display will reset to zero. As set in function programming, 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.

3. Dispense product.
4. Return the nozzle to the nozzle boot, or depending on model, lower the start lever and return the nozzle to the nozzle boot.

Note: 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.

4.4 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.

4.5 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 4.7. **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.

4.6 Resetting After All Stop

This section only applies to models connected to a Wayne 2400 MCS, Wayne Plus or Nucleus system. Pressing the All Stop key on one of these systems 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.
- **Nucleus** - All fueling points will display the Stop Sign icon. Press All Start.

4.7 Error Codes

The severity level of errors are set in Programming Function F39. Error codes are displayed in Statistical Functions S21 and S22. Depending on how function programming is set, the error may be logged and the dispenser may continue operation, the error may be logged and that sale is terminated or that side of the dispenser is shut down, or both sides are shut down. When the side (or both) are shut down, the dispenser must be reset by cycling power or the fault condition must be 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.

4/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

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.

4.8 Customer Activated Terminal (CAT)

The dispenser may be equipped with Customer Activated Terminals (CATs) for credit/debit card transactions at the dispenser. Normal operation of the CAT requires the rest of the components in a complete card processing system. However, the CAT self-test procedure provided in the back of this manual can be performed independent of the card processing system. For more details, refer to the manuals provided with the card processing system.

4.9 Stand-alone Operation

Note: For extra security on dispensers not equipped with the local authorize keyswitch, a jumper on the sales/volume display board may have been removed at initial startup of the dispenser. This jumper must be in place at location J5 on back lower right of the display board before the dispenser can be put into the stand-alone mode of operation.

Vista series dispensers may be placed in stand-alone operation - not operated by a control system. All nozzles must be hung up before performing the following procedure. To set the dispenser in stand-alone, function F01 and its 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 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 mode operated by the pump control system.
7. Press **UP** to increment the value of function *1.02* by one, followed by **ENTER**, or press **#** and type **2** followed by **ENTER** (*2* means that the filling mode is Stand-alone Mode, dispenser not operated by 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.

5 OPERATOR MAINTENANCE

5.1 Preventive Maintenance

Adhere to the safety precautions on the inside cover and in Section 1.3 of this manual when performing preventive 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.

Take the following precautions:

- Do not abuse the hose by trying to stretch it to reach an automobile. This will cause early failure at the couplings.
- Do not use pipe sealant (pipe dope) on hose/nozzle threads on dispensers equipped with vapor recovery assist systems.
- Do not spray the dispenser with pressurized water. Pressurized water from a power washer or even a garden hose may cause the water to enter the electronic enclosure.

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 leaks or defects repaired immediately.
- 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. See Section 5.3 for specific cleaning procedures.
- 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 to ensure that the flipper up inside the nozzle boot, or the up/down side level, depending on model, operates freely. Also see Section 3.11.

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.

NOTE: Replacement fuel filters must be UL recognized. Typically, gasoline filters are rated at 10 microns.



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.

- 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.

5.3 Dispenser Cleaning Procedures

Dispenser cleaning should be done frequently and in the manner outlined below. We can not stress enough that regular care of the dispenser is the most important element of the cleaning procedure. It prevents dirt and liquids from permeating the surface materials and forming stains that can only be removed with more abrasive and aggressive cleaning methods.

NOTE: Do not use pressurized water (even from a garden hose) to wash or rinse off a dispenser. Under no circumstance should power washers be used to clean a dispenser. 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.

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

PAINTED SURFACES

Wayne dispensers built prior to 2002 were painted with a standard paint. Cleaning these dispensers may require a higher level of cleaning (see cleaning levels below). In 2002 Wayne switched to using automotive grade paint on all painted surfaces of our dispensers. As such, they can be maintained in the same fashion as one would maintain your personnel vehicle. The cleaning process level for all Wayne dispensers is based on the amount of dirt or stains on the dispensers. We recommend starting with level one and moving to the second and third levels only as necessary.

Dispenser Cleaning Process

Wayne recommends using one of the below listed cleaning level for maintaining your dispensers. As with maintaining any painted surface the climate and surrounding environment will be a factor in how often you need to clean your dispensers.

There are three levels in the cleaning process. The first level describes the standard cleaning process for dispensers. Levels two and three describe the process for cleaning dispensers that have persistent and stubborn stains. Wayne strongly recommends you begin cleaning your dispensers using the level one process. If stains are still present you may need to move to level two or three depending on the degree of the stains.

- Level One

The first step should be to wash the dispensers using a non-abrasive cloth, warm water, and a mild household cleaner. Dishwashing liquids with 'degreasing' agents, such as *Dawn*, work well to remove most of the dirt that accumulates on the dispenser.

After the above cleaning process, be sure to wipe down the entire dispenser with a clean cloth and clean water. Cleaning residue left on the dispenser will actually attract dirt and lead to a graying effect.

- Level Two

The second step, aimed at removing persistent stains, is to use a more aggressive, non-abrasive household cleaner, such as *409*, or non-abrasive industrial cleaners, such as *Simple Green*.

After the above cleaning process, be sure to wipe down the dispenser with a clean cloth and clean water.

5.3 Dispenser Cleaning Procedures, continued

- Level Three

The third step, only for the most stubborn of stains, is to use mildly abrasive cleaners, such as *Soft Scrub*. Afterwards, be sure to wipe down the dispenser with a clean cloth and clean water.

Periodic waxing of the dispenser surfaces is essential to maintain the original finish and inhibit corrosion. Painted surfaces should be waxed with an automotive wax or polish.

GLASS AND CLEAR PLASTIC SURFACES

Glass and clear plastic surfaces can be cleaned as in the first step. A household glass cleaner, such as *Windex*, can also be used. It is important that nothing abrasive is used on these surfaces. Please use extra caution during levels two and three cleaning to avoid contact with display windows. Should the more aggressive cleaners come in contact with the displays, please wash with water immediately.

STAINLESS STEEL SURFACES

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

Two cleaners in particular are very effective and practical to use on these surfaces: *Zud Heavy Duty Cleaner* and *Bar Keepers Friend*. They can 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.

NOTE: It is important to wipe down the dispenser with a clean cloth and clear water after every cleaning.

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.

Note: No chlorine based cleaners can be used on the stainless steel, especially, if the dispenser is installed in a marina environment.

5.4 Vapor Recovery

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

Do not use pipe sealant (pipe dope) on hose/nozzle threads on dispensers equipped with vapor recovery assist systems. Pieces of the pipe dope may become lodged in the vapor pump causing the system to be inoperative.

5.4.1 Wayne Vac

See Section 2.14 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 2.13.

5.4.3 Healy Vapor

See information contained in the separate manual supplied with dispensers equipped with Healy vapor recovery systems.

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, service personnel should 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.

5.6 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.

APPENDIX A

QCAT SELF-TEST PROCEDURE

The following are instructions for testing the CAT (Customer Activated Terminal) on the dispenser. 4V dispensers equipped with the CAT use the QVGA display and QCAT board.

1. QCAT SYSTEM SELF-TEST

The following paragraphs provide instructions for testing and setting the address of the QCAT. 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 QCAT.

Step 2 Power up the QCAT while holding down any key on the keypad until the alternating message below appears on the display. If using the alphanumeric keypad, see note on page 57.

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

CONTRAST ADJUST
PRESS NEXT TO EXIT

YES = DARKER
NO = LIGHTER

1.2. QCAT 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 QCAT 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).

Step 3 Verify that the Keypad revision level is displayed on the screen.

Step 4 Press ENTER to continue.

KEYPAD 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

Answering **NO** to the prompt 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.

INVERT INSERTED SIGNAL
(Y/N)

Answer **NO** to the above prompt.

Offline msg: Out
of Service (Y/N)

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

Step 4 Answer the following prompts as they appear:

Fixed Length Scanner?
(Y/N)

1.3 CONFIGURE CARD READER, CONTINUED

SOFT KEY PRESENT? (Y/N)

This prompt should be set to yes only if the dispenser has softkeys along side the QVGA display. On dispensers without softkeys, answer No to the above prompt, otherwise, the numeric keypad will not work when the dispenser is online.

FULL SCREEN MODE? (Y/N)

INITIALIZE FLASH AREA? (Y/N)

Select NO to the above prompt unless installing softkeys for the first time.

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.

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.

At the prompt "Press Key", press each of the Softkeys to verify they are active and installed correctly. The following values should be displayed upon key presses:

Left	Right
34	44
33	43
32	42
31	41
30	40

Note: If values are switched right to left and top to bottom, the softkey cables are reversed.

Press NEXT when finished verifying Softkeys.

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 QCAT 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.

INSERT CARD

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

PULL IT OUT

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

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.

TRACK READ ERROR

CARD READ ERROR

1.7. KEYPAD SELF-TEST

Test the CAT keypad by performing the steps below. For standard keypads (4x5), refer to the Standard Keypad Test table below. For the optional alphanumeric keypad (9x5), refer to the Alphanumeric Keypad Test table.

Complete the following steps to test the keypad.

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

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

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

TABLE 1. STANDARD 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.

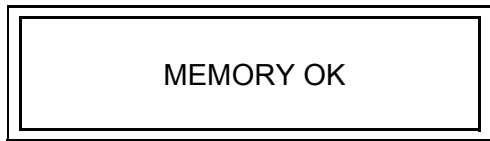
Note: During CAT configuration, use the G, L and Q keys for the Yes, No and Next keys, respectively.

TABLE 2. ALPHANUMERIC KEYPAD TEST

04 CANCEL	14 SPACE	24 A	34 B	44 C	54 D	64 E	74 F	84 F1
03 1	13 2	23 3	33 G	43 H	53 I	63 J	73 K	83 F2
02 4	12 5	22 6	32 L	42 M	52 N	62 O	72 P	82 F3
01 7	11 8	21 9	31 Q	41 R	51 S	61 T	71 U	81 F4
00 CLEAR /NO	10 0	20 ENTER /YES	30 V	40 W	50 X	60 Y	70 Z	80 HELP

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

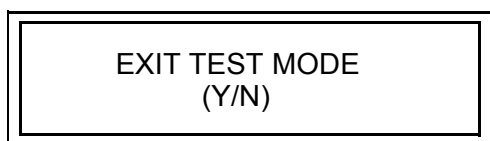
Once the system successfully completes the memory self-test, the exit prompt shown below appears on the screen.

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.



This completes the QCAT self-test.

APPENDIX B

IX CAT SELF-TEST PROCEDURE

1. Press reset button on the iX board.

Note: A screen will be displayed showing “iX ” with an activity bar moving across the bottom of the screen. When the activity bar has completed, the screen becomes dark briefly and then the screen prompts System Initializing is displayed for a several few seconds, Dispenser Manager Initializing is displayed briefly and then the Screen Contrast. If there are no softkeys, press Yes, No or Cancel on the keypad as appropriate during this procedure.

Refer to the iX CAT Software Installation manual, part number 920880, if more details are needed on the above screen sequence or if iX CAT software installation is required.

2. At the “One Moment Please” prompt, immediately press and release softkey 2 (left side 2nd down) or press 1 on the keypad for QVGA without softkeys.

Note: If you miss the prompt, the screen will stay on the “Dispenser Manager Starts” message for several seconds and then go back to the online prompt screen, or to the offline prompt if the POS is offline.

Note: Softkey 1 is upper left softkey, softkey 5 is upper right softkey.

3. Press Yes softkey at the prompt “Want to Test Bezel Devices”. This will begin the diagnostic test.
Note: At startups, always select YES to this prompt and test the peripheral devices.

4. At the Softkey Test screen, verify each softkey is working properly by pressing each softkey and then press the Cancel softkey after the test.

5. At the Keypad Test screen, press each key and verify each digit shows on the display. Press Cancel softkey when finished and the *Card Reader test* will begin.

6. At the “Please Insert Card or Press Cancel” prompt, insert a card or scan a bar code and the screen will display: “Track #1 Data: %# # # # # #.....#
“Track #2 Data: %# # # # # #.....#

At this point, pressing the Help softkey will allow you to insert another card or scan a bar code and/or press Cancel and the *Printer test* will automatically print a receipt, and the Printer Status window will display “Printer online” or “Printer offline”.

7. The Pump Test CAN Bus Test screen will be displayed. This screen will verify that the CAN bus is working properly by displaying the following information:

“Pump Rev __
Nozzle Status __
Grade Selected __

Note: If the pump iGEM software revision number, for example 50.00, is not displayed after the “Pump Rev”, the CAN bus connections may be faulty, disconnected, or side A and B may be set backwards.

iX CAT Self Test Procedure, continued

8. Press Yes or No at the “Want to Configure DM” prompt.

If No is pressed, the self-test ends and the screen prompt sequence in step 12 occurs.

If Yes is pressed, the Contrast screen is displayed, see step 9.

9. Press Cancel or press the appropriate #1, #2, #5 or #6 softkeys to change QVGA screen Contrast and press Cancel.
10. Press Yes or No at the “Softkey Enable Mode to POS” screen.
11. Enter the dispenser Fueling Point number, via the keypad, and press Cancel at the prompt “Please enter F. P. press Cancel when done”.

Note: **IP Address is assigned automatically** (via xml file) when the F.P. number is entered.

At this point, the self-test ends, a configuration report will print, and the system will reboot.

12. After the screen prompt Dispenser Manager Starts is displayed for several seconds, the One Moment Please, Dispenser Manager Starts, and Dispenser Offline prompts are displayed briefly, and then the screen will go to the online prompt screen, or to the offline prompt if the POS is offline.

This completes the self-test procedure.

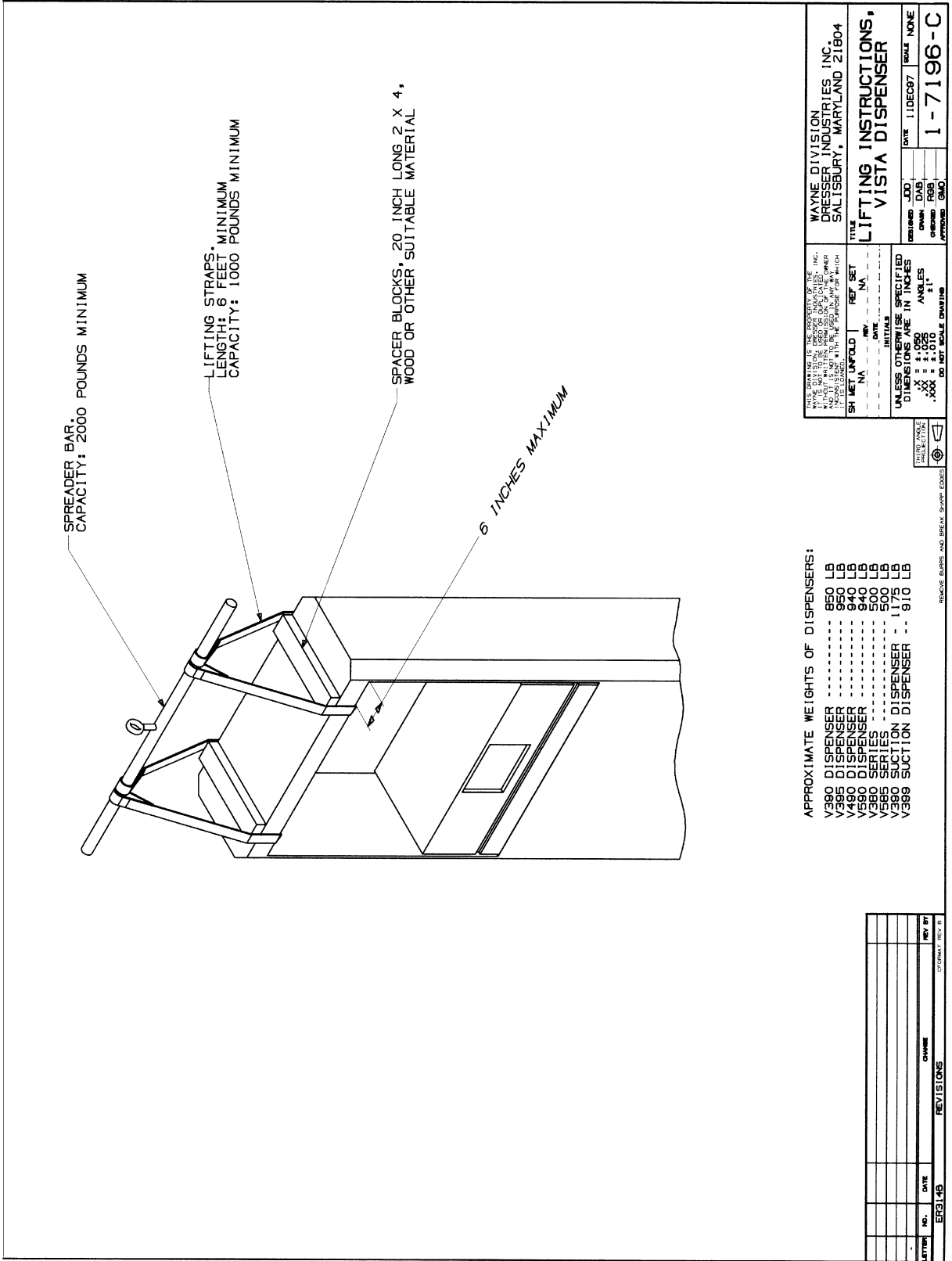
APPENDIX C ENGINEERING DRAWINGS

4/Vista models have the **same base layouts** (footprints) and **installation wiring** in the junction box as the 3/Vista models; therefore, the drawings in this section are the same drawings used with the 3V models and show front views of the 3V 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
4/V390D, 4/V390D/U	Remote	1-7243-C	Footprint
4/V590D/U, 4/V595D/U	Remote	2-7243-C	Footprint
4/V399D, 4/V394D	Remote	3-7243-C	Footprint
4/V490D/U	Remote	4-7243-C	Footprint
4/V387D	Remote	5-7243-C	Footprint
4/V388D, 4/V389D	Remote	6-7243-C	Footprint
4/V580D, 4/V585D	Remote	7-7243-C	Footprint
4/V595D, except D/U	Remote	8-7243-C	Footprint
4/V490D, except D/U	Remote	9-7243-C	Footprint
4/V590D, except D/U	Remote	10-7243-C	Footprint
4/V591D	Remote	11-7243-C	Footprint
4/V590P/U, 4/V595P/U	Suction	9-7193-C	Footprint
4/V390P, 4/V390P/U	Suction	10-7193-C	Footprint
4/V399P	Suction	11-7193-C	Footprint
4/V591P, 4/V595P, except P/U	Suction	12-7193-C	Footprint
4/V387P	Suction	13-7193-C	Footprint
4/V389P	Suction	14-7193-C	Footprint
4/V580P, 4/V585P	Suction	15-7193-C	Footprint
4/V390D, except D/U	Remote	1-7157-C	Wiring Diagram
4/V389D, 4/V399D	Remote	2-7157-C	Wiring Diagram
4/V490D	Remote	3-7157-C	Wiring Diagram
Blenders, except 591D, 595D	Remote	4-7157-C	Wiring Diagram
4/V387D	Remote	5-7157-C	Wiring Diagram
4/V591D, 4/V595D, except D/U	Remote	10-7157-C	Wiring Diagram
4/V390D/U	Remote	13-7157-C	Wiring Diagram
4/V390P	Suction	6-7157-C	Wiring Diagram
4/V389P, 4/V399P	Suction	9-7157-C	Wiring Diagram
4/V590P/U, 4/V595P/U	Suction	19-7157-C	Wiring Diagram
		-7151-C	Typ Disp Site Wiring

The drawings in this section show front views of the 3V models. See paragraph text on the previous page.



APPROXIMATE WEIGHTS OF DISPENSERS:
 V390 DISPENSER 950 LB
 V395 DISPENSER 950 LB
 V380 DISPENSER 940 LB
 V380 SERIES 500 LB
 V385 SERIES 500 LB
 V380 SUCTION DISPENSER 1,175 LB
 V399 SUCTION DISPENSER 910 LB

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SH MET UNFOLD | REF SET
 DIM. INCHES | DIM. MILLIMETERS
 INITIALS DATE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
 FRACTIONS ARE IN 16ths
 DECIMALS ARE TO 2 DECIMAL PLACES
 ANGLES ARE TO 1°
 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
 FRACTIONS ARE IN 16ths
 DECIMALS ARE TO 2 DECIMAL PLACES
 ANGLES ARE TO 1°
 DO NOT SCALE DRAWING

WAYNE DIVISION
 DRESSER INDUSTRIES, INC.
 SALISBURY, MARYLAND 21604

TITLE: **LIFTING INSTRUCTIONS, VISTA DISPENSER.**

DATE: 11DEC97

SCALE: NONE

DESIGNED: JDO
 CHECKED: DAB
 DRAWN: RBB
 APPROVED: GMD

1-7196-C



REV	NO.	DATE	CHANGE	REV BY

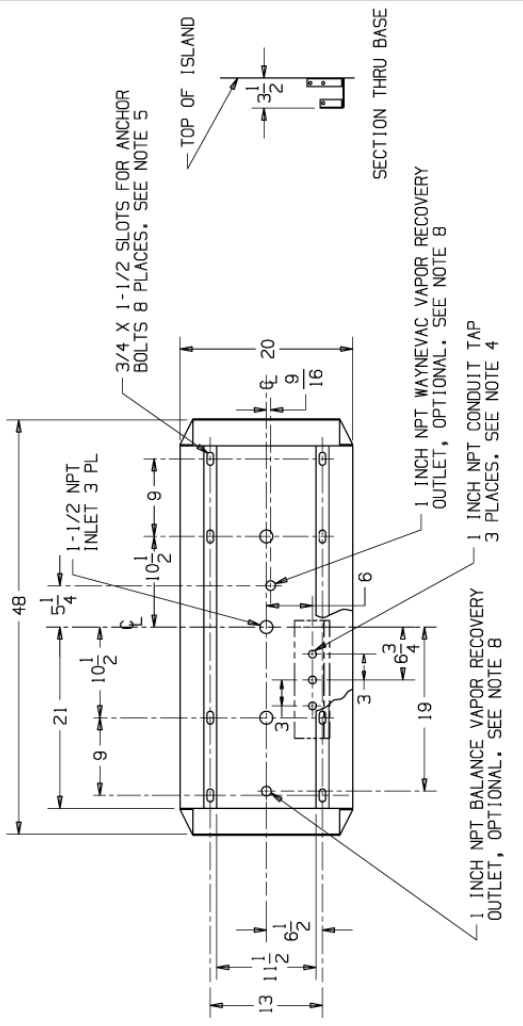
REVISIONS

FORM 1 REV. 2

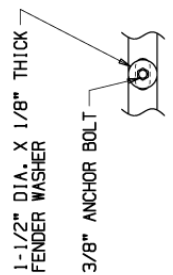
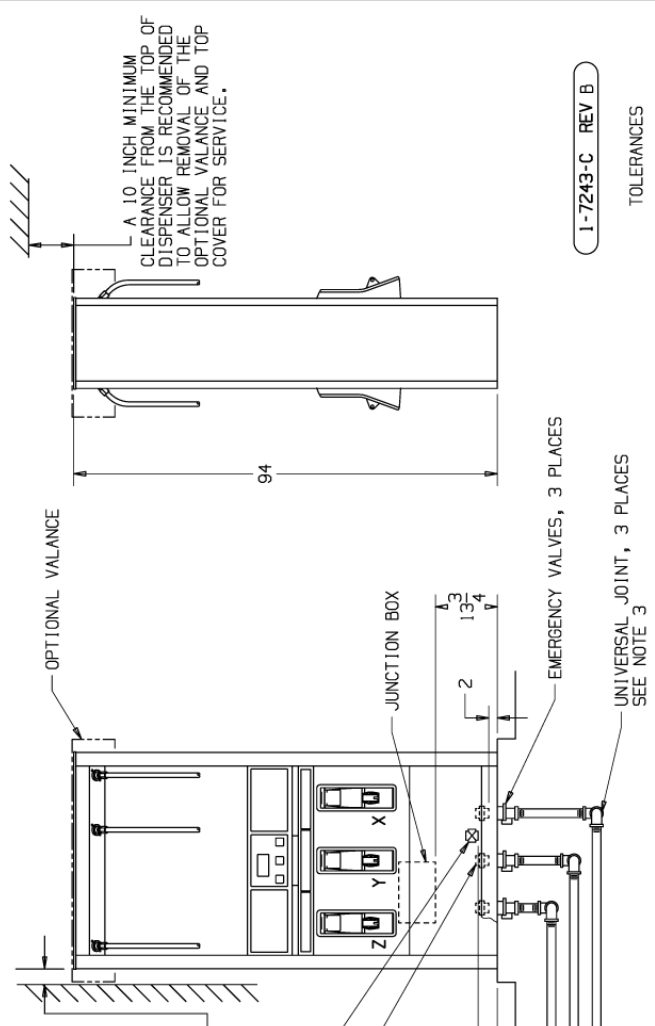
Figure C-1. 1-7196-C Vista Field Lifting Instruction

NOTES:

- 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.
- PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
- USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
- USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
- FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
- 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.
- 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.
- BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS



ANCHORING DETAIL

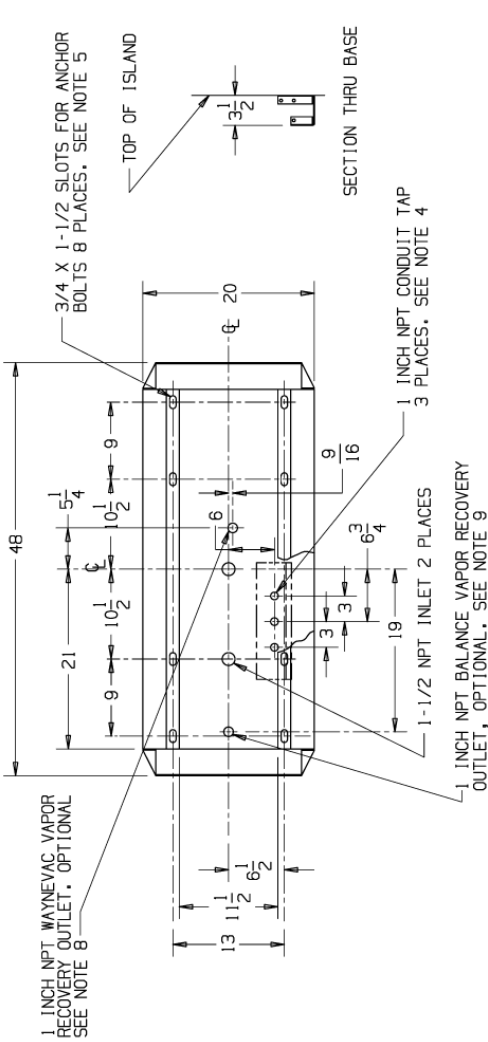
PRODUCT ORIENTATION:

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.

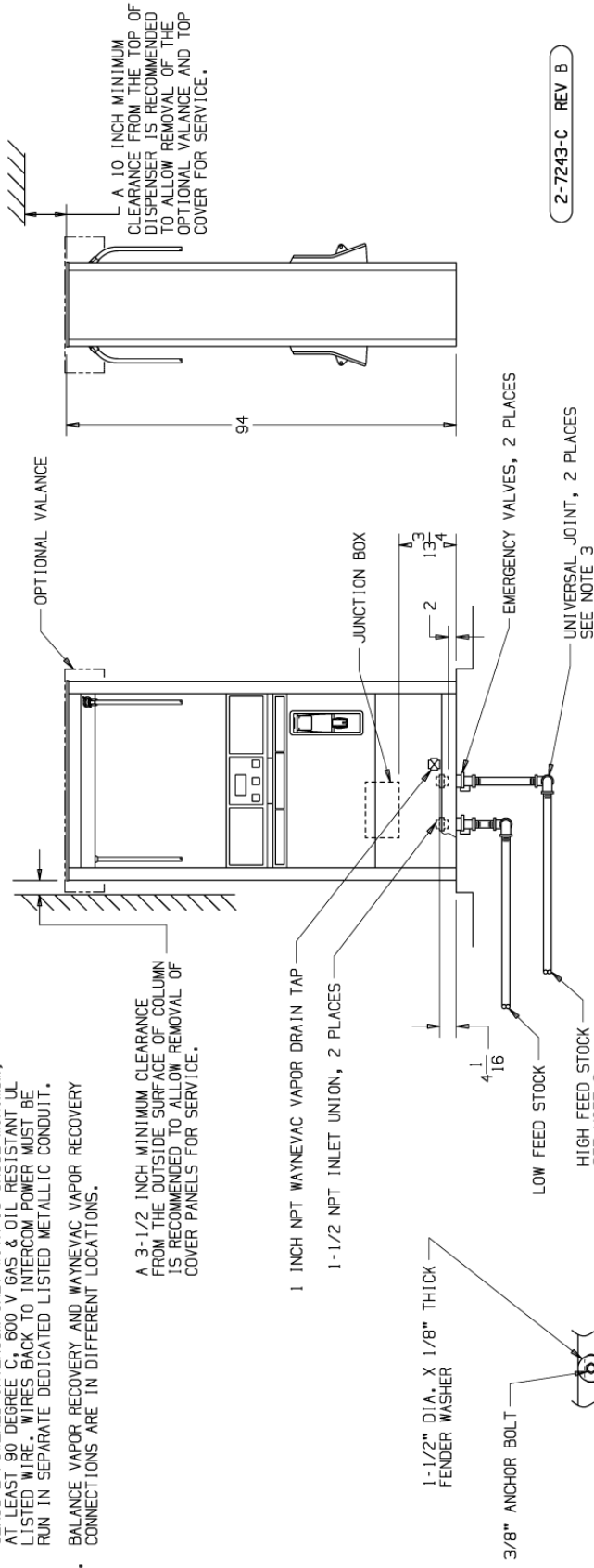
Figure C-2. 1-7243-C Installation Instructions - 4/V390D and 4/V390D/U (Remote)

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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS IS RECOMMENDED.
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



2-7243-C REV B

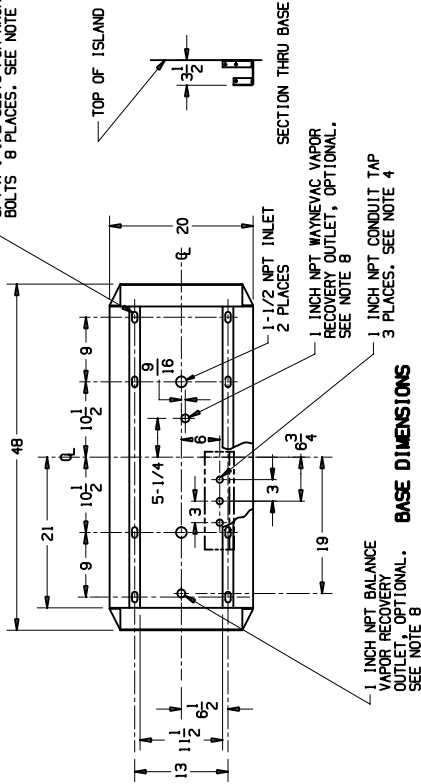
TOLERANCES
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

JUNCTION BOX SIDE
3/4 V590D/U SHOWN

Figure C-3. 2-7243-C Installation Instructions - 4V590D/U and 4V595D/U (Remote)

3/4 X 1-1/2 SLOTS FOR ANCHOR BOLTS 8 PLACES, SEE NOTE 5



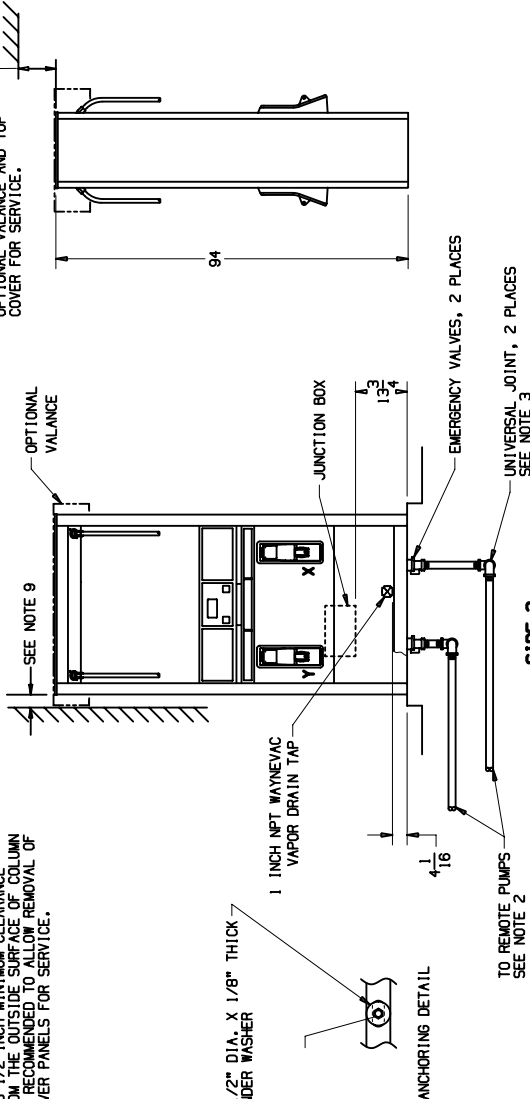
TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

BASE DIMENSIONS

NOTES:

1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, ELECTRICAL CODE; NFPA70, "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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS IS RECOMMENDED.
6. EMERGENCY SHUTOFF VALVES AND BREAKAWAY DEVICES ARE EXAMPLES OF REQUIREMENTS STATED IN THE NFPA30, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, ELECTRICAL CODE; NFPA70, "CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT. THESE REQUIREMENTS 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. 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 VAPOR AND TOP COVER FOR SERVICE.



**SIDE 2
JUNCTION BOX SIDE
3/V398**

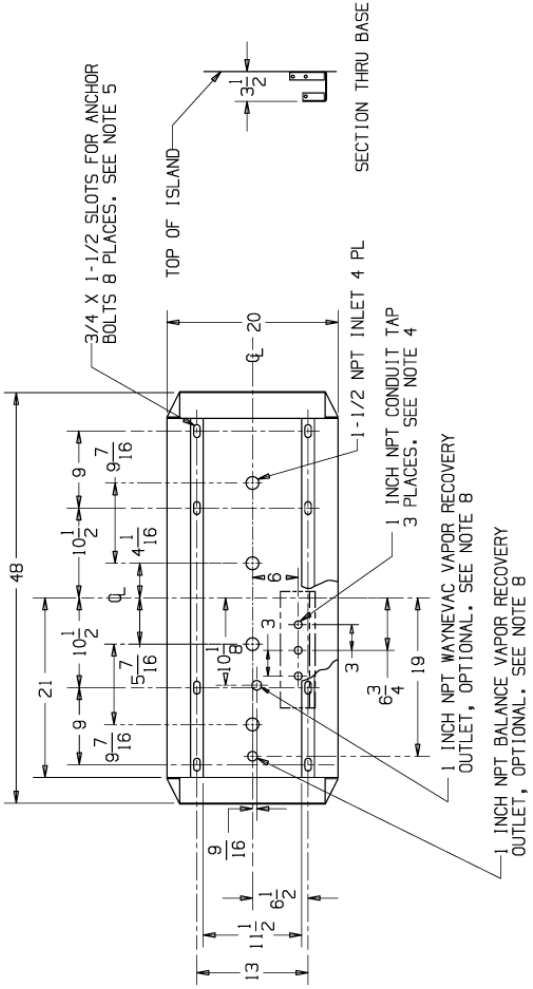
3-7243-C REV D

1 IGBM COMPUTER - 2 FUELING POINTS

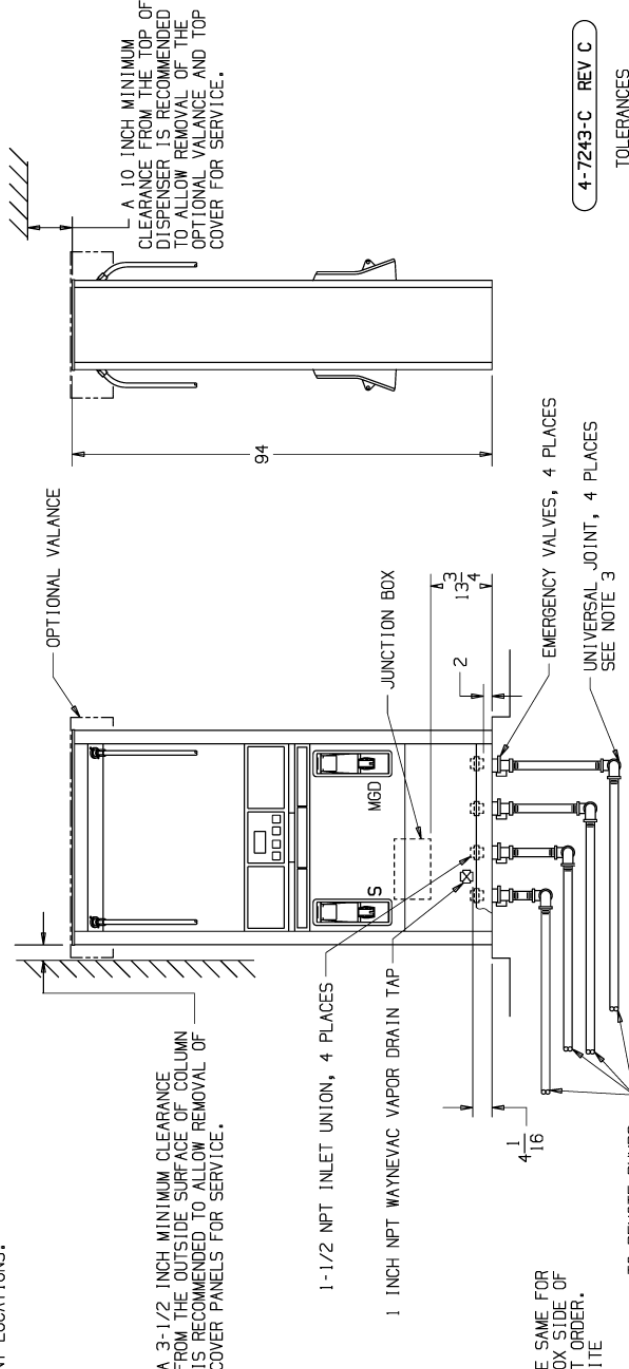
Figure C-4. 3-7243-C Installation Instructions - 4V399D (Remote)

NOTES:

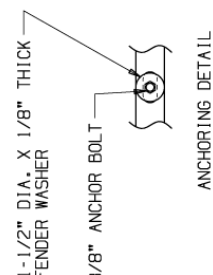
- ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
- PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
- USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
- USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
- FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS IS RECOMMENDED.
- 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.
- 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.
- BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS



JUNCTION BOX SIDE



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 C

TOLERANCES
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

Figure C-5. 4-7243-C Installation Instructions - 4N490D/U (Remote)

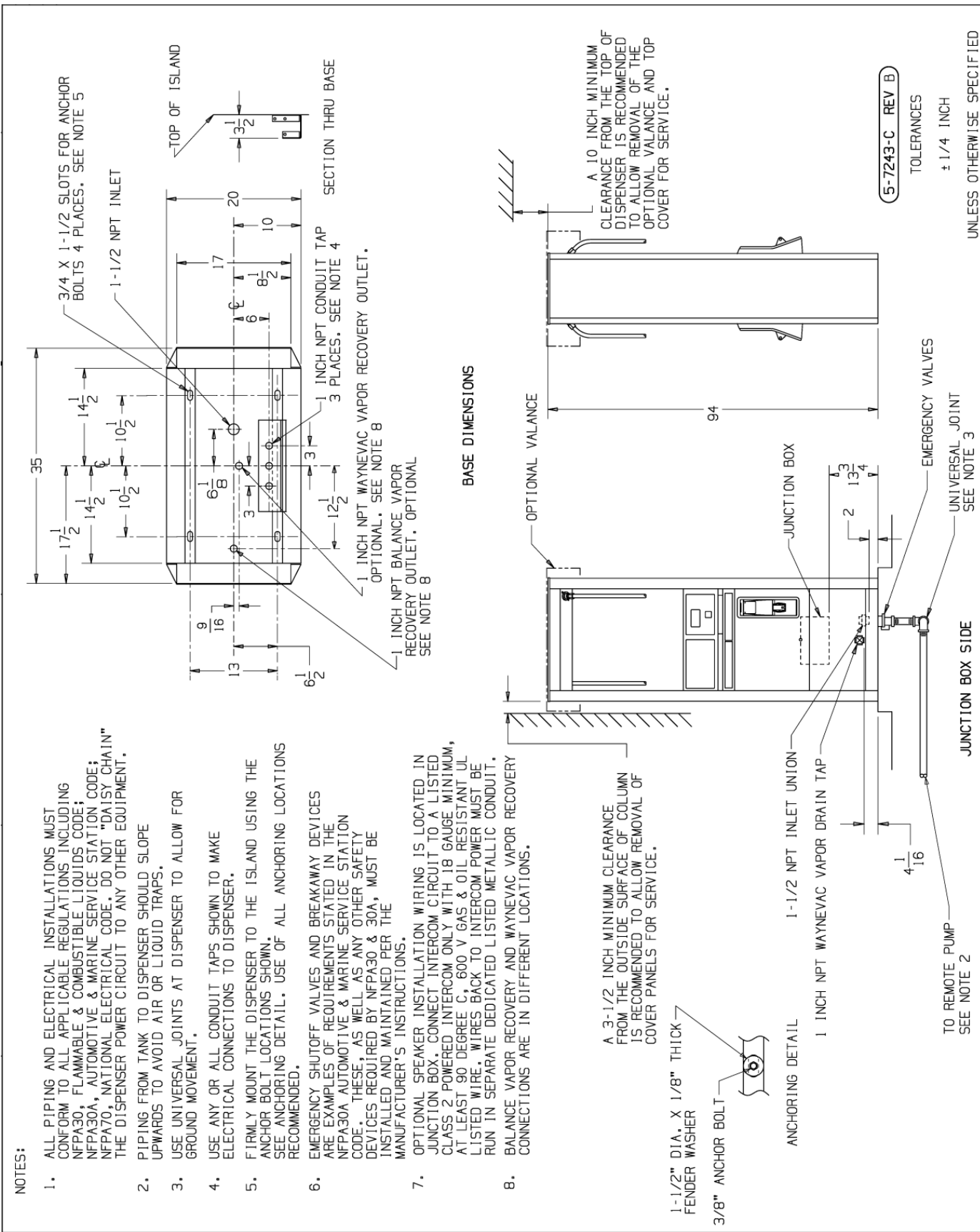


Figure C-6. 5-7243-C Installation Instructions - 4/V387D (Remote)

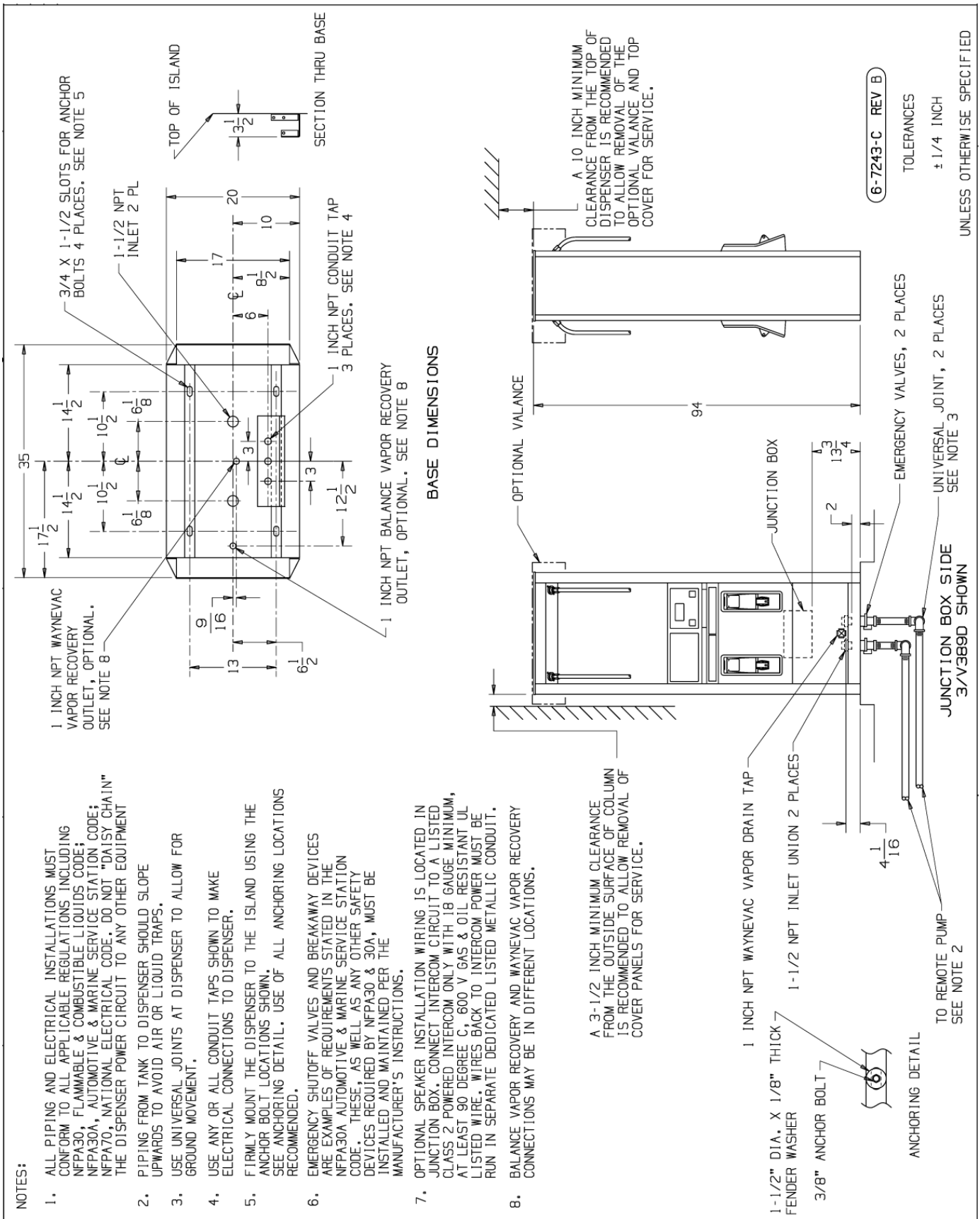
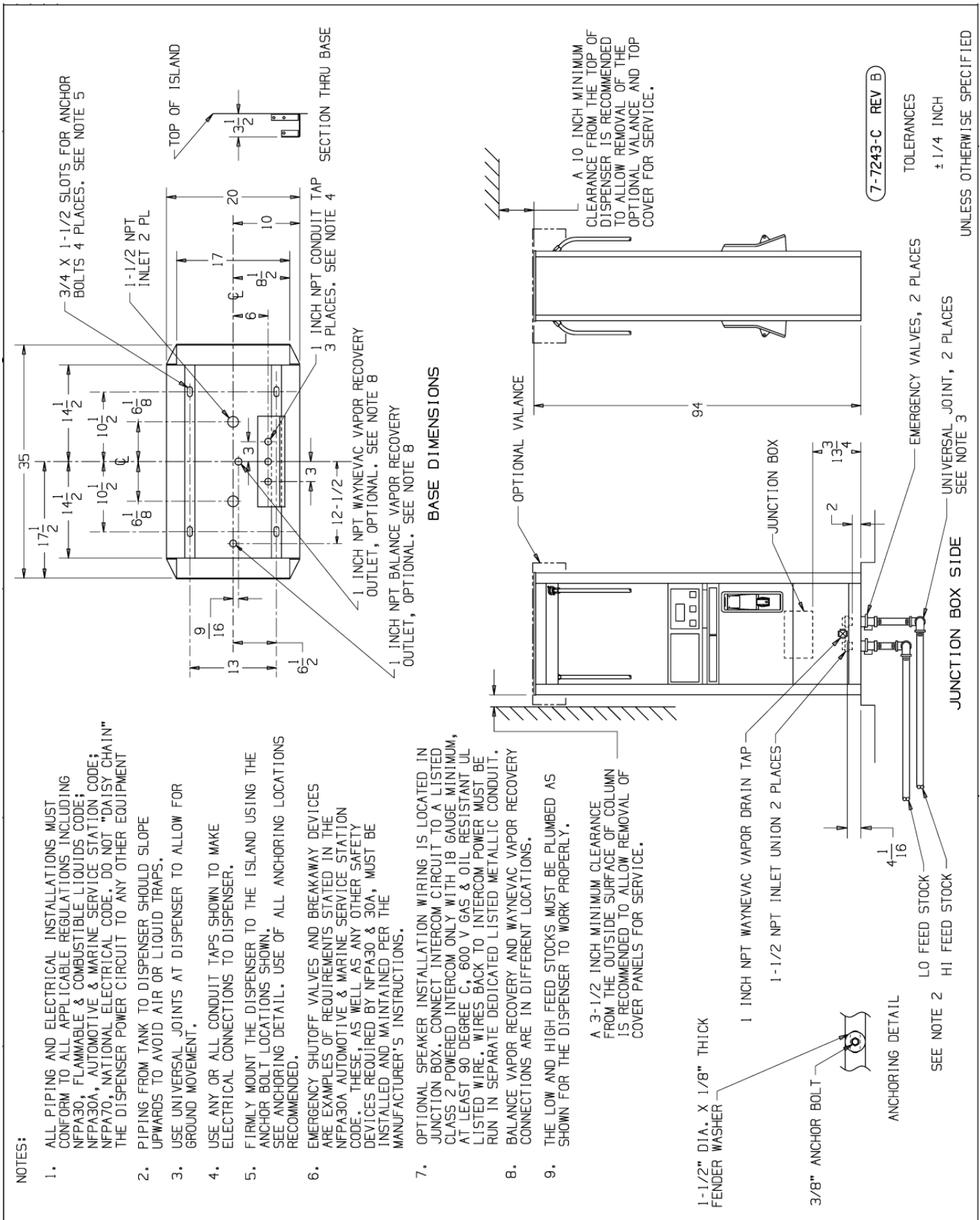


Figure C-7. 6-7243-C Installation Instructions - 4/V388D and 4/V389D (Remote)



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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS IS RECOMMENDED.
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.

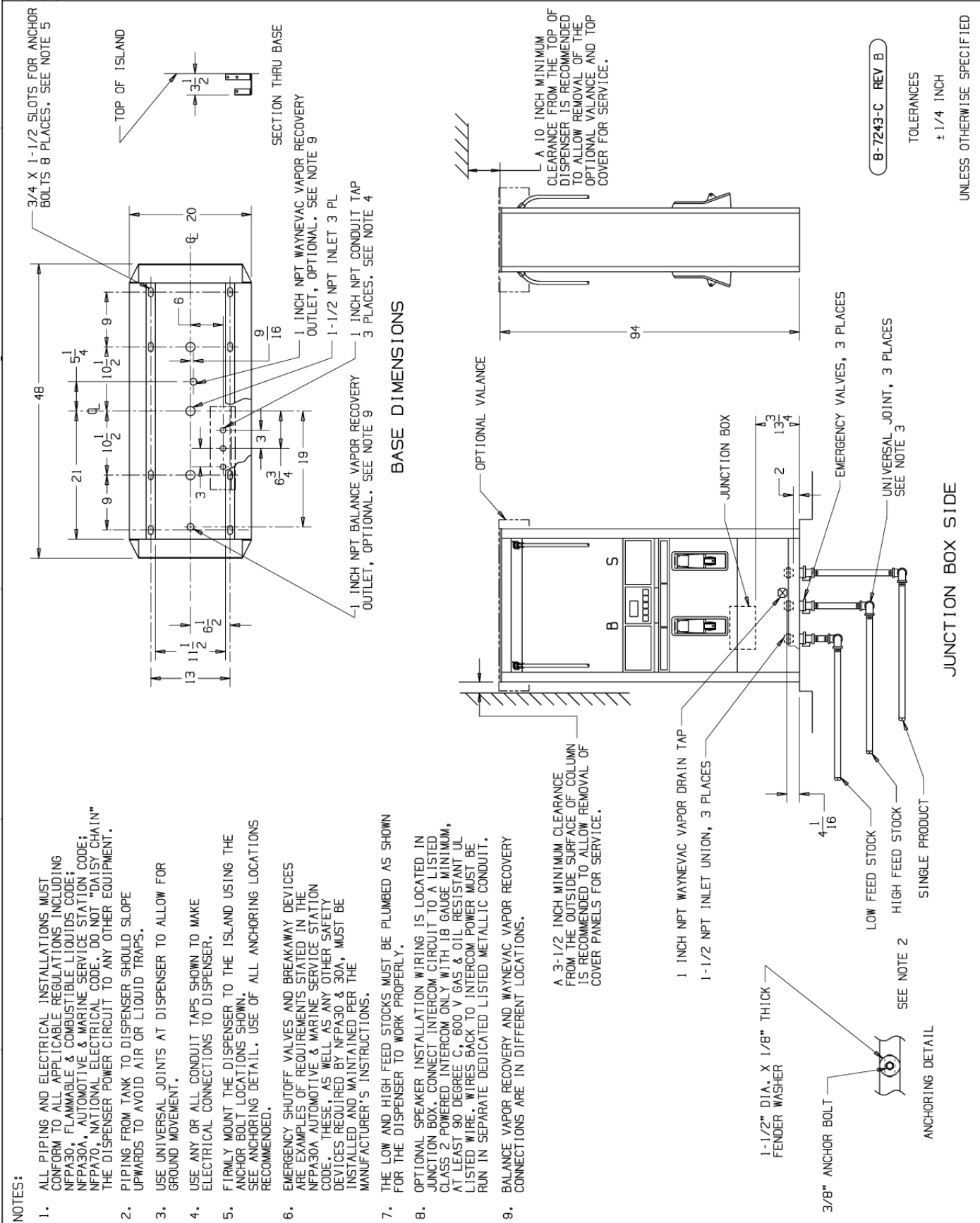
A 3-1/2 INCH MINIMUM CLEARANCE FROM THE OUTSIDE SURFACE OF COLUMN IS RECOMMENDED TO ALLOW REMOVAL OF COVER PANELS FOR SERVICE.

7-7243-C REV B

TOLERANCES
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

Figure C-8. 7-7243-C Installation Instructions - 4/V580D and 4/V585D (Remote)



NOTES:

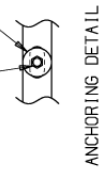
1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. 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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS IS RECOMMENDED.
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.

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, 3 PLACES

1-1/2" DIA. X 1/8" THICK FENDER WASHER

3/8" ANCHOR BOLT



SEE NOTE 2

ANCHORING DETAIL

LOW FEED STOCK

HIGH FEED STOCK

SINGLE PRODUCT

EMERGENCY VALVES, 3 PLACES

UNIVERSAL JOINT, 3 PLACES SEE NOTE 3

JUNCTION BOX

OPTIONAL VALANCE

1 INCH NPT BALANCE VAPOR RECOVERY OUTLET, OPTIONAL. SEE NOTE 9

1 INCH NPT CONDUIT TAP 3 PLACES. SEE NOTE 4

1 INCH NPT WAYNEVAC VAPOR RECOVERY OUTLET, OPTIONAL. SEE NOTE 9

1-1/2 NPT INLET 3 PL

SECTION THRU BASE

3/4 X 1-1/2 SLOTS FOR ANCHOR BOLTS B PLACES. SEE NOTE 5

TOP OF ISLAND

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

94

8-7243-C REV B

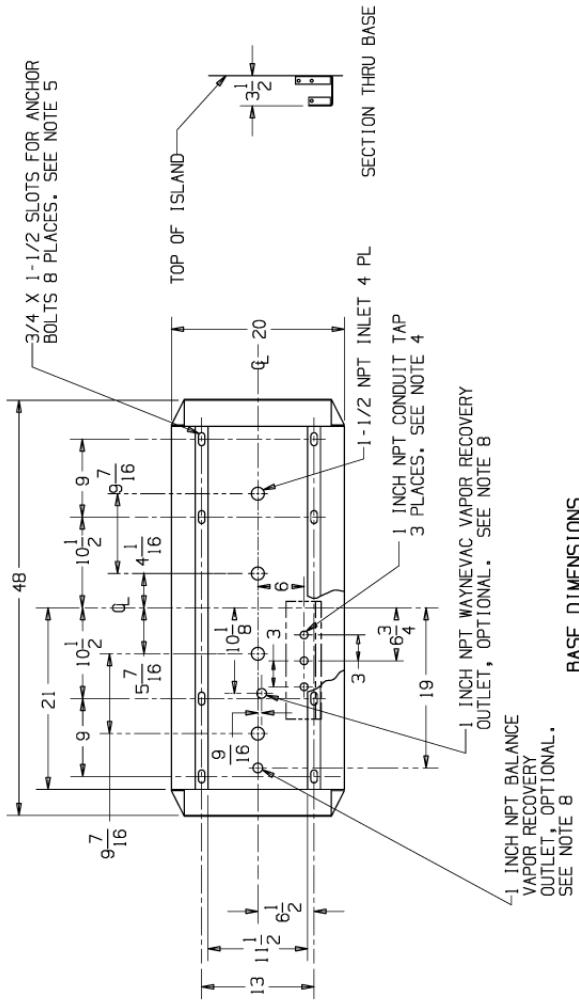
TOLERANCES ± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

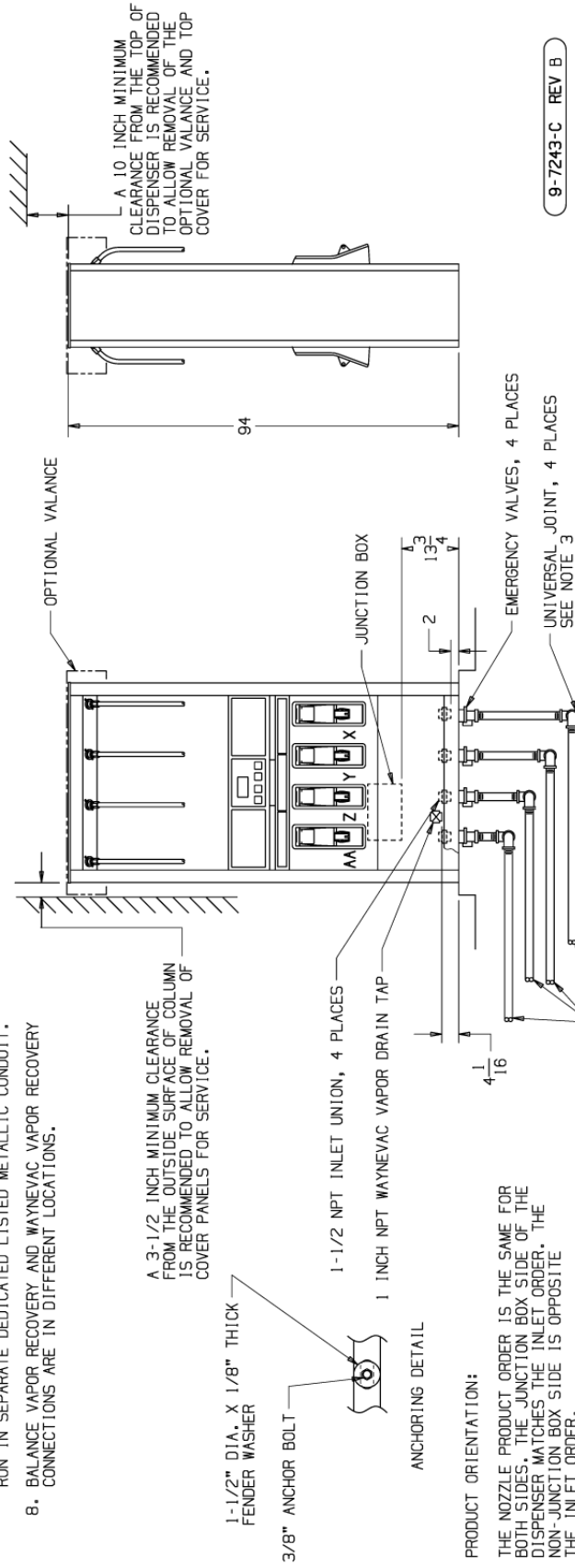
Figure C-9. 8-7243-C Installation Instructions - 4V595D (Remote) - Except 4V595D/U See 2-7243-C

NOTES:

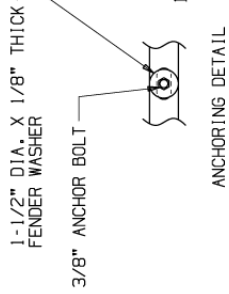
- ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
- PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
- USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
- USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
- FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS IS RECOMMENDED.
- 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.
- 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.
- BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS



TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED



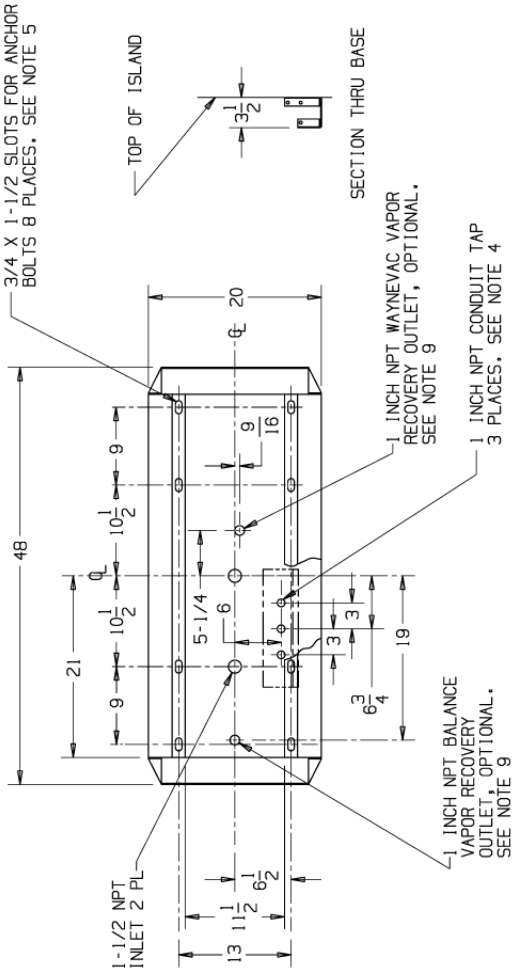
PRODUCT ORIENTATION:

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.

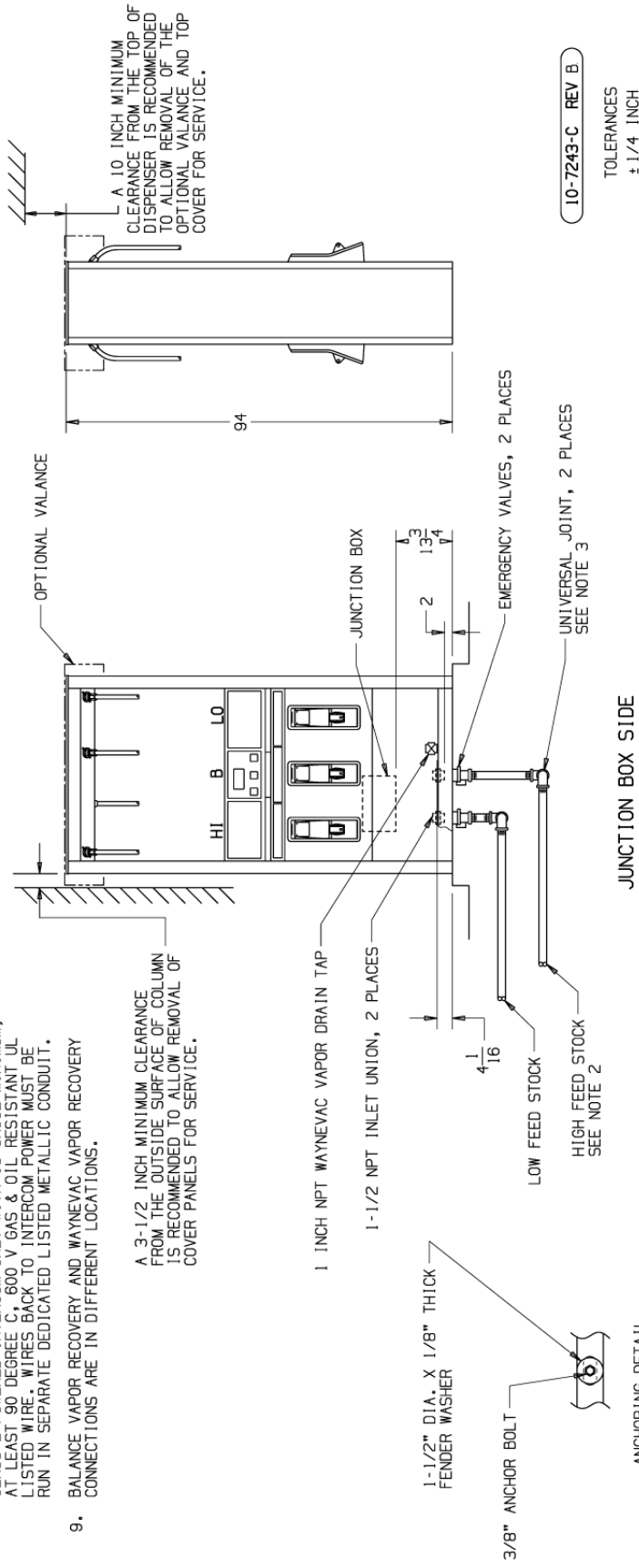
Figure C-10. 9-7243-C Installation Instructions - 4/V490D (Remote) - Except 4/V490D/U See 4-7243-C

NOTES:

- 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.
- PIPING FROM TANK TO DISPENSER SHOULD SLOPE UPWARDS TO AVOID AIR OR LIQUID TRAPS.
- USE UNIVERSAL JOINTS AT DISPENSER TO ALLOW FOR GROUND MOVEMENT.
- USE ANY OR ALL CONDUIT TAPS SHOWN TO MAKE ELECTRICAL CONNECTIONS TO DISPENSER.
- FIRMLY MOUNT THE DISPENSER TO THE ISLAND USING THE ANCHOR BOLT LOCATIONS SHOWN. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
- 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.
- THE LOW AND HIGH FEED STOCKS MUST BE PLUMBED AS SHOWN FOR THE DISPENSER TO WORK PROPERLY.
- 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.
- BALANCE VAPOR RECOVERY AND WAYNEVAC VAPOR RECOVERY CONNECTIONS ARE IN DIFFERENT LOCATIONS.



BASE DIMENSIONS



10-7243-C REV B

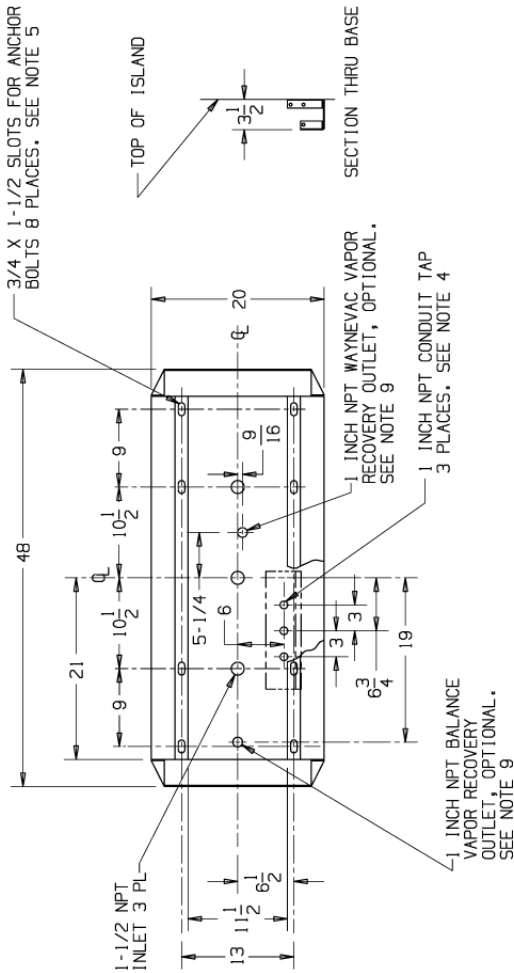
TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

JUNCTION BOX SIDE

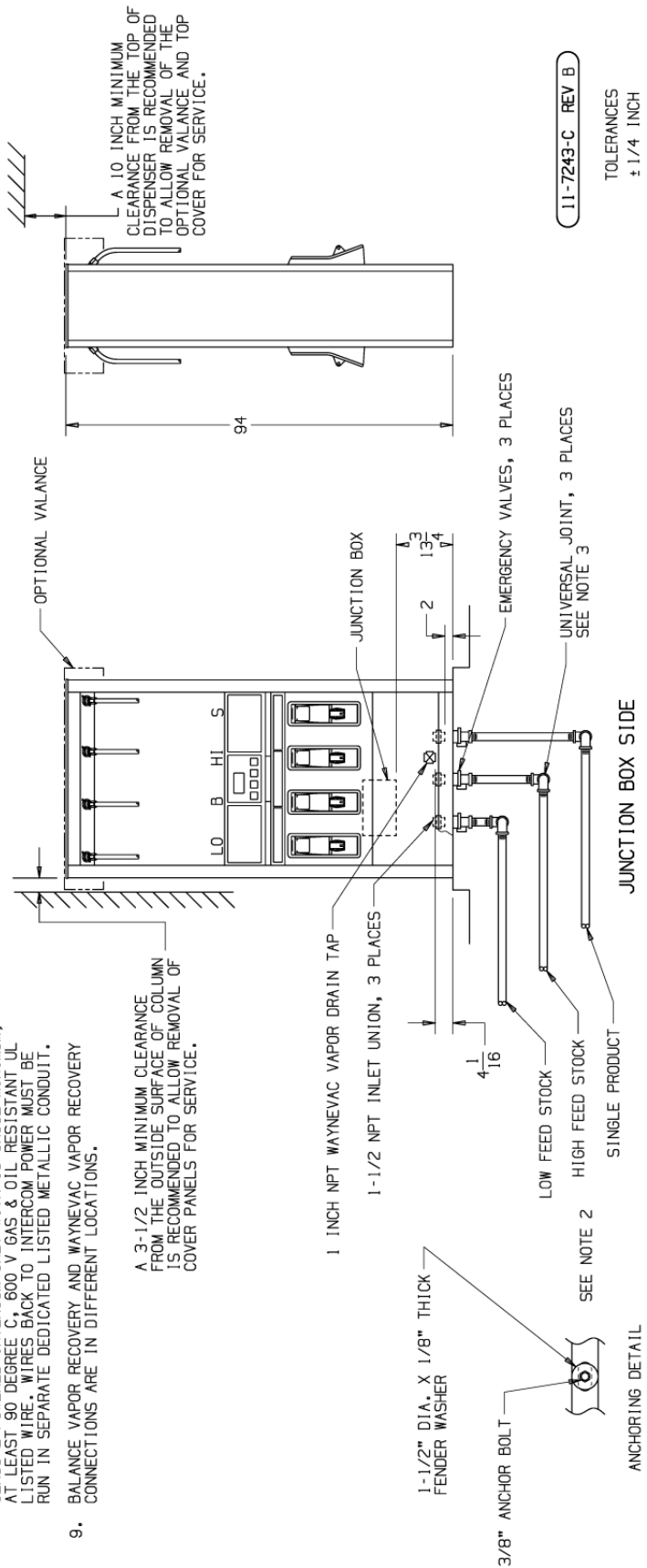
Figure C-11. 10-7243-C Installation Instructions - 4/IV590D (Remote) - Except 4/IV590D/U See 2-7243-C

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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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

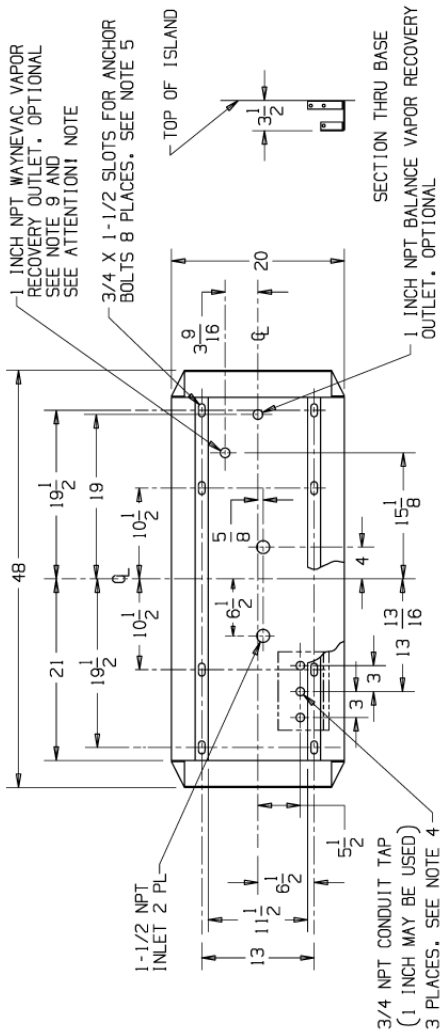


TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-12. 11-7243-C Installation Instructions - 4/V591D (Remote)

NOTES:

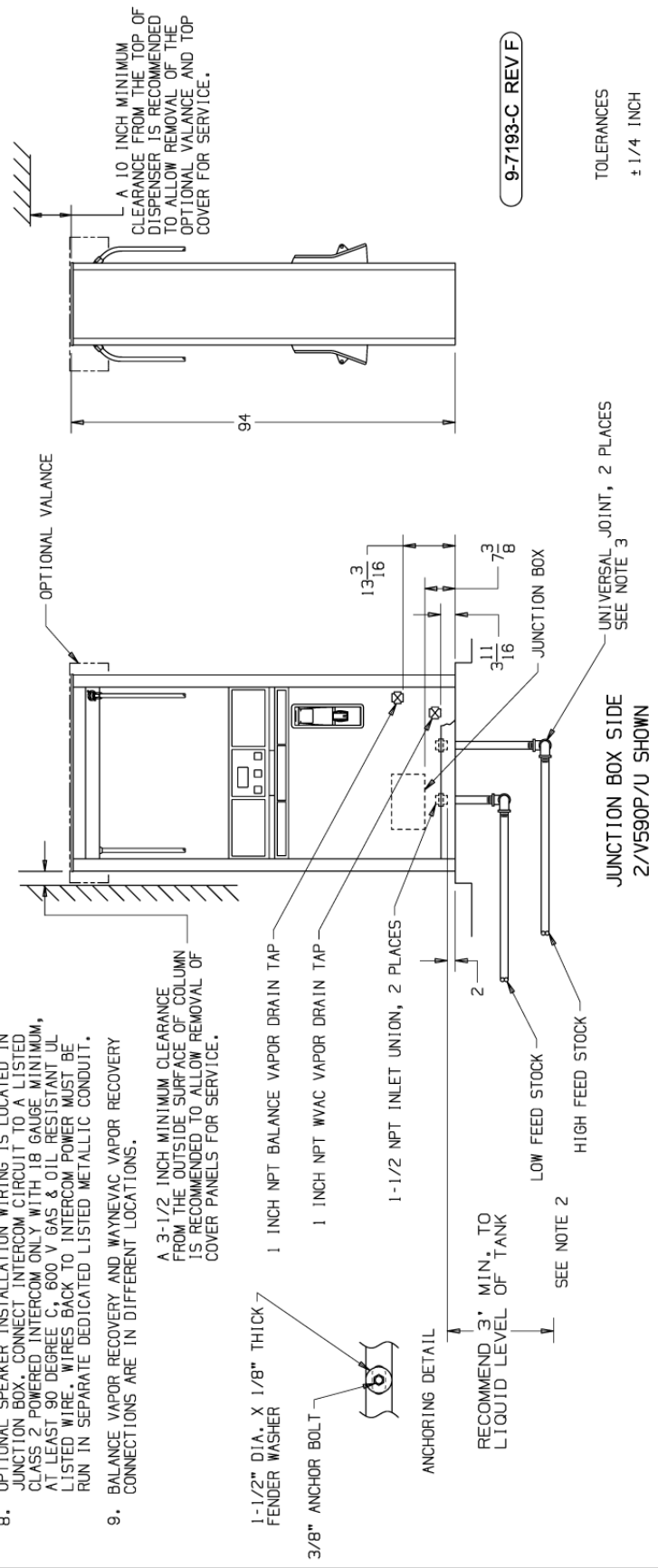
1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS, INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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.



ATTENTION 1

WAYNEVAC VAPOR OUTLET MOVED TO CURRENT LOCATION AS SHOWN ABOVE. EFFECTIVE WITH DISPENSER DATE CODE C00

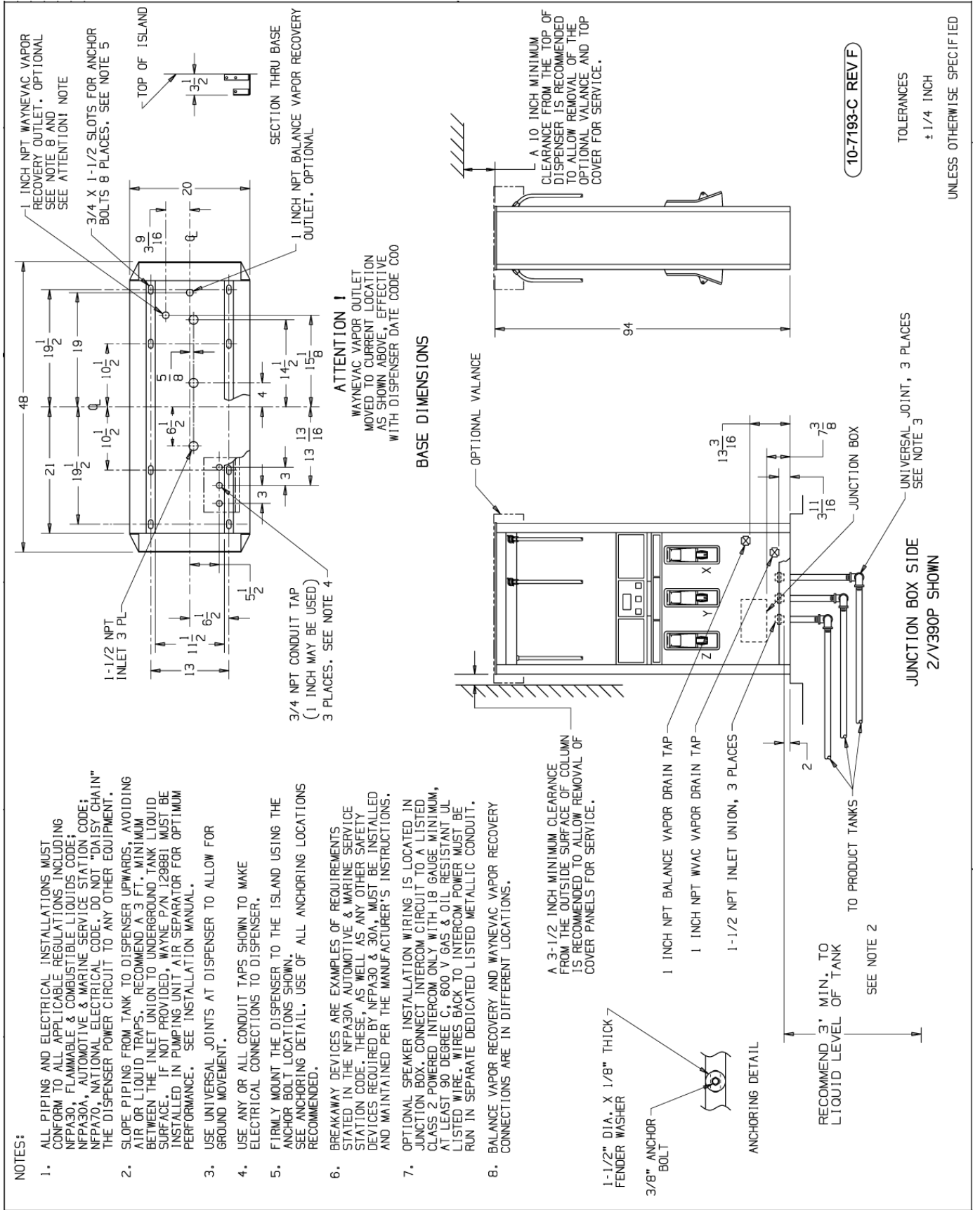
BASE DIMENSIONS



9-7193-C REV F

TOLERANCES ± 1/4 INCH UNLESS OTHERWISE SPECIFIED

Figure C-13. 9-7193-C Installation Instructions - 4/V590P/U and 4/V595P/U (Suction)



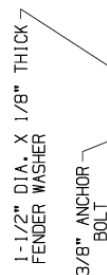
NOTES:

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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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. 800 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.

ATTENTION !
WAYNEVAC VAPOR OUTLET
MOVED TO CURRENT LOCATION
AS SHOWN ABOVE, EFFECTIVE
WITH DISPENSER DATE CODE C00

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.



ANCHORING DETAIL

RECOMMEND 3' MIN. TO LIQUID LEVEL OF TANK
SEE NOTE 2

10-7193-C REV F

TOLERANCES
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

Figure C-14. 10-7193-C Installation Instructions - 4/V390P and 4/V390P/U (Suction)

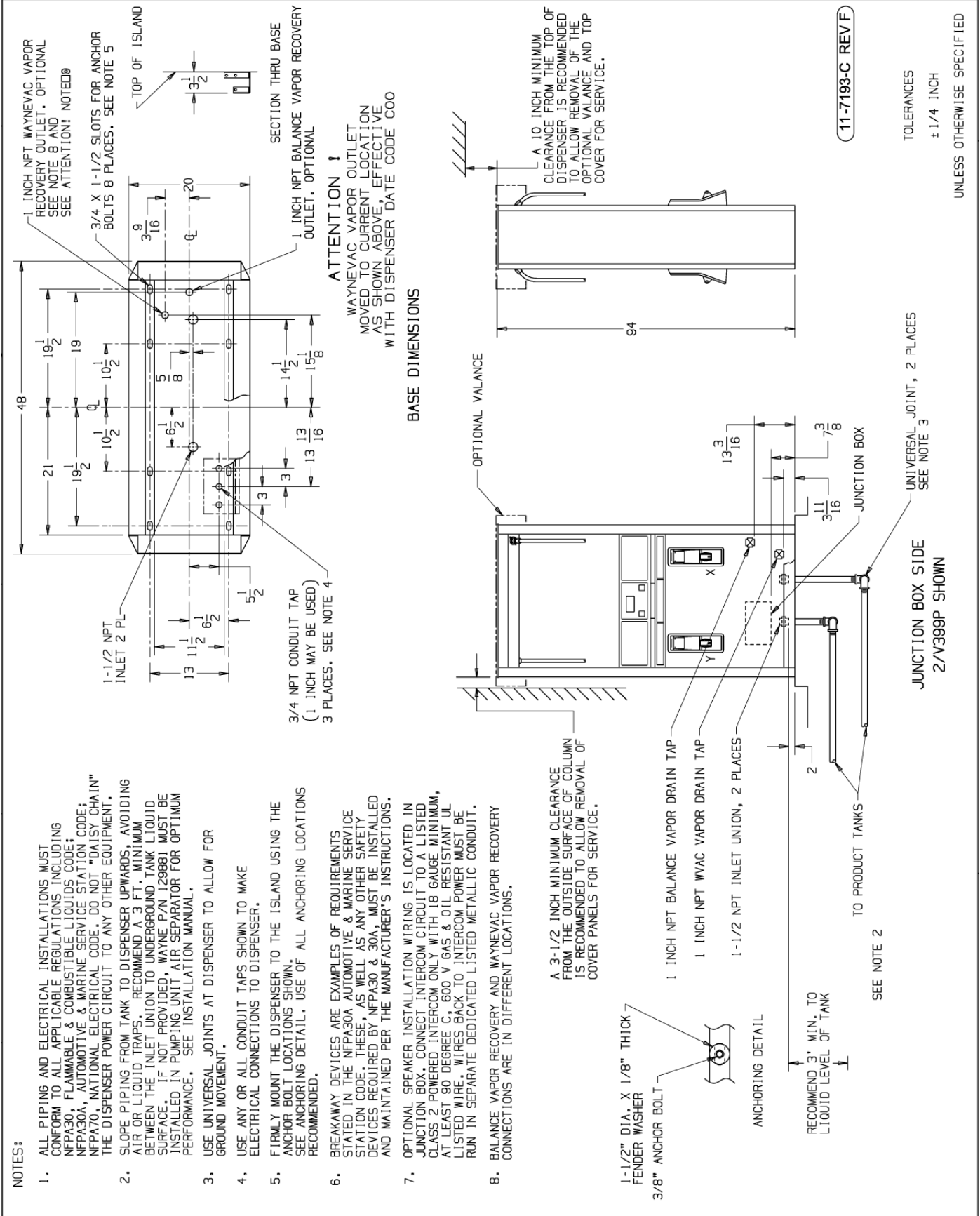
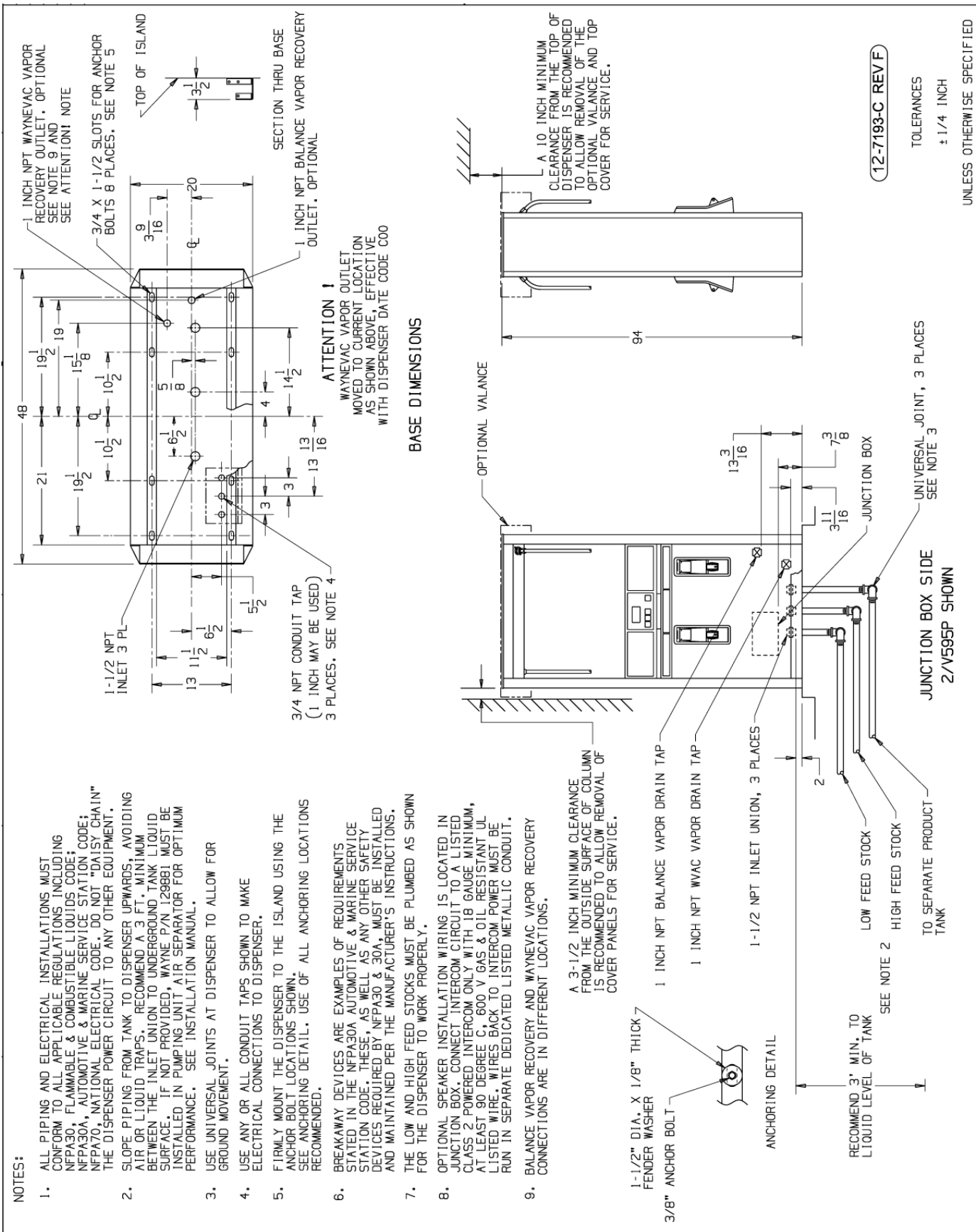


Figure C-15. 11-7193-C Installation Instructions - 4/V399P (Suction)



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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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.

12-7193-C REV F

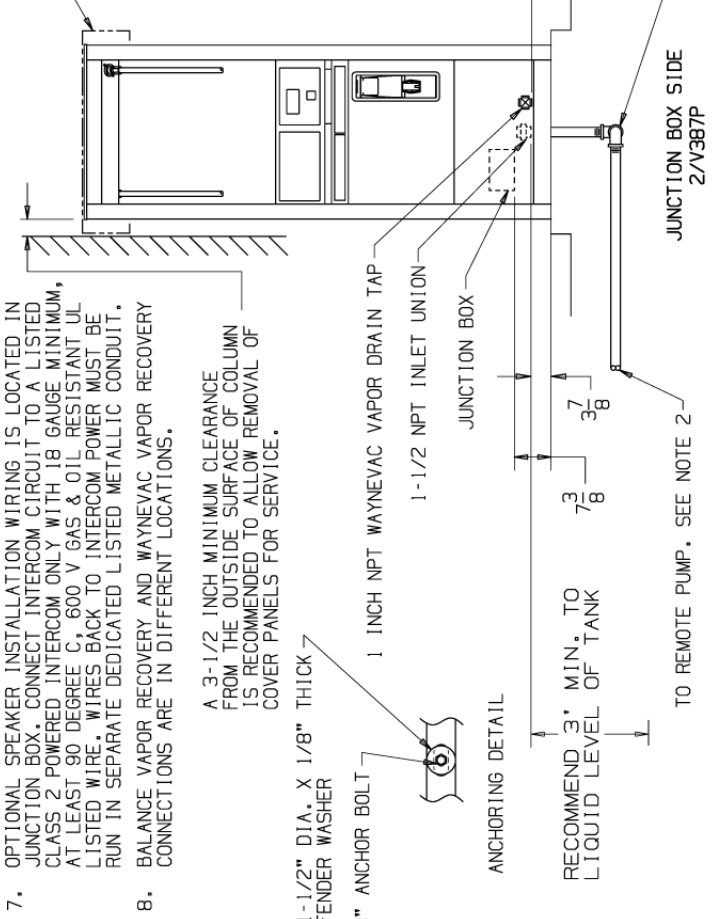
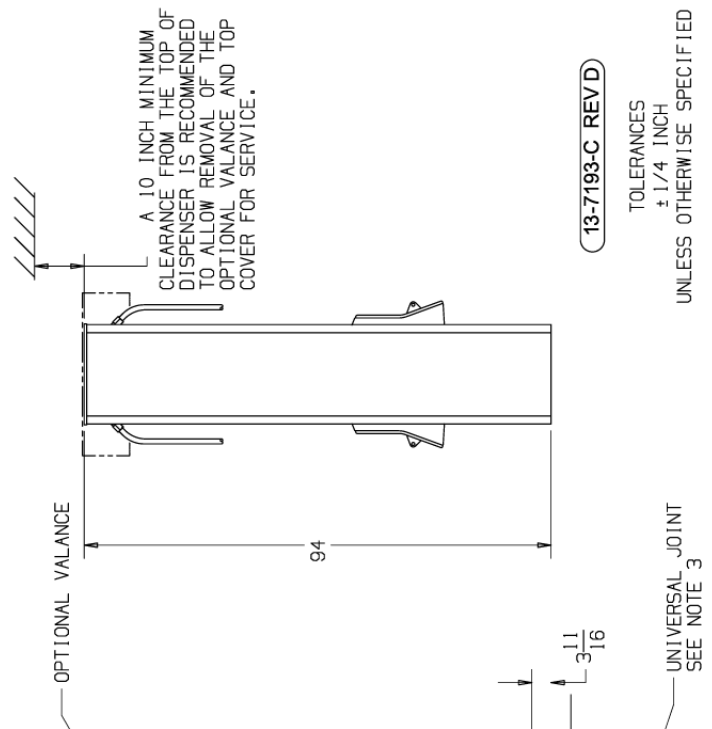
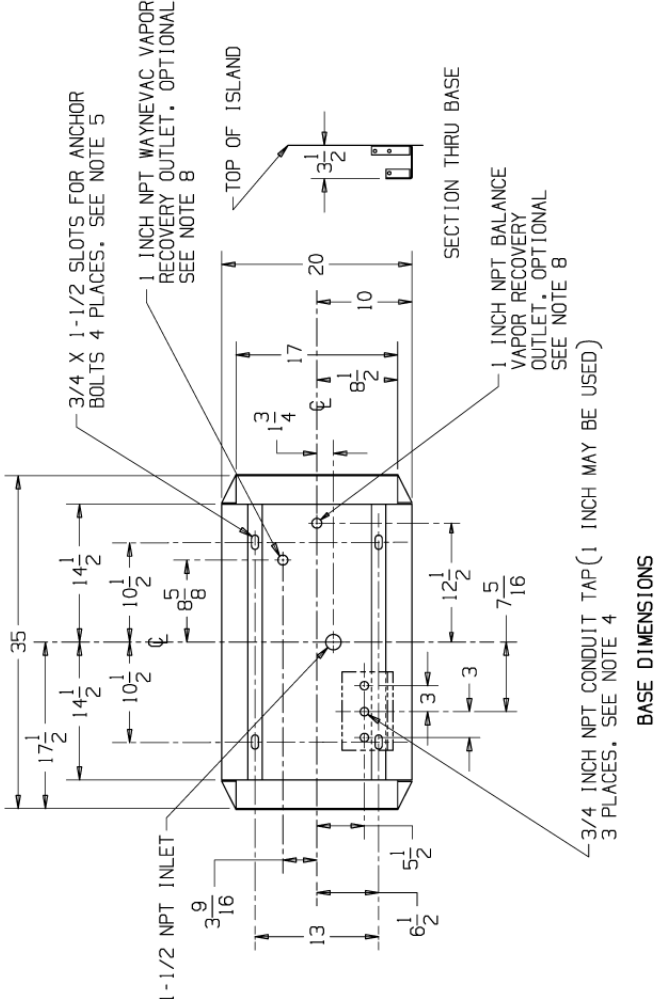
TOLERANCES
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

Figure C-16. 12-7193-C Installation Instructions - 4V591P and 4V595P (Suction) - Except 4V595P/U See 9-7193-C

NOTES:

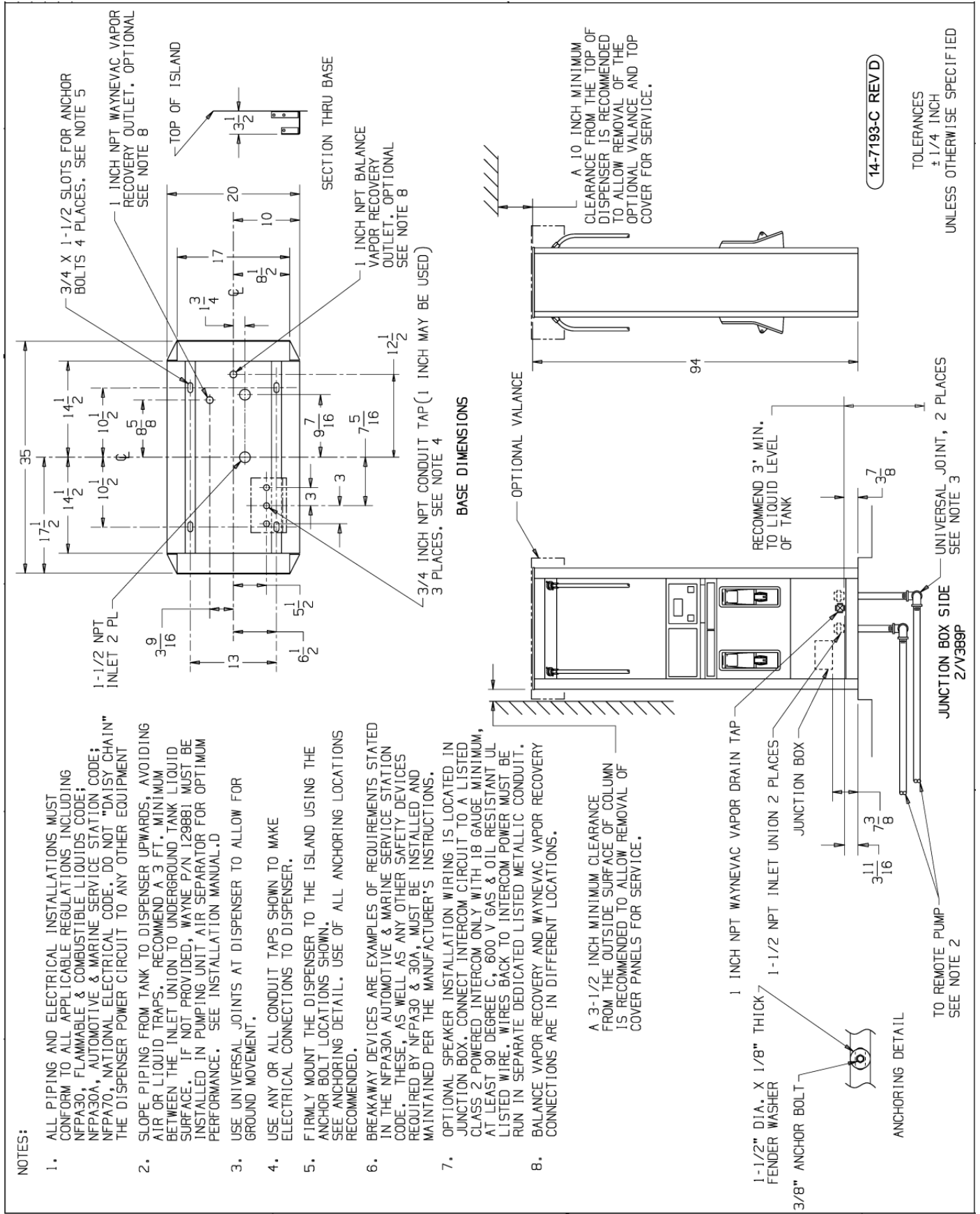
1. ALL PIPING AND ELECTRICAL INSTALLATIONS MUST CONFORM TO ALL APPLICABLE REGULATIONS INCLUDING NFPA30, FLAMMABLE & COMBUSTIBLE LIQUIDS CODE; NFPA30A, AUTOMOTIVE & MARINE SERVICE STATION CODE; NFPA70, NATIONAL ELECTRICAL CODE. DO NOT "DAISY CHAIN" THE DISPENSER POWER CIRCUIT TO ANY OTHER EQUIPMENT.
2. 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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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.



13-7193-C REVD

TOLERANCES
± 1/4 INCH
UNLESS OTHERWISE SPECIFIED

Figure C-17. 13-7193-C Installation Instructions - 4V387P (Suction)



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.D
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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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.

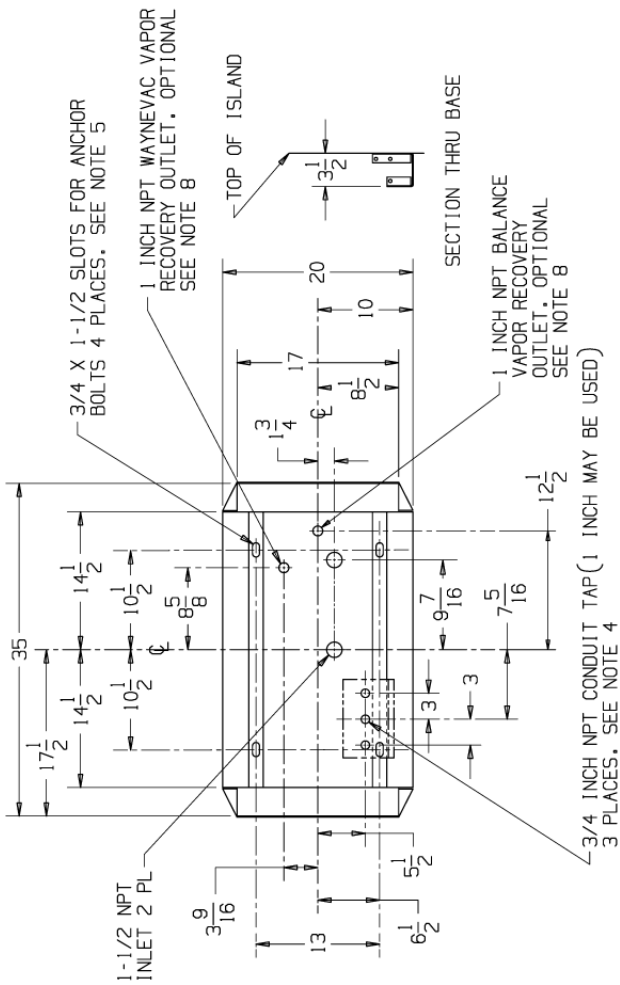
- 1 INCH NPT WAYNEVAC VAPOR DRAIN TAP
- 1-1/2 NPT INLET UNION 2 PLACES
- JUNCTION BOX
- TO REMOTE PUMP SEE NOTE 2
- ANCHORING DETAIL
- UNIVERSAL JOINT, 2 PLACES SEE NOTE 3
- JUNCTION BOX SIDE 2/V389P
- OPTIONAL VALANCE
- OPTIONAL VAPOR RECOVERY OUTLET, OPTIONAL SEE NOTE 8
- 1 INCH NPT BALANCE VAPOR RECOVERY OUTLET, OPTIONAL SEE NOTE 8
- 3/4 INCH NPT CONDUIT TAP (1 INCH MAY BE USED) 3 PLACES. SEE NOTE 4
- 1-1/2 NPT INLET 2 PL
- 3/4 X 1-1/2 SLOTS FOR ANCHOR BOLTS 4 PLACES. SEE NOTE 5
- 1 INCH NPT WAYNEVAC VAPOR RECOVERY OUTLET, OPTIONAL SEE NOTE 8
- TOP OF ISLAND
- SECTION THRU BASE
- BASE DIMENSIONS
- RECOMMEND 3' MIN. TO LIQUID LEVEL OF TANK
- A 10 INCH MINIMUM CLEARANCE FROM THE TOP OF DISPENSER IS RECOMMENDED TO ALLOW REMOVAL OF THE OPTIONAL VALANCE AND TOP COVER FOR SERVICE.
- 14-7193-C REV D
- TOLERANCES ± 1/4 INCH UNLESS OTHERWISE SPECIFIED

Figure C-18. 14-7193-C Installation Instructions - 4/V389P (Suction)

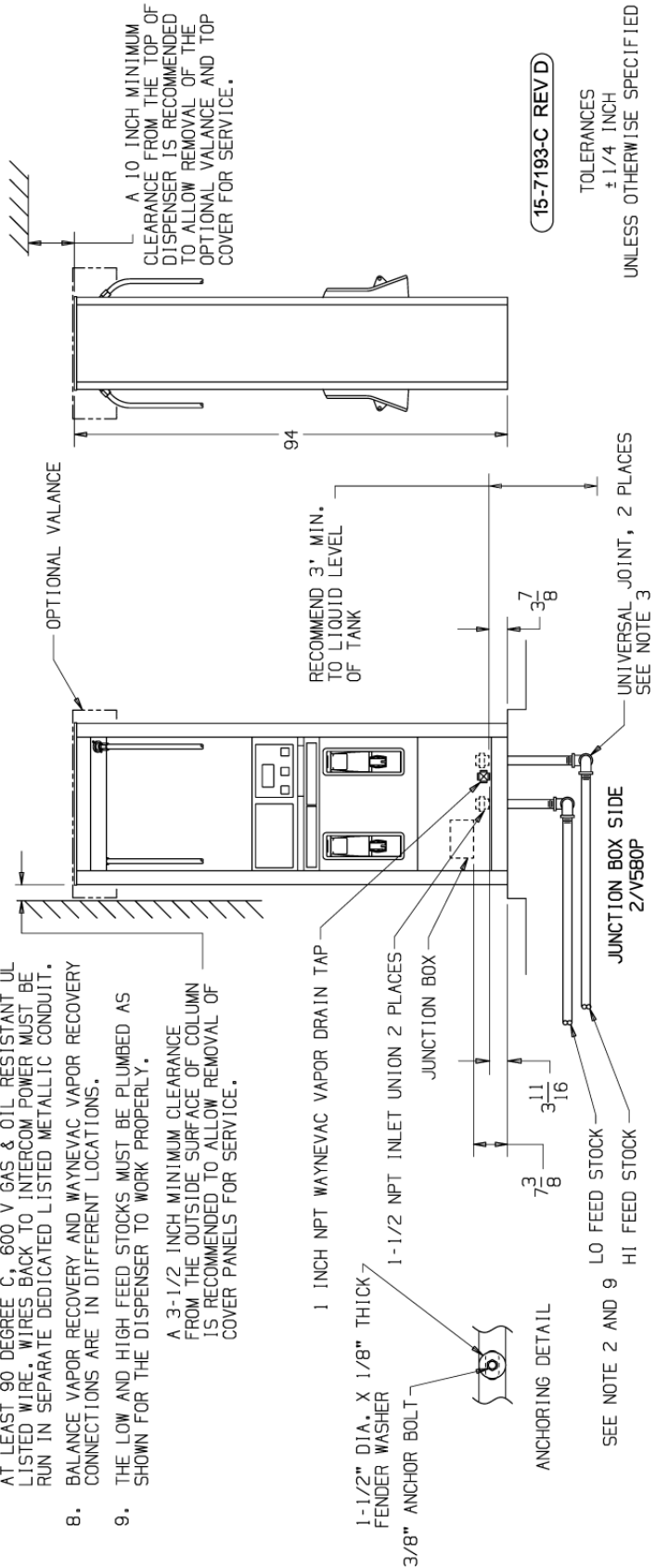
NOTES:

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. SEE ANCHORING DETAIL. USE OF ALL ANCHORING LOCATIONS RECOMMENDED.
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.

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



BASE DIMENSIONS



15-7193-C REV D

TOLERANCES
± 1/4 INCH

UNLESS OTHERWISE SPECIFIED

SEE NOTE 2 AND 9
LO FEED STOCK
HI FEED STOCK
UNIVERSAL JOINT, 2 PLACES
SEE NOTE 3

Figure C-19. 15-7193-C Installation Instructions - 4/V580P and 4/V585P (Suction)

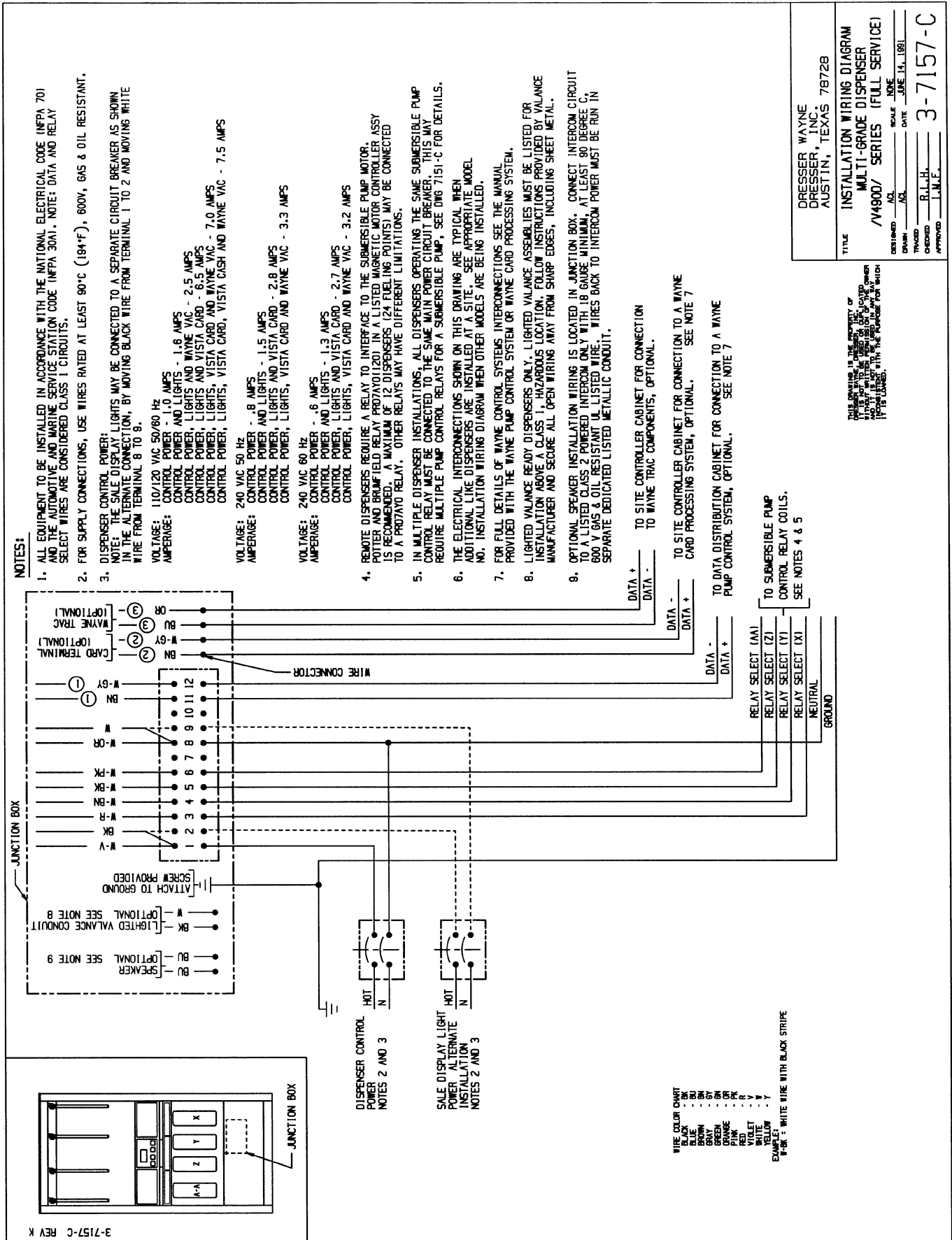
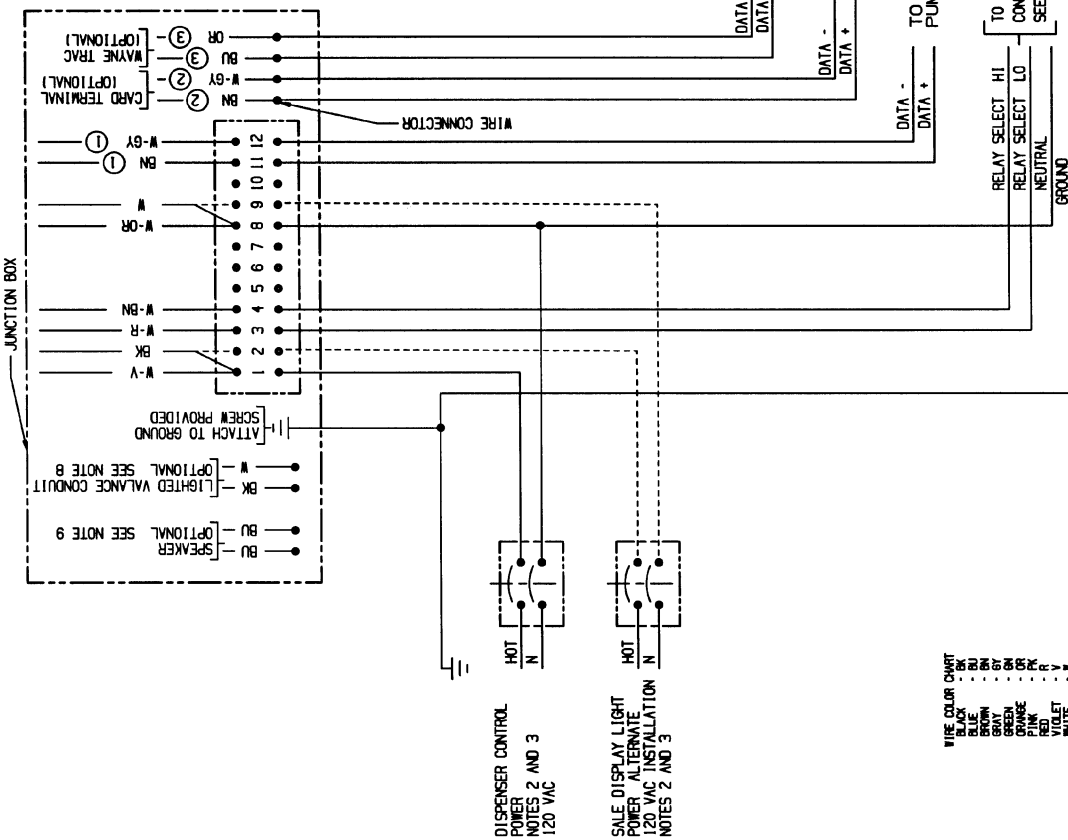


Figure C-22. 3-7157-C Installation Wiring - 4/V490D (Remote)



NOTES:

- ALL EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA 70) AND THE MOTIVE AND MARINE SERVICE STATION CODE (NFPA 30). 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 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 POWER AND BRAINFIELD RELAY (P704) (20) IN A LISTED MAGNETIC MOTOR CONTROLLER ASSEMBLY IS RECOMMENDED. A MAXIMUM OF 12 DISPENSERS (12 PUMPING POINTS) MAY BE CONNECTED TO A P704/0 RELAY. OTHER RELAYS MAY HAVE DIFFERENT LIMITATIONS.
- IN MULTIPLE DISPENSER INSTALLATIONS, ALL DISPENSERS OPERATING THE SAME SUBMERSIBLE PUMP 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, 600 V GAS & OIL RESISTANT UL LISTED WIRE. WIRES BACK TO INTERCOM POWER MUST BE RUN IN SEPARATE DEDICATED LISTED METALLIC CONDUIT.

TO SITE CONTROLLER CABINET FOR CONNECTION TO A WAYNE PUMP CONTROL SYSTEM, OPTIONAL.

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

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

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

WIRE COLOR CHART
 BLACK - BK
 BROWN - BR
 GRAY - GR
 GREEN - GN
 PINK - PK
 RED - R
 VIOLET - V
 YELLOW - Y
 EXAMPLE:
 P-BK : WHITE WIRE WITH BLACK STRIPE

THIS DRAWING IS THE PROPERTY OF DRESSER WAYNE. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREON. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE OTHER PARTY. THIS DRAWING IS TO BE USED IN CONJUNCTION WITH THE PURCHASE FOR WHICH IT IS PREPARED.		DRESSER WAYNE DRESSER, INC. AUSTIN, TEXAS 78728	
SH MET UNFOLD	REF SET	INSTALLATION WIRING DIAGRAM, FIXED-BLEND DISPENSER /V5900, X/V5900/1/V3950/1, I/V5900/GU, XI/V5900/G, I/V580-5850/G SERIES DISPENSERS	DATE: JUNE 14, 1981
NA	DATE	DESIGNED A.D.L.	SCALE
INITIALS	DATE	DRAWN A.D.L.	SCALE
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	ANGLES	CHECKED B.L.L.H.	DATE
.XXX = ±.005	±1°	APPROVED J.M.F.	SCALE
.XXX = ±.010	±1°		
DO NOT SCALE DRAWING			

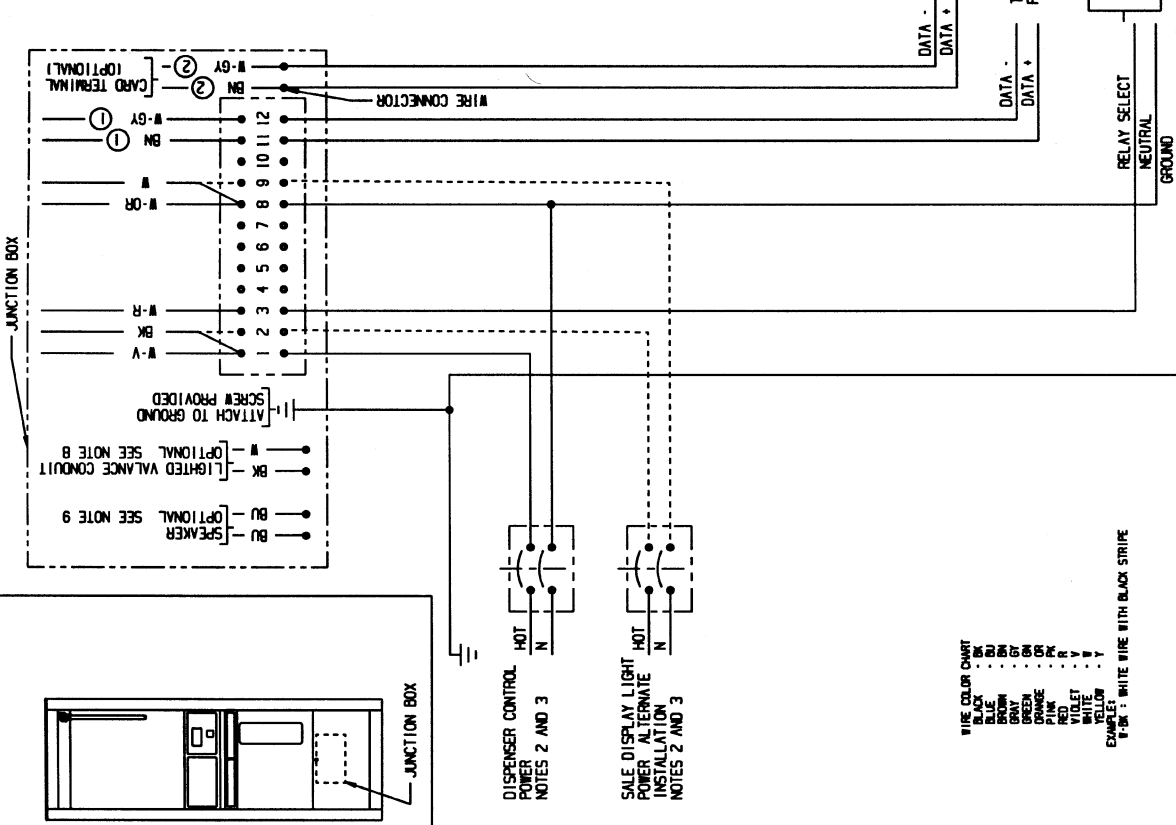


THIRD ANGLE PROJECTION

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

NOTES:

1. 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.
2. FOR SUPPLY CONNECTIONS, USE WIRES RATED AT LEAST 90°C (194°F), 600V, GAS & OIL RESISTANT.
3. 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: 110/120 VAC 50/60 Hz
AMPERAGE:
CONTROL POWER AND LIGHTS - 1.0 AMPS
CONTROL POWER AND LIGHTS AND WAYNE VAC - 1.8 AMPS
CONTROL POWER, LIGHTS AND VISTA CARD - 2.5 AMPS
CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 6.5 AMPS
CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 7.0 AMPS
CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 7.5 AMPS
VOLTAGE: 240 VAC 50 Hz
AMPERAGE:
CONTROL POWER AND LIGHTS - .8 AMPS
CONTROL POWER AND LIGHTS - 1.5 AMPS
CONTROL POWER, LIGHTS AND VISTA CARD - 2.8 AMPS
CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 3.3 AMPS
VOLTAGE: 240 VAC 60 Hz
AMPERAGE:
CONTROL POWER AND LIGHTS - 1.3 AMPS
CONTROL POWER, LIGHTS AND VISTA CARD - 2.7 AMPS
CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 3.2 AMPS
4. REMOTE DISPENSERS REQUIRE A RELAY TO INTERFACE TO THE SUBMERSIBLE PUMP MOTOR. POTTER AND BRAMFELD RELAY (POT7AY0120) IN A LISTED MAGNETIC MOTOR CONTROLLER ASSY IS RECOMMENDED. A MAXIMUM OF 12 DISPENSERS (24 FILING POINTS) MAY BE CONNECTED TO A POT7AY0 RELAY. OTHER RELAYS MAY HAVE DIFFERENT LIMITATIONS.
5. IN MULTIPLE DISPENSER INSTALLATIONS, ALL DISPENSERS OPERATING THE SAME SUBMERSIBLE PUMP CONTROL RELAY MUST BE CONNECTED TO THE SAME MAIN POWER CIRCUIT BREAKER. THIS WAY REQUIRE MULTIPLE PUMP CONTROL RELAYS FOR A SUBMERSIBLE PUMP. SEE DWG 7151-C FOR DETAILS.
6. 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.
7. FOR FULL DETAILS OF WAYNE CONTROL SYSTEMS, INTERCONNECTIONS SEE THE MANUAL PROVIDED WITH THE WAYNE PUMP CONTROL SYSTEM OR WAYNE CARD PROCESSING SYSTEM.
8. 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.
9. 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.



5-7157-C REV 6

WAYNE DIVISION
DRESSER INDUSTRIES, INC.
SALISBURY, MARYLAND 21801

TITLE: INSTALLATION WIRING DIAGRAM
/1387D/ SERIES (FULL SERVICE)

DESIGNED: JAL SCALE: NONE
DRAWN: JAL DATE: JUNE 14, 1991
CHECKED: R.L.H.
APPROVED: L.M.L.C.

5-7157-C

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Figure C-24. 5-7157-C Installation Wiring - 4/V387D (Remote).

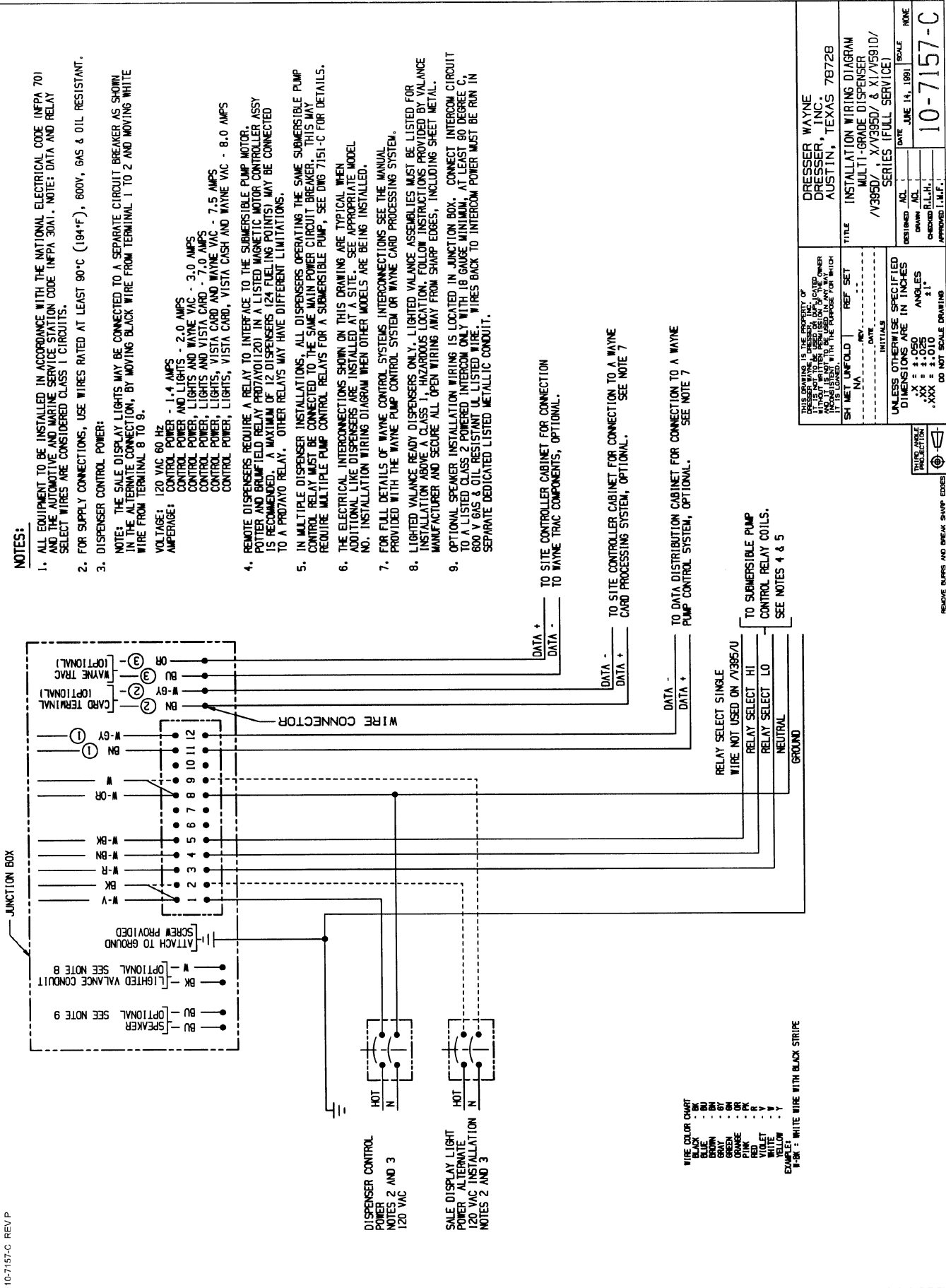


Figure C-25. 10-7157-C Installation Wiring - 4/V591D and 4/V595D (Remote) - Except 4/V595D/U See 4-7157-C

NOTES:

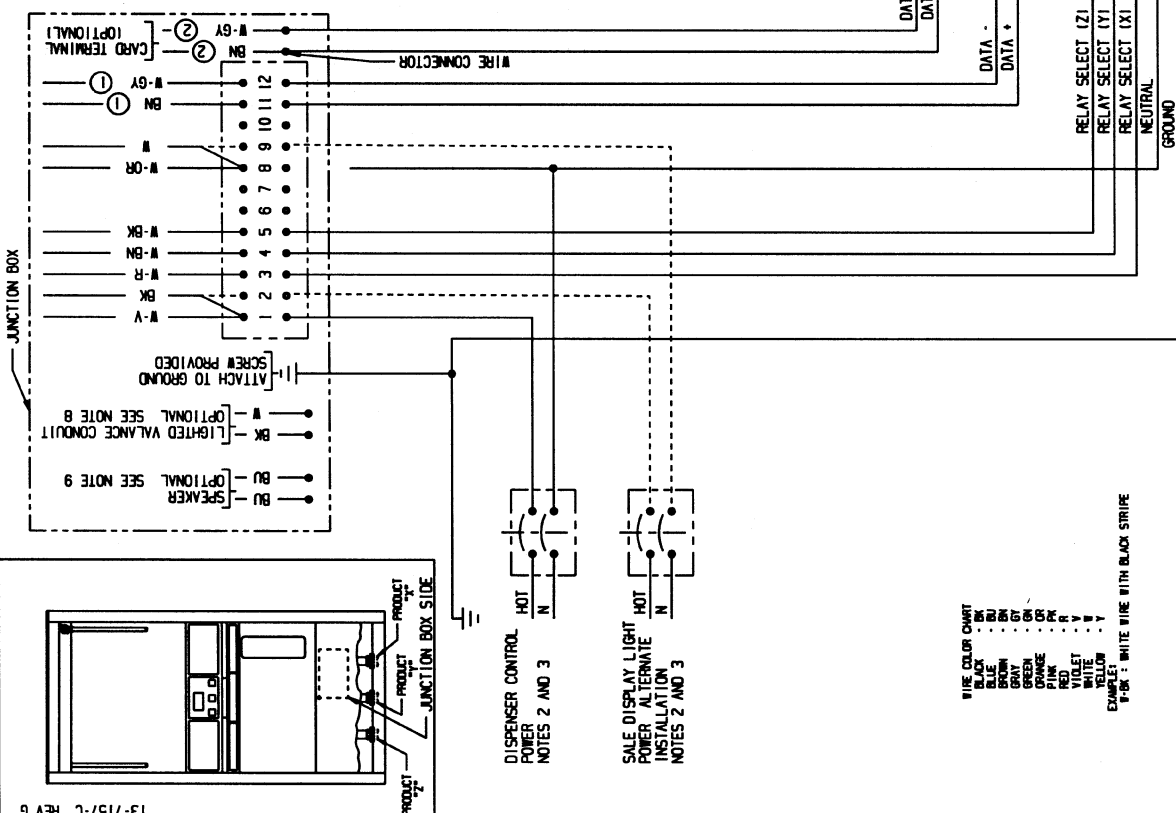
1. ALL EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NFPA 70) AND THE AUTOMOTIVE AND MARINE SERVICE STATION CODE (NFPA 30A). NOTE: DATA AND RELAY SELECT WIRES ARE CONSIDERED CLASS 1 CIRCUITS.
2. FOR SUPPLY CONNECTIONS, USE WIRES RATED AT LEAST 90°C (194°F), 600V, GAS & OIL RESISTANT.
3. 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: 110/120 VAC 50/60 Hz
 - AMPERAGE:
 - CONTROL POWER AND LIGHTS - 1.6 AMPS
 - CONTROL POWER, LIGHTS AND WAYNE VAC - 2.5 AMPS
 - CONTROL POWER, LIGHTS AND VISTA CARD - 6.5 AMPS
 - CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 7.0 AMPS
 - CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 7.5 AMPS
 - VOLTAGE: 240 VAC 50 Hz
 - AMPERAGE:
 - CONTROL POWER - .8 AMPS
 - CONTROL POWER AND LIGHTS - 1.5 AMPS
 - CONTROL POWER, LIGHTS AND VISTA CARD - 2.8 AMPS
 - CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 3.3 AMPS
 - VOLTAGE: 240 VAC 60 Hz
 - AMPERAGE:
 - CONTROL POWER - .8 AMPS
 - CONTROL POWER AND LIGHTS - 1.3 AMPS
 - CONTROL POWER, LIGHTS AND VISTA CARD - 2.7 AMPS
 - CONTROL POWER, LIGHTS, VISTA CARD AND WAYNE VAC - 3.2 AMPS

4. REMOTE DISPENSERS REQUIRE A RELAY TO INTERFACE TO THE SUBMERSIBLE PUMP MOTOR. PROVIDE A BUMP-FIELD RELAY (PRTV10120) IN A LISTED MAGNETIC MOTOR CONTROLLER ASSY IS RECOMMENDED. A MAXIMUM OF 12 DISPENSERS (24 FUELING POINTS) MAY BE CONNECTED TO A PROTOYO RELAY. OTHER RELAYS MAY HAVE DIFFERENT LIMITATIONS.
5. 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.
6. THE ELECTRICAL INTERCONNECTIONS SHOWN ON THIS DRAWING ARE TYPICAL WHEN ADDITIONAL LINE DISPENSERS ARE INSTALLED AT A SITE. SEE APPROPRIATE MODEL NO. INSTALLATION WIRING DIAGRAM WHEN OTHER MODELS ARE BEING INSTALLED.
7. FOR FULL DETAILS OF WAYNE CONTROL SYSTEMS INTERCONNECTIONS SEE THE MANUAL PROVIDED WITH THE WAYNE PUMP CONTROL SYSTEM OR WAYNE CARD PROCESSING SYSTEM.
8. 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.
9. 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.

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

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

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



WIRE COLOR CHART

BLACK	BN
BROWN	BR
GRAY	GT
GREEN	GR
PINK	PK
RED	R
VIOLET	V
WHITE	W
YELLOW	Y

EXAMPLE: P-BK : WHITE WIRE WITH BLACK STRIPE

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WAYNE DIVISION
DRESSER INDUSTRIES INC.
SALTSBURY, MARYLAND 21801

TITLE: INSTALLATION WIRING DIAGRAM
MULTI-GRADE SINGLE HOSE DISPENSER /V3900/U SERIES (FULL SERVICE)

DESIGNED: JEL SCALE: NONE
DRAWN: JEL DATE: JUNE 14, 1981
CHECKED: R.L.H.
APPROVED: J.M.F.

13-7157-C

Figure C-26. 13-7157-C Installation Wiring - 4/V390D/U (Remote)

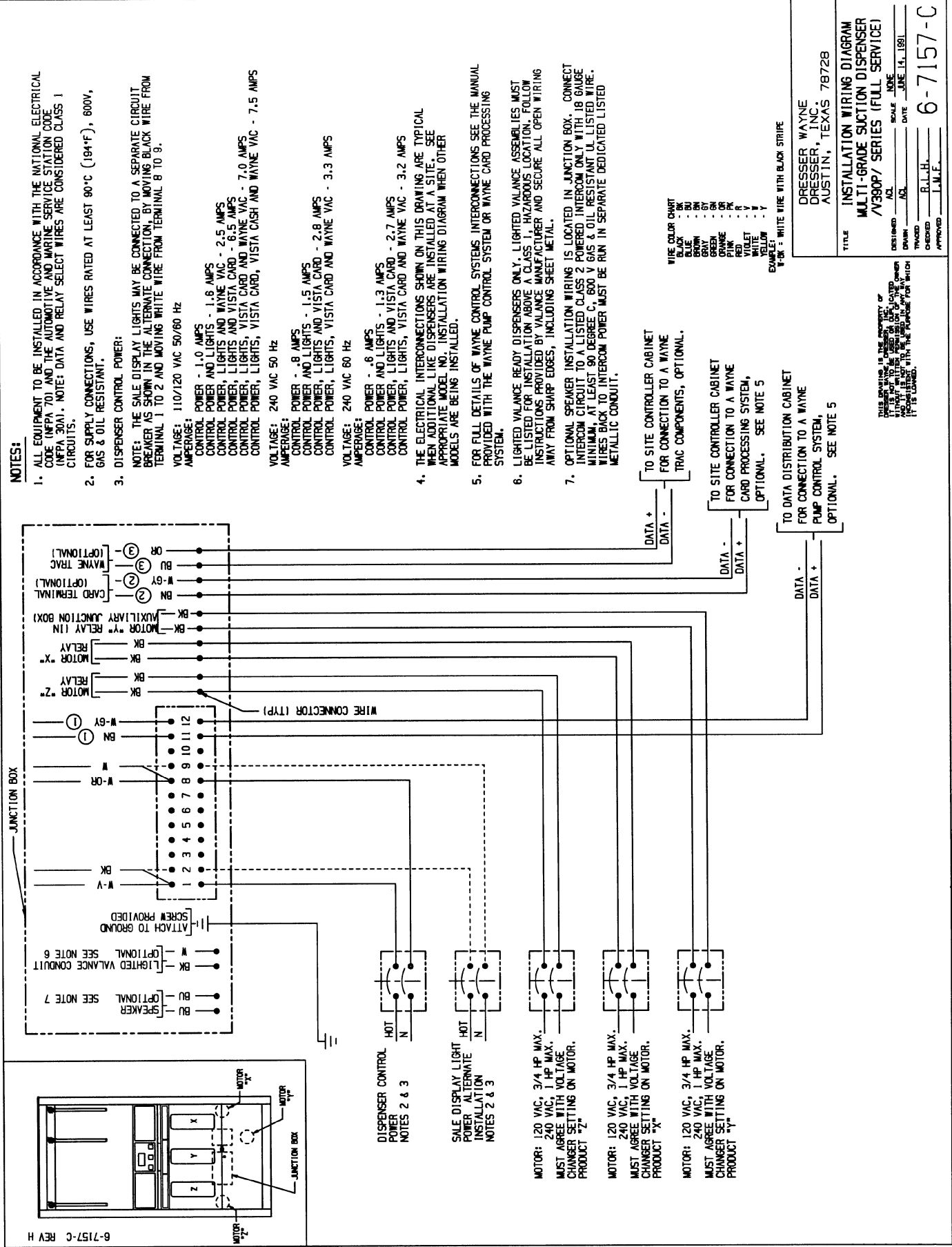
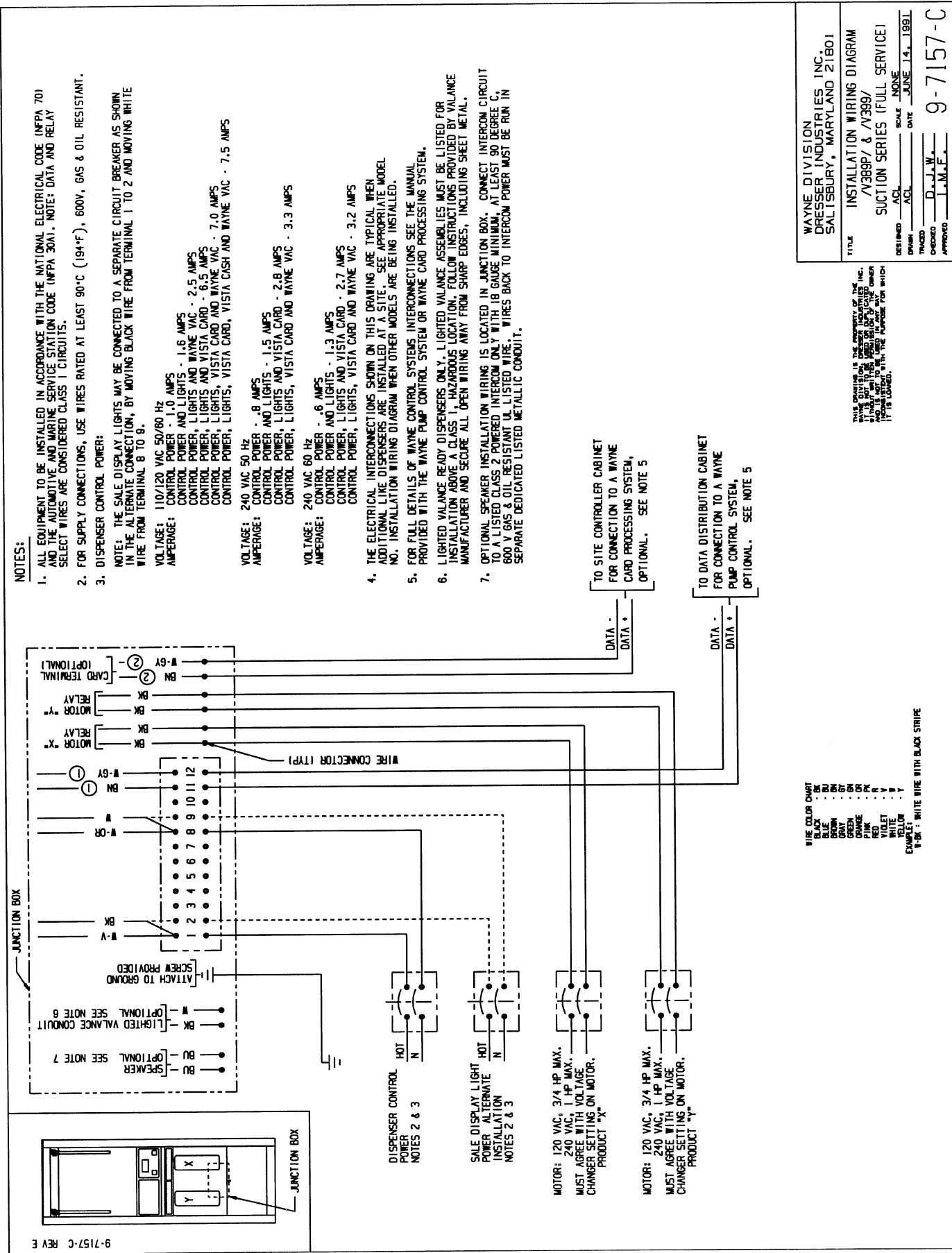


Figure C-27. 6-7157-C Installation Wiring - 4/V390P (Suction).



WAYNE DIVISION
DRESSER INDUSTRIES, INC.
SALISBURY, MARYLAND 21801

TITLE: INSTALLATION WIRING DIAGRAM
4/V389P/ & 4/V399P/
SUCTION SERIES (FULL SERVICE)

DESIGNED: _____ SCALE: NONE
TRACED: _____ DATE: JUNE 14, 1991
CHECKED: D.J.W.
APPROVED: L.M.F.

9-7157-C

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Figure C-28. 9-7157-C Installation Wiring - 4/V389P and 4/V399P (Suction).

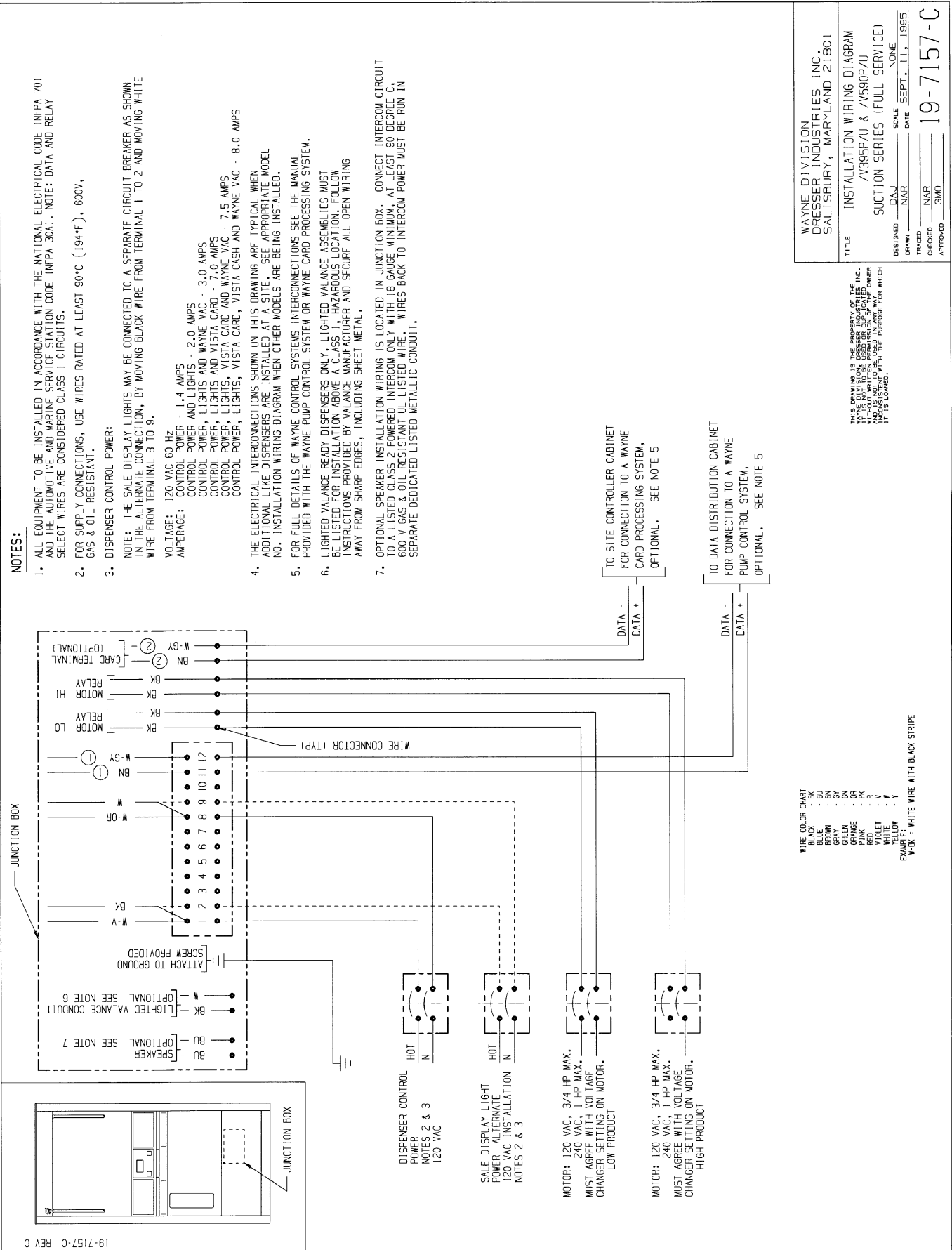
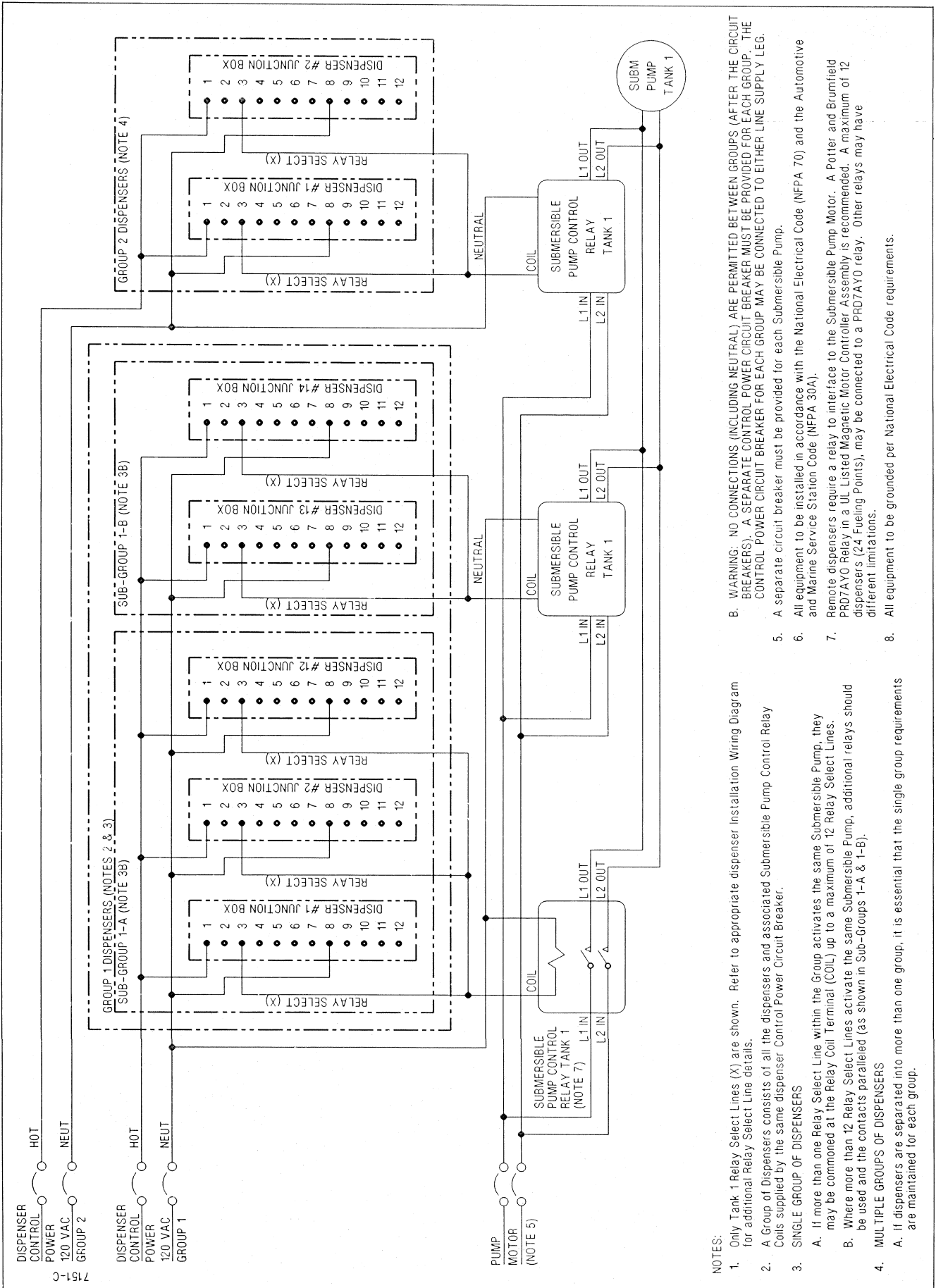


Figure C-29. 19-7157-C Installation Wiring - 4V590P/U and 4V595P/U (Suction)

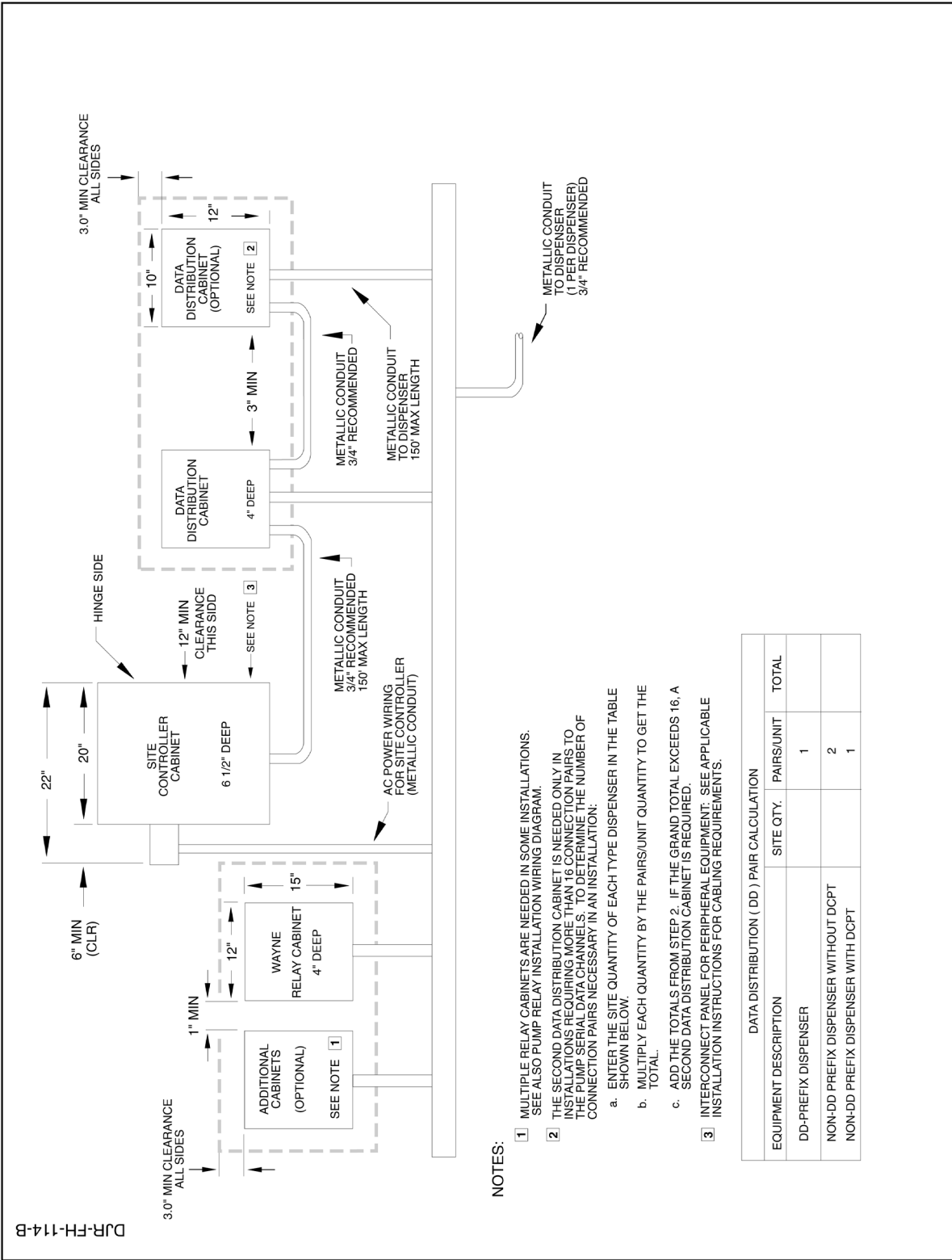


- NOTES:**
1. Only Tank 1 Relay Select Lines (X) are shown. Refer to appropriate dispenser installation wiring diagram for additional Relay Select Line details.
 2. A group of dispensers consists of all the dispensers and associated Submersible Pump Control Relay Coils supplied by the same dispenser 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 (COL) up to a maximum of 12 Relay Select Lines.
 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. B. WARNING: NO CONNECTIONS (INCLUDING NEUTRAL) ARE PERMITTED BETWEEN GROUPS (AFTER THE CIRCUIT BREAKERS). A SEPARATE CONTROL POWER CIRCUIT BREAKER MUST BE PROVIDED FOR EACH GROUP. THE CONTROL POWER CIRCUIT BREAKER FOR EACH GROUP MAY BE CONNECTED TO EITHER LINE SUPPLY LEG.
 6. A separate circuit breaker must be provided for each Submersible Pump.
 7. All equipment to be installed in accordance with the National Electrical Code (NFPA 70) and the Automotive and Marine Service Station Code (NFPA 30A).
 8. 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.
 9. All equipment to be grounded per National Electrical Code requirements.

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

APPENDIX D

SITE INTERCONNECTION DIAGRAMS



NOTES:

- 1 MULTIPLE RELAY CABINETS ARE NEEDED IN SOME INSTALLATIONS. SEE ALSO PUMP RELAY INSTALLATION WIRING DIAGRAM.
- 2 THE SECOND DATA DISTRIBUTION CABINET IS NEEDED ONLY IN INSTALLATIONS REQUIRING MORE THAN 16 CONNECTION PAIRS TO THE PUMP SERIAL DATA CHANNELS. TO DETERMINE THE NUMBER OF CONNECTION PAIRS NECESSARY IN AN INSTALLATION:
 - a. ENTER THE SITE QUANTITY OF EACH TYPE DISPENSER IN THE TABLE SHOWN BELOW.
 - b. MULTIPLY EACH QUANTITY BY THE PAIRS/UNIT QUANTITY TO GET THE TOTAL.
 - c. ADD THE TOTALS FROM STEP 2. IF THE GRAND TOTAL EXCEEDS 16, A SECOND DATA DISTRIBUTION CABINET IS REQUIRED.
- 3 INTERCONNECT PANEL FOR PERIPHERAL EQUIPMENT. SEE APPLICABLE INSTALLATION INSTRUCTIONS FOR CABLING REQUIREMENTS.

DATA DISTRIBUTION (DD) PAIR CALCULATION			
EQUIPMENT DESCRIPTION	SITE QTY.	PAIRS/UNIT	TOTAL
DD-PREFIX DISPENSER		1	
NON-DD PREFIX DISPENSER WITHOUT DCPT		2	
NON-DD PREFIX DISPENSER WITH DCPT		1	

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

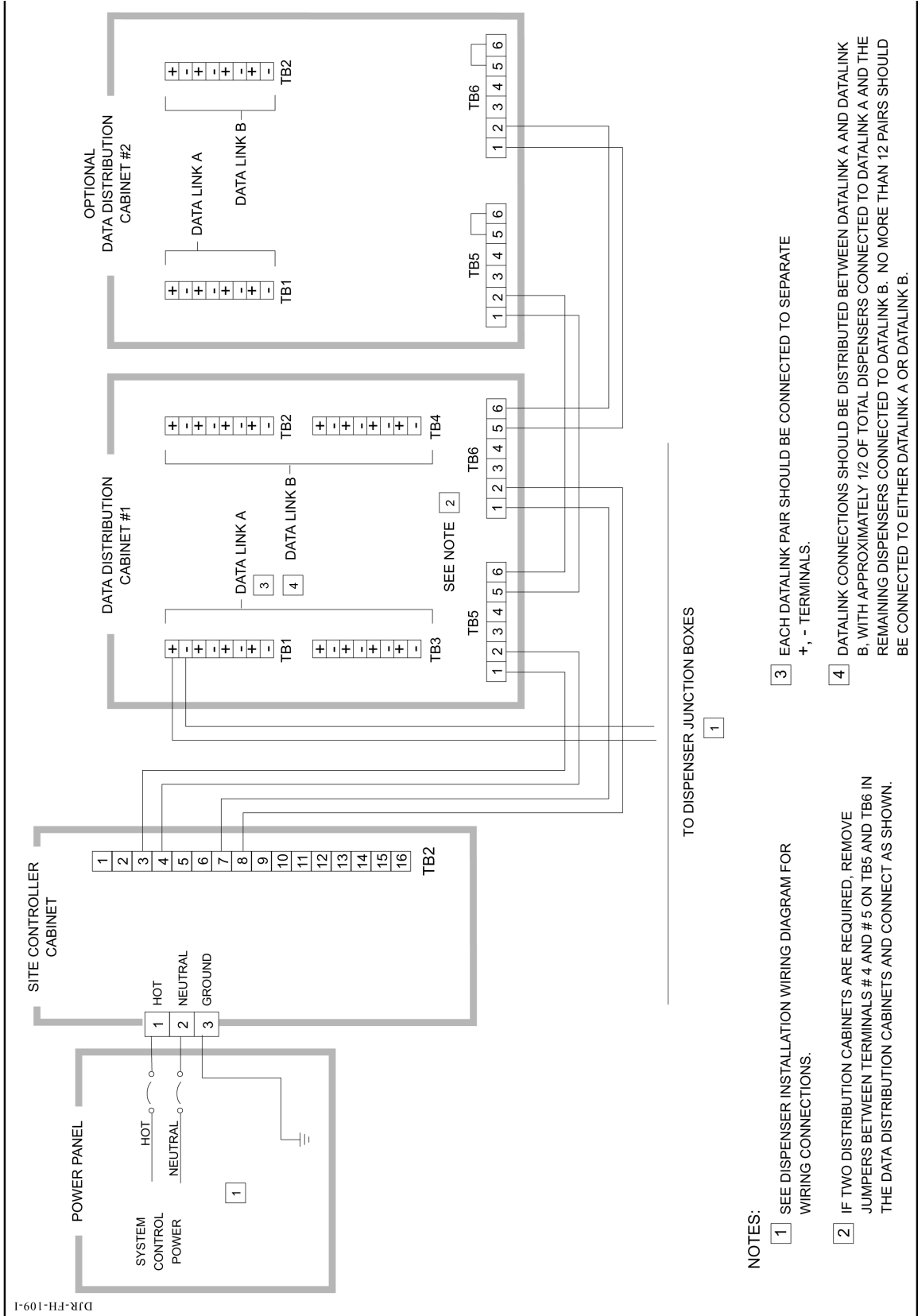
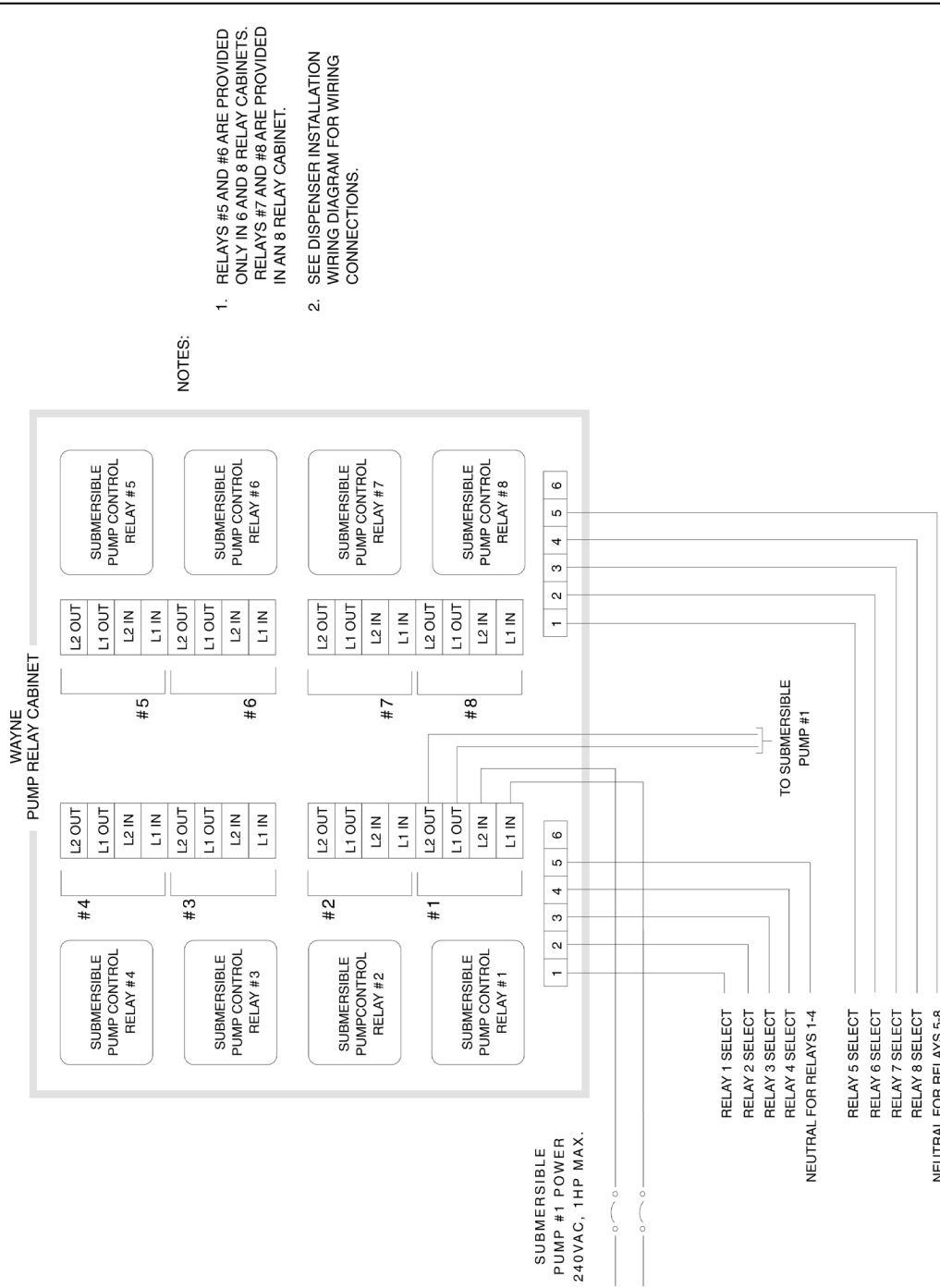


Figure D-2 Interconnection Wiring Diagram - Data Distribution Cabinet To Dispensers.



- 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.

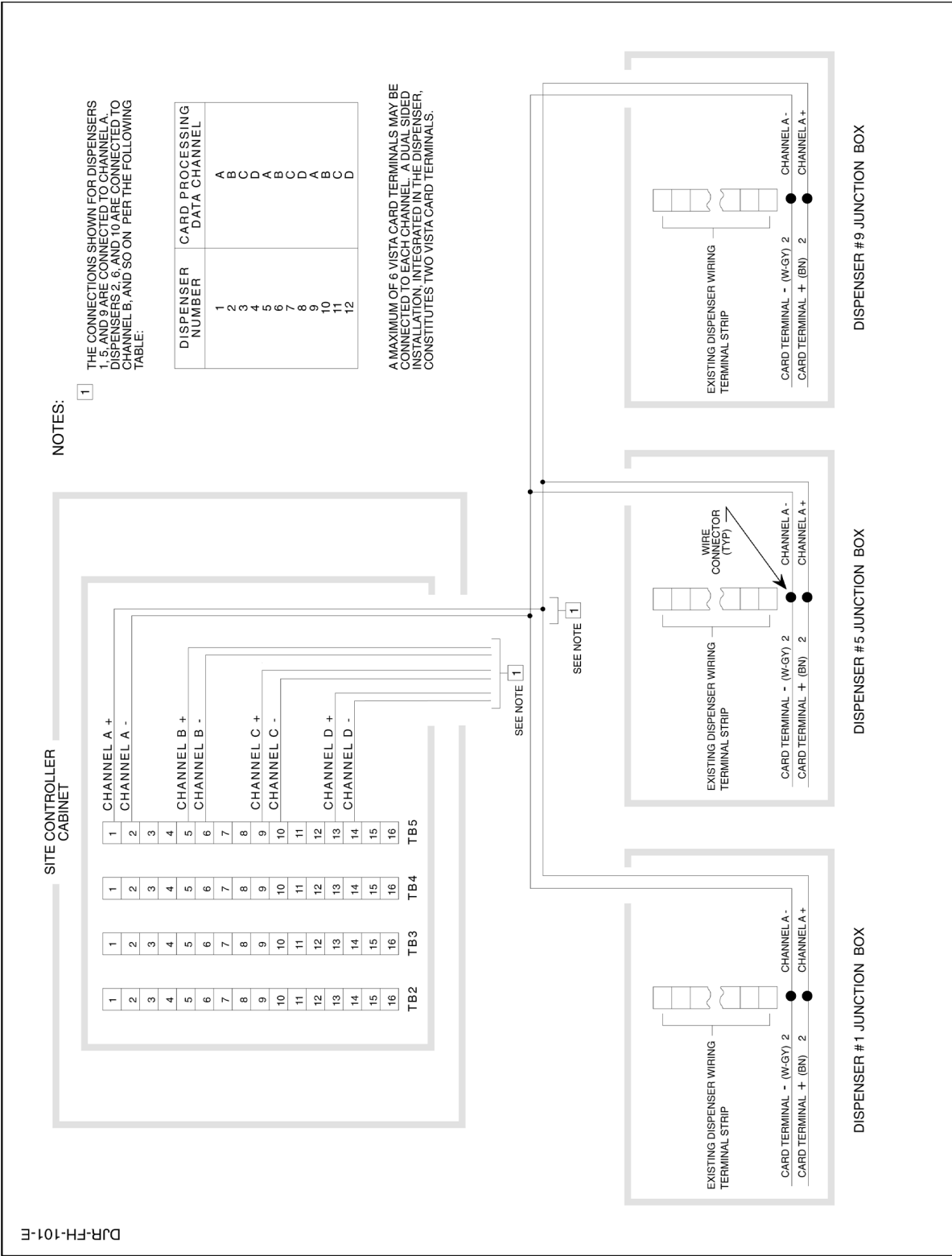


Figure D-4 Interconnection Wiring Diagram - Dispenser Card Processing (CATs) .

APPENDIX E

HS4/VISTA ULTRA HIGH CAPACITY MODELS

E1. INTRODUCTION

General

The following documentation details the differences found in the main sections of the 4/Vista installation manual as they pertain to the HS4/V Ultra High Capacity (UHC) models. For the UHC models, use the installation drawings and meter verification/calibration procedure in this appendix and use the appropriate section in the manual for all other installation and startup procedures not listed in this appendix.

Dispensers Covered

Model	Type	Inlets	Products Dispensed	Hoses per Side
HS4/V387Dx/4R	Master	1	1	1
HS4/V387Dx/4	Master/Master	1	1	1 (2 sides)
HS4/V388Dx/4	Master/Master	2	2	1 (2 sides)
HS4/V389Dx/4R	Master/Master	2	2	2 (1 side)
HS4/V388Cx/4	Master/Satellite	2	2	1 (2 sides-Master/Sat Combo)
HS4/V287S/4R	Satellite	1	1	1
HS4/V288S/4	Satellite/Satellite	2	2	1 (2 sides)
HS4/V289S/4R	Satellite/Satellite	2	2	2 (1 Side)

x = numeric placeholder representing price posting and payment method

Technical Information

Performance:	Ultra High Capacity (UHC): Up to 60 GPM (227 LPM) maximum test rate at discharge outlet (based on total of both Master & Satellite hoses in use at same time). IMPORTANT: Actual flow rates will depend upon the installation conditions, product dispensed, dispenser accessories, and the size of the submersible pump.
Meter:	Ultra High Capacity Models: Liquid Controls [®] M-5 positive displacement rotary meter with Wayne optical pulser. Electronic calibration.
Strainer:	Ultra High Capacity Models: No strainer is provided. See filter section. Disposable strainer canisters are available as an option to replace the internal filters.
Filter:	Ultra High Capacity Models: Two internal Cimtek Series 800 filters (40 GPM each) per hose with 30-micron particulate filter elements. IMPORTANT: User should make sure the filter element meets the application and replace with the appropriate element as necessary.
Flow Control Valve:	Ultra High Capacity Models: Two-stage 1-1/2" (3.81cm) 120VAC valve.
Inlet:	Ultra High Capacity Models: 2" (5.1cm) male NPT. (Satellite models are 1-1/2" NPT).
Outlet:	Ultra High Capacity Models: 1-1/4" (3.2cm) female NPT. 1" (2.5cm) reducing bushing supplied for 1" hose assemblies. Outlet for satellite connection on Master configurations is 1-1/2" NPT.

E2. METER CHECK (CALIBRATION) – ULTRA HIGH CAPACITY MODELS

General

- Ultra High Capacity models use the Liquid Controls (LC) M-5 meter with a Wayne optical pulser to measure the fuel dispensed. One meter is used per hose.
- The LC meter is used in conjunction with a Pulse Processing Module (PPM) that is located in the head of the dispenser. The PPM has a switch for each meter that is used to calibrate the meter. Switch “Side A – M1” is used to calibrate the meter on Side A while switch “Side B – M1” is used to calibrate the meter for Side B. If the dispenser has two hoses on the same side, Switch “Side A – M1” is used for Hose 1 and “Side B – M1” is used for Hose 2.
- All LC meters are tested, calibrated, and sealed at the factory before a dispenser is shipped. As part of the start-up procedure, the accuracy should be verified, and if re-calibration is required, the calibration procedure should be followed.
- Prior to calibrating the dispenser for the first time, make sure to follow the steps in Section 2.10, Bleeding Product Lines, to make sure all air and air pockets are bled from the product trunk lines. To thoroughly flush out all air and completely fill the system prior to verification and calibration, dispense product from the dispenser (and satellite if applicable) until a continuous and steady flow of product is observed at each nozzle.

NOTE: If all air and air pockets are not removed from the dispenser and satellite product lines, you may receive pulser errors when the air decompresses and causes the pulser to move backwards.

- In applications involving the resale of fuel, for the initial use and after any adjustments to the calibration, the meter will need to be sealed by the appropriate Weights & Measures authority.
- A calibration container that handles at least 50 gallons (or 190 liters) is recommended for verifying, and calibrating if necessary, this high capacity dispenser.
- Messages you will/may see on the unit price display during the calibration process on dispensers using the PPM are:
 - **CAL** - when switch position 1 is set to “On” -signifying calibration mode in process.
 - **RECD** - after dispensing product in test measure and setting switch back to “Off” position, the new calibration factor was received.
 - **C-ER** - calibration error -calibration factor not received.
- Only one position on one switch can be set to “On” during the calibration process (only one meter at a time can be calibrated).

NOTE: If position 1 (M1) on both switches is set to “On” at the same time during the calibration of the meter, a calibration “RECD” message may be displayed erroneously.

- If the Pulse Processing Module is replaced, the dispenser must be calibrated first prior to running a sale. If not calibrated first and you try to run a sale, the sale will be stopped due to a calibration error shown on the display as “C-ER.”

Accuracy Verification Procedure – Ultra High Capacity

Step 1 Dispense product into a certified calibration container to wet the container and then empty it back into the tank, allowing it to drain for 10 seconds.

Step 2 Dispense product into the container until exactly the quantity of the container is shown on the dispenser display.

NOTE: When temperature compensation is activated (Canada), the dispenser should be placed into Temp Comp Fueling Mode, so that the accuracy can be verified using the gross (uncompensated) volume shown on the display in this mode.

Step 3 Compare the reading on the container's sight glass to the dispenser display. For the "Acceptance" test, the container volume should be within a total of +/- 1 cu. in. plus +/- 0.5 cu. in. for each gallon dispensed for a 5 or 10 gallon prover. For larger provers, the acceptance tolerance is $\pm 0.2\%$ (units rated over 30 GPM).

NOTE: For U.S. Weights & Measures applications, acceptance tolerance of +/- 1 cu. in. plus +/- 0.5 cu. in. for each gallon dispensed (into a 5 or 10 gallon prover) and 0.2% into a larger prover, is only required for newly placed in service devices for 30 days. After 30 days, the maintenance tolerance is increased to +/- 1 cu. in. plus +/- 1 cu. in. for each gallon dispensed (into a 5 or 10 gallon prover) and 0.3% for larger provers. Consult Handbook 44 for full information.

Step 4 If the values are out of range, proceed with the following calibration procedure.

Step 5 Repeat the verification procedure for each hose.

Calibration Procedure – Ultra High Capacity

- Step 1** Verify that the dispenser calibration volume is set to match the test container that will be used to calibrate the dispenser. This can be checked (and if needed changed) using the F19.26 (Gallons) or F19.16 (Liters) function in the dispenser software configuration. The entry must be in whole gallons or whole liters.
- Step 2** Dispense product into the certified calibration container to wet the container and then empty it back into the tank, allowing it to drain for 10 seconds.
- Step 3** Identify the calibration switch for the meter in need of calibration. The Pulse Processing Module (PPM) is located in the electronics area of the dispenser. It is mounted on a bracket directly above the vapor barrier. The switches are located behind a bracket used to seal the switches. Reference Figure 1 for the location of the calibration switches.

Note: To identify the hose designation, when viewing the dispenser from the side of the iGEM CPU, the Hose A discharge outlet is always on the left side of the dispenser and the Hose B discharge outlet is always on the right side.

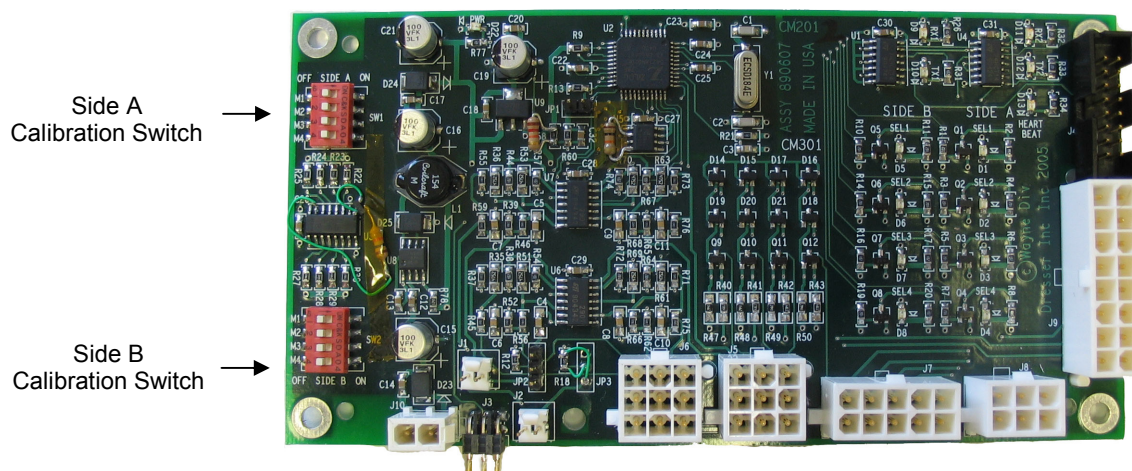


FIGURE 1 PULSE PROCESSING MODULE

- Step 4** Remove the seal wire and screw to allow access to the calibration switch.
- Step 5** Set the calibration switch of the meter to be calibrated to the “on” position. “CAL” will display on the dispenser Unit Price display indicating the dispenser is in calibration mode.
- Step 6** Fill the calibration container to exactly the “0” mark on the sight glass (read the bottom of the meniscus). Disregard any volumes shown on the dispenser display.
- Step 7** Return the nozzle to the nozzle boot and set the calibration switch to the “off” position (this now redefines the calibration factor in the PPM). If the calibration is accepted by the dispenser, ‘rECd’ will show in the Unit Price display for 5 seconds. If the calibration is rejected, a “C-Er” message will appear in the display for 5 seconds, and the calibration procedure will need to be repeated.
- Step 8** Empty the container back into the tank and let it drain for 10 seconds.
- Step 9** Verify the accuracy by following the verification procedure on the previous page.
- Step 10** If this is a twin dispenser, repeat the calibration procedure for the other hose.
- Step 11** Replace the calibration switch cover and seal the calibration cover.

E3. MAINTENANCE

Filters – Ultra High Capacity Models

Ultra high capacity models have two high capacity filters per hose prior to the meter in place of an inlet strainer. If the filters are removed for any reason (e.g. external filters are desired), they must be replaced with disposable 100-mesh strainer canisters (p/n 890255-002) in order to protect the meter.

Dirty filters will slow down the delivery of product. With new tank and piping installations, it may be necessary to replace the filters two or three times during the first few days of operation to remove installation debris and pipe sealant. After this, filter replacement should be performed periodically. If strainer canisters are used, a drop in flow may indicate a need to replace the disposable strainer.



WARNING

Before removing the filters or strainer canisters, always turn off the power to the dispenser, and if applicable, turn off the power to the submersible pump and close the emergency shutoff valve underneath the dispenser. Failure to do so may result in a hazardous condition that can result in serious injury. Make sure safety goggles are worn. Loosen the filter or strainer canister slightly and allow the product to drain into a plastic container until pressure is relieved. Return the product to the appropriate tank.

The filters or strainer canisters are 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 filters or strainer canisters: apply a film of oil to the gasket, hand turn until gasket contacts base, then tighten 3/4 turn (follow any directions supplied with filter). Open the emergency shutoff valve, turn the electrical power ON, and check for leaks.

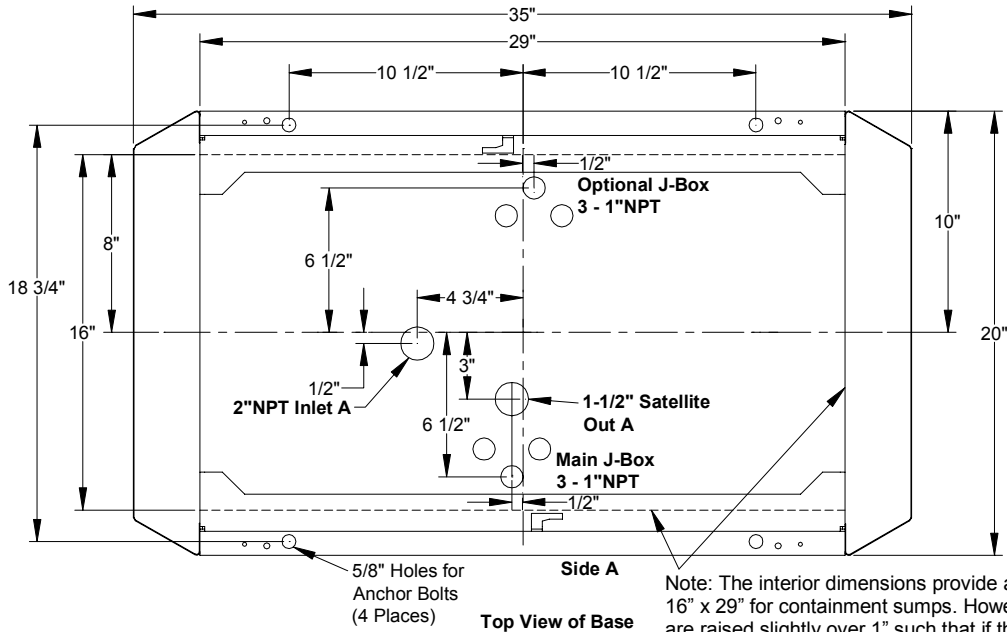


WARNING

Remote dispensers are shipped with 30-micron particulate filters (unless the dispenser is supplied with the optional strainer canister). These filters do not provide water absorption. The installer and user should make sure the filters meet the requirements of the application, satisfy local/state/federal codes, and replace the filters with appropriate filters as necessary. If strainer canisters are used, or for special applications even when the internal filters are supplied, external filters, used on the discharge, may be required for the application. Some applications, such as aircraft refueling, require special filtration equipment in order to ensure product purity. Replacement filters must be UL-recognized.

E4. DIMENSIONS & BASE LAYOUTS

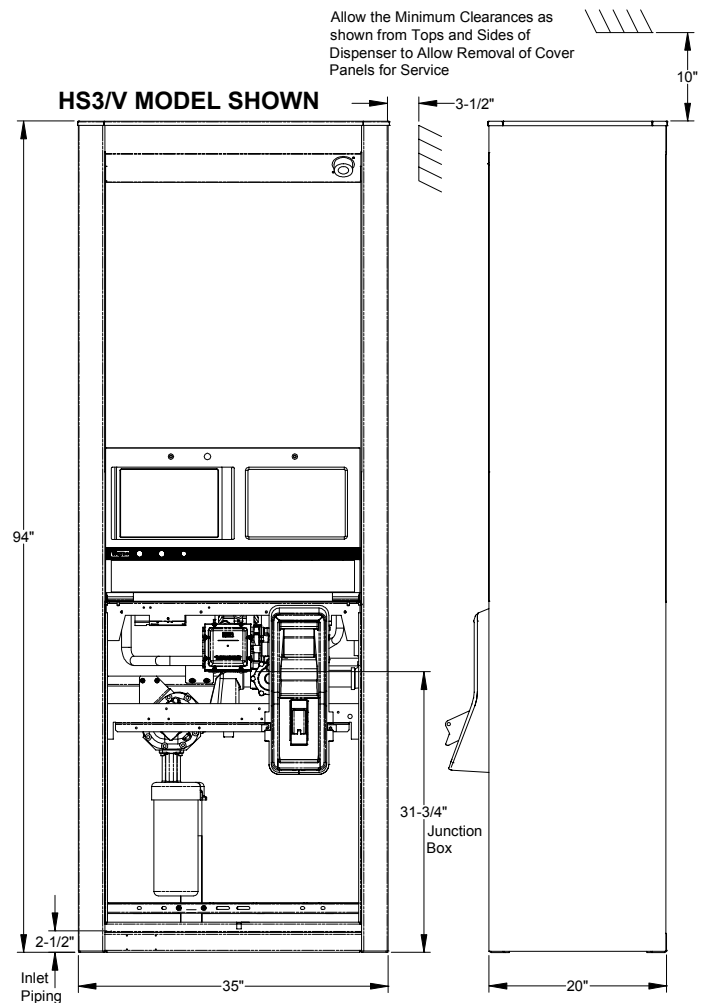
Model HS4/V387Dx/4R UHC, Single Master

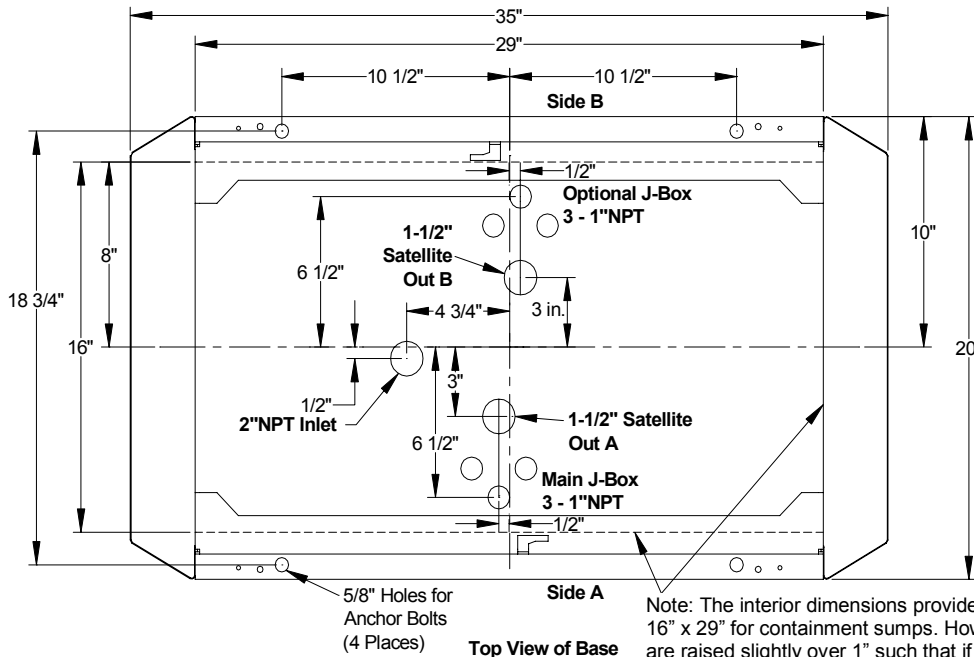


Note: The interior dimensions provide a max. rectangular area of 16" x 29" for containment sumps. However, the inside columns are raised slightly over 1" such that if the sump has a rain lip of 1" or less, the available length increases from 29" to 34".

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. Use 2" minimum piping. 3" or 4" piping is recommended to maximize flow. Long lengths of flexible piping are not recommended because it can expand when the nozzle is closed and can cause excessive reverse flow of product and pulser errors.
3. Use universal joints at dispenser to allow for ground movement.
4. Firmly mount the dispenser to be the island using the anchor bolt locations shown.
5. A double poppet emergency valve, where the top valve is normally in a closed position when there is no flow, is recommended (e.g. OPW 2" 10RUP). The top valve acts as a check valve which reduces the reverse flow of product that can occur in some high speed installations. Reverse flow of product can result in pulser errors.
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 installation wiring for Speaker, Call Button, TRAC, and Valance Light is located in the "Optional Junction Box." Connect intercom circuit to a Listed Class 2 powered intercom only with 18 gauge minimum, at least 90° C, 600 V Gas & Oil Resistant UL Listed wire. Wires back to intercom power must be run in a separate dedicated Listed metallic conduit.
8. When connected to a satellite, a Wayne Ultra High Capacity Satellite must be used.

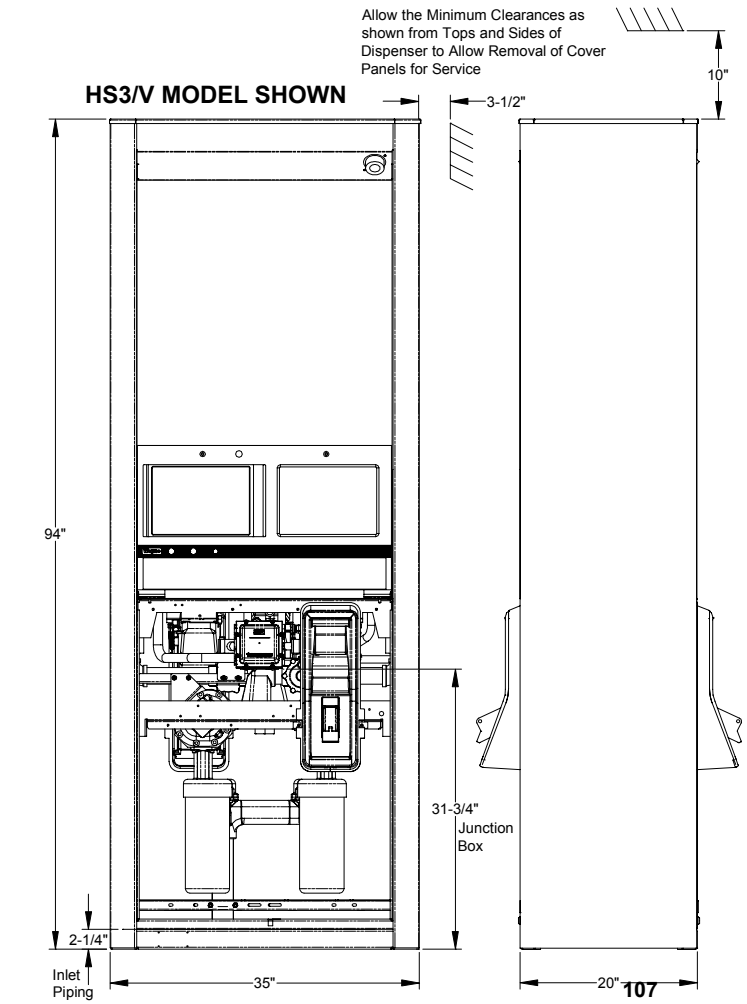




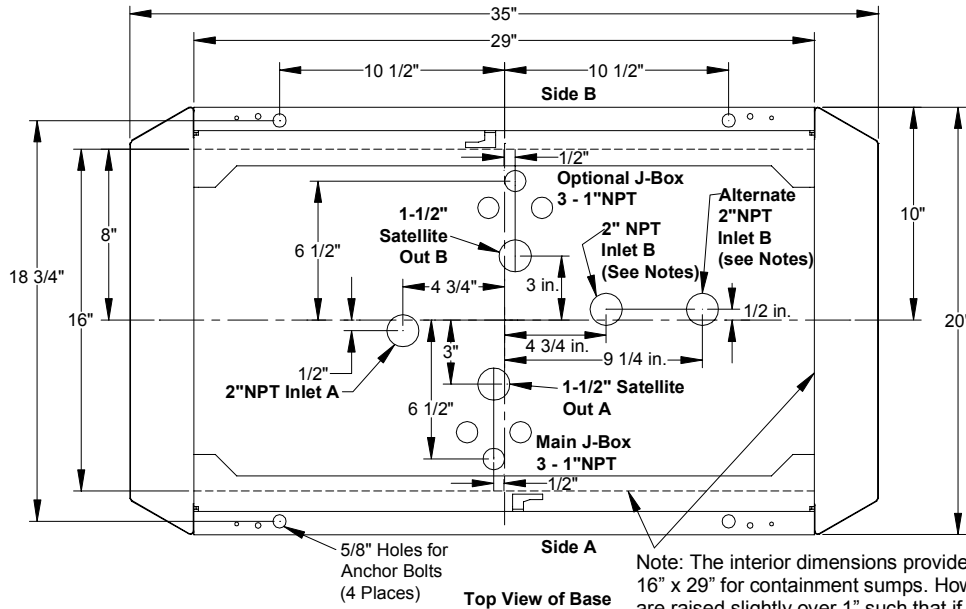
Note: The interior dimensions provide a max. rectangular area of 16" x 29" for containment sumps. However, the inside columns are raised slightly over 1" such that if the sump has a rain lip of 1" or less, the available length increases from 29" to 34".

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. Use 2" minimum piping. 3" or 4" piping is recommended to maximize flow. Long lengths of flexible piping are not recommended because it can expand when the nozzle is closed and can cause excessive reverse flow of product and pulser errors.
3. Use universal joints at dispenser to allow for ground movement.
4. Firmly mount the dispenser to be the island using the anchor bolt locations shown.
5. A double poppet emergency valve, where the top valve is normally in a closed position when there is no flow, is recommended (e.g. OPW 2" 10RUP). The top valve acts as a check valve which reduces the reverse flow of product that can occur in some high speed installations. Reverse flow of product can result in pulser errors.
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 installation wiring for Speaker, Call Button, TRAC, and Valance Light is located in the "Optional Junction Box." Connect intercom circuit to a Listed Class 2 powered intercom only with 18 gauge minimum, at least 90° C, 600 V Gas & Oil Resistant UL Listed wire. Wires back to intercom power must be run in a separate dedicated Listed metallic conduit.
8. When connected to a satellite, a Wayne Ultra High Capacity Satellite must be used.



Model HS4/V388Dx/4 UHC, Two Product, Master/Master

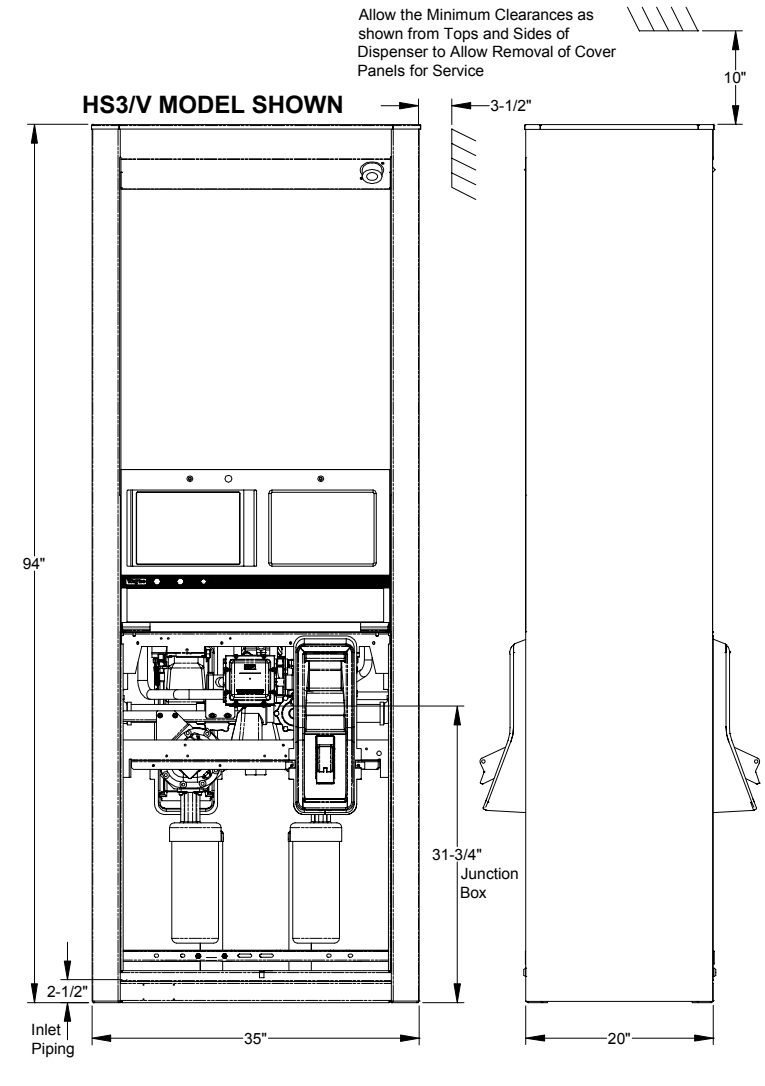


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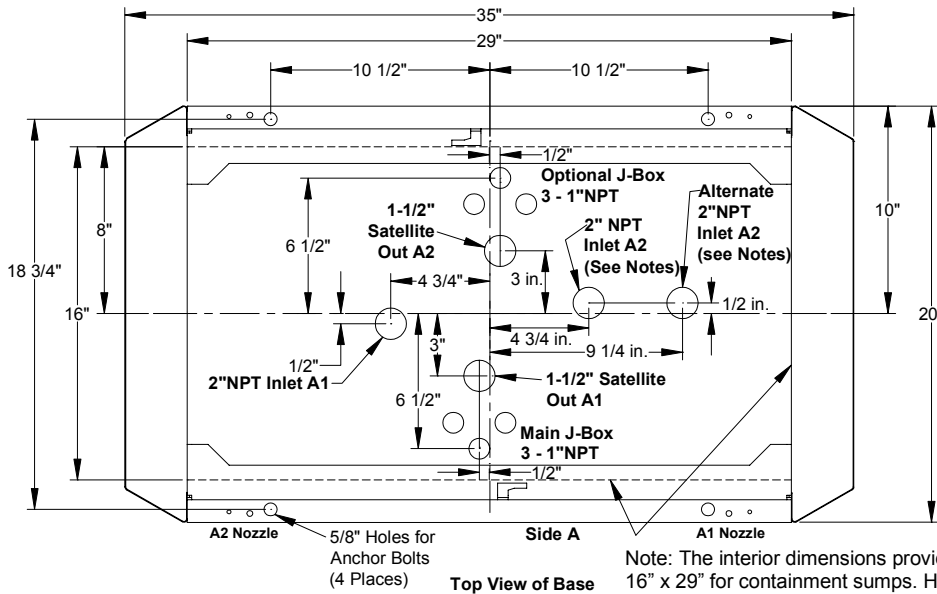
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8. When connected to a satellite, a Wayne Ultra High Capacity Satellite must be used.
9. Alternate 2" Inlet Note: Recommended for Masters with Satellite piping. Remount the dual filter inlet casting 180° from the supplied orientation. This creates more room between the inlet piping connections, and may simplify the installation of emergency impact valves.

Allow the Minimum Clearances as shown from Tops and Sides of Dispenser to Allow Removal of Cover Panels for Service



Model HS4/V389Dx/4R UHC, Two Product, Single Side, Master/Master

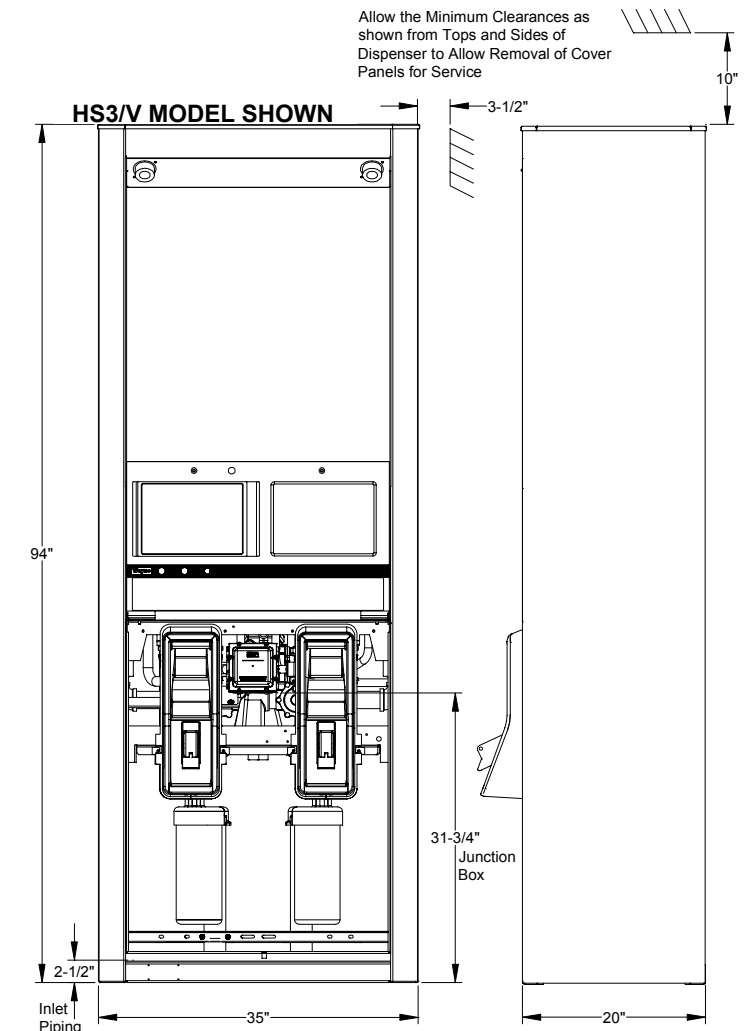


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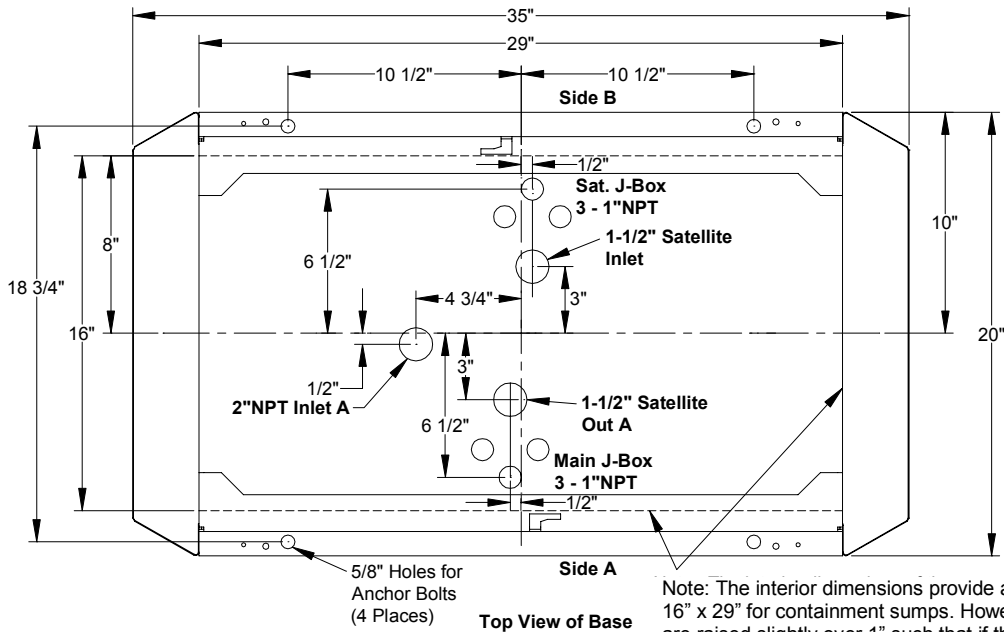
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Allow the Minimum Clearances as shown from Tops and Sides of Dispenser to Allow Removal of Cover Panels for Service



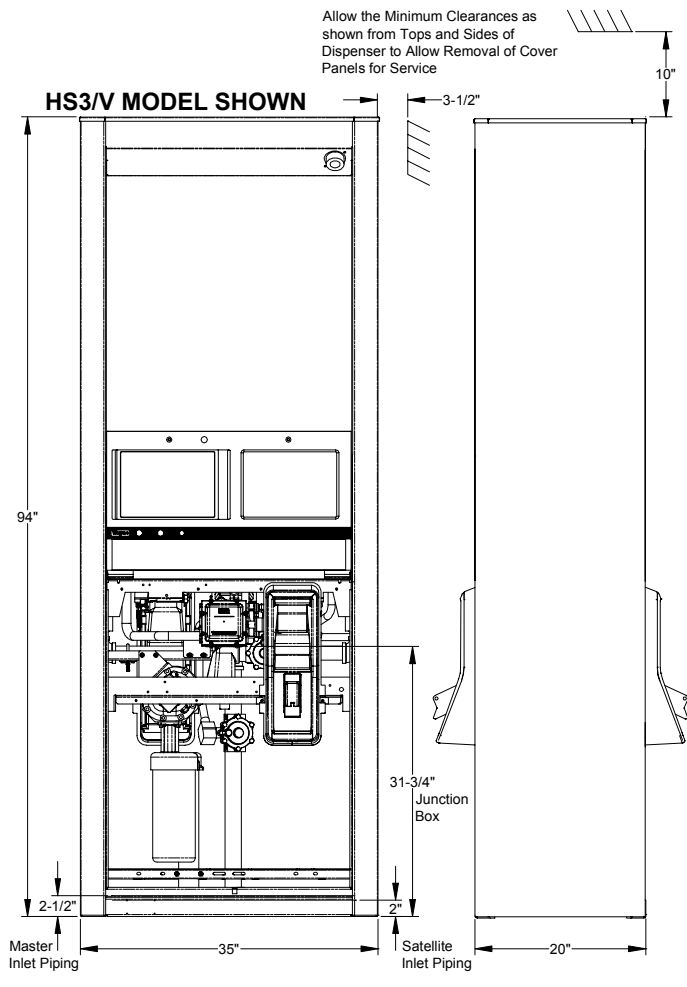
Model HS4/V388Cx/4 UHC, Master/Satellite



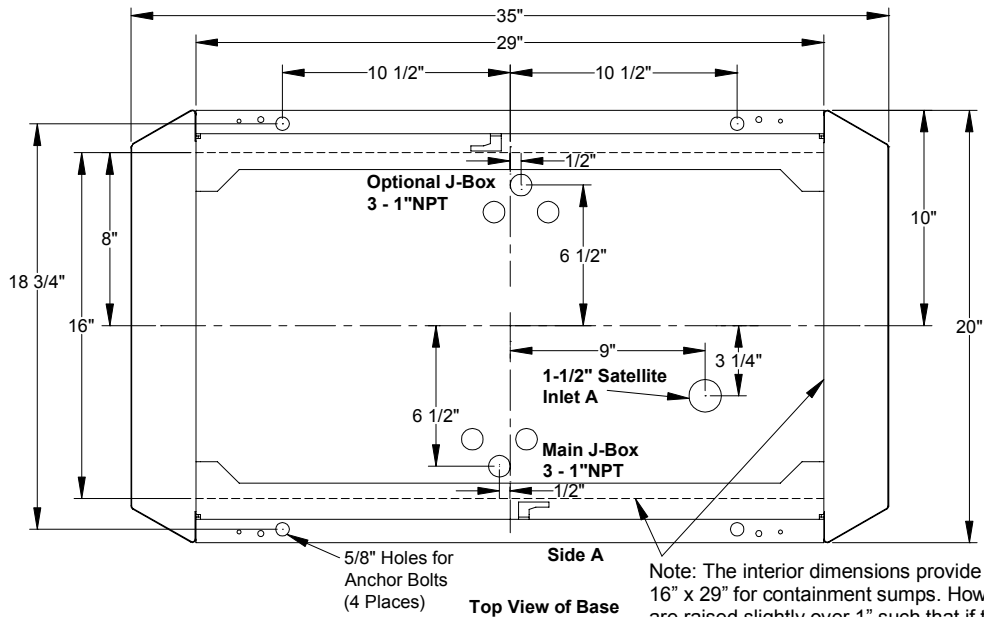
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7. Optional installation wiring for Speaker, Call Button, TRAC, and Valance Light is located in the "Optional Junction Box." Connect intercom circuit to a Listed Class 2 powered intercom only with 18 gauge minimum, at least 90° C, 600 V Gas & Oil Resistant UL Listed wire. Wires back to intercom power must be run in a separate dedicated Listed metallic conduit.
8. When connected to a satellite, a Wayne Ultra High Capacity Satellite must be used.

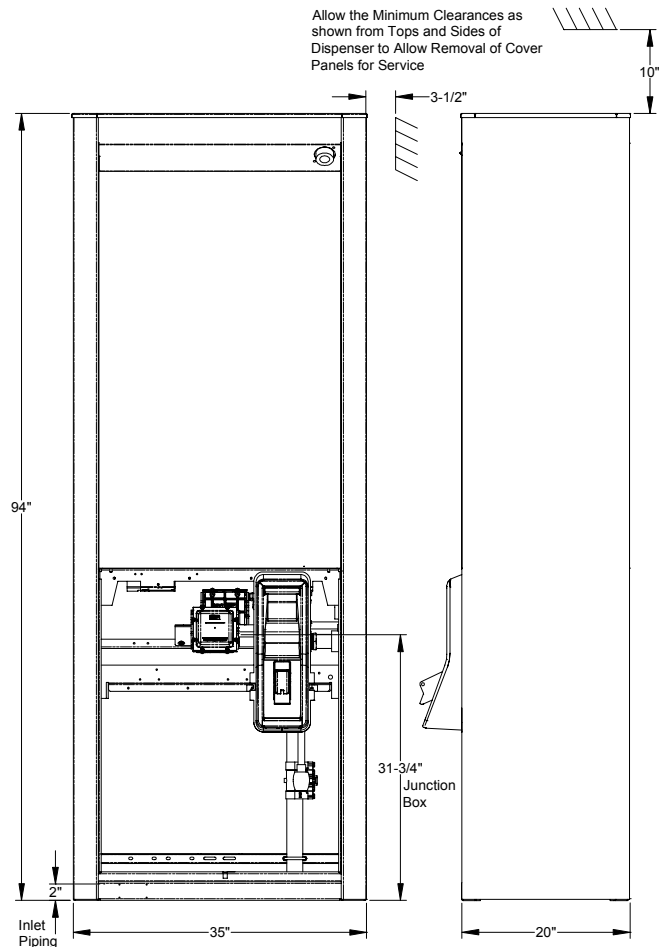


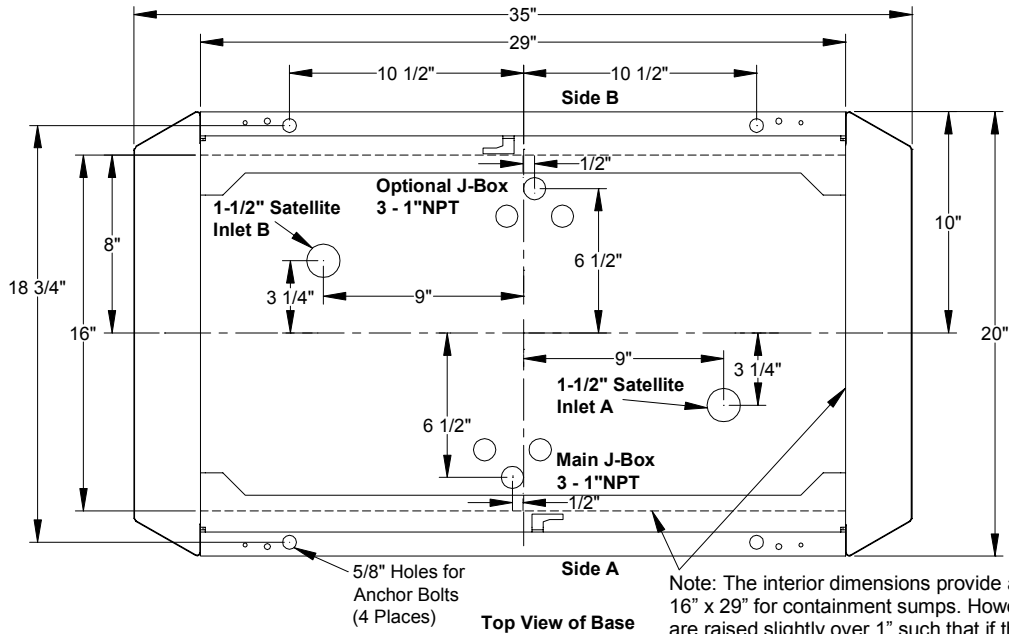
Model HS4/V287S/4R UHC, Single Satellite



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.
2. Use 1-1/2" minimum piping. Long lengths of flexible piping are not recommended because it can expand when the nozzle is closed and can cause excessive reverse flow of product and pulsar errors.
3. Use universal joints at dispenser to allow for ground movement.
4. Firmly mount the dispenser to be the island using the anchor bolt locations shown.
5. 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.
6. Optional installation wiring for Valance Light is located in the "Optional Junction Box."

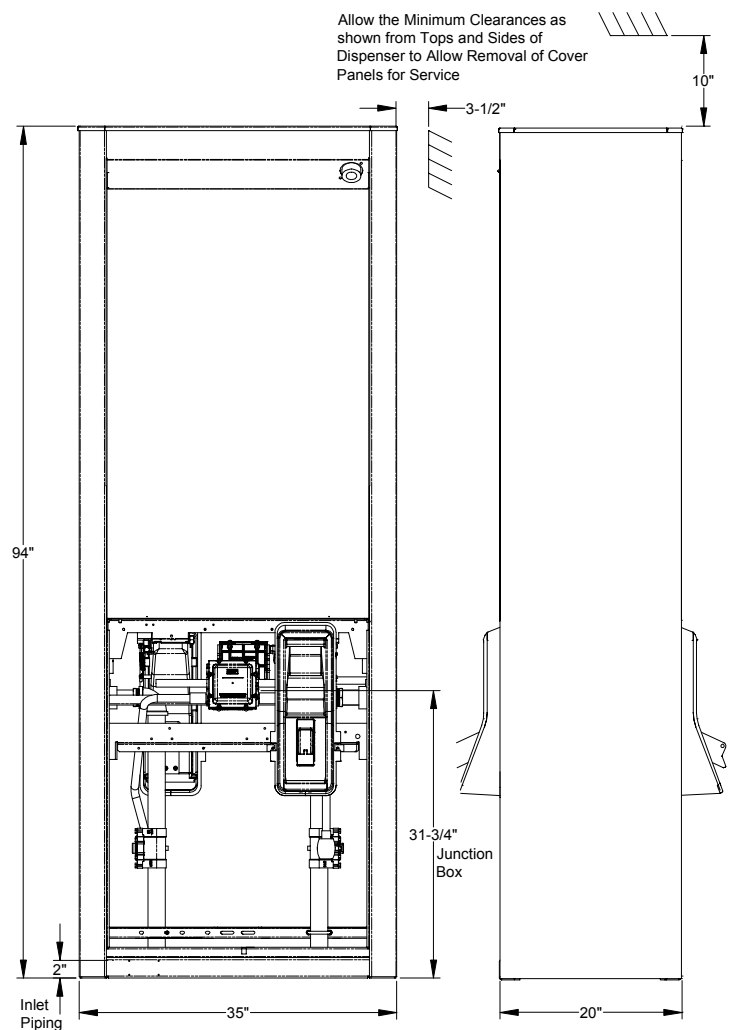




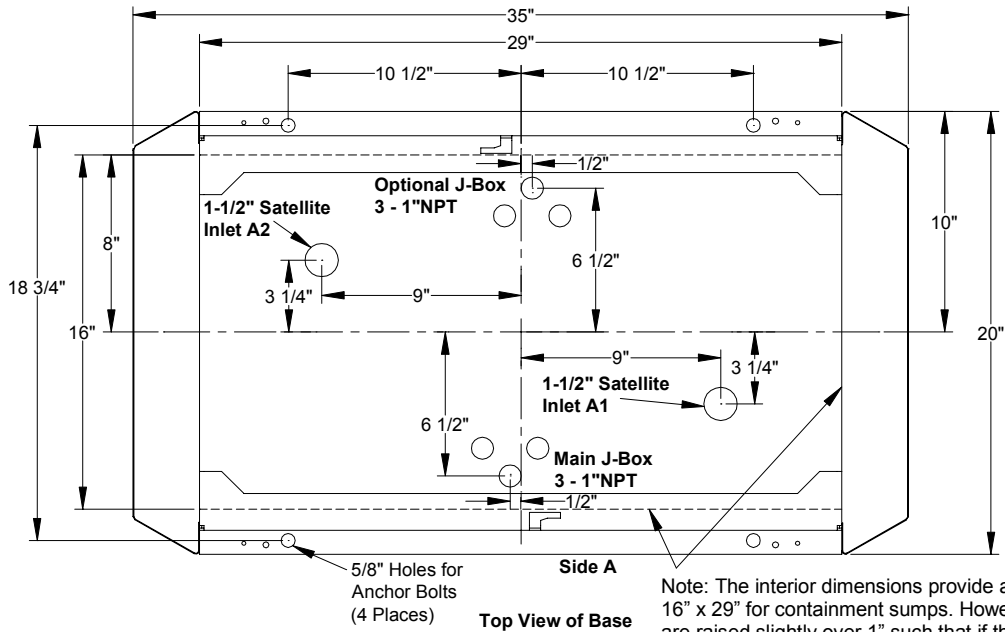
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NOTES:

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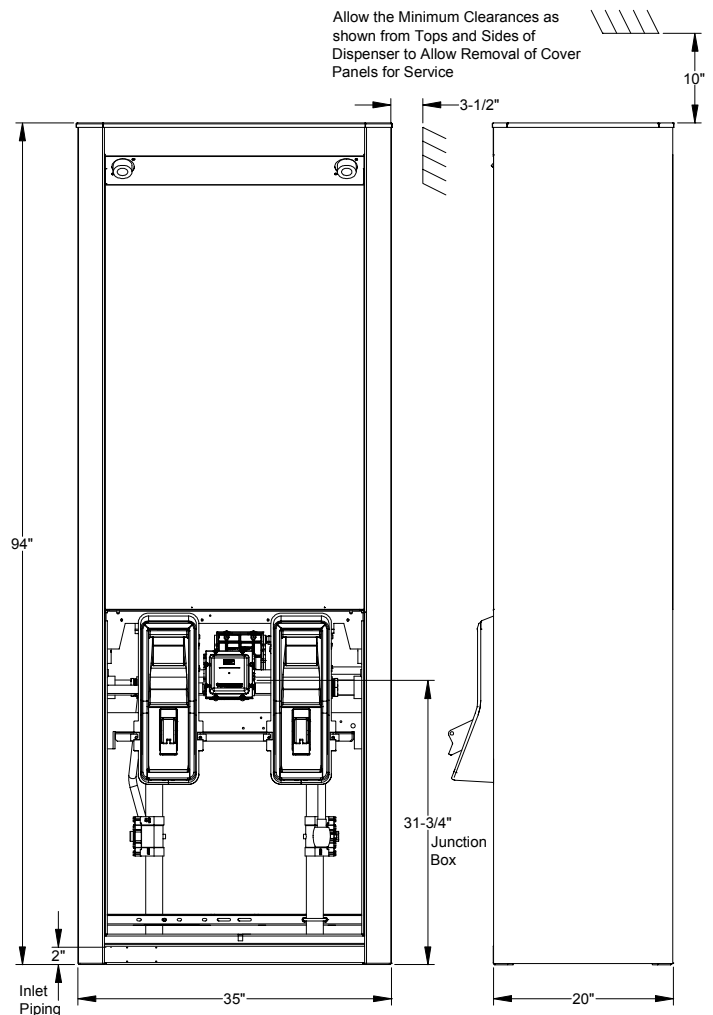
Model HS4/V289S/4R UHC, Single Sided Satellite/Satellite



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E5. ELECTRICAL RATINGS & WIRING DIAGRAMS

Electrical Ratings

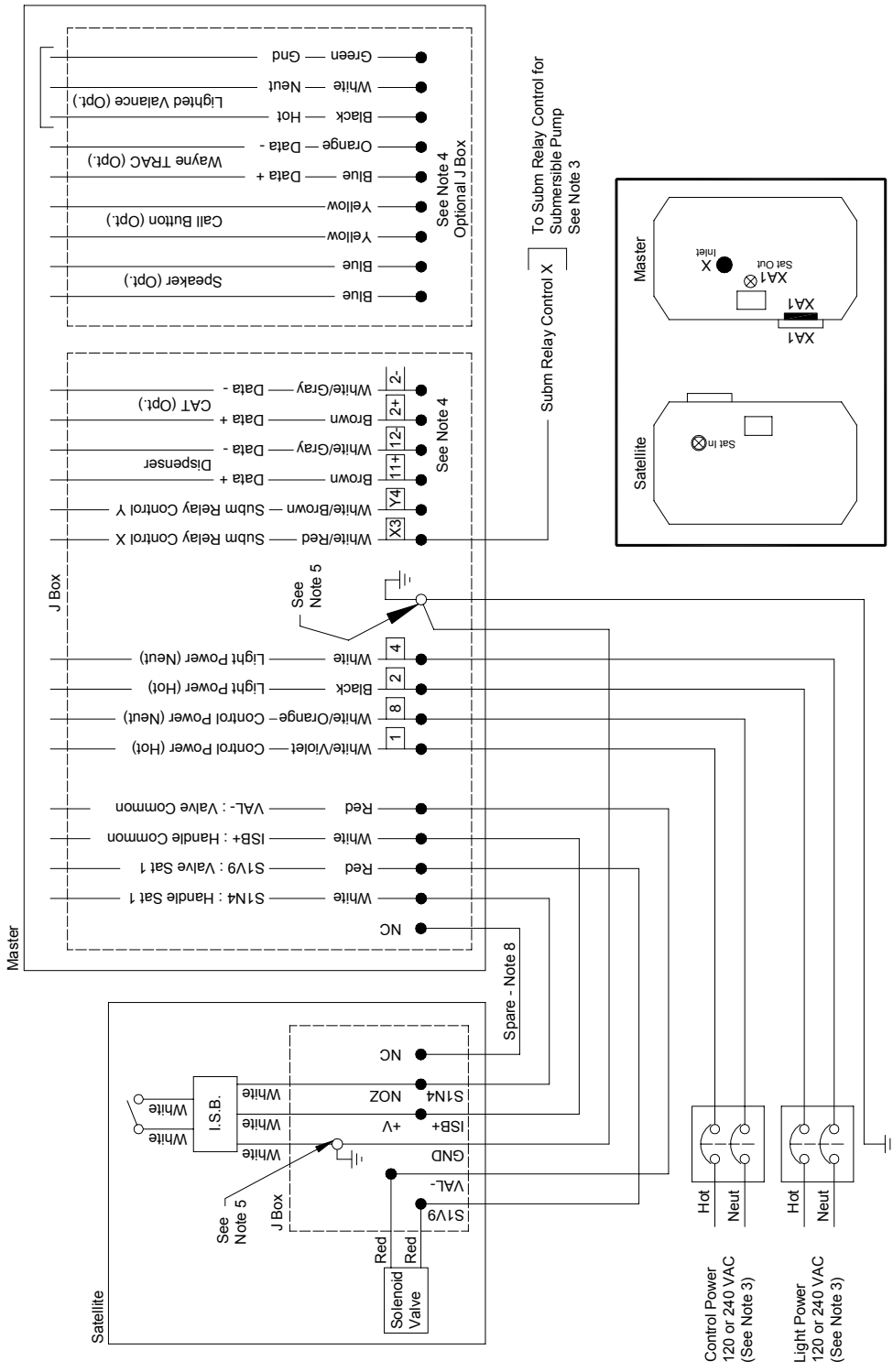
NOTE: The sale display lights may be connected to a separate circuit breaker as shown or they can be combined with the power supplied from the "Control Power" breaker.

Voltage: 110/120 VAC 50/60 Hz
Amperage: Control Power – 1.0 Amps
Control Power and Lights – 1.6 Amps
Control Power, Lights and CAT – 6.5 Amps

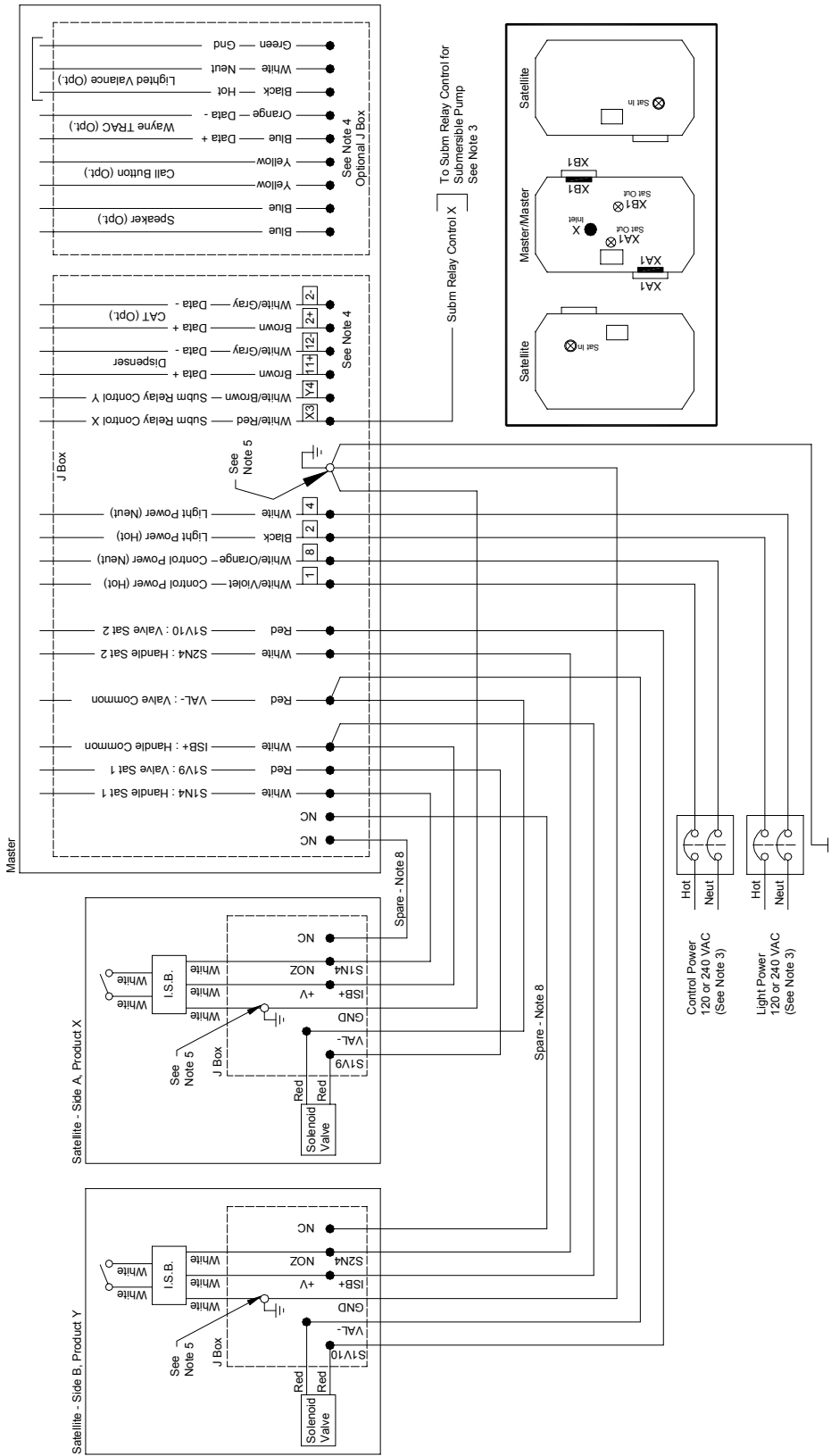
Voltage: 240 VAC 50 Hz
Amperage: Control Power – 0.8 Amps
Control Power and Lights – 1.5 Amps
Control Power, Lights and CAT – 2.8 Amps

Voltage: 240 VAC 60 Hz
Amperage: Control Power – 0.6 Amps
Control Power and Lights – 1.3 Amps
Control Power, Lights and CAT – 2.7 Amps

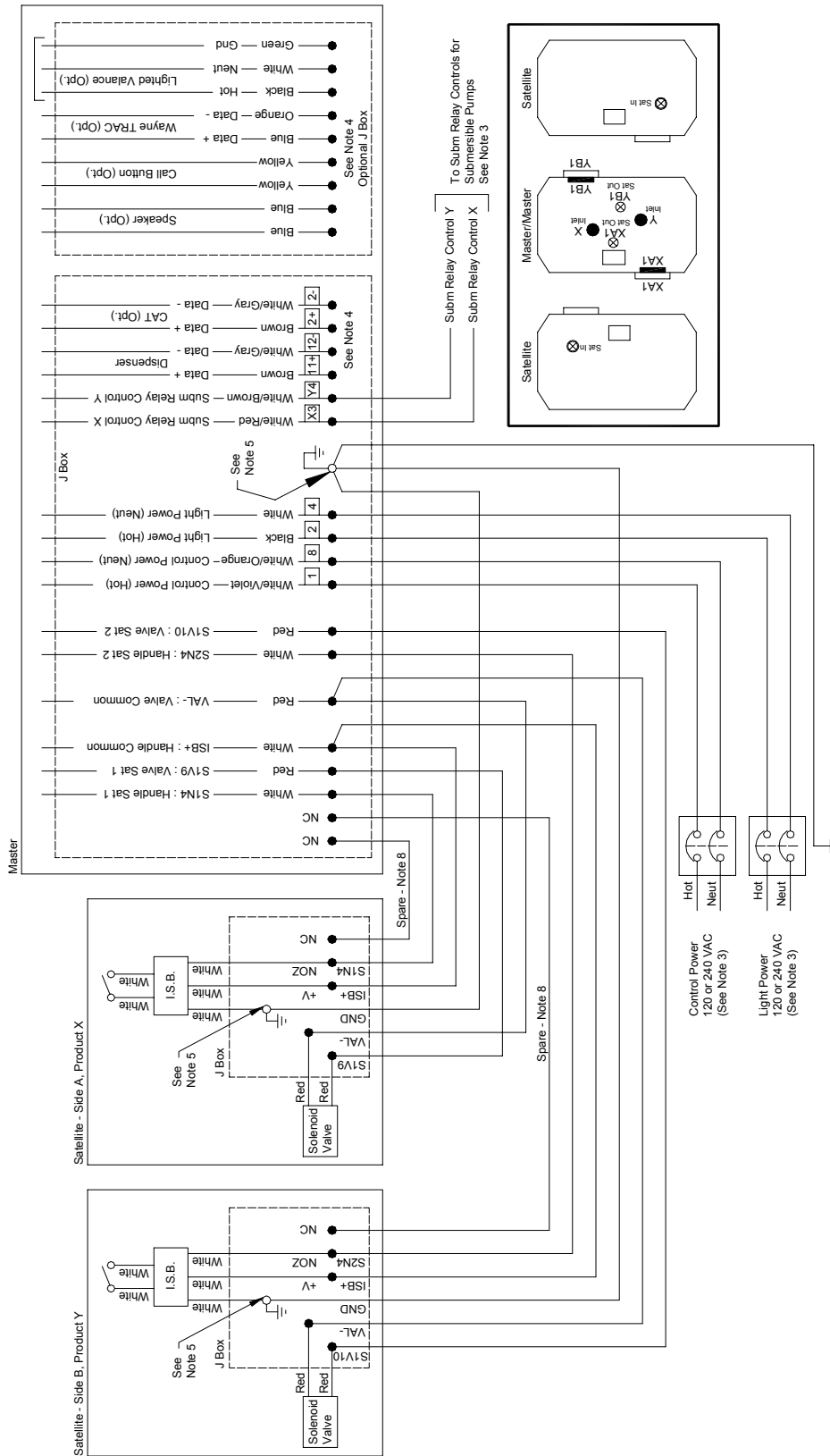
Model HS4/V387Dx/4R UHC, Single Master



- Notes:**
- All equipment to be installed in accordance with all applicable local, state, and federal codes, including, but not limited to, the National Electrical Code (NFPA 70), NFPA 30, and the Automotive and Marine Service Station Code (NFPA 30A).
 - For wiring connections, use wires rated at least 90°C, 600V, Gas & Oil Resistant.
 - Remote dispensers require a relay to interface to the submersible pump motor. In multiple dispenser applications, 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.
 - For full details of Wayne control systems interconnections see the manual provided with the Wayne pump control system or Wayne card processing system.
 - Attach all grounds to the ground screw provided.
 - Lighted valance ready dispensers only. Lighted valance assemblies must be Listed for installation above Class I, Hazardous Location. Follow instructions provided by valance manufacturer and secure all open wiring away from shaper edges, including sheet metal.
 - Optional speaker installation wiring is located in optional junction box. Connect intercom circuit to a Listed Class 2 powered intercom only with 18 gauge minimum, at least 90 degree C, Gas & Oil resistant UL Listed wire. Wires back to intercom power must be run in a separate dedicated Listed metallic conduit.
 - Spare wire should be installed to also allow for use of Parker 2-stage valves for service part replacement.

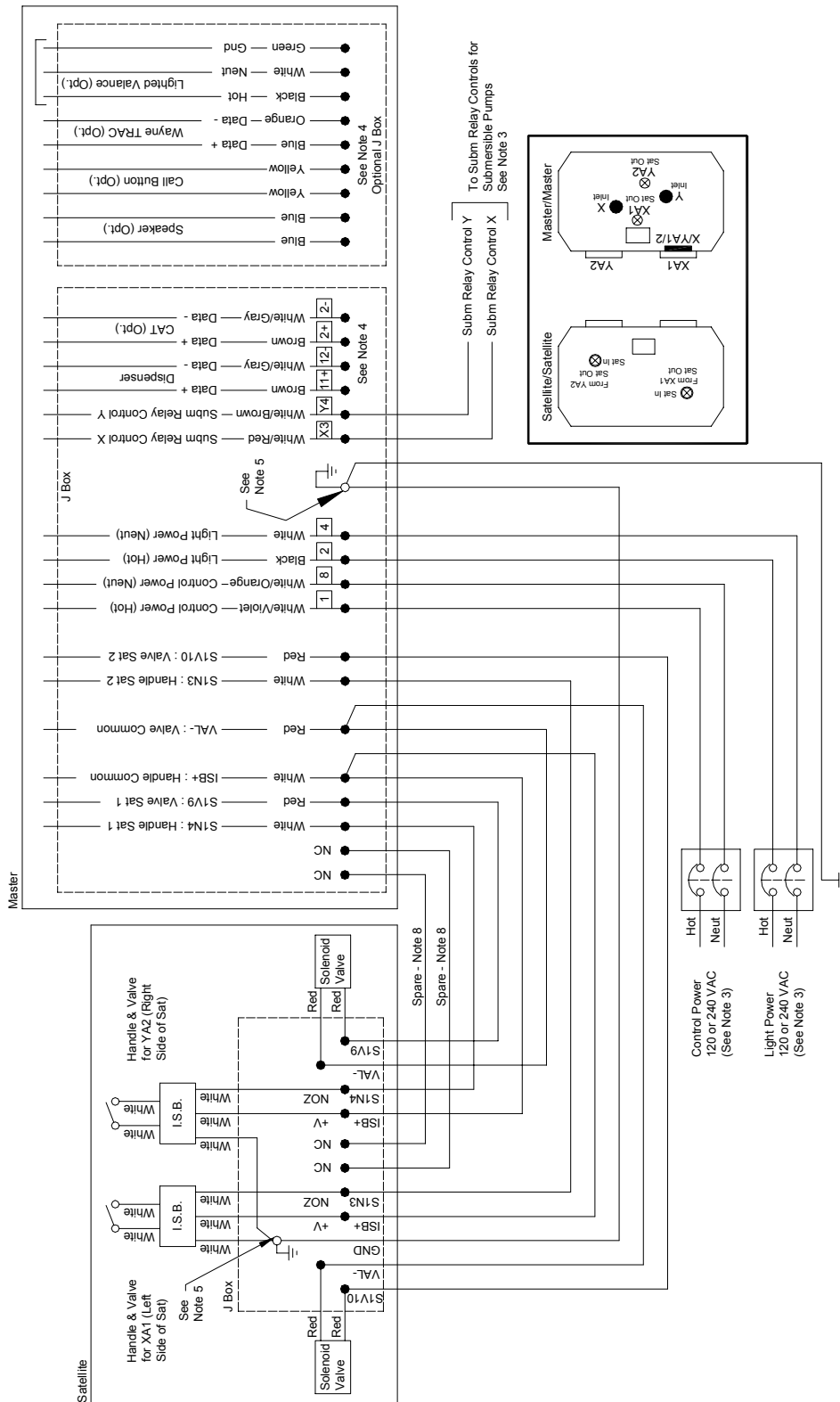


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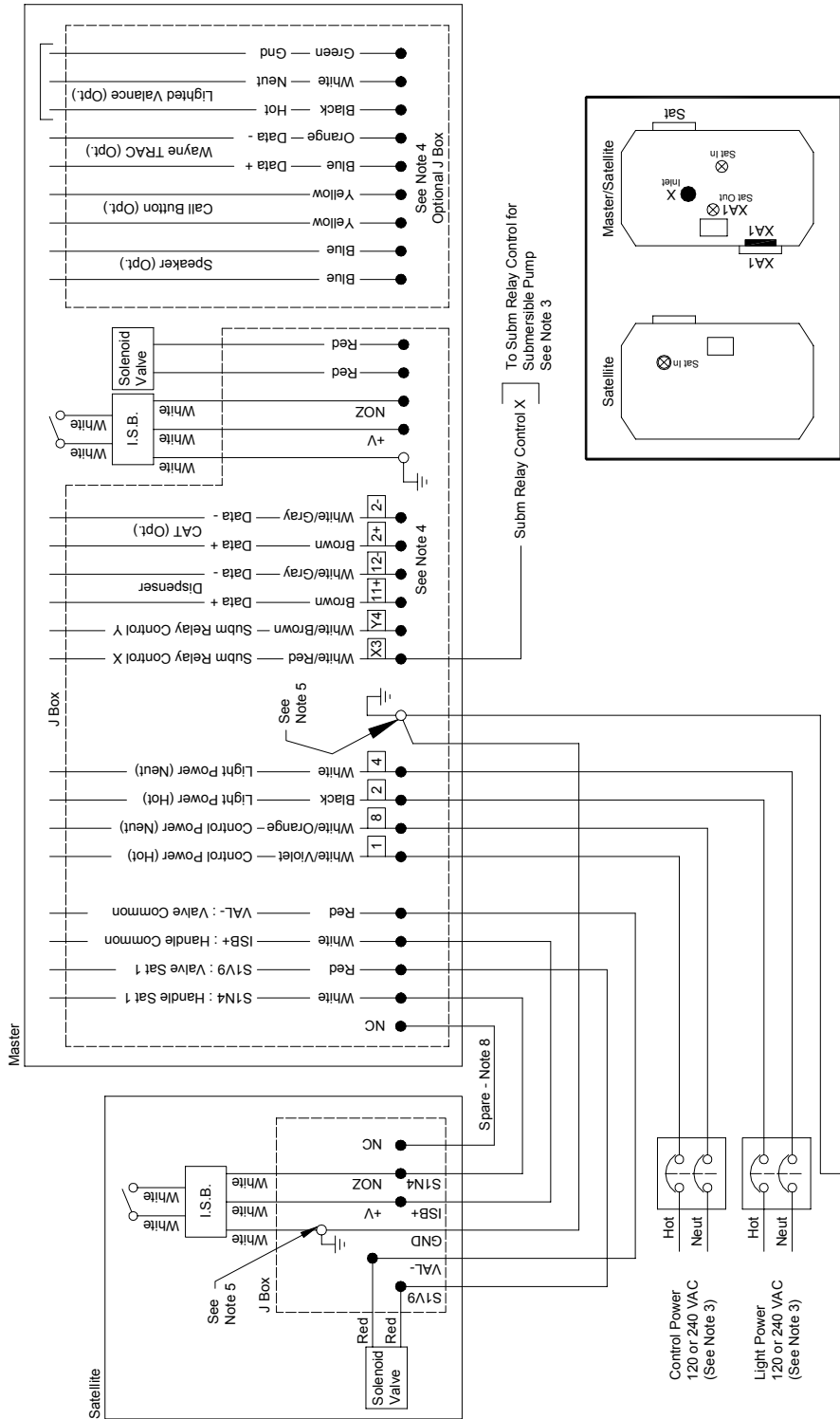
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INSTALLATION & OPERATION MANUAL

4/Vista Series Suction Pumps and Remote Dispensers Including Ultra High Capacity UHC Models

Written by S. G. Martin

This manual was produced using Adobe® FrameMaker® and Photoshop®

Page design uses Arial Fonts

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**Dresser Wayne, Dresser, Inc., is located at 3814 Jarrett Way, Austin TX 78728.
Wayne's general telephone number is (512)-388-8311.**

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

