



Atlas™ Fuel Systems

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# Site Preparation Manual

## Computer Programs and Documentation

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## FCC Warning

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. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

## Approvals

**Gasboy International, Greensboro, is an ISO 9001:2000 registered facility.**

### Underwriters Laboratories:

| U. L. File# | Products listed with U. L.   |
|-------------|--|
| MH4314      | All dispensers and self-contained pumping units  |
| MH6418      | Power operated Transfer Pump Models 25, 25C, 26, 27, 28, 72, 72S, 72SP, 72X, 73 and 1820   |
| MH7404      | Hand operated Transfer Pump Models 1230 Series, 1243 Series, 1520 and 1720 Series  |
| MH10581     | Key control unit, Model GKE-B Series<br>Card reader terminals, Models 1000, 1000P<br>Site controller, Model 2000S CFN Series<br>Data entry terminals, Model TPK-900 Series<br>Fuel Point Reader System |

### New York City:

| NYFD C of A # | Product   |
|---------------|---|
| 4823          | 9100A, 9140A, 9152A, 9153A, 9800A, 9840A, 9850A, 9852A, 9853A, 9140 |
| 4997          | 9822A, 9823A  |
| 5046          | 9100Q, 9140Q, 9152Q, 9153Q, 9800Q, 9840Q, 9852Q, 9853Q              |

### California Air Resources Board (CARB):

| Executive Order # | Product                |
|-------------------|------------------------|
| G-70-52-AM        | Balance Vapor Recovery |
| G-70-150-AE       | VaporVac               |

## NCWM - Certificate of Compliance:

Gasboy pumps and dispensers are evaluated by the National Conference of Weights and Measures (NCWM) under the National Type Evaluation Program (NTEP). NCWM has issued the following Certificates of Compliance (COC):

| COC#     | Product   | Model #                                      | COC#     | Product    | Model #                           | COC# | Product | Model # |
|----------|-----------|--|----------|------------|-----------------------------------|------|---------|---------|
| 95-179A2 | Dispenser | 9100 Retail Series, 8700 Series, 9700 Series | 91-019A2 | Dispenser  | 9100 Commercial Series            |      |         |         |
| 95-136A5 | Dispenser | 9800 Series                                  | 91-057A3 | Controller | 1000 Series FMS, 2000S-CFN Series |      |         |         |

## Patents

Gasboy products are manufactured or sold under one or more of the following U.S. patents.:

### Dispensers

5,257,720

### Point of Sale/Back Office Equipment

D335,673

## Trademarks

### Non-registered trademarks

Atlas™  
Consola™  
Infinity™

### Registered trademarks

ASTRA®  
Fuel Point®  
Gasboy®  
Keytrol®  
Slimline®

Additional U.S. and foreign trademarks pending.

Other brand or product names shown may be trademarks or registered trademarks of their respective holders.

Additional U.S. and foreign patents pending.

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# 1 – Introduction

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## Read This First

### Purpose of This Manual

This manual gives you information to prepare a site for Gasboy® Atlas™ Series pumps or dispensers. It provides the following:

- Safety information
- Equipment needed for installation
- Station layout information
- Electrical requirements
- Plumbing requirements

Perform all site prep in accordance with NFPA 30A, NFPA 70, and applicable national, state and local codes/regulations. For non-US installation, other codes may apply. Plan your site ahead of time. Use experienced, licensed personnel that practice accurate, safe construction techniques. Time, expense, and extra effort in the early stages of preparing a site can eliminate problems in later stages. Careful site preparation provides a sound troubleshooting framework for field repairs. Always consult manufacturer installation instructions for additional information. This manual does not purport to list all requirements for installation of outside venter components.

### Who Should Use This Manual

This manual is intended for individuals who are trained in the construction of gasoline stations. If you do not have experience with this type of construction (gasoline stations) please contact licensed, trained engineer or contractor or Gasboy Authorized Service Contractor (ASC).

### Who To Contact

| <b>For this type of information</b>   | <b>Call the following phone numbers</b>                   |
|---|---|
| To schedule training on Gasboy products   | Contact your local Gasboy distributor for assistance.     |
| For technical assistance  | Gasboy Technical Support at 1-800-444-5529                |
| For warranty service and information  | Gasboy Call Center at 1-800-444-5529                      |
| For explanation of Gasboy's warranty policy   | Contact your local Gasboy distributor for assistance.     |
| For additional technical literature, for example installation, parts manuals, and other documents | Gasboy Literature Department at 1-336-547-5661            |
| Solutions, Products, Services and Support   | <a href="http://www.gasboy.com">http://www.gasboy.com</a> |

## Reference Documents

### Read Manufacturer's Instructions

Equipment manufacturers must provide instructions for other equipment, such as submerged turbine pumps (STPs), leak detectors, underground tanks, product lines, and shear valves. Gasboy does not provide complete installation instructions for other manufacturer's equipment.

### Read Gasboy Technical Manuals

|          |                                       |
|----------|---------------------------------------|
| FE-356   | Atlas Dispenser Field Wiring Diagrams |
| FE-357   | Atlas Pump Field Wiring Diagrams      |
| MDE-4331 | Atlas Installation Manual             |
| MDE-4334 | Atlas Service Manual                  |
| MDE-4363 | Atlas Owner's Manual                  |
| PT-1949  | Atlas Illustrated Parts Manual        |
| PT-1950  | Atlas Recommended Spare Parts Manual  |

## Glossary of Terms

**C.O.C.** - Certificate Of Conformance (see back of front cover for listing of numbers).

**Dispenser** - Dispensing device that uses STP in storage tank to move fuel from storage tank to dispenser.

**High Hose** - Pumps/Dispensers with hoses that connect overhead.

**Listed** - Products that bear the authorized Listing Mark of U.L. (Underwriters Laboratories). This is the manufacturer's declaration that the product complies with U.L.'s requirements in accordance with the terms of U.L.'s Listing and Follow-Up Service agreement.

**Low Hose** - Pumps/Dispensers with hoses that connect at hydraulics level.

**Master/Satellite** - Master dispensers are teamed with satellites for rapid fueling of trucks with saddle tanks. The master unit meters and computes product flow for both units. The satellite is a dispenser without the electronics module.

**Pump** - Uses self-contained pumping unit and motor to move fuel from storage tank

**STP** - Submerged turbine pump

**Valves** - Mechanical device by which the flow of fuel in bulk may be started, stopped, or regulated by a movable part that opens, shuts, or partially obstructs one or more ports or passageways.

## 2 – Important Safety Information

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause death or serious injury if these safe service procedures are not followed.

### Preliminary Precautions


You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.

### Emergency Total Electrical Shut-Off

The first and most important information you must know is how to stop all fuel flow to the pump and island. Locate the switch or circuit breakers that shut-off all power to all fueling equipment, dispensing devices, and submerged turbine pumps (STPs).

**⚠ WARNING**

The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL NOT shut off electrical power to the pump/dispenser.

 This means that even if you activate these stops, fuel may continue to flow uncontrolled.

You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not only these cashier station "stops."

### Total Electrical Shut-Off Before Access

Any procedure requiring access to electrical components or the electronics of the dispenser requires total electrical shut-off of that unit. Know the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gasboy equipment.

### Evacuation, Barricading and Shut-Off

Any procedures requiring accessing the pump/dispenser or STPs requires the following three actions:



- An evacuation of all unauthorized persons and vehicles
- Using safety tape or cones as barricades to the effected units
- A total electrical shut-off of that unit and any associated STPs.

## Read the Manual

Read, understand and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call a Gasboy Authorized Service Contractor or call the Gasboy Call Center at 1-800-444-5529. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

## Follow the Regulations

There is applicable information in: NFPA 30A: *Automotive and Marine Service Code*; NFPA 70: *National Electrical Code (NEC)*; OSHA regulations; and federal, state, and local codes which must be followed. Failure to install, inspect, maintain or service this equipment in accordance with these codes, regulations and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

## Replacement Parts

Use only genuine Gasboy replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gasboy replacement parts could create a safety hazard and violate local regulations.

## Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.

### Alert Symbol



This safety alert symbol is used in this manual and on warning labels to alert you to a precaution which must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

### Signal Words

These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions that follow must be followed to prevent death, injury or damage to the equipment

- **DANGER** - This signal word is used to alert you to a hazard to unsafe practice which will result in death or serious injury
- **WARNING** - This alerts you to a hazard or unsafe practice that could result in death or serious injury.
- **CAUTION** with Alert symbol - This signal word designates a hazard or unsafe practice which may result in minor injury.
- **CAUTION** without Alert symbol - When used by itself, CAUTION designates a hazard or unsafe practice which may result in property or equipment damage.

## Prevent Explosions and Fires

Fuels and their vapors will become explosive if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause explosive vapors in the vicinity of dispenser or island.

## No Open Flames



Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.

## No Sparks - No Smoking



Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuels and their vapors. After getting out of a vehicle, touch the metal of your vehicle to discharge any electrostatic charge before you approach the dispenser island.

## Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Be familiar with Cardiopulmonary Resuscitation (CPR) methods if you are working with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA tag out and lock out procedures. If you are not familiar with this requirement, refer to information in the service manual and OSHA documentation.

## Working With Fuel Safely

Be sure to follow information in this manual, related materials and approved industry standard practices in handling fuel and fueling equipment.

## Protect Your Eyes



Spraying fuel from residual pressure in lines can cause serious eye injuries. Always wear eye protection. Gasoline spilled in eyes may cause burns to eye tissue. Rinse eyes with water for approximately 15 minutes. Seek medical advice immediately. It is not necessary to wear eye protection unless performing hydraulic service.

## Use Proper Fuel Handling Techniques

- Be sure breakaways, shear valves and other emergency devices are properly installed. Refer to manufacturer's instructions for proper installation.
- Collect, transport and dispose fuel only in approved containers specifically designed for this purpose.
- Before working with or disposing of any chemicals or fuels in and around a dispensing facility, read the MSDS pertaining to those chemicals as prescribed in the Occupational Safety and Health Administration Standard, 29 CFR 1910.1200. Refer to the supplier's literature.

## Hydraulic Pressure Releases and Fuel Leakage

Working on hydraulic systems can result in leakage of fuel that may also be under pressure.



Turn off all circuit breakers for unit being worked on, all dispensers using the same grades of fuel, and all associated STPs.

Do not allow unauthorized or untrained individuals to service hydraulic equipment.

Shear valves, required by NFPA 30A, are intended to shut-off the flow of fuel at the dispenser base (hydraulics area) during vehicle impact or fires. A single-poppet shear valve prevents fuel from flowing from the underground tank. A double-poppet shear valve prevents fuel from flowing from the underground tank and from the dispenser.

## React Quickly to Fuel Spills, Fires or Vehicle Impact



Follow these steps in the event of a fuel spill, fire, or vehicle impact.

- 1 Use station EMERGENCY TOTAL ELECTRICAL SHUT-OFF immediately. Turn off all system circuit breakers to the island. Refer to “Total Electrical Shut-Off Before Access” on page 3.
- 2 Call emergency numbers for fires, vehicle impact or any significant spills.
- 3 Use safety tape, cones or barricades to block the work area. Do not go near fuel spill or allow anyone else in the area.
- 4 Take precautions to avoid igniting fuel. Do not allow starting of vehicles in the area and immediately stop use of open flames, smoking or power tools in the area.
- 5 Provide emergency and first aid assistance. If any gasoline has been inhaled or spilled on skin, seek emergency help immediately.
- 6 Use approved and safe procedures to clean up all spills with a “fuel or gasoline absorbent” material approved by your local regulatory agencies. (Dispose of fuel and hazardous absorbent material promptly and according to the requirements of the fire department, local EPA, and federal, state or local resources.)

## Working With Electricity Safely

Be sure to use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock.

- Be sure grounding connections are properly made.
- Make sure that sealing devices and compounds are in place.
- Be sure not to pinch wires when replacing covers
- Follow OSHA Lock-Out and Tag-Out requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

## Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Be sure to clean hands after handling equipment. Do not place any equipment in mouth.

### **WARNING**

This area contains a chemical known to the State of California to cause cancer.

### **WARNING**

This area contains a chemical known to the State of California to cause birth defects or other reproductive harm.

## Emergency First Aid Information

### **WARNING**



Gasoline ingested may cause unconsciousness and burns to internal organs. Do not induce vomiting. Keep airway open. Oxygen may be needed at scene. Seek medical advice immediately.

### **WARNING**



Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs. Keep airway open. Seek medical advice immediately.

### **WARNING**



Gasoline spilled in eyes may cause burns to eye tissue. Irrigate eyes with water for approximately 15 minutes. Seek medical advice immediately.

### **WARNING**



Gasoline spilled on skin may cause burns. Wash area thoroughly with clear/water. Seek medical advice immediately.

## Informing Emergency Personnel

Compile the following information for emergency personnel:

- Location of accident (for example, address, front/back of building.)
- Nature of accident (for example, possible heart attack, run over by car, burns.)
- Age of victim (for example, baby, teenager, middle-age, elderly)
- Whether or not victim has received first aid (for example, stopped bleeding by pressure.)
- Whether or not victim has vomited (for example, if swallowed or inhaled something.)

**IMPORTANT:** Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

## Other Useful Safety Information

This subsection provides additional safety information.

### OSHA Lock-Out and Tag-Out Requirements

OSHA Standard 29 CFR 1910-147 Control of Hazardous Energy Sources (Lock-Out/Tag-Out) covers ways to avoid personal injury because power was turned on or fuel pressure was applied **unexpectedly** while servicing equipment. The rule requires:

- (1) Turning off equipment power and fuel under pressure.
- (2) Use of a locking device (breaker, valve, and so on.) or label device with a warning tag.

Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

### Breakaways

Required by NFPA 30A, breakaways are emergency devices designed to retain liquid on both sides of the breakaway point installed on each hose. Refer to manufacturer's instructions for proper installation.

### Collection of Fuel in Approved Containers

NFPA 30A, Section 2, requires use of approved containers to collect, transport, and dispose of fuel. Containers must be specifically designed and labeled for handling hazardous fuels.

### Read Material Safety Data Sheets (MSDS)

Before working with any chemicals or fuels in and around a dispensing facility, read the MSDS pertaining to those chemicals as prescribed in the Occupational Safety and Health Administration Standard, 29 CFR 1910.1200. Refer to the supplier's literature.

## 3 – Site Preparation

### Station Layout



Gasboy recommends that you:

- Consider traffic flow, kiosk, and store location when planning location of pumps/dispensers.
- Plan islands for efficient routing of plumbing and wiring. Arrange product lines by hose and foundation layouts (See MDE-4331 Atlas Installation Manual). Follow local codes.  
*Note: Actual flow rates will depend on your specific installation and accessories used. Remember pipe size and number of fittings can affect flow rate. Refer to “Plumbing Requirements” on page 22.*
- Place pump/dispenser so customers can dispense fuel safely and conveniently.
- Install pumps/dispensers at least 8-feet apart on island.
- Consider the service person. They must have easy access to the entire pump/dispenser (top, rear, front and sides). Gasboy recommends at least 60 inches of clearance from any structure (for example, wall, fence).
- Install protective posts at ends of island to protect pumps/dispensers against collision. Posts must not interfere with customer fueling.

### Product System Layout

- Distance from tank to pump - not more than 50 feet.
- Fuel line dimensions, reference “Pipe Size” on page 23.
- Fuel line minimum burial depth starting at inlet riser to the pumping unit is 18 inches.
- Fuel line piping sloping rate of 1-1/2 to 2 inches per 10 foot of piping run.

*Note: Traps and sags are not acceptable.*

- Maximum lift is 10 foot. (Reference “Fuel Tanks” on page 22.)
- Pumps (self contained units) must have a vacuum actuated pressure regulating valve to prevent positive pressure at the pump base when used with above ground tanks.
- Above ground tank installations, reference “Shear Valves” on page 25 and “Pipe Installation” on page 23.

### Station Security

This section includes information that is primarily applicable to Commercial sites and some Retail sites. It may be impossible with any manufacturer's unit, even if it is designed for security, to stop a knowledgeable, unobserved experienced thief. It is possible to greatly reduce the probability that a theft will be successfully attempted if security measures are designed into the station layout and security minded actions are planned into site operation. The following recommendations are intended to decrease the probability of theft by observance and/or incorporating obstacles that deter criminal activity.

### Steps to Enhance Security

- 1 Design stations where employees have full unobstructed view of all fueling locations. Do not block employee views with merchandise displays or other obstructions. If full view is not possible, utilize video surveillance equipment. Monitoring of equipment should be made obvious and signs stating its use should be posted.

- 2 Use dispenser/pump security kits when available.
- 3 For Fuel management or console models with the “time out” programming capabilities, plan to use modular programming “time out” functions that shut down the unit if no pulser activity occurs for a preselected time.
- 4 Plan to provide periodic/frequent inspection of equipment security provisions to verify their integrity.
- 5 For electronic retail units, enter a new programming access code, as default codes are commonly known. These codes should only be known by trusted station employees and the involved ASCs.
- 6 At installation and all times thereafter ensure that lower door locks are adjusted correctly and will not allow the panels to be removed easily without a key or tools. If you suspect that keys are available to thieves in your area, consider using special locks or keys available from locksmiths.
- 7 Use surveillance cameras especially for high risk or locations potentially blocked from view.
- 8 Observe POS warnings or messages for units off line, when available.

## Equipment and Materials Needed At Site

- Fuel storage tanks
- STPs and leak detectors for dispensers
- Piping and fittings
- Pit boxes
- Shear valves for dispensers
- Check valves for pumps
- Conduit and gas/oil resistant wiring
- STP control relay boxes for dispensers
- Circuit breakers
- Isolation relays for electronic dispensers
- Emergency power cutoff switch
- Safety warning signs  
Place warning signs (for example: No Smoking, Turn Off Engine) where fuel customers will notice and read them. Contact your local distributor for warning signs.
- Conduit Seal (Potting) Compound (as required by seal manufacturer)
- For above ground tanks with self-contained pumps use vacuum actuated pressure regulating valve with a shear section at the pump.
- Distribution box(es) or service module(s) is required per unit type.
- UL<sup>®</sup> approved sealant suitable for the application involved.
- Wiring and conduit materials as outlined in the wiring diagram, and wiring and conduit sections.

## Electrical Requirements


- Prepare sites according to NFPA 30A, NFPA 70, and applicable national, state and local codes/regulations.
- Use licensed electricians to make all electrical connections.
- Use a dedicated circuit/phase system. Wire all electronic units to the same power leg.
- Use an earth ground for circuits.
- Mount all circuit breaker panels and relay boxes securely to the wall.
- Use UL recognized/approved components and/or systems.
- Recommended voltages for pumping unit motors are 220VAC- single phase or 380VAC- 3 phase.
- Route product wiring to protect from damage, using conduit as required.

*Note: Pumping units require higher load levels than dispensers. See FE-356 and FE-357 for details.*

*Note: Switched Neutral is not allowed in Canada.*

## Emergency Power Cutoff Switch

**⚠ WARNING**

 Spills and collisions expose highly flammable and explosive fuels.

Failure to install and use an Emergency Power Cutoff could result in severe injury or death.

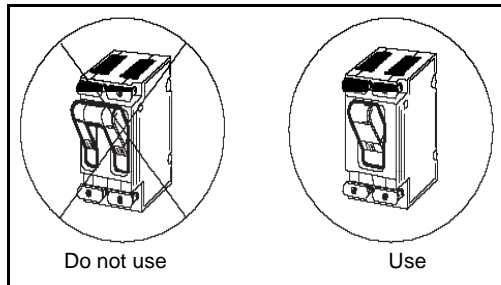
Observe all safety precautions in this and other manuals.

- NFPA 30A and Gasboy require that you install one or more emergency power cutoff switches.
- An emergency power cutoff switch is a single control that removes AC power to all island equipment (pumps/dispensers, STPs, canopies, lights, and so on.).
- Make the emergency power cutoff switch accessible, label it clearly and install it away from any hazard that may occur at the pumps/dispensers. Do not install cutoff switches more than 100-feet away from the pumps/dispensers.
- Show all employees where the emergency power cutoff switch is located and how to use it. Remind them often.

*Note: Do not use E-STOP, ALL-STOP, or PUMP STOP keys on Gasboy console/cash registers to shut off pump/dispenser power. These keys do not remove AC power and do not always stop product flow.*

*Note: Daisy Chain Wiring is used to reduce wiring cost. However, it is not recommended due to loss of power to all pumps in the event of one bad wire, or bad connection. Wiring shown in this manual is for non-daisy chain applications.*

## Circuit Breakers



- Install a dedicated UL/CUL/CSA listed switched-neutral breaker to each circuit leading to a pump/dispenser or dispenser and STPs. It must be able to disconnect hot and neutral conductors simultaneously. Single-pole breakers with handle ties shall not be permitted. Ref. NEC 514.11. (Switched Neutral is not allowed in Canada.)
- Use only UL/CUL/CSA listed circuit breaker panel as appropriate for that area.
- Install circuit breakers away from the pumps/dispensers. They must be readily accessible and clearly marked.
- Install a separate circuit breaker for each STP (dispenser models) or each pump motor (self-contained models).
- Install one circuit breaker for each pump/dispenser or small island group to allow powering down of pump/dispenser for service.

Power to the unit should be supplied from a dedicated breaker. No other equipment should be powered from this breaker. Remote dispensers may be grouped together on a single breaker when the submersible pump has its own breaker. It is recommended that no more than two remote dispensers be powered from one breaker to maintain isolated control with the circuit breaker panel in case of problems. Units directly driving pumps (suction or submersible) should be supplied power from a separate breaker. A tag on the motor identifies the maximum current draw of the motor. If two (2) pumps are supplied from one breaker, that breaker must be capable of handling the load of both motors. In cases where multiple remote dispensers supply power to a single submersible pump, all breakers controlling the remote dispenser must be on the same phase of power. Failure to do this will damage the equipment. Provisions must be made to break both legs of any AC circuit.

## STP Control Relay Boxes for Dispensers

- Install a separate control relay for each STP.
- Do not use the dispenser relay to power the STP.
- Combined STP Control Relay/Isolation Relay boxes are recommended.

## STP Isolation Relays for Electronic Dispensers

STP isolation relays provide electrical isolation between dispensers and prevent damage from cross phasing. Refer to MDE-4334 Atlas Service Manual and FE-357 Atlas Pump Field Wiring Diagrams.

*Note: For 3-phase STP, use isolation relay at the input of the 3-phase STP control box.*

- Gasboy requires installation of STP isolation relays in addition to STP control relays.
- Use isolation relays for each STP control line at each dispenser or dispenser grouping on a single circuit breaker.
- Route neutral wire to the control relays from the dispenser circuit breaker (see field wiring diagrams).
- Combined STP Control Relay/Isolation Relay boxes are recommended.

## Conduit

- Use one-inch trade size rigid aluminum conduit with the Gasboy pumps/dispensers to connect wires to the pump/dispenser (Retail). Two-wire data wires can share power wiring conduit (See model-specific wiring diagrams).
- Use threaded, rigid metal conduit or a rigid non-metallic conduit for applications below the pump dispenser to carry electrical wires. Conduit must conform to national and local electrical codes. If you use nonmetallic conduit, it must be at least two-feet underground. The last two-feet of the underground run to the junction box must be rigid metal conduit or threaded steel intermediate metal conduit. Tighten all threaded conduits.
- Never share conduit or wire troughs with other manufacturers' equipment (for example, speaker wires, canopy lights).



*Note: You can use the same conduit for routing power to the pump/dispenser and the two-wire (Retail) data loop (Class 1 circuit). The two-wire data loop is a Class 1 circuit.*

- Never rely on metal conduit to provide an equipment ground. Run a separate ground wire.
- Never use knock-out boxes or flexible conduit for installation.

*Note: Extra junction boxes added to the pump/dispenser must be listed Class 1, Div. 1, Group C and D explosion-proof.*



- Use electrical fittings that are listed for Class 1, Group C and D hazardous locations as required by NFPA 30A and NFPA 70.
- A seal-off 'Y' fitting (example: Killark® Type EY) must be installed on all units as a first connection where conduit leaves the ground.
- If TopKAT is factory mounted, a separate conduit must be installed. Reference the TopKAT documentation for field wiring (C36089 Field Installation of a TopKat (Series 900) Mechanical Interface Kit and MDE-4340 Series 9800Q Pumps and Dispensers Installation/Operation Manual).

## Wiring

The distinction between the Commercial and Retail dispenser/pump units is that the Commercial unit must use the separate conduit arrangement to keep the signals from interfering with one another or other noise generating devices where as with the Retail unit this is not required.

### Atlas - Commercial

The Atlas Commercial dispenser/pump utilizes two conduits, one for AC power and a second for the DC signals. (The two conduits must be kept separate to reduce signal interference.) The AC conduit carries the AC power line and supplies power to the valves and motors, where as the DC conduit delivers the RS-485 signal when used with a CFN and Topkat or the Pulse Output when used with a series 1000 or other manufactures control system.

When installed in a separate DC conduit, 18 AWG wires are required for installation. Although it is recommended that DC Commercial pump interface wires (RS-485 or Pulse Output) be run in a conduit separate from AC wires, they can be combined in the same conduit with AC wires providing UL-Listed cable with the following specifications is used:

- Conductor:** 18 AWG stranded wire. Number of conductors to be determined by pulser requirements (reference wiring diagram to determine number of wires used.)
- Shield:** Foil-wrapped 100% coverage and/or tinned copper braid 90% coverage

**Drain Wire:** Stranded, tinned copper, 20 AWG or larger/or braided shield

**Voltage Rating:** Maximum operating voltage of 600V

**Environmental:** Gas- and oil-resistant; suitable for wet or dry locations.

Gasboy can supply Belden 1063A (P/N C09655) which is a UL-Listed, four-conductor cable that meets the requirements listed above.

*Note: Belden 1063A is UL-Listed but not CSA listed.*

### Atlas - Retail

The Atlas Retail dispenser/pump utilizes only one main conduit as it does not require a DC conduit. The AC conduit is used to carry the AC wire and the two wire interface twisted pair.

### Wiring Requirements



- Wire all pumps/dispensers according to NFPA 30A, NFPA 70 and applicable national, state, and local codes/ regulations.
- Wire all circuits N.E.C. Class 1.
- Use stranded gas and oil resistant copper wire rated for 300 volts (up to 240VAC source) and 80°C.
- In the main conduit of Retail units, for communications use only twisted-pair, two wire data pairs. Do not use shielded twisted pair.
- Unshielded twisted pair wire is required for Retail two-wire communication wiring for new installations. Replacement units, depending upon location of the wiring conduit and previous unit style, may require new wiring or adaptive conduit, explosion proof junction box and jumper wiring to mate with the old wiring. Previously wired stations may continue to use tested existing non-twisted pair wiring that has been short and continuity tested and passed, where communication problems between the older units and console have not been a problem. Twisted pair is highly recommended for existing stations experiencing higher than national average lightning strikes or for stations previously experiencing console to dispenser communication problems.
- Leave three-feet of wire out of conduit for connection to dispenser.
- Place dispensers on the same phase.

*Note: If Gasboy isolation relay box is installed, dispensers are not required to be on the same phase.*

- Use listed wire nuts for all connections. Do not use tape.
- Pull spare wires for future use.
- Protect conduit ends and wire from water or damage prior to installation of the pumps/ dispensers.
- Seal-off 'Y' fitting(s) must be potted after all wires are run to termination points.

For additional wiring notes and requirements consult the following documents:

- FE-356 Atlas Dispenser Field Wiring Diagrams
- FE-357 Atlas Pump Field Wiring Diagrams

## Retail Data Wire Lengths

Use the following table to determine maximum Retail data wire lengths.

| For This Distribution Box    | The Distance Between the Distribution Box and Dispenser         | The Distance Between the Distribution Box and Console/Controller |
|------------------------------|---|--|
| PA0133, PA0187 G-SITE®       | "Total" data wire system run no more than 2600 ft. with 14 AWG. |  |
| PA0242 Transac® System 1000™ | No more than 2600 ft. with 14AWG.                               | No more than 2600 ft. with 14AWG.                                |
| PA0261 Universal D-Box       |   |  |
| PA0306 Distribution Box      |   |  |

## Commercial Data Wire Lengths

Use the following table to determine maximum Commercial data wire lengths.

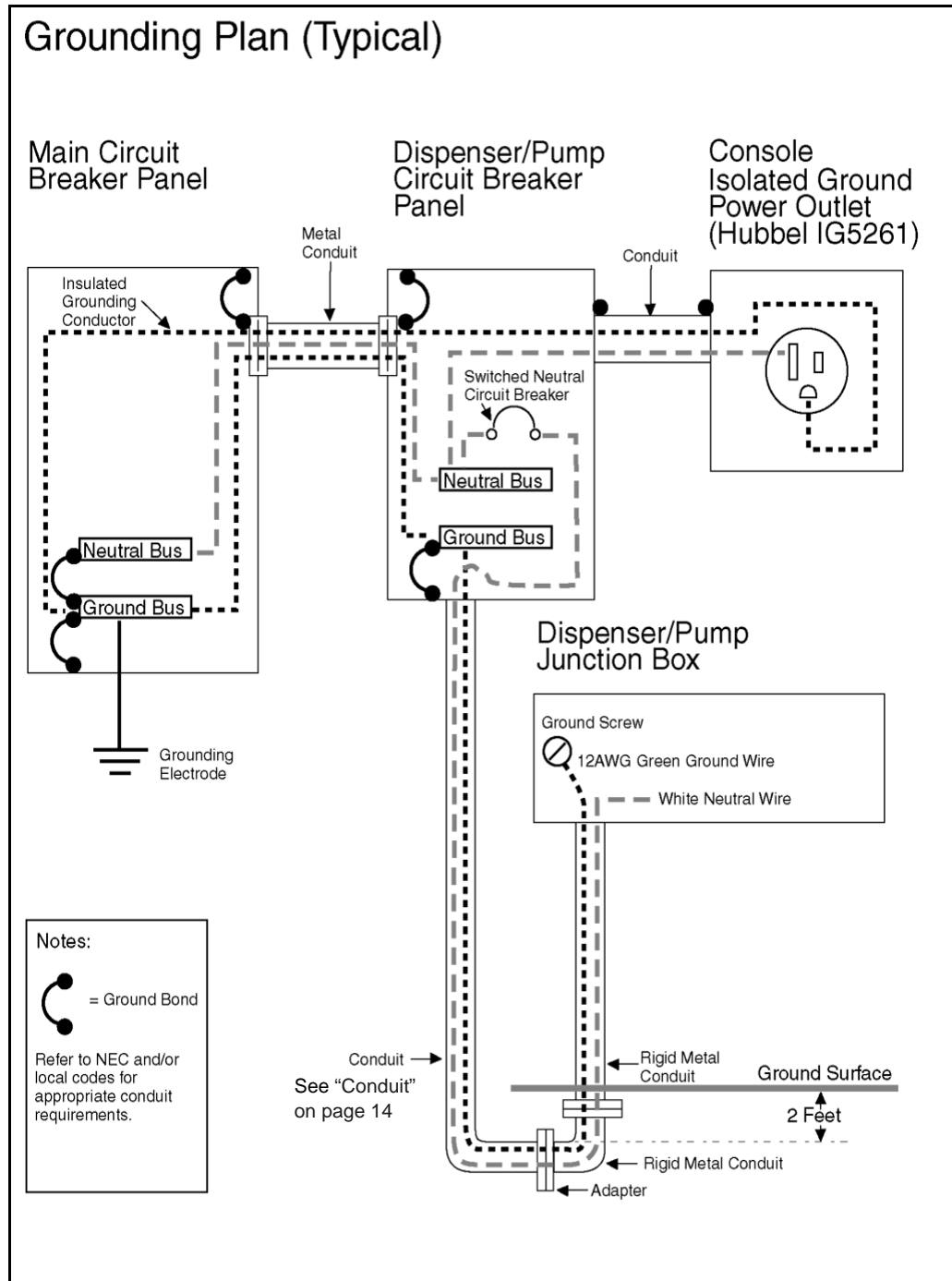
| For this Distribution Box | The Distance Between the Distribution Box and Dispenser            | The Distance Between the Distribution Box and Console/Controller |
|---------------------------|--|--|
| RS-485 Cable              | No more than 1000 ft. from junction box to farthest CFN component. | No more than 1500 ft. between all CFN components.                |

## Grounding



- NFPA 70 requires that you connect the following to system ground:
  - Consoles
  - Pumps and dispensers
  - Submerged turbine pumps
  - Relay control boxes
  - Circuit breaker panel
  - Electronic leak detectors
  - Service Module
  - Distribution Box
- Gasboy requires that you connect each pump/dispenser to an equipment grounding conductor located in the conduit per NFPA 70, Article 250. The following applies to ground conductor:
  - Gasboy recommends using wire no smaller than 12AWG. A larger wire may be required per NFPA 70, Article 250.
  - Use wire with green or green and yellow striped insulation.
  - Connect to grounding screw in junction box.
  - Ground the providing power under NFPA 70, Article 250.
  - Bond the neutral bus to an approved grounding electrode.

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



## Electrical Control Lines

This section provides control input and output information for the Atlas pump/dispensing unit. Reference FE-356 and FE-357 for electrical drawing information.

## Light Feed

The light feed is a 115 VAC (230 VAC Int'l) input required to power the fluorescent lights. In a site configuration using multiple remote dispensers (or pumps), the power for the lights of up to eight units can be supplied by one breaker. If separate control of the lights is not desired, the light feed for each dispensing unit may be taken from its Reset Motor Feed.

## Light Neutral

The light neutral is a return line for AC current from the lights to the breaker panel. When a separate breaker is not used to control the lights, the light neutral is attached to the neutral which is connected to the reset motor.

## Phase 2 Feed

The phase 2 feed is a hot feed which is the opposite phase of the pump motor feed. This line and the pump motor feed are used for domestic 230VAC motor applications.

## Pulse Out (Commercial Only)

The Pump Interface Board (Pulse Out and RS485) supplies a DC output which is provided to indicate the quantity dispensed. Pulse Output Boards are optional and are only used when monitoring of the dispensing unit operation is desired as when used with a fuel management system.

*Note: Customers and installers having any questions pertaining to the installation should contact their Gasboy distributor.*

## Wiring Overview

The quality of the electrical installation is a major factor in maintaining proper safety levels and providing trouble-free operation of your Gasboy pump/remote dispenser. (Also reference “Electrical Requirements” on page 11.) To assure a quality installation, follow these rules:

- 1 All wiring must be installed to conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations. Canadian users must also comply with the Canadian Electrical Code.
- 2 Use only threaded, rigid, metal conduit. Reference “Conduit” on page 14 for more details.
- 3 Use only UL-labeled insulated gasoline- and oil-resistant stranded copper wiring of the proper size. (Reference “Atlas - Commercial” on page 14.)
- 4 Wire connections should be tightly spliced and secured with a wire-nut; close off the open end of the wire nut with electrical tape.
- 5 The line to the motor should be on a separate circuit and installed on a 20 to 30 AMP breaker depending on the motor size and/or the voltage setting. (Reference “Circuit Breakers” on page 12.)
- 6 Install an emergency power cutoff. (Reference “Emergency Power Cutoff Switch” on page 11.) In addition to circuit breaker requirements of NFPA 70 and NFPA 30A, a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes.

In a fuel management system application, the EMERGENCY STOP and STOP keys on the console and/or the optional EMERGENCY STOP button on the Island Card Reader do not remove AC power from equipment, and under certain conditions, will not stop product flow.

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

### **WARNING**



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

- 8 Have the pump/remote dispenser installed by a competent installer/electrician.

## Pump Motors

Pumps are shipped from the factory with motors wired according to the specifications given on the order as to kind of current, frequency and voltage.

Very often on installation, it becomes necessary to change the original setting to suit the AC power source. To do this, locate the motor change-over plate, typically located on the shaft end of the motor, and remove the screw which secures it in place. Slide the plate so that the desired voltage, as marked on the plate, lines up with the screw hole. Reinsert the screw and secure the plate in place.

Many motor failures result from improper setting of the motor change-over plate. If set for 115-VAC and a 230-VAC feed is used, the motor will burn out after running only a short time. If set for 230-VAC and a 115-VAC feed is used, the motor will run very slowly and the starting field will soon burn out.

### Motor Loads

The following chart shows the maximum running amperage that can be expected for the pump motor, unless noted otherwise:

| Model  | Motor Rating           |                       |                       |                       |
|--|------------------------|-----------------------|-----------------------|-----------------------|
|  | 115V 50/60HZ<br>1PH    | 230V 50/60HZ<br>1PH   | 230V 50/60HZ<br>3PH   | 380V 50/60HZ<br>3PH   |
| 9152K, 9152KTW1, 9152KTW2<br>9852K, 9852KTW1, 9852KTW2<br>8152K, 8152KTW1, 8152KTW2<br>8852K, 8852KTW1, 8852KTW2<br>9153K, 9153KTW2<br>9853K, 9853KTW2<br>8153K, 8153KTW2<br>8853K, 8853KTW2 | 13 amps                | 6.5 amps              | 3.4 amps              | 2.3 amps              |
| 9140K<br>9840K   | 13.0 amps per<br>motor | 6.5 amps per<br>motor | 3/4 amps per<br>motor | 2.3 amps per<br>motor |
| 9850K  | 13.0 amps              | 6.5 amps              | 3.4 amps              | 2.3 amps              |

*Note: Inadequate feed wiring (to long or too small a diameter wire) will increase current draws on the motor and/or reduce voltage at the motor. This may also reduce motor life.*

*Note: These numbers do not account for the higher load upon startup, nor up to one additional amp associated with other electrical components (lights, solenoid valves, etc.).*

*Note: All model Nos ending in TWIM or TW2 have one pump motor per side. 9140K and 9840K have one pump motor per side.*

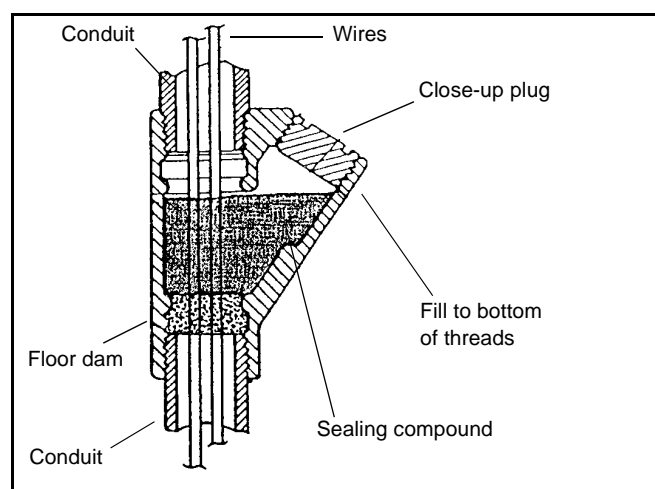
*Note: The 9140K and 9840K models should use no less than a 20-amp breaker to account for the high current upon startup.*

## Sealing 'Y' Fittings

'Y' seals are installed in conduit runs to minimize passage of vapors, gases or flames from one portion of the electrical installation to another through the conduit. Fittings must be installed in accordance with Articles 501-5 and 502-5 of the National Electric Code and fitting manufacturers' instructions.



Gasboy uses Killark® Type EY fittings and recommends them or their equivalent for vertical conduit runs. The following sealing directions are for Killark fittings only, and instructions may vary for other manufacturer's fittings. Read through all instructions completely before beginning.



- 1 Remove close-up plug.
- 2 Separate conductors and fill conduit in and around conductors using Killark type "PF" packing fiber to make a floor dam to hold fluid sealing compound.
 

*Note: Floor dam must be even with the conduit stop in the lower hub of fitting. Use care so as not to damage conductor insulation. Force packing between conductors and hubs, pushing any shreds of packing fiber away from conductors to prevent leakage path.*
- 3 Use only Killark Type "SC" sealing compound with Killark fittings, and do the following:
  - Use a clean mixing vessel for every batch of sealant.
  - Mix compound at the rate of 3 parts compound to 1 part water by volume.
  - Sprinkle compound in water while stirring, until thick paste is formed.




*Note: Do not mix more compound than can be used in fifteen minutes.*

  - Continue mixing for at least 3 minutes, until consistency is just fluid enough to pour slowly, like thick gravy (not watery).
- 4 Slowly pour approved fluid compound into sealing fitting to level of bottom of threads for close-up plug.
 

*Note: Be careful to pour slowly to avoid trapping air bubbles in seal.*
- 5 Immediately wipe off any spilled compound and close seal with close-up plug.
 

*Note: Initial setting of sealing compound will occur within 30 minutes. Compound requires a minimum of eight hours above 32 degrees F to develop sufficient strength to withstand explosion pressures.*

# Plumbing Requirements

|  |   |
|--|---|
|  <b>WARNING</b>   |   |
|   |  |
| <p>Highly flammable and explosive fuels are present.<br/>Failure to observe all safety precautions could result in severe injury or death.<br/>Observe all safety precautions in this and other manuals.</p> |   |

## Fuel Tanks

Follow tank manufacturer instructions, national, state and local regulations for storage tank installation.

On pumps (self-contained units), it is recommended that a vertical lift of 10-feet should not be exceeded. The EPA and API regulates the vapor pressure of gasoline. A lift greater than 10-feet may result in vapor suction rather than gasoline suction.

*Note: The maximum lift is defined as the vertical distance from the bottom of the suction pipe in the storage tank to the pump shaft centerline of the pumping device.*

*Note: Install vacuum actuated valve with shear section (per NFPA 30A) directly beneath a self-contained pump when above-ground storage tanks are used. Without vacuum actuated valve, sump may overflow. See the manufacturer's installation instructions, Gasboy Product Service Bulletin 26-91 and "Check Valves" on page 25 for more information.*

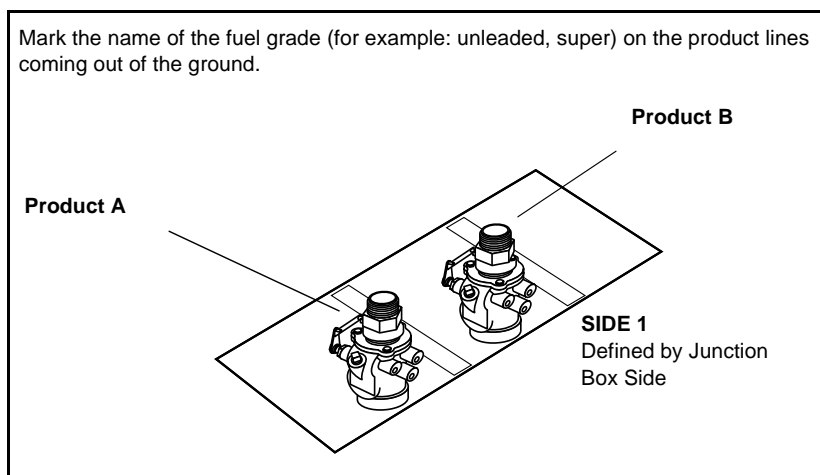
## Leak Detectors

Use only listed leak detectors. Follow manufacturer instructions for leak detector installation.

## STPs

Use only listed STPs. Follow manufacturer instructions for installation of STPs.

## Pipe Installation



See PEI Publication RP100 Recommended Practices For Installation Of Underground Liquid Storage Systems (Chapter 9) and PEI Publication RP200 Recommended Practices For Installation Of Above ground Storage Systems For Motor Vehicle Fueling. See model-specific footprint before installing pipes.

- Check national, state and local regulations for installation of pipe system.
- Use containment system as required by national, state and local regulations.
- Below the unit, use new black iron pipe. Non-metallic UL and code approved flexible pipe is also acceptable, constructed of U.L. approved pipe material and U.L. approved fittings. Use of galvanized pipe is acceptable as an alternative to black iron pipe, when black iron pipe is specified.
- Use 1-1/2-inch pipe for riser-to-pump or dispenser.
- Use 2 inch pipe for riser to pump or dispenser for Super-HI and Ultra-HI models.

*Note: When pipes are shared by different pumping units, special installation considerations are required to prevent one unit from draining the other during fueling.*

*Note: A dedicated line is recommended to supply each self-contained pump.*

### Pipe Size

The required pipe size depends on the number of units sharing lines, size of the STPs (dispensers only), and length of the run. Use the following guidelines.

#### Pumps (Standard Flow)

Use new 2-inch, 2-1/2-inch or 3-inch pipe. Use 2-inch pipe for runs up to 50-feet to a single pump. Increase to 2-1/2-inch or 3-inch pipe for longer runs up to 75-feet to a single pump with maximum lift condition. A dedicated line is recommended to supply each self-contained pump.

#### Pumps (High Flow, Super-HI, Ultra-HI)

Use new 3-inch, 3-1/2-inch or 4-inch pipe. Use 3-inch pipe for runs up to 50-feet to a single pump. Increase to 3-1/2-inch or 4-inch pipe for longer runs up to 75-feet to a single pump with maximum lift condition. A dedicated line is recommended to supply each self-contained pump.

**Dispensers (Standard Flow)**

Use new 2-inch or 2-1/2-inch or 3-inch pipe. If the distance from the STP to the farthest dispenser is 200 feet or less, use 2-inch pipe. If the distance exceeds 200 feet, use 2-1/2-inch or 3-inch pipe to the first dispenser and 2-inch pipe the rest of the way. Trunk lines supplying multiple dispensers must be larger and should be sized to provide low pressure drop for anticipated flow rate.

**Dispensers (High Flow, Super-HI, Ultra-HI)**

Use new 3-inch or 3-1/2-inch or 4-inch pipe. If the distance from the STP to the farthest dispenser is 200 feet or less, use 3-inch pipe. If distance exceeds 200 feet, use 3-1/2-inch or 4-inch pipe to the first dispenser and 3-inch pipe the rest of the way. Trunk lines supplying multiple dispensers must be larger and should be sized to provide low pressure drop for anticipated flow rate.

**Sharing Product Inlet Pipes (Pumps)**

To avoid problems with low flow rate, noise, etc. always size any common pipe to multiple pumping units so that the maximum flow velocity within the shared pipe never exceeds the fluid velocity in any of the branches with all pumping units running a maximum flow output. Check valves (without springs) are required at each pumping unit inlet to avoid one pumping unit from draining the other during fueling which will result in loss of prime, flow hesitation, etc.



## Check Valves

### (Used on Pumps Only)

See PEI publication RP100 and manufacturer's installation instructions for information on installing check valve. Install check valve as close as practical to the suction unit. It should be gravity activated with minimal, or no spring load. Check valves for use internal to the pumping unit are available from Gasboy as an order entry item.

Be sure there is only one check valve in each dedicated line (preferred method). Use of multiple check valves can restrict flow and cause cavitation resulting in significant flow rate reductions. If installation necessitates placing more than one unit on a single dedicated product line, then check valves must be placed at each pump. Check valves must be accessible for service.

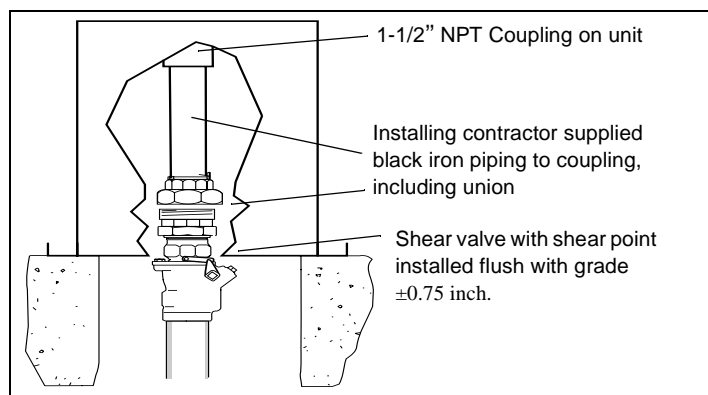
## Shear Valves

|   |   |
|---|---|
| <b>⚠ WARNING</b>  |   |
|    |  |
| <p>Dispensers knocked off island exposes fuel.<br/>Explosion and fire could result in severe injury or death.<br/>Installation of shear valve is required by NFPA30A. Install shear valve properly per manufacturer's instructions.</p> |   |

### (Generally Used On Dispensers Only)

*Note: Shear valves are not required on pumps but installation is discretionary and sometimes required - consult local codes.*

See PEI Publication RP100 Recommended Practices For Installation Of Underground Liquid Storage Systems (Chapter 9) and PEI Publication RP200 Recommended Practices For Installation Of Above ground Storage Systems For Motor Vehicle Fueling. A shear valve is a NFPA 30A required safety device. It closes automatically to stop product flow during a fire or if the dispenser gets knocked off the island. It also provides a means of manually closing inlet pipes.



Follow shear valve manufacturer's instructions for installation procedures, testing, and other procedures.

- Install shear valve on each product inlet pipe.

*Note: Gasboy strongly recommends using double poppet shear valves that shut off flow from the tank and the dispenser. (examples: OPW #10BHMP or Exxon - OPW # 10RMSP)*

- Also install a shear valve on master dispenser satellite outlet and at satellite inlet.
- Do not mount the shear valve upside down.

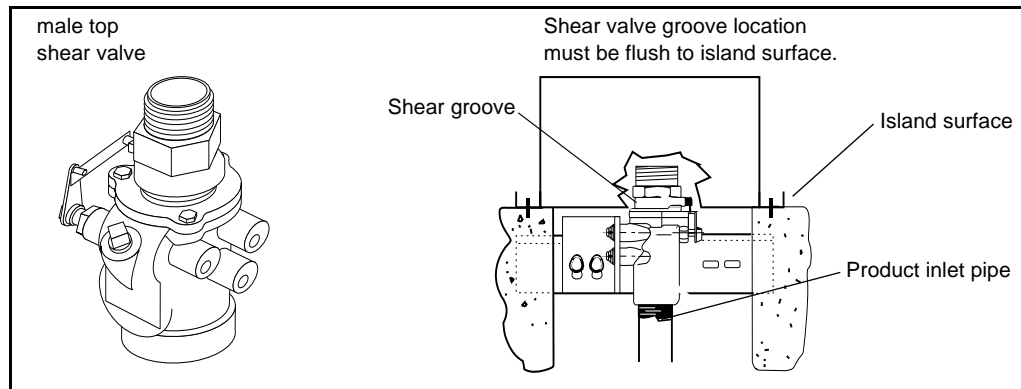
- Be sure that the valve linkage is accessible and has no interference to opening or closing from other piping, structure or components.
- Do not anchor shear valves at this time. See MDE-4331 Atlas Installation Manual for anchoring procedures.

*Note: The dispenser product inlet pipes need to be aligned with the shear valve.  
Do not restrict shear valve linkage with pipes, braces, and so on.*

- Test shear valve operation.
- Close shear valve until equipment start-up. Cap outlet pipe. This prevents dirt and other particles from getting in the dispenser product line. It also prevents fuel spillage.
- Install a vapor return line where required. This can be done two ways:  
Install a flexible connector or shear section on vapor return pipes as required by NFPA 30A to ensure the product side shear valves will operate correctly. Use 1-inch pipe to connect vapor return pipes located inside pump/dispenser.

or

Install 1-inch shear valve listed for use with vapor recovery lines. See MDE-4331 Atlas Installation Manual for Vapor Recovery (Return) Lines.



## Pit Box Mounting

- Use strongly designed pit boxes that will not twist, bend or dislocate the shear valve during a collision.
- Use a pit box which will allow proper access to components during service, does not expose the pit after unit mounting and properly fastens and supports the unit.
- Anchor pit boxes per pit box manufacturer's recommendations. Use recommended fasteners and tighten to manufacturer's instructions.
- Pit boxes with rain lips are recommended, otherwise sealing at the base of the unit may be required.

## Safety Signs

- Safety signs warning of potential hazards may be required depending on state and local codes, and NFPA regulations.
- Gasboy requires installing applicable signs in locations likely to be noticed and read by users of the equipment.
- Signs should be easily read, bilingual, durable and fade resistant. Unless local regulations dictate otherwise, nationally recognized safety symbols with brief text are recommended.

- Signs should include, but are not limited to the following:
  - Use approved containers
  - No smoking/match warnings
  - Turn vehicles off during fueling
  - Emergency procedures
  - Static electricity hazards during fueling
  - Health related warnings (involving fuels), advisement of fuel flammability/explosiveness, and others as required or desirable.



## 4 – Appendix - Trademark Information

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**Trademarks used in this document and held by other companies are:**

- G-SITE® is a registered trademark of Gilbarco Inc.
- Hubbel® is a registered trademark of Hubbel, Inc.
- Killark® is a registered trademark of Killark Electric Manufacturing Company.
- Transac® System 1000™ is a registered trademark of Gilbarco Inc.
- UL® is a registered trademark of Underwriters' Laboratories, Inc.



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