



# **SERIES 300V** **115 and 230 VOLT AC** **FUEL TRANSFER PUMP**

Owner's Operation & Safety Manual

Models FR300V, FR301V, FR310V & FR311V

## **SAFETY INSTRUCTIONS**

To ensure safe and efficient operation, it is essential to read and follow each of these warnings and precautions.

1. Improper use or installation of this product can cause serious bodily injury or death.
2. Do NOT smoke near pump or use pump near an open flame when pumping flammable fluids. Fire could result.
3. A Fill-Rite filter should be used on pump outlet to ensure that no foreign material is transferred to fuel tank.
4. Use gasoline and oil resistant thread sealant or sealant tape on all threaded joints to protect against leakage.
5. Storage tank should be anchored to prevent tipping in both the full and empty conditions.
6. To minimize static electricity buildup, only use static wire, conductive hose when pumping flammable fluids and keep nozzle in contact with container being filled.
7. The pump motor is equipped with thermal overload protection. If overheated, it will shut off without any damage to the windings. Be sure to turn off the pump power if this occurs. When the motor cools, it will restart without warning if power is on.
8. Take motors needing service to an authorized repair shop to maintain "explosion proof" and "rain proof" integrity.

## **DANGER**

Electrical wiring should be done by a licensed electrician in compliance with local, state and national electric code NEC/ANSI/NFPA 70, NFPA 30, NFPA 30A, as appropriate to the intended use of the pump. Threaded rigid conduit, seal fittings and conductor seal should be used. Pump should be properly grounded. Improper use or installation of this product can cause serious bodily injury or death.

## **WARNING**

This product should not be used for fluid transfer into aircraft. This product is not suited for use with fluids for human consumption or fluids containing water.

## **INSTALLATION**

### **GENERAL**

Pumps are furnished with a tank adapter for skid tank mounting; pedestals are available for island installations. All tanks must be properly vented. A pressure retaining vent/fill cap can be used to reduce fuel loss due to evaporation but will reduce flow rate. Fill-Rite filters are recommended when pumping fuels. Pump has a built-in check valve with pressure relief to prevent fluid thermal expansion from causing unsafe system pressures. **Do not use additional check valves or foot valves unless they have a proper pressure relief valve built into them.** Additional check valves will reduce flow rate.

Use a gasoline and oil resistant pipe sealant on all pipe threads to protect against leaks.

### **SKID TANK MOUNTING**

1. Cut a 1-1/4" pipe that will extend to at least 3" above bottom of tank when screwed into tank adapter and tank adapter is screwed into tank flange.
2. Screw pipe into tank adapter, then screw tank adapter into tank flange.
3. Mount pump on tank adapter.

### **DIRECT MOUNTING TO UNDERGROUND TANK**

1. Cut and thread both ends of a 2" pipe that will extend about 31" above the ground when installed in tank flange.
2. Install this pipe in tank flange. Screw 2" standard pipe coupling onto top of pipe.
3. Cut a 1-1/4" pipe that will extend to at least 3" above bottom of tank when screwed into tank adapter and tank adapter is screwed into 2" coupling.
4. Screw this pipe into tank adapter, then screw tank adapter into 2" coupling.
5. Mount pump on tank adapter.

### **ISLAND INSTALLATION**

1. Install tank and piping per illustration.
2. The threaded 1-1/4" suction pipe is to extend 32-1/2" above island.
3. Remove coupler from pedestal pipe by loosening set screws.
4. Slip pedestal pipe/pump base assembly over suction pipe.
5. Loosen screws in pump base to allow pedestal pipe to slide down exposing end of suction pipe.
6. Screw coupler onto suction pipe.
7. Slide pedestal pipe into coupler, tighten set screws. Tighten screws in pump base.
8. Mount pump on coupler.

### **ELECTRICAL**

Pump motor voltage is factory set at 115 VAC. See diagram to change voltage setting.

1. Install pump. Read and understand all the electrical wiring instructions before proceeding.
2. Remove pump's electrical junction box cover and straighten the wires to make the stripped wire ends accessible outside of the junction box.

**WARNING: AUX. WIRE IS LIVE WIRE!** The AUX. lead wire is insulated and enclosed when shipped. **Do not** connect this wire without first verifying the 'ON' line voltage of the wire for compatibility to the equipment to be installed. Maximum amperage on wire is 1 ampere. The wire must be insulated and enclosed in the junction box if not used.

3. Power to the unit should be supplied from a dedicated 30 amp circuit breaker. No other equipment should be powered from this breaker. Threaded rigid conduit, seal fittings and conductor seal should be used. Provisions must be made to break both legs of any AC circuit. Connect like colored pump wires to supply wires. Ground wire must be connected.
4. Fold wires into junction box and replace cover making sure that gasket is in place. Make sure screws are seated so there is no space between the cover and the junction box.

## **OPERATING INSTRUCTIONS**

1. Reset meter to 0 (if applicable).
2. Remove nozzle from nozzle boot and move switch lever up. This will turn the pump on.
3. Insert nozzle into container to be filled. To minimize static electricity buildup, keep nozzle in contact with container.
4. Operate nozzle lever to dispense fluid.
5. When desired amount of fluid has been dispensed, release nozzle lever, remove nozzle from container, move switch lever to down position to turn off pump, replace nozzle in boot.

## **TROUBLESHOOTING**

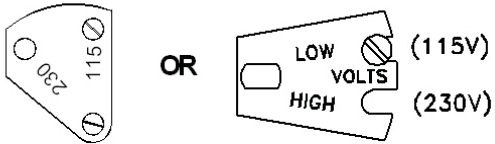
**IF PUMP FAILS TO PRIME:** Check suction line for leaks or obstructions.

Check bypass valve for dirt. The bypass poppet should slide freely.

**PUMP WILL NOT START:** If motor hums but will not start, a probable cause is a stuck rotor. Remove rotor cover; check rotor and vanes for dirt. Also have an electrician check the electrical power to the pump.

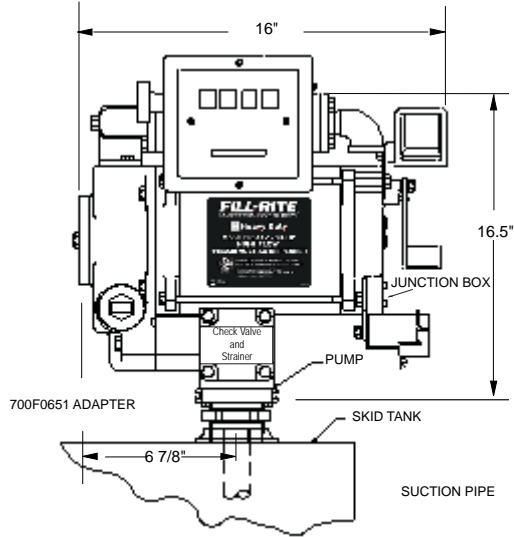
**LOW PUMPING CAPACITY:** Strainer screen clogged; bypass valve not seated properly; obstruction in suction lines. Make sure all 8 vanes slide easily in the rotor slots.

## VOLTAGE SELECTION SWITCH

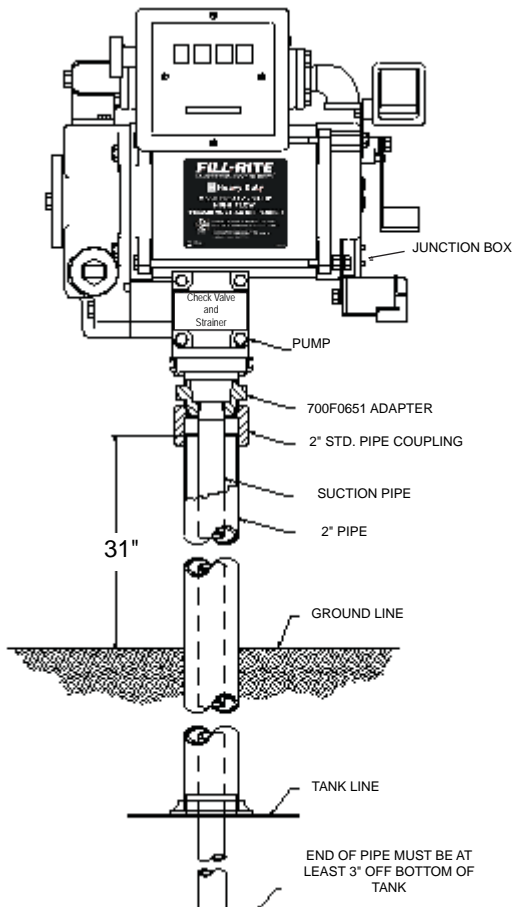


Voltage select screw should be placed next to correct voltage setting (115 VAC shown)

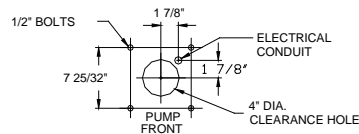
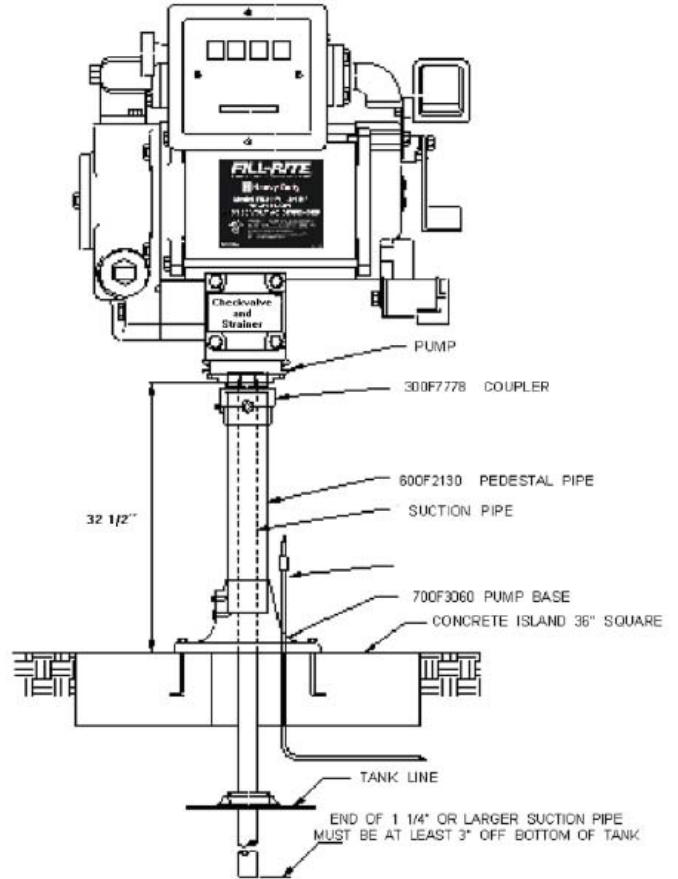
## SKID TANK INSTALLATION



## DIRECT MOUNTING INSTALLATION



## TYPICAL ISLAND INSTALLATION



LAYOUT FOR  
BASE ANCHOR BOLTS

## TROUBLESHOOTING

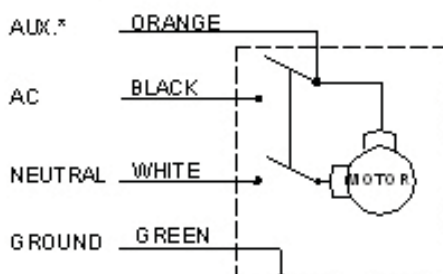
PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump w on't prime	1. Suction line problem	Check for leaks in suction line
	2. Bypass valve open	Remove and inspect valve; must move freely & be free of debris
	3. Vanes sticking	Check vanes and slots for nicks, burrs and wear
	4. Gasket leakage	Tighten covers and joints
	5. Excessive rotor or vane wear	Check rotor & vanes for excessive wear or damage
	6. Outlet blocked	Check pump outlet, hose, nozzle & filter for blockage
	7. Vapor Lock	Reduce vertical and horizontal distance from pump to liquid; Remove automatic nozzle
Pump hums but will not operate	1. Dirt in pump cavity	Clean out pump cavity
	2. Motor failure	Return to place of purchase
	3. Broken key	Remove all debris & replace key
Low capacity	1. Excessive dirt in screen	Remove and clean screen
	2. Suction line problem	Check suction line for leaks or restrictions; it may be too small, too long or not airtight
	3. Bypass valve sticking	Remove and inspect valve; must move freely & be free of debris
	4. Vanes sticking	Check vanes and slots for wear
	5. Excessive rotor or vane wear	Check rotor & vanes for excessive wear or damage
	6. Hose or nozzle damage	Replace hose or nozzle
	7. Plugged filter	Replace filter
	8. Low fluid level	Fill tank
Pump runs slowly	1. Incorrect voltage	Check incoming line voltage while pump is running
	2. Vanes sticking	Check vanes and slots for nicks, burrs and wear
	3. Wiring problem	Check for loose connections
	4. Motor problem	Return to place of purchase
Motor stalls	1. Bypass valve sticking	Remove and inspect valve; must move freely & be free of debris
	2. Low voltage	Check incoming line voltage while pump is running
	3. Excessive rotor or vane wear	Check rotor & vanes for excessive wear or damage
	4. Debris in pump cavity	Clean pump cavity
Motor overheats	1. Pumping high viscosity fluids	These fluids can only be pumped for short periods of time (less than 30 minutes duty cycle)
	2. Clogged screen	Remove and clean screen
	3. Restricted suction pipe	Remove and clean pipe
	4. Motor failure	Return to place of purchase
	5. Pump rotor lock-up	Clean and check pump rotor and vanes
Motor will not turn on	1. No power	Check incoming power
	2. Switch failure	Return to place of purchase
	3. Motor failure	Return to place of purchase
	4. Thermal protector failure	Return to place of purchase
	5. Incorrect/loose wiring	Check wiring
Fluid leakage	1. Bad o-ring gasket	Check all o-ring gaskets
	2. Dirty shaft seal	Clean seal & seal cavity
	3. Bad shaft seal	Replace seal
	4. Incompatible fluid	Refer wetted parts list to fluid manufacturer
	5. Loose fasteners	Tighten fasteners

**Figure 4. WIRE DIAGRAM**  
**Series FR300V, FR301V, FR310V, FR311V**

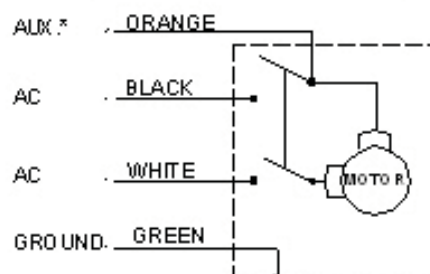
**\*WARNING: AUX. WIRE (orange) IS ALIVE WIRE!**

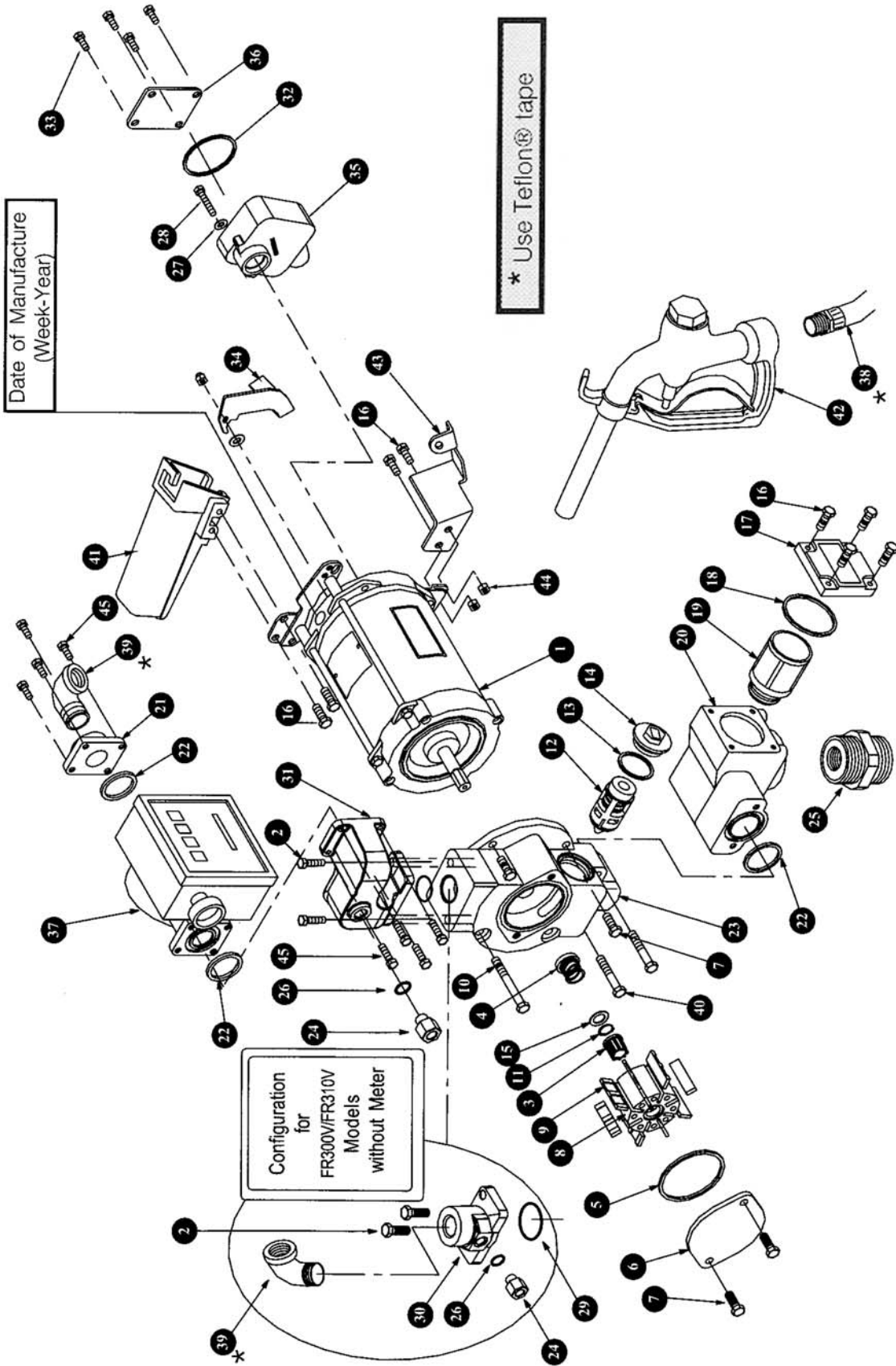
The AUX. lead wire is insulated and enclosed when shipped. **Do not** connect this wire without first verifying the 'ON' line voltage of the wire for compatibility to the equipment to be installed. Maximum amperage on wire is 1 ampere. The wire must be insulated and enclosed in the junction box if not used.

**115 VOLT WIRE DIAGRAM**



**230 VOLT WIRE DIAGRAM**





ITM. NO.	PART NO.	DESCRIPTION	QTY.
1	300G7376	Motor - 3/4 HP 115/230 VAC, 50/60 Hz (Models FR310V, FR311V) UL/CSA	1
	300G7375	Motor - 1/2 HP 115/230 VAC, 50/60 Hz (Models FR300V, FR310V) UL/CSA	1
	300G7638	Motor - 3/4 HP 115/230 VAC, 50 Hz (Model FR310VE, FR311VE) AUS	1
	300G8368	Motor - 0.55KW 230 VAC, 50/60 Hz (Models FR310VE, FR311VE) ATEX,	1
2	LP50G9973	3/8-16 x 1" SHCS	2
3	300F7787	Rotor Insert	1
4	300KTH0034	Seal Assembly Kit (Includes Items 11 & 15)	1
5	300F7743	O-Ring Gasket Buna (-236)	1
6	700G7063	Rotor Cover	1
7	300G7296	3/8-16 x 3/4 HHCS	4
8	300G8379	Rotor	1
9	300H0723	Vanes	8
10	300F7746	3/8-16 x 3 HHCS	2
11	700F2688	Retaining Ring (Included w/Item 4)	1
12	300F7723	Bypass Valve Assembly	1
13	800F4380	O-Ring Buna (2-131)	1
14	300F7731	Bypass Cap	1
15	30F4660	Seal Washer (Included w/Item 4)	1
16	700F2810	5/16-18 x 7/8 HHCS	8
17	300F7739	Check Valve Cover	1
18	300F7742	O-Ring Gasket Buna (-231)	1
19	300F7735	Check Valve Assembly	1
20	300G8621	Lower Housing	1
20	300H1241	Lower Housing BSPT	Opt.
21a	900F8076	1" Meter Fitting	1
21b	900F8074	1" BSPT Meter Fitting	Opt.

ITM. NO.	PART NO.	DESCRIPTION	QTY.
22	300F7744	Inlet Gasket Buna (-224)	3
23	300H0757	Pump Housing (Models FR310V & FR311V)	1
24	700H1168	Anti-Siphon Plug	1
25a	700F0651	2" x 1 1/4" Tank Adapter	1
25b	300H1164	2" x 1 1/4" BSPT Tank Adapter	Opt.
26	1200F6576	Gasket for Anti-Siphon Device	1
27	300G9432	Washer 1/4" Split lock	1
28	300G9273	10-32NC-2B x 1.50 SHCS	1
29	700H0676	O-Ring for flange	1
30a	300H0129	1" Outlet Flange	1
30b	300H1243	1" BSPT Outlet Flange	1
31	300H0133	Meter Flange	1
32	300G9129	O-Ring (2-146)	1
33	304F7904	1/4-20 1/2 HWHMS	4
34	300F7761	Switch Lever	1
35	300G8967	Junction Box	1
36	300G8971	Junction Box Cover	1
37	901MK300V	901 Meter (Models FR301V & FR311V)	1
38	300F7773	1" x 12' Hose	1
39	800F4400	1" Street Elbow	1
40	300F7745	3/8-16 x 2 HHCS	2
41	300F7765	Nozzle Cover	1
42	700F3125	1" Manual Nozzle	1
43	300F7759	Nozzle Retainer	1
44	700F2950	5/16 Lock Nut	2
45a	100G8800	1/4-20 x 3/4 HWHTHS (FR301V & FR311V)	8
45b	900H0409	1/4-20 x 3/4 HWG Swageform	8

300KTG9180	BIODIESEL and E85 Kit (Includes items 2, 5, 11, 15, 4, 13, 14, 17, 21 & 22)
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300KTG9180	Repair Kit (Includes items 3, 4, 5, 6, 8, 9, 12, 13, 18 & 22)
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ACCESSORIES	
300F7801	Automatic Nozzle
TH14	Pedestal Kit
F4010PM	Particulate Filter
700ACCF7017	Filter Head

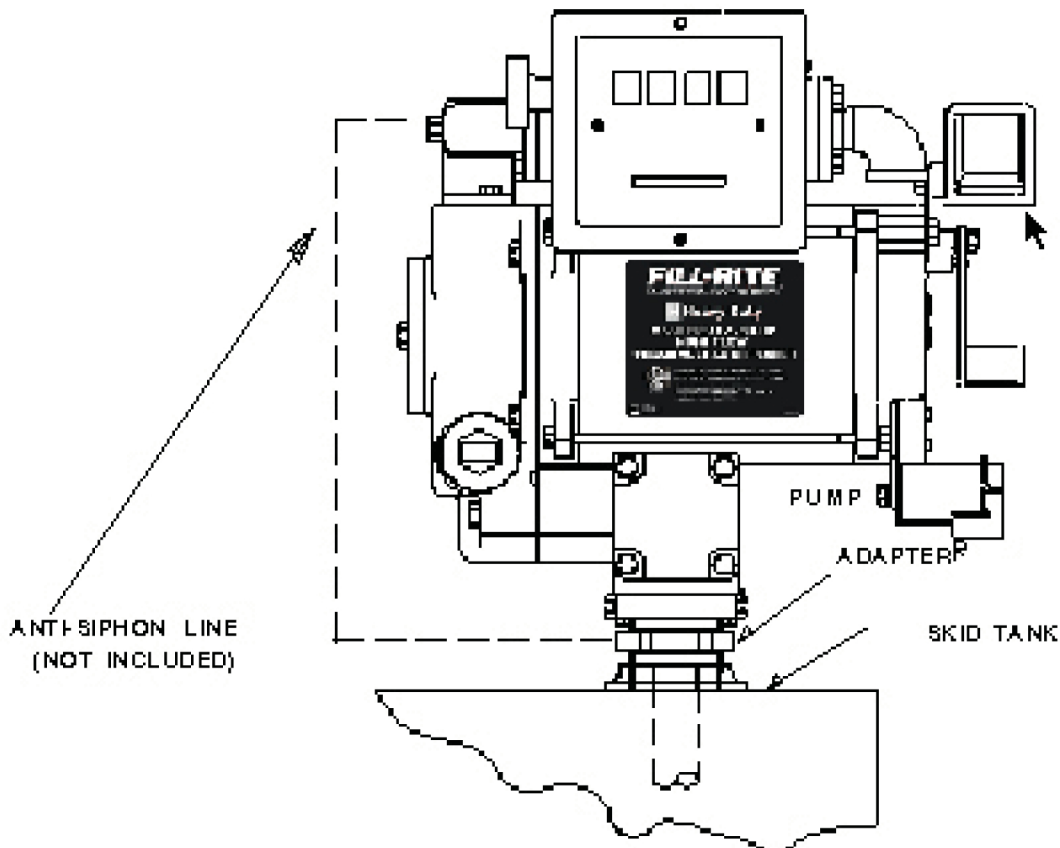
# ANTI-SIPHON

The pumps are shipped vacuum breaker ready.  
Fill-Rite recommends that the vacuum breaker be tubed back to the tank. The vacuum breaker is used to break a siphon should an open nozzle or a leaking hose be below the fluid level in the tank with the pump turned off.

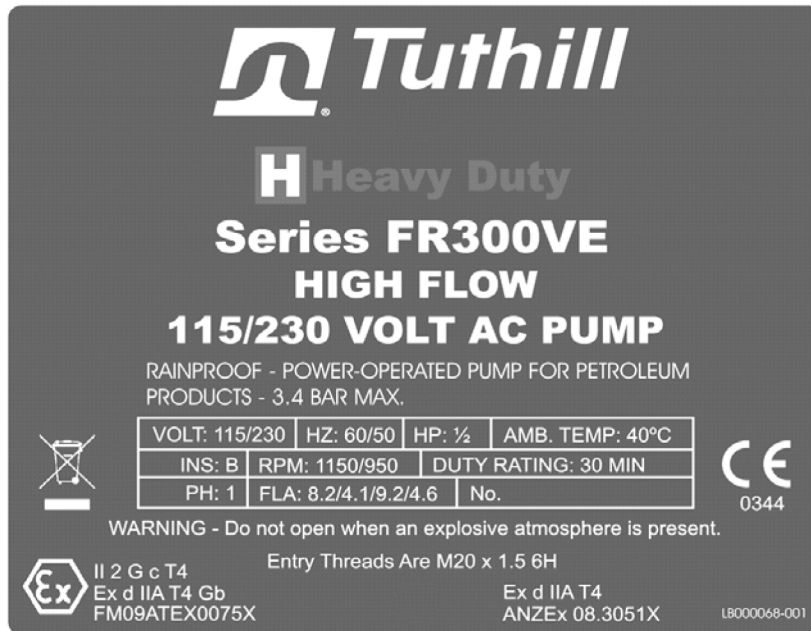
## ANTI-SIPHON TUBING INSTALLATION

The following illustration shows methods of installing tubing for the vacuum breaker that terminates in the vapor space at the top of the tank. The tubing must terminate in the vapor space; if the tubing terminates below the liquid level of the tank, the vacuum breaker will not prevent siphoning. It is also very important that there are no liquid traps in the tubing. The tubing must have a continuous slope from the pump down to the tank. If the pump is installed below the top of the tank, the tubing may slope both ways from a single high point above the tank. Alternately, tubing can be piped to any available opening on top of tank if the tank adapter is not used. Use reducer bushings as required.

Fill-Rite recommends using the vacuum breaker tank adapter with a 1/4 npt opening in the side of the hex portion that terminates in the vapor space of the tank. Install tank adapter per instructions found in this manual. Make liquid tight connection from the adapter to the vacuum breaker using a minimum of 1/4 metal tubing compatible with the liquid being pumped. If a vacuum breaker tank adapter is used and the 1/4 npt opening is not used for the tubing, plug the opening liquid tight.



## FR300VE



### Materials of Construction

Materials of construction of the external surface of the unit are: painted steel; painted cast iron; painted aluminum; zinc plated steel.

Materials of construction of the wetted parts are: cast iron; steel; zinc plated steel; 300 series stainless steel; bronze; carbon; ceramic; polyester; fiber; fluorocarbon; buna; 400 series stainless steel; aluminum.

### Repair and Maintenance

Contact the place of purchase for warranty repair and maintenance.

### Special Conditions for Safe Use

The M8 fasteners used for securing the stator housing shall be Class 8.8. The M6 fasteners used for securing the terminal compartments cover shall be Class 8.8.

An electrically conductive hose and nozzle must be used with flammable liquids. To minimize static electricity buildup, keep nozzle in contact with container being filled.

### Installation

Pump must be installed in compliance with EN 60079-14.

For Australia, the pump must be installed in compliance with AS/NZS 60079.14 and maintained in compliance with AS/NZS 60079.17

## Tuthill Product Warranty

Tuthill Transfer Systems ("Manufacturer") warrants each consumer buyer of its Fill-Rite products ("Buyer") from the date of invoice or sales receipt, that goods of its manufacture ("Goods") shall be free from defects of materials and workmanship. Duration of the warranty is as follows:

- Heavy Duty Products – Two Years
- Standard Duty Products – One Year
- Economy Duty Products – One Year
- Cabinet Pumps, Parts, and Accessories – One Year

Manufacturers sole obligation under the foregoing warranties will be limited to either – at Manufacturers option – repairing or replacing defective goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the buyer, and Buyers exclusive remedy for breach of any such warranties will be enforcement of such obligations of the Manufacturer. If the Manufacturer so requests the return of such Goods, the Goods will be redelivered to the manufacturer in accordance with Manufacturers instructions FOB Factory. The remedies contained herein shall constitute the sole recourse of the Buyer against the Manufacturer for breach of warranty. **IN NO EVENT SHALL THE MANUFACTURER'S LIABILITY FOR ANY CLAIM FOR DAMAGES ARISING OUT OF THE MANUFACTURE, SALE, DELIVERY, OR USE OF THE GOODS EXCEED THE PURCHASE PRICE.** The foregoing warranties will not extend to goods subject to misuse, neglect, accident, improper installation or maintenance, or have been repaired by anyone other than the Manufacturer or its authorized representative. **THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PURPOSE OF ANY OTHER TYPE, WHETHER EXPRESSED OR IMPLIED.** No person may vary the forgoing warranties or remedies, except in writing signed by a duly authorized officer of the Manufacturer. The Buyer's acceptance of delivery of the Goods constitutes acceptance of the foregoing warranties and remedies, and all conditions and limitations thereof.



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