

FILL-RITE®

SERIES FR702VR 115 and 230 VOLT AC FUEL TRANSFER PUMP

Owner's Operation & Safety Manual
Models FR702VR & FR702VER

OUTSTANDING FEATURES

- Up to 18 GPM/68 LPM
- UL listed dispenser & motor
- Full 1/3 HP explosion proof motor
- Meter accuracy of $\pm 1\%$

GENERAL DESCRIPTION

The FR702VR compact cabinet pump is based on Fill-Rite's FR700V positive displacement, direct drive pump, and Fill-Rite's series 800C nutating disc flow meter which features a flow rate of 5 to 20 GPM or 19 to 76 LPM and is accurate to within $\pm 1\%$. Depending on product viscosity and nozzle selection, the FR702VR can deliver up to 18 gallons/68 liters of fluid per minute. This pumping system is UL listed for use with gasoline and diesel fuel.

The U.S. gallon meter has three resettable wheels, two unit wheels and a tenth wheel. It's non-resettable totalizer has five unit wheels and a tenth wheel. The optional liter meter has three unit wheels which can be reset to zero. It's non-resettable totalizer has six unit wheels.

OPTIONS

- Automatic nozzles
- Metering in U. S. gallons or liters
- Red or white cabinet paint
- Pedestal for island installations
- 220 VAC, 50/60 Hz

TECHNICAL INFORMATION

Design Features:

- 1.25" NPT inlet, 3/4" NPT outlet
- 22 PSI maximum outlet pressure
- Minimum dry vacuum of 10" Hg
- Furnished with 3/4" dia. x 12' hose and manual nozzle
- Cabinet measures 13"W x 11.5"D x 17.5 "H (38x29x 43.6 cm)
- Built-in check valve, bypass valve and thermal expansion valve
- No additional foot valve or check valve needed to hold prime
- 1/3 HP 115VAC-60Hz, 5.5 amp, 1725 RPM, direct drive motor
- Ball bearing construction: no lubrication required
- Thermal overload protection
- Explosion proof
- Meter's mechanical totalizer to 100,000 units
- Meter accuracy is $\pm 1\%$
- Unit wheels have large 11/16" (18 mm) figures
- Convenient, large reset knob with positive zero stop
- Not for resale use
- Pre-installed Anti-Siphon Valve

FLUID COMPATIBILITY

If in doubt about compatibility of a specific fluid, contact supplier of fluid to check for any adverse reactions to the wetted materials in the parts list.

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 while filling container.
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.
9. Do not operate without the check valve (700F2661) in place. Fluid leakage could result.

DANGER

Electrical wiring should be done by a licensed electrician in compliance with local, state and national electric codes. 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

Do not use this product 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" (8 cm) 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" (79 cm) 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" (8 cm) 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" (83 cm) 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

1. Install pump. Read and understand all the electrical wiring instructions before proceeding.
2. Remove cabinet top to expose FR700V pump for electrical hookup. Cabinet can be disassembled by following the steps outlined in "ASSEMBLY/DISASSEMBLY" section of this manual.
3. 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.
4. Power to the unit should be supplied from a dedicated 20 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.
 5. 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.
 6. Route wiring and rigid conduit through opening at base of cabinet. Pump has 1/2" NPT threaded conduit port.

OPERATING INSTRUCTIONS

1. Reset meter to 0 (if applicable).
2. Remove nozzle from nozzle boot and move switch handle 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 being filled while filling 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 handle to down position to turn off pump, replace nozzle in boot.

ASSEMBLY/DISASSEMBLY

Remove power to pump before removing cover. Drain liquid from system before loosening any fittings to prevent excessive spillage.

Pump Cabinet (see FR702VR cabinet drawing)

Disassembly

1. Pull off reset knob (item 26).
2. Turn switch handle (item 2) to vertical position.
3. Remove six screws (item 38) from cabinet top (item 7/7A).
4. Remove top and set aside to expose pump and meter.

Assembly

1. Replace cabinet top, making sure it slips over the meter and the outside edges of the cabinet base (item 6/6A).
2. Replace screws in cabinet top. Install the two screws in back of cabinet before replacing side screws. Position top squarely before tightening screws.
3. Attach reset knob.

REPAIR

Motors needing repair should be taken to an authorized repair shop. Pumps must be thoroughly flushed and drained before being taken in for service.

If pump was used for a fluid other than a petroleum product, it must be triple-rinsed and accompanied by an MSDS sheet indicating the chemicals which have been pumped with the unit. Pumps not adhering to these specifications may be refused service at the repair shop.

MAINTENANCE

To keep pump running at its best, remove cabinet cover and periodically perform the following procedures to the FR700V pump (see FR700V pump drawing).

1. Check pump strainer for dirt accumulation. To clean strainer, remove strainer cover (item 58) and pull out screen (item 48).
2. Remove pump rotor cover (item 64) and inspect vanes (item 51) for nicks, burrs or wear. Vane height should be no less than .40" (10 mm) or damage to pump could result.
3. Meter should operate maintenance free. However, certain liquids can dry out while in meter housing, causing meter to stop. If this happens, meter should be thoroughly cleaned (see cleaning instructions below).
4. Check hose (item 17) and nozzle (item 18) for wear or damage. Defective hoses or nozzles are potential safety hazards.

CLEANING INSTRUCTIONS

METER

Run a flushing fluid through meter. For a more thorough cleaning, disassemble meter according to the "ASSEMBLY/DISASSEMBLY" section, "Meter Chamber Assembly" subsection of the 800 C manual. Rinse all meter components. Recalibrate meter following calibration instructions in the 800C manual.

PUMP

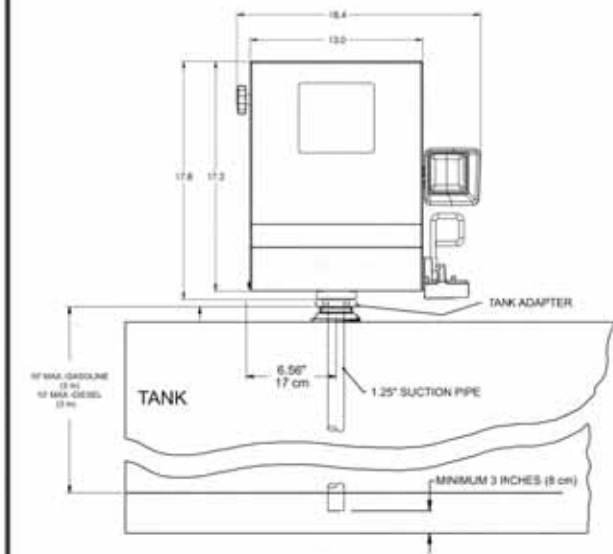
Cleaning Seal (item 45):

Due to the precise method of this procedure, only attempt to clean seal if all other troubleshooting solutions fail.

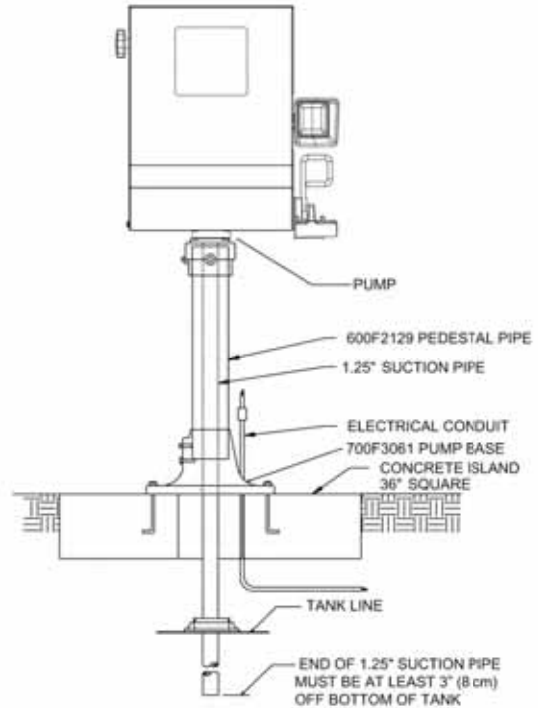
1. Remove any oil or particulate material from optically flat metal and carbon mating surfaces using a lint free cloth and methyl alcohol.
2. Visually check surfaces for damage such as nicks or wear.
3. Replace seal if any damage is noted.

NOTE: Do not allow body oil or any grease to coat mating seal surfaces as these surfaces must be clean and dry to properly seal.

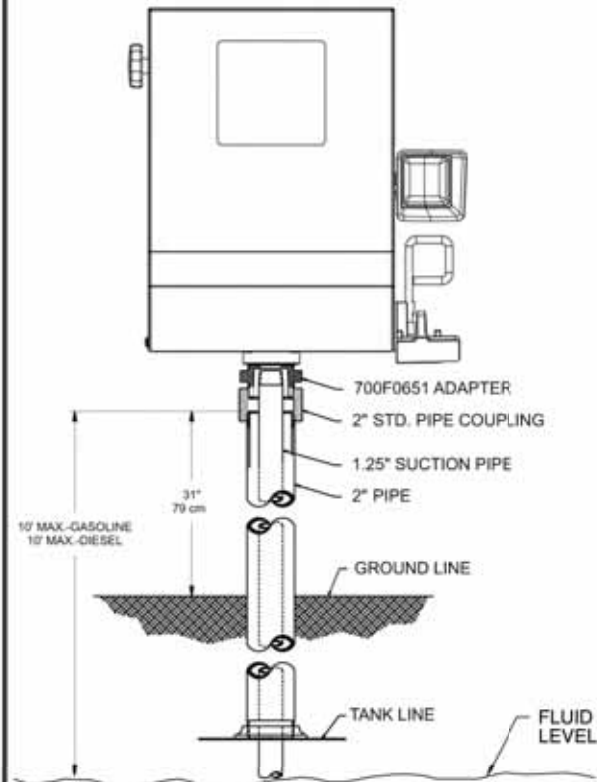
SKID TANK INSTALLATION



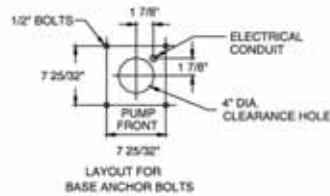
RECOMMENDED ISLAND INSTALLATION

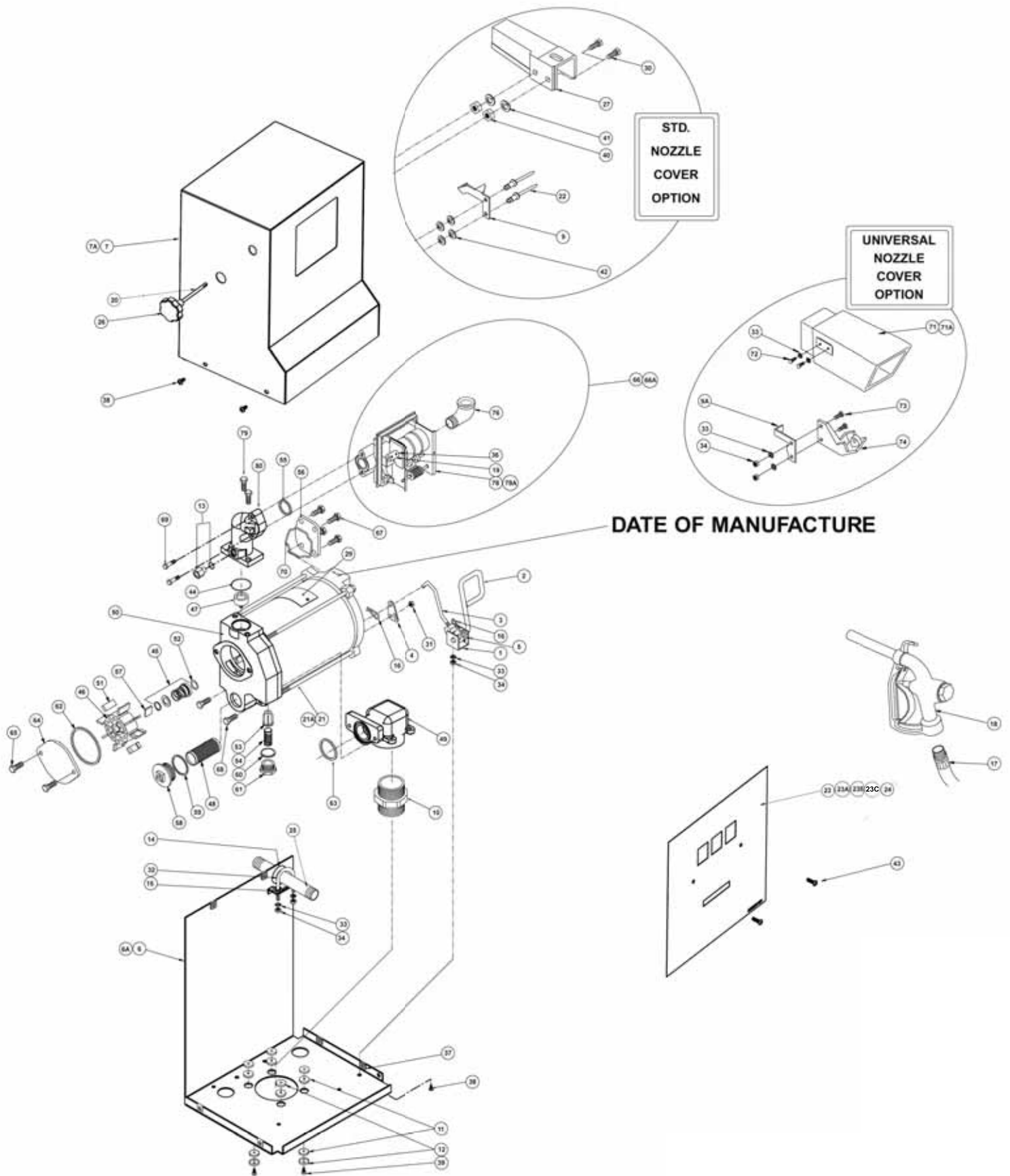


DIRECT MOUNTING INSTALLATION



MAXIMUM LIFT
 Gasoline - 10' (3 m)
 Diesel - 10' (3 m)





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FR702VR PUMP PARTS LIST

ITM. NO.	PART NO.	DESCRIPTION	QTY.	ITM. NO.	PART NO.	DESCRIPTION	QTY.
1	702F1023	BRACKET	1	39	704F3640	SCREW 5/16-18 X 1-1/4" HHCS	4
2	702F1024	SWITCH HANDLE	1	40	704F3680	HEX NUT 5/16-18 (STD. NOZZLE COVER)	2
3	702F1027	ROD SWITCH	1	41	704F3690	WASHER 5/16" LOCK (STD. NOZZLE COVER)	2
4	702F1031	LEVER SWITCH STEEL	1	42	704F3811	WASHER 1/4" FLAT (STD. NOZZLE COVER)	4
5	702F1042	LEVER SWITCH STEEL (J-SHAPED)	1	43	35F1397	SCREW #4 X 3/8" PHTS. (FACEPLATE)	2
6	MF000146-000	CABINET BASE (RED)	1	44	700H0676	O-RING FLUOROCARBON (-030)	1
6A	MF000146-001	CABINET BASE (WHITE)	OPT.	45	300KTH0034	SEAL ASSEMBLY	1
7	SA000149-000	CABINET TOP (RED)	1	46	700G8380	ROTOR	1
7A	SA000149-001	CABINET TOP (WHITE)	OPT.	47	700F2661	CHECK VALVE ASSEMBLY	1
8	702H0760	CABINET FRONT (RED)	1	48	700F2665	STRAINER	1
8A	702H0763	CABINET FRONT (WHITE)	OPT.	49	700F2668	INLET HOUSING	1
9	702F1103	STOP HANDLE STD. BOOT	1	50	700H0126	PUMP HOUSING (700V SERIES)	1
9A	702F1104	STOP HANDLE UNIVERSAL BOOT	1	51	700H0534	VANE	8
10	700F0651	TANK ADAPTER	1	52	700F2754	SLINGER SEAL	1
11	702F2450	GROMMET MOUNTING	8	53	700F2762	POPPET	1
12	702F2460	CUP WASHER	8	54	700F2775	BYPASS SPRING	1
13	700KTH0931	ANTI-SIPHON VALVE KIT ASSEMBLY	1	55	700F2800	O-RING GASKET (BUNA -218)	1
14	702F2600	GROMMET (PIPE NIPPLE)	1	56	700G9000	JUNCTION BOX COVER	1
15	702F2620	SPACER	1	57	700F3131	ROTOR KEY	1
16	702F3579	CLIP HAIRPIN	2	58	800F4360	STRAINER COVER	1
17	700F3135	12' UL LISTED HOSE	1	59	800F4380	O-RING GASKET (BUNA -131)	1
18	6U075	NOZZLE MANUAL 3/4" INLET	1	60	1200F6455	O-RING GASKET (BUNA -121)	1
19	702F3250	COUPLING RESET	1	61	1200F6464	BYPASS CAP	1
20	702F3260	SHAFT RESET	1	62	300F7743	GASKET CUSTOM BUNA N 70	1
21	702H0996	PUMP SUB FR702VR 115V	1	63	300F7744	O-RING GASKET (BUNA -224)	1
21A	702H1000	PUMP SUB FR702VER 230V	OPT.	64	700G7063	ROTOR COVER	1
22	702F6684	POP RIVET 1/4 SHANK	2	65	300G7296	SCREW 3/8-16 X 3/4" HHCS (ROTOR COVER)	2
23	LB000238-000	FACEPLATE FR702VR	1	66	800G1178	METER ASSY GALLONS	1
23A	LB000239-000	FACEPLATE FR702VRU	OPT.	66A	702F4183	METER ASSY LITER	OPT.
23B	LB000240-000	FACEPLATE FR702VRGU	OPT.	67	700H0640	SCREW 1/4-20 X 5/8" HWHMS (COVER JUNCTION BOX)	4
23C	LB000241-000	FACEPLATE FR702VLRU	OPT.	68	704F3700	SCREW 3/8-16 X 1" HHCS (HOUSING)	2
24	LB000242-000	FACEPLATE FR702VELRU	OPT.	69	704F3640	SCREW 5/16-18 X 1-1/4" HHCS (FLANGE-METER)	2
25	700F3375	NIPPLE 3/4" X 7" GALV	2	70	700G9066	JUNCTION BOX GASKET	1
26	800G8870	RESET KNOB	1	71	712F3489	UNIVERSAL NOZZLE COVER (RED)	1
27	700F6673	STD. NOZZLE COVER (700 RED)	1	71A	712F3572	UNIVERSAL NOZZLE COVER (WHITE)	OPT.
28	100F0830	SCREW 3/16-24 X 3/8" PHMS (CABINET FRONT)	4	72	5200F1470	SCREW 1/4-20 X 1/2" HHCS (UNIVERSAL NOZZLE COVER)	2
29		MOTOR NAMEPLATE		73	712F7338	SCREW 1/4-20 X 3/4" PHMS (UNIVERSAL NOZZLE COVER)	2
30	600F2220	SCREW 5/16-18 X 5/8" HHCS (STD. NOZZLE COVER)	2	74	702F3519	UNIVERSAL NOZZLE RETAINER	1
31	700F2950	NUT LOCK 5/16-18 X 0.27" (SWITCH LEVER)	1	75	702F3390	ELBOW 3/4" F X F	1
32	702F2610	BOLT 'U'	1	76	702F3400	STREET ELBOW 3/4" M X F	1
33	702F3300	1/4" EXTERNAL LOCK WASHER	3	77	702F3340	3/4" CLOSE NIPPLE	1
34	702F3310	HEX NUT 1/4-20	3	78	800G1132	METER GALLON	1
35	702F3430	NUT #10-24 TYPE 'U' (CABINET TOP)	4	78A	800G1677	METER LITER	OPT.
36	702F3440	SCREW #10-32 X 1/4" SHSC (COUPLING RESET)	2	79	704F3700	3/8-16 X 1" HHCS (FLANGE-HOUSING)	2
37	702F3555	NUT 1/4-20 TINNEDMAN 'U' TYPE (CABINET BASE)	6	80	700H0131	METER FLANGE	1
38	702F8643	SCREW 1/4-20 X 1/2" PHMS	7				

ACCESSORIES

TH13	PEDESTAL KIT
1200KTF7018	FILTER KIT (PARTICULATE)
1210KTF7019	FILTER KIT (HYDROSORB)
KIT702VRFP	KIT, FR702VR FACEPLATE
KIT702VRUFP	KIT, FR702VRU FACEPLATE
KIT702VRGUF	KIT, FR702VRGU FACEPLATE
KIT702VLRUF	KIT, FR702VLRU FACEPLATE
KIT702VELRUF	KIT, FR702VELRU FACEPLATE
KIT902CC	KIT, CLEAR COVER
702KTF3518	KIT, UNIVERSAL NOZZLE BOOT, SWITCH



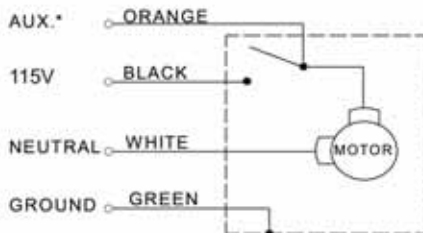
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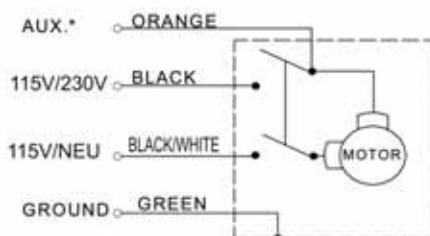
TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump won'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. Broken key	Remove all debris & replace key
	3. Motor failure	Return to place of purchase
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. Pump rotor lock-up	Clean and check pump rotor and vanes
	5. Motor failure	Return to place of purchase
Motor will not turn on	1. No power	Check incoming power
	2. Incorrect/loose wiring	Check wiring
	3. Switch failure	Return to place of purchase
	4. Motor failure	Return to place of purchase
	5. Thermal protector failure	Return to place of purchase
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

115 VOLT WIRE DIAGRAM



230 VOLT WIRE DIAGRAM



WIRE DIAGRAM

***WARNING: AUX. WIRE (orange) IS A 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.

IF UNSURE OF THE MOTOR VOLTAGE, PLEASE REFER TO THE VOLTAGE RATING ON THE MOTOR NAMEPLATE (ITEM 29 ON PARTS LIST).

VACUUM BREAKER

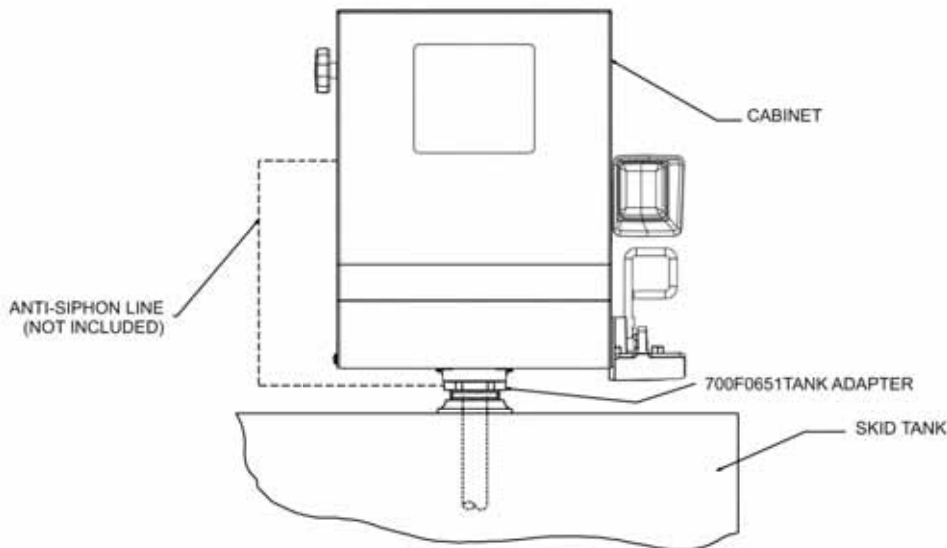
The pumps are shipped with a threaded vacuum breaker (#13 on the Pump Parts List) installed. The vacuum breaker is used to break a siphon should an open nozzle or a leaking hose be below the fluid level in the tank with the

pump turned off. Fill-Rite has provided a 1/4" NPT opening in the vacuum breaker and tank adapter to plumb the vacuum breaker back to the tank. The 1/4" NPT hole in the tank adapter has a plug installed at the factory.

VACUUM BREAKER TUBING INSTALLATION

The following illustration shows a method of installing tubing for the vacuum breaker that terminates in the vapor space at the top of the tank. Install tank adapter per instructions found in this manual. Before installing tubing, remove the plug from the tank adapter. It is 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. A liquid tight connection must be made from the tank

adapter to the vacuum breaker by using a minimum of 1/4" tubing that is compatible with the liquid being pumped. Alternately, if the tank adapter is not used, tubing can be piped to any available opening on top of tank. Use reducer bushings as required. 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.



PRODUCT WARRANTY

Tuthill Transfer Systems ("Manufacturer") warrants to each consumer buyer of its Fill-Rite products (the "Buyer"), from the date of invoice or sales receipt, that goods of its manufacture ("Goods") will be free from defects of material and workmanship. Duration of this 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

Manufacturer's sole obligation under the foregoing warranties will be limited to either, at Manufacturer's option, replacing or repairing defective Goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the Buyer, and Buyer's exclusive remedy for breach of any such warranties will be enforcement of such obligations of Manufacturer. If Manufacturer so requests the return of the Goods, the Goods will be redelivered to Manufacturer in accordance with Manufacturer's instructions F.O.B. Factory. The remedies contained herein shall

constitute the sole recourse of the Buyer against Manufacturer for breach of warranty. IN NO EVENT SHALL MANUFACTURER'S LIABILITY ON ANY CLAIM FOR DAMAGES ARISING OUT OF THE MANUFACTURE, SALE, DELIVERY, OR USE OF THE GOODS EXCEED THE PURCHASE PRICE OF THE GOODS. The foregoing warranties will not extend to Goods subjected to misuse, neglect, accident or improper installation or maintenance, or which have been altered or repaired by anyone other than 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 EXPRESS OR IMPLIED. No person may vary the foregoing warranties and remedies except in writing signed by a duly authorized officer of Manufacturer. Warranties or remedies that differ from the foregoing shall not otherwise be binding on 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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