



**STOP! READ THIS SECTION NOW**  
**THE FOLLOWING INFORMATION IS CRITICAL TO THE PROPER INSTALLATION AND OPERATION OF THIS FUEL UNIT. READ IT CAREFULLY BEFORE STARTING ANYTHING ELSE!**

- This fuel unit must be installed by a qualified technician familiar with oil heating systems, equipped with the proper tools and test equipment, familiar with all governing codes and ordinances, and licensed by the proper authority where applicable. Installation and service done by unqualified persons can result in hazards to that person and others. These hazards may include spillage of fuel oil, fire, severe burns, damage to system components, and other hazards.
- Installation must conform to all governing codes and ordinances.
- Check the ratings of this fuel unit match the job requirements.
- Installation must be exactly as outlined in these instructions and conform to the diagrams shown. **No other system configuration is approved nor sanctioned by the manufacturer.** Failure to comply with the instructions provided may result in hazards that include spillage of fuel oil, fire, severe burns, damage to system components, and other hazards.
- Never alter nor modify any components in this fuel unit. Doing so will adversely affect its proper, safe operation.

## Fuel Unit Description

The part numbers shown in Table 1 are remanufactured Suntec Model A (single-stage) and B (two-stage) fuel units for use as replacements for defective units on oil burners. They include internal pressure regulators that are field adjustable for desired nozzle pressure and provide for cut-off of oil flow to the nozzle at burner shut-down. An internal cleanable inlet strainer is provided. Fuel units are shipped without an installed by-pass plug (needed for two-pipe installations - see Installation section below).

## Installation



**WARNING: ELECTRIC SHOCK AND UNEXPECTED SYSTEM OPERATION HAZARD!**

Turn off all power before servicing any part of the system. Use a volt meter to verify the power has been turned off.

All work must be performed by a qualified technician familiar with oil heating systems and licensed by the proper authority where applicable.

To insure that the replacement fuel unit will be correct for the application, it's rotation, nozzle port location, firing rate, pressure, etc. must be the same as the fuel unit being replaced. If the defective fuel unit's specifications are not known, the numbers stamped on it's casting must be referenced to original equipment manufacturer's literature to determine specifications. The replacement pump's specifications are determined by referencing the part number indicated on the fuel unit's label to Table 1. **It is the installer's responsibility to determine if the replacement fuel unit's specifications match the requirements of the job.**

Inspect the entire fuel system to insure that all components are in good condition and that the system conforms to all applicable codes and ordinances. Replace components found to be unserviceable with new. Figures 4, 5, and 6 show typical installations that conform to generally accepted practices and may be used as a guide in the absence of local codes and ordinances.

One-pipe systems are generally for installations where the fuel unit is below, or no more than 8 feet above, the bottom of the storage tank (see Figure 4). Two-pipe systems are generally for remote tank installations that may require oil to be lifted by the fuel unit (see Figures 5 and 6). Oil lines should be of copper tubing to minimize the possibility of air leaks. One-pipe system lines may be 3/8" O. D. if less than 50 feet; 1/2" O. D. if 50 to 100 feet. Two-pipe system lines are 1/2" O. D. Consult the factory when line lengths exceed 100 feet. **Flare fittings must be used for all tubing connections - do not use compression fittings!** Lines must be absolutely air tight to prevent fuel leakage and performance problems (ie. air binding, after drip, rough burner starts and stops, loss of prime, etc.). A line filter should be installed on the inlet line as shown in Figures 4, 5, and 6. A replaceable element type (SH No. 264 (one-pipe), No. 265 (two-pipe) or spin-on element type (SH No. 264-90) are recommended.

When the fuel unit is above the storage tank, the return line must be submerged in the oil to prevent possible loss of prime during burner off cycles (see Figure 6). When the fuel unit is below the storage tank, the return line must terminate at the top of the tank and shut-off valves installed as shown in Figure 5.

Since the replacement of an oil burner fuel unit involves the disconnecting of piping containing fuel oil, it is necessary that proper precautions be taken beforehand to avoid releasing fuel that can harm the environment and service personnel. Therefore, good service practice requires the following:

1. Proper eye protection (safety glasses or face shield) and gloves (fuel oil resistant) must be worn.
2. Close all oil line shut-off valves.
3. Place oil absorbent pads (SH No. F1-89†) or socks (SH No. F1-87†) in the work area to catch any possible release of fuel.
4. Have spreadable oil absorbent material (SORBITAL MP® non-clay product SH No. F1-84 or KWIKSORB® paper pulp product SH No. F1-83) ready to immediately apply to fuel releases if needed.
5. Place a large, oil resistant container (bucket, large cooking pan, etc.) under the fuel unit to be replaced to catch released fuel and into which the fuel unit can be drained when removed.
6. Ensure an ample supply of oil resistant plastic bags‡ are on hand to adequately clean up refuse and oil absorbent products after completing the fuel unit replacement.

† Product included in KWIK II® Spill Kit (SH No. F1-86).

Carefully disconnect all oil lines (and wires, if solenoid valve equipped) attached to the fuel unit to be replaced taking care to catch any fuel oil released. Remove the fuel unit from the burner, drain it into a suitable container, and remove any serviceable fittings that will be used on the replacement fuel unit. If it is a two-pipe system, remove the by-pass plug from the defective fuel unit (see Figure 1 or 2) and save it for installation in the replacement fuel unit. Plug all open ports with pipe plugs to prevent any remaining oil from leaking out of the defective fuel unit.

Remove the pipe plugs from the ports to be used on the replacement fuel unit. If it is a two-pipe system, install the by-pass plug removed from the defective fuel unit (see Figure 1 or 2). Install the rest of the pipe fittings using a good quality non-hardening pipe compound (SH No. F3-61). If oil has drained from the fuel unit during installation of the fittings, refill it using the inlet port with clean fuel oil or lubricating oil. Mount the fuel unit on the burner in accordance with the allowable mounting positions indicated (see Table 1. and Figure 7). Connect all the oil lines (and wires, if solenoid valve equipped - see Figure 3).

## Startup and Checkout



**WARNING: FIRE HAZARD!**

Make sure the combustion chamber is free of oil or oil vapor before operating the system!

To verify proper operation and to ensure the heating system is left in a safe condition, the following steps must be taken to place the fuel unit in service when first installed and at any time service involving the fuel unit has been performed on the system.

### 1. Inlet Pressure Check

Install a compound pressure/vacuum gauge (SH No. P127) in the unused inlet port. Open all the oil line shut-off valve(s) and immediately check for, and correct, any leaks. To comply with National Fire Protection Association (NFPA) Bulletin 31., check that the pressure on the compound gauge does not exceed 3 P.S.I. Correct any high inlet pressure condition.

**WARNING: Inlet pressure above 10 P.S.I. can cause a seal leak creating a fire hazard and possible environmental damage!** After checking inlet pressure remove the gauge and re-install the pipe plug in the inlet port.

### 2. Air Bleeding

**One-Pipe Systems** - Start the burner. Open the air bleeder (see Figure 1 or 2) CCW and catch oil flow in a suitable container (TURN-A-KIT® bleed wrench SH No. P131-11, recommended). Continue bleeding until air free oil flows from the air bleeder. Close the air bleeder and stop burner.

**Two-Pipe Systems** - Using a suitable tee fitting, install a pressure gauge in the return port to allow pressure monitoring of the oil being returned to the tank through the return line. Start the burner. Air bleeding is automatic (use of the air bleeder will hasten bleeding - see bleeding one-pipe systems). When bleeding is finished, close the air bleeder (if used), and allow the burner to fire. While the burner is firing, check that the return line pressure gauge does not exceed 10 P.S.I. Pressure in the return line indicates a restriction that must be corrected. **WARNING: Return line pressure above 10 P.S.I. can cause a seal leak creating a fire hazard and possible environmental damage!** After checking the return line pressure, stop the burner, remove the pressure gauge and re-connect the return line for normal operation.

### 3. Nozzle Pressure Check‡

Install a 0-300 P.S.I. pressure gauge (SH No. P125-2) in the gauge port (gauge connector SH No. P127-10, recommended). See Figure 1 or 2 for gauge port location. **Do not use the air bleeder port for checking pressure! (exception: use the air bleeder port on models with built-in solenoid valve)** Start the burner. Observe the pressure gauge and set the fuel unit for the desired pressure using the pressure adjuster (see Figure 1 or 2). **Note: Set pressure only within the pressure range shown in Table 1 for that fuel unit.** Stop the burner after setting the pressure and remove the pressure gauge. Re-install the pipe plug in the gauge port.

### 4. Nozzle Cut-Off Check‡

Disconnect the nozzle line and install a 0-300 P.S.I. pressure gauge (SH No. P125-2) in the nozzle port. Operate the burner for 5-10 seconds, then shut it off. Gauge pressure should drop to no lower than approximately 80% of operating pressure and remain stable (needle steady, not dropping).

**Dropping pressure indicates a defective cut-off which can create a fire hazard and possible environmental damage!** After cut-off has been checked, remove the pressure gauge and re-connect the nozzle line. **Note: Air that is unavoidably introduced into the nozzle assembly during fuel unit replacement may cause an after-burn condition when the burner shuts down. This is not a fuel unit cut-off problem and will stop as the air is pushed out the nozzle through repeated burner cycling.**

‡These checks are made easier and faster by using the KWIK CHECK II® pump test kit SH No. P115-2 or Pump Test Manifold SH No. P115-10.

When all of the above steps have been successfully completed, operate the system to insure that it is working properly and will be left in a safe condition. Clean up the site and properly dispose of all liquid fuel oil and used absorbent materials and refuse in accordance with applicable regulations. Use of a non-aerosol odor eliminator (SH No. F1-75) in the immediate area may be appropriate.

## Maintenance & Service

Clean the strainer once a year, or more often if necessary, to keep running vacuum as low as possible. Access to the strainer is accomplished by removing the cover held by the four machine screws. Replace corroded or damaged strainers with new. Always install a new cover gasket (SH No. P165-5) whenever the cover is removed.

**Other than the strainer, there are no field-serviceable parts in this fuel unit. Replace the complete unit if it fails to operate properly. Do not attempt to repair!**

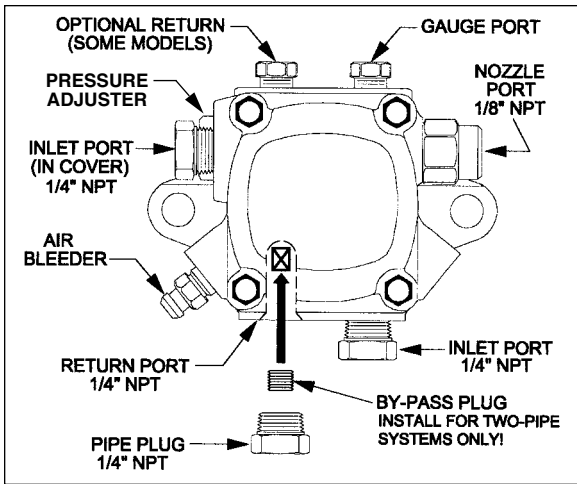


Figure 1 - By-pass plug location for Model A, B fuel unit with nozzle port left\*.

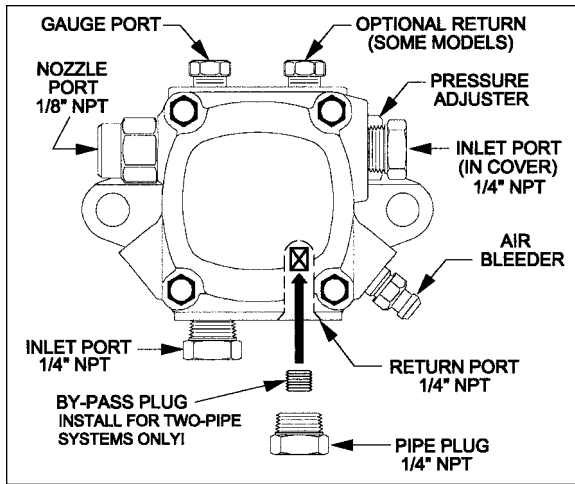


Figure 2 - By-pass plug location for Model A, B fuel unit with nozzle port right\*.

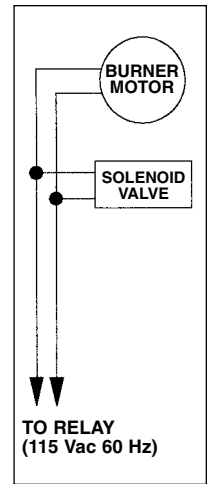


Figure 3

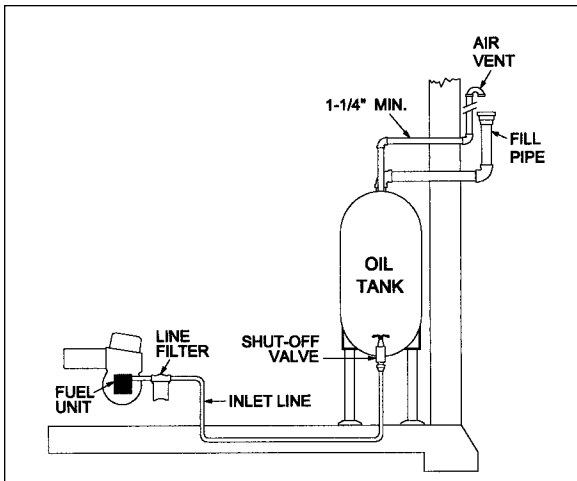


Figure 4 - One-pipe system (Not Lifting Oil)

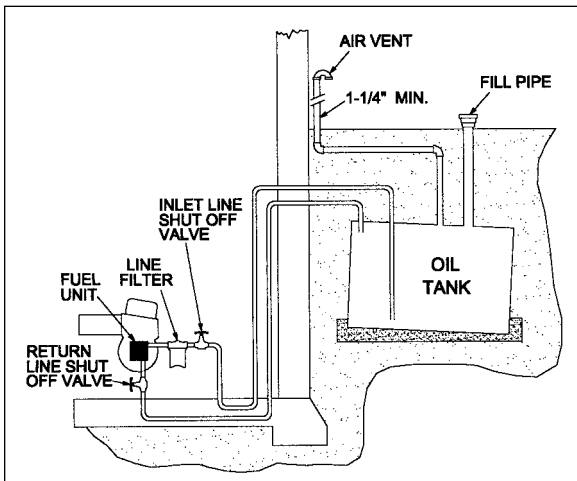


Figure 5 - Two-pipe system (Not Lifting Oil)  
(Fuel unit below bottom of tank)

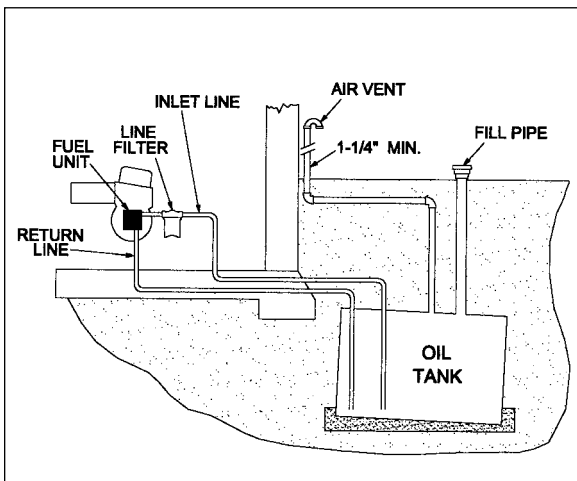


Figure 6 - Two-pipe system (Lifting Oil)  
(Fuel unit above bottom of tank)

SID HARVEY No.	SUNTEC MODEL	ROTATION AND NOZZLE PORT SIDE*	STAGE	GPH @ 1725 RPM	GPH @ 3450 RPM	PRESSURE (P.S.I.)	VACUUM LIMIT ("Hg.)	HEAVIEST OIL TYPE	1 - PIPE	2 - PIPE	MOUNTING POSITION (see figure 7)	MOUNTING STYLE	
P4-30R	B2	CWR	2	-	7	95-150	15	2	A	B	FLANGE		
P4-60R	B1	CWR	2	3	-	95-150	15	2	A	B	FLANGE		
P4-61R	B1	CWL	2	3	-	95-150	15	2	A	C	FLANGE		
P4-62R	B1	CCWL	2	3	-	95-150	15	2	A	C	FLANGE		
P4-63R	B1	CWR	2	3	-	95-150	15	2	A	B	HUB		
P4-70R	B2	CWR	2	-	3	95-150	15	2	A	B	FLANGE		
P4-71R	B2	CWL	2	-	3	95-150	15	2	A	C	FLANGE		
P4-72R	B2	CWR	2	-	3	95-150	15	2	A	B	HUB		
P4-83R	A1	CWR	1	3	-	95-150	6	2	A	A	FLANGE		
P4-84R	A1	CWL	1	3	-	95-150	6	2	A	A	FLANGE		
P4-85R	A1	CCWL	1	3	-	95-150	6	2	A	A	FLANGE		
P4-86R	A1	CCWR	1	3	-	95-150	6	2	A	A	FLANGE		
P4-87R	A1	CWR	1	3	-	95-150	6	2	A	A	HUB		
P4-88R	A1	CWL	1	3	-	95-150	6	2	A	A	HUB		
P4-89R	A1	CCWL	1	3	-	95-150	6	2	A	A	HUB		
P4-90R	Ω	A1	CWR	1	2	4	95-150	6	2	A	A	FLANGE	
P4-91R	A2	CWR	1	-	3	95-150	6	2	A	A	FLANGE		
P4-92R	A2	CWL	1	-	3	95-150	6	2	A	A	FLANGE		
P4-94R	A2	CCWR	1	-	3	95-150	6	2	A	A	FLANGE		
P4-95R	A2	CWR	1	-	3	95-150	6	2	A	A	HUB		
P4-96R	Δ	A2	CWR	1	-	3	95-150	6	2	A	A	FLANGE	
P4-100R	A1	CWR	1	7	-	95-150	6	2	A	A	FLANGE		
P4-101R	A2	CWR	1	-	7	95-150	6	2	A	A	FLANGE		
P4-196R	Δ	A2	CWR	1	-	4	100-150	6	2	A	A	FLANGE	
						3	150-200						
P4-198R	Δ	A2	CWR	1	-	4	100-150	6	2	A	A	FLANGE	
						3	150-200						
P4-830R	∅	A1	CWR	1	3	-	95-150	6	2	A	A	FLANGE	
P4-910R	∅	A2	CWR	1	-	3	95-150	6	2	A	A	FLANGE	

Ω= Dual Speed® Mini Pump (field adjustable for 1725 or 3450 RPM)  
 Δ= Includes built-in solenoid valve      ∅= Specially set up for kerosene

Table 1 - Fuel unit specifications

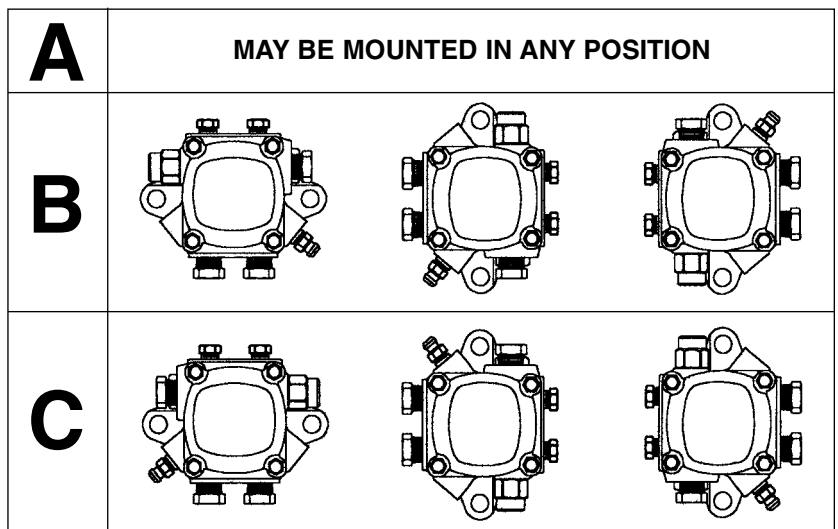


Figure 7 - Allowable mounting positions

\* Rotation and nozzle port specifications as viewed from shaft end