

**HELIPORT
FUEL/WATER SEPARATOR
MODEL H-200**



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A. PRINCIPLE OF OPERATION

Primarily for use at Heliports, the **MODEL H-200 FUEL/WATER SEPARATOR** prevents a sudden deluge of spilled fuel in the event of an aircraft accident from entering city storm sewer where a fire or explosion could occur - yet normal rainwater and any fire suppression water pass through to the storm sewer. When employed at a rooftop heliport, fuel is prevented from entering the building's roof drain lines - eliminating the need to install an additional, isolated drain line down the outside of the entire building.

The size of the Separator is hydraulically engineered in relation to the size of its Inlet to reduce the velocity of water and fuel as they flow by gravity into the separator. Baffles inside the separator create a precise, constant water level, see **SECTION**, Page 2. Fuel entering the separator floats to the top of the water almost immediately due to the difference in Specific Gravity of **fuels** from **water**. As the fuel accumulates on top of the water, it flows into a 2" pipe leading to a separate Fuel Containment Tank from where it is removed as soon as possible and the heliport is reopened.

The H-200 Separator will contain flows of pure fuel (Jet-A or Avgas) and should not be confused with an **oil-y** water separator which separates only small amounts of fuel mixed with large amounts of water (2% fuel to 98% water) in order to function.

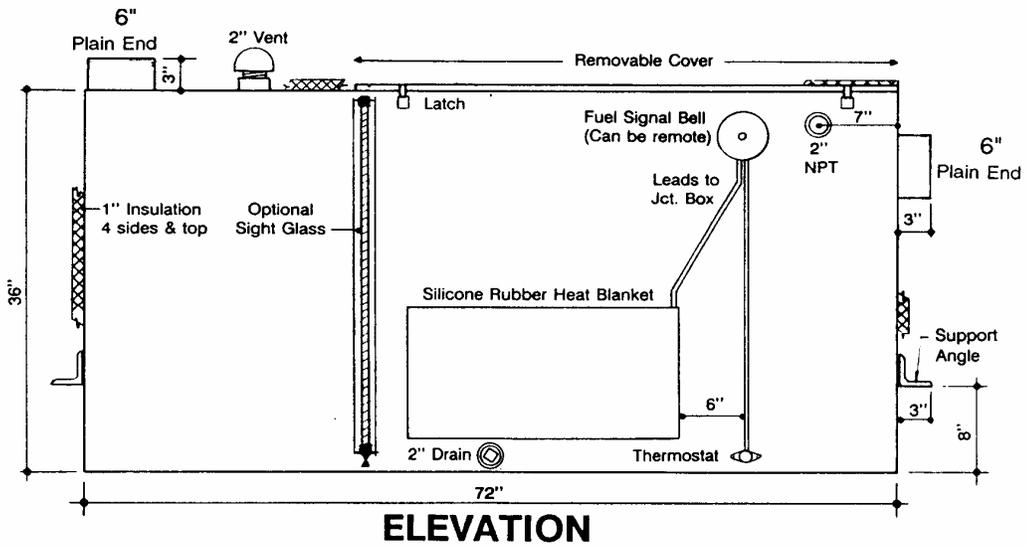
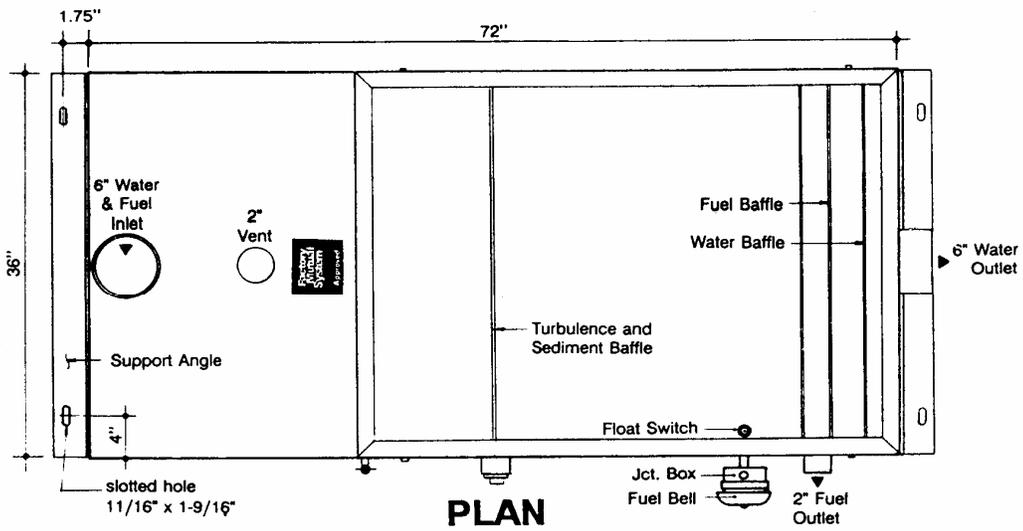
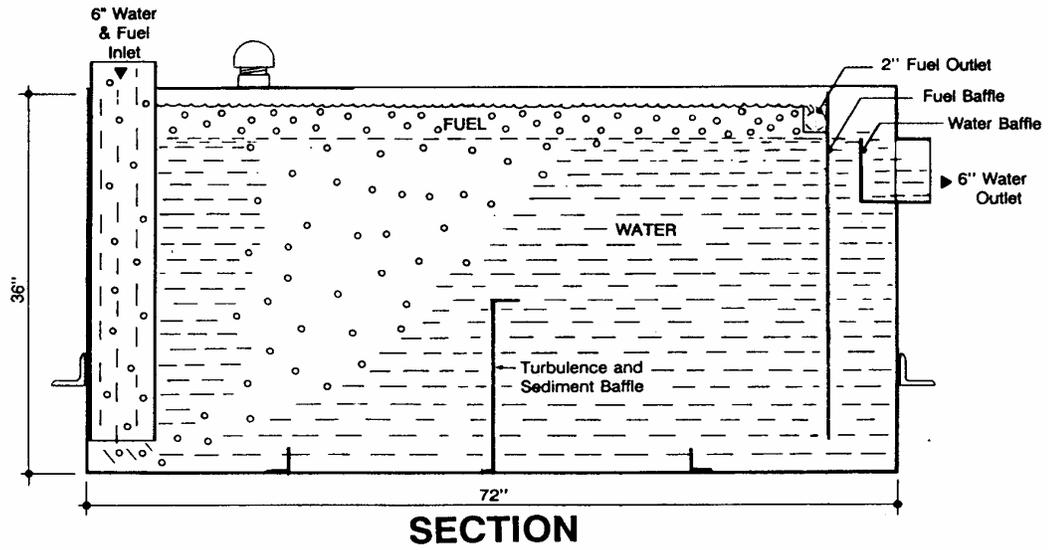
The H-200 can separate nearly any *amount* of fuel due to its **two-piece** design (**Separator Unit** and **Fuel Containment Tank**), the latter being an inexpensive tank sized to the amount of fuel expected without changing the more expensive Separator which is constructed entirely of stainless steel.

The H-200 will accommodate rain and/or fire suppression **water flow rates up to 200 GPM** simultaneously with **fuel flow rates up to 30 GPM**. These flow rates are greater than those expected at most one and two-helicopter heliports. However, if the calculated water flow *rate* exceeds 200 GPM or if the fuel flow *rate* exceeds 30 GPM, a second H-200 can be placed in parallel for a total water flow rate of 400 GPM and fuel flow rate of 60 GPM. A third separator in parallel increases the total water flow rate to 600 GPM and total fuel flow rate to 90 GPM, etc. Fuel flow from multiple separators can flow to one large fuel containment tank, if desired.

The maximum flow rate of water from a heliport expected to enter the Separator is determined by either: 1) the square footage of the area where the fuel spill is expected times the maximum rainfall intensity (inches per hour) expected to fall on that fuel spill area, or 2) the fire suppression water rate - **whichever is greater** - to arrive at a Gallon Per Minute figure. Contact Heliport Systems, Inc. for assistance in sizing the separator for a particular heliport or airport ramp.

The "standard" Fuel Containment Tank furnished is 330 gallons, ample for most heliports. This obround shaped tank fits easily at most rooftop locations. If necessary, it can be manifolded to a second 330 gallon tank for 660 gallons of fuel containment, see **ROOF INSTALL**, Pages 4 & 5. A larger, single fuel tank is possible, but is round and therefore seldom fits at most rooftop locations and is appropriate often only at other locations.

If spilled fuel on the helideck ignites, any fire traveling down the drain line leading to the Separator will be stopped at the inlet to the separator by a Barometric Liquid Seal formed by the 32" of water always inside the separator.



B. INSTALLATION

ROOFTOP HELIPORTS - Three potential locations are:

1. BETWEEN HELIDECK AND ROOF The preferred location if the underside of the helideck is *elevated five feet or more* above the roof. By code the helideck must be designed to withstand a crash of the largest helicopter expected to land at the facility, leakage of spilled fuel, and any fire. Therefore the safest rooftop location is under the helideck. Locate the Separator's Inlet directly below the helideck drain, if possible; otherwise, piping from helideck drain across to the Separator's Inlet must pitch 3/16" per foot. For maximum **head/flow**, always install the Separator **as close as possible to the roof**. The Separator mounts between two horizontal W8 steel members hung from the helideck structural steel, so that the bottom of the Separator and W8 members are just above the roof, see **ROOF INSTALLATION**, Pages 4 and 5. The steel members are by others.

The standard Fuel Containment Tank is a 330 gallon, obround, UL 142/Above Ground type, for placement next to the Separator. It can be manifolded to a second 330 gallon tank for 660 gallons of containment. Also it can be located remotely from the Separator, for example, on the ground. To ease installation, the Separator can be ordered with the 2" Fuel Outlet exiting the Separator's **left side**, instead of from the **right side, standard**. The Fuel Tank mounts between two horizontal W4 x 13 members which span between the two W8 members so that the bottom of the fuel tank, separator, W4 & W8 steel members, are all just above the roof. Install level.

The Separator's water outlet is piped to one or two existing roof drains, preferably the roof drains intended for the portion of the roof now covered by the heliport. If more than one roof drain is required, the 6" outlet pipe can tee to two roof drains. Piping must terminate immediately next to the roof drain basket, but need not connect directly to the drain pipe itself. Pour water down the helideck drain to 1) fill the separator and 2) ensure there is no standing water in the pipe between helideck drain and inlet to Separator.

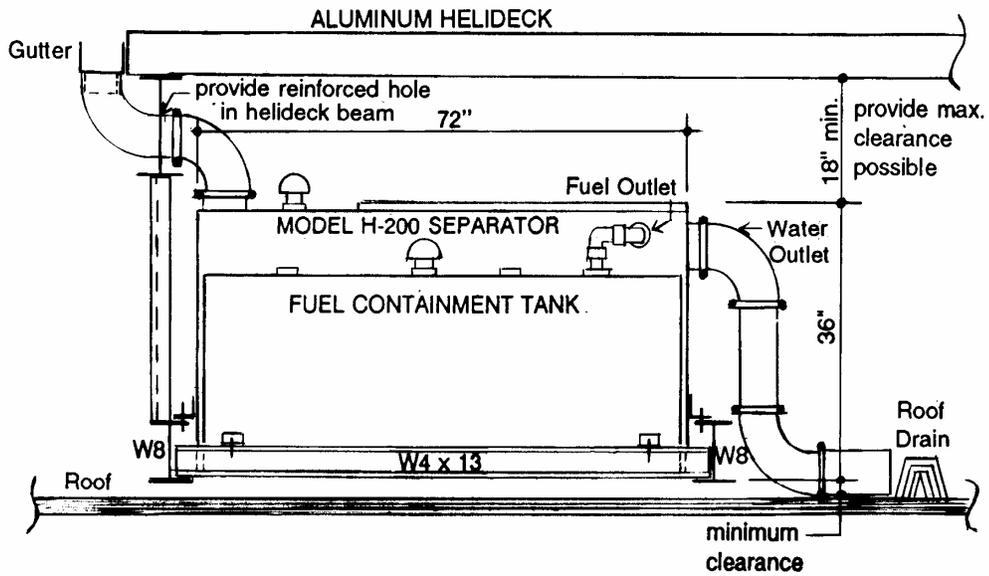
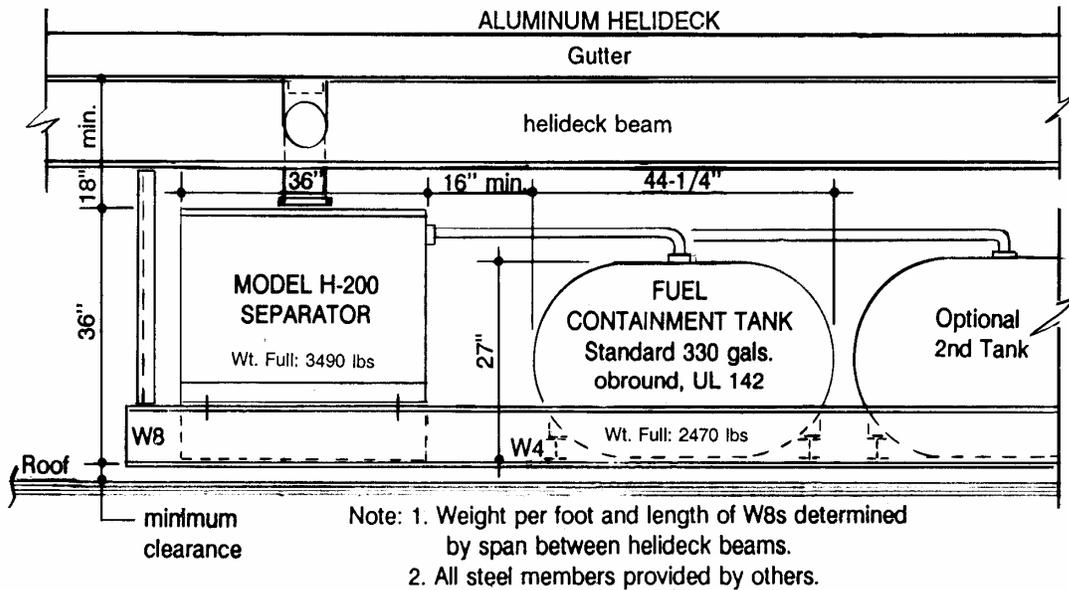
Fuel is removed from the Fuel Containment Tank with a hose from the roof to a waste oil truck on the ground. An alternate location for the Fuel Containment Tank is at the base of the building; however, a separate 2" fuel line down the outside of the building will be required.

2. IN MECHANICAL ROOM BELOW ROOF Place the Separator (3490 lbs full) and 330 gallon Fuel Containment Tank (2470 lbs full) on the floor of the Mechanical Room provided a structural engineer confirms the floor can support the weights. If necessary, locate directly above a column supporting the floor. Install both tanks level and vent outside the building. Pipe from roof to mechanical room.

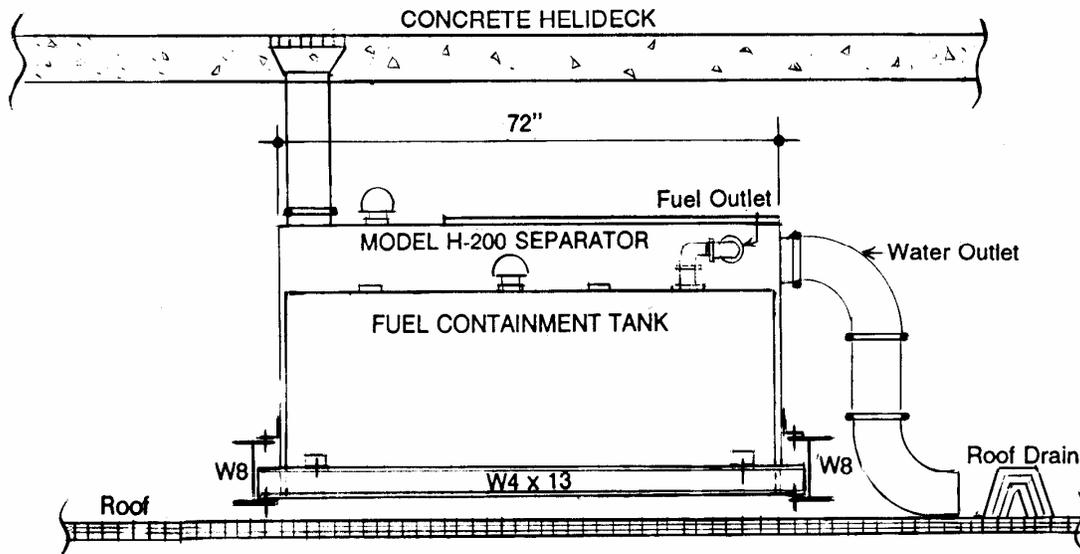
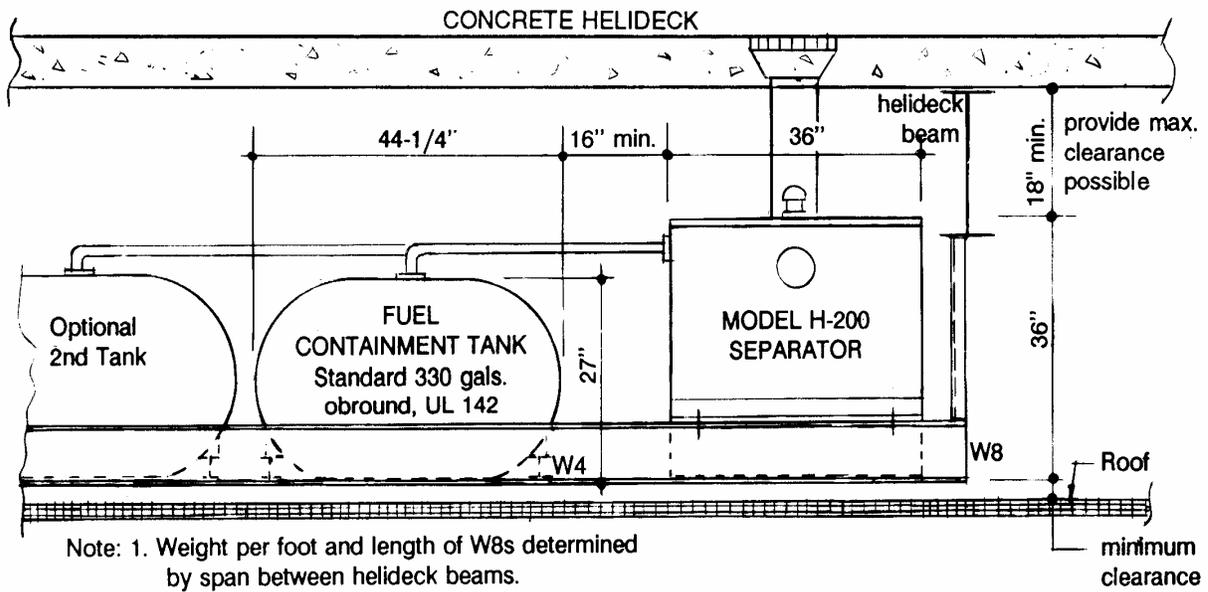
3. AT BASE OF BUILDING Install outside the building, either **Above Ground** or **Below Ground**, piping from roof to base of building. If **Above Ground**, install on a level precast concrete slab and hide from view with shrubbery, a fence, or wall. If a single 500+ gallon *round* is desired, the Separator must be elevated for fuel to flow by gravity. See **ABOVE GROUND INSTALLATION**, Page 6.

If **Below Ground**, install the Separator and standard 330 gal. UL 142 Fuel Containment Tank in a precast concrete vault (water meter pit) with access cover and floor drain, see **BELOW GROUND INSTALLATION**, Page 6. Larger Fuel Containment Tanks which cannot fit in the vault are *direct buried outside the vault*, and must be UL Listed for direct burial.

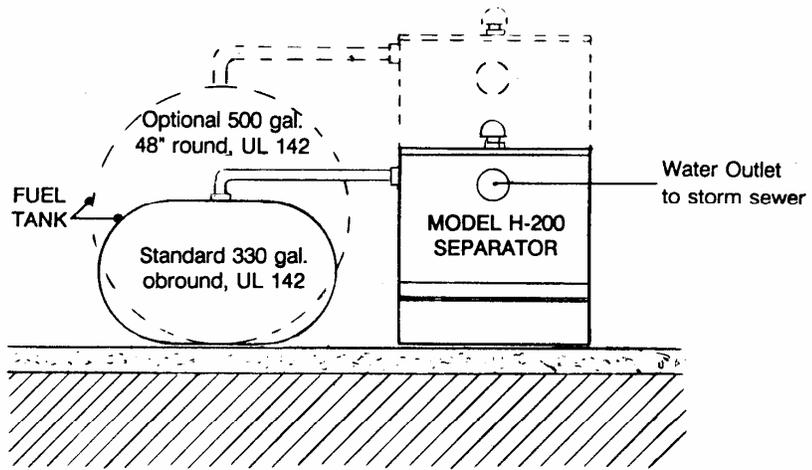
GROUNDLEVEL HELIPORTS - Install either **Below Ground** or **Above Ground**.



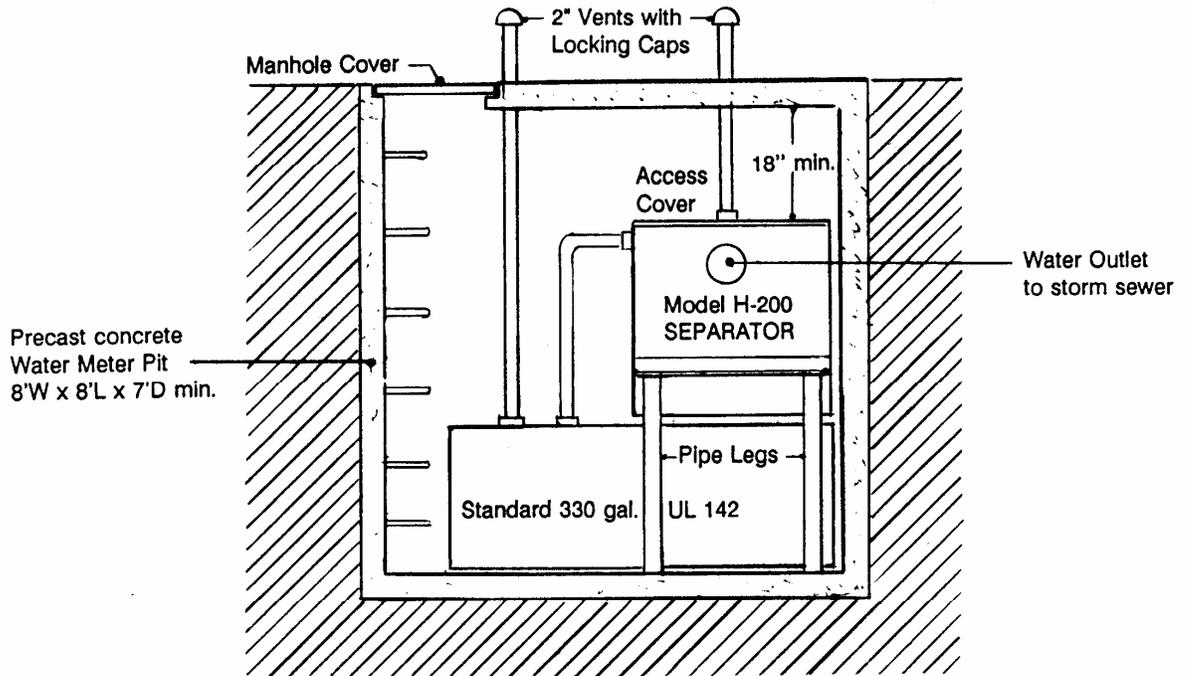
ROOFTOP INSTALL - Aluminum Helideck



ROOFTOP INSTALL - Concrete Helideck



ABOVE GROUND INSTALLATION



BELOW GROUND INSTALLATION

FREEZE PROTECTION AND WIRING

In freezing climates, the **Separator Unit** which always contains water must be freeze protected; the Fuel Containment Tank does not require freeze protection because fuel does not freeze. Piping from helideck drain to inlet of the separator does not require freeze protection because it does not contain standing water when installed properly.

Remove the 4" bell from the 4" round weatherproof electrical junction box and screw the box onto the 1/2" NPT fitting on the right side of the Separator, see **ELEVATION**, Page 2. Before attaching the **heat blanket** and **insulation** to the Separator, first ensure the metal is clean and dry. Affix the **heat blanket** to the Separator exactly where shown in the **ELEVATION** by removing the clear plastic backing from the pressure sensitive adhesive on the back of the blanket and pressing firmly to the metal. Attach the thermostat to the two 8-32 studs.

Run the leads from the heat blanket and thermostat up to the electrical junction box above. If the Sight Glass Gauge is installed, heat trace with UL Listed or FM Approved heat trace cable with integral thermostat.

Affix the 1" thick elastomeric foam "armaflex" type **insulation** to the Separator by first cutting the six 3' x 4' sheets to length to cover the four **sides** and **top**. Using the aerosol adhesive furnished, apply to both the metal and the insulation; when tacky carefully press the insulation firmly to the Separator, covering the heat blanket and its leads, the thermostat leads, but not the thermostat itself. Once applied, the insulation **cannot** be repositioned.

Run a dedicated, preferably emergency power, 15 amp, 120 VAC line, Hot-Neutral-Ground stranded copper wire with THWN insulation inside 1/2" rigid conduit or 1/2" flexible liquid tight conduit to the 4" round weatherproof electrical junction box and wire per the **WIRING DIAGRAM**, Page 8, and in accordance with the NEC, latest edition.

FUEL SIGNAL

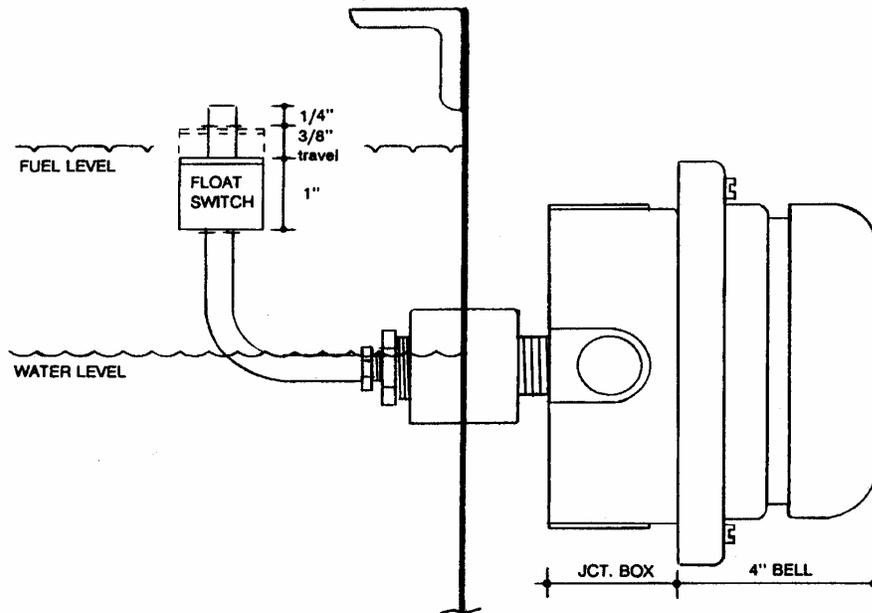
The Separator is equipped with a signal to indicate fuel is flowing into the Fuel Containment Tank. See **FUEL SIGNAL**, Page 8. Inside the separator an *intrinsically safe* float switch is factory mounted just above the water level. As fuel accumulates on top of the water, the magnetic float rises, closing contacts in the shaft, sending power to a bell, buzzer, or light - any item drawing less than 15 watts at 120 VAC. A weatherproof 4" bell having an 88 decibel level drawing only 7 watts mounts to the 4" electrical junction box. The bell also may be remote mounted, for example, to inside a building. **CAUTION:** Wiring a load greater than 15 watts through the float switch will fuse the contacts, causing the bell to ring constantly. Follow the **WIRING DIAGRAM**. To test, lift the float: the bell must ring; drop the float: the bell must stop. If multiple or larger signaling devices are desired, the higher current can be accommodated with an optional relay.

SIGHT GLASS GAUGE

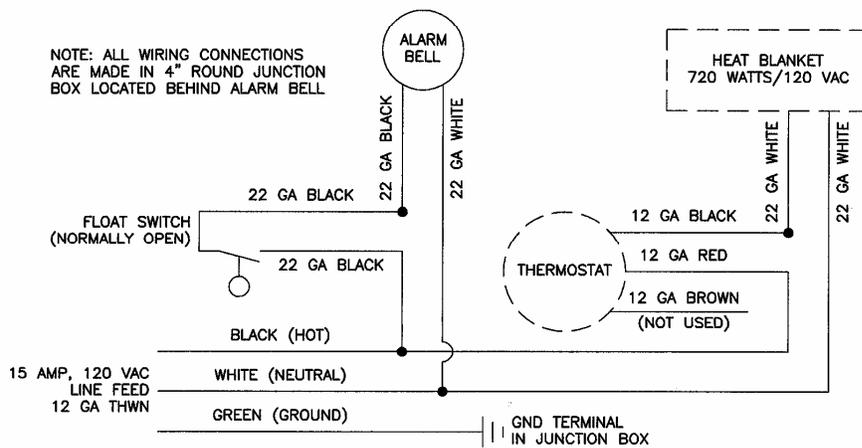
Only the City of Los Angeles requires a sight glass gauge to show the water level inside the Separator without removing the cover. See **ELEVATION**, Page 2. This optional item can be furnished for other locales if desired. Contractor to install to the two 1/2" NPT fittings provided.

FUEL CONTAINMENT TANK

The standard Fuel Containment Tank, Page 9, is a 330 gallon obround, UL 142 Listed for Rooftop/Mechanical Room/Above Ground and Below Ground when in a concrete vault with the Separator. For larger sizes requiring *direct burial outside the vault*, the fuel tank must be UL 58 Listed for Below Ground, and in some jurisdictions must be coated steel (sti-P3) or fiberglass, anchored to a concrete slab. It can be *any size or type*, provided it is UL Listed for fuel storage and the intended installation, but in all cases must be installed 1) lower than the Separator so fuel will flow by gravity, 2) level, and 3) vented above ground. A 2" flame check vent with locking cap is furnished, enabling this vent line to be used for pump out when the fuel containment tank is below ground.

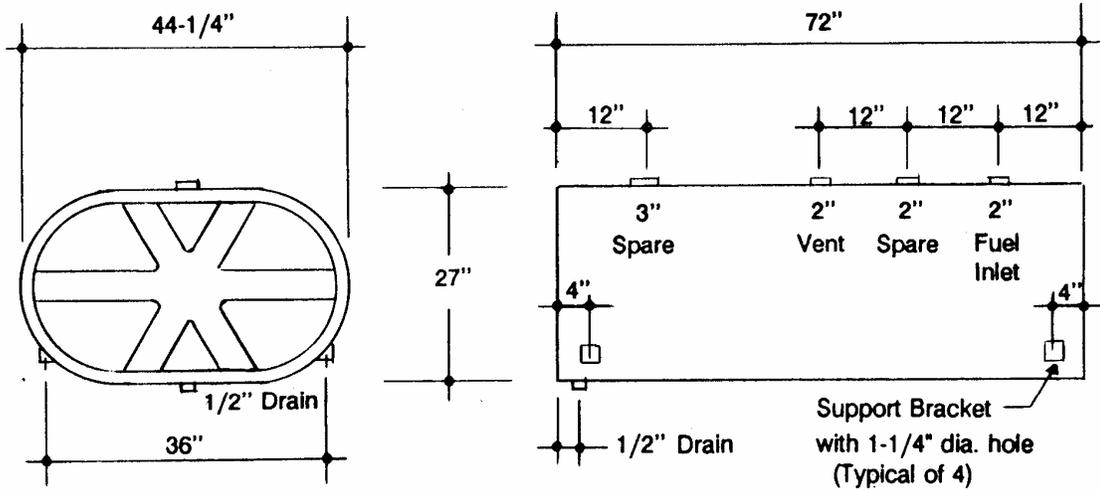


FUEL SIGNAL & ELEC. JCT. BOX



SCHEMATIC WIRING DIAGRAM

STANDARD FUEL CONTAINMENT TANK



END VIEW

SIDE VIEW

SPECIFICATIONS

CAPACITY	330 U.S. Gallons
MATERIAL	Mild Steel, 12 GA.
TEST	5 PSIG
PAINT	Exterior: Red Oxide Primer
WEIGHT	Empty: 320 lbs Full: 2460 lbs
LABEL	UL 142 (Above Ground)

C. MAINTENANCE

1. Inspect every three months for:
 - a. Proper water level (Dry climates: Inspect every month)
 - b. Presence of fuel
 - c. Presence of sediment, algae, or other foreign matter
 - d. Operation of Fuel Signal
 - e. Secure attachment of Insulation
2. Remove any fuel or foreign matter.
3. If detergent is used to clean the inside the Separator, flush thoroughly with water to remove all traces of detergent.
4. The Separator is constructed of stainless steel, inherently corrosion resistant.
5. Inspect the Fuel Containment Tank for integrity.
6. Inspect the Vents for obstructions.

COMPONENTS AND SPECIFICATIONS

SEPARATOR UNIT:

Overall Dimensions:	39" High x 36" Wide x 75" Long
Weight:	EMPTY 520 Lbs. FULL 3490 Lbs.
Construction:	Stainless steel, Type 304 2B
Fuel-Water Inlet:	6" nominal diameter, Victaulic Plain End
Water Outlet:	6" nominal diameter, Victaulic Plain End
Fuel Outlet:	2" nominal diameter, NPT
Rated Water Flow:	200 GPM
Rated Fuel Flow:	30 GPM
Vent:	2" NPT with flame check screen & locking cap
Fuel Signal:	Intrinsically safe Float Switch & 4" Bell, 7 watts @ 120VAC

SEPARATOR FREEZE PROTECTION:

Heat Blanket:	Silicone Rubber, 12"W x 24"L, 720 watts @ 120 VAC, with pressure sensitive adhesive backing.
Thermostat:	Open 55 F ⁰ ; Close 45 F ⁰ .
Insulation:	Elastomeric foam "armaflex" type, 1" thick sheets, ea. 3' x 4'.

FUEL CONTAINMENT TANK:

<u>Standard Type:</u>	330 gal. fuel storage tank, obround, UL 142 AboveGround.
Size:	27" High x 44-1/4" Wide x 72" Long
Weight:	EMPTY 320 Lbs FULL 2470 Lbs.
Construction:	12 ga. mild steel, red oxide primed or optional red enael
Fittings:	3 ea. 2" NPT and 1 ea. 3" NPT, along center axis of top
Vent:	2" NPT with flame check screen & locking cap
<u>Optional Type:</u>	Any size commercially available, UL Listed. (May be purchased directly by Mechanical Contractor)

SHIPPING LIST

MODEL H-200 FUEL/WATER SEPARATOR

<u>QUANTITY</u>	<u>ITEM DESCRIPTION</u>	<u>LOCATION</u>
1 each	Separator Tank, stainless steel, rectangular 36" W x 36" H x 72" L Weight: 520 lbs	On wood skid
1 each	Standard Fuel Containment Tank, oval 44-1/4" W x 27" H x 72" L Weight: 320 lbs	With Separator
1 each	Signal Bell & 4" round Elec. Jct. Box	Small cardboard
2 each	Vents (1 for Separator, 1 for Fuel Tank) For locations subject to freezing:	
1 each	Heat Blanket, 12" W x 24" L, orange	box
1 each	Thermostat for Heat Blanket	
2 cans	Insulation adhesive, 3M 90	
6 sheets	Insulation, black armafex type, ea. 3' x 4' (Locations subject to freezing only)	Inside Separator
1 each	Sight Glass Gauge and fittings Optional item, special order only	Rectangular cardboard box