

UNITOR

CHEMICAL SERVICE



CHEMICAL HANDLING & DOSING EQUIPMENT

MANUAL

Common manual for the following Unitor products:

EDP No.

664 613808

664 613807

664 625194

664 711358

664 639567

Chemical Cleaning Unit (without heater)

Chemical Cleaning Unit (with heater)

Manual Soot Remover Dosing Unit

Automatic Soot Remover Dosing Unit

2nd and 3rd Lance Fitting Kits

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CHEMICAL CLEANING UNIT

1



Specifications

Air supply for pump:

7 bar nominal

Heater supply:

220V single phase or 415V 3 phase

Heating time:

2 hours

Environmental:

IP66

Weight:

60 kg (with heating element), 54kg (without heating element)

Dimensions:

Width 60cm, shipping height 90cm, height with pump mounted 130cm

Capacity:

205 litres/45 gallons

Chemical Compatibility:

Compatible with all Unitor cleaning chemicals.

CHEMICAL CLEANING TANK

Installation

Initial Assembly - Unpacking

Remove all components from tank and remove all wrapping.



Heater (Optional, 220/415 VAC only)

- I When a heater is used, remove the 2" plug from the base of the tank. Ensure sealing washer is centrally aligned and insert the heater. Check for liquid tightness, but do not over tighten.

- I Fit heater cover inside the tank, over the heater.

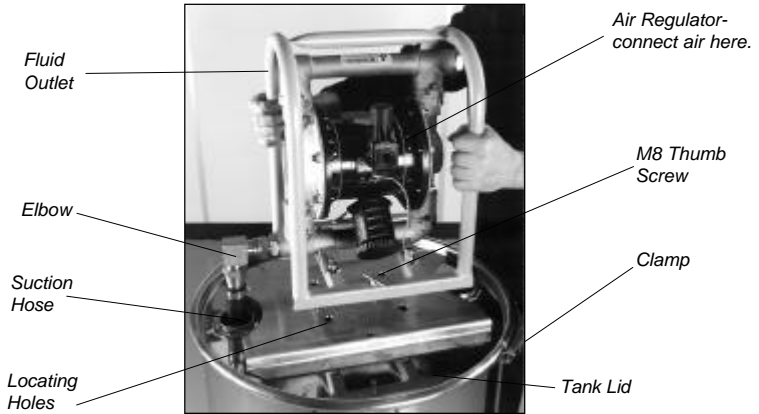


- I A full tank will take 2 hours to heat from 20°C to 80°C.

Note: The heater must be wired by a qualified electrician and MUST be earthed.

Pump Assembly - Using Pump on Tank Lid

A fluid return hose is not supplied as standard (see pump manufacturers instructions for pump spares and maintenance procedures).



Operation

Using Pump on floor

- I Place pump on floor.

- I Fit the tank lid and close the clamp.

- I Insert suction hose into tank, ensuring strainer is at the bottom of tank and with coupling end standing upright.

- I Connect hose to pump and tighten the suction connection.

- I Fasten delivery hose to the upper pump connector.

- I Connect the air regulator to the ship's air system (7 bar max.).

Using Pump on Tank lid

The tank can be filled before fitting the lid, or the pump suction can be used to fill from the stock chemical drums.

- I Fit the tank lid and close the clamp.

- I Insert suction hose into tank, ensuring strainer is at the bottom of tank and with coupling end standing upright.

- I Lower pump onto tank top and screw tight the suction connections.

- I Locate pump on tank lid using projecting pins in the frame and fasten down using the M8 thumb screws.

- I Fasten delivery hose to the upper pump connector.

- I Connect the air regulator to the ship's air system (7 bar max.).



Unit set up with pump on floor.



Unit set up with pump on lid.

Cleaning the Unit (when using with Acid).

After use, empty the unit and flush with a neutralising rinse (0.5% Alkalinity Control).

Spares

EDP no.664 617845 (FG-K10731-UN)	Heater (220V) + Guard Plate
EDP no.664 639419 (BI-K10732-UN)	Heater (220V)
EDP no.664 639427 (BI-K10718)	Circulating Hose (10m)
EDP no.664 617720 (BI-K10710)	Circulating Pump (air powered)
EDP no.664 639435 (BI-K10719)	Air Regulator (7 bar)

AUTOMATIC SOOT REMOVER DOSING UNIT

2



Specifications (applies to the prominent pump version only)

Power:

120 - 230 VAC (-20% / +15%), 50/60 Hz, 40 VA max.

Air Supply:

7 bar nominal (5 bar minimum, 8 bar maximum.)

Weight:

10kg

Size:

400 (w) x 800(h) x 400 (d) mm

AUTOMATIC SOOT REMOVER DOSING UNIT

Installation

- I Unpack the unit.

- I Fit the control panel to the side of the tank using the four nuts and washers supplied.

- I Fit the pump to the top of the tank using the screws included with the tank.

- I Fit a seal to the top of the pump from the 12mm connection pack.

- I Cut the suction assembly tube to the correct length and connect to the suction side of the pump as described in the prominent pump instructions using the 12mm connection pack.

- I Fit the orange level switch control cable from the suction tube to the front of the pump.

- I Fit the relay cable (grey) from the control box to the side of the pump housing ensuring the rubber connector seal is in place and tighten the screw.

- I Fit the orange pump control cable from the control box into the connector on the front of the pump.

- I Fit the mains cable (black) from the control box to the front of the pump.
Note: Make sure the connector is firmly in place before screwing the connector cover on BY HAND.

- I Select an injection point 1 to 2 m after the turbo charger outlet trunking.

- I Locate the unit not greater than 5 m from the injection point but out of the heat of the exhaust system.

- I Drill and weld a ½" BSP socket to the trunking at the injection point providing a gas tight seal for the injection lance. Mount the injection lance in the exhaust trunking using a ½" BSP gland nut. Fit the injector with the nozzle in the centre of the trunk with the pipe bend pointing towards the turbocharger, as shown in Figure 1. The nozzle will then spray in the same direction as the gas flow.

- I For installation for very large engines and very wide exhaust fittings, fit the injector at an angle so that the middle of the spray cone meets the centre line of the exhaust pipe (see figure 1 below).

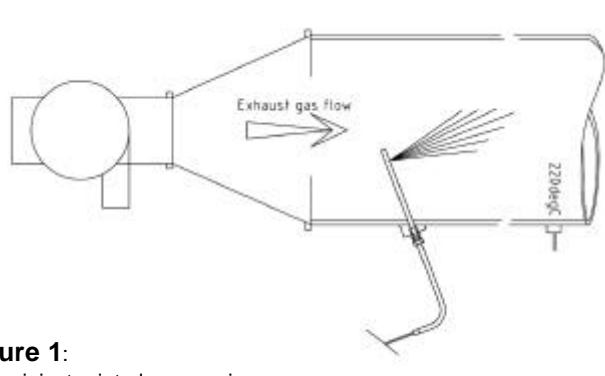


Figure 1:
Fitting injector into large engines

- I Connect the injection lance to the unit using a length of the 4mm teflon tube for the air assist and the 6mm stainless steel pipe (as shown in figure 2). The stainless pipe must fit directly onto the end of the lance. Do not shorten the stainless pipe.

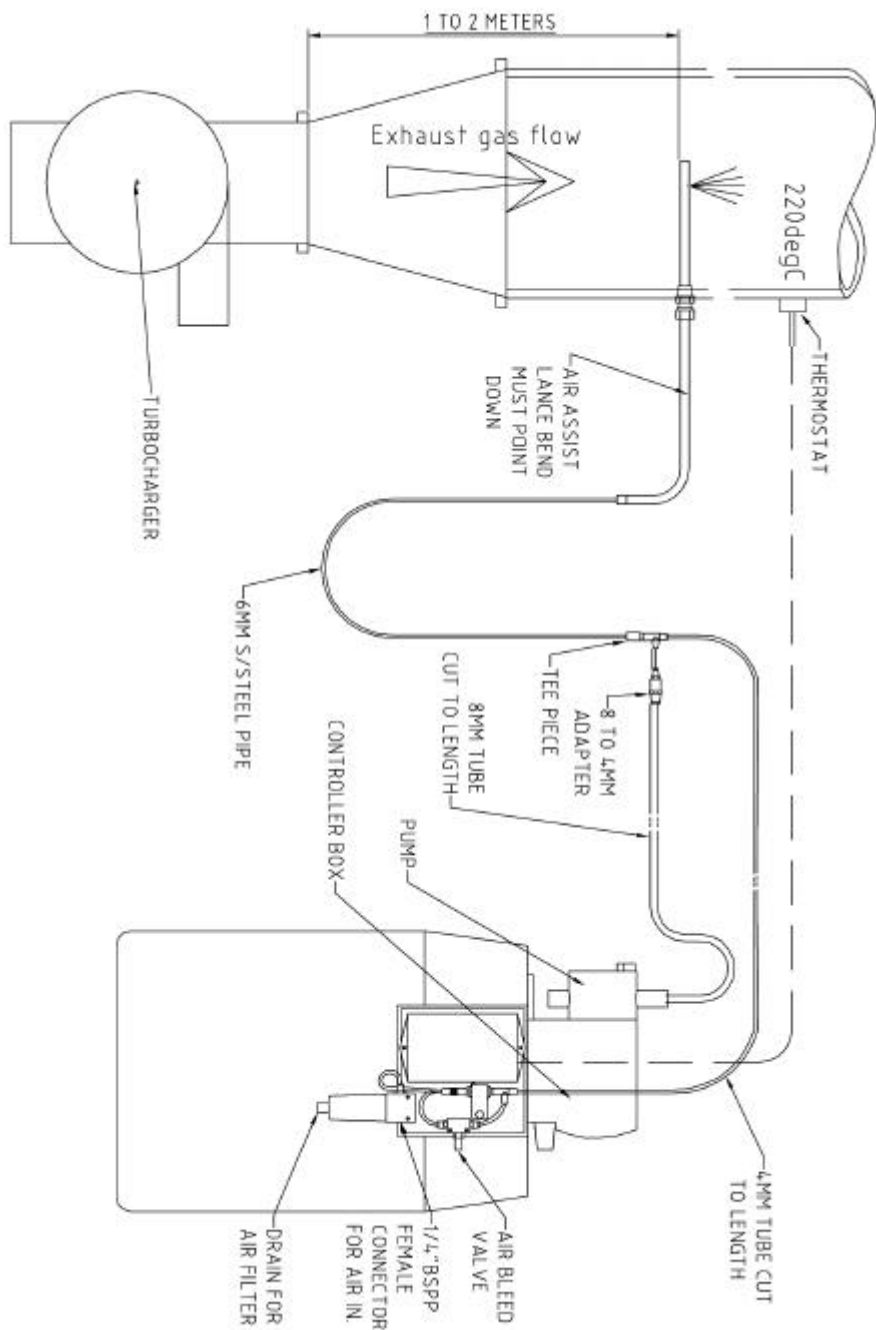
- I Connect the 8mm tube between the pump and the lance. You will need to use the 8mm pump connection pack, the 8mm to 4mm adaptor and a short length of 4mm tube to connect the 8mm tube to the 4mm fitting on the stainless steel pipe.

- I Unpack the Thermostat and fit the uprated gold plated switch part 017-424066, following instructions supplied with the switch.

- I Select the thermostat mounting point after the turbocharger, in the vicinity of the nozzle mounting point. Drill & weld a second ½" BSP socket to the trunking, not directly in line with the injection point. Mount the thermostat-sensing bulb using a suitable bulb pocket.

- I Connect an air supply of approximately 7 bar (5 bar min, 8 bar max) to the unit via the ¼" BSP female fitting on the side of the air inlet filter.

Figure 2: Installation Diagram



Note: The unit requires a 110v to 240v AC feed at 0.5Amp. The pump automatically adjusts to the voltage (power consumption 30VA max).

- I If you are using an 110V supply you will need to change the solenoid on the control panel to a 110V version supplied with the kit. To do this remove the connector by undoing the screw and pulling off. Remove the solenoid by unscrewing the retaining nut and sliding the 240V solenoid off, replace with the 110V solenoid. Replace the connector ensuring the rubber seal is fitted and the screw is tightened.
-

- I The terminations are made on the internal terminal blocks using the cage clamp screwless terminals. These provide long life vibration proof connections (see Figure 3 for method of use).

Note: The first three steps can be omitted with a new installation as the control box is supplied pre-wired.

- I Connect the pump power cable (black) to terminals (L2), (N) and earth on the green terminal.
-

- I Connect the pump relay cable (grey outer) white wire to terminal (N) and brown wire to terminal (L3). Cut off the green wire as it is not needed.
-

- I Connect the pump control cable (orange outer), black wire to (A) and brown wire to (B), cut off the other wires as they are not needed.
-

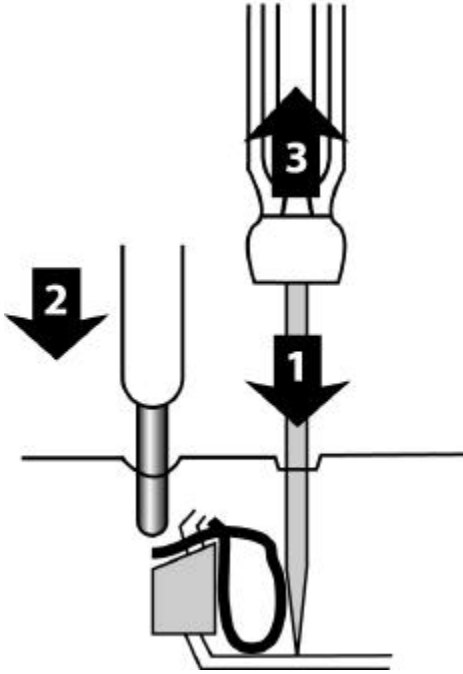
- I The power connections are made to terminals (L1) and (N) with the earth connection on the green terminal. (Figure 4)
-

- I Connect the thermostat connections 1 and 4 to terminals (A) and (B) using the 2 core screened cable supplied with the unit. Connect the screen wire to the green earth terminal.

Note: the thermostat contact must be closed for the unit to operate.

- I Replace the cover over the terminals before operation.

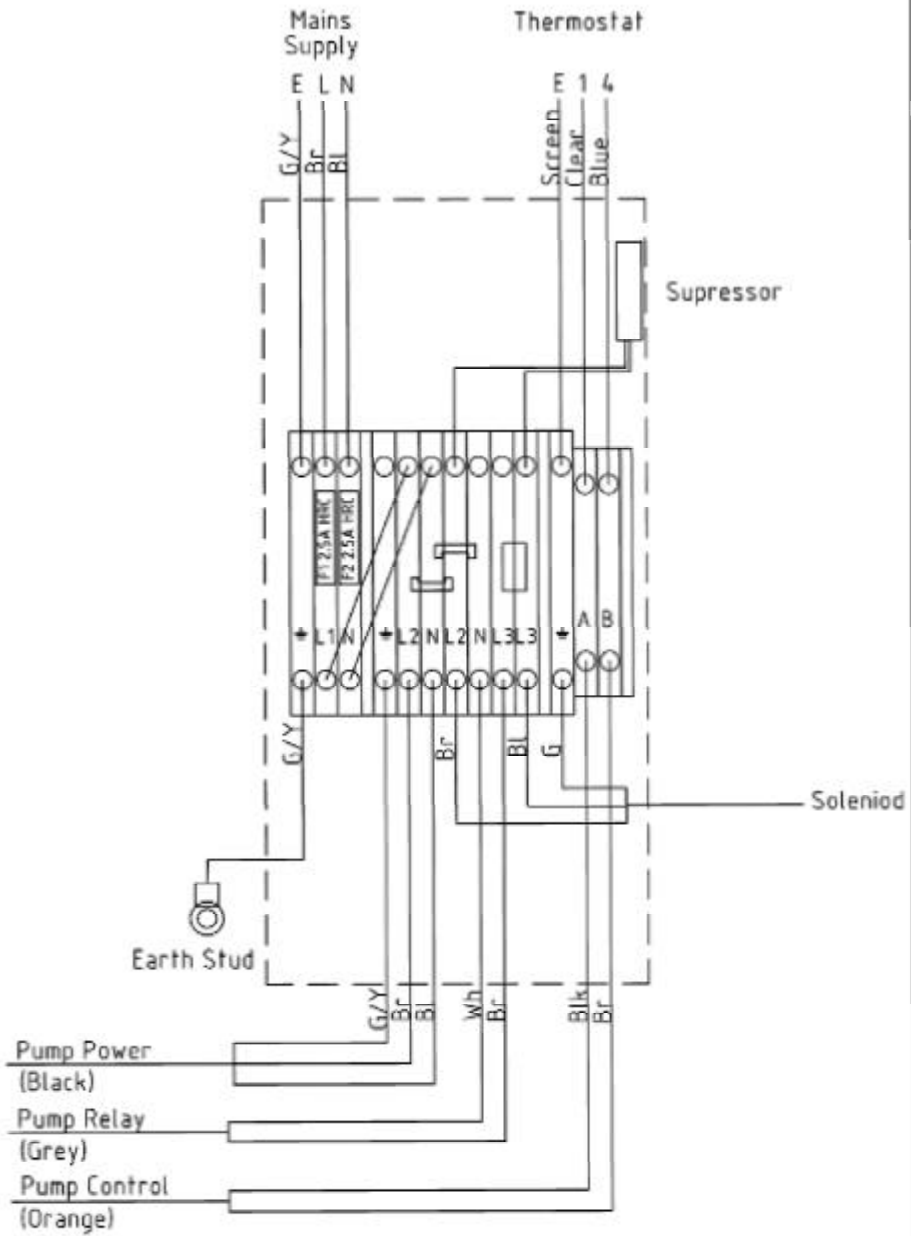
Figure 3: Use of Cage
Clamp Screwless Terminals



Wire Size 1 - 2.5 mm²

Strip to expose 8-9mm of conductor. Then insert into terminal using screwdriver, as per diagram.

Figure 4: Wiring Diagram



Operation

The unit will then supply a continuous reduced air flow to the exhaust injection nozzle in order to keep it cool and clear of exhaust deposits. Dosing will not start until the exhaust has reached normal operating temperature. One minute prior to dosing the air supply will go to full and one minute after dosing the air supply will reduce again. The timing of dosing is set in the pump program, please consult Unitor for guidance on correct dosing settings and alternative dosing timings. If the tank fluid level is low an amber light will show on the pump. If the tank is empty a red light will show on the pump and the dosing will be disabled.

Commissioning

Note: A full explanation of the pump controls and features are given in the pump manual. Operations described here must be implemented by following the pump manual. The pump is pre-programmed with the control algorithm. You need to ensure the pump is set to "AUTO" as indicated by the "AUTO" word appearing in the top right of the pump display. If it is not then consult the pump manual to change the "MODE" to "AUTO".

- 1 Connect the power supply to the unit.

- 1 Check that the pump display shows the clock.

- 1 Fill the tank with water to test the unit.

- 1 Prime the pump as described in the pump manual (this can only be done in the manual mode).

- 1 Connect the air supply.

- 1 Adjust the air bleed valve to give a continuous flow of air through the lance, this keeps the lance cool.

- I The pump doses at specific times in the day, as recorded on the programming sheet. For example:
One time is set at 17:59 to 18:09, use this to test the unit as follows:
- Set the clock to 17:57 as described in the pump manual (this can only be done in the manual mode).
 - Immediately set the pump back to automatic mode (as described in the pump manual). When the clock rolls round to 17:59 the air feed relay will open. This will give a full force air supply to the lance, at 18:00 the pump will start to dose. Check that the lance is spraying. The pump will then stop at 18.08 and one minute later the air valve will close.
Note: if the thermostat is not hot then remove the cable and put a wire link across (A) and (B) whilst testing.
 - Remember to set the clock back to the correct time (this can only be done in the manual mode).
 - Set the pump to automatic mode for normal operation.
-

- I Fill up the tank with soot remover liquid and the unit is ready to use.
-

- I See the Unitor guidance notes for correct dosing levels, this can be adjusted using the % control on the front of the pump.

Servicing

The only serviceable parts are the pump, air line filter and injection lance. These should be inspected every 6 months and cleaned. Please see the pump manual for guidance on cleaning. The Air Line Filter also has a water drain, which can be emptied if any water is present. To empty press rotate the knob located on the bottom of the filter whilst the line is depressurised.

Maintenance

To flush the system periodically, about every two months or so, when the tank is empty, fill 10 litres of fresh water into the tank and dose manually into the exhaust trunking while the engine is running under load.



Specifications

Air Supply:

7 bar nominal (5 bar min, 8 bar max) Vessel pressure tested to 25bar

Size:

320 (w) x 700 (h) x 180 (d) mm

Weight:

13kg

Tank Capacity:

5.25 litres

Delivery Rate:

5 litres/dose

Installation

- I Unpack the unit and select an injection point 1 to 2 m after the Turbocharger Exhaust Outlet Trunking. Mount the unit using 4 x M10 bolts on a vertical panel, with the funnel at chest level (approximately 1.25m high), not greater than 5 m from the injection point, but out of the heat of the exhaust system. Allow access for filling the funnel.

- I Drill & weld a ½" BSP socket to the trunking at the injection point, providing a gas tight seal for the Injection Lance. Mount the Injection Lance in the exhaust trunking using a ½" BSP gland nut. Fit the injector with the nozzle in the centre of the trunk, with the pipe bend pointing towards the Turbocharger. The nozzle will then spray in the same direction as the gas flow.

- I Connect the Injection Lance to the unit using the 4mm Teflon tube, with push fittings and the 6mm stainless steel pipe. The stainless pipe must fit directly onto the end of the lance. Do not shorten the stainless pipe, as it prevents the Teflon tube from being melted by the hot exhaust gas.

- I Connect an Air Supply of approximately 7 bar (5 bar min, 8 bar max) to the unit via the ¼" BSP Air Inlet Valve (C).

Operation

Startup

Open (D) - Drain valve and collect any waste in a suitable container.

Filling

- I To fill tank, set the 5 valves as follows:
 - Close valves -
 - (C) Air inlet valve
 - (D) Drain valve
 - (E) Dose valve
 - Open Valves -
 - (A) Air vent valve
 - (B) Filling valve
- I Measure up to 5 litres of dosing fluid into a suitable container, and pour into the dosing funnel. Do not overflow the funnel.

- I When the funnel is empty, set valves: Close valves -
 - (A) Air vent
 - (B) Filling valve

Dosing

- I When ready to dose the exhaust system: Open valves -
 - (C) Air inlet valve, followed by (E) Dose valve
-
- I Wait a few minutes to empty tank when the Teflon pipe should become clear.

Note: Valve identification can be seen in figures 12 and 13. All valves are shown open on diagrams for clarity (this is not a valid operating condition).

Cleaning

When all of the dosing fluid has been injected, flush system through with fresh water, by repeating the filling and dosing procedure. When all water has been injected, close all valves.

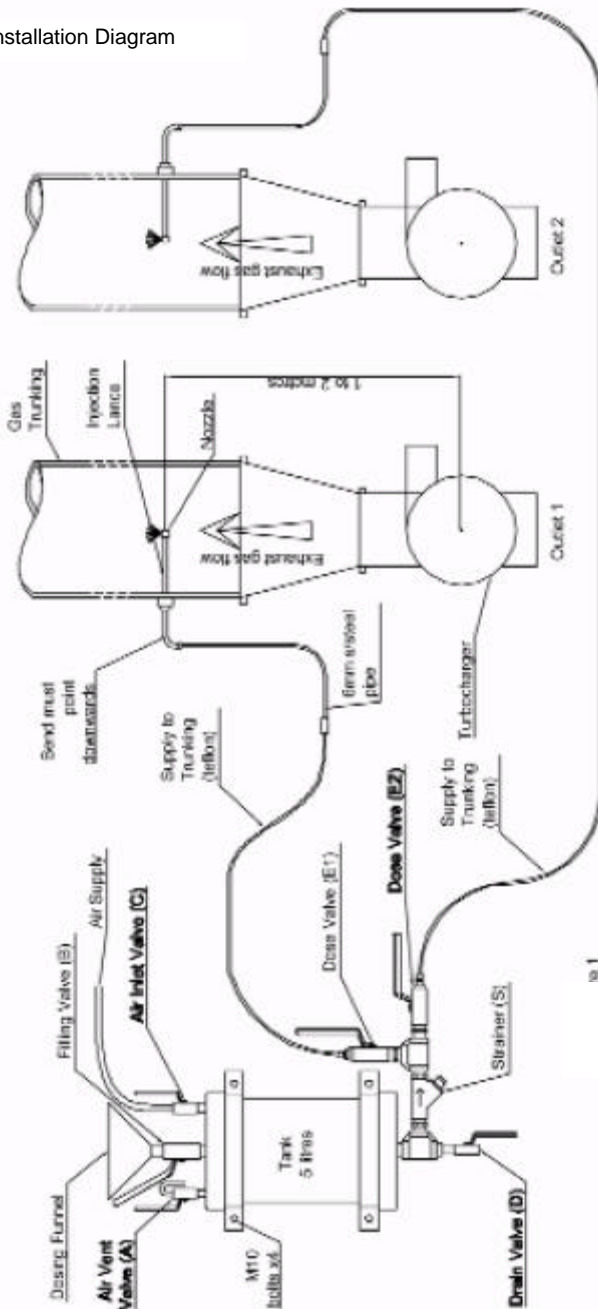
For dosing volume and frequency consult the UNITOR chemicals handbook.

Servicing

- I The Dosing Line Strainer should be inspected every 6 months and cleaned.
-
- I The lance should be removed every 6 months to clean the nozzle, by loosening the ½" BSP gland nut.
-
- I The valves can be cleared by opening the Air Inlet Valve (C) and opening valves A, B, D, & E in turn.

2ND LANCE FITTING KIT

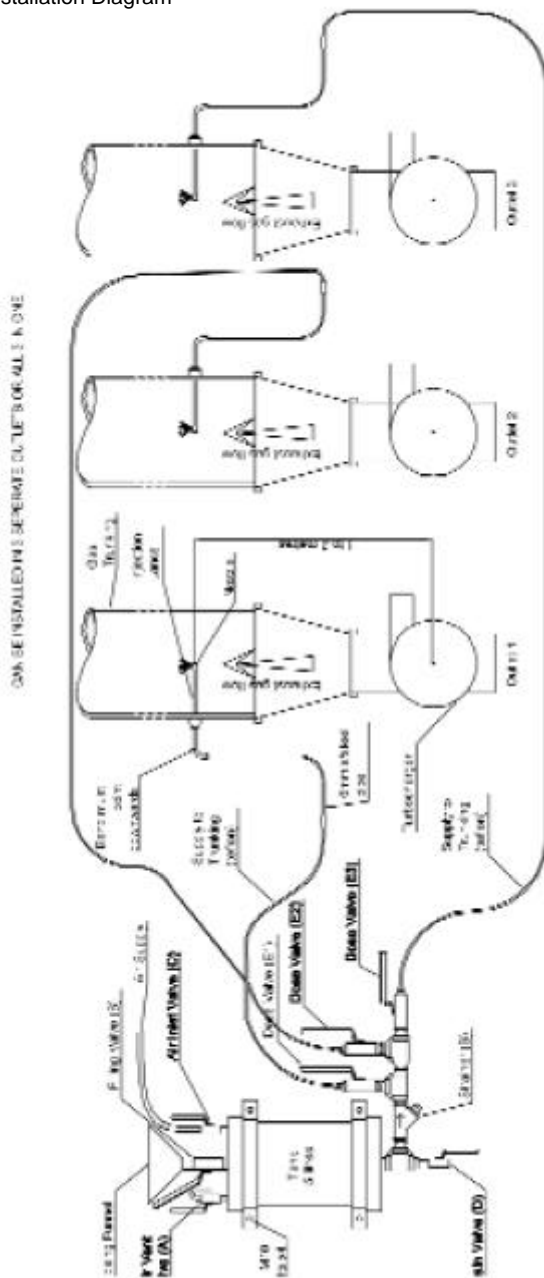
Figure 6: Installation Diagram



Note: All valves are shown open on diagrams for clarity. This is NOT a valid operating condition.

3RD LANCE FITTING KIT

Figure 7: Installation Diagram



Note: All valves are shown open on diagrams for clarity. This is NOT a valid operating condition.

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