



**KENTMASTER EQUIPMENT (AUST) PTY LTD**  
Unit 2, 24 Central Court  
Hillcrest, QLD 4118

## **OPERATOR'S MANUAL**

Including, Safety, Equipment Description, Operation and Clean Up  
and Installation Guidelines.



## **Kentmaster VFR 2000 Unit.** **Universal Vacuum system (82 Deg C. Water or Steam).**

Important, Read this manual carefully before installing, operating or servicing this  
equipment.

Date: June 2012.



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- **Safety Instructions.**
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# Kentmaster VFR 2000. Universal Vacuum System.

## SAFETY INSTRUCTIONS.

- WARNING** Do not operate this equipment until you have read and understood the safety instructions and operating manuals.
- WARNING** Do not operate this equipment until you have received training in the handling, operation and use of this tool.
- WARNING** **The VFR 2000 uses very hot water which can cause severe burns and personal injury.**
- WARNING** Stop using malfunctioning or defective equipment immediately. Report any problems or defects so your Supervisor can removal the tool from service.
- WARNING** Do not attempt to repair the equipment yourself.
- WARNING** Do not allow unauthorised persons to use this equipment.
- WARNING** Turn off water and power when the equipment is left unattended for extended periods or not in use.
- WARNING** Never tie down, bypass, alter or modify the activating switches of this equipment.
- WARNING** Never make alterations or modifications to this equipment.
- WARNING** Be constantly aware and alert for unsafe conditions and report them immediately to your supervisor.
- WARNING** Never place your hand or any part of your body in the path of the vacuum wand or relief valve blow down pipe.
- WARNING** Never allow anyone else to place their hands or any part of their body in the path of the vacuum wand or relief valve blow down pipe.
- WARNING** Do not activate control switches of this equipment unless you intend to test or operate this equipment.
- WARNING** Do not use this tool for any other purpose other than its intended purpose.

## **SAFETY INSTRUCTIONS Cont.**

**CAUTION** For some applications, it is necessary to wear a face mask and rubber gloves. Be sure to wear the safety equipment supplied to you by your supervisor.

**WARNING** The noise emission (sound pressure level) at the work station may exceed 85 dB (A). Ear and sound protection gear may be required.

### **LEGEND**

**WARNING** = Hazards or unsafe practices which could result in severe personal injury.

**CAUTION** = Hazards or unsafe practices which could result in minor personal injury.

**NOTICE** = Important installation, operation or maintenance information.

**WARNING** = Hot water can cause severe burns and personal injury.

## EQUIPMENT DESCRIPTION.

The Kentmaster VFR 2000 Universal Vacuum System consists of the following major components:-

- **Control Cabinet.**

1. Steam & Water Pressure Gauges. **997511 (1)**
2. Vacuum Gauge. **997512**
3. Water & Steam Temperature Gauges. **997513 (1)**
4. Pressure Regulators. **997533 (1)**
5. On / Off Valve (Water). **997535 (1)**
6. Vacuum Hose to Hand Wand. **997761 (3Mtr)**
7. Low Pressure steam and Water Hoses to Hand Wand. **997643 (3Mtr)**
8. Hand Wand. **2" 997760**
9. Power Head for Spinal Cord and Fat removal optional.
10. Solenoid to shut off water (optional).



- **VACUUM BLOWER.**

**Vacuum Blower.**

The system features a direct driven (8hp) Regenerative Blower complete with exhaust muffler to create the system vacuum. Vacuum is rated at 8·0” mercury and 350cfm airflow and is measured at the vacuum blower.

**In-line Filter.**

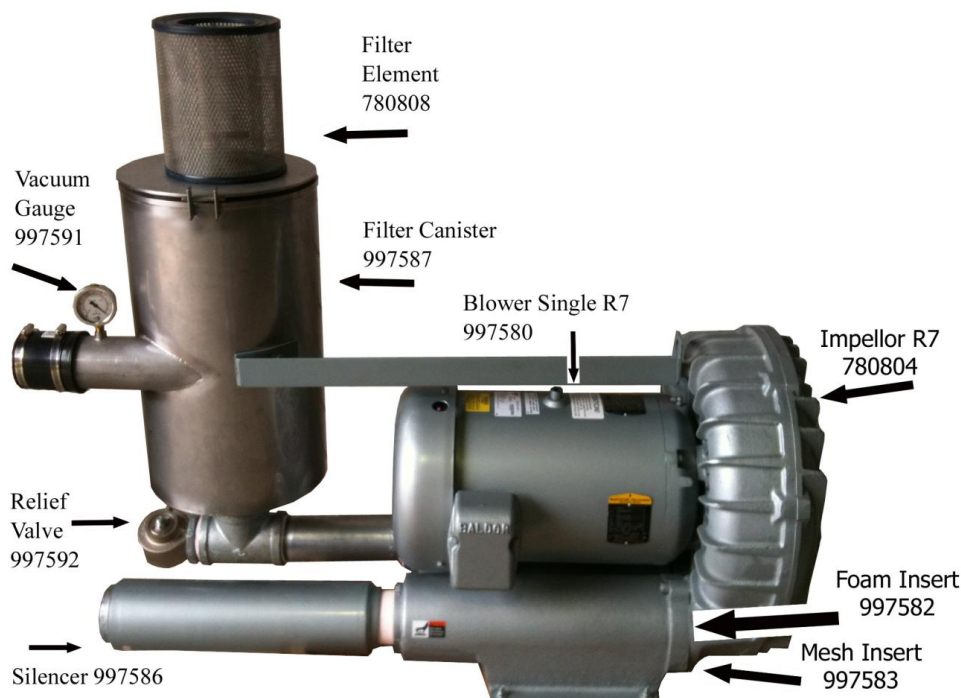
This stainless steel unit is fitted as an integral item to the vacuum blower and features a filter within a canister to filter the air to prevent damage to the blower.

**Relief Valve.**

This valve prevents the vacuum blower from over heating and will vent to relieve suction if the line is fully blocked. This is normally preset at 7·5” mercury.

- **Vacuum Blower.**

1. Blower, Single R7. **997581**
2. In-line Filter. **780808**
3. Relief Valve (Vacuum). **997592**
4. Vacuum Gauge. **997591**
5. Filter Canister. **997730**
6. Silencer R7. **997586**
7. Starter Unit. **997701**



- **RECEIVER.**

**Receiver:**

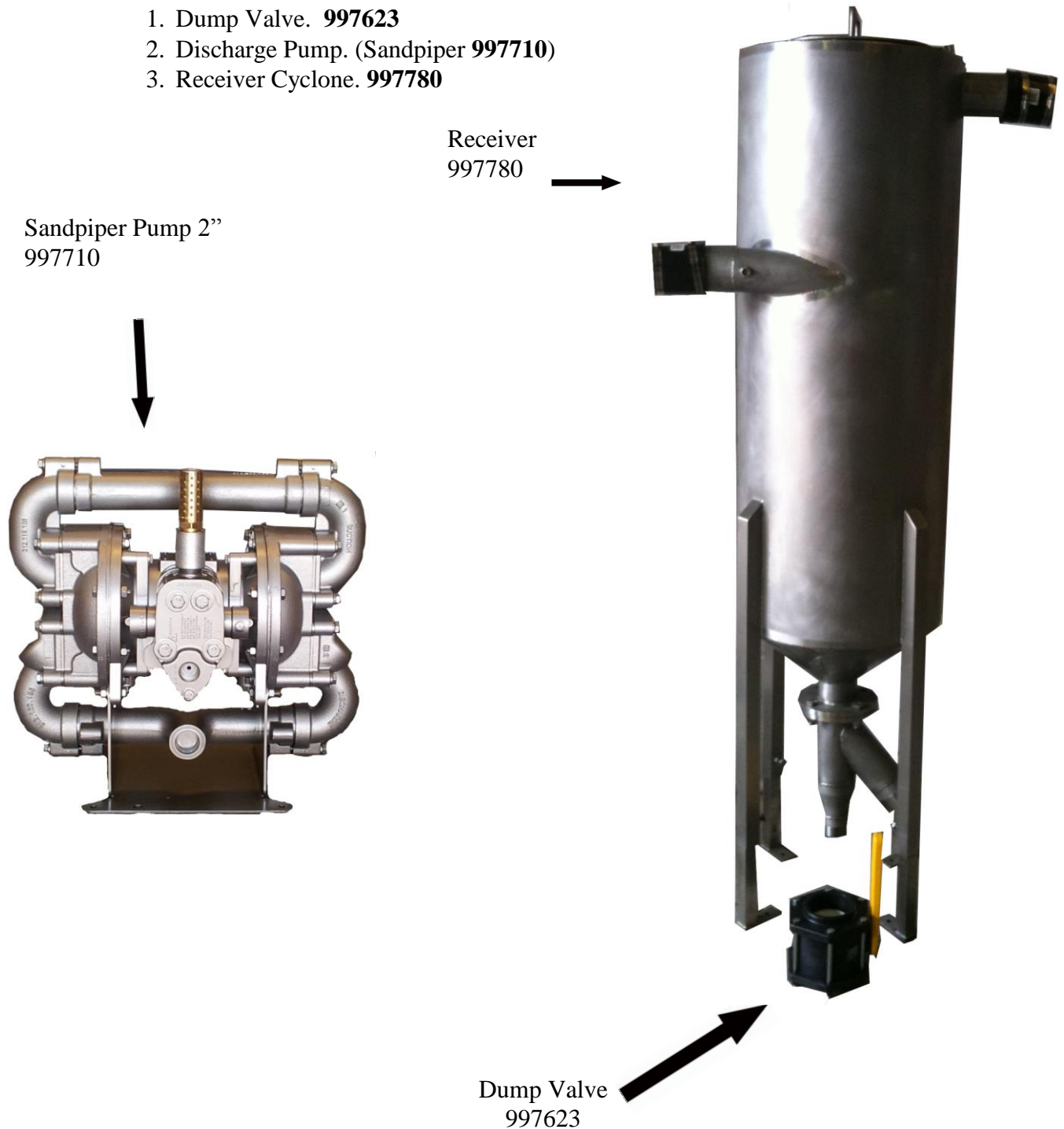
The stainless steel receiver separates and collects vacuumed material from the air stream. A manually operated dump valve and a discharge pump are connected to the cyclone.

**Discharge Pump:**

An air diaphragm pump runs continuously, after start up, to discharge water and solids from the cyclone receiver. Be careful not to run unit too fast.

- **Receiver.**

1. Dump Valve. **997623**
2. Discharge Pump. (Sandpiper **997710**)
3. Receiver Cyclone. **997780**





• **Wand 2”**

1. Wand 2”. **997642**
2. ¼” Swivel. **997652**



Spinal cord



Fat removal

**Vacuum Wand:**

The stainless steel vacuum wand is available in many different shapes and sizes according to the task being performed, eg 50mm round fat sucker, spinal cord, floor cleaning etc. This is used to vacuum off the fat, spinal cord and contamination from the surface of the animal and bench tops. This wand is hand held by the operator and is connected to the cabinet by a vacuum hose, hot water hose.

A hot water injection point, positioned inside the wand to spray 82° C plus water to be mixed with the material being removed. Note that providing the vacuum pump is operating and that the system has been set up correctly, no water will spray from the nozzle. The wand should not be directed toward any person in case of a malfunction. Severe burning could occur.

The hot water provides good dislodgment of contaminant properties, good conveyance back to cyclone and is above normal sterilising temperature.

In the case of the Power Head applications Fat and Spinal cord removal the injection point can be located in the return vacuum hose behind the tool.

2"Wand  
997642



## OPERATING INSTRUCTIONS.

**WARNING** Only trained personnel are to operate this equipment.

**WARNING** Always wear the recommended safety equipment when operating this equipment.

1. Start up blower, diaphragm pump, power to cabinet, steam and water as described in following Section.
2. Hold vacuum wand, by handle - firmly in hand.
3. Position the vacuum wand on the carcass to perform the vacuuming operation.
4. Do not exert excessive pressure and draw down the vacuum wand over the surface to be vacuumed. Allow time for the surface sterilisation to take place: i.e. draw slowly and evenly. For spot treatment, apply vacuum wand to spot and draw down over spot and remove wand.
5. Hang up vacuum wand in a safe place when not in use. Ensure nozzle is pointed away from harms way.
6. At the end of shift the equipment should be shut down by:-
  - Turning off steam and then water.
  - Turning off alarm/control to panel.
  - Turning off vacuum blower and air to diaphragm pump.
  - Open receiver and dump product.
  - Prepare for cleaning.

In some cases a PLC may be used to perform the shut down or start up sequence.

**\* It is very important steam & water is shut off before the blower is shut down.**

## OPERATING INSTRUCTIONS - Cont'd.

The VacSan Unit uses very hot water 82° C plus and steam 120°C plus and should not be used in any manner other than described. The steam/water vacuum wand should **never** be directed towards another person and the operator should wear appropriate safety gear.

### Machine Start Up:

1. Check that the cover on top of the receiver is closed and sealed and the dump valve at the bottom of the receiver is closed.
2. Check that a clean in-line filter has been installed and close the filter canister.
3. Check that the vacuum hose, the hot water hose and the steam hose to the vacuum wand are properly connected both ends, and check for signs of wear or damage and have replaced if necessary.
4. Turn on the diaphragm pump, by adjusting the air volume. Ensure it is cycling properly. Do not run pump too fast. Visual check for pump performance, after the vacuum system has been operating, is also recommended.
5. Turn on the blower motor and check that a proper vacuum is being pulled at the vacuum wand when blocked. Gauge should read more than 5•5 Hg. A visual check of the vacuum gauge on the blower, with wand blocked, is also good practice. Gauge should read 7•5 Hg. Conduct these initial checks with system cold.

**It is very important that the blower is started and in running mode before water and steam is turned on.**

6. Turn on control panel electrics, this arms the low temperature warning light.
7. Turn on fully steam tap (1) and allow steam to exit the wand to sterilise the outer surfaces. **Note:** steam pipe may initially supply water condensate for a period until steam arrives. Allow time for this water to clear.
8. Turn on hot water tap (3) and allow hot water to be supplied to the vacuum wand.
9. Turn on fully steam tap (2) and allow steam to flow to the mixing valve. Again allow time for water condensate to be removed.

**WARNING** Be very careful not to allow hot water or steam to contact your skin as it can cause serious burns and personal injury.

The machine is now in a basic run mode. You should now proceed to adjust/check water flow and water temperature.

# OPERATING INSTRUCTIONS. - Cont'd

## 1. To Adjust Water Pressure.

Find pressure regulator at the front of the panel marked **Water Pressure**. Unlock locknut and screw in (Clockwise) adjusting knob to increase flow. Screw out (anti-clockwise) adjusting knob to decrease flow. Ideal water flow is having the water flume and return at the end of the vacuum wand without water exiting. The water will exit the wand during the normal vacuuming process. Lock the nut once the desired flow is reached.

## 2. To Adjust the Water Temperature.

Find the pressure regulator marked **Steam 2** at the front of the panel. To increase water temperature, unlock the locknut and screw in (Clockwise) the adjusting knob. View water temperature gauge on the panel to ensure minimum water temperature of 85° C / 90° C. To decrease water temperature, screw out (anti-clockwise) the adjusting knob of the pressure gauge. You may need to balance the levels of steam & water supply for proper temperature control.

**Note: That it is AQIS regulation that the water temperature remains above 82° C at the wand and an alarm indicator is used to warn of a drop in water temperature below this regulatory requirement.**

**The water and steam temperature and vacuum pressure should be checked daily at start up, to ensure the unit is operating correctly. A Kentmaster test kit (NATA Certified) is available for purchase should this be required for certification of readings.**

A drop in temperature from the mixing valve/temperature sensor will occur by normal losses hence the reason for setting our initial temperature higher than 82° C sterilising temperature.

**The machine is now ready for use as per your slaughter floor manual.**

Regular inspection of the wand for incidental contamination should be done during normal operation. Occasional drawing of hot water from a “local” steriliser will aid in keeping hoses clean.

**Consider temporary shut down over smoko and lunch periods.**

## Machine Shut Down.

1. Turn off Steam Tap 1.
2. Turn off Steam Tap 2.
3. Turn off Water Tap.
4. Turn off power to Panel by on/off switch or E/S button.
5. Turn off Vacuum Pump.
6. Turn off Diaphragm Pump.
7. Open Dump Valve under receiver and remove collected particles and water.

## OPERATING INSTRUCTIONS. - Cont'd

1. Check filter and drain any collected water.
2. Prepare for clean up.
3. Clean in-line filter at end of shift.

Where solenoid vales are fitted to steam, water and air supply, 1 to 6 would be automatically shut down on actuation of the on/off switch.

### Safeguards:

There are several safeguards built into the system.

- The relief valve prevents the vacuum unit from being damaged by a blocked suction line.
- A temperature sensor will signal and activate a light on the cabinet should water temperature drop below an acceptable level.
- Safety reliefs are fitted for excess steam pressure build up.
- Solenoid shut off for steam, water, air supply (optional).



# MAINTENANCE & SERVICE INSTRUCTIONS.

## **WARNING**

**ONLY TRAINED AND QUALIFIED PERSONEL ARE TO PERFORM MAINTENANCE AND SERVICE OF THIS EQUIPMENT.**

### **1. Control Panel**

- Check operation of pressure regulators (3).
- Check “Y” strainers, clean if necessary.
- Check for steam and water leak, and repair.
- Check safety relief valves, steam.
- Check temperature sensor setting for low temperature alarm.
- Check low temperature bulb.
- Visually check accuracy of gauges
- Calibrate or check with NATA Cert Equipt all gauges yearly

### **2. Vacuum Wand and Hoses.**

- Check for leaks in vacuum hoses and replace if necessary.
- Check for leaks/deterioration of hot water and hot steam hoses, repair or replace as necessary.
- Check Vee Jets in vacuum wand for proper operation and blockage and replace if necessary.

### **3. Receiver and Diaphragm Pump.**

- Check dump valve for proper seal and operation.
- Check diaphragm pump for leaks and operation - refer to diaphragm pump manual attached.
- Check seal in receiver top cover - replace if necessary.
- Check hoses to diaphragm pump.

### **4. Vacuum Pump, Filter System, Relief Valve.**

- Check for full system pressure of 8” Hg.
- Refer to vacuum pump manual attached
- For proper operation of relief valve, please refer to notes attached.
- Filter should be regularly inspected and replaced if necessary.
- Check complete system for leaks or loss of vacuum.

## SERVICE INSTRUCTIONS.

1. Keep good records of all service activity and include this equipment in your preventive maintenance program.
2. Use only genuine Kentmaster replacement parts to assure proper performance of this equipment.
3. Contact Kentmaster for supply of spare parts and service information.

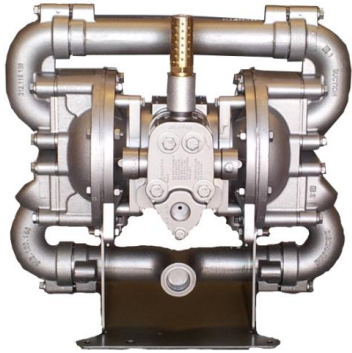
These items are required for annual service and any regular repairs.

Qty	Description of Items	Part No.
1	Filter Element	780808
1	Mixing Valve	785042
2	Pressure Gauge	997511
1	Vacuum Gauge	997512
2	Temperature Gauge	997513
3	Check Valve (use instead of Brass Check Valve 997532)	997531
3	Steam Regulator Valve	997533
6	½" Plain Nipple (if required)	997536
2	Pressure relief valve	997563
8	Foam insert (blower)	997582
2	Mesh insert (blower)	997583
1	Silencer (blower)	997586
1	Pressure relief valve	997592
1	GT 200 Thermometer	997658

Other spare parts that may be required:

Qty	Description of Items	Part No.
3	½" Brass Strainer	997534
3	½" Ball Valve full flow 2 piece S/S	997535
Multi	½" Nipple S/S	997537
Multi	½" Tee S/S	997538
Multi	½" M/F Elbow	997539
As Req	½" Union S/S	997540
1	Steam Regulator Valve Repair	997566
2	Steam/Water Hoses	997643
3 mtr	1 ½" Spiral Hose	997644





### Sandpiper HDF

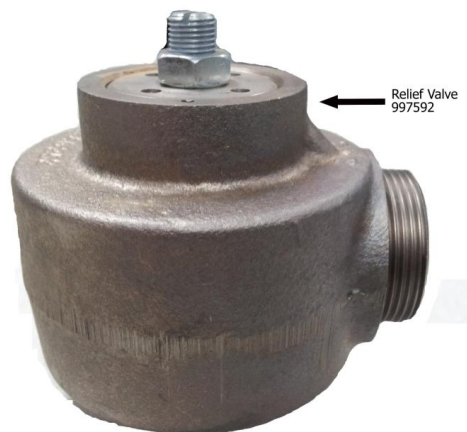
Items required for service:

Qty	Description of Items	Part No.
1	Sandpiper Wet End Kit 2" (50mm)	997625
1	Sandpiper Air End Kit 2" (50mm)	997626

## TROUBLE SHOOTING BLOWER.

<b>Symptom.</b>	<b>Possible Diagnosis.</b>	<b>Possible Remedy.</b>
Excess vibration	Impeller damaged or contaminated by foreign material.	Replace or clean impeller. Install adequate filtration.
Abnormal sound.	Motor bearing failed, impeller rubbing against cover or housing.	Replace bearings. Repair vacuum pump. Check clearances.
Increase in sound.	Foreign material or heat can destroy muffler foam.	Replace foam muffler element. Filter foreign material.
Blown fuse.	Electrical wiring problem.	Have qualified electrician check that impeller turns correctly, check fuses, check wiring diagram or wiring capacity.
Unit very hot.	Running at too high a pressure or vacuum.	Install new relief valve and pressure or vacuum gauges.
Vacuum too low.	Faulty gauge. Ball valve on cyclone open. Vacuum leak.  Dirty filter.  Relief valve set too low.  Exhaust pipe too small.  Impeller damaged or clogged.	Check gauge on panel & gauge on filter. Close ball valve. Check all connections and piping for leaks from hand wand to blower. Clean or replace filter element. Adjust relief valve, clean relief valve, check hole in piston is clean. Install at least 4" schedule 40 or 80/pipe. Replace or clean impeller.

## VACUUM RELIEF VALVE OPERATING INSTRUCTIONS.



Operating the vacuum with more than 1 HP motors and insufficient air flow can result in damage to the vacuum caused by excessive heating of the air passing through the vacuum.

The relief valve can be adjusted to limit the pressure and/or vacuum level and maintain adequate air flow through the vacuum to prevent damage from excessive heat.

The adjusting of the relief valve is accomplished by loosening the lock nut on the adjusting screw and turning the adjusting screw with the blade of a screwdriver. Turning the adjusting screw clockwise will increase the relief valve setting and counter clockwise will decrease the setting. Hold the screwdriver in place when retightening the lock nut. The use of the vacuum gauge will provide an accurate setting from 7.2" to (not exceeding) 7.5" Hg. at pump deadheaded. Vacuum at hand wand is set at 4" – 6" Hg. while operating VacSan.

The valve is position sensitive. The recommended installation position is with the adjusting screw position horizontally.

All components of the valve are made of corrosion resistant metal. In normal operation the only maintenance required is cleaning the valve. Often the valve need not be disassembled to clean. Particular attention should be given to cleaning the small hole through the centre of the piston. If this becomes clogged, the valve will not function properly. A pin or small diameter wire may be used to clean the blocked hole.

### **WARNING:**

**When installing the pressure/vacuum relief valve, all power sources to the electric motor and any accessory devices should be disconnected and all rotating parts should be at a standstill or bodily injury may result.**

## **CLEANING PROCEDURE.**

**WARNING** Always shut down the equipment especially the steam, water, electrical and air (Blower) before cleaning.

At the end of shift:-

1. Clean as per cleaning Part 1.
2. Clean as per cleaning Part 2.

**NOTE:** Reassemble all parts in reverse order.

### **Frequency:**

For routine cleaning (Part 1) the vacuum will be cleaned at end of shift. The complete breakdown of the unit for cleaning (Part 2) will be performed weekly.

### **Procedure: - Part 1. (Nightly or at end of shift).**

1. Pre rinse outer surface of the vacuum system with 55°- 60° C water.
2. Use a neutral detergent (Simple Green) with hot water and hand scrub all outer surfaces; wand, hoses, control panel and cyclone receiver. (Be careful not to use high pressure water on the controls)
3. Rinse with 55°- 60° C water.
4. Remove vacuum discharge exhaust filter and clean with a mild detergent, also clean filter canister.
5. Prepare a solution using a mild alkaline cleaner with chlorine added (to prepare 20 litres mix alkaline detergent by following manufacturer's instructions and add 500 gms of a chlorine based sanitiser or use an alkaline cleaner which contains a chlorine based compound.) Place this solution into a large container and vacuum the solution through the wand to the cyclone receiver. (This solution can then be dumped from the bottom of the cyclone.)
6. Spot clean/scrub any areas missed.
7. Sanitise all outer surfaces using a 200 ppm chlorine based sanitiser.

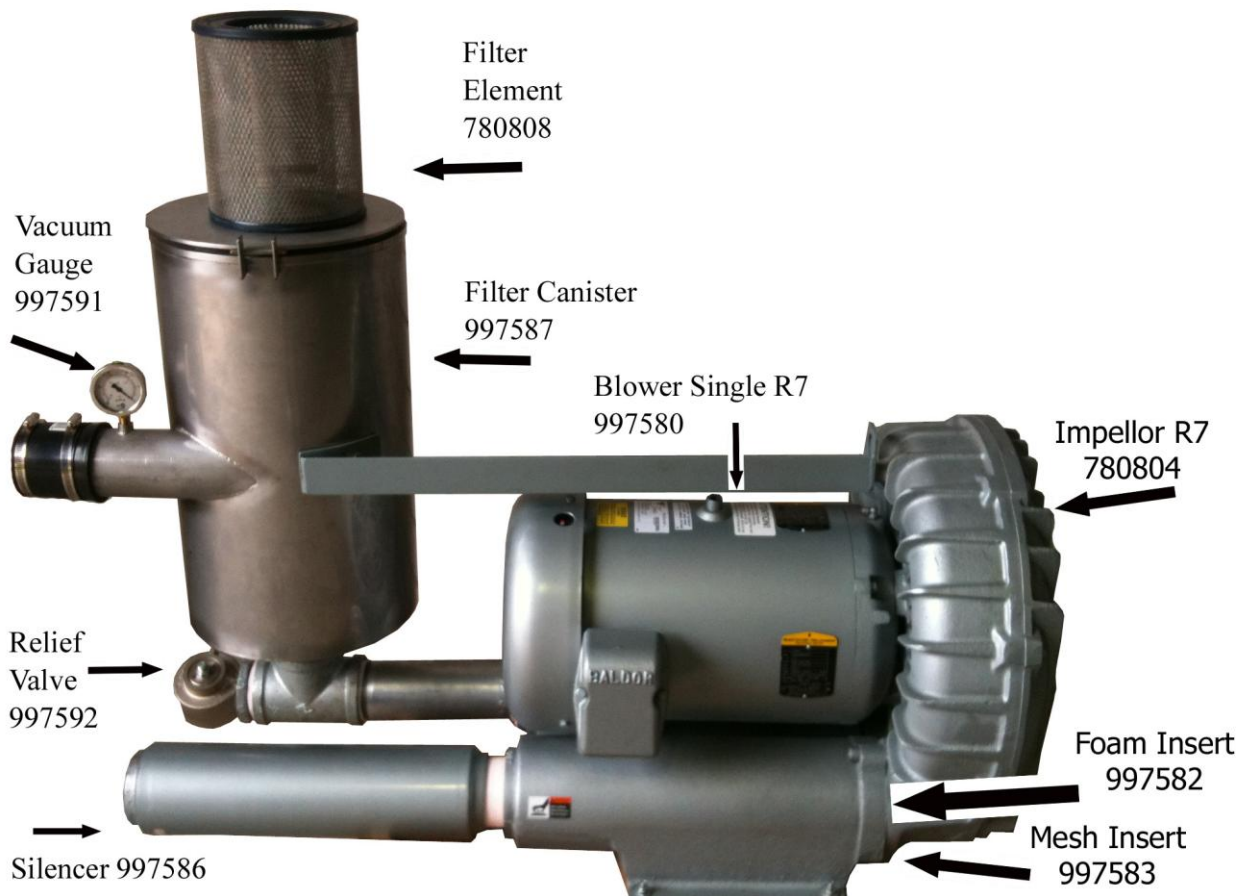
### **Procedure: - Part 2. (Weekly).**

1. Follow steps 1 to 4 above.
2. Open the top of the cyclone and the lid of the in line exhaust.
3. Flush cyclone vessel with a mild alkaline or acid cleaner and manually scrub any build up that remains.

## CLEANING PROCEDURE: - Cont'd.

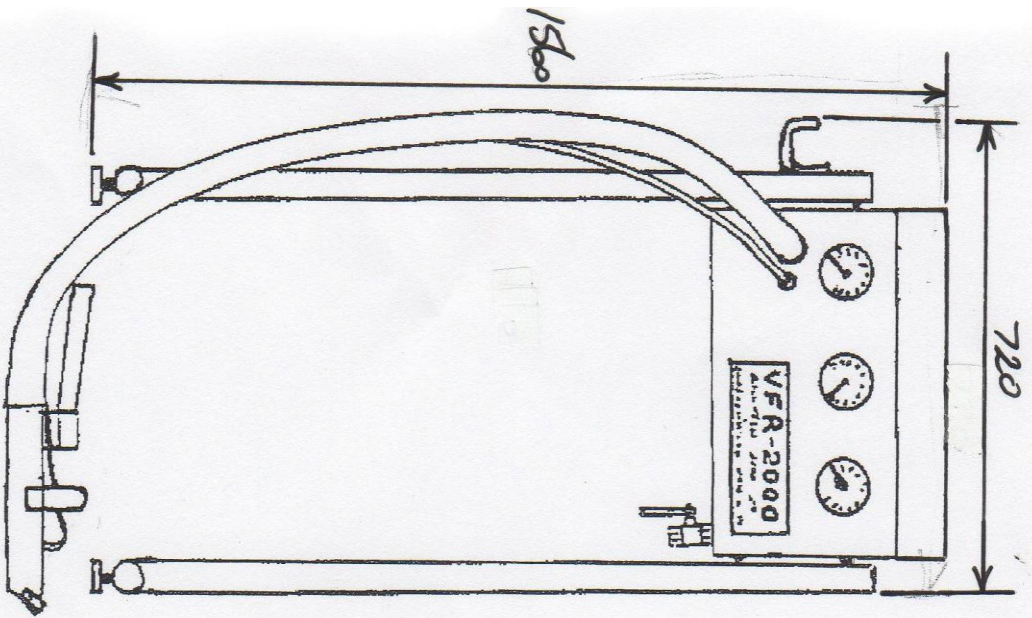
4. Remove filter element and clean with a mild detergent and warm water. Clean inside filter canister.
5. Rinse with 55°- 60° C water.
6. Replace filter element and close the lid of the in line filter and the top of the cyclone.
7. Sanitise, using a 200ppm QAC or a 200 ppm chlorine based sanitiser.

The 3" P.V.C. vacuum line from the cyclone to the in line filter on the blower, needs to be installed, so it can be disconnected and flushed out with same cleaner used in Part 1, #5.

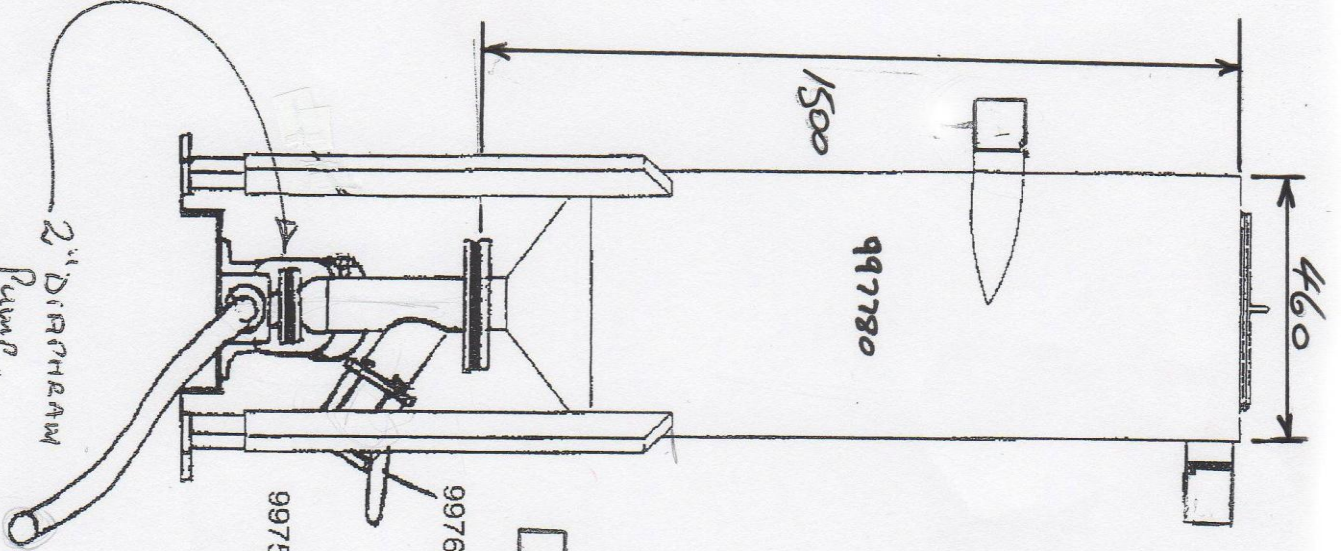




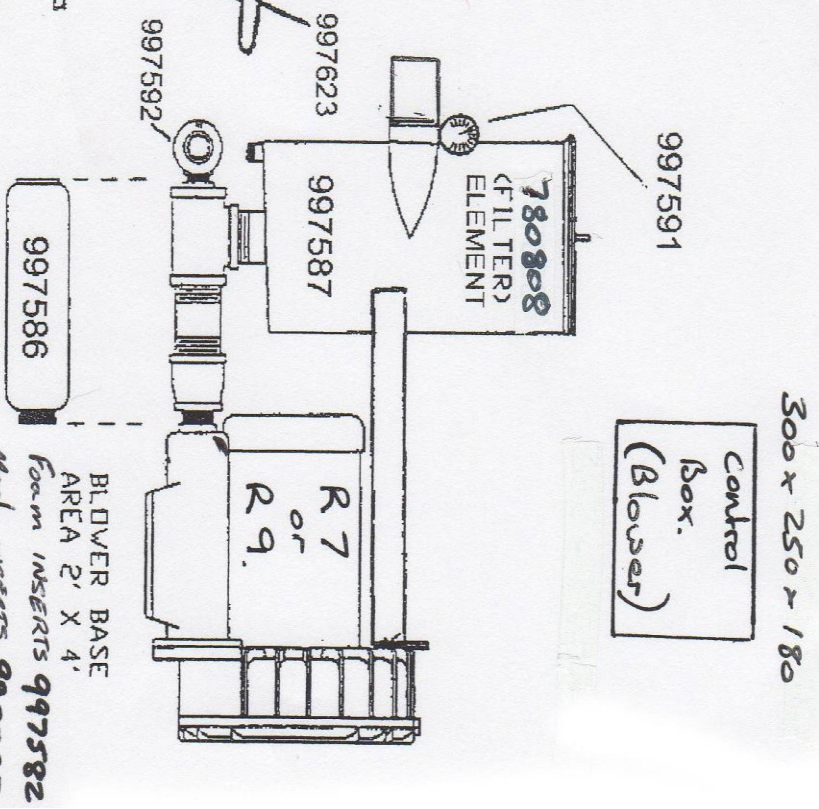
# VFR 2000 Layout



HAND WAND  
 3/8" STEAM HOSE  
 2" VACUUM HOSE  
 HAND WAND MAXIMUM 3m  
 FROM CONTRL PANEL

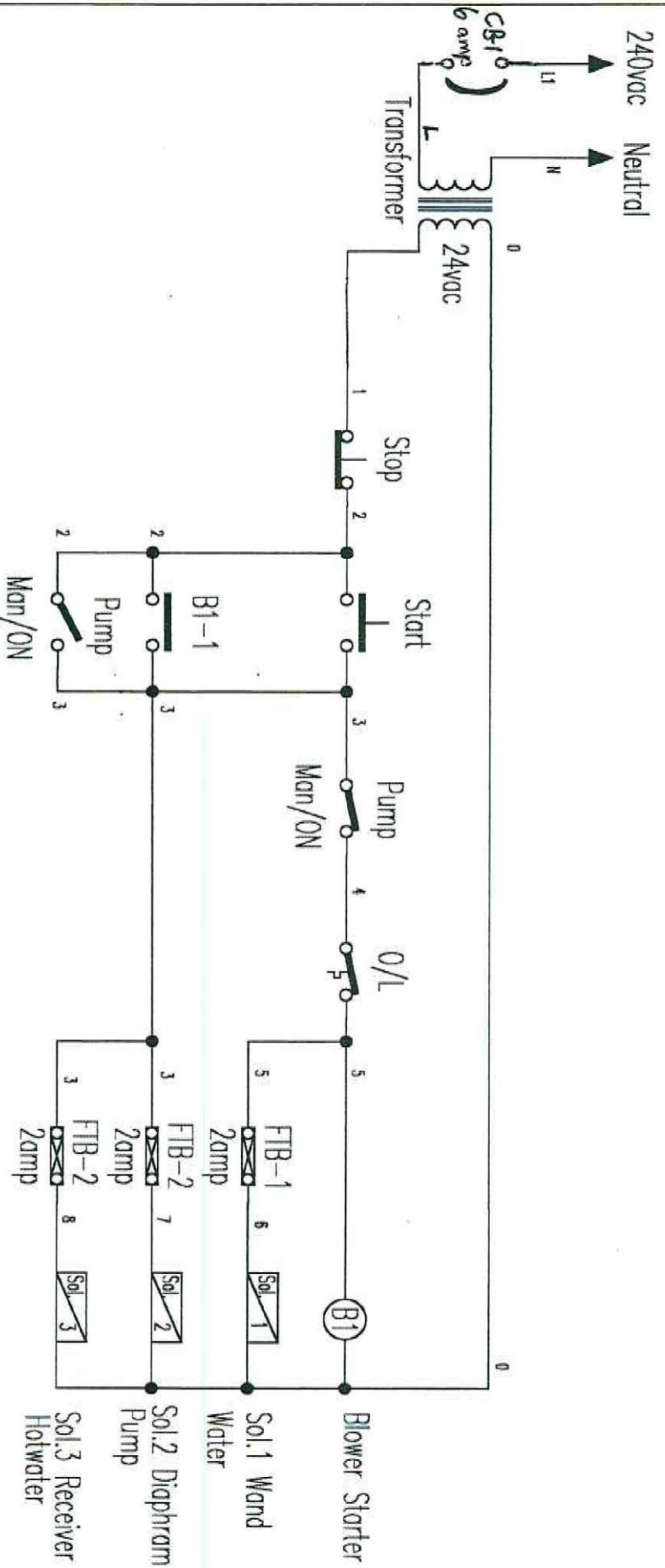


2" DIAPHRAGM  
 PUMP  
 997710



VACUUM  
 MAXIMUM 20m FROM  
 CONTRL PANEL,  
 ISOLATED FROM  
 PRODUCTION AREA

BLOWER BASE  
 AREA 2' X 4'  
 Foam INSERTS 997582  
 Mesh INSERTS 997583



VFR 2000 ELECTRICAL SCHEMATIC DIAGRAM  
WITH 2" SANDPIPER DIAPHRAM PUMP.

Drawn: KWN Date: 5/11/99	KENIMASTER EQUIP. (AUST.) PTY. LTD.	
Note: All DIM's. are in mm's.	Subject: VFR-2000 ELECT. SCHEMATIC.	Drawing Number: KMAUS99022
Scale: :	Rev. b	filename: VFR2000E



## **INSTALLATION – VFR 2000.**

The guidelines for the installation of your Kentmaster VFR 2000 Unit are:-

- Position & fix Control Panel incorporating gauges, steam, water regulators, wand, etc at your work area. You may reverse hangers and hang from overhead structure if so desired. Ensure panel is positioned to allow operator to freely operate the wand connected to panel. Do not extend or shorten water hoses to wand. It may be preferable to hang your wand on a balancer.
  1. Connect 82°C water
  2. Connect all electrical components.
  3. Connect vacuum pipe - use 3”dia stainless steel tube or heavy wall PVC pipe to the reducer at back of panel.
  
- Position and fit Product Receiver in an appropriate area outside your main production area. Note that it is preferable to limit the total distance from Control Cabinet to Receiver/Blower to less than 15/20m total pipe run. Consult Kentmaster if you exceed this requirement as a larger vacuum blower may be necessary.
  1. Use 3” dia pipe receiver to cabinet. Large radius bends preferred.
  2. Install dump valve on the ‘Y’ section pipe under the receiver. You may connect this dump valve direct to your drain.
  3. It is intended that you mount the diaphragm pump on suitable base close by and connect to receiver and to drain. Connect air (about 90 psi) is all you need to run this unit.
  4. Run a suitable discharge pipe from the diaphragm pump to your waste product chute or catchment receptacle.
  5. Mount the electrical control panel (starter) close by.
  6. Check seal on lid of receiver,
  
- Position and fix blower assembly nearby the receiver.
  1. Use 3” dia pipe, large radius bends preferred, connect blower to receiver.
  2. Provide and wire up motor starter and isolator & use 20/32A motor fuses.
  3. Start up and test system for leaks and performance.



