



# Florida Department of Environmental Protection

Northwest District Branch Office  
3900 Commonwealth Boulevard, MS 55  
Tallahassee, Florida 32399-3000

Rick Scott  
Governor

Jennifer Carroll  
Lt. Governor

Herschel T. Vinyard Jr.  
Secretary

October 31, 2012

SENT VIA E-MAIL

[bharat@embarqmail.com](mailto:bharat@embarqmail.com)

Bharat Joshi, Owner  
Vogue Cleaners  
1839 Thomasville Road  
Tallahassee, Florida 32303-5709

Dear Mr. Joshi:

A Department representative inspected your facility to determine compliance with the Air Quality Operating Permit. The program identification number for this facility is **0730074**. Your permit **expires on November 8, 2013**. This letter applies only to activities covered by the Air Resource Management Program.

The Tallahassee Branch Office reported a status of In Compliance for your facility. Your facility compliance status may be subject to further review by the District Program Office.

The assistance you provided is appreciated. The inspection report is enclosed. If you have any questions, your local contact is Tracy White at (850) 245-2960 or [tracy.a.white@dep.state.fl.us](mailto:tracy.a.white@dep.state.fl.us).

Sincerely,

Clifford D. Wilson III, P.E.  
Northwest District Branch Administrator

CW/tw

Enclosures:  
Vogue response letter  
Vogue pressure doc

cc: Rick Bradburn, Mary Beth Curle, Carol Melton (FDEP, Pensacola)



# PERCHLOROETHYLENE DRY CLEANERS



## COMPLIANCE INSPECTION CHECKLIST

**INSPECTION TYPE:** ANNUAL (INS1, INS2)  COMPLAINT/DISCOVERY (CI)   
 RE-INSPECTION (FUI)  ARMS COMPLAINT NO:

**AIRS ID#:** 0730074 **DATE:** 10/31/2012 **ARRIVE:** 9:30 A.M. **DEPART:** 10:00

**FACILITY NAME:** VOGUE CLEANERS

**FACILITY LOCATION:** 1839 THOMASVILLE RD  
TALLAHASSEE 32303-5709

**OWNER/AUTHORIZED REPRESENTATIVE:** BHARAT JOSHI **PHONE:** (850)222-1322  
**Email:** **Mobile:**

**CONTACT NAME:** BHARAT JOSHI **PHONE:** (850)222-1322  
**Email:** **Mobile:**

**ENTITLEMENT PERIOD:** 11/8/2008 / 11/8/2013  
 (effective date) (end date)

**PART I: INSPECTION COMPLIANCE STATUS** (check  only one box)

IN COMPLIANCE  MINOR Non-COMPLIANCE  SIGNIFICANT Non-COMPLIANCE

**PART II: FACILITY CLASSIFICATION** - Rule 62-213.300 FAC  
 (check  only one box in A)

**A. 1. Existing small area source**   
 dry-to-dry only,  $x < 140$  gal/yr  
 transfer only,  $x < 200$  gal/yr  
 both types,  $x < 140$  gal/yr  
 (constructed before 12/9/91)

**2. New small area source**   
 dry-to-dry only,  $x < 140$  gal/yr  
 transfer only,  $x < 200$  gal/yr  
 both types,  $x < 140$  gal/yr  
 (constructed on or after 12/9/91)

**3. Existing large area source**   
 dry-to-dry only,  $140 \leq x \leq 2,100$  gal/yr  
 transfer only,  $200 \leq x \leq 1,800$  gal/yr  
 both types,  $140 \leq x \leq 1,800$  gal/yr  
 (constructed before 12/9/91)

**4. New large area source**   
 dry-to-dry only,  $140 \leq x \leq 2,100$  gal/yr  
 transfer only,  $200 \leq x \leq 1,800$  gal/yr  
 both types,  $140 \leq x \leq 1,800$  gal/yr  
 (constructed on or after 12/9/91)

**5. Ineligible for General Permit**   
 d rop store/out of business/petroleum /  
 facility exceeds above limits

**B. The sum of the volume of all perchloroethylene (perc) purchases made in each of the previous 12 months by this dry cleaning facility was 30 gallons.**

**PART III: GENERAL CONTROL REQUIREMENTS – Rule 62-213.300 FAC**

(check  only one box for each question)

1. Is all perc, and wastes containing perc, in tightly sealed & impervious containers? -----  Yes  No  N/A
2. Are all perc. containers leak free? -----  Yes  No  N/A
3. Are all machine doors kept closed and secured except during loading/unloading? -----  Yes  No
4. Are cartridge filters drained in their housing or in sealed containers for at least 24 hours prior to disposal? -----  Yes  No  N/A
5. Has each dry cleaning system installed after December 21, 2005 at an area source, routed the air-PCE gas-vapor stream contained within each dry cleaning machine through a refrigerated condenser and passed the air-PCE gas-vapor stream from inside the dry cleaning machine drum through a non-vented carbon adsorber or equivalent control device immediately before the door of the dry cleaning machine is opened? The carbon adsorber must be desorbed in accordance with manufacturer's instructions. -----  Yes  No  N/A
6. Is solvent-to-carbon ratios and steam pressure for carbon adsorber beds maintain according to the manufacturer's specifications? -----  Yes  No  N/A

**PART IV: PROCESS VENT CONTROLS – Rule 62-213.300 FAC**

(Refer to Part II-A.1.-4. Classification: page 1 of 4, this form)

1. If the facility classification is an **existing small area source**, no controls are required. **Proceed to Part V.**
2. If the facility classification is a **new small area source**, the machine should be equipped with a refrigerated condenser. **Complete section A. below.**
3. If the facility classification is an **existing large area source**, the machine should be equipped with either a refrigerated condenser or a carbon adsorber. **Complete both sections A and B below.** *Carbon adsorber must have been installed prior to September 22, 1993*
4. If the facility classification is a **new large area source**, the machine should be equipped with a refrigerated condenser. **Complete both sections A and B below.**

**A. Has the responsible official of all existing large area & new sources:**

(check  only one box for each question)

1. Equipped all machines with the appropriate vent controls? -----  Yes  No
2. Equipped dry-to-dry machines with a closed-loop vapor venting system? -----  Yes  No  N/A
3. Equipped the condenser with a diverter valve so airflow will be directed away from the condenser upon opening the door? -----  Yes  No  N/A
4. Measured and recorded the temperature of the outlet exhaust stream of a refrigerated condenser on a weekly basis? -----  Yes  No  N/A
5. Repaired or adjusted the equipment within 24 hours if the exhaust temperature of the condenser exceeded 45° F? -----  Yes  No  N/A
6. Conducted all temperature monitoring after an appropriate cool-down period and after verifying that the coolant had been completely charged? -----  Yes  No

**PART IV: PROCESS VENT CONTROLS – Rule 62-213.300 FAC (continued)**

**B. For all existing large or new large area sources:**

1. Is the exhaust temperature on the outlet side of the condenser located on dry-to-dry, reclaimer, and dryer machines measured and recorded on a weekly basis? -----  Yes  No
2. Is the washer exhaust temperature at the condenser inlet and outlet measured and recorded weekly? -----  Yes  No  N/A
  - a) Is the temperature differential equal to, or greater than 20° F? -----  Yes  No  N/A
3. Is the perc concentration in the exhaust stream inlet and outlet measured weekly at the end of the final drying cycle while the machine is venting to the adsorber, if machines are equipped exclusively with a carbon adsorber? -----  Yes  No  N/A
  - a) Is the perc concentration equal to, or less than 100 ppm? -----  Yes  No  N/A
4. Is the sampling port on the carbon adsorber exhaust for measuring perc concentrations at least 8 duct diameters downstream of any bend, contraction, or expansion; is at least 2 duct diameters upstream from any bend, contraction, or expansion; and downstream from no other inlet? -----  Yes  No  N/A
5. Are transfer machines equipped (dryers, reclaimers, and washers) with individual condenser coils? -----  Yes  No  N/A
6. Is airflow routed to the carbon adsorber (if used) at all times? -----  Yes  No  N/A

**PART V: RECORDKEEPING REQUIREMENTS – Rule 62-213.300(3) FAC**

(check  only one box for each question)

1. Are receipts maintained for all perc purchased? -----  Yes  No
2. Are rolling monthly totals of yearly perc consumption maintained? -----  Yes  No
3. Are leak detection inspection and repair reports maintained for the following:
  - a) Of any leaks repaired w/in 24 hrs? or; -----  Yes  No  N/A
  - b) Of any parts ordered to repair leak and leak repaired w/in 2 days and parts installed w/in 5 days of receipt? -----  Yes  No  N/A
4. Is calibration data maintained for applicable direct reading instruments? -----  Yes  No  N/A
5. Is exhaust duct monitoring data on perc concentrations maintained? -----  Yes  No  N/A
6. Is a startup/shutdown/malfunction plan maintained for each machine? -----  Yes  No
7. Are deviation reports maintained? -----  Yes  No  N/A
  - a) Problem corrected? -----  Yes  No  N/A
8. Is a compliance plan maintained, if applicable? -----  Yes  No  N/A

**PART VI: LEAK DETECTION AND REPAIRS – Rule 62-213.300 FAC**

(check  only one box for each question)

1. What type of leak detection equipment is used to detect leaks?  
 Halogenated hydrocarbon detector  PCE gas analyzer  None used
2. Is the halogenated hydrocarbon detector or PCE gas analyzer operated according to the manufacturer's instructions (*manual was available and RO could demonstrate procedure*) ? -----  Yes  No
3. For major sources is the halogenated hydrocarbon detector or PCE gas analyzer operated according to EPA Method 21 ?- -----  Yes  No  N/A
4. Is the vapor leak inspection conducted by placing the probe inlet at the surface of each component interface where leakage could occur and moving it slowly along the interface periphery? -----  Yes  No
5. Is the PCE gas analyzer a flame ionization detector, photo ionization detector, or infrared analyzer capable of detecting vapor concentrations of PCE of 25 parts per million by volume (*based on documented specifications*) ? -----  Yes  No  N/A
6. Is the halogenated hydrocarbon detector capable of detecting vapor concentrations of PCE of 25 parts per million by volume (*based on documented specifications*) and indicating a concentration of 25 parts per million by volume or greater by emitting an audible or visual signal that varies as the concentration changes? -----  Yes  No  N/A
7. Are the following dry cleaning system components inspected weekly for perceptible leaks (sight, smell or touch) while the system is in operation (§63.322(k))?  
*(Inspection with a halogenated hydrocarbon detector or PCE gas analyzer also fulfills the requirement for inspection of perceptible leaks)*

a) Hose connections, fittings, couplings, and valves ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	g) Muck cookers ----- <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
b) Door gaskets and seating ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	h) Stills ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
c) Filter gaskets and seating ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	i) Exhaust dampers ----- <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
d) Pumps ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	j) Diverter valves ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
e) Solvent tanks and containers -- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	k) Cartridge filter housings <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
f) Water separators ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
8. Are the following dry cleaning system components inspected monthly for vapor leaks using a halogenated hydrocarbon detector or PCE gas analyzer while the system is in operation? (*Any inspection conducted according to this paragraph shall satisfy the requirements to conduct an inspection for perceptible leaks under §63.322(k) or (l)*)

a) Hose connections, fittings, couplings, and valves ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	g) Muck cookers ----- <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
b) Door gaskets and seating ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	h) Stills ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
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d) Pumps ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	j) Diverter valves ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
e) Solvent tanks and containers -- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	k) Cartridge filter housings <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
f) Water separators ----- <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

**PART VI: LEAK DETECTION AND REPAIRS – Rule 62-213.300 FAC (continued)**

9. What evidence suggests that leak checks are performed as required?

Leak log documentation  RO Assurances  On-site observation  other

Explain other :

Tracy White

10/31/2012

Inspector's Name (Please Print)

Date of Inspection

*Tracy White*

Inspector's Signature

Approximate Date of Next Inspection

**COMMENTS:**

Mr. Joshi's 4/23/2012 letter, in response to the 2/15/2012 non compliance inspection, indicated that the temperature setting on the machine "should be between 68...and 59 degrees F." However, the indicated and observed cool-down temperatures still did not appear to be in compliance with the rule (45 degrees or less).

On 6/01/2012, I arrived at the facility to perform a follow up inspection. I met with Mr. Joshi. I discussed the rule requirement in regard to cool-down temperature versus monitoring of high and low refrigerent pressures. We appeared to agree that the facility, by rule, could use the alternative method of pressure monitoring. Mr. Joshi indicated he would retrieve the proper, recommended manufacturer's recommendations for pressure (he could not locate or did not have the readings at the site).

On 9/18/2012, I conducted a follow-up inspection visit. Mr. Joshi did not appear to have the pressure information, and he indicated he would retrieve the information and would call back.

I scheduled another follow-up inspection for 9/27/2012. During the inspection, for demonstration purposes, Mr. Joshi voluntarily started the machine in cool-down cycle and I observed approximate readings of 20 bar for high pressure, and 3 to 4 bar for low refrigerant pressure. Since there was some confusion for the gauge scales (pressure units, etc), Mr. Joshi indicated he would again contact the manufacturer. He would then fax the manufacturer's written documentation to me the next day.

In a phone conversation on 10/30/2012, I contacted Mr. Joshi in regard to the documentation. Mr. Joshi indicated he had faxed the manufacturer's recommended pressures on 9/27/2012. However, for some unknown reason, I did not receive the fax.

On 10/31/2012, I met with Mr. Joshi in order to retrieve the manufacturer's documentation (follow up inspection) and also to perform a routine inspection. The documentation appeared to match the observations I had made on the 9/27/2012 inspection. The documentation will be attached to this report, along with Mr. Joshi's 4/23/2012 response letter.

Mr. Joshi's leak check and monitoring records were in compliance. He had an onsite leak detector. No odor or leak issues were noted for the machine. The facility appeared to be in compliance.

Rule reference: 40 CFR, Part 63 Subpart M. states the following:

§ 63.323 Test methods and monitoring.

(a) When a refrigerated condenser is used to comply with §63.322(a)(1) or (b)(1):

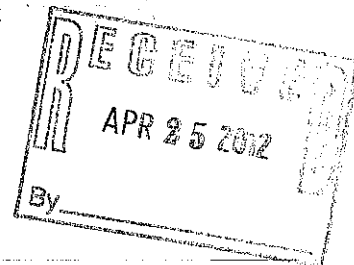
(1) The owner or operator shall monitor on a weekly basis the parameters in either paragraph (a)(1)(i) or (ii) of this section.

(i) The refrigeration system high pressure and low pressure during the drying phase to determine if they are in the range specified in the manufacturer's operating instructions.

(ii) The temperature of the air-perchloroethylene gas-vapor stream on the outlet side of the refrigerated condenser on a dry-to-dry machine, dryer, or reclaimer with a temperature sensor to determine if it is equal to or less than 7.2°C (45°F) before the end of the cool-down or drying cycle while the gas-vapor stream is flowing through the condenser. The temperature sensor shall be used according to the manufacturer's instructions and shall be designed to measure a temperature of 7.2°C (45°F) to an accuracy of ±1.1°C (±2°F).

DBKJ Inc. D/B/A Vogue Cleaners  
1839 Thomasville Road  
Tallahassee FL 32303  
April 23, 2012

Florida Department Of Environmental Protection  
N.W. District Branch Office  
3900 Commonwealth Boulevard, MS 55  
Tallahassee Fl 32399



Dear Ms.Castellanos,

A Department representative came to inspect my facility and we observed the gauge reading of 50 degrees F. According to inspector the reading should read 45 Degrees Fahrenheit. I told the inspector that as it is a new machine may be the specifications are different. He told me they have up to date specifications for all dry cleaning machines.

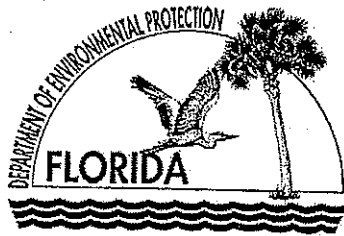
I contacted the Union Dry cleaning Machines manufacturer and they sent me the Temperature setting for all the machines and my machine is a **800 series** machine and setting should be between 68 degrees F. and 59 degrees F. My machine is set at 50 degrees F which I think is in compliance. Old 700 series machine s the temperature settings is 45 degrees F.

I am enclosing the temperature setting for different models sent by the Union dry cleaning Company. If you have any questions please contact Union Dry cleaning Company at **404-361-7775**.

I hope the above explanation will clear the matter.

Thanks

Sincerely,  
  
Bharat Joshi



# Florida Department of Environmental Protection

Northwest District Branch Office  
3900 Commonwealth Boulevard, MS 55  
Tallahassee, Florida 32399-3000

Rick Scott  
Governor

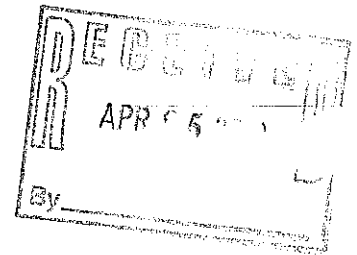
Jennifer Carroll  
Lt. Governor

Herschel T. Vinyard Jr.  
Secretary

March 28, 2012

SENT VIA E-MAIL  
[bharat@embarqmail.com](mailto:bharat@embarqmail.com)

Bharat Joshi, Owner  
Vogue Cleaners  
1839 Thomasville Road  
Tallahassee, Florida 32303-5709



Dear Mr. Joshi:

A Department representative inspected your facility to determine compliance with the Air Quality Operating Permit. The program identification number for this facility is 0730074. Your permit expires on November 8, 2013. This letter applies only to activities covered by the Air Resource Management Program.

The Tallahassee Branch Office reported a facility status of Non Compliance for the following issue:

The condenser exhaust cool-down temperature does not appear to comply with 40 CFR Part 63 Subpart M. If applicable, please repair the temperature sensor and/or repair/service the refrigeration condenser unit in order to achieve proper cool-down cycle temperature (45 degrees F. or less). Until repair and/or confirmation of compliance is received, the facility will remain in non compliance status.

The assistance you provided is appreciated. The inspection report is enclosed. If you have any questions, your local contact is Tracy White at (850) 245-2960 or [tracy.a.white@dep.state.fl.us](mailto:tracy.a.white@dep.state.fl.us).

Sincerely,

*Marlane Castellanos*

Marlane Castellanos  
Branch Manager

MC/tw

Enclosures

cc: Rick Bradburn, Mary Beth Curle, Carol Melton, FDEP, Pensacola



**PART VI: LEAK DETECTION AND REPAIRS – Rule 62-213.300 FAC (continued)**

9. What evidence suggests that leak checks are performed as required?

- Leak log documentation    RO Assurances    On-site observation    other

Explain other :

Tracy White

2/15/2012

Inspector's Name (Please Print)

Date of Inspection

*Tracy White*

Inspector's Signature

Approximate Date of Next Inspection

**COMMENTS:** I met with Bharat Joshi. Mr. Joshi provided records as requested. Afterwards I observed the drycleaning machine. The machine was in operation. I asked Mr. Joshi to point out the temperature gauge for the evaporator exhaust. I then asked Mr. Joshi if the unit was in cool-down cycle.

He indicated that it was in cool-down. I observed the gauge and noted a reading of 50 degrees Fahrenheit. I informed Mr. Joshi that the required cool-down temperature was 45 degrees or below. I asked him if the machine was near the end of cool-down cycle. He indicated it was, but that there was nothing wrong with the machine. He also indicated that the "...[coolant] pressure was fine."

We observed the operating manual, but we could not locate the appropriate high and low pressure requirements for the machine during cool-down cycle. Mr. Joshi appeared to record temperature measurements in his log sheet.

40 CFR, Part 63 Subpart M. states the following:

§ 63.323 Test methods and monitoring.

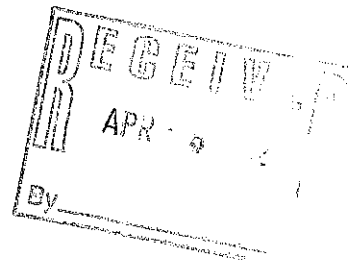
(a) When a refrigerated condenser is used to comply with §63.322(a)(1) or (b)(1):

(1) The owner or operator shall monitor on a weekly basis the parameters in either paragraph (a)(1)(i) or (ii) of this section.

(i) The refrigeration system high pressure and low pressure during the drying phase to determine if they are in the range specified in the manufacturer's operating instructions.

(ii) The temperature of the air-perchloroethylene gas-vapor stream on the outlet side of the refrigerated condenser on a dry-to-dry machine, dryer, or reclaimer with a temperature sensor to determine if it is equal to or less than 7.2°C (45°F) before the end of the cool-down or drying cycle while the gas-vapor stream is flowing through the condenser. The temperature sensor shall be used according to the manufacturer's instructions and shall be designed to measure a temperature of 7.2°C (45°F) to an accuracy of ±1.1°C (±2°F).

The condenser exhaust cool-down temperature does not appear to comply with 40 CFR Part 63 Subpart M. If applicable, please repair the temperature sensor and/or repair/service the refrigeration condenser unit in order to achieve proper cool-down cycle temperature (45 degrees F. or less). Until repair and/or confirmation of compliance is received, the facility will remain in non compliance status.



ATTN:

BJ

**Thermostat Temperature Settings**

**800 series**

N

Perc:

Inlet Air: Recommended setting 176 °F High point 185°F Low point 104°F

Outlet Air: Recommended setting 140 °F High point 158°F Low point 104°F

Solvent Temp: Recommended setting 68 °F High point 86°F Low point 59°F

Cool Down: Recommended setting 95°F High point 122°F Low point 77°F

Still Bottom: Recommended setting 280°F High point 284 °F Low point 230°F

Hydro:

Inlet Air: Recommended setting 176°F High point 185°F Low point 104°F

Outlet Air: Recommended setting 140°F High point 158°F Low point 104°F

Solvent Temp: Recommended setting 82°F High point 86°F Low point 68°F

Cool Down: Recommended setting 115°F High point 122°F Low point 77°F

Still Bottom: Recommended setting 275°F High point 284°F Low point 230°F

GE:

Inlet Air: Recommended setting 186°F High point 195°F Low point 104°F

Outlet Air: Recommended setting 158°F High point 167°F Low point 104°F

Solvent Temp: Recommended setting 86°F High point 86°F Low point 68°F

Cool Down: Recommended setting 115°F High point 122°F Low point 77°F

Still Bottom: Recommended setting 284°F High point 284°F Low point 230°F

700 series (older) perc:

Cold Air: Recommended setting 45°F High point 45°F Low point 40°F

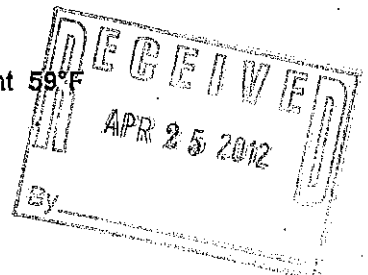
Dry: Recommended setting 140°F High point 158°F Low point 104°F

(700 series the drying control temperature was just in the drum outlet )

Solvent temp: Recommended setting 68°F High point 86°F Low point 59°F

700 series (older) hydro:

same as 800 series????



Date: 5-15-2003

How the Refrigeration Unit should operate on the U2000 models.

During Dry:

1, 5, 6, 7, 8

When the Dry Temp reaches 140 F then the Cold Air Temp Gauge should be around 77F to 82F.

The Refrigeration Gauges should read: HIGH 20 Bar, LOW 5 Bar

NO BUBBLES IN THE SIGHT GLASS.

(20 Bar)

If there are bubbles in the sight glass this could indicate the following:

Low Freon in the machine

If the Low Side gauge is low between 2-3.5 then the filters could be very dirty, coils dirty, fan not working, damper not opening fully.

A good sign of the unit working properly is a cool ( not cold ) suction line to the compressor and a HOT discharge on the bottom of the compressor. Also the water Freon receiver will be warm/hot from the top to the bottom.

During Cooldown:

1, 5, 6, 7

Last 210 Seconds

At the end the cooldown the gauges should read approximately:

Drying = 113 F

COLD AIR TEMP = 59 F

The Ref gauges should be at 20 bar and approx 3.5 bar. No bubbles in the sight glass

The compressor lines should be the same as drying.

During the Recuper Step.

1, 7, 10 for 5 minutes

The Ref Gauges should be at 20 bar and 3.5 bar. The low side will slowly drop to around 1 bar by the end.

The Drying Gauge should be approx 100 F and the COLD AIR TEMP should be at 45F or below.

The Compressor should feel the same as drying and cooldown. But some bubbles in the sight glass is normal.

If the top of the compressor is freezing then the filters could be dirty, coil dirty, Recuper fan not running, etc...

If the temperature does not drop on the COLD AIR TEMPERATURE gauge then check the following:

Make sure the pipe leaving the Drying chamber going to the Recuper( it is 1.5" and is in the front of the machine behind the electrical panel). Make sure this pipe is COLD. If so then maybe the probe is not in the best position for the airflow.

If the compressor is freezing then try to close the expansion valve a few turns counterclockwise to decrease the amount of Freon going to the coil.

If the expansion valve has been replaced then it might need readjusting the capillary bulb should be in the 11 o'clock or 1 o'clock position. Not the 12 o'clock position.

# Refrigeration Sequence



UNION MACHINE

## Refrigeration Sequence of Operation:

Depending on the model of the machine there can be a maximum of 5 solenoid valves.

### PERC MACHINES

Most Perc machines with water cooled refrigeration have a total of three. Two of these are directly beside the compressor. EF 34 (on the left) controls the heat pump circuit. (Buttons 1, 5, 6, 7, 8). EF 35 is on the right and it controls the cool-down cycle (Buttons 1, 5, 6, 7). But both solenoids will open for 15 seconds to equalize the pressure on the startup of drying (heat pump) and cool-down. If a sudden increase (over 24 bar) in pressure along with a A4 alarm is noted after 15 seconds then most of the time the diaphragm could be defective in the corresponding solenoid valve. It is recommended to first check that voltage is being sent to both red wires 34 and 35 and then depending on the cycle one of these will lose power therefore closing the solenoid. If the voltage is checked and is normal (24 volts AC) then the diaphragm is probably bad and needs replacing. It is recommended to replace both diaphragms and the filter dryer if the unit is evacuated.

The other solenoid valve is for the liquid line. It is opened anytime button 7 is pressed. If a problem is in this coil or diaphragm the unit will pump down the Freon into the receiver tank and the compressor will cut off on low pressure. This can be noted by the low pressure gauge showing 0.

On machines with refrigeration cooled solvent cooling then the other solenoid will function when the pump circuit is on and the thermostat calls for cooling of the solvent. If this solenoid does not open then you will see the compressor pump down the Freon into the receiver tank and the compressor cut off on low pressure. This can be noted by the low pressure gauge showing 0.

If a gradual increase in pressure is noted up to the cutoff of 348 psi (24 bar) A4 alarm. Then the machine could have a water restriction problem ( blocked strainer, chiller pressure problem), water temperature problem ( water is too hot coming into the machine), overcharged condition ( noted by a cool to the touch receiver tank at the bottom), or a scaled receiver tank condition that would require an acid wash to remove the scale. This is noted mainly on machines utilizing a water tower system for cooling.