



# OWNER'S MANUAL



## THE SIROCCO WOOD PELLET EVAPORATOR



Les Équipements d'Érablière CDL inc.

Thank you for choosing a CDL wood pellet evaporator. Our 40 years of experience working with sugarmakers ensures you that you acquired a performant and quality piece of equipment. Before using this piece of equipment, it is recommended to thoroughly read this document.

## FINDING INFORMATION

### Make a record for future use

Brand: \_\_\_\_\_

Purchased Date: \_\_\_\_\_

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

### Serial number location

The serial number is located on the back of the evaporator arch



## TABLE OF CONTENT

Finding information	2
Table of content	3
Safety	3
Installation	4
Operating the evaporator	9
Maintenance	11
Troubleshooting	13
Dimensions	14
Performance	15
Warranty	16

## SAFETY

A wood pellet evaporator can be a dangerous piece of equipment. Always wear heat resistant gloves and clothing when you fire an evaporator. Often, visitors can be in the sugarhouse. Make sure they stay at a safe distance from the evaporator, especially children.

Do not let the equipment exposed to outside weather conditions. A pellet evaporator works with solid material (wood) and produces intense heat in front of the arch and around the smoke stack. Follow the installation instructions to avoid any safety related issues concerning the heat produced.

Every day when you shut down the evaporator empty the evaporator feeding screw to make sure that the fire doesn't go back to the bin. If the evaporator is not to be used for an extended period of time, cut the power to the evaporator and empty the screw and bin from any remaining pellets.

# INSTALLATION

- 1) Remove the wheels under the evaporator
- 2) Level your arch with the adjustable legs.
- 3) Install the roof jack, base stack, stack pipe, collar and stack cover (please make sure that the stack cover is installed against the dominant wind). Ideally, have a rope coming down from the stack cover to a place where it is easy to operate.
- 4) Place the pans on the arch, install the base stack behind the flue pan and be sure that flue pan is levelled. If there is space left between the pans, tighten the pan tightener located at the front of the arch.
- 5) Install the float boxes and transfer connections.
- 6) Install the small pellet bin behind the evaporator by coupling the steel tube of the bin to the tube coming out the back of the evaporator. Tighten firmly the set screw.
- 7) Connect the pellet feeding system. There are 3 possibilities:
  - a) Feed with 40 lbs bags. No other system required.
  - b) Feed with 1000 lbs bag. Install conveying system to the small bin.
  - c) Feed with an outside silo. Install conveying system to the small bin
- 8) Connect power to the evaporator. The main electrical box is located on the back of the evaporator (it is recommended to use a certified electrician).
- 9) It is highly recommended to have a make up air entry near the burner to improve combustion (especially if the building is well insulated).
- 10) To reduce noise in the building, it is an option to move the blower outside the main room. It is also recommended, to reduce dust in the main room to also have the small pellet bin in a separate room directly behind the evaporator. Call your CDL representative for more information.
- 11) A start up with a CDL technician is included with the purchase of a new wood pellet evaporator, please contact your sales representative to take an appointment with CDL's service department. A technician will come on site to make the necessary adjustments and to start the evaporator for the first time. Before his visit, all the electrical components must be hooked up, you must have enough pellets to run a couple hours and you need to have a big enough water supply to feed the evaporator. The start up can be done using soft water.

For the location of your evaporator, make sure you have a concrete or ceramic floor strong enough to support the weight of the evaporator and its content as well as at least 24" between any wall and the smoke stack. If you need to put it closer to the wall, a heat barrier (ceramic blanket for example) should be installed. Also, make sure that your steam and smoke stacks have a free way to the roof of the building (avoid rafters). Also, your ceiling should be high enough for you to raise the hoods safely with a cable and pulley system. The installation of this evaporator must be done by qualified personnel.

If your building is not insulated, you will have a better combustion and a better steam evacuation. If it is insulated, you will need to have an air intake inside your building (air trap, open window etc). The air intake should at least be 24" x 24".

**IMPORTANT:** Make sure to contact your insurance company in order to verify their safety standards.

### **Prefabricated chimney**

If you decided to buy a pre-fabricated chimney to install with your evaporator, please refer to the manufacturer's instructions. A chimney can get up to 1000 F degrees. Before installing this type of equipment, make sure it's made for this kind of conditions and validate with your insurance company that it's in compliance with their safety standards.

## **OPERATING THE EVAPORATOR**

Starting for the 1<sup>st</sup> time or at the beginning of a new season

- Verify that all the electrical controls are in good working condition.
- Clean with compressed air the inside of the electrical panel to remove any accumulated dust.
- Verify that the air control levers move freely.
- With a vacuum cleaner, remove any left over ashes from the previous season from the bottom of the fire chamber.
- Clean and grease the chain link and gears of the pellet bin feeding system (for the double burner models only).
- Verify that the coupling between the motor and the screw is well in place.
- Before filling the small bin with pellets, turn the feeding screw and make sure it turns the way it should.

### Pellet information

We recommend to use good quality pellets. To use lesser quality pellets will give you lesser boiling performances and a lot more ashes to clean everyday. The presence of non combustible material in the pellets could cause premature wear in the moving parts, jamming of the screw and general failure of the system.

### Pellet characteristics

This evaporator is designed to run with wood pellets with the following properties:

- Soft wood (burns better than hard wood)
- No bark inside the pellet (bark will leave ashes after burn)
- Humidity content less than 6% (weight)
- Ash percentage less than 1% (weight)
- Diameter: 6 to 7 mm (0.236" to 0.276")
- Length: no longer than 35 mm (1.378")
- Energy capacity: between 5 and 5.68 kWh/Kg (7738 to 8800 BTU/lb)
- Density: 650 Kg/m<sup>3</sup> (40.5 lbs/pi<sup>3</sup>)

### Starting instructions

#### **Before starting the evaporator**

- Open the valve under the silo (if there is one).
- Open the gate under the pellet bin at 1/3 feeding the screw.
- Feed the evaporator with electricity.
- Open the stack covers.
- Make the pellet feeding system is ready.
- Make sure the power is on in the main panel.
- If you don't feed the pellets manually, you need to set the feeding switch on the main electrical panel to "auto" or "manual".
  - choose "auto" to have the whole feeding system work automatically. The silo motor (M2) feeds the pellet bin until the level of pellets reaches the high level sensor. The sensor will stop the silo motor. A timer (TD1) will start for a preset number of minutes. When the timer reaches its preset value, the silo motor will start again to fill the bin. Make sure the timer value is not too long to run out of pellets in the bin. Try to start the motor when the bin is 2/3 empty.
  - Choose "manual" if you want to fill the bin manually. When manual is chosen, the silo motor will turn continuously. Flip the switch to "auto" when you reach the desired pellet level in the bin.

### **When ready**

1. Open smoke stack Damper 100% (handle going down) – this will increase draft while chimney is cold and will allow you faster starts.
2. Scrape and clean ashes from the burner and make sure none of the air openings are plugged.
3. Open the pellet bin shut-off gate at "3" (arm is located close to the pellet bin).
4. Make sure all valves are open and water levels are good, adjust floats if necessary.
5. Turn on auger at maximum speed to get pellets in the burner (1/3 of the burner maximum), then stop the auger.
6. Close air in the door and air in the burner completely (pull handles).  
Note: Even when the handle is fully closed, there will always be some air going in the door for safety reasons.
7. Pour diesel or wood alcohol on the pellets and light it with a torch.
8. Turn on the blower.
9. Adjust the burner air at  $\frac{3}{4}$  of its maximum , let the pellets burn in the burner for 6 minutes.
10. Increase gradually the screw RPM until you reach full power (See Max RPM chart per evaporator size in the operator manual) and gradually decrease air in the burner by rotating counter-clockwise the burner air adjustment handle. Leave enough air to get the pellets dancing in the burner but if the burning pellets jump out of the burner, the air is too high. Even if a few pellets fly out of the burner, it's not a problem, they will burn.

11. Adjust the smoke stack damper to get between 0.03 to 0.05 on the Magnehelic gauge (this must be done after the chimney reached operating temperature because the draft will increase with heat).
12. Put your hand on the door often, you always should be able to hold your hand on the door. Too much heat will warp the door. If door gets too hot, add air in the door but don't add too much. **Too much air in the door will only decrease the draft and over heat the chimney throwing energy outside!!! Try it, you'll understand!**

**IMPORTANT : EVERY TIME YOU ADJUST THE AIR (DOOR OR BURNER), IT WILL AFFECT THE DRAFT. YOU WILL NEED TO ADJUST THE BASE STACK DAMPER EVERYTIME!**

13. Have some vegetable oil or defoamer close by when operating evaporator, should pans start to foam up, put a drop into the pan and the foam will go down. This will prevent boiling over.
14. Maintain these levels by the adjustment on your front and rear floats. **(THEY WILL HAVE TO BE ADJUSTED AS EVAPORATOR STARTS TO EVAPORATE WATER FROM THE MAPLE SAP).**
15. At this point the thermometer that is being used has to be placed in boiling water for 5 minutes. **(WRITE THIS TEMPERATURE DOWN)** and then place the thermometer at the point where syrup is to be drawn from the evaporator.
16. Finish syrup is always drawn off 7 degrees above the boiling point of water.
17. **(EXAMPLE: IF BOILING WATER IS AT 212 DEGREES, THEN YOU WOULD OPEN VALVE AT 219 DEGREES).**
18. When you become more experienced on the evaporation of your evaporator, you can bring the level of sap down to 3/4" above the flues in the flue pan.
19. **(ALWAYS MAINTAIN 1 1/2" to 2" IN THE SYRUP PAN).**

**Note: when you shutdown the evaporator, the blower will run for another 10 minutes before shutting down. This is to cool down the unit faster and protect the equipment.**

Should you have any problems, our service personnel will be pleased to assist you. Our toll free number is: 800-762-5587

#### Pan change procedure

1. Stop the Auger.

2. Wait 10 minutes with the blower ON (this will cool down the burner and extend its life).
3. Shutdown the blower.
4. Change pans.
5. Start the blower.
6. Start the auger increasing the speed gradually (3 rpm at the time) to normal speed (you will not need to use fuel or torch to restart)
7. You shouldn't need to re-adjust any air but, it's always better to check from time to time.

#### End of the day shutt-off procedure

1. Close the pellet bin gate, keeping the auger running (we recommend to empty the auger every night, especially in damp conditions, the pellets could expand and lock the auger). **Make sure you have enough concentrate do do this.**
2. When you see that no more pellets are getting in the burner, turn the auger off.
3. Wait 10 minutes with the blower **ON** (this will cool down the burner and extend its life). Leave the blower running longer if you can, why not while you clean everything?
4. Stop the blower.
5. Close the stack cover.

#### Emergency stop

1. Stop the feed screw.
2. After 5 minutes, shut-off the blower.

or

1. Lift the sap level sensor if you have a detecto. The feed screw will stop and soon after the blower will stop too.

#### At the end of the season

1. Empty the silo feed screw.
2. Empty the evaporator feed screw completely.
3. Close the gate at the bottom of the silo (photo H and I).
4. Clean the burner of all residues, clean the base of the smoke stack using the access door (photo E).
5. Clean the bottom of the evaporator of any unburned pellets.
6. Cut the power off every equipment.

## **ELECTRICAL INFORMATION**

Drive for feed screw motor DRV1

Silo timer TD1

Detecto contactor (optional)



Timer: Mode A

C1: Main contactor for water level (Detecto)

M2: Relay for silo motor

CB1: Main breaker

DRV1: Drive for feed screw motor

TD1: Silo timer

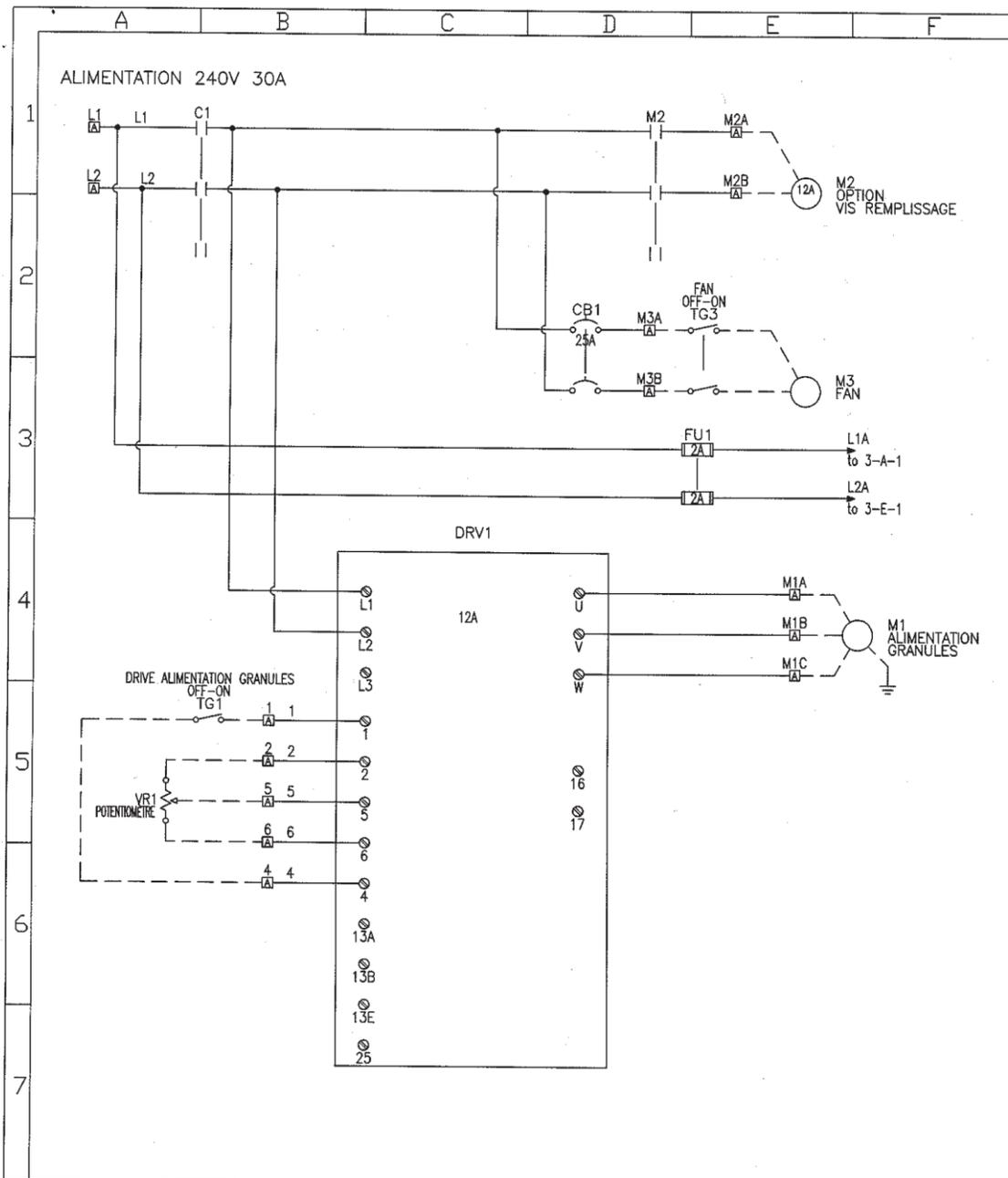
TG2: Toggle switch for manual or auto mode to feed pellets

TG1: Toggle switch for drive (feed screw ON/OFF)

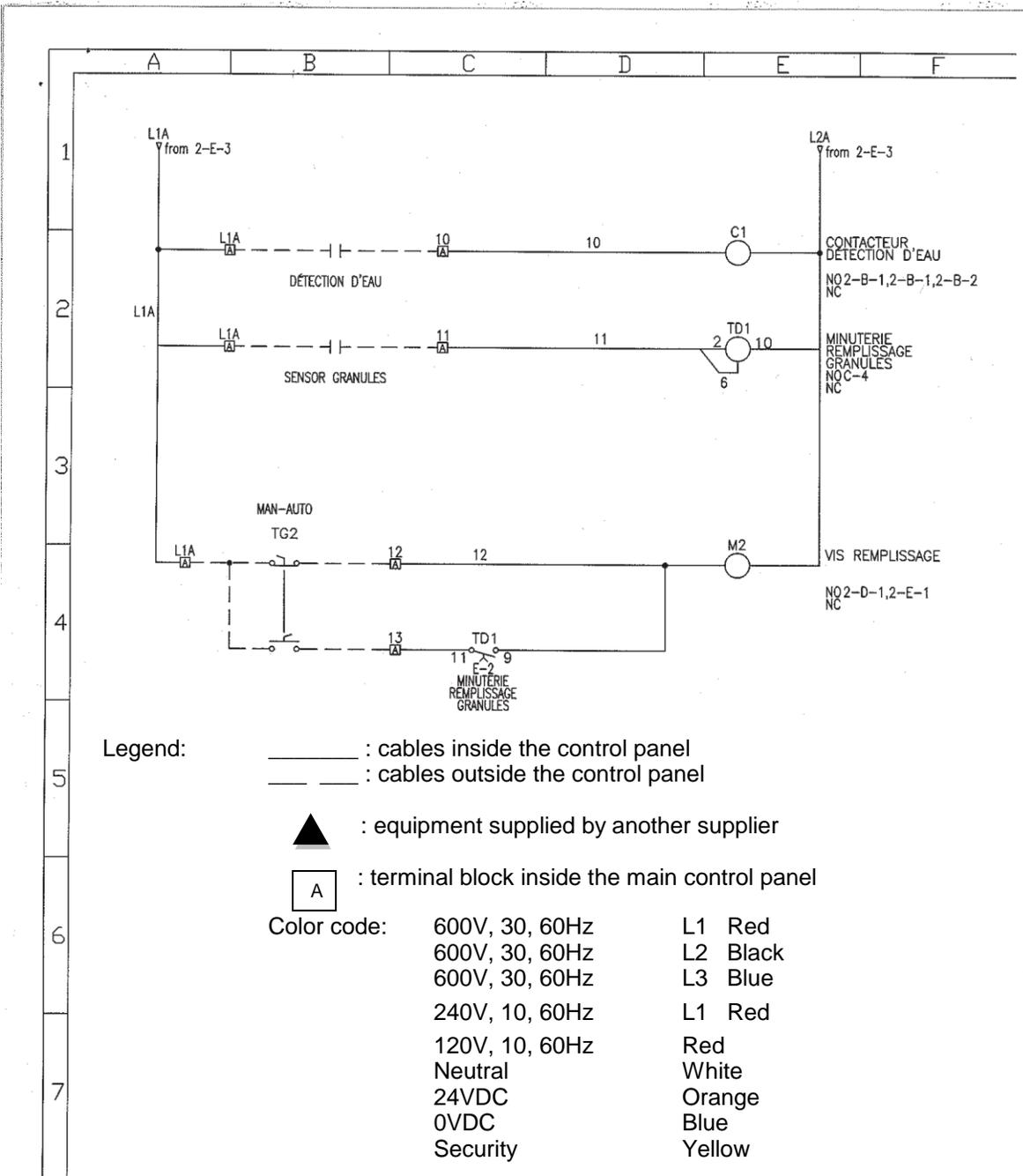
TG3: Toggle switch for air blower

M1: Feed screw motor

VR1: Feed screw motor speed control (RPM)



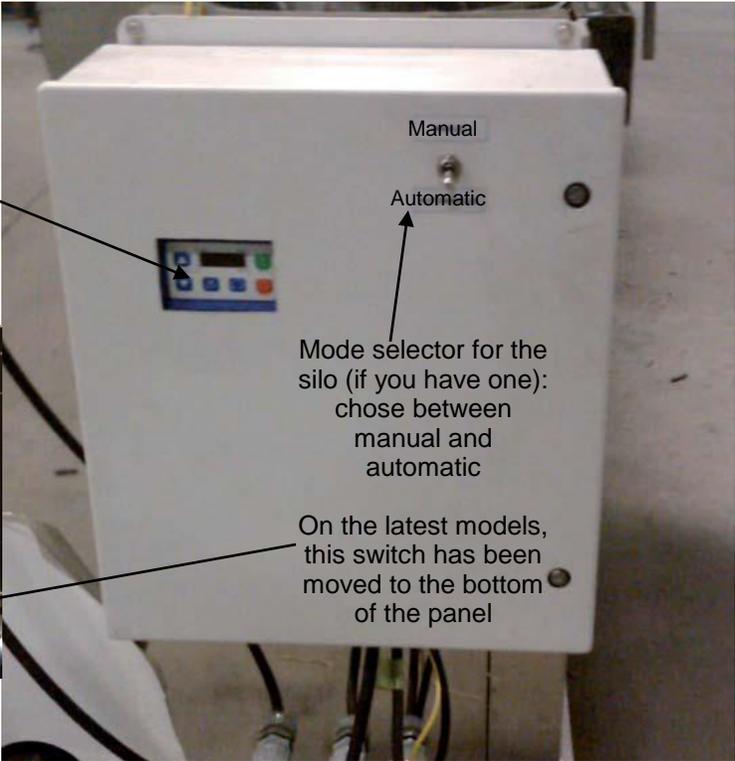
CLIENT:	CDL		 Automatisation et contrôle industriel				
PROJET:	EVAPORATEUR						
DESS. PAR:	Olivier Blanchet	DATE:	07-10-2011	994, DES CALFATS, LÉVIS, QUÉBEC, G8V 9V5	VER. PAR:	APP. DATE:	DESCRIPTION
APPR. PAR:	Jacques Bélanger	DATE:	07-10-2011	TEL: (418) 835-6013 FAX: (418) 835-6139	DESSIN NO.:	25660-01	PAGE: 2 DE 3



CLIENT:	CDL		 <b>Dracon</b> Automatisation et contrôle industriel						
PROJET:	EVAPORATEUR								
DESS. PAR:	Olivier Blanchet	DATE:		07-10-2011					
APPR. PAR:	Jacques Bélanger	DATE:		07-10-2011					
				984, DES CALFATS, LÉVIS, QUÉBEC, G6V 9V5 TEL.: (418) 835-6013 FAX.: (418) 835-6139		VER. PAR:	APP.	DATE:	DESCRIPTION:
						DESSIN NO.:	25660-01	PAGE:	9 DE 3

# Control box: photo A

RPM readout of the pellet feed screw to the burner



Mode selector for the silo (if you have one): chose between manual and automatic

On the latest models, this switch has been moved to the bottom of the panel

# Burner: photo B

Fill 1/3 of the burner to start up



## Light the pellets: photo C

Spray the top of the pellets with fire starter like diesel and lite with a propane torch



## Control panel: photo D

Base stack temperature

Magnehelic gauge

Blower on/off



Pellet feed screw speed adjustment

Pellet feed screw on/off switch

## Access door: photo E

Remove this panel to access the inside of the evaporator from the back



## Air adjustments (double burner model): photo F



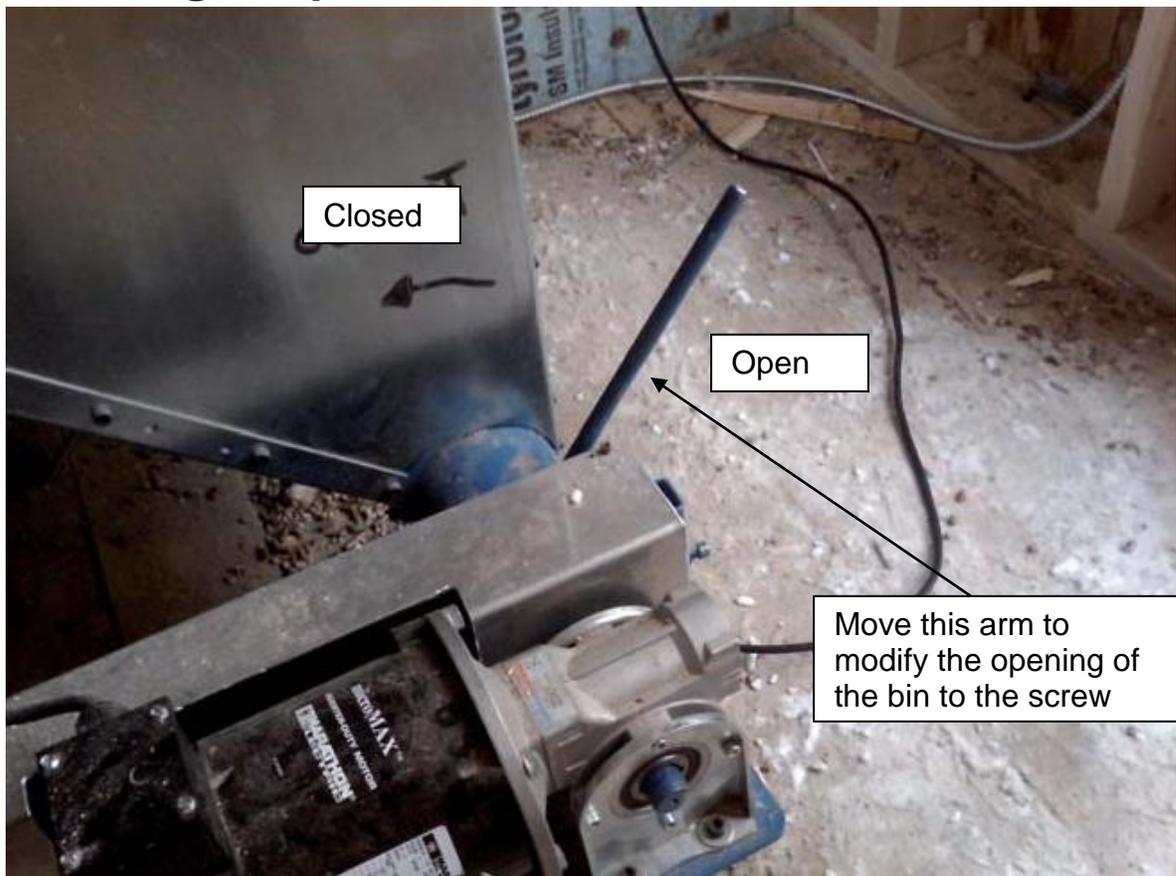
Single burner unit only has 1 gauge and 2 handles

## Base stack damper: photo F



The damper will have to be adjusted between 35 to 45 degrés from the vertical. Magnehelic gauge must read 0.1.

## Pellet bin gate: photo G



## Silo set up: photo H

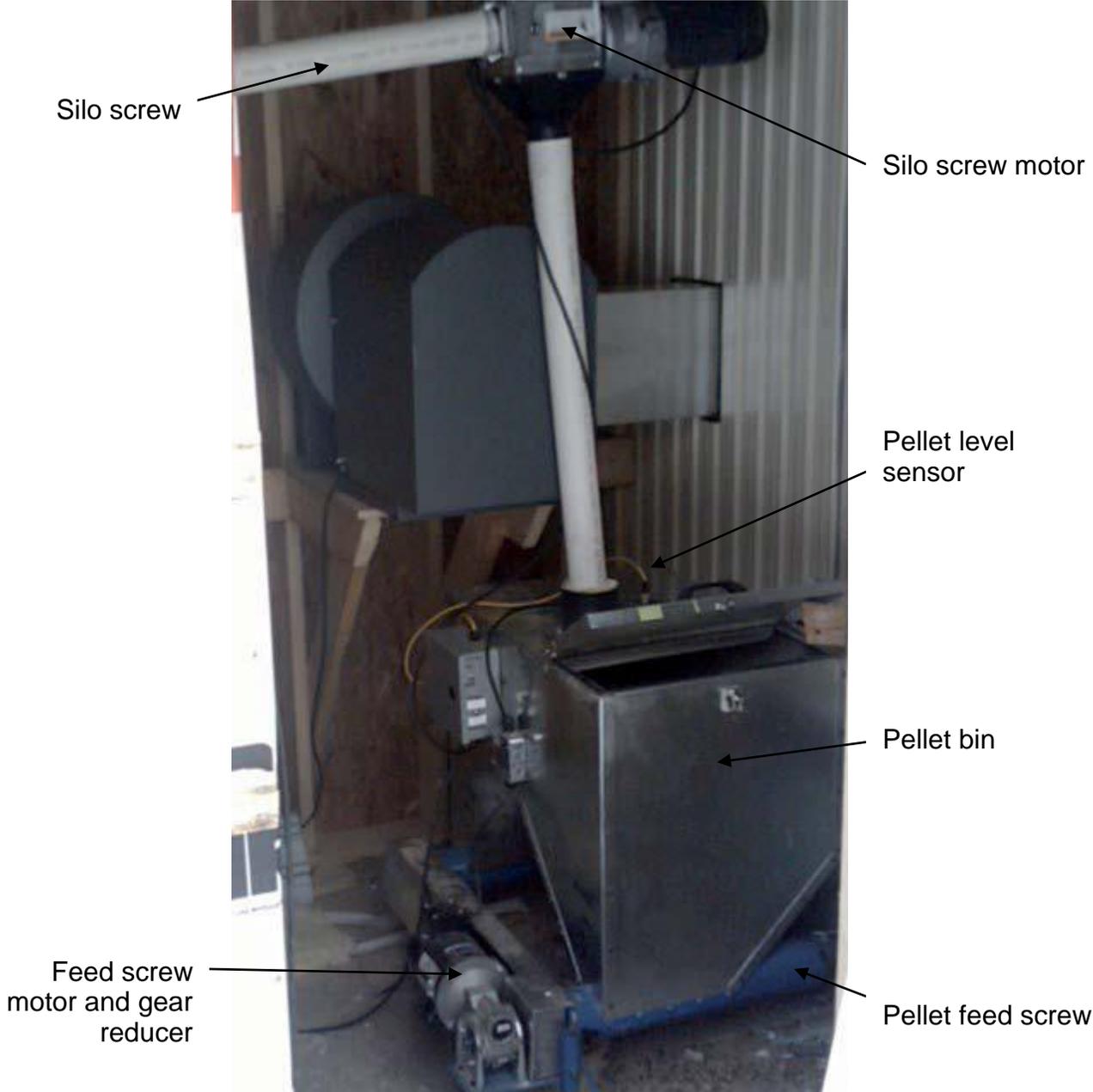


## Bottom of silo: photo I



Silo gate valve, only open 1/3 in normal operation

# Silo screw motor: photo J



**Pellet level sensor in bin: photo K**



Pellet level sensor

**Single and double burner: photos L**

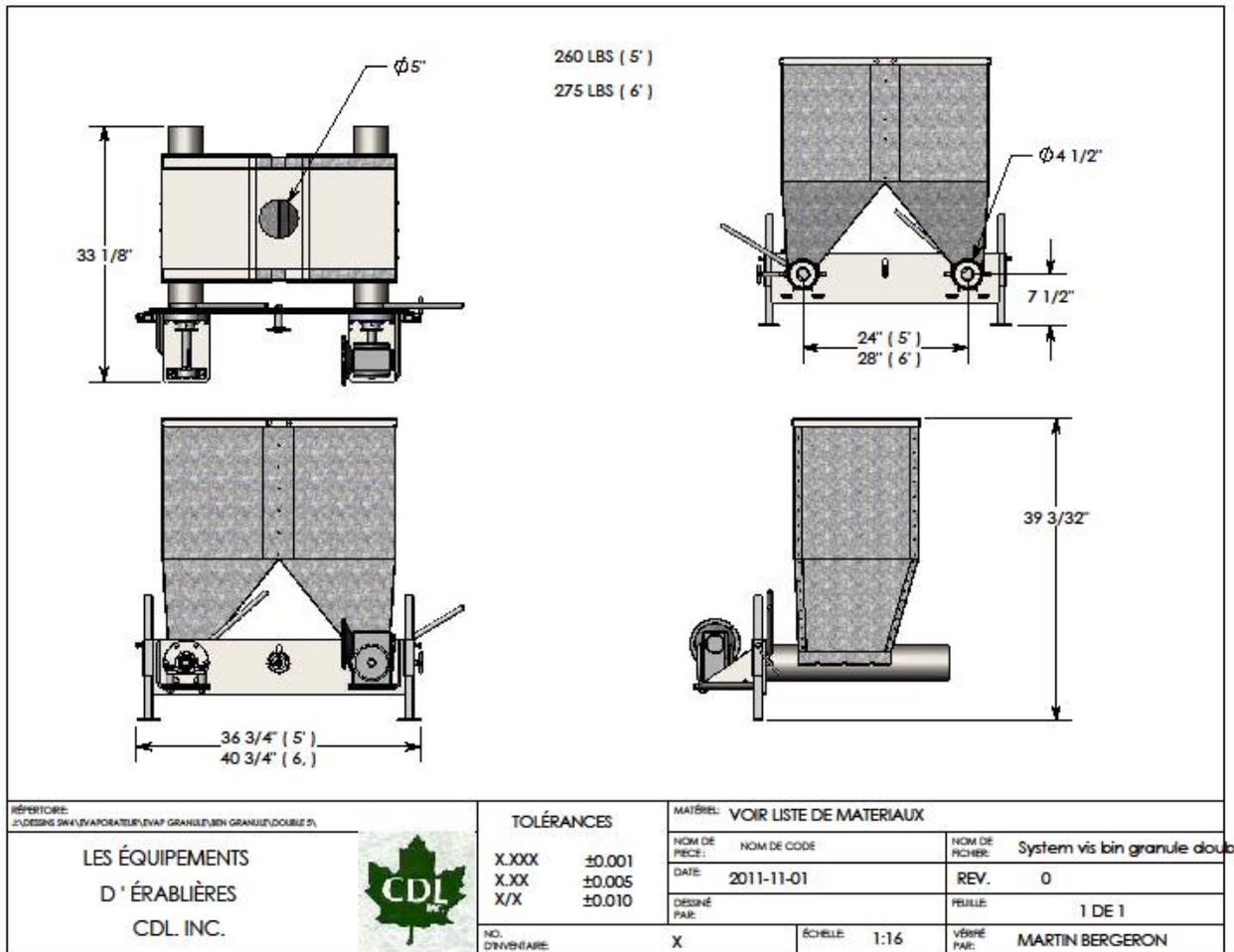


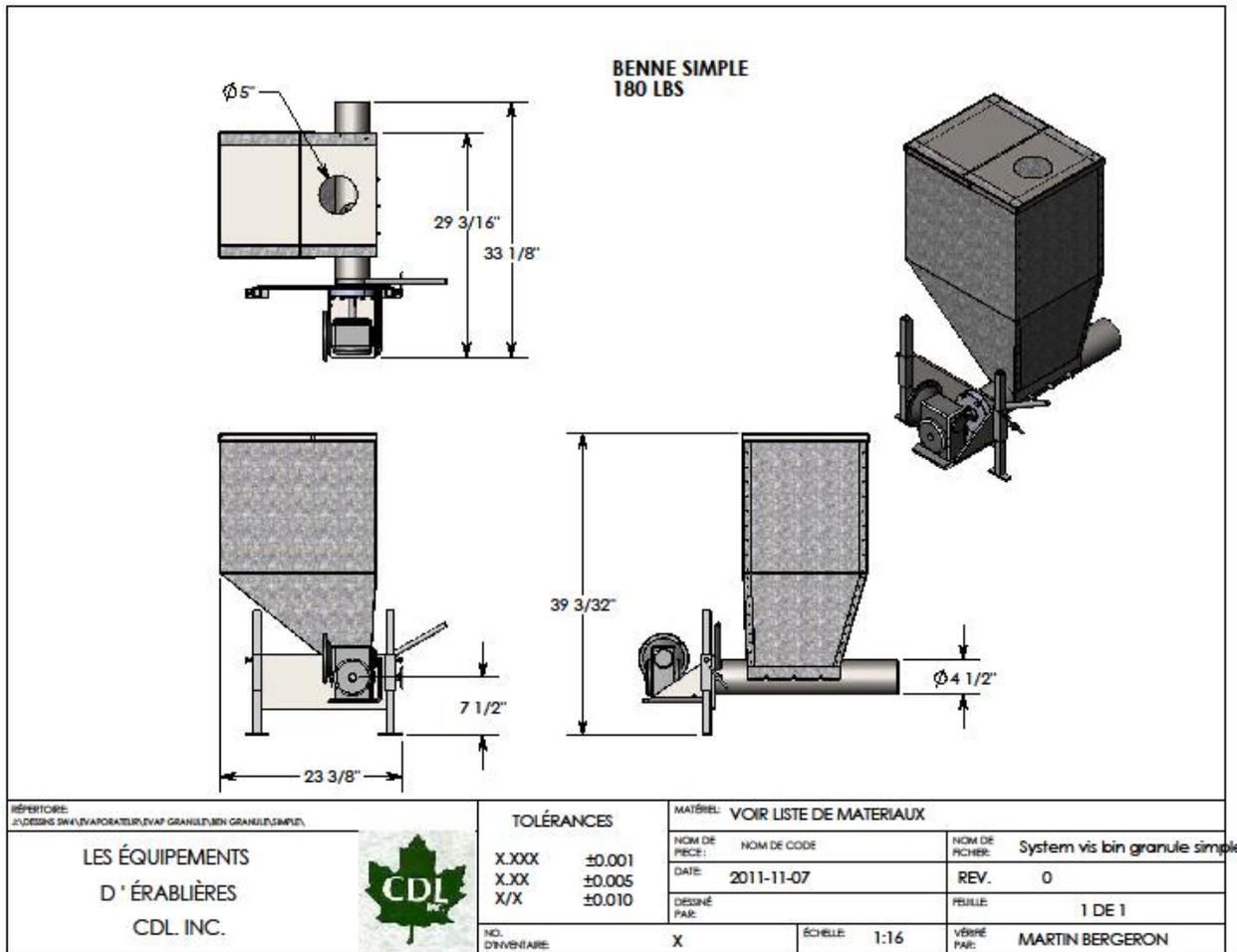
## Technical information

Model	Surface ft <sup>2</sup>	Evapor. Gal imp/hr	Btu/hr	Pellets Lbs/hr	RPM	Max RPM	# bags 40 lbs	Equiv.oil gal/hr	Pellets ton/5hr
2 ½ x 8	20	66	910000	107	7.1	10	2.7	6.5	0.24
2 ½ x 10	25	83	1120000	132	8.8	10	3.3	8	0.3
3 x 10	30	99	1400000	165	11	12	4.1	10	0.37
3 x 12	36	119	1610000	189	12.6	13	4.7	11.5	0.43
3 ½ x 12	42	139	2100000	247	16.5	18	6.2	15	0.56
3 ½ x 14	49	162	2100000	247	16.5	18	6.2	15	0.56
4 x 12	48	158	2100000	247	16.5	18	6.2	15	0.56
4 x 14	56	185	2450000	288	19.2	20	7.2	17.5	0.66
4 x 15	60	198	2450000	288	19.2	20	7.2	17.5	0.66
4 x 16	64	211	2450000	288	19.2	20	7.2	17.5	0.66
5 x 12	60	198	3360000	395	13.2	15	9.9	24	0.9
5 x 14	70	231	3360000	395	13.2	15	9.9	24	0.9
5 x 15	75	248	3360000	395	13.2	15	9.9	24	0.9
5 x 16	80	264	3640000	428	14.3	15	10.7	26	0.97
6 x 14	84	277	4200000	494	16.5	18	12.4	30	1.12
6 x 15	90	297	4480000	527	17.6	20	13.2	32	1.2
6 x 16	96	317	4760000	560	18.7	22	14	34	1.27
6 x 18	108	356	5320000	626	20.9	22	15.6	38	1.42

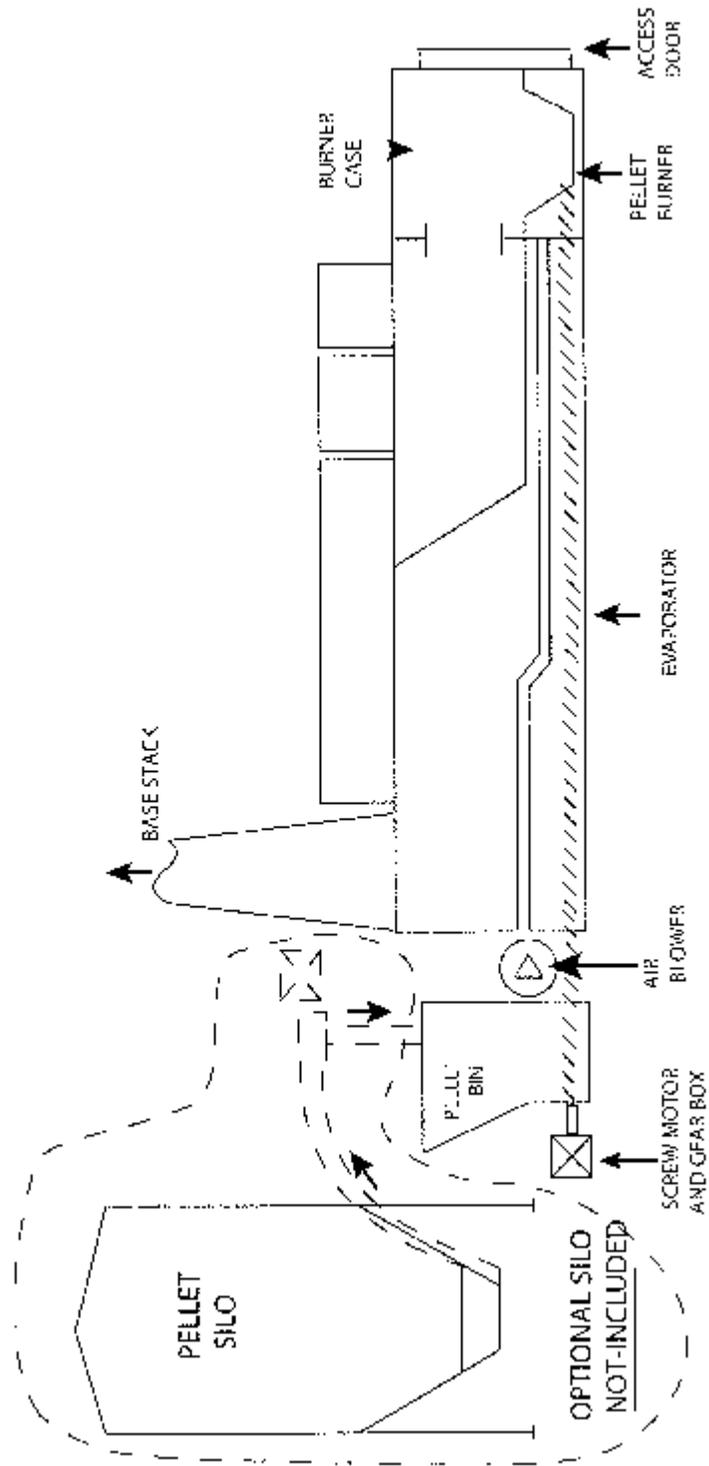
\* 5' and 6' wide evaporators have 2 burners, that's why the RPM is lower

\*\* Multiply by 1.2 to get the evaporation rate in US gallons per hour





## SCHEMATICS OF THE COMMERCIAL UNIT 2010-2011





Modèles	Dimension in inches						Smoke diam.	Steam diam.	Steam diam.	Air blower	Pellet bin
	A	B	C	D	E	F	G	H	I	J	K
2 ½ x 8	39¼	87¼	116	35½	34	187	11	12	12	Fan with 1 HP motor 220V 8"x12" air duct	Bin size: 5 ft³ ¾ HP motor 220 V
2 ½ x 10	51¼	111¼	140	35½	34	211	12	12	12		
3 x 10	51¼	111¼	140	42	34	211	14	14	14		
3 x 12	57¼	129¼	164	42	34	235	15	14	14		
3 ½ x 12	57¼	129¼	164	48	34	235	16	15	15		
3 ½ x 14	69¼	153¼	188	48	34	259	18	15	15		
4 x 12	57¼	129¼	164	54	34	235	18	16	16		
4 x 14	69¼	153¼	188	54	34	259	20	16	16		
4 x 15	69¼	159¼	200	54	34	271	20	16	16		
4 x 16	69¼	165¼	212	54	34	283	20	16	16		
5 x 12	59¼	131¼	169	65½	34	240	20	18	18	Fan with 2 HP motor 220V 9¾"x12" air duct	Bin size: 9 ft³ ¾ HP motors (2x) 220 V
5 x 14	71¼	155¼	193	65½	34	264	22	18	18		
5 x 15	71¼	161¼	205	65½	34	276	22	18	18		
5 x 16	71¼	167¼	217	65½	34	288	22	18	18		
6 x 14	71¼	155¼	192	77½	34	263	26	20	20		
6 x 15	71¼	164¼	204	77½	34	275	26	20	20		
6 x 16	71¼	167¼	216	77½	34	287	26	20	20		
6 x 18	83¼	191¼	240	77½	34	311	26	20	20		

# MAINTENANCE

## Pan cleaning

- 1) Fill pans with permeate or clean water. Fill it to the top.
- 2) Add a CDL recommended cleaner, heat up and leave sitting all night.
- 3) Drain and rinse thoroughly with water.
- 4) Fill the pan to the top again with clean soft water and bring it to a boil for 15 minutes, to insure that there is no more cleaner residues left.
- 5) Use only a CDL recommended cleaner.
- 6) Never use abrasive products or steel brush, steel wool or any product containing chlorine or muriatic acid.
- 7) If there is burned syrup on the side of a pan, use commercial **cold** oven cleaner. It will dissolve the syrup without using abrasive products. To bring back the shine, use a foaming industrial glass cleaning product.

IMPORTANT: if there is any cleaning product left in the pan, it will seriously damage the pan. It could even make holes in it.

## When to clean you pans

Pan cleaning depends on evaporator size and the amount of scale deposit produced by your evaporator. Front pans have to be checked every hour to prevent overheating. If too much scale deposit in your pan, you could burn it. So make sure that you check your flue pan at the end of every day, especially in the corners at the end of each flue. Too much scale deposits can cause a pan to overheat.

## **Maintenance of the optionnal base stack preheater**

- 1) It's very important to drain the preheater at the end of each day. If sap stays for a long time in a warm environment, bacterias will grow and they will be transferred to the pans when you start the evaporator.
- 2) It's also important that after every time concentrated sap is boiled, permeate water is boiled for 10 to 15 minutes. This will sterilize the interior of the preheater for the next time you will boil.
- 3) Empty the preheater.
- 4) Don't go over 180 F degrees in the preheater because if the sap gets to 212 F degrees, steam will come out of the water entrance relief pipe and could damage the preheater. If you have difficulty maintaining the temperature under 180 F degrees, call you local representative for support.

# TROUBLESHOOTING GUIDE

## Float doesn't hold a constant level of sap

- The rubber piece of the float arm needs to be replaced or readjusted.
- Float box arm needs to be realigned.
- Make sure there isn't sap inside the float (hole in the float).
- The sap tank is too high and puts too much pressure on the float arm; you need to install a secondary pressure control float box or to relocate the sap tank.

## Smoke comes out of the pellet bin

- Not enough draft, readjust the base stack damper.

## The feed screw turn, but the pellets don't come out the screw

- The gate at the bottom of the silo is closed
- The silo timer is set too long
- The pellet bin gate is closed or open too wide (blocked)
- You ran out of pellets
- The coupling between the motor and the screw is apart
- The screw is jammed, take it apart and clean it

## Sap boils too hard in front or at the back of the evaporator

- Adjust the key in the back of the evaporator to add more draft.

## EVAPORATOR WARRANTY

Your evaporator is covered by a two year limited warranty. For two years from your original date of purchase, Les Équipements d'Érablière CDL (CDL), will replace or replace any parts of this evaporator that prove to be defective in materials or workmanship when such evaporator is installed, used and maintained in accordance with the provided instructions.

### Exclusions

This warranty does not cover the following:

1. Products with original serial number that have been removed, altered or cannot be readily determined.
2. Product that has been transferred from its original owner to another party or removed outside the USA or Canada.
3. Production loss due to any kind of failure of the evaporator.
4. Revenu losses due to syrup quality.
5. Service calls which do not involve malfunction or defect in materials or workmanship, or used other than in accordance with the provided instructions.
6. Service calls to correct the installation of your evaporator or to instruct you how to use your evaporator.
7. Expenses for making the evaporator accessible for servicing, such as the removal of wall, shelves etc.
8. Any service beyond the first two years.
9. Damages caused by: services performed by unauthorized service companies; use of parts other than genuine CDL parts or parts obtained from persons other than authorized service companies; or external causes such as abuse, misuse, inadequate power supply, accidents, fires, or acts of God.
10. It doesn't cover the consumable products (as wood pellets) or accessories.
11. If the product was damaged by abusive use, negligence, accident caused by the customer, modification made by the customer, water damage, variation in the electric power or power surge.
12. Damage cause by the use of products that are not meant for use with our equipment or a bad use of a product as acids, cleaning products.
13. Use of contaminated, recycled or sub standard wood pellets.
14. Use of any other burning agent other than wood pellets.

**Disclaimer of implied warranties; limitation of remedies**

Customer's sole and exclusive remedy under this limited warranty shall be repair or replacement as provided herein. Claims based on implied warranties, including warranties of merchantability or fitness for a particular purpose, are limited to two years or the shortest period allowed by law, but not less than two years. CDL shall not be liable for consequential or incidental damages such as property damages and incidental expenses or loss or revenues caused by any event covered by this warranty. Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages, or limitations on the duration of implied warranties, so these limitations or exclusions may not apply to you. This written warranty gives you specific legal rights. You may also have other rights that vary from states to states.

**If you need service**

Keep your receipt, delivery slip or some other appropriate payment record to establish the warranty period should service be required. If service is performed, it is in your best interest to obtain and keep all receipts. Service under this warranty must be obtained by contacting CDL at the addresses or phone numbers below. Obligations for service and parts under this warranty will be performed by CDL in Canada. Products features or specifications as described or illustrated are subject to change without notice.

Les Équipements d'Érablière CDL  
257 Route 279  
St-Lazare, Québec, Canada  
G0R 3J0  
(418) 883-5158

CDL USA  
3 Lemnah Drive  
St. Albans, VT, 05478  
(802) 527-0000