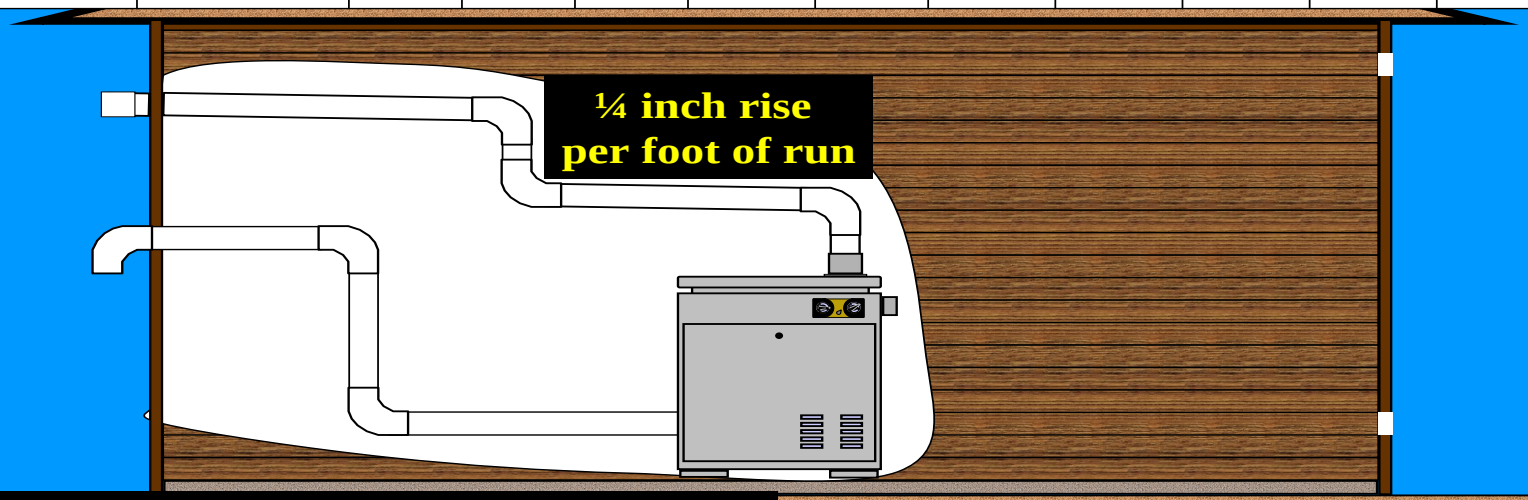
HiE2 Start Up and Service Procedure

Start up

Please review ventilation before proceeding any further. If there is a total of more than 16 feet of ventilation going into the heater and exhausting from the heater along with 5 elbows, we must have a minimum of 5 inch Schedule 40 PVC for ventilation.

Venting: Two Pipe Side Wall

Model	Pipe Size inches	Number of Elbows									
		1	2	3	4	5	6	7	8	9	10
		Total Length of Pipe in Feet									
350	4”	61	50	39	27	16	NA	NA	NA	NA	NA
	5”	225	211	197	184	170	157	143	130	116	103

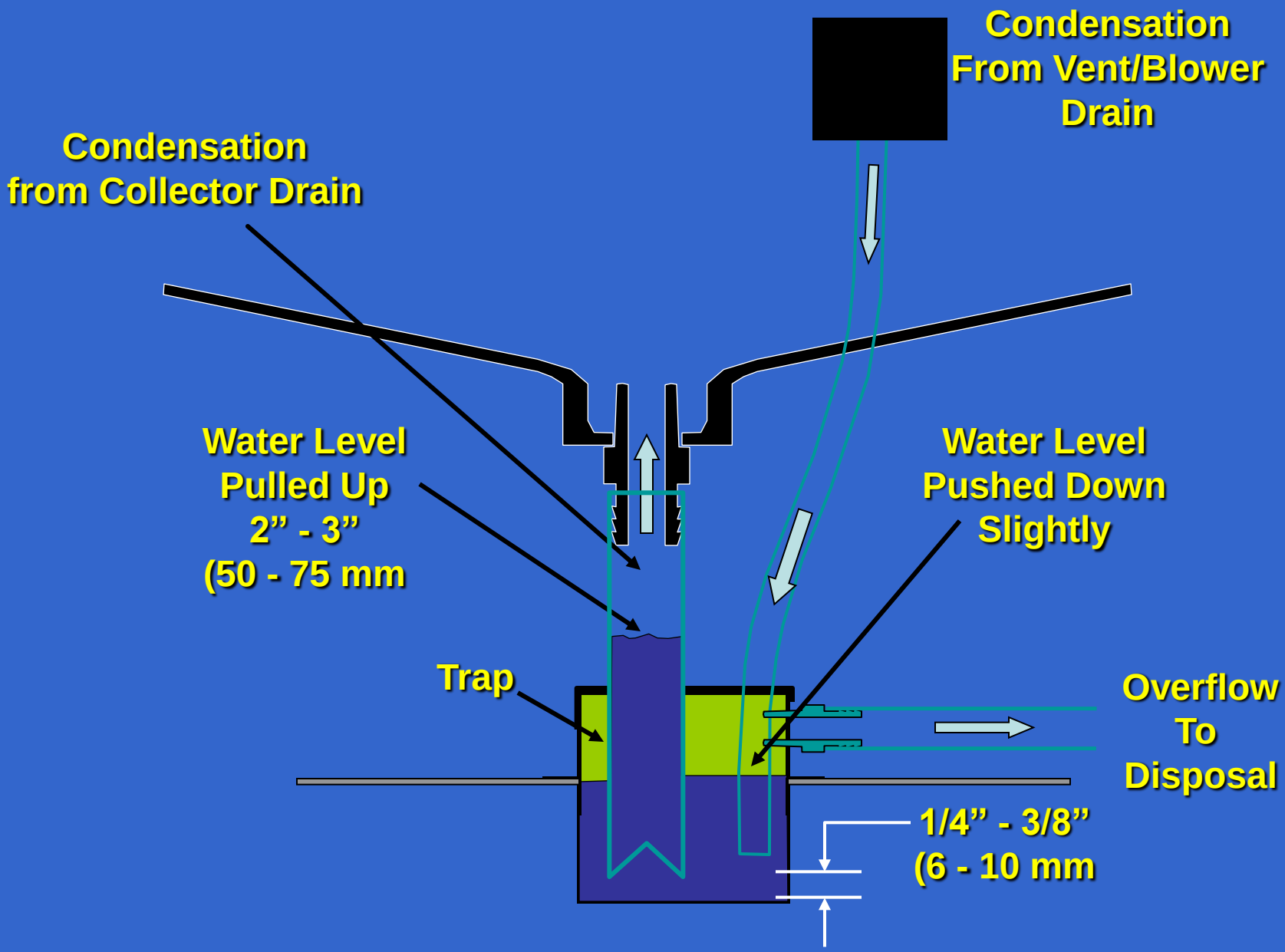


Vent MUST NOT be combined with any other appliance


This is now a 1 1/2 inch pipe and will destroy this heater

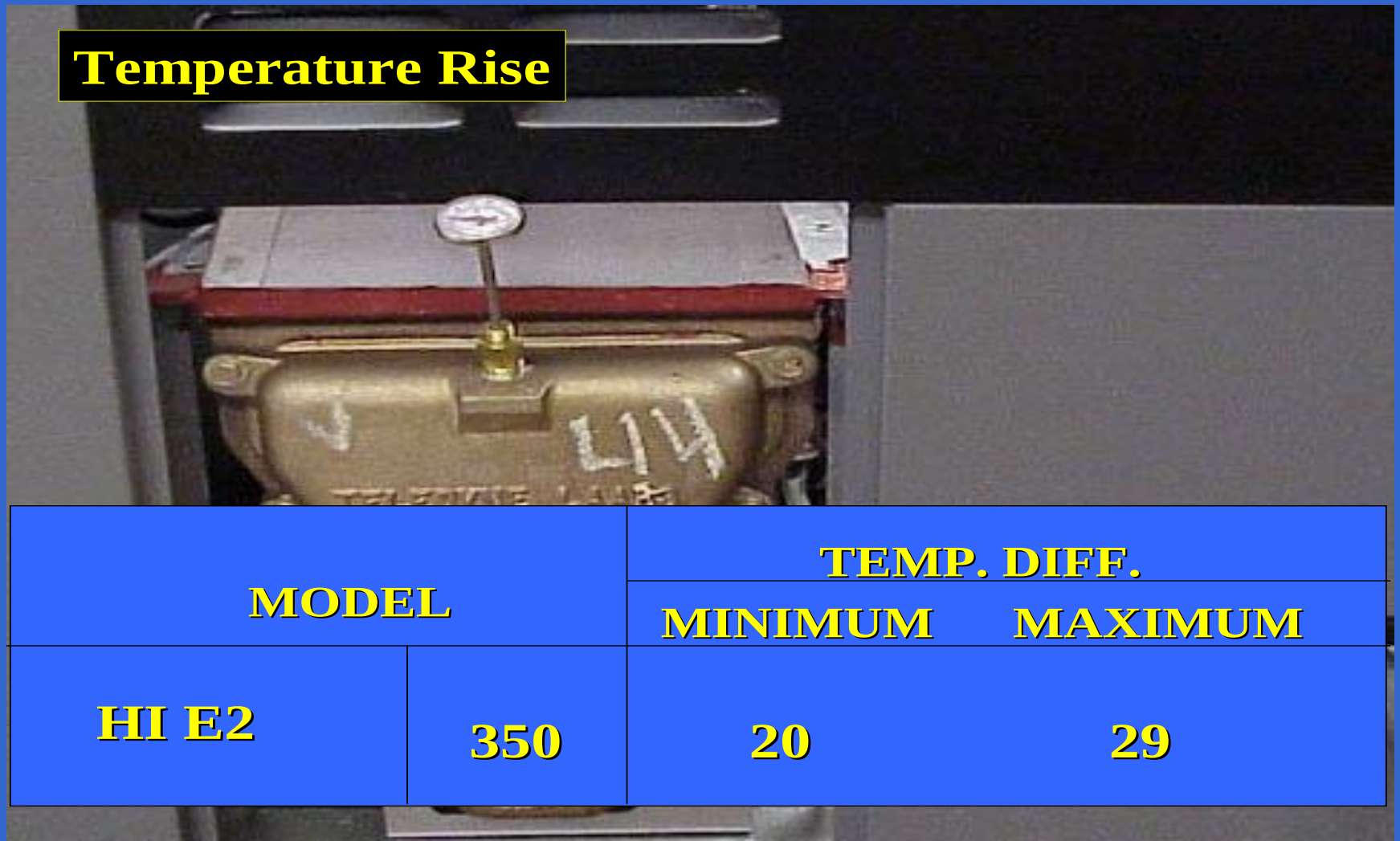
Please do a visual check for the filter inside the air intake. The condensation trap must be filled with limestone and water (must be primed), and that the back hose is connected to the bottom of the combustion chamber into the condensation trap.


WARNING
RISK OF ELECTRIC SHOCK
DO NOT OPEN


Condensation
From Vent/Blower
Drain
Condensation
from Collector Drain
Water Level
Pulled Up
2” - 3”
(50 - 75 mm
Water Level
Pushed Down
Slightly
Trap
Overflow
To
Disposal
1/4” - 3/8”
(6 - 10 mm

Temperature Rise Test to Test GPM and Efficiency

Please take the temperature rise on the top of the rear header. You will need a Pete's plug and a thermometer to do this test. We are testing the difference between the water temperature going into the heater and on its last pass out of the heater. We do this to ensure that we have the correct amount of water flowing through the heat exchanger. This allows us to dial in the maximum efficiency and life of the heater. If we have too much water flowing through the heater our temperature rise will be low, causing excessive condensation, corrosion and poor efficiency. If we don't have enough water flowing through the heater our temperature rise will be high, causing over heating and destruction of many metal components.



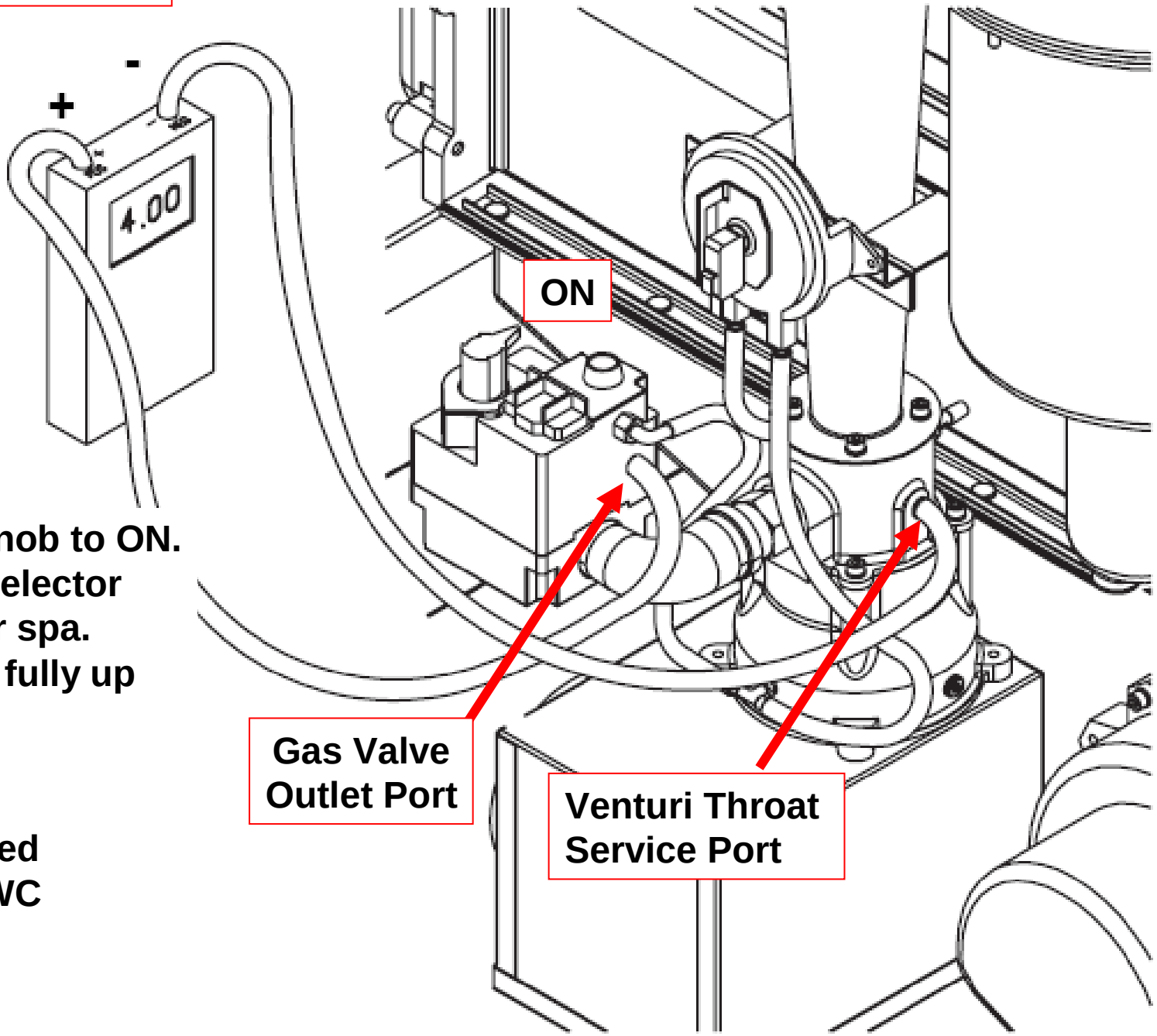
MODEL		TEMP. DIFF.	
		MINIMUM	MAXIMUM
HI E2	350	20	29

Venturi Combustion Flow System

Verifying proper operation of the combustion flow system has two aspects - air flow and gas flow. Air flow is checked by measuring pressures at service ports on the venturi. Gas flow is checked by evaluating venturi pressures plus the regulator offset pressure and the gas orifice size.

In a venturi flow system the difference between various pressures is far more important than their "gauge" value relative to the room. The *gas pressure offset* and the *gas orifice pressure differential* are especially important concepts. The following sections illustrate these and related information.

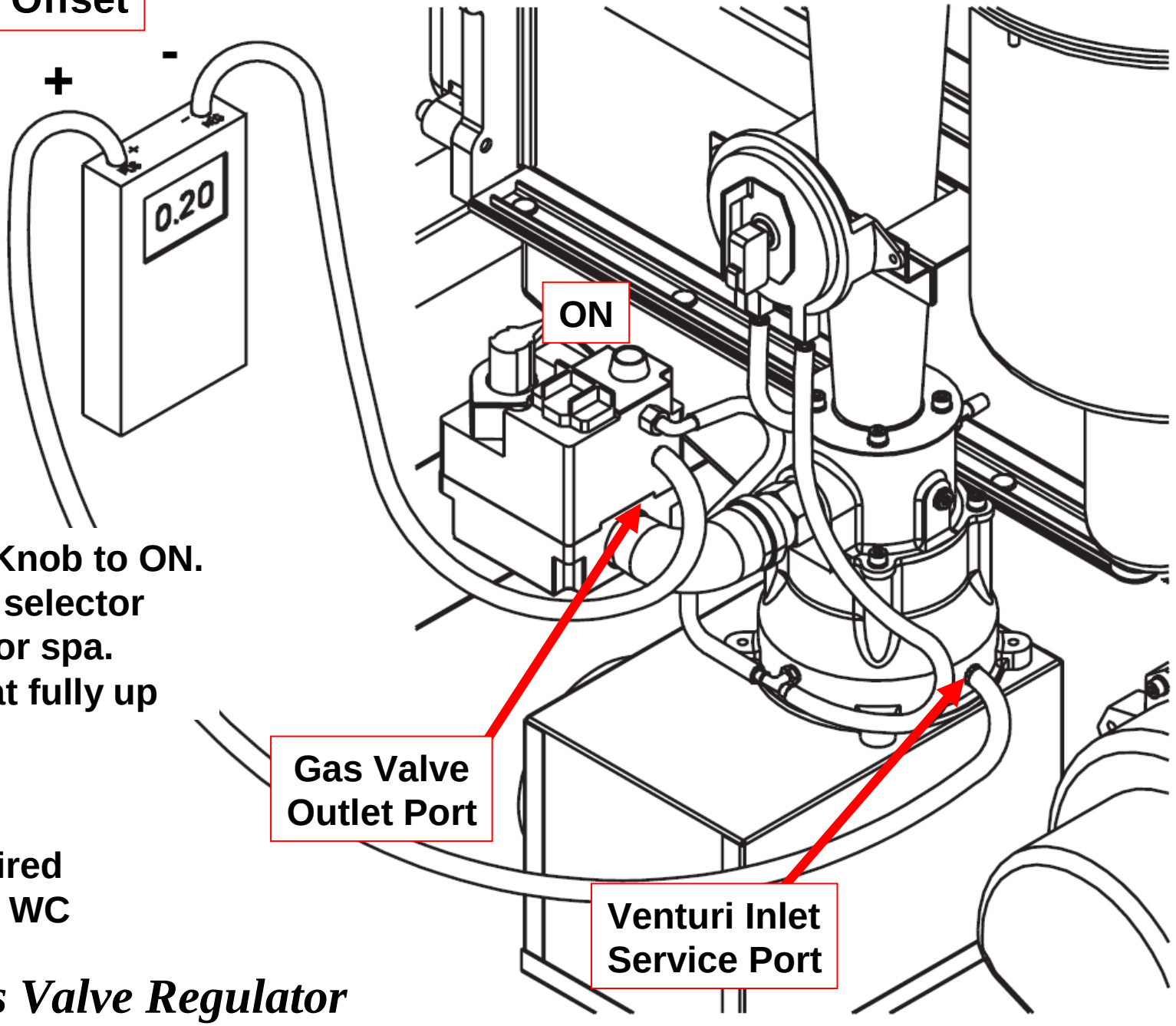
Gas Orifice Differential



Set Gas Valve Knob to ON.
Set thermostat selector switch to pool or spa.
Turn thermostat fully up

Burners Fired
4.0 ± 0.3” WC

Gas Pressure Offset



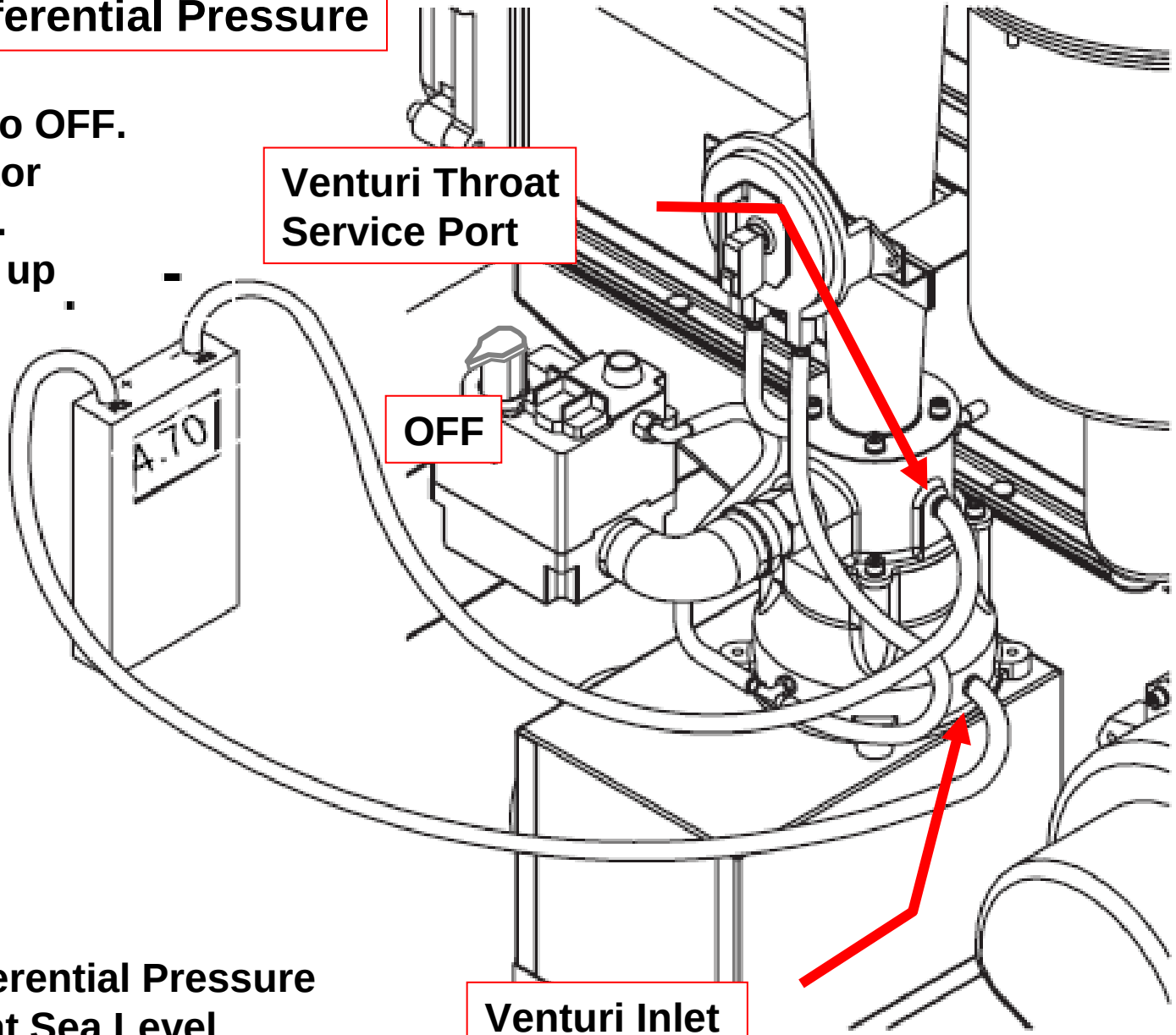
Set Gas Valve Knob to ON.
Set thermostat selector switch to pool or spa.
Turn thermostat fully up

Burners Fired
0.2 ± 0.1” WC

Adjust Gas Valve Regulator

Unfired Venturi Differential Pressure

Set Gas Valve Knob to OFF.
Set thermostat selector switch to pool or spa.
Turn thermostat fully up



Booklet Has Wrong picture

Unfired Venturi Differential Pressure
4.7 ± 0.3" WC at Sea Level

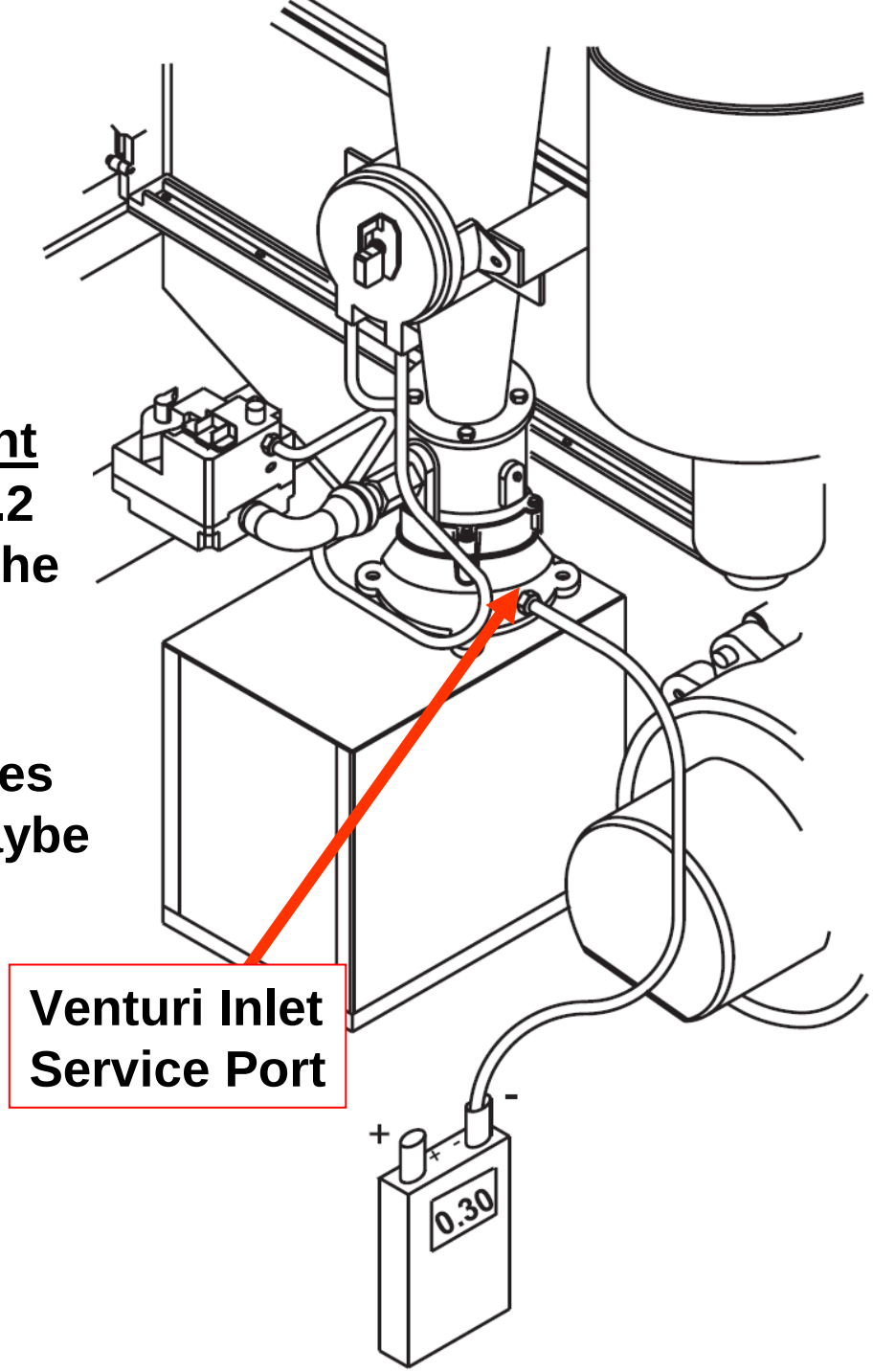
Adjust Blower Speed

Combustion Air Flow

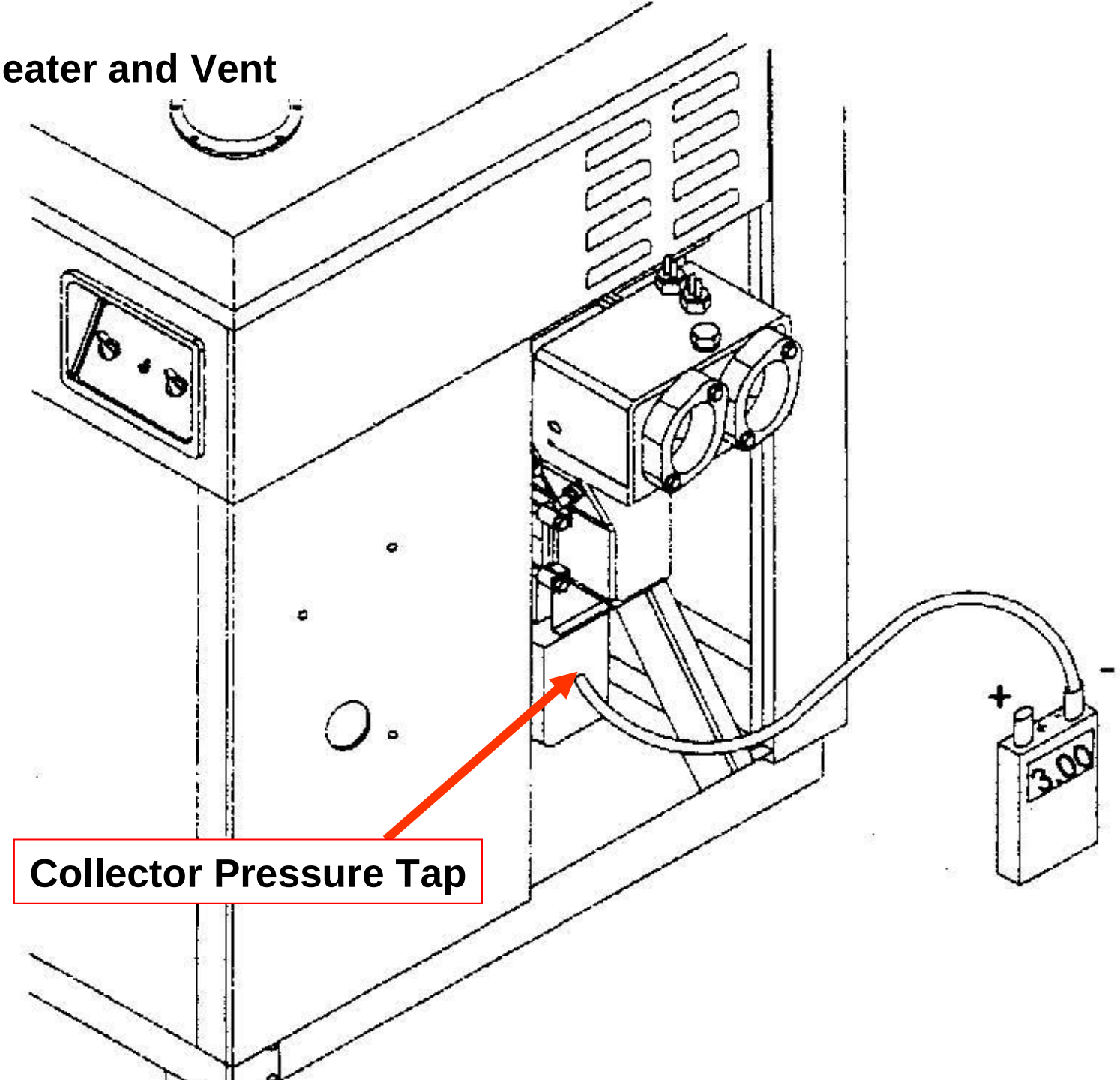
Venturi Inlet Pressure Measurement

Pressure should be 0.2 to 0.6” WC *less* than the ambient pressure.

More negative indicates restricted air flow, maybe a dirty filter pad.



Flow in Heater and Vent



Maintenance

Please do a visual check of the air filter, condensation trap, and flame (through site glass) every two months. Your air filter should be relatively clean. If it has a concerning amount of dirt built up on filter, please replace. Check your flame through the provided site glass. If you notice your flame is bright orange, then we are not burning properly, and we need to take the combustion tests provided in the earlier section. I highly recommend removing the internal by-pass and doing a visual check on the brass rod. It is a great indication of what may be happening inside the copper exchanger.

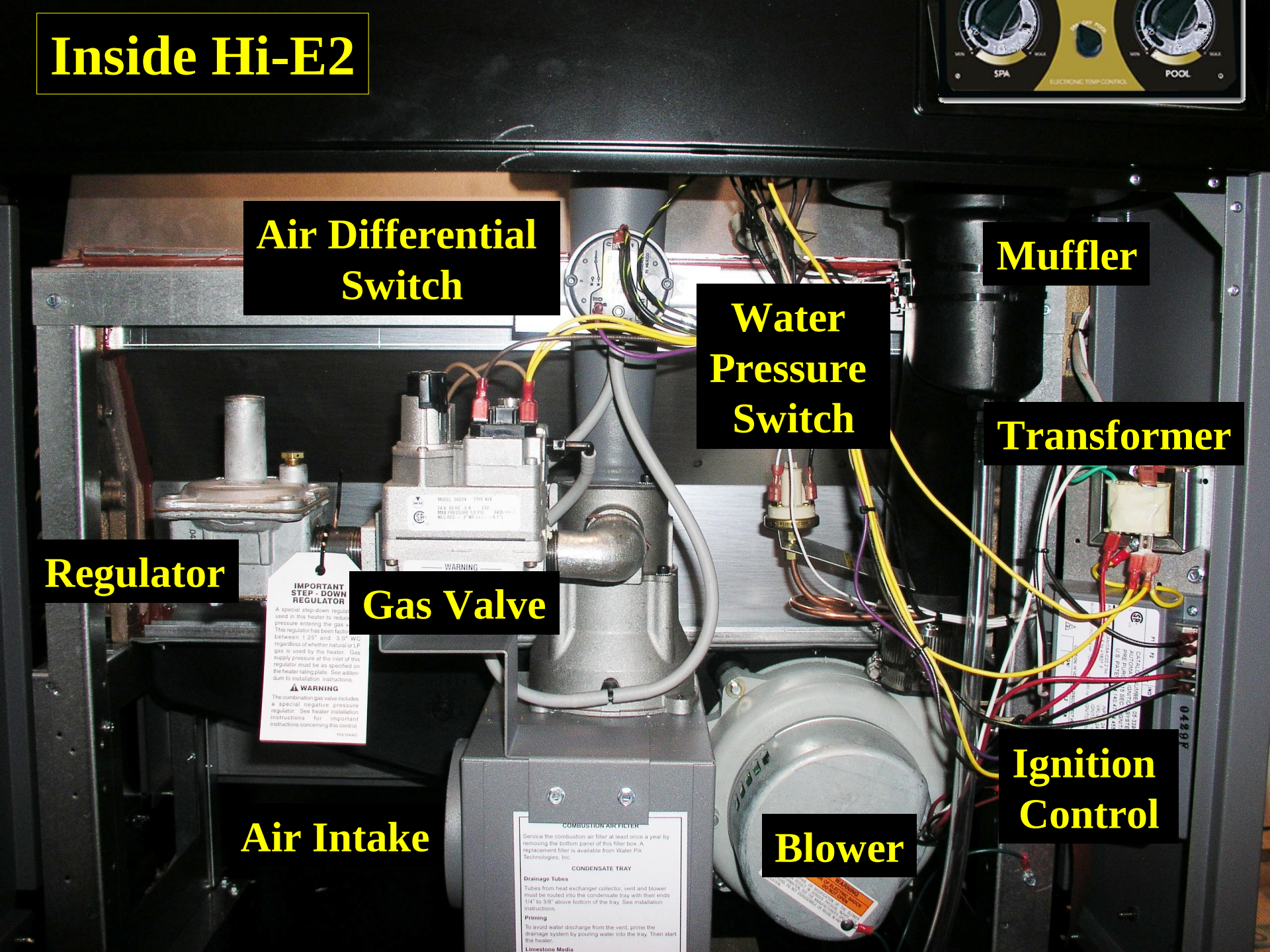
The last and most important visual check is the condensation trap. Please check and see if your limestone is extremely discolored or dissolving. If your limestone is extremely discolored, even after you move it around, please replace. We need fresh limestone to neutralize the acid in the condensation. It is critical to see if all your plastic drain tubes are attached and functioning. You need to remove the back tube and stick something skinny into the black nipple it was attached to. This is to ensure we do not have anything clogging the condensation from draining. Return the back tube to the black nipple and do a visual check when heater is fired to ensure condensation is draining. I recommend taking a temperature rise test every other month to ensure proper water flow.


No Backhose
Insert something skinny up the black nipple to clear any blockage
Limestone needs to be changed
Missing drain hose

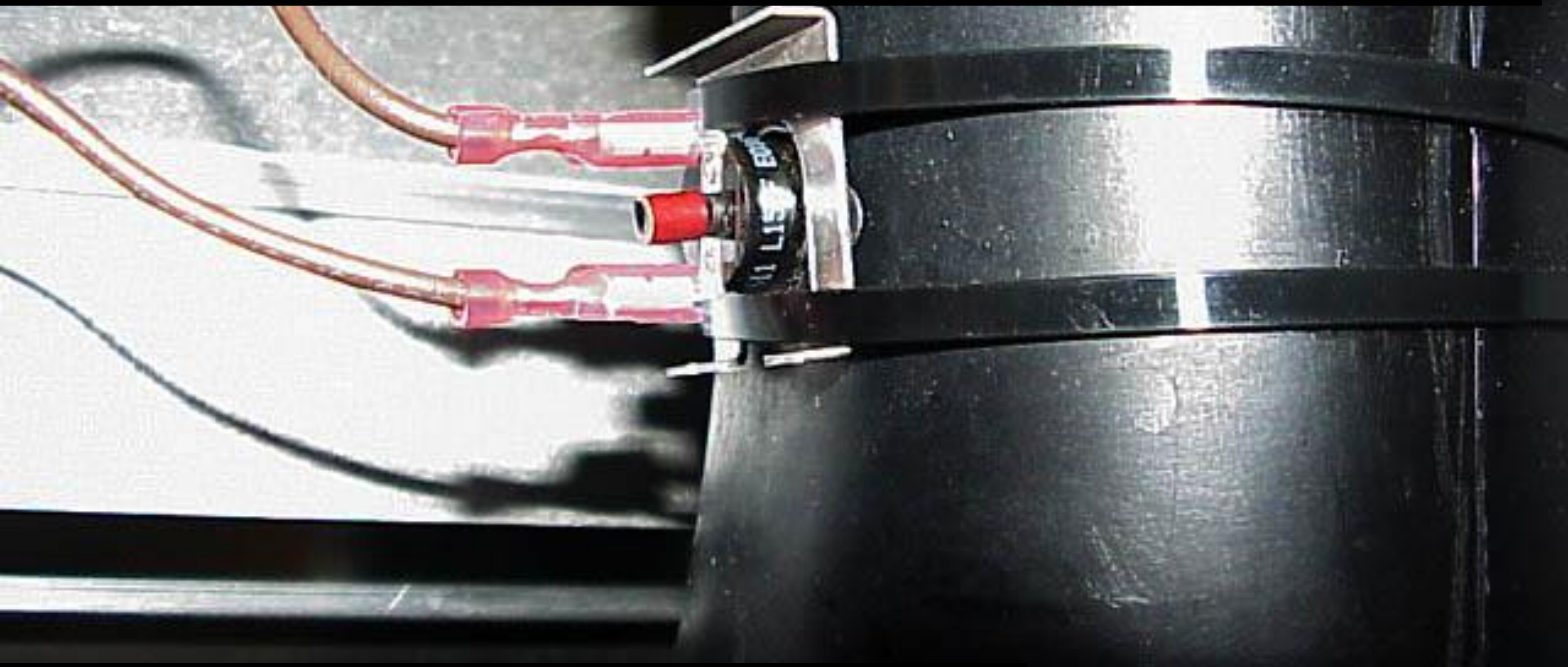

IT IS VERY IMPORTANT TO BOND THIS HEATER. ATTACH BONDING GRID HERE.
IL EST TRES IMPORTANT DE METTRE UNE PRISE A LA TERRE POUR CE CHAUFFE-EAU. ATTACHER LA GRILLE DE MISE A LA TERRE ICI.
1120 PR 330 PSI @ 23°C ASTM


The start of a
condensation trap
problem

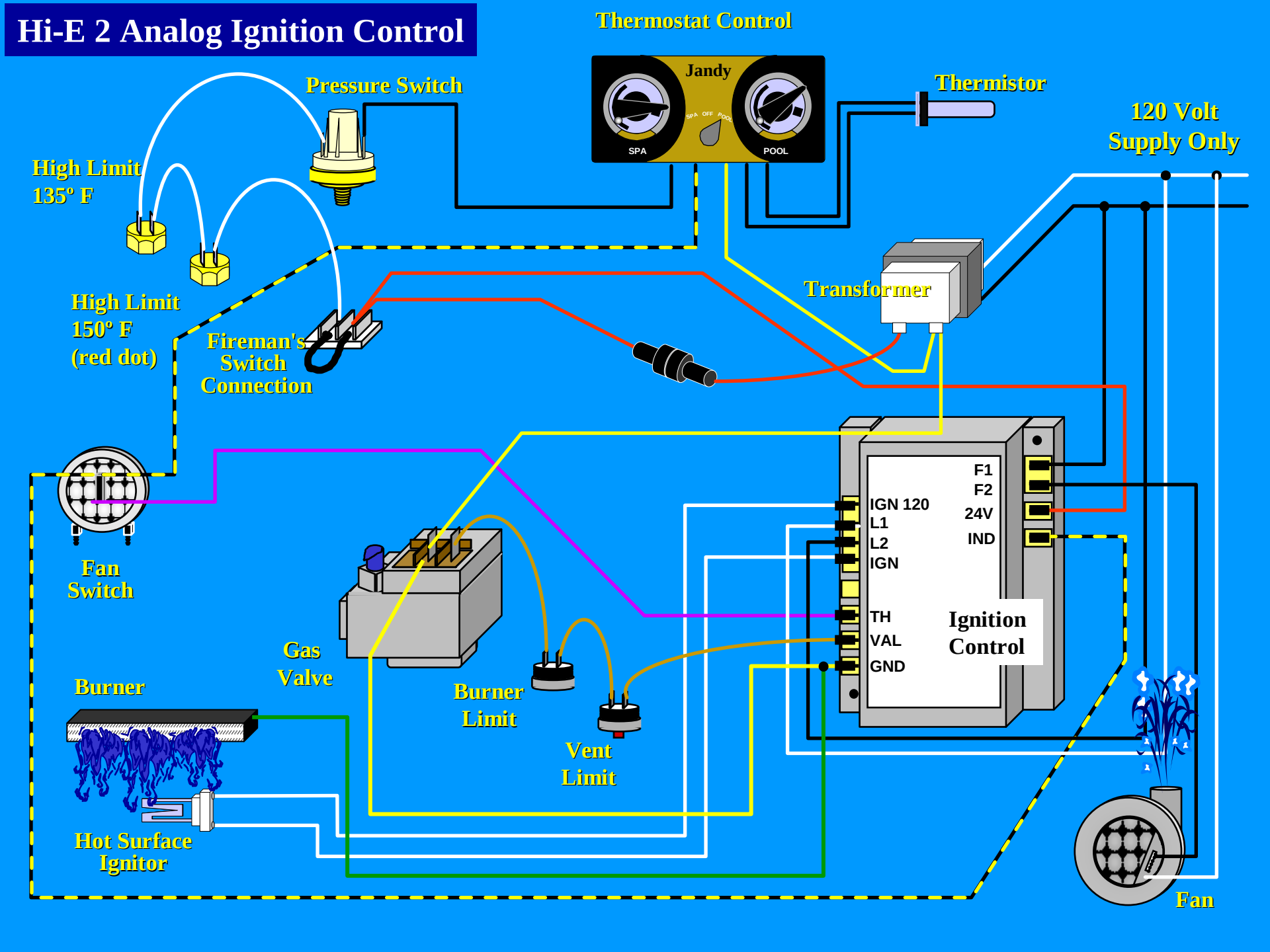

The result of a condensation trap problem unresolved
Hi-E2
Laars
POOL

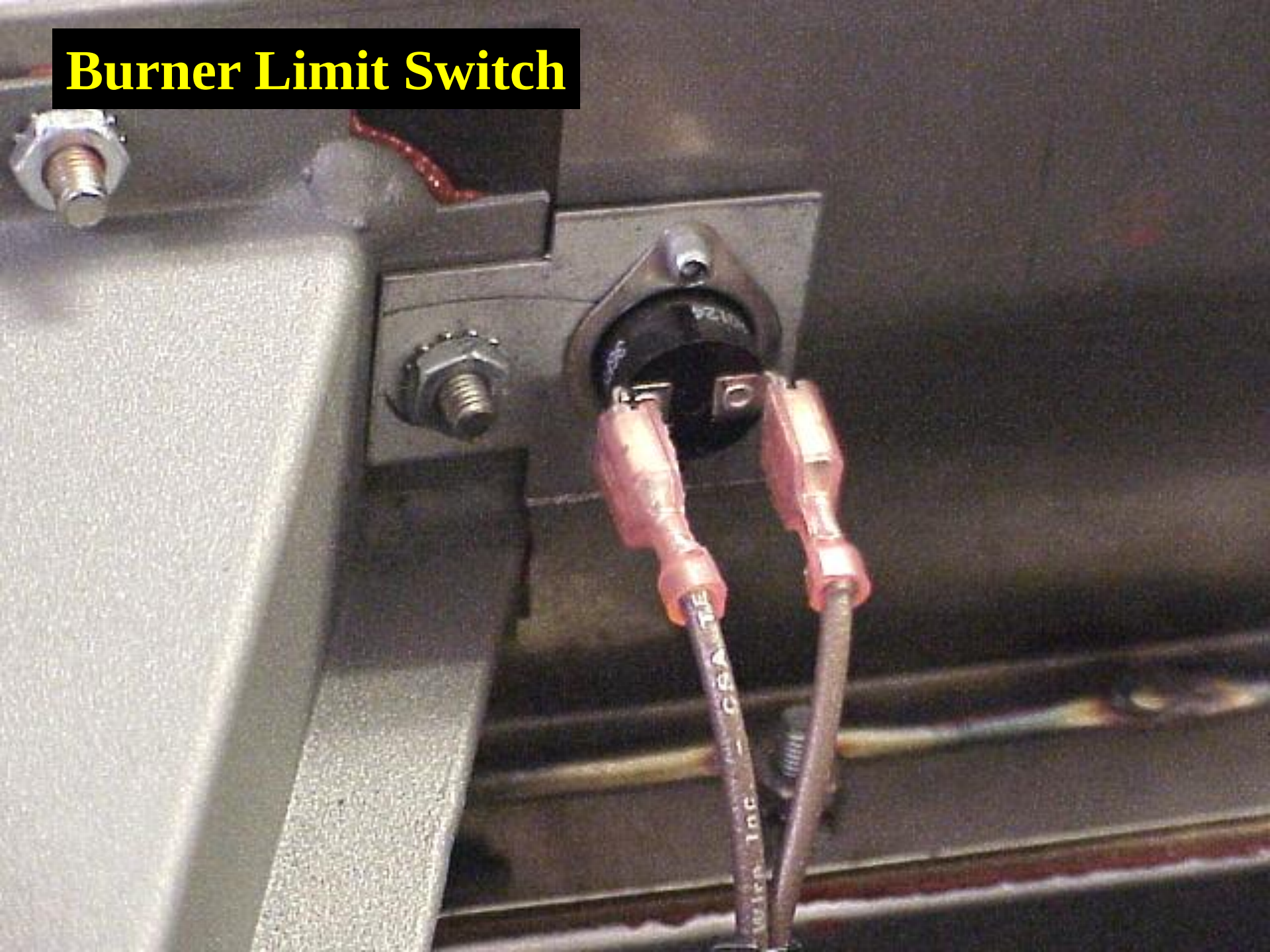

Inside Hi-E2
Air Differential Switch
Water Pressure Switch
Muffler
Transformer
Regulator
Gas Valve
Ignition Control
Air Intake
Blower
SPA
POOL
IMPORTANT STEP - DOWN REGULATOR
WARNING
COMBUSTION AIR FILTER
CONDENSATE TRAY
Drainage Tubes
Priming

Please note, exhaust vent limit and burner limit are after the ignition control and before the gas valve. This will allow the igniter to glow and it will allow the ignition control to send 24 volts to the gas valve, but it will not make it if one of these two limits are open.



R0309000 = 155 Exhaust Limit Switch
R0461600 = 185 Exhaust Limit Switch


Hi-E 2 Analog Ignition Control
Thermostat Control
Jandy
SPA
OFF
POOL
Pressure Switch
Thermistor
120 Volt
Supply Only
High Limit
135° F
High Limit
150° F
(red dot)
Fireman's
Switch
Connection
Transformer
Fan
Switch
Gas
Valve
Burner
Burner
Limit
Vent
Limit
Hot Surface
Ignitor
IGN 120
L1
L2
IGN
TH
VAL
GND
F1
F2
24V
IND
Ignition
Control
Fan


Burner Limit Switch

Burner Assembly

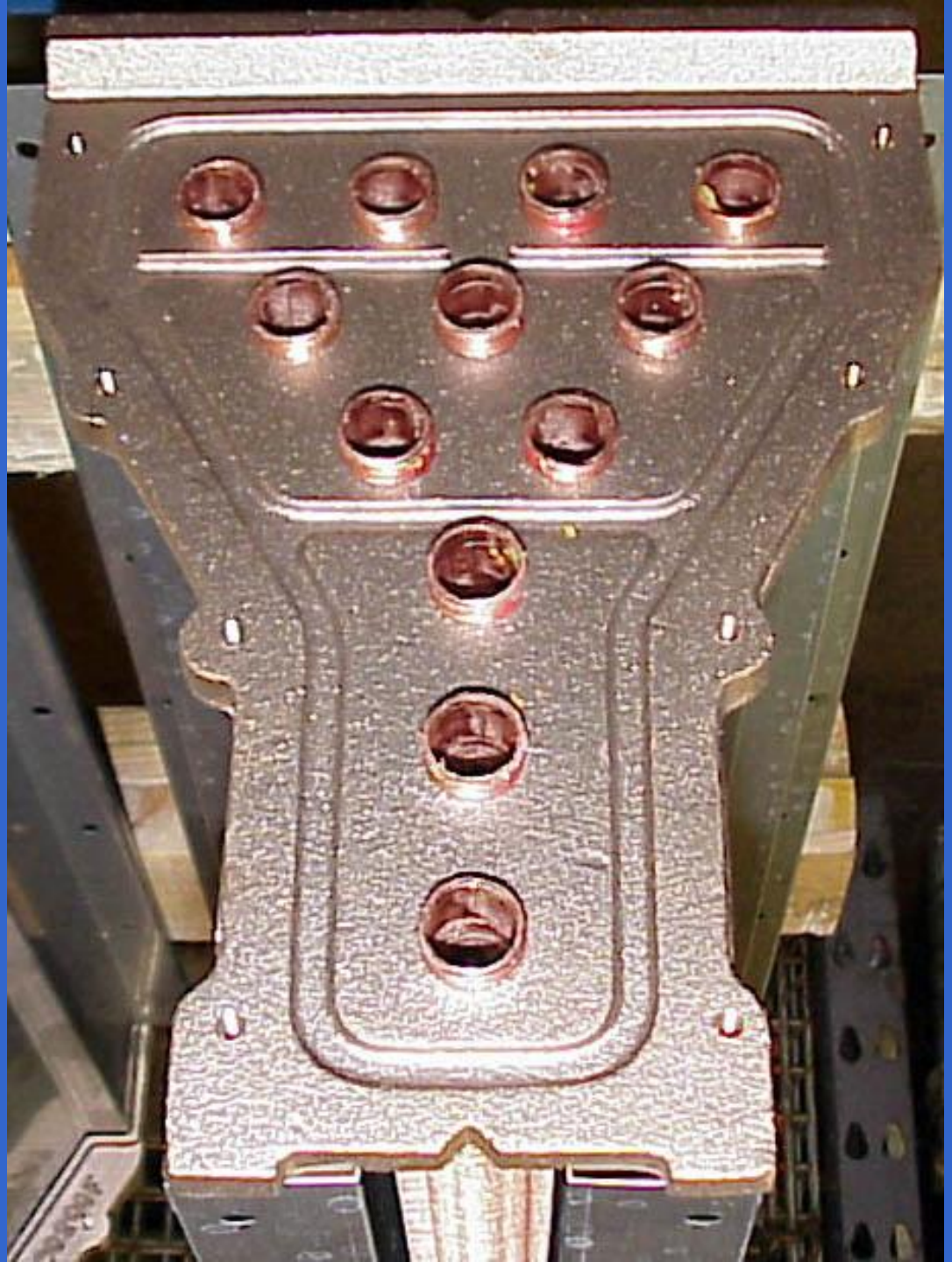
Ferecoloy

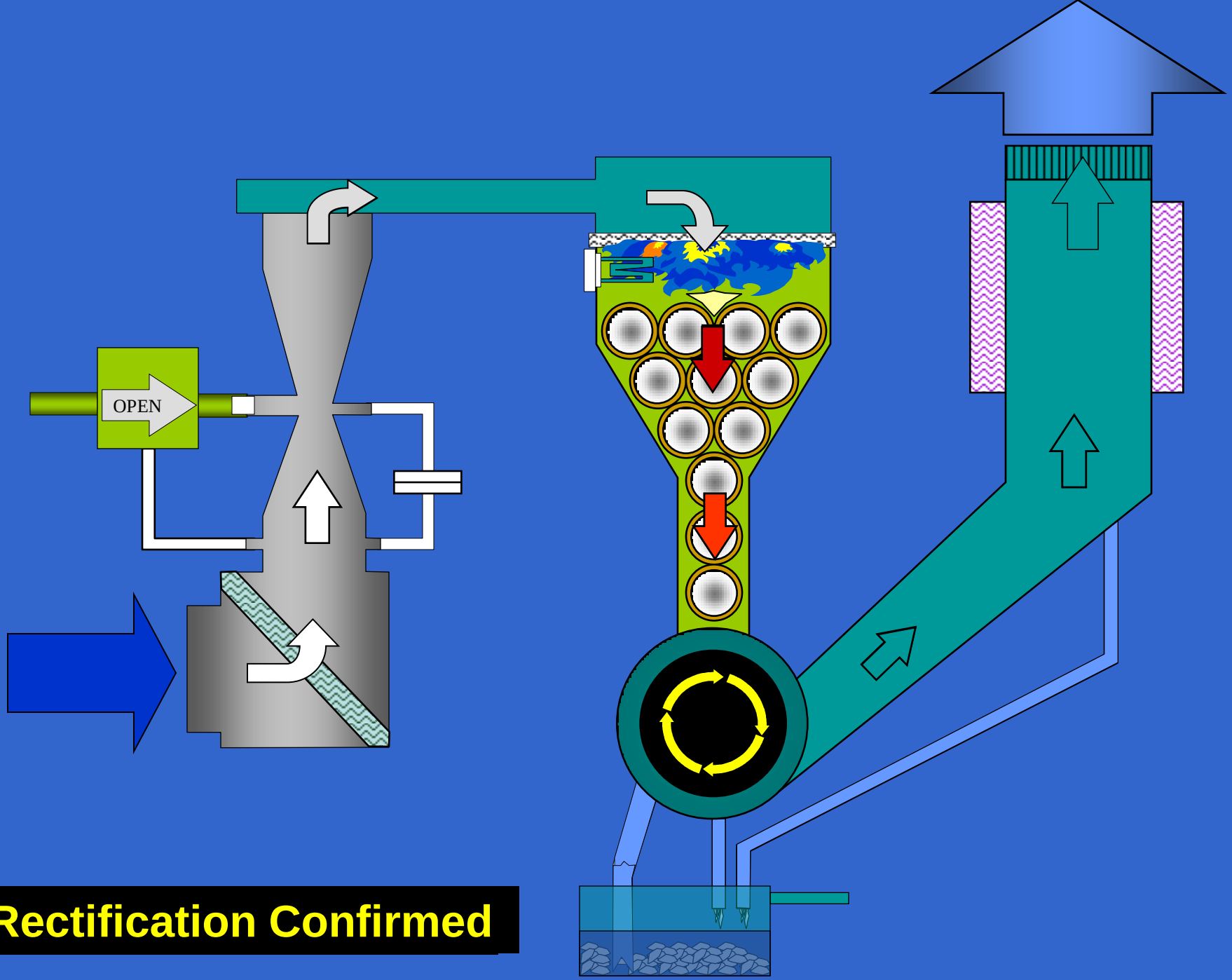
Damaged burner, noticed the warped frame of the burner.

Heat Exchanger

Damaged heat exchanger

V12 - 4 pass Heat Exchanger





Rectification Confirmed

HiE2 Maintenance Schedule

Limestone **Filter** **Temp Rise**

X	Please Change / Agitate Every Two Months and Record Date	X	Please Change/ Clean Every Two Months and Record Date	Please Take Temp Rise Every Visit