RETRIEVER II—CONDENSATE AND STEAM

Installation Manual

NATIONAL COMBUSTION CO., INC.
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The Retriever II: Purpose

The purpose of the RETREIVER II for Condensate & Steam is to recover heat and steam remaining in condensate returns in order to generate hot potable water. When the heat and steam in condensate is not sufficient to heat enough hot water, the RETRIEVER II for Condensate & Steam will boost hot water recovery through utilizing live steam from a High Pressure Steam Boiler. What's so important about the Retriever II *is that condensate is still used during a live steam boost*.

The Retriever II: Sequence of Operation

1. When hot domestic water is drawn from the Retriever II, incoming cold water replaces it and the temperature decreases.

2. When the temperature dips *below* the set point programmed on the control, the bypass solenoid valve will close—blocking condensate from returning directly to the condensate return tank—and the condensate solenoid valve will open-forcing condensate into the Retriever II's lower coil for condensate.

3. If the temperature continues to drop either because there is not much condensate or if a lot of domestic water is being used, the steam solenoid valve will open allowing live steam from a high pressure boiler to enter into the Retriever II's upper coil for steam. The condensate coil will continue to accept condensate.

4. When the temperature of the water in the tank reaches the set point, all solenoid valves, except the bypass solenoid valve, will close. No steam or condensate will circulate through the coils of the Retriever II.

5. The vinyl and polyurethane insulation jacket allows less than 1/2 degree per hour standby loss.

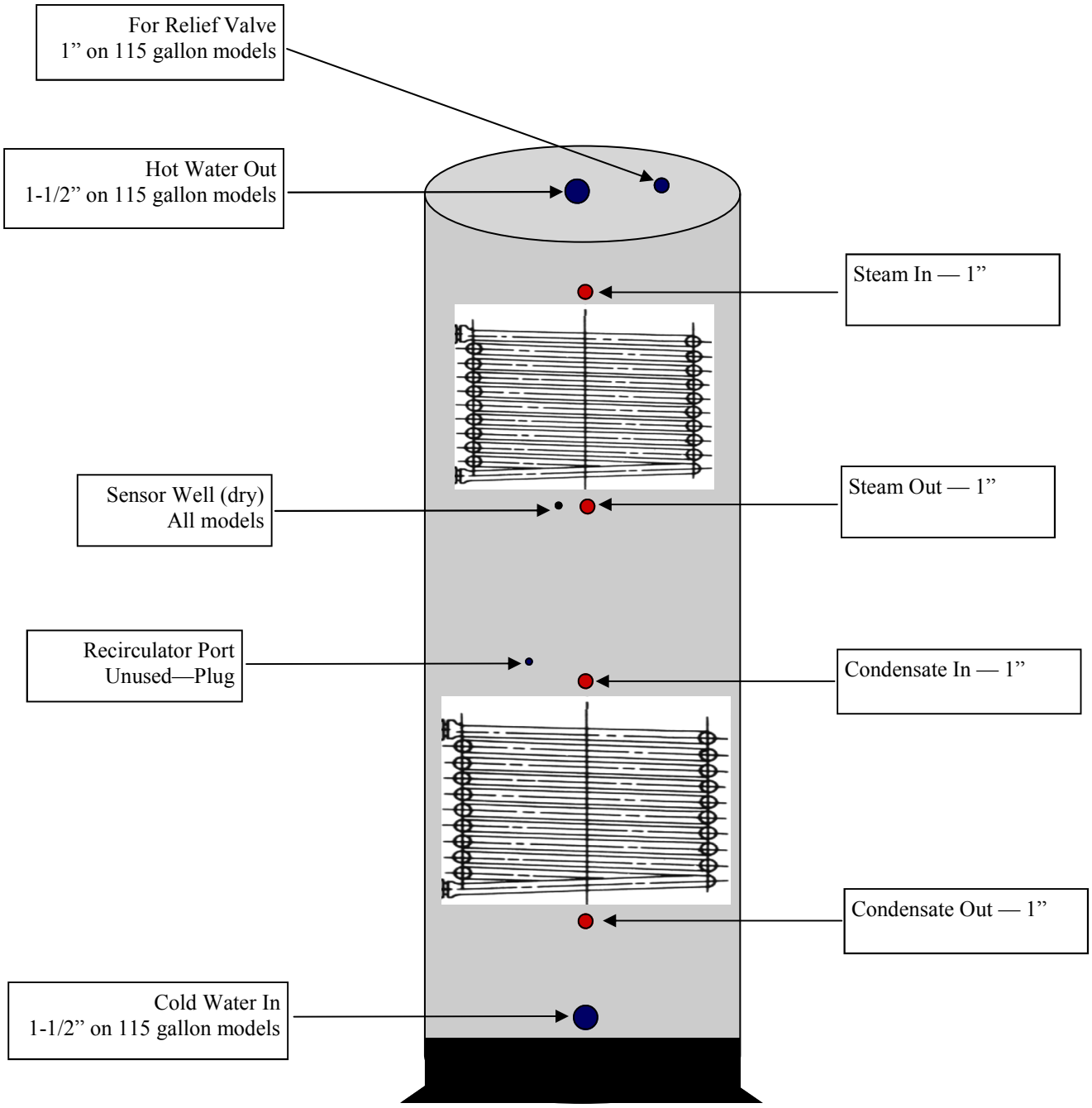
Frequently Asked Questions

Q: Do I need steam traps on the heat exchanger outlets?

A: The surface area of the Retriever II's coils is oversized for most applications in laundries and Drycleaning plants. Steam traps are usually not necessary because all of the steam will be condensed upon exiting the coils.

Q: If I cool down my condensate, won't that make my boiler work harder?

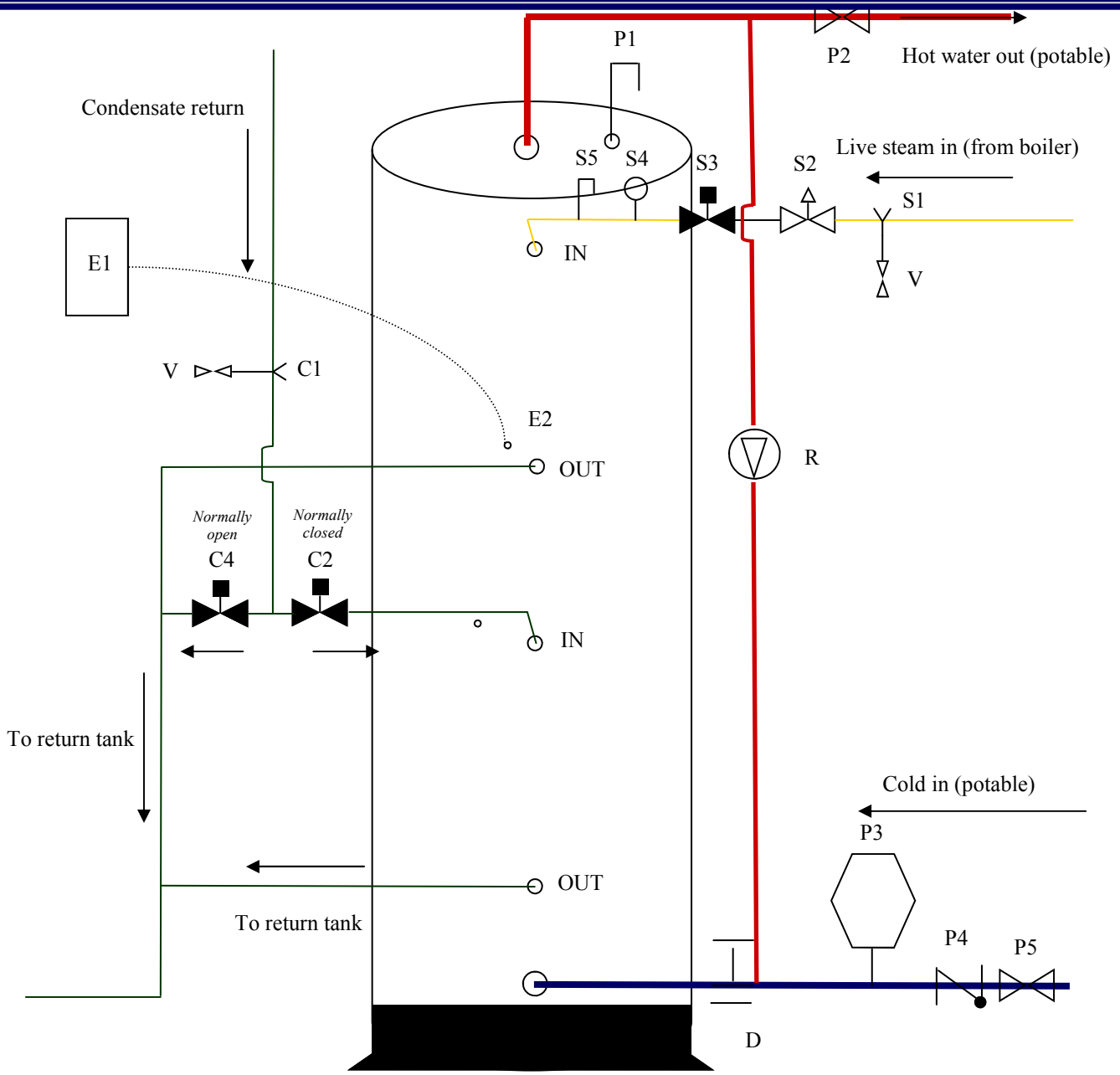
A: Probably. But you recover 970 BTU's per pound of latent heat. Moreover, steam that vents out of a condensate system is pure waste. Also, by using the condensate to heat hot water you're doing without a separately fired hot water heater, which will have significant draft and standby losses.



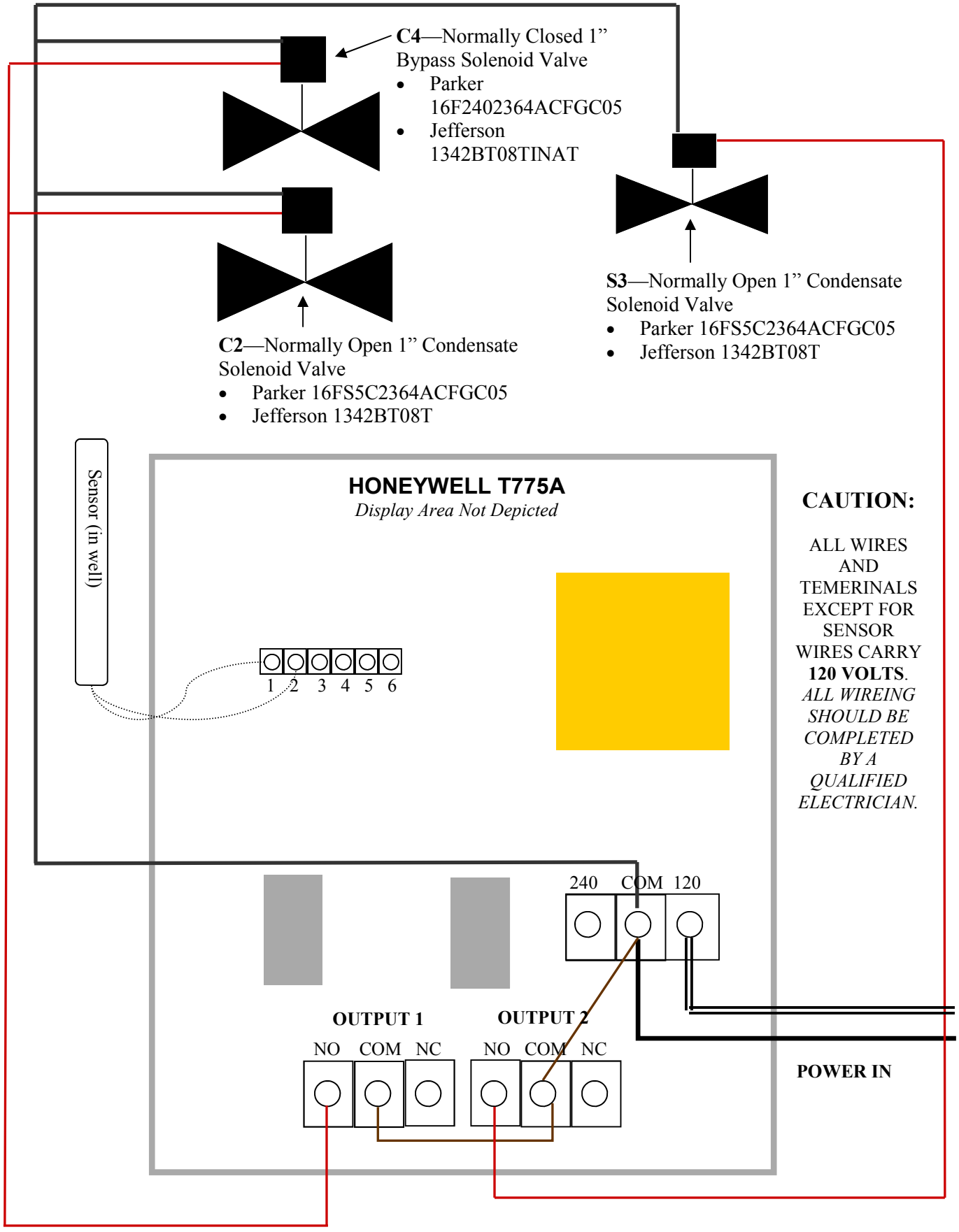
Get the feel of your **Retriever II**:

- Blue connections are potable water side connections
- Red connections are non-potable boiler steam or condensate connections.
- Black ports are dry wells for installation of control sensor.

Note: This diagram is not exactly to scale.



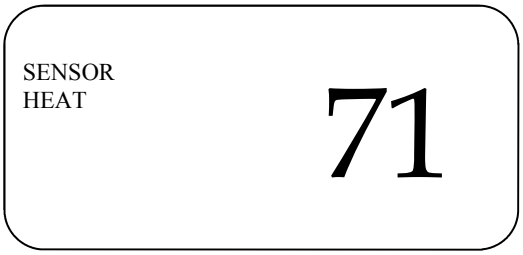
Potable Side Parts	Live Steam Side Parts	Condensate Side Parts	Other Parts
P1. 40XL T&P Relief Valve (included)	S1. 3/4” Y-strainer (included)	C1. 1” Y-Strainer (included)	E1. Honeywell T775A control (included)
P2. Ball Valve (not included)	S2. Steam Pressure Reducing Valve (included)	C2. 1” NC Condensate Solenoid (Parker 16FS5C, Jefferson 1342BT08T)	E2. Sensor for Honeywell T775A (insert into dry well)
P3. Expansion Tank (optional)	S3. 3/4” NC* Steam Solenoid (Parker 12FS5C, Jefferson 1342BT06T)	C4. 1” NO* Condensate Solenoid Valve (Parker 16F240, Jefferson 1342BT08INAT)	R. Bronze recirculator pump (optional). Install on 1/2” or 3/4” line.
P4. Water Check Valve (not included)	S4. 60 # Pressure Gauge (included)	*NC = Normally Closed *NO = Normally Open	V. 3/8” Blowdown Valves—Quantity of 2 (included)
P5. Ball Valve (not included)	S5. 15 # Steam Relief Valve (included)		D. Drain Valve


C4—Normally Closed 1" Bypass Solenoid Valve
• Parker 16F2402364ACFGC05
• Jefferson 1342BT08TINAT
S3—Normally Open 1" Condensate Solenoid Valve
• Parker 16FS5C2364ACFGC05
• Jefferson 1342BT08T
C2—Normally Open 1" Condensate Solenoid Valve
• Parker 16FS5C2364ACFGC05
• Jefferson 1342BT08T
Sensor (in well)
HONEYWELL T775A
Display Area Not Depicted
1 2 3 4 5 6
CAUTION:
ALL WIRES AND TEMERINALS EXCEPT FOR SENSOR WIRES CARRY 120 VOLTS. ALL WIREING SHOULD BE COMPLETED BY A QUALIFIED ELECTRICIAN.
240 COM 120
OUTPUT 1
NO COM NC
OUTPUT 2
NO COM NC
POWER IN

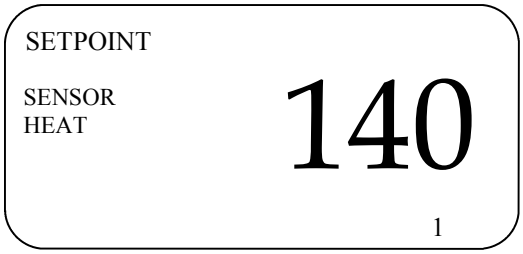
Setting the Control

Before powering up the control, wire the control completely to the solenoid valves as diagrammed. Before powering the system, check both the potable system and the steam and condensate system for leaks.

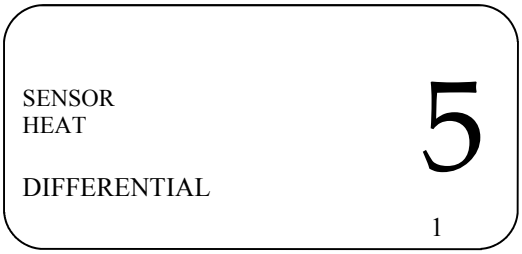
1. Power the control. Immediately hit the **SELECT** button once. You will see the following display. The temperature displayed is the temperature registered by the sensor, which should now be installed in the tank well.



2. Press the **SELECT** button again. You will see the following display. The temperature displayed is the condensate set point. This is the maximum temperature of water you want. Press the up or down arrow keys under **SET** to set the set point to the desired value. In many applications this is 140º. The '1' displayed below the set point temperature tells you that this is for stage 1, or for the condensate stage. Use the arrow keys to set the desired temperature. Press **ENTER** when done.

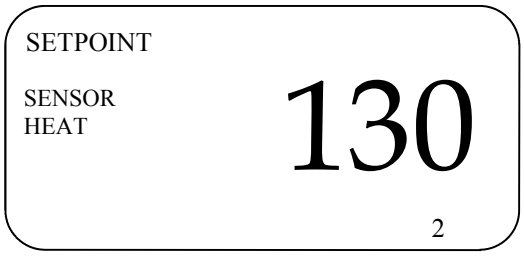


3. Press the SELECT button again. You will see the following display. The number displayed is the differential. This is the number of degrees under the set point at which the condensate system, or stage 1, is activated (i.e. the bypass solenoid closes, the condensate solenoid opens, and condensate enters the lower heat exchanger). 5 is the standard and recommended setting. Use the arrow keys to set the desired number. Press **ENTER** when done.

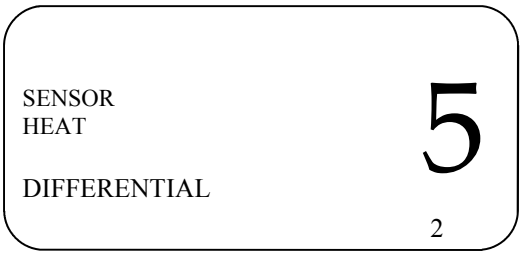


Continue instructions on following page.

4. Press the **SELECT** button again. You will see the following display. The temperature displayed is the steam set point, or stage 2 set point. This is the minimum water temperature you can live with. This is the temperature that the live steam boost will be used to raise the temperature of the potable water in the tank. The '2' displayed below this set point tells you that this is for stage 2, or the steam stage. Usually, this should be set between 10 and 20 degrees lower than the condensate (stage 1) set point). Use the arrow keys to set the desired temperature. Press **ENTER** when done.



5. Press the **SELECT** button again. You will see the following display. The number displayed is the differential for stage 2. This is the number of degrees under the set point for stage 2 at which the steam system, or stage 2, is activated (i.e. steam solenoid opens). 5 is the standard and recommended setting. Use the arrow keys to set the desired number. Press **ENTER** when done.



6. Press **SELECT**. You are now done! The basic display will show the sensor temperature. The 'STAGE ENERGIZED' will tell you what the control is doing. If you see '1', then the condensate system is on. If you see both '1' and '2', that means that both the condensate system and the steam system is on. If you see '2' on without '1', the control has not been wired correctly.

Problem	Cause	Solution
Water in tank exceeds set point temperature	1) Sensor is not positioned properly 2) Sensor is not wired properly 3) A solenoid valve is stuck open 4) Sensor is malfunctioning. 5) Hot water is stacking at top of tank.	1) Check sensor, use thermally conductive puddy. 2) Check wiring of sensory, check Honeywell recc. for type of wire. 3) Clean or rebuild solenoid valves. 4) Replace sensor. 5) Install recirculation loop.
Tank uses too much live steam from a steam boiler, hot water recovery is not a problem.	Stage 2 set point is too close to stage 1, or stage 2 differential is too low.	Decrease stage 2 set point, or increase stage 2 differential.
Stage 1 is energized, but piping leading to the lower heat exchanger is always cold.	1) Condensate valve is not opening. 2) Bypass valve is not closing. 3) Condensate strainer is clogged.	1) Clean or rebuild condensate valve. 2) Clean or rebuild bypass valve. 3) Blow down 1" Y-Strainer.
Water-side relief valve is blowing when no potable water is used.	1) Expansion tank missing or not sufficiently pressurized. 2) Tank is overheating.	1) Install tank or charge tank to street pressure. 2). See above.
Water-side relief valve is blowing when potable water is used.	High water pressure or water hammer coming from main supply.	Install a pressure reducing valve on the cold water side of the tank (expansion tank must also be installed).
Steam relief valve is blowing.	High steam pressure.	Adjust and/or replace steam pressure regulator.

General Maintenance Notes:

1. Blow down your Y-strainers. This will lengthen the life of your solenoid valves.
2. Recharge your expansion tank. If the expansion tank loses air pressure, it'll become useless. Make sure you charge your expansion tank so that the air pressure equals the water pressure coming from the street.
3. Make sure that the control stays dry. Like any electrical component, when wet it will malfunction and will likely be destroyed.
4. If you have a hard water situation, occasionally de-lime the tank utilizing a de-liming kit (available at most plumbing supplies).
5. DO call NATCO with questions. You can reach us at the following:

National Combustion Co., Inc.
104-11 180th Street
Jamaica, NY 11433
Ph: 718-291-8400
Fx: 718-291-6870
Email: technical@nationalcombustion.com

National Combustion Co., Inc. warrants the Retriever tank and integral heat exchangers for defects in materials and workmanship for **5** years after the certified date of installation **or 5 years after** the date of purchase, whichever can be proven. If the date of installation is greater than one (1) year past the date of purchase, the date of purchase + one (1) year will be the date for determining whether the Retriever tank and integral heat exchanger are warranted.

National Combustion Co., Inc. warrants all other components for defects in material and workmanship for 1 year of the date of purchase. The warranties of all other parts are subjects to the terms and conditions of the various manufacturers of those components.

National Combustion Co., Inc. reserves the right to inspect tanks claimed by the purchaser to be defective. Retriever tanks found to have defects in the tank or heat exchangers shall be replaced with the closest available current model. National Combustion Co., Inc. will provide a replacement, but is not liable for costs of (i) shipping replacement tanks, (ii) labor for installation of a replacement and removal and disposal of a defective tank, and (iii) inconveniences due to a defective water heater. National Combustion Co., Inc. is not responsible for damage caused by a leaking tank or heat exchanger. The Retriever tank should be positioned so that the flow of leaked water will not cause damage.

National Combustion Co., Inc. does not warranty Retrievers in the case or malfunctions caused by or in:
1) Improper installation or maintenance accorded to these printed installation instructions.
2) Retrievers that have been moved from their initial site of installation.
3) Water freezing in the tank or heat exchanger(s).
4) Retrievers for which the tank or heat exchanger(s) have been repaired without express authorization from National Combustion Co., Inc.
5) Excessive pressure due to extraordinary water pressure or failure to properly install and maintain an expansion tank.
6) Failure to maintain tank to prevent buildup of lime and scale.
7) Operation of the Retriever in a corrosive environment.
8) Usage of the Retriever tank and heat exchangers for purposes other than heating water for potable use.
9) Flood, fires, wind, or lighning.

THIS WARRANTY IS NOT-TRANSFERABLE AND IS FOR THE BENEFIT OF THE ORIGINAL PURCHASER ONLY.

IMPORTANT:

To certify an installation date, call, write, or email National Combustion Co., Inc, with the following information:

Name of Purchaser
Address of Installation
Name of Dealer Purchased From
Name of Contractor Responsible for Installation
Serial Number

All correspondence to the National Combustion Co., Inc. warranty department can be addressed to the following:

National Combustion Co., Inc.
104-11 180th Street
Jamaica, NY 11433
warranties@nationalcombustion.com
Ph: 718-291-8400 Fx: 718-291-6870