

## **Bruest Catalytic Heater Startup Summary**

- 1) Pre-Heat Unit - provide power to the heater's electrical element.
- 2) Keep Pre-Heat on of at least 15 minutes. (If unit is wet... pre-heat of 30 minutes or longer until dry)
- 3) Activate safety valve to allow fuel gas into the heater after pre-heat period... keep electricity on!
- 4) Read gauge pressure downstream of the safety valve for 3.5" WC pressure?
- 5) If the safety valve does not open, wait 10 minutes and repeat step 3. Unit should get hot!
- 6) Leave electricity on for 10+ minutes after lighting to saturate heating over entire pad and drive out moisture.
- 7) Disconnect power

**Note 1:** Heating element must reach 300-400 degrees for safety valve hold open. Fuel gas is typically 40-60 degrees and will cool interior of heater before it starts to create heat. Turning off electricity too soon can result in a loss of interior heat and take the process back to step 1.

**Note 2:** Allow time for combustion heat to spread across entire heater face. Wait at least 10 minutes after lighting for heat to stabilize before disconnecting electrical power. Older heaters may require extended time to stabilize heat due to lower catalyst pad efficiency and moisture saturation from wet environments.

**Note 3:** Do not forget to turn off the electrical element after unit is fully hot and burning properly. Leaving electricity on for extended times will shorten lifespan of electrical element.

## **Bruest Catalytic Heater Shutdown**

- 1) Shut off the gas supply to the heater. (If a Mertik is in use, turn dial to OFF)

## **Pressure Regulator Settings:**

- 1) Bruest heaters are designed to operate w/max pressure of 3.5" of water column at the fuel inlet.
- 2) It is ideal to measure pressure at back inlet close to heater. Add gauge test fittings if necessary or gauges.
- 3) Fisher 1301 Max Inlet = 6000 psig, Target Outlet = 20-50 psig
- 4) Fisher 912 Max Inlet = 50 psig, Target Outlet = 13.8" WC (0.5 psig)
- 5) A single 912 regulator with 20 psig inlet can service multiple small heaters, but larger heaters will each require individual 912 regulator.
- 6) Maxitrol Appliance regulator Max Inlet = 13.5" WC, Target Outlet = 3.5" WC

## **Appliance regulator selection varies depending on heater fuel consumption:**

- 7) < 30,000 BTU/hr. Heaters use Maxitrol RV20L, Max Inlet = 13.8" psig, Target Outlet = 3.5" WC
- 8) <60,000 BTU/hr. Heaters use Maxitrol RV47L, Max Inlet = 13.8" psig, Target Outlet = 3.5" WC
- 9) All Heaters can use Maxitrol R400S, Max Inlet = 13.8" psig, Target Outlet = 3.5" WC

## **Adjusting Pressure Settings:**

- 1) Adjust furthest downstream regulator while observing the manifold pressure. Add gauge test fittings if necessary or gauges.
- 2) When a 912 and Maxitrol regulators are used in series, it may be necessary to tweak both the 912 and Maxitrol to achieve the proper outlet pressure.
- 3) A manometer is the preferred and most accurate low-pressure measurement device, but a gauge works if a manometer is not available.
- 4) The heater pad should receive 3.5" of water column at the fuel inlet.
- 5) Excess fuel can result in unburnt fuel and less clean emissions, but it will also produce a bit more heat.
- 6) The heaters can operate within window of 1.5 – 3.5" WC.
- 7) If less heat is desired the fuel inlet pressure can be turned down as far as 1.5" WC
- 8) Thermostats will automatically switch between high and low "Fire" based on real time temperature measurements when properly tuned.
- 9) At 1.5" WC, fuel output is ~50% of rated.
- 10) At less than 1.5" WC low fuel pressure will starve heater and will trip off!

## Troubleshooting

<p><b>The Safety Valve Won't Open</b></p>	<ol style="list-style-type: none"> <li>1) Pre-Heat longer before lighting.</li> <li>2) Thermocouple connection into the safety valve is not functioning properly. Remove T/C from safety valve, clean end with eraser or light sandpaper and reconnect firmly pressed into safety valve contact. Do not over-tighten the threads.</li> <li>3) Check the entire thermocouple for damage and inspect the safety valve. signs of rust, corrosion or discoloration are indicators that replacements might be needed.</li> <li>4) May require filtration upstream of entire fuel gas supply if moisture or impurities (oil or H<sub>2</sub>S) in natural gas streams are present. Even when "pipeline quality" gas is in use. Small orifices in Regulators and Safety valves cannot handle contamination. Sulfur is the worst enemy. Oil or other gunk getting into the Baso valve would be a problem and is a sign there's probably some of the same gunk into the heater.</li> </ol>
<p><b>Mertik Safety Valve Dial is Stuck</b></p>	<ol style="list-style-type: none"> <li>1) Mertik Safety Valve Dial can potentially lock the "ON" and "OFF" knob out of its full range of motion. This safety lock typically occurs after the device has tripped from a loss of heat.</li> <li>2) Remove thermocouple from the back of the Mertik and thread it right back in. Breaking the contact of the thermocouple resets the Mertik and should allow for the dial to operate once more.</li> </ol>
<p><b>Heater Was Hot... I Came Back to Find a Cold Heater!</b></p>	<ol style="list-style-type: none"> <li>1) Something has stopped fuel flow to the heater.</li> <li>2) Look for oils, particulate, Moisture forming H<sub>2</sub>SO<sub>4</sub> or junk accumulated in fuel line filter!</li> <li>3) Check pressures in and out of each regulator with manometer or pressure gauges. Adjust if necessary. Pressures set properly is very important. Add gauges or test Tees everywhere and verify pressures if necessary!</li> <li>4) Check low fire pressure setting on thermostat (1.25" to 1.5" WC). Lower settings could cause the fuel supply at low fire to be insufficient and starve unit of fuel. Increase thermostat's low fire pressure by 1/2" WC increments. (Ignore if you do not use a thermostat).</li> <li>5) Lowering the inlet fuel gas pressure below 3.5" WC by 1/2" WC increments may help heat source to migrate deeper into the heater body and closer to the thermocouple probe tip feeding signal back to open safety valve.</li> <li>6) Check for Thermocouple damage or a loose connection causing safety valve to close.</li> <li>7) Over time the catalyst in the pad will age from pipeline and ambient contamination... matter getting into and onto the heater pad over the course of time. Old heaters or heaters in harsh environments may require repair or replacement.</li> </ol>
<p><b>Replacement Parts</b></p>	<ol style="list-style-type: none"> <li>1) Often, a heater only needs a new filter, thermocouple and safety valve to remedy operational problems.</li> <li>2) Bruest recommend replacing those parts first in most cases.</li> </ol>
<p><b>Contact Local Representative for field service or parts</b></p>	<p><b>ANTEC CORPORATION</b> - Box 1609, North Bend, WA 98045  <b>Matthew A Davidson - President</b> <a href="mailto:Matthew@AntecCorporation.com">Matthew@AntecCorporation.com</a>  C: 206-660-1311, O: 425-888-9090  <b>Cindy Straka – Inside Sales &amp; Support</b> <a href="mailto:support@anteccorporation.com">support@anteccorporation.com</a>  O: 425-888-9090,</p>