

AFTERBURNER PROFILE

The afterburner is designed to start at the same time as the roaster. This is to get the afterburner prepared to consume the smoke produced during the roasting process. The typical afterburner will be started and attempt to reach it's operating temperature, typically 950-1200DegF and hold that condition, regardless if the roaster is empty or full of coffee beans.

The problem with typical afterburners is this is a waste of gas, money and pollution. If the roasting process isn't producing smoke, there is no need for the afterburner to be at the temperature for the burning off of the smoke.

The use of the Afterburner Profile system allows the operator to restrain the firing rate of the afterburner to only that which is needed during the roasting cycle. The purpose of any afterburner is to remove visible smoke from the exhaust stream. If the roaster isn't producing smoke, the afterburner doesn't need to be at such a high temperature.

The steps for measuring the roasting conditions and setting the variables in the control outputs for the afterburner do not have to be frequent or often. But those measurements must be initially monitored, and set, by the operator to make sure the goal of smoke elimination during the entire roasting process is achieved.

The following is the Afterburner Settings screen used to set the parameters that assures the roaster operator the system will operate at it's most efficient level while achieving the goal of smoke elimination.

Back		<h1>After Burner Settings</h1>			Roaster	
<		LOOK UP TEXT			Off	
BEAN						
123						
AB Over Temp		BEAN Temp AB START	AB Set Temp	AB Valve	AB Off TMR	
1234		123	1234	123	123	
1ST STAGE After Burner Settings		BEAN Temp 1	AB Set Temp 1	AB Valve 1	CAT IN AIR	
		123	1234	123	1234 123	
2ND STAGE After Burner Settings		BEAN Temp 2	AB Set Temp 2	AB Valve 2	CAT OUT CYCLONE	
		123	1234	123	1234 123	
3RD STAGE After Burner Settings		BEAN Temp 3	AB Set Temp 3	AB Valve 3	RECIRC BRNR BOX	
		123	1234	123	123 1234	
4TH STAGE After Burner Settings		BEAN Temp 4	AB Set Temp 4	AB Valve 4		
		123	1234	123		
COOLER STAGE After Burner Settings			AB Set Temp 5	AB Valve 5		
			1234	123		



-This button sets the alarm limit for the afterburner. Should the temperature be exceeded, the PLC will shutdown the afterburner, sound an alarm and notify the operator.



-When the system is started, the afterburner will ignite but stay at low/zero flame. When the system detects that beans have been dropped into the roaster, and the Bean temperature reaches this setting, the afterburner will go to it's initial setpoint and valve position.



-These are the initial afterburner setpoint and valve position settings. If the afterburner temperature goes above the setpoint, the burner is reduced towards zero. The afterburner cannot exceed the valve position. It sets maximum fire.

1ST STAGE After Burner Settings	BEAN Temp 1 123	AB Set Temp 1 1234	AB Valve 1 123
2ND STAGE After Burner Settings	BEAN Temp 2 123	AB Set Temp 2 1234	AB Valve 2 123
3RD STAGE After Burner Settings	BEAN Temp 3 123	AB Set Temp 3 1234	AB Valve 3 123
4TH STAGE After Burner Settings	BEAN Temp 4 123	AB Set Temp 4 1234	AB Valve 4 123

The afterburner will stay at its initial settings until the roaster bean temperature reaches the 1st STAGE BEAN Temp 1. At that point the afterburner will go to the set point and valve position assigned with the 1st STAGE.

The system will step through the stages of control for the afterburner based on the roaster BEAN temperature as long as the system has detected beans are still in the drum.

All these stages are progressive. The BEAN temperature that triggers the advancement to the next stage should be increasing values. As the beans get hotter, the more smoke is produced and the higher the temperature for the afterburner is required and the wider the gas valve for the afterburner should be allowed to open to enable it to reach that temperature.

COOLER STAGE After Burner Settings		AB Set Temp 5 1234	AB Valve 5 123
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-Some systems have the cooler tray exhaust going into the afterburner, for an initial amount of time, until the smoke is reduced because the beans are cooling. This is the settings for that scenario. Because there will be smoke still coming out of the roaster, and the smoking beans are dumped into the cooling tray, and the exhaust from the cooling tray is much cooler, there should be special adjustments to make sure the visible smoke is consumed by the afterburner and it doesn't unnecessarily run too hot or long.

As soon as the system detects the next load of beans are dropped into the drum, the profile for the afterburner starts again.

AB OFF TMR 123

When the roaster system is turned off, the afterburner will remain on for this set amount of seconds so that the last of the smoke from the drum is consumed, and then it will also turn off.