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BMS-73 I MANUAL

PLATINUM BMS-731  
Model SF731  
Platinum Burner Management System

# MANUAL

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**PLATINUM CONTROL TECHNOLOGIES**  
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For Manual updates,  
please visit [www.platinumcontrol.com](http://www.platinumcontrol.com)



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## WARRANTY STATEMENT

Platinum Control Technologies (PCT) warrants all its manufactured products to be free from defects in material and workmanship, under normal use intended for the product, for a period of twelve (12) months from the date of installation, not to exceed eighteen (18) months from the date of shipment.

The warranty does not cover damage to end devices.

The warranty shall be void for the following reasons:

1. If the product is installed or modified by personnel not trained by, or considered representatives of, Platinum Control Technologies.
2. If there is damage to the product caused by misuse.
3. If there is willful or intentional damage to the product.
4. If the product is neglected.
5. If the product is damaged or destroyed by Acts of God (i.e., hurricane, tornado, etc.).

Warranty repairs are FOB (Freight On Board) origin; the customer is responsible for shipping costs to Platinum's facility. All repairs are to be mailed to the below address:

Platinum Control Technologies, Technical Services Department  
2822 West 5th Street, Fort Worth, Texas 76107

If you have technical support questions, please contact 877.374.1115 or 817.529.6485 for help.

Onsite calls are subject to labor and travel charges to and from site.

## WARNING

- A. EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICE: STATUS OUTPUT RELAY K1.  
L'EXPOSITION A CERTAIN PRODUIT CHIMIQUE PEUX DEGRADER L'ETANCHEITE DE MATERIAUX UTILISES DANS LES COMPOSANTS SUIVANTS: STATUS OUTPUT RELAY K1.
- B. WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I DIVISION 2.  
AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS THE CLASSE I DIVISION 2.

REFERENCE DESIGNATION NUMERO DE REFERENCE	DESCRIPTION DESCRIPTION	TYPE OF PROTECTION TYPE DE PROTECTION
G6A-234P-ST-US 5DC (RLY1 on Micro board)	Relay	Sealed Device
G6AK-234P-ST-US 12VDC (RLTY1 on the Valve board)	Relay	Sealed Device



- C. EXPLOSION HAZARD - DO NOT REMOVE OR REPLACE FUSES OR PLUG-IN MODULES UNLESS POWER HAS BEEN DISCONNECTED OR THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATION OF FLAMMABLE GASES OR VAPORS.  
RISQUE D'EXPLOSION – COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX AVANT DE REMPLACER LES FUSIBLES OU LES MODULES.
- D. EXPLOSION HAZARD. DO NOT DISCONNECT THE EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.  
RISQUE D'EXPLOSION – AVANT DE DECONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.
- E. DO NOT OPEN THE PLATINUM BMS UNLESS THE AREA HAS BEEN DETERMINED TO BE NON-HAZARDOUS.  
NE PAS OUVRIR L'UNITE BMS PLATINUM SANS S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON DANGEREUX.
- F. RISK OF EXPLOSION - ANY SUBSTITUTION OF PARTS OR ASSEMBLIES MAY COMPROMISE SUITABILITY OF CLASSIFICATION, CAUSING INJURY OR DEATH.  
RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEU RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMENTS DE CLASSE I DIVISION 2.
- G. THE PLATINUM BMS IGNITION MODULE IS NOT RATED AND THEREFORE MUST BE MOUNTED IN AN UNCLASSIFIED AREA OR EXPLOSION PROOF CLASS I, DIVISION I ENCLOSURE.  
LE MODULE DE HAUT-VOLTAGE PLATINUM (HIGH VOLTAGE UNIT) DOIT ETRE INSTALLE DANS UN EMBLEMENT NON-CLASSIFIE OU DANS UNE BOITE ANTIDFLAGRANTE CLASSE I DIVISION 1.
- H. BEFORE BEGINNING THE INSTALLATION OR OPERATION OF A PLATINUM BMS, PLEASE READ THIS ENTIRE MANUAL.  
AVANT DE COMENCER L'INSTALLATION OU L'OPERATION DE L'UNITE BMS PLATINUM, IL EST IMPORTANT DE LIRE CE MANUEL ENTIEREMENT.

**NOTE**

All Platinum BMS systems are intended for oil and gas industry, direct and indirect natural draft fired heaters only, and are not to be used for residential or commercial buildings of any kind.



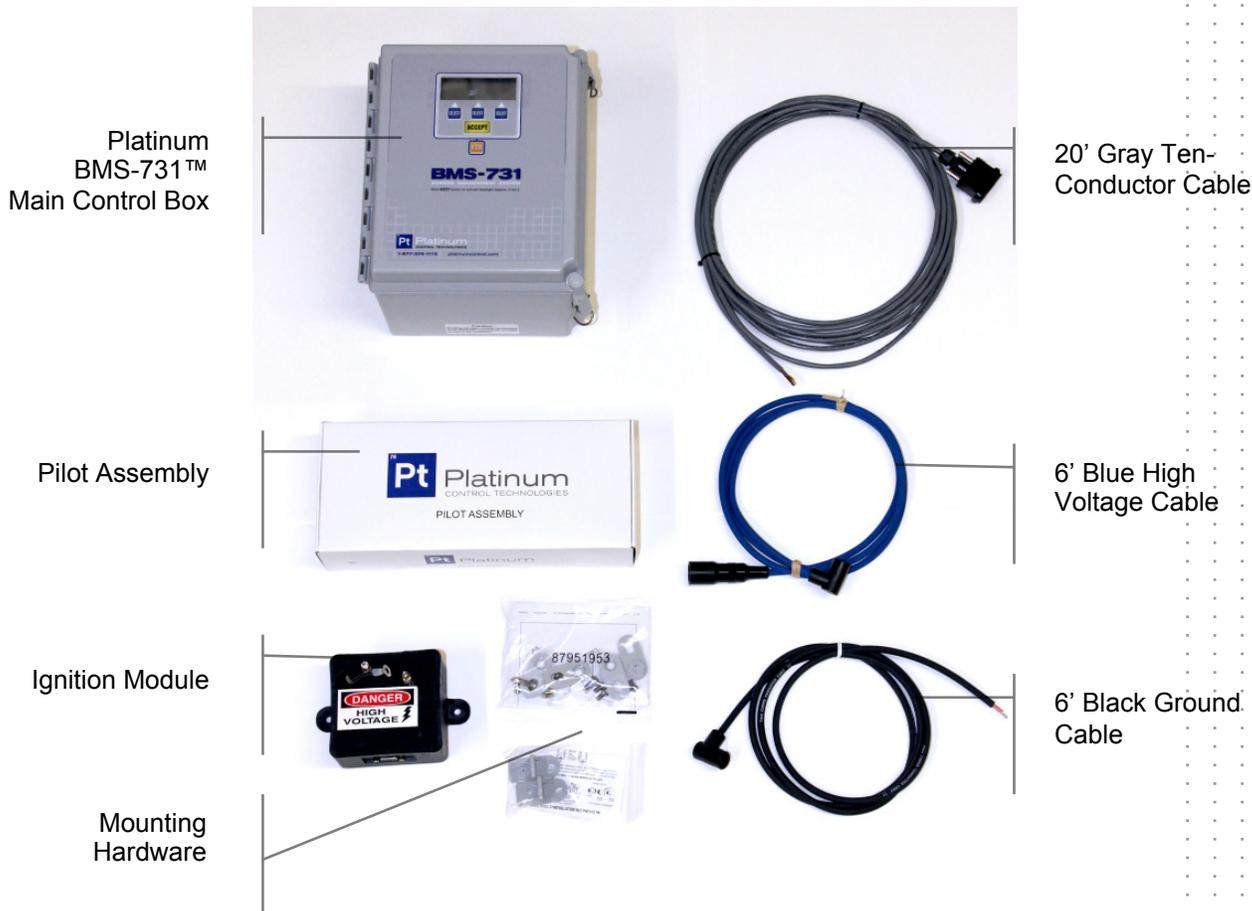


## COMPONENTS AND SPECIFICATIONS

### Shipping Box Contents

Upon receipt of shipping box, inspect the units for physical damage or missing parts, and become familiarized with the system.

Components that will be shipped with the Platinum BMS:



Optional components that may be shipped with the Platinum BMS:

- Anti-static bag for microprocessor boards
- Solenoid Valves

DO NOT install Solenoid Valves that are in excess of 14 Watts 24 VDC or below 1.4 Watts 24 VDC. Low watt solenoid valves are recommended for solar applications. Any substitutions of solenoid valves must be reviewed and approved by Platinum. Solenoid Valves outside these parameters will impair the operation of the system, potentially causing injury or death.

- 1000 ohm RTD or Type K Thermocouple

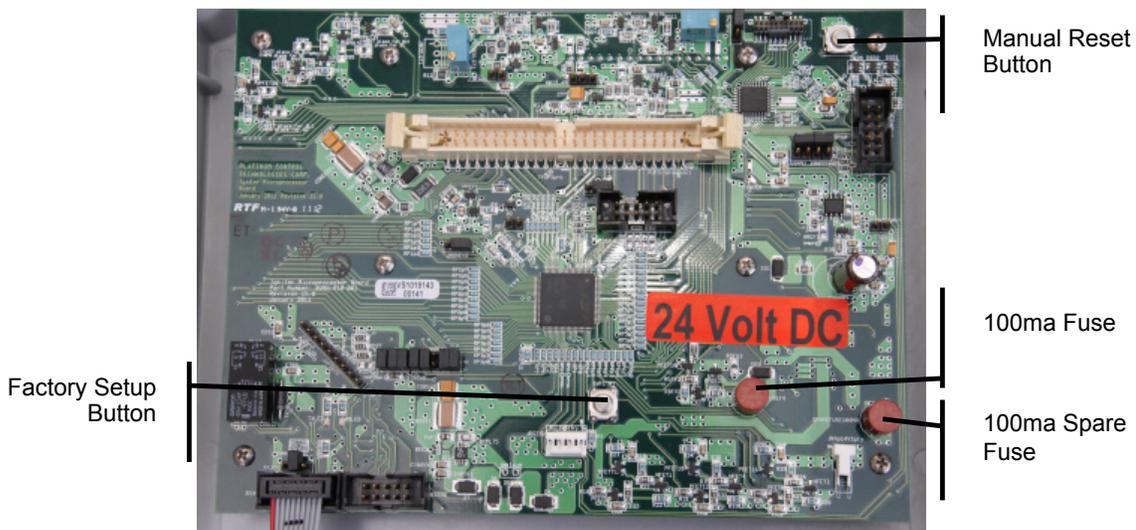


## Microprocessor Board

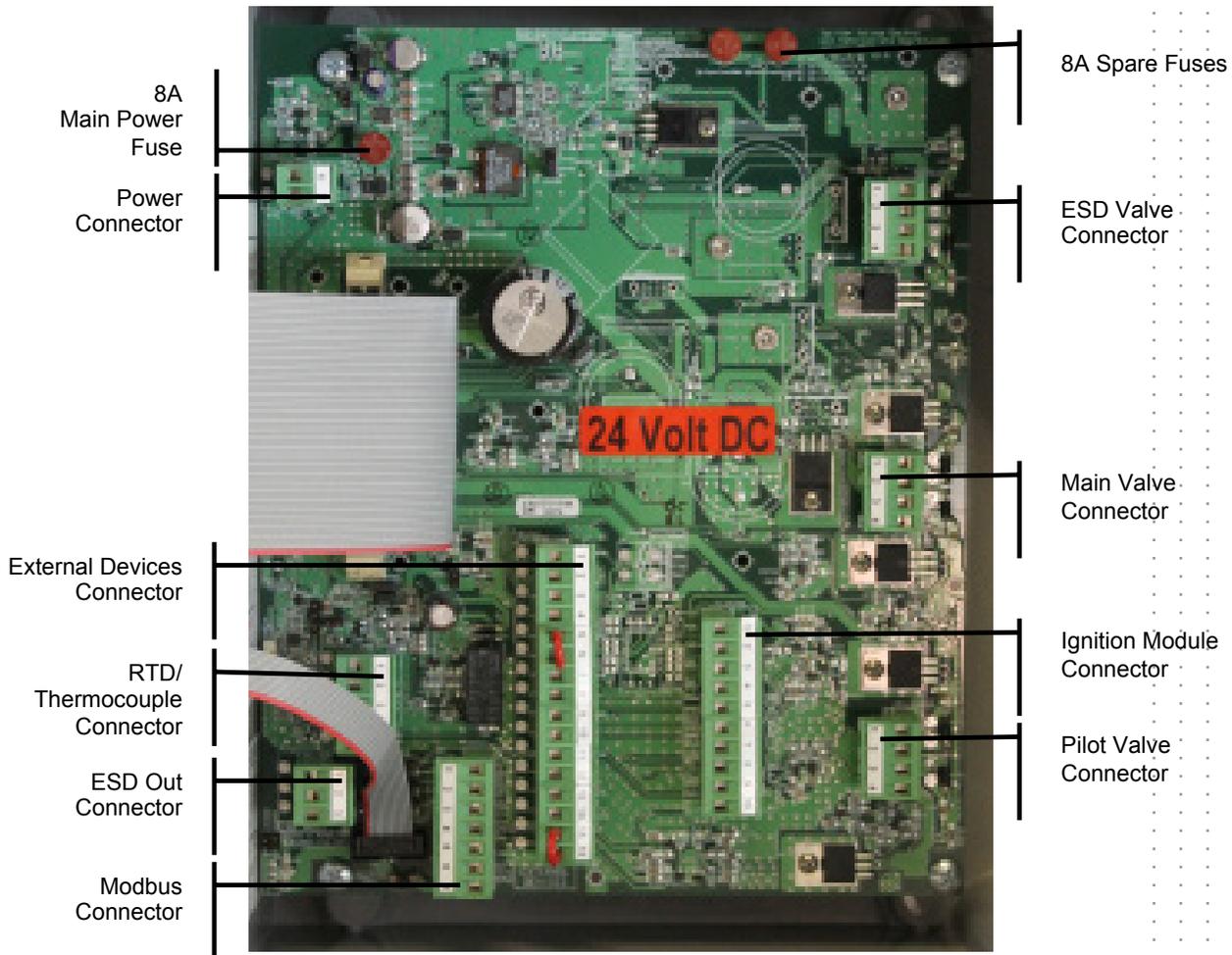


### Platinum BMS-731™ Processor Board

The Platinum BMS Processor Board is in the main control box of the system, and manages the various processes and functions of the Platinum BMS. Two (2) switches are located on this Processor Board; the RESET button is used to reboot the system and the FACTORY SETUP button allows you to set up the various system options.



### Microprocessor Board Continued



The connectors are sized to accept a single conductor 16 to 24 gauge wire.

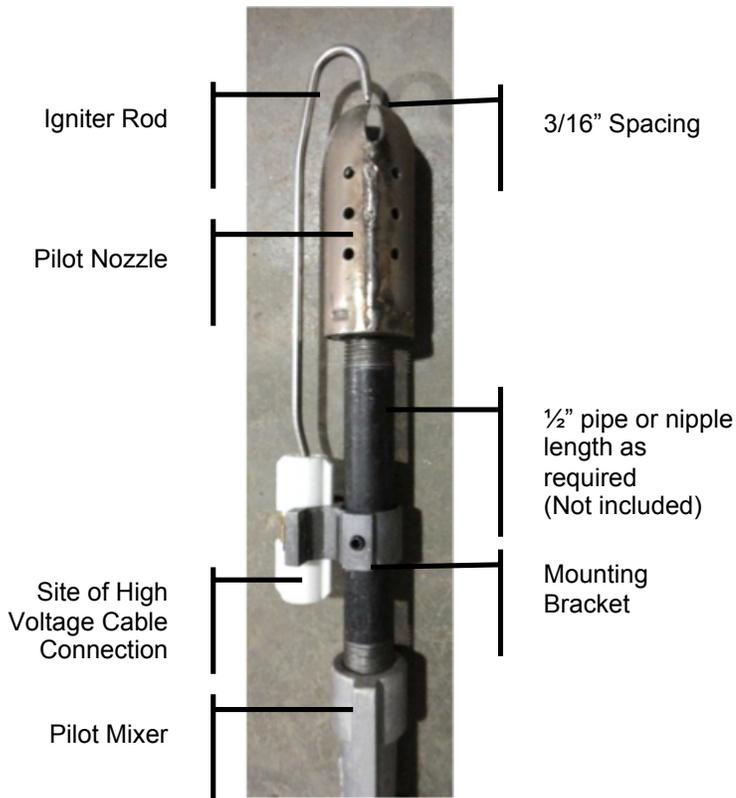
### Platinum BMS- 731 Ignition Module

The Ignition Module is connected to the Main Control Box with the Ten-Conductor cable. The Ignition Module is connected to the Pilot Assembly with the High Voltage cable and Ground cable.



## Pilot Assembly

The Platinum Pilot Assembly consists of the Igniter Rod, Pilot Nozzle, and Pilot Mixer.



## INSTALLATION

### 1. Pre-Installation Requirements

In order to properly install the Platinum Burner Management Systems the following will be required:

- Fuel Train Requirements:

Main regulator

Pilot regulator

Main control valve (pneumatic valve ideally)

Pressure gauge for main valve

Pressure gauge for pilot valve

Main Ball valve, recommended but not necessary

- Unistrut to mount the Main Control Box. The unit must be mounted within 15 feet of the arrestor. (longer cables available, if needed)
- Arrestor needs to be large enough to mount the Ignition Module inside of the arrestor.
- Thermowell in vessel for RTD or Thermocouple (Platinum recommends a pneumatic high temperature shutdown for redundancy, i.e. T-12)
- Power Requirements
  - 10-30 Volts allowed (24 volts is recommended)
- Suggested 5 AMP power supply
- Up to 10 MMBtu/hr natural draft burner
- Type K Thermocouple wire if thermocouple is being used



## 2. Mounting the Main Control Box

The Main Control Box contains two (2) electronic circuit boards. The Processor Board is mounted in the door, and the Valves/Terminations Board is mounted in the main body of the case. They are connected by two (2) multi-conductor flat cables.

### STEPS

1. Attach the Main Control Box mounting hardware to the back of the Main Control Box with the hardware provided. Specific instructions are located in the Main Control Box mounting hardware package.
2. Mount the Main Control Box in a secure Class I, Division II area.
3. The Main Control Box will need to be within 15 feet of the arrester.  
\*If this is not possible, please contact us for a longer ten-conductor cable.

### WARNING

- A. Platinum Burner Management Systems (BMS) are certified for Class I, Division II, Groups C and D and any areas considered unclassified.
- B. DO NOT install a Platinum BMS Main Control Box in a Class I, Div. I area.
- C. DO NOT open the Platinum BMS Main Control Box unless the area has been declassified by qualified personnel.
- D. Adherence to local classification of areas is crucial to safety and operation.



### 3. Installing Solenoid Valves

#### WARNING

DO NOT install Solenoid Valves that are in excess of 14 Watts 24 VDC or below 1.4 Watts 24 VDC. Low watt solenoid valves are recommended for solar applications. Any substitutions of solenoid valves must be reviewed and approved by Platinum. Solenoid Valves outside these parameters will impair the operation of the system, potentially causing injury or death.

As there are a number of different solenoid valve system configurations, suitable solenoid valve types will vary based on the application.

Typical types are:

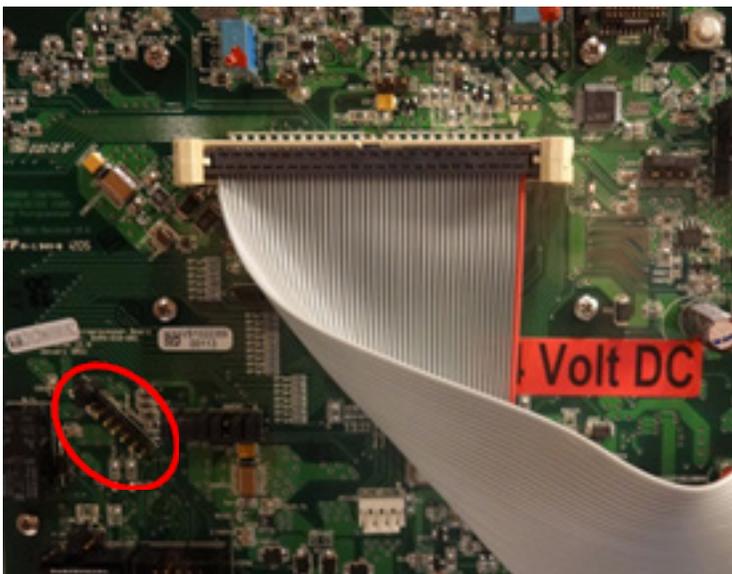
1. 24 volt high-power single coil Solenoid Valve (11.6 Watts) (Platinum BMS 731 Only)
2. 24 volt low-power single coil Solenoid Valve (1.4 Watts) (Platinum BMS 731 Only)

It is very important that you use the appropriate Solenoid Valves. DO NOT try to substitute Solenoid Valves outside the above specifications without first consulting with Platinum.

#### PEAK AND HOLD SOLENOIDS

Peak and Hold solenoid valves are now compatible with the BMS-731. This option allows the use of very low power with Peak and Hold solenoid valves. For example, a zero emission, all electric fuel train utilizing 1" Peak and Hold solenoid valves will only consume 0.85 watts per valve. A jumper will need to be installed to utilize this feature. The below images display the location and proper placement of the jumper on the Microprocessor Board.

Location of Jumper Header on the Microprocessor Board



Jumper Installed for Standard Solenoid Valve Operation (Default)



Jumper Installed for Peak and Hold Solenoid Valve Operation Pins #7 & 8.



The ESD, Main, and Pilot solenoids will now be terminated in terminal# 1&2 on their respective input connectors (see the below image).



The only exception is if a High Fire solenoid is being used. In that case, the High Fire solenoid connects to terminal #1 and 2 and the Main solenoid connects, as usual, to terminal #3 and 4. In this configuration, the Main solenoid is not a peak and hold but a standard type solenoid and the High Fire is peak and hold.

#### STEPS

1. Install the Pilot Solenoid Valve into the tubing between the pilot pressure regulator and the arrestor in the tubing line. Install the Main Solenoid Valve into the tubing before the main temperature control valve in the tubing line. Install the ESD Solenoid Valve as the first thing after the inlet pressure regulator into the tubing line controlling the pneumatic ESD Valve.

#### TIP

Be sure to orient Solenoid Valves correctly with the respective valve flow direction.  
ASCO Solenoids are configured port 1 out, port 2 in and port 3 vent.

2. Open the lid of the Main Control Box by simply unlatching the two (2) latches.

#### WARNING

DO NOT pull open the box lid forcefully. Two (2) multi-conductor flat cables connect the Valves/ Termination Board and the Processor Board and opening the lid forcefully could potentially cause damage to the boards.



3. Safely unplug the two (2) multi-conductor flat cables from the Valves/Termination Board and unscrew the 4 screws holding the Valves/Termination board to the box. Place the Valves/Termination board in a safe, anti-static location. Platinum recommends using the Anti-static Bag included in the shipping box. Fold over the bag for better protection. ALWAYS practice safe anti-static methods, such as discharging your hands to earth ground prior to handling electronics.

**WARNING**

DO NOT drill any holes in the Main Control Box without at least removing the Valves/Termination board. Any damage to the circuit boards while drilling holes is not covered under the warranty.

4. Determine the best method to run the wiring to each solenoid. This will typically be flex conduit or rigid conduit. The conduit can be run directly to each solenoid or preferably to each in series through conduit "T's" attached to each solenoid. It is preferable to have the fewest penetrations possible into the Main Control Box. Locate all holes in the Main Control Box to the front edge so as not to interfere with the circuit board.
5. Install Meyers hubs, seals and conduit as required.

**WARNING**

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.

6. Pull wires through conduit and connect to solenoids as required. Be sure to pull ground wires to terminate the solenoid grounds as well.
7. When installing flex conduit it is good practice to install a service or drip loop where warranted.
8. On the right hand side of the Valves/Termination board there are three connectors for the 3 different Solenoid Valves. Each connector is labeled for the respective valve; ESD, PILOT, or MAIN.

**WARNING**

Be sure to insert the ESD wires into the connector labeled ESD, the Pilot wires into the connector labeled PILOT and the Main wires into the connector labeled MAIN.

9. To install a wire into a connector, strip 0.3" (7mm) of insulation off of the wire. The connector has a removable top for easy insertion of wires. Remove the top portion of the connector, turn screw counter-clockwise to open the terminal slot, insert the stripped wire into the terminal slot until it bottoms out. Turn the screw clockwise to shut the terminal slot and tug on the wire to ensure that it is firmly in



place.

10. Single coil (S.Coil) Solenoid Valves are hooked up as in the figure below.

**NOTE**

On the Main Solenoid Connector, there are two (2) connections for the single coil Main Solenoid Valve, and two (2) connections for the optional High Fire Solenoid Valve.



11. There are also two (2) output connections for an optional forced air purge contactor on the Emergency Shutdown (ESD) Solenoid valve output. (Refer to connection diagram in Addendum Drawings for termination requirements.)
12. Push the removable connector back onto the connector base on the Valves/Termination board.

**TIP**

If polarity sensitive Solenoid Valves are used, terminal #3 on the solenoid connector is the negative connection and terminal #4 on the solenoid connector is the positive connection.

#### 4. Mounting the Pilot Assembly

**STEPS**

1. Open flame arrestor or remove the flame cell. You will want enough room to properly mount the pilot assembly to the burner.
2. The pilot assembly needs to be mounted so that the nozzle tip is positioned at the flame end of the burner and the pilot mixer is partially positioned inside of the arrestor to allow enough air to the mixer.



3. Determine the length of ½" pipe/nipple that will be needed for the extension of the pilot assembly. The length of the pipe/nipple will depend on the length of the burner and positioning of pilot assembly, as mentioned previously.
4. Slide the igniter rod and mounting bracket onto the ½" pipe/nipple before screwing the pipe/nipple into the nozzle tip end of the pilot assembly.
5. The igniter rod will need to be positioned so that the tip of the igniter rod is 3/16" away from the top opening of the pilot nozzle within the gas stream. (See Pilot Assembly Diagram)
6. Secure the igniter rod to the ½" pipe/nipple by tightening the 2 black screws on the mount with a 1/8" Allen key.

#### WARNING

Don't over tighten the set screws on the bracket that mounts the igniter rod to the nipple on the pilot assembly.

7. Attach the black Ground Cable to the pilot assembly by removing the small screw located on the end of the pilot mixer. Place the screw through the hole located in the Ground Cable followed by the bonding washer and screw back into the pilot mixer.

#### WARNING

Don't over tighten screw to prevent stripping the threads or breaking the screw.

8. Pull back the boot on the blue High Voltage cable to expose the connector. Push the connector into the end of the igniter rod and you will hear a small click. Then pull the boot over the connector and onto the igniter rod ending.
9. Position the pilot assembly to the burner. The igniter rod will need to be positioned on top of the Pilot Assembly and adjacent to the burner. Once the pilot assembly is in the correct position on the burner, securely fasten the pilot assembly tip approximately 1" behind the tip of the burner. Make sure that the securing device isn't touching the igniter rod.

#### NOTE

Platinum Control Technologies does not tune burners or guarantee efficiency. We strongly recommend that a qualified burner technician inspect and tune the burners upon completion of the installation.



## 5. Setting-up the Ignition Module

The Ignition Module common to all Platinum BMS models is a small sealed module which houses the High Voltage Ignition Controller/Transformer. The Ignition Module produces a high voltage spark through the Igniter Rod, and senses the presence of a flame through the Igniter Rod.

### STEPS

1. Attach the end of the gray ten-conductor cable with the connector to the side of the ignition module and secure with the two built in screws.



## 6. Mounting the Ignition Module

### WARNING

The Ignition Module itself is not rated and **MUST** therefore be mounted inside the spark arrestor (unclassified area).

### STEPS

1. The Ignition Module must be mounted on the inside sidewall of the arrestor.

### WARNING

DO NOT mount the Ignition Module on the bottom inside wall of the arrestor. The Ignition Module must be mounted up and away from any possible water accumulation.

2. Using the ignition module as a template, mark suitable mounting holes on the side of the arrestor. Drill  $\frac{1}{4}$ " holes and mount the module with suitable mounting hardware making sure to capture the ground wire under the head of the mounting bolt.

Earth ground must be established.



3. Attach the two high voltage wires from the pilot assembly to the ignition module and secure.
4. Determine the best placement to drill a hole through the arrestor to run the ten-conductor wire through to the Main Control Box and then drill a hole through the arrestor and install a ½" Meyers hub. Be sure the screw on the locking ring is facing out so you can reach the screw attachment.
5. BE SURE THE VALVES/TERMINATION BOARD HAS BEEN REMOVED FROM THE MAIN CONTROL BOX.

**WARNING**

DO NOT drill any holes in the Main Control Box without removing the circuit boards. Any damage to the circuit boards while drilling holes is not covered under the warranty.

6. Drill a hole through the bottom of the Main Control Box and install the ½" Meyers hub and run ½" Flex Conduit from the Meyers hub on the arrestor to the Meyers hub on the Main Control Box. Install seal if required.

**TIP**

Leave a drip loop or service loop when installing the flex conduit.

**WARNING**

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.

7. Run a ground wire with the Ten-Conductor through the flex conduit connection from the arrestor to the Main Control Box.

**TIP**

It is good practice to run the ground wire with the Ten-Conductor wire and terminate at each end of the Meyers hub. If possible, separate and secure the high voltage cable from the ten-conductor cable.



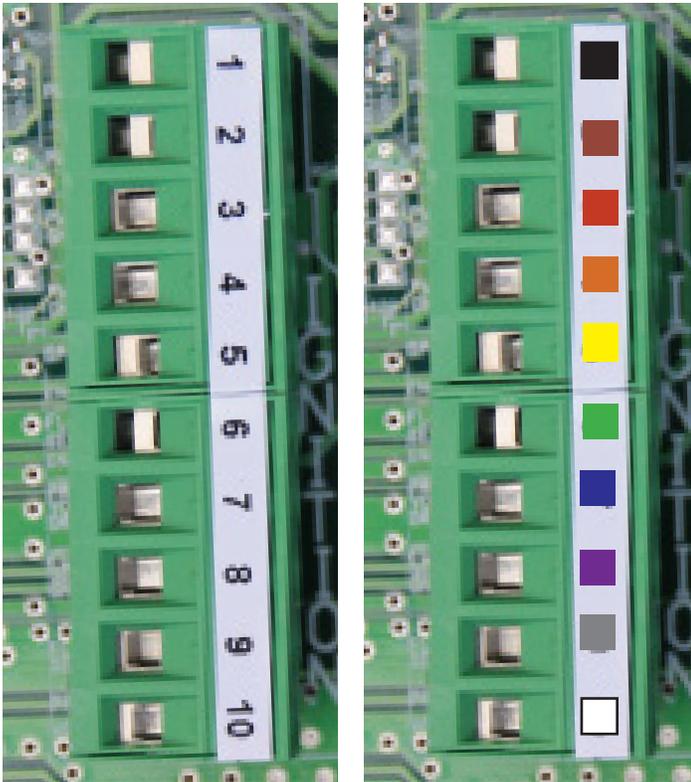
8. Once the Ten-Conductor wire and ground wire have been run through the flex conduit into the Main Control Box, wrap the bare Drain wire in the ten-conductor wire around the base of the remaining 10 colored wires and tape off.
9. Locate the connector labeled Ignition Module on the Valves/Termination Board. To install a wire into a connector, strip 0.3" (7mm) of insulation off of the wire. The connector has a removable top for easy insertion of wires. Remove the top portion of the connector, turn screw counter-clockwise to open the terminal slot, insert the stripped wire into the terminal slot until it bottoms out. Turn the screw clockwise to shut the terminal slot and tug on the wire to ensure that it is firmly in place.

#### NOTE

The ten-conductor cable interconnects the Main Controller Box and the Ignition Module. The ten connectors are labeled by number from the top down. Later production units may have the connector color coded.

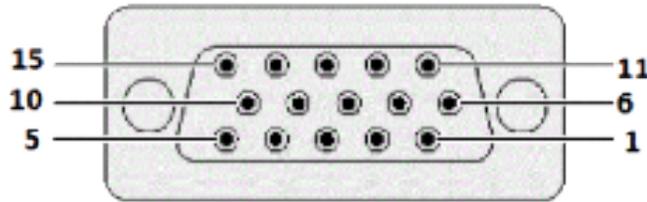


10. Insert the each wire from the ten-conductor wire into the terminal on the connector with the following color order(see images below for reference):
- a. Black Wire Terminal #01 Connector Label
  - b. Brown Wire Terminal #02 Connector Label
  - c. Red Wire Terminal #03 Connector Label
  - d. Orange Wire Terminal #04 Connector Label
  - e. Yellow Wire Terminal #05 Connector Label
  - f. Green Wire Terminal #06 Connector Label
  - g. Blue Wire Terminal #07 Connector Label
  - h. Purple Wire Terminal #08 Connector Label
  - i. Gray Wire Terminal #09 Connector Label
  - j. White Wire Terminal #10 Connector Label



11. Push the removable connector back onto the connector base on the Valves/Termination Board.

**Ignition module cable connector as viewed from pin side**



Pin 1	Black	Pin 7	Blue
Pin 2	Brown	Pin 8	Purple
Pin 3	Red	Pin 9	Gray
Pin 4	Orange	Pin 10	White
Pin 5	Yellow	Pin 11	Bare drain
Pin 6	Green		

## 7. Installing the Temperature Device

### NOTE

Only one type of temperature device can be installed at one time.

### 7.1 Installing the RTD

#### STEPS

1. The 1000 Ohm RTD will need to be placed in a thermowell in the vessel. The RTD length should match the insertion length of the thermowell. The use of thermal grease is recommended. Once the RTD is secure in the thermowell of the vessel, open the top of the RTD by simply twisting the lid counter clockwise.
2. Three (3) connection wires (typically, 2 red and 1 white) and one (1) ground wire will need to run from the RTD to the Main Control Box. Drill a hole through the bottom of the Main Control Box and install a ½" Meyers hub.

#### WARNING

DO NOT drill any holes in the Main Control Box without removing the circuit boards. Any damage to the circuit boards while drilling holes is not covered under the warranty.



3. Attached a ½" flex conduit connector to the RTD. Run ½" Flex Conduit from the Meyers hub on Main Control Box to the hub on the RTD. Be sure to run all of the three (3) connection and ground wires through before securing the flex conduit to the Meyers hub. Install seal if required.

**TIP**

Leave a drip loop or service loop when installing the flex conduit.

**WARNING**

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.

4. Secure the three (3) connection wires and one (1) ground wire to the inside of the RTD by adding a crimp connector to the end of each wire. The ground wire will need to be secured to the RTD with the screw located on the inside case of the RTD marked ground.
5. Loosen the three screws located on the inside of the RTD. Gently place one (1) of the connection wires underneath one of the loosened screw and tighten screw back.
6. Repeat #5 for all three connection wires.
7. Place the RTD lid back on the top by screwing on clock wise.
8. Locate the 5 terminal connector labeled RTD on the Valves/ Termination Board. To install a wire into a connector, strip 0.3" (7mm) of insulation off of the wire. The connector has a removable top for easy insertion of wires. Remove the top portion of the connector, turn screw counter-clockwise to open the terminal slot, insert the stripped wire into the terminal slot until it bottoms out. Turn the screw clockwise to shut the terminal slot and tug on the wire to ensure that it is firmly in place.
9. Insert the 3 connection wires into the terminals on the connector with the following order:
  - a. Red Wire Terminal #3
  - b. Red Wire Terminal #4
  - c. White Wire Terminal #5



10. Push the removable connector back onto the connector base on the Valves/Termination Board.

**TIP**

If the temperature read out on the Main Control Box says 32 degrees and 0 degrees, you have one of your red wires crossed with the white wire or actual temperature is below 32 degrees Fahrenheit as unit will not read lower temperature than 32 degrees Fahrenheit.

## 7.2 Installing the Type K Thermocouple

**NOTE**

Thermocouple must be of non-grounded type.

**STEPS**

1. The Type-K Thermocouple will need to be placed in a thermowell in the vessel. The use of thermal grease is recommended. Once the Type-K Thermocouple is secure in the thermowell of the vessel, open the top of the Thermocouple by simply twisting the lid counter clockwise.
2. Type-K connection wire (1 red-negative and 1 yellow-positive) will need to run from the Thermocouple to the Main Control Box.

**WARNING**

Only type-K wire (not supplied) can be used with the Type-K Thermocouple.

3. Drill a hole through the bottom of the Main Control Box and install a ½" Meyers hub.

**WARNING**

DO NOT drill any holes in the Main Control Box without removing the circuit boards. Any damage to the circuit boards while drilling holes is not covered under the warranty.

4. Attach ½" flex conduit connector to the Thermocouple. Run ½" Flex Conduit from the Meyers hub on Main Control Box to hub on the Thermocouple. Be sure to run the 2 connection wires through before securing the flex conduit to the Meyers hub.

**TIP**

Leave a drip loop or service loop when installing the flex conduit.

**WARNING**

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.



5. Gently place one of the connection wires underneath one of the loosened screw and tighten screw back. The yellow wire (positive) should be secured to the yellow screw and the red wire (negative) should be secured to the red screw. Place the Thermocouple lid back on the top by screwing clock wise.
6. Locate the connector labeled RTD/Thermocouple on the Valves/ Termination Board. To install a wire into a connector, strip 0.3" (7mm) of insulation off of the wire. The connector has a removable top for easy insertion of wires. Remove the top portion of the connector, turn screw counter-clockwise to open the terminal slot, insert the stripped wire into the terminal slot until it bottoms out. Turn the screw clockwise to shut the terminal slot and tug on the wire to ensure that it is firmly in place.
7. Insert the 2 connection wires into the terminals on the connector with the following order:
  - a. Red Wire Terminal #1
  - b. Yellow Wire Terminal #2
8. Push the removable connector back onto the connector base on the Valve Board.

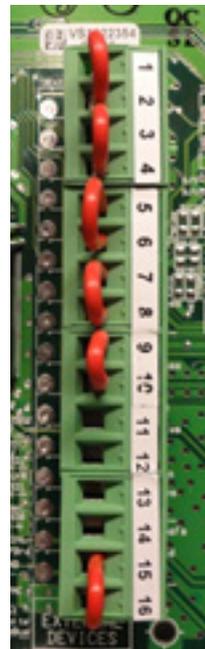
## 8. Connecting External Devices

### WARNING

DO NOT connect voltage to any of these inputs.  
DRY CONTACTS ONLY.

From a safety and ease of operation perspective we have eliminated the configuration menus for the discreet inputs. This means that all safety devices with the exception of proof of closure switches will be factory enabled and have a jumper installed at their respective input terminals. If an external device (eg: level switch) is installed, it will replace the jumper. This new process will eliminate the possibility of a safety device being installed but not enabled.

Terminal	Location
Spare switch	1,2
External on/off	3,4
External ESD	5,6
Low pressure switch	7,8
High Pressure switch	9,10
Unsafe condition	15,16



1. Spare Switch: This signal will ESD the burner when the switch is open. This switch can be enabled in the factory settings:
  - a. Spare switch
  - b. Suggested uses: level switch
2. Remote ON/OFF Switch: This signal will direct the microcomputer to enter the OFF state. The burner is ON when the switch is closed. Open the switch only in the NORMAL burning state. If the contacts are closed, the burner will start. If the contacts are open, the burner will stop. A remote system should be used to control the burner.

**NOTE**

The Platinum BMS must be placed in the NORMAL state to enable this feature. (The local interface overrides the feature if the system is in OFF or ESD.)

3. External ESD Switch: This signal will direct the microcomputer to ESD the burner when the switch is open. A remote system should be used to shut down the burner.

**NOTE**

System has to be reset locally on an ESD.

4. Low Pressure Switch: This contact looks for an open when the pressure is low, causing an ESD state.
5. High Pressure Switch: This contact looks for an open when the pressure is high, causing an ESD state.
6. ESD Valve Switch (Proof of Closure): This contact looks for an open when the ESD valve is closed. Optional proximity switches on the valve or a downstream pressure switch on the pneumatic signal can be used for the input.
7. Main Valve Switch (Proof of Closure): This contact looks for an open when the Main valve is closed. Optional proximity switches on the valve or a downstream pressure switch on the pneumatic signal can be used for the input.
8. Unsafe Condition: This signal ties directly to the Watchdog Processor, in order to ESD the burner on an open circuit. This function resets the Processor directly and produces a Watchdog failure.

**NOTE**

Manual reset of unit will be required



## 9. Connecting External ESD (status out)



Terminal 1	Normally Closed
Terminal 2	Common
Terminal 3	Normally Open

### WARNING

DO NOT connect voltage to any of these inputs.

**DRY CONTACTS ONLY.**

These contacts are used for an ESD OUT or Status signal. The contacts will change state when an ESD occurs.

## 10. Grounding Wires

### STEPS

1. You should have multiple disconnected ground wires in the Main Control Box. The number of ground wires will depend on the specific setup.
2. Create a termination site for grounding inside of the Main Control Box.
3. Connect all of the ground wires inside of the Main Control Box to this termination site.
4. Run a ground wire from the spade located on the Valves/Termination Board to the termination site inside of the Main Control Box.



Location of spade on  
Valves/Termination  
Board



5. Connect the termination site to a grounding rod. Ideally, there should be one common point of earth ground for termination.

### NOTE

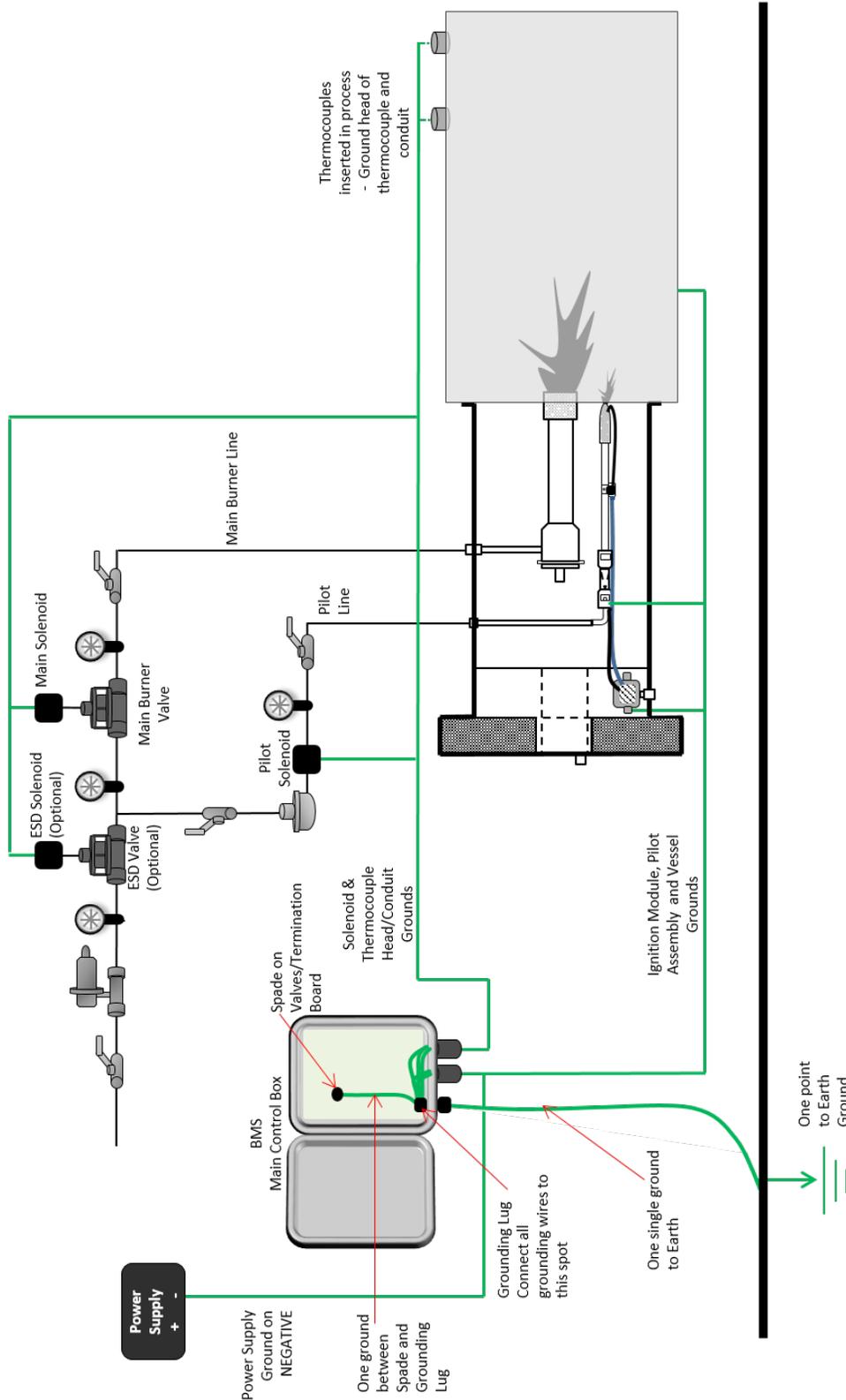
The recommended wire gauge for grounding wires is 14-16.

The type-K thermocouples are of non-grounded type. However, the head of the thermocouple and conduit should be grounded.



**WARNING**

Always follow local codes for proper grounding methods.



## 11. Connecting Valves/Termination Board to Main Control Box

### STEPS

1. Re-connect the Valves/Termination Board back onto the Main Control Box with the four (4) screws. Make sure the Valves/Termination Board is secure.
2. Reattach the two (2) multi-conductor cables to connect the Valves/Termination Board (located in the right hand side of the Main Control Box) with the Processor Board (located in the left hand side door of the Main Control Box).

### WARNING

Only connect the Valves/Termination Board to the Main Control Box if all drilling into the Main Control Box is complete.

## 12. Connecting power to the Main Control Box

### STEPS

1. In the upper left hand corner of the Valves/Termination Board is the connector for power.
2. Locate the connector on the Valves/Termination Board. To install a wire into a connector, strip 0.3" (7mm) of insulation off of the wire. The connector has a removable top for easy insertion of wires. Remove the top portion of the connector, turn screw counter-clockwise to open the terminal slot, insert the stripped wire into the terminal slot until it bottoms out. Turn the screw clockwise to shut the terminal slot and tug on the wire to ensure that it is firmly in place.
3. Insert the positive and negative wires into the terminals with the following order:
  - a. Negative Wire      Terminal #1
  - b. Positive Wire      Terminal #2
4. Turn each screw clockwise to close the connector terminal and lightly tug on the wire to make sure it is securely connected to the connector.
5. Push the removable connector back onto the connector base on the Valves/Termination board.



## OPERATING

### WARNING

Prior to powering up the Platinum BMS-731™, a second inspection of wiring, solenoid flow direction and setup is recommended. The Platinum BMS-731™ power terminates in the two (2) terminals supplied on the top left of the Valves/Termination Board.

### POWERING UP

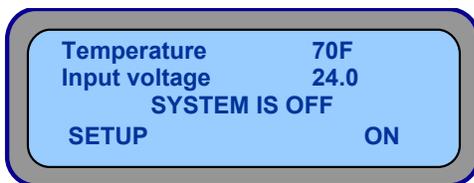
Close the Main and Pilot gas source valves and proceed to power up the system.

The startup display will read "Initializing valve control," then after several seconds will read "SYSTEM IS OFF."

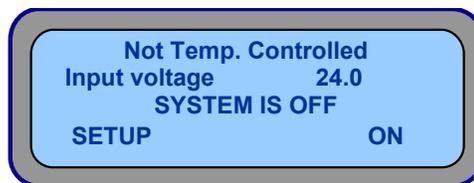
The ESD solenoid (if turned on in the programming) will now be energized, and the remaining Pilot and Main solenoids will be in the OFF state.

The Platinum BMS-731™ will be in the OFF position, waiting for the system to be turned ON.

The following display will appear if the Temperature Control option is enabled:



The following display will appear if the Temperature Control option is not enabled:



### NOTE

The Main Burner is in the OFF STATE and the Pilot flame is OFF.



## FACTORY SETUP

Prior to startup, enter the Factory Setup Mode and determine what inputs are being used in the system. The Factory Setup mode does not allow you to exit and save before viewing each screen. To enter the Factory Setup Mode, press the Factory Setup button on the Process Board in the Main Control Box (see image below), located under the multi-conductor flat cable, while the system is in the OFF state.



The following screens will appear in this order, prompting you to choose which functions are required.

### NOTE

If an ESD Solenoid has not been installed, the following message will appear: "ESD Control Failure". The factory setup button will need to be pressed twice to enter factory setup.

If at any time you want to exit the Factory Setup menu without saving, press the ESD button on the front panel.



## Software Revision Number

This screen shows the revision date for the Platinum BMS™ firmware.



1. Hit the NEXT button to go to continue on to the next screen.

## Temperature Control

The Temperature Control option is enabled for the default setting.

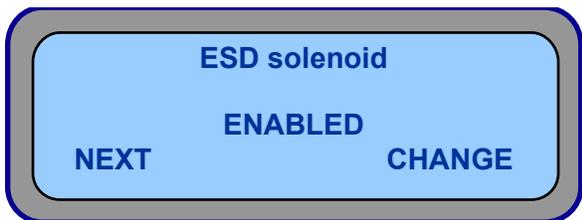


1. If you want to disable the Temperature Control, press the CHANGE button.
2. Hit the NEXT button to go to continue on to the next screen.

## ESD Solenoid

This will enable the ESD solenoid in the event one is installed. The default setting is enabled.

If no ESD solenoid is installed, the system will indicate “ESD Control Failure” on startup. This function will need to be disabled if an ESD solenoid valve is not installed.

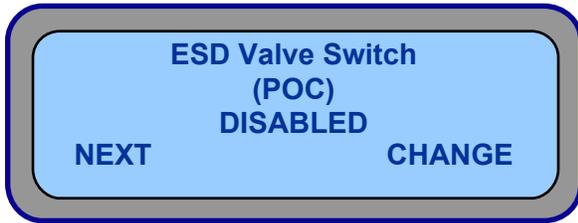


1. If you want to disable the ESD Solenoid, press the CHANGE button.
2. Hit the NEXT button to go to continue on to the next screen.



### ESD Valve Switch (POC)

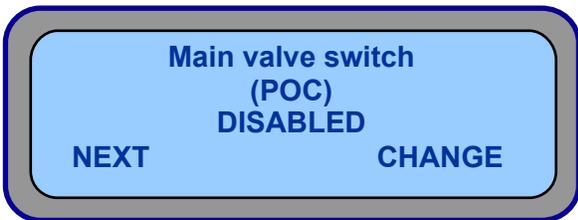
If the ESD Solenoid is disabled, the ESD Valve Switch screen will not be present.



1. If you want to enable the ESD Valve Switch, press the CHANGE button.
2. Hit the NEXT button to go to continue on to the next screen.

### Main Valve Switch (POC)

The Main Valve Switch (POC) option is disabled for the default setting.

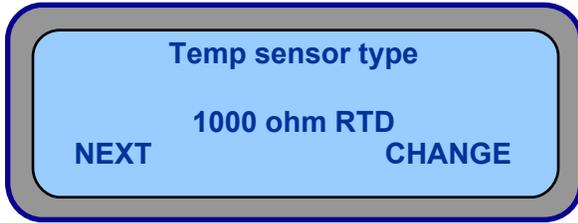


1. If you want to enable the Main Valve Switch, press the CHANGE button.
2. Hit the NEXT button to go to continue on to the next screen.



## Temp Sensor Type

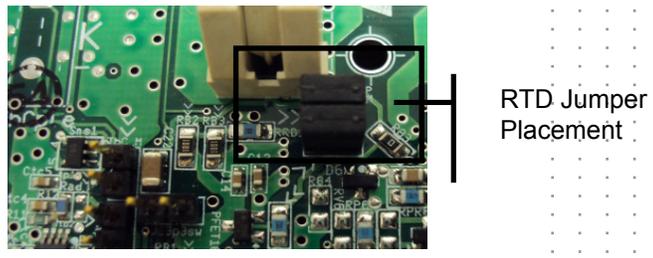
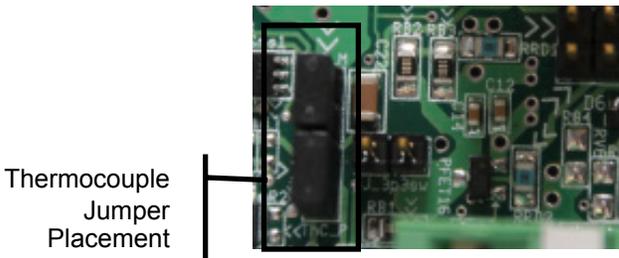
Activate the temperature detection element. Select either "1000 Ohm RTD" or "Type-K Thermocouple". The default setting is 1000 Ohm RTD.



1. If you want to change the Temp Sensor Type to Thermocouple, press the CHANGE button.
2. Hit the NEXT button to go to continue on to the next screen.

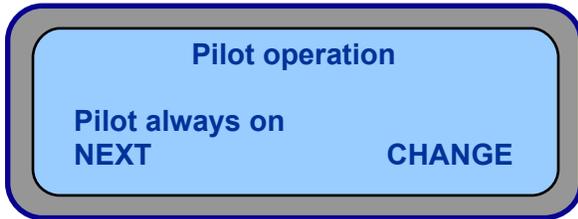
### NOTE

When changing sensor type make sure hardware jumpers on valve board are correctly positioned. See the below images.



## Pilot Operation

The pilot operational status has two setting options: pilot always on and pilot tracks main. The pilot operational status default setting is Pilot always on.



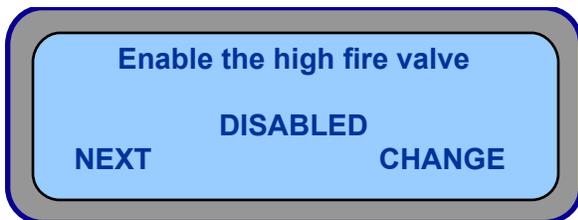
1. If you want to change the setting to Pilot Tracks Main, press the CHANGE button.
2. Press the NEXT button to continue to the next screen.

## Enable the High Fire Valve

On larger Btu/hr heating systems, this option can be enabled in order to stage the Main Gas Train, therefore eliminating back draft and hard firing on startup.

### NOTE

This option requires the installation of an additional valve in the main fuel train.

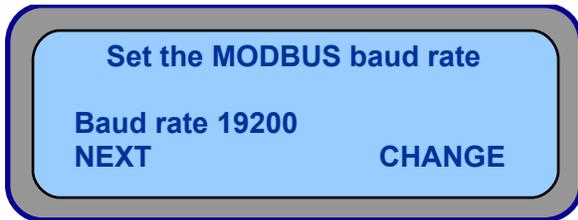


1. If you want to enable the High Fire Valve, press the CHANGE button.
2. Press the NEXT button to continue to the next screen.



## Set the Modbus Baud Rate

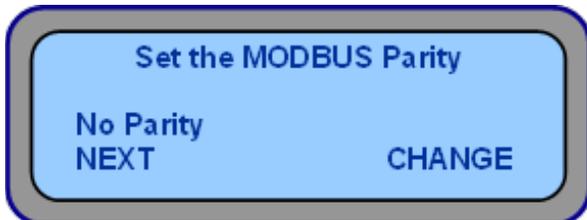
The MODBUS communication rate is set at one of the following baud rates; 1200; 4800; 9600; 19200; 38400. The default rate is 19200.



1. If you want to change the Baud Rate, press the CHANGE button to toggle through the options.
2. Press the NEXT button to continue to the next screen.

## Set Modbus Parity

The MODBUS parity is chosen as one of the following; No Parity; Odd Parity; Even Parity. No Parity is the default setting.

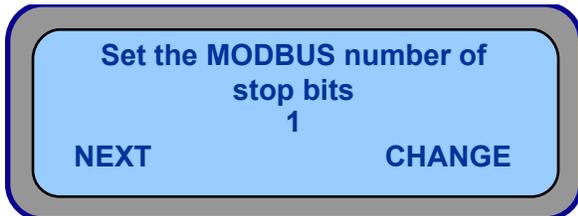


1. If you want to change the Modbus Parity, press the CHANGE button to toggle through the options.
2. Press the NEXT button to continue to the next screen.



## Set Number of Modbus Stop Bits

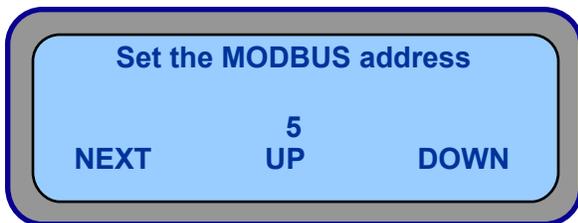
The number of stop bits required for the MODBUS communication is selected as either one (1) or two (2). The default number of stop bits is one (1).



1. If you want to change the number of stop bits, press the CHANGE button to choose one (1) or two (2).
2. Press the NEXT button to continue to the next screen.

## Set Modbus Address

The address of the MODBUS is selected here. It ranges from 0 to 255. The default MODBUS address is five (5).



1. If you want to change the address, press and hold the UP or DOWN button to select the desired address at a faster interval.
2. Press the NEXT button to continue to the next screen.
3. **NOTE:** This is the last step in the Factory Setup Mode.

## Backlight Always On

The feature allows you to enable or disable the backlight on the front door panel. The backlight always on default setting is disabled. It is recommended to disabled this option if using solar applications.





1. If you want to enable the Backlight Always On option, press the CHANGE button.
2. Press the NEXT button to continue to the next screen.
3. NOTE: This is the last step in the Factory Setup Mode.

### Password Control

The Password Control setup option allows the user to enable or disable a password to activate or deactivate the unit. The default setting is disabled.



1. If you want to enable the Password Control, press the CHANGE button.
2. Hit the NEXT button to go to continue on to the next screen.

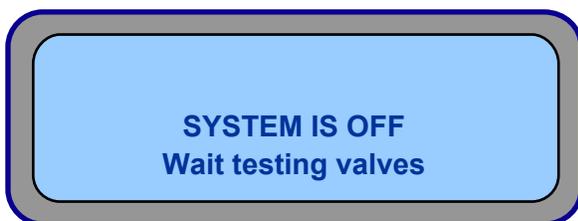
### Factory Menu Password

Once the Password Control feature is enabled a password will need to be entered to access the Factory Menu. Press the following arrow buttons in this order: Right, Right, Middle, Right

### Setup Menu Password

Once the Password Control feature is enabled a password will need to be entered to access the Setup Menu. Press the arrow buttons in the following order: Left, Middle, Middle, Right

This screen will appear momentarily as the system resets and performs a valve check.

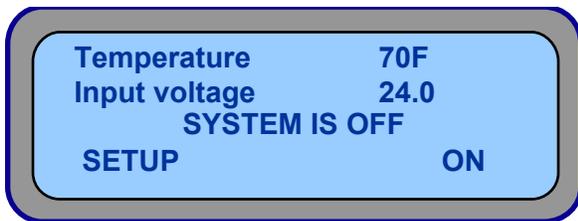


## OPERATING PARAMETERS

The Operation Parameters Menu allows you to specify how certain functions/parameters are characterized within the Platinum BMS-731™. In the Setup Menu, press **SETUP** to set the options for the displayed parameter. Press the **NEXT** and **PREV** to navigate between operational parameters. When adjusting the various operation parameters, press **ACCEPT** to accept the parameter and return to the Operation Parameters Menu.

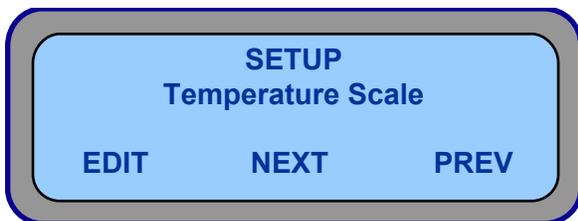
### NOTE

If at any time you want to exit the Operating Setup without saving, press the **ESD** button on the front panel. If you would like to exit and save the Operating Setup early, press the **Accept** button twice on the front panel.



Temperature Scale (Thermocouple Unit Only; RTD Displays both Fahrenheit and Celsius)

In Thermocouple Temperature Control, select “Celsius” or “Fahrenheit” for temperature display.



1. Press the **EDIT** button to change the temperature scale.



2. Press the **CHANGE** button to toggle between the temperature options.





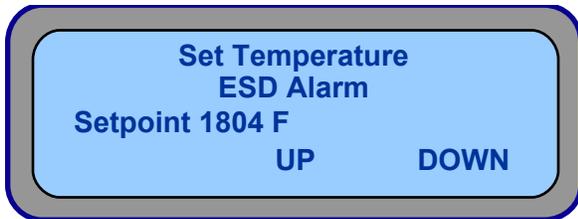
3. Press the ACCEPT button to save the changes and continue on to the next screen.

### Alarm Setpoint (High Temperature Shutdown)

This parameter allows you to enter a setpoint at which the Platinum BMS-731™ will ESD on high temperature shutdown. This parameter will only work with a Platinum BMS-731™ that has the Temperature Control option turned ON.



1. Press the EDIT button to enter into the Alarm screen.



2. Press and hold UP or DOWN button to increase or decrease the setpoint faster.
3. Press the ACCEPT button to save the changes and continue on to the next screen.



The Alarm Temperature Setpoint is shown in both degrees Fahrenheit and Centigrade in RTD setting. For the thermocouple setting, you have to select "C" or "F". Alarm Temperature Setpoint can be set within the range of 40°F (4°C) and 545°F (285°C) for RTD and 40°F and 2481°F for thermocouple.

The Alarm Temperature Setpoint cannot be set below the Main Burner "MAIN OFF" Temperature Setpoint, as programmed in the Temperature Control Setting.

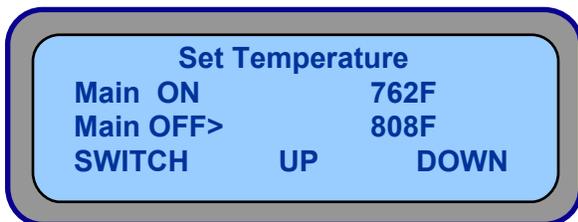
### Temperature Control Setting

The Temp Setpoints parameter allows you to set control setpoints to control the Main Burner ON and OFF.



1. Press the EDIT button to enter the Set Temperature screen.

An (>) indicates the setpoint being adjusted.

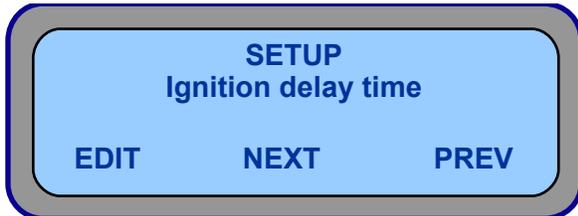


2. Press the UP or DOWN button to increase or decrease the setpoint for the Main OFF temperature.
3. Press the SWITCH button to change the setpoint to the Main ON temperature (NOTE: The > will change to the temperature next to the Main ON).
4. Press the UP or DOWN button to increase or decrease the setpoint for the Main ON temperature.
5. Press the ACCEPT button to save the changes and continue on to the next screen.

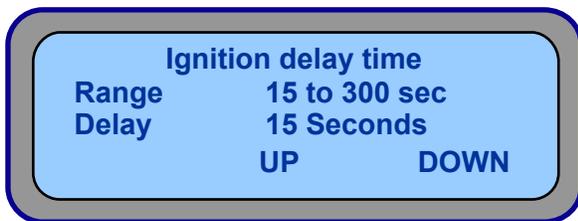


## Ignition Delay Time

This parameter allows you to adjust the delay time required to eliminate excess gas prior to ignition of the Pilot. The delay state comes on before each ignition sequence.



1. Press the EDIT button to enter the Ignition Delay Time screen.
2. Press the UP or DOWN button to increase or decrease the delay until the desired delay time is reached.



3. Press the ACCEPT button to save the changes and continue on to the next screen.



## Setting the Main Valve Delay

Main Valve Delay is the time from successful ignition of the Pilot to the opening of the Main Valve. This allows the Pilot to stabilize and create air movement within the fire tube for successful Main light off. The delay can be adjusted anywhere from 1 to 300 seconds. The default valve delay is 5 seconds.



1. Press the EDIT button to enter the Main valve delay screen.



2. Press the UP or DOWN button to increase or decrease the delay until the desired time is reached.
3. Press the ACCEPT button to save the changes and continue on to the next screen.

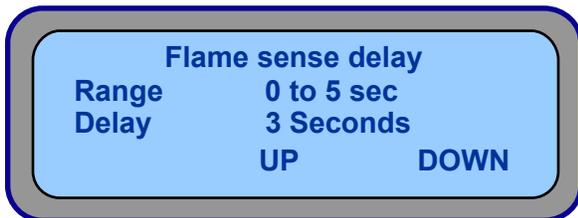


### Setting the Flame Sense Delay

“Flame Sense Delay” is a variable parameter that allows a time delay for a Pilot flame to stabilize, prevent nuisance shutdowns if the Main comes on hard, and removes the flame from the Pilot Tip momentarily. The delay can be anywhere from 0 to 5 seconds. The default delay is 3 seconds.



1. Press the EDIT button to enter the Flame Sense Delay screen.



2. Press the UP or DOWN button to increase or decrease the delay until the desired time is reached.
3. Press the ACCEPT button to save the changes and continue on to the next screen.

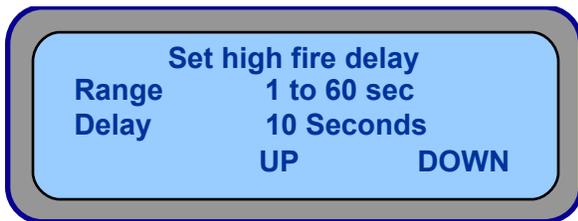


## High Fire Delay

The High Fire Delay parameter will dictate the time delay between when the Main comes on and when the High Fire comes on. The High Fire Delay can be set anywhere from 1 to 60 seconds. The default delay is 10 seconds.



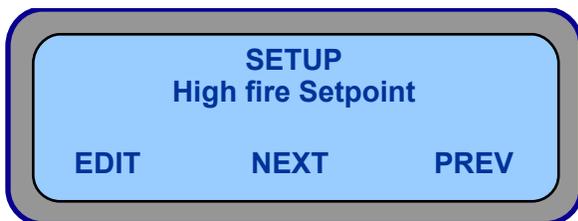
1. Press the EDIT button to enter the High fire delay screen.



2. Press the UP or DOWN button to increase or decrease the delay until the desired time is reached.
3. Press the ACCEPT button to save the changes and continue on to the next screen.

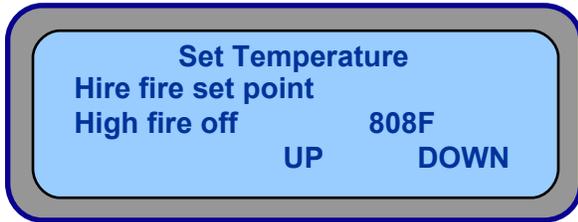
## Setting the High Fire Temperature Setpoint

Use this parameter to set the temperature at which the High Fire Valve shuts off. This temperature setting cannot exceed the Main Burner OFF Temperature Setpoint.



1. Press the EDIT button to enter the High fire delay screen.

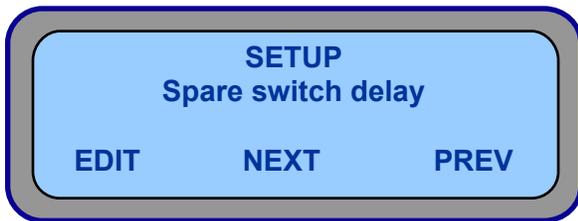




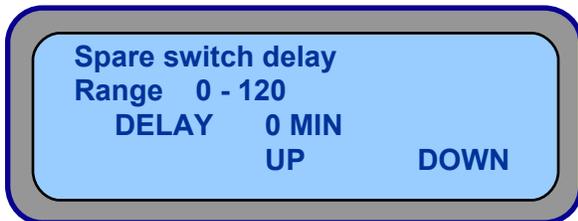
2. Press the UP or DOWN button to increase or decrease the temperature.
3. Press the ACCEPT button to save the changes and continue on to the next screen

### Spare Switch Delay

This is a programmable delay that provides a temporary, timed bypass for the contacts terminated to clear. Example: level switch in an expansion pot during startup. The range of this delay is 0 to 120 minutes.



1. Press the EDIT button to enter the Spare switch delay screen.

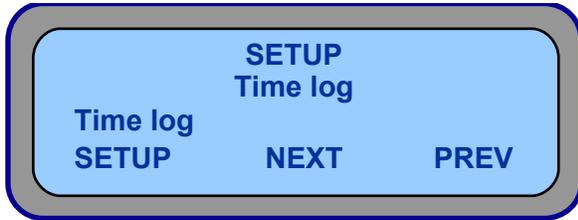


2. Press the UP or DOWN button to increase or decrease the delay time.
3. Press the ACCEPT button to save the changes and continue on to the next screen



## Time Log

The Time Log function logs the amount of time the Pilot and Main Burner Solenoid Valves are engaged, using a dedicated real time clock within the control unit. The Pilot ON Time screen is a logged record of the run time of the Pilot Valve.



1. Press the SETUP button to enter the Time Log screen.



2. Operators MUST record the number from this screen, as it will be reset to zero (0) after this procedure.
3. Press the CONTINUE button to reach the next screen.



4. Operators MUST record the number from this screen, as it will be reset to zero (0) after this procedure.
5. Press the CONTINUE button to reach the next screen.

The Main ON Time screen is a logged record of the run time of the Main Burner valve. Operators MUST record the number from this screen, as it will be reset to zero (0) after this procedure.

**\*\*Both the Pilot and Main Burner log times are cleared to zero (0) once a new Log Start Date has been entered on the following screen. It is therefore important to record these numbers – and the previous log start date – when viewing these screens.\*\***





6. The log function start date and time are programmed in sequence, starting with the year on the far left, and moving across to month, day, hour and minute, each time you press NEXT.
7. As each parameter is selected, its symbol becomes capitalized on the readout, as in the "Year" parameter shown above.
8. Press the UP or DOWN to escalate the advancement of years into 5-year increments.
  - a. The Month parameter increments or decrements one (1) month at a time and does not escalate when the UP/DOWN buttons are pressed.
  - b. The Day parameter will escalate to 5-day increments when UP or DOWN buttons are pressed.
  - c. The Hour parameter will escalate to 5-hour increments when UP or DOWN buttons are pressed.
  - d. The Minute parameter will escalate to 5-minute intervals when UP or DOWN buttons are pressed.
  - e. The real time clock operates in a 24-hour mode only.
9. Once the new log date and times are correctly entered, press ACCEPT to clear the log times on the Pilot and Main Burner and exit the programming sequence.



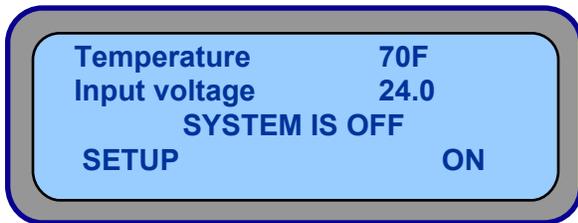
## Exiting the Operation Parameters

Log Start Time is the last of the programmable parameters.



1. Press DONE to exit the programming mode of the Platinum BMS.

## Ignition Procedure



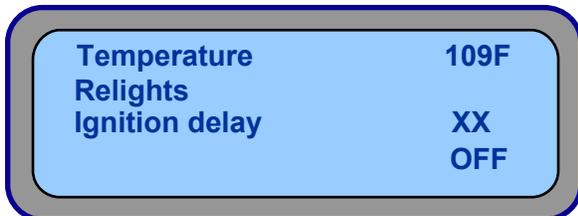
### WARNING

Ensure the burner arrestor and arrestor housing are correctly sealed prior to introducing gas.

### WARNING

Enable Pilot gas valve only (set gas pressure at 2 to 4 psig) on initial startup and keep Main gas valve blocked, proceeding to test Pilot only.

With the Platinum BMS-731™ in the OFF state, press the ON button. The Platinum BMS-731™ will then initiate a purge time delay, which allows excess gas to evacuate before a burner ignition attempt.



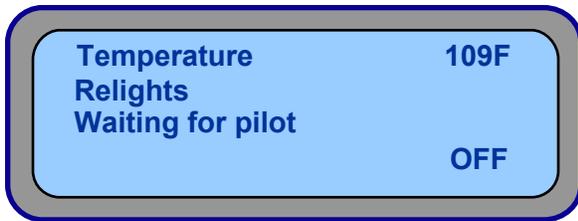
“XX” denotes the ignition delay count down time remaining before ignition



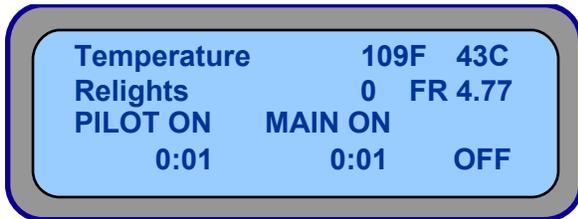
Once the ignition delay has expired, the Pilot valve will open and a series of ten sparks will arc between the Igniter Rod Tip and the Nozzle Tip (ground).



After ignition, the system will check for the presence of the Pilot flame.



Upon successful Pilot ignition, the preset Main Time Delay for the Pilot to stabilize will start counting. The display will read "PILOT ON" and "Main Off". Once the preset Main Time Delay has passed, the display will read "Main ON" as long as the system is calling for temperature.



The flame resistance "FR" requires approximately 20 seconds to establish a stable value as shown above. This is an indication of flame quality.

**NOTE**

The first time the burner tries to ignite the Pilot, it may take several attempts to purge air out of the Pilot line.



## Confirm Proper Functionality of the Flame Sensing Probe

1. With the Pilot on, close the Pilot gas valve to starve the Pilot of gas. The loss of flame will cause the system to close the Main and Pilot Solenoid Valves, initiate a re-ignition cycle, and then attempt a relight. Once the re-ignition cycle is confirmed, open the Pilot gas, and the Platinum BMS will automatically relight the Pilot. The number of retries is incremented for each attempt. A successful relight will be displayed with each relight. The relight number is reset to zero (0) if the Platinum BMS is set to the OFF state or reset after a shutdown.
2. Once the Pilot is proven, open the Main gas valve slowly and confirm air gas mixture is proper according to flame color. When using the Temperature Control option, allow the heater to come up to temperature and confirm proper temperature cutout as preset into the unit.

### NOTE

Platinum Control Technologies does not set burners, and strongly recommends that a qualified burner technician inspect and tune the burner upon completion of the installation.



## TROUBLESHOOTING

### Display Error Codes

SCREEN ERROR	PROBABLE CAUSE	REMEDY
ESD CNTR Failure A2	Indicates an "open" in the ESD solenoid circuit.	Check solenoid wiring and the solenoid itself.
ESD Coil Short A2	Indicates a "short" in the ESD solenoid circuit.	Check solenoid wiring and the solenoid itself.
ESD control failure	Indicates a failure to control the ESD solenoid or that no ESD solenoid is installed.	Check solenoid wiring. Should be wired to lower 2 terminals on ESD solenoid connector labeled "scoil". If no ESD solenoid is installed, disable the ESD Solenoid option in the Factory Setup.
E.S.D. Valve Failure	Proof of closure position on E.S.D. valve does not match BMS. I.e. BMS says E.S.D. valve should be closed but P.O.C. indicates open.	If on initial startup wiring to P.O.C. may be reversed. (N/O V.S. N/C) Main valve may be stuck. Main may be opening too slowly.
External ESD Signal	Indicates an open circuit on the "Ext ESD" Terminals.	Make sure jumper is installed or external device is closed (n/c).
Flame in purge state	This indicates some resistance between the igniter rod and the pilot tip or ground when the unit is attempting to light.	This can indicate the presence of a flame when igniting. Check for leaking or open Solenoid Valves. Check for short between igniter rod and pilot tip or burner tube. Check to see that pilot/ion assy. Is not wet. Check for cracked ceramic on igniter rod.
Flame sensor failure	Indicates very low resistance or a short between the Igniter rod and either the pilot tip or ground. This message should only occur while the unit is running.	Check to make sure spark gap is sufficient and that the rod is not touching the pilot tip or the fire tube wall. A very lean mixture combined with a very small burner tube can occasionally cause this failure.
High burner pressure	Indicates an open circuit on the "Hi Press" contacts.	Check for proper system pressure, defective switch or wiring.
Low main pressure	Indicates an open circuit on the "Lo Press" contacts.	Check for proper system pressure, defective switch or wiring.
Main CNTR Failure A2	Indicates an "open" in the Main solenoid circuit.	Check solenoid wiring and the solenoid itself.



## Display Error Codes Continued

SCREEN ERROR	PROBABLE CAUSE	REMEDY
Main Coil Short A2	Indicates a "short" in the Main solenoid circuit.	Check solenoid wiring and the solenoid itself.
Main control failure VC System requires manual reset	Indicates a failure to control the main solenoid.	Check solenoid wiring. Should be wired to lower 2 terminals on main solenoid connector labeled "scoil" Check for defective solenoid. Open door and press manual reset button on top right corner of microprocessor board.
Main valve failure	Proof of closure position on main valve does not match BMS. I.e. BMS says main valve should be closed but P.O.C. indicates open.	If on initial startup wiring to P.O.C. may be reversed. (N/O V.S. N/C) Main valve may be stuck. Main may be opening too slowly.
Max Delta Temp - XX	The temperature change in a specific time is greater than allowed. This is used to identify a failed RTD or thermocouple.	Check Temp sensor and wiring.
Max retries Exceeded	The unit has tried to light on three consecutive tries without proving the pilot.	Check supply gas. Check for plugged pilot orifice. Check for correct spark.
Overtemp Aux A (only on BTEX units)	The temperature indicated has exceeded the programmed Aux A alarm temperature.	Look for temp control valve stuck open or open thermocouple.
Overtemp Aux B (only on BTEX units)	The temperature indicated has exceeded the programmed Aux B alarm temperature.	Look for temp control valve stuck open or open thermocouple.
Overtemp main	The temperature indicated has exceeded the programmed main alarm temperature.	Look for temp control valve stuck open or open thermocouple.
Pilot CNTR Failure A2	Indicates an "open" in the Pilot solenoid circuit.	Check solenoid wiring and the solenoid itself.
Pilot Coil Short A2	Indicates a "short" in the Pilot solenoid circuit.	Check solenoid wiring and the solenoid itself.
Remote system off	Indicates the unit has been remotely shutdown.	Check for external shutdown either by modbus or hardwire control.
Reset -xx- -xx- system requires manual reset	Internal microprocessor code. <b>(MAKE NOTE OF ERROR CODE)</b>	Make note of error code on display, open door and press manual reset button on top right corner of microprocessor board. If problem reappears call for service. <b>Have error code available.</b>



## Display Error Codes Continued

SCREEN ERROR	PROBABLE CAUSE	REMEDY
Shutdown by operator	Front panel ESD button has been pressed.	Restart unit to resume normal operation.
Spare Switch Active	Indicates an open circuit in the "Spare Sw" contacts when Spare A is enabled in hardware setup menu.	Check wiring and external devices. This is usually where a level switch is connected
WD Unsafe input	This error will occur when the Unsafe condition contacts (bottom two on external devices terminal strip) are open.	Make sure jumper is installed or external device is N/C.

## Microprocessor Codes

Key for Microprocessor Codes	
xx=08	A "08" at the beginning of the microprocessor code represents a hardware generated code.
xx=10	A "10" at the beginning of the microprocessor code represents a software generated code.

CODE	DESCRIPTION
xx-01	Manual reset, not a fault
xx-02	Checks state_flag to see if the state is entered correctly
xx-03	State exited with state_flag clear
xx-04	The state was entered and state_flag was set
xx-05	The reference voltage did not measure correctly
xx-06	Bad adc control register
xx-07	Bad ADC channel pointer
xx-08	MUX control register failure
xx-09	The buffer used to hold the ADC counts failed
xx-0A	Executing code outside the code space
xx-0B	A state procedure exited with the state_flag cleared
xx-0C	The stack pointer is incorrect when the state machine runs
xx-0D	ADC had not finished a scan when the next scan started
xx-0E	Checks to see if the a non state procedure was call outside a state procedure
xx-0F	Failure of the keyboard flag memory
xx-10	Measure counter memory failed
xx-11	Temperature look table was generated incorrectly
xx-12	Memory containing the start voltages for the pulse capacitors failed
xx-13	Debounce counter failed
xx-14	Memory adc_flag failed
xx-15	A register in register bank 0 failed
xx-16	Memory purge_cntr failed
xx-17	One of the following timer registers failed CKCON,TMOD,RCAP2H and RCAP2L
xx-18	Check the state was entered properly
xx-19	Not used
xx-1A	Check the state flag at the end of the watchdog state
xx-1B	Stack pointer is corrupted when watchdog state machine runs
xx-1C	Checks the state flag on entry to a watchdog state



xx-2C	The value in return state was corrupted.
xx-33	Check the values in the XBAR registers
xx-34	Port0 configuration failed
xx-35	Port1 configuration failed
xx-36	Port2 configuration failed
xx-37	Port3 configuration failed
xx-38	Port4 to port7 configuration failed
xx-39	Code byte CRC failure
xx-3A	The temperature table check failed
xx-3B	The state pointer against failed
xx-3C	The control flags failed
xx-3D	Set point data failed
xx-3E	The high voltage flag failed
xx-3F	Comparator zero has an incorrect value
xx-40	Not used
xx-41	Comparator 1 did not enable properly
xx-42	Comparator 1 did not disable properly
xx-43	Comparator 0 did not enable properly
xx-44	Comparator 0 did not disable properly
xx-45	Bad reference control
xx-46	Invalid burning state pointer
xx-47	The main system is not stable and caused a system reset
xx-48	The crystal oscillator would not start
xx-49	The internal watchdog caused a reset
xx-4A	The sensor short counter failed
xx-4B	The no flame time out counter failed
xx-4C	The delay on the spare input failed
xx-4D	This is the end of the error list



## Tips for Troubleshooting

Issue	Possible Solutions
Fuel is not properly getting to the pilot tip.	<ul style="list-style-type: none"> <li>• Check the pilot orifice to see if it is plugged.</li> <li>• Check to see if fuel gas is getting past the regulator. Can you hear gas in the arrestor?</li> <li>• Make sure the fuel gas making it through the solenoid.</li> </ul>
The pilot is not sparking.	<ul style="list-style-type: none"> <li>• Make sure that the igniter rod is positioned approximately 3/16" away from pilot nozzle.</li> <li>• Make sure the ignition cables are properly terminated.</li> <li>• Make sure the ten-conductor cable is terminated properly.</li> <li>• Check to see if the igniter rod has any damage.</li> <li>• Make sure the igniter rod is not touching any metal.</li> </ul>
The main burner is not lighting.	<ul style="list-style-type: none"> <li>• Make sure the main (temperature) solenoid is opening. You should hear a clicking noise.</li> <li>• Make sure the main control valve is opening.</li> <li>• Verify that the Main Control Box is reading Main ON.</li> </ul> <p>Check to see if gas is coming out of the main burner nozzle.</p>
Main Control Box buttons are not working properly.	<ul style="list-style-type: none"> <li>• Check to see if the two (2) multi-conductor flat cables are connected properly. Refer to the section Board Multi-Conductor Interconnect.</li> </ul>
No display on the Main Control Box.	<ul style="list-style-type: none"> <li>• Check to see if the fuses are blown on the boards. Additional fuses are located on the boards.</li> <li>• Make sure that the negative power component is connected to the top terminal on the POWER Connector in the Valves/Termination Board and the positive power component is connected to the bottom terminal on the POWER Connector in the Valves/Termination Board.</li> <li>• If you are using solar power, contact us.</li> </ul>



Issue	Possible Solutions
The incorrect temperature is reading out on the display screen.	<ul style="list-style-type: none"> <li>• If the temperature is stuck at 32F 0C then the RTD might be bad or the associated wiring is not connected properly.</li> <li>• If the temperature is stuck at -1F then the Thermocouple might be bad or the associated wiring is not connected properly.</li> </ul>
The pilot lights, but then goes out.	<ul style="list-style-type: none"> <li>• Make sure that the ignition cables are terminated properly.</li> <li>• Make sure that the pilot assembly is mounted properly. Refer to the section Mounting the Pilot Assembly.</li> <li>• Check to see if the pilot has burned off.</li> </ul>
The pilot sparks, but does not light.	<ul style="list-style-type: none"> <li>• Check to see if the pilot orifice is plugged.</li> <li>• Make sure that fuel gas is getting to the arrestor.</li> </ul>
When the main lights, it comes back into the arrestor.	<ul style="list-style-type: none"> <li>• Check to see if the primary air shutter is closed.</li> <li>• The burner tube could be cold and have back pressure.</li> <li>• Make sure the main temperature control valve is not opening too quickly.</li> <li>• Make sure the rain cap on the arrestor is not causing back pressure on the exhaust stack.</li> <li>• Make sure you have enough pressure on the main fuel gas line.</li> </ul>

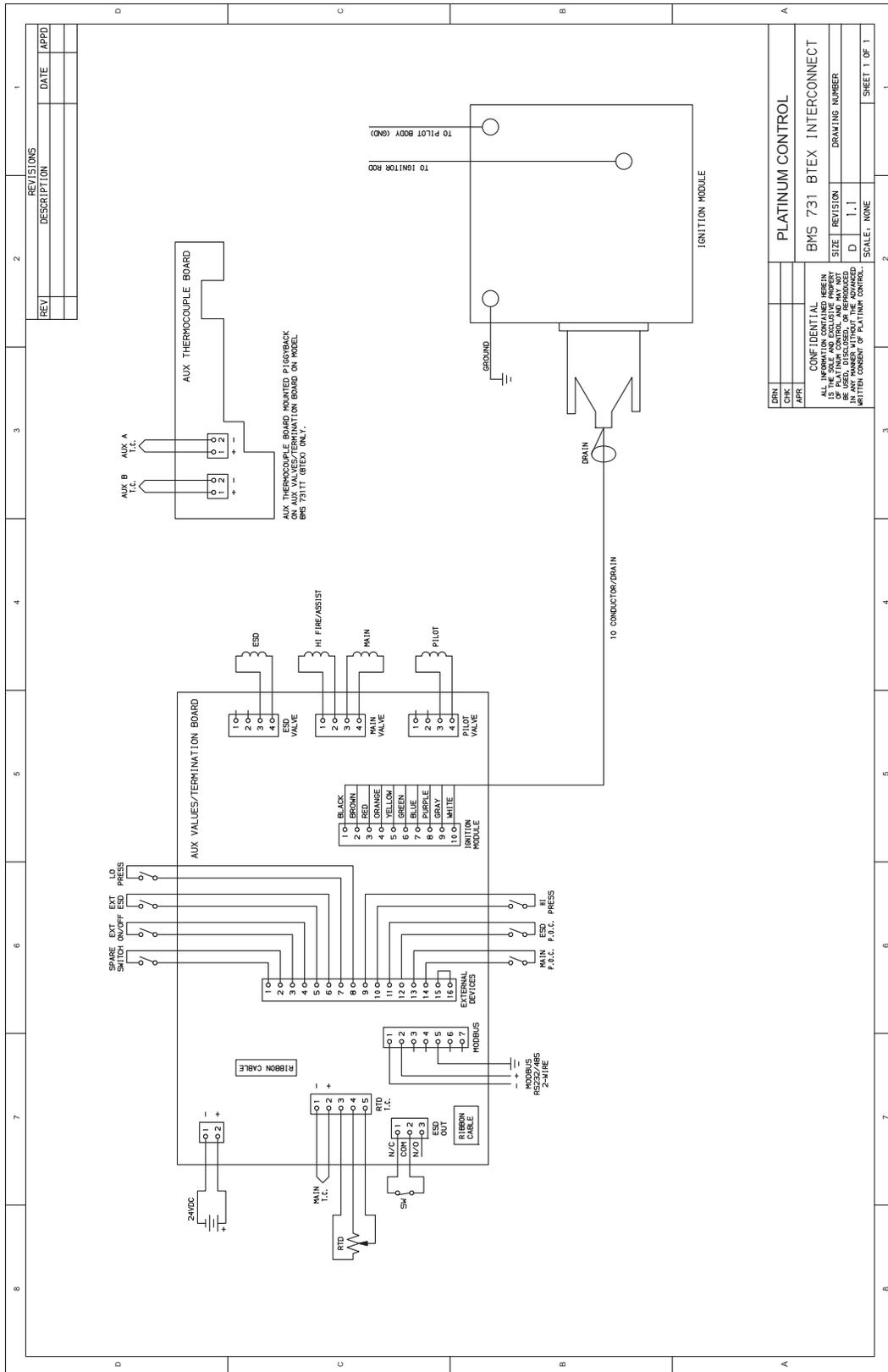
## CONCLUSION

The Platinum Burner Management System is simple and safe to use, and provides extensive operator feedback. For technical assistance, contact Platinum Control Technologies, or your local authorized distributor.



# ADDENDUM DRAWINGS

## BMS 731/BTEX Interconnect Diagram



REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

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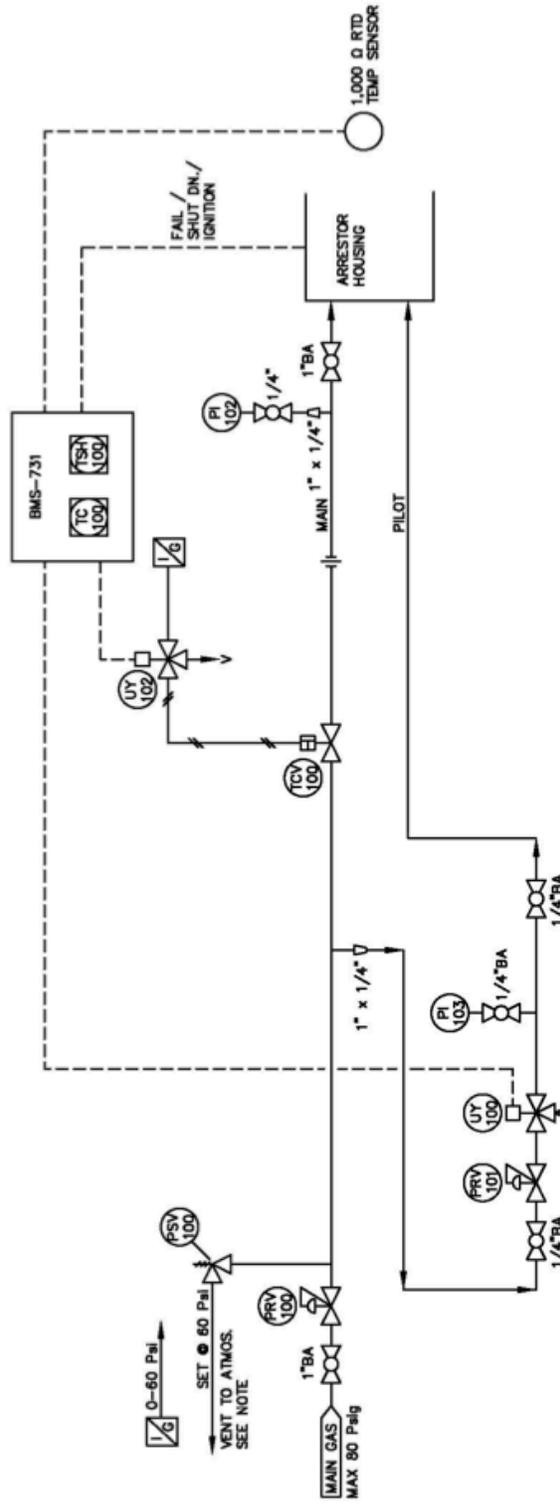
REV	DATE	DESCRIPTION

REV	DATE	DESCRIPTION

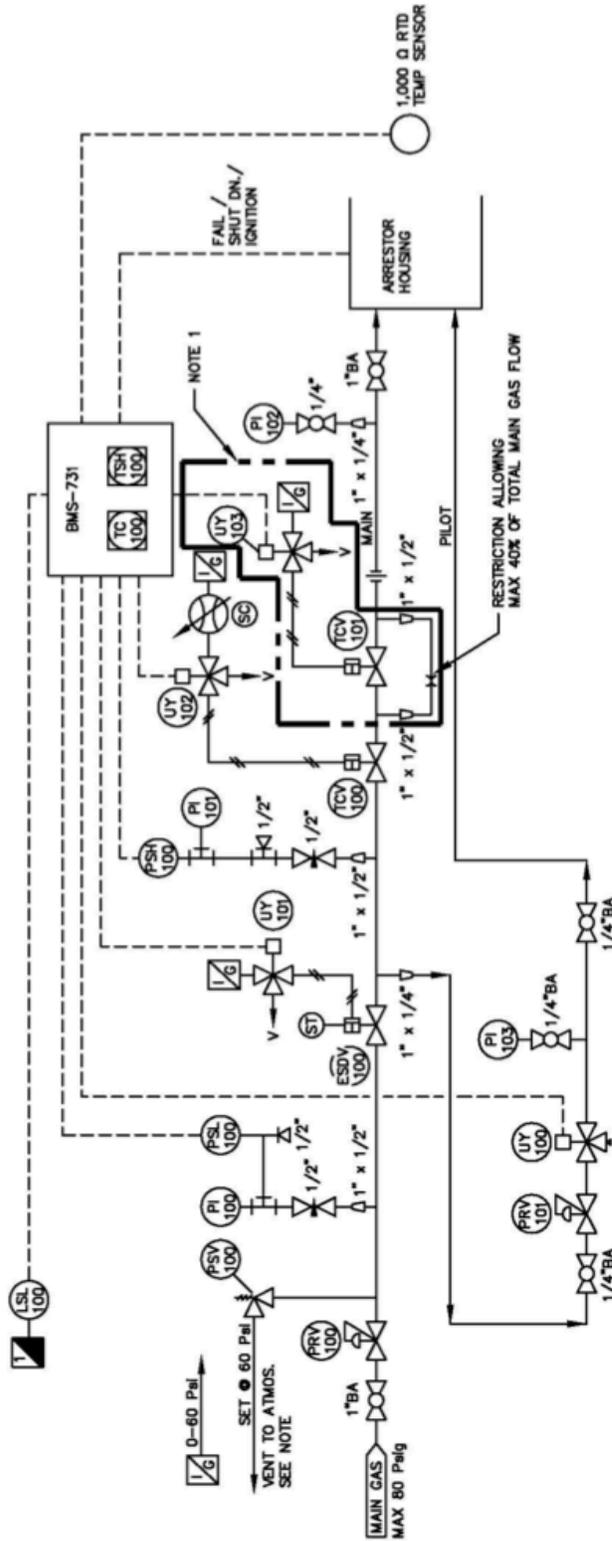


Basic P&ID



Full P&ID

NOTE 1 - OPTIONAL HIGH FIRE VALVE



78

Pt



73 I - BTEX ADDENDUM

## COMPONENTS AND SPECIFICATIONS

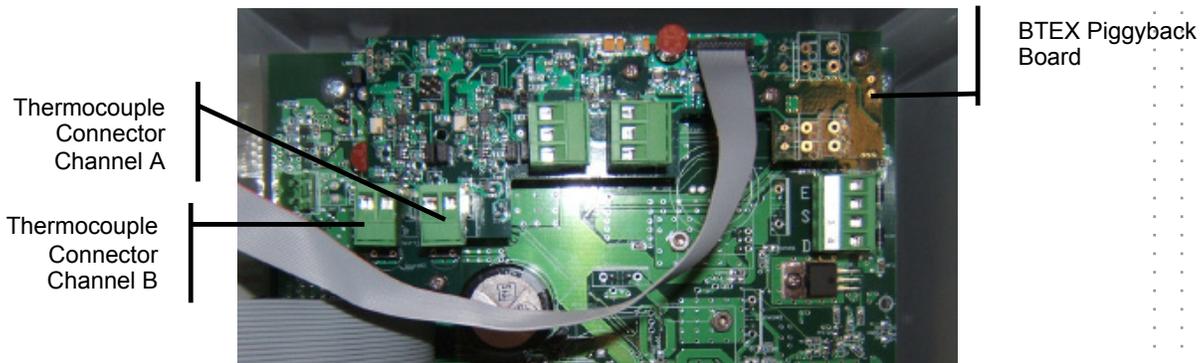
### BTEX Adapter Board (Piggyback Board)

The optional BTEX Piggyback Board enables the BMS-731™ to read two additional thermocouple temperature inputs (CH A and CH B). Each of these inputs has an associated programmable ESD alarm set point. Only the MAIN thermocouple can be used for temperature control.

#### NOTE

The Piggyback Board can only be used with the BMS-731™ configured for Thermocouple use. Multiple RTD's are not supported at this time.

The board is mounted "piggyback" to the Valve Board in the Main Control Box. A single ribbon cable connects the Piggyback Board to the Microprocessor Board.



## INSTALLATION

### Installing three (3) Type K Thermocouple

#### NOTE

Thermocouple must be of non-grounded type.

#### STEPS

1. The Type-K Thermocouples will need to be placed in a thermowell in the vessel. The use of thermal grease is recommended. Once the Type-K Thermocouples are secure in the thermowell of the vessel, open the top of the Thermocouples by simply twisting the lid counter clockwise.
2. Type-K connection wires (1 red-negative and 1 yellow-positive) will need to run from the Thermocouples to the Main Control Box.

#### WARNING

Only type-K wire (not supplied) can be used with the Type-K Thermocouple.

3. Drill a hole through the bottom of the Main Control Box and install a

#### WARNING

DO NOT drill any holes in the Main Control Box without removing the circuit boards. Any damage to the circuit boards while drilling holes is not covered under the warranty.

4. Attach ½" flex conduit connector to the Thermocouples. Run ½" Flex Conduit from the Meyers hub on Main Control Box to hub on the Thermocouples. Be sure to run the 2 connection wires through before securing the flex conduit to the Meyers hub.

#### TIP

Leave a drip loop or service loop when installing the flex conduit.

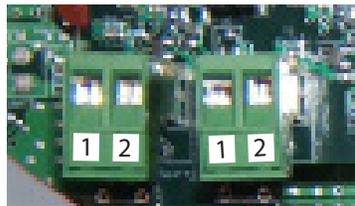
#### WARNING

Always follow local codes for sealing, electricity, etc. Proper sealing methods will need to be used when changing areas of classification.

5. Gently place one of the connection wires underneath one of the loosened screw and tighten screw back. The yellow wire (positive) should be secured to the yellow screw and the red wire (negative) should be secured to the red screw. Place the Thermocouple lid back on the top by screwing clock wise. Repeat for all three thermocouples.



6. Locate the connector labeled RTD/Thermocouple on the Valves/Termination Board and the Channel A and Channel B connectors on the Piggyback Board. To install a wire into a connector, strip 0.3" (7mm) of insulation off of the wire. The connector has a removable top for easy insertion of wires. Remove the top portion of the connector, turn screw counter-clockwise to open the terminal slot, insert the stripped wire into the terminal slot until it bottoms out. Turn the screw clockwise to shut the terminal slot and tug on the wire to ensure that it is firmly in place.
  
7. Insert the connection wires into the terminals on the connectors with the following order:
  1. RTD/Thermocouple Connector on Valves/Termination Board
    - i. Yellow Wire (positive) Terminal #1
    - ii. Red Wire (negative) Terminal #2
  2. Thermocouple Connector Channel A on Piggyback Board
    - i. Yellow Wire (positive) Terminal #1
    - ii. Red Wire (negative) Terminal #2
  3. Thermocouple Connector Channel B on Piggyback Board
    - i. Yellow Wire (positive) Terminal #1
    - ii. Red Wire (negative) Terminal #2



**NOTE**

If using only one auxiliary channel, insert a jumper wire in the remaining connector to read ambient temperature on that channel. If no jumper is installed that channel will read -1 degree

8. Push the removable connectors back onto the connector base on the Valve Board and Piggyback Board.



## OPERATING

### WARNING

Prior to powering up the Platinum BMS-731™, a second inspection of wiring, solenoid flow direction and setup is recommended. The Platinum BMS-731™ power terminates in the two (2) terminals supplied on the top left of the Valves/Termination Board.

### POWERING UP

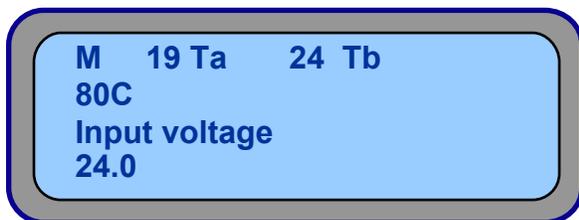
Close the Main and Pilot gas source valves and proceed to power up the system.

The startup display will read "Initializing valve control," then after several seconds will read "SYSTEM IS OFF."

The ESD solenoid (if turned on in the programming) will now be energized, and the remaining Pilot and Main solenoids will be in the OFF state.

The Platinum BMS-731™ will be in the OFF position, waiting for the system to be turned ON.

For the BTEX option, when the BMS is powered up the microprocessor will see the attached Piggyback Board and enable the software to read the additional inputs. The Alarm set point menu will change also to allow the additional set points. The display will now show Ta and Tb on the screen along with Main temperature. It will take approximately 20 seconds for the additional temperatures ratings to read-out on the front display panel.



## OPERATING PARAMETERS

The Operation Parameters Menu allows you to specify how certain functions/parameters are characterized within the Platinum BMS-731™. In the Setup Menu, press SETUP to set the options for the displayed parameter. Press the NEXT and PREV to navigate between operational parameters. When adjusting the various operation parameters, press ACCEPT to accept the parameter and return to the Operation Parameters Menu.

### NOTE

If at any time you want to exit the Operating Setup without saving, press the ESD button on the front panel. If you would like to exit and save the Operating Setup early, press the Accept button twice on the front panel.

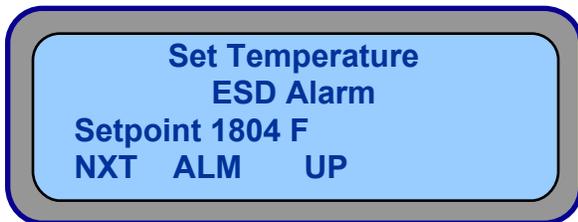
Press the NEXT key until the Alarm Setpoint menu appears.

### Alarm Setpoint (High Temperature Shutdown)

This parameter allows you to enter a setpoint at which the Platinum BMS-731™ will ESD on high temperature shutdown. This parameter will only work with a Platinum BMS-731™ that has the Temperature Control option turned ON.



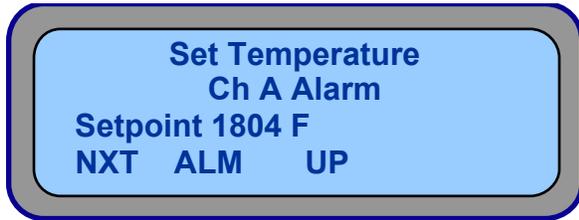
1. Press the EDIT button to enter into the Alarm screen.



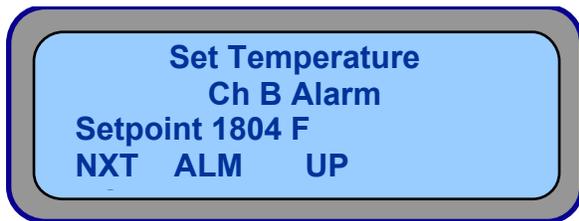
2. The first alarm setpoint that appears is the Main setpoint.
3. Press and hold UP or DOWN button to increase or decrease the setpoint faster.



4. Press the NEXT ALM button to bring up the Channel A setpoint.



5. The second alarm setpoint that appears is the Ch A setpoint.
6. Press and hold UP or DOWN button to increase or decrease the setpoint faster.
7. Press the NEXT ALM button to bring up the Channel B setpoint.



8. The third and final alarm setpoint that appears is the Ch B setpoint.
9. Press and hold UP or DOWN button to increase or decrease the setpoint faster.
10. Press the ACCEPT button to save the changes and continue on to the next screen or press the SELECT button on the main control box twice to save and exit.











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