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WESTERN

**HTDM
INSTALLATION, OPERATION AND MAINTAINANCE MANUAL**

ATEENTION: Read this manual, unit submittal sheets and all labels attached to the unit carefully before attempting to install, operate or service these units! Check unit data plates for type of gas, model number and serial numbers. Retain this document for future reference.

**FOR YOUR SAFETY IF YOU
SMELL GAS FOLLOW THESE
INSTRUCTIONS,**

- 1) OPEN WINDOWS
- 2) DO NOT TOUCH
ELECTRICAL SWITCHES
- 3) EXTINGUISH ANY OPEN
FLAMES
- 4) CALL THE GAS
SUPPLIER IMMEDIATLY

**FOR YOUR SAFETY THE USE
OF GASOLINE OR OTHER
FLAMMABLE VAPORS AND
LIQUIDS IN OPEN
CONTAINERS IN THE
VICINITY OF THIS
APPLIANCE IS HAZARDOUS**

Model: _____ Serial Number: _____

Job: _____ Date of Installation: _____

WARNING

**IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR
MAINTAINACE CAN CAUSE PROPERTY DAMAGE OR DEATH. PLEASE READ THIS
INSTALLATION, OPERATION AND MAINTAINANCE MANUAL THOUROUGHLY BEFORE
INSTALLING OR SERVICING THIS EQUIPMENT**

INSTALLERS RESPONSIBILITY

Installer please note: This equipment has been test fired and inspected. It has been shipped free from defects from our factory. However, during shipment and installation, problems such as loose wires, leaks or loose fasteners may occur. It is the installer's responsibility to inspect and correct any problems that may be found.

INSTALLER/SERVICE CONTRACTOR

NAME: _____
ADDRESS: _____
TELEPHONE: _____
CONTACT: _____

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RECEIVING AND WAREHOUSING

Inspect the unit upon arrival for any shipping damage. If any part is missing or damaged, Mark bill of lading as to damage and notify the carrier at once.

If the unit cannot be installed immediately, store it and its accessories in a clean and dry place.

GENERAL HANDLING INSTRUCTIONS

A qualified and experienced crane operator must do all rigging. General rigging methods should be followed in all cases:

- a) Spreader bars must be used when lifting equipment.
- b) Equipment must be lifted simultaneously by all "eye" bolts or channel slots provided on each section at the same time to distribute the loading properly. Damage or injury may result if all provisions for lifting are not utilized at time of lift. When multiple lifting eyes are furnished they are to share the weight of the lift evenly via spreader bar(s).
- c) Lifting eyes and channel slots are designed to be lifted vertically. The **MAXIMUM** angle from a vertical lift, which is permitted, is 30 degrees. Single sections only are to be lifted at one time and stacked from the lowest section upward. Sections are designed to be self-supporting in compression only. Do not attempt to hang multiple sections from any structure. The total perimeter base and all frame structure must be supported, and levelled, on high-density concrete or sufficient I-beam steel.
- d) For some models the heating and blower sections may be shipped separately. Assemble the sections by aligning the base frames and/or the pre-drilled flanges and secure the assembly with the fasteners provided. Use gasketing material to prevent infiltration at the joints.

WARNING

FAILURE TO COMPLY WITH THE GENERAL REQUIREMENTS MAY RESULT IN EXTENSIVE PROPERTY DAMAGE, SEVERE PERSONAL INJURY OR DEATH.

GENERAL INSTALLATION NOTES

- a) In Canada the installation must conform with local building codes or, in the absence of local building codes, with the current CAN/CGA -B149.1 or B149.2 "Installation Codes for Gas Burning Appliances and Equipment". Indoor duct furnaces

have been designed for, and certified to comply with, CAN/CGA2.8.

- b) Installation must be made in accordance with local codes or in absence of local codes with ANSI Standard Z223.1-1992 (N.F.P.A. No.54) "National fuel Gas Code" or the latest edition of all ANSI and NFPA standards. Standards referred to in these installation instructions are in effect at the time of certification. ANSI Standards are available from the American Gas Association 1515 Wilson Boulevard, Arlington, Virginia 22209. NFPA standards are available from the National Fire Protection Association, Batterymarch Par, Quincy, Massachusetts 02269. Heaters referred to in this manual are designed for use in airplane hangers when installed in accordance with ANSI/NFPA No.409 and in public garages when installed in accordance with the NFPA No. 88a and NFPA No.88b.
- c) No alterations are to be made on this equipment.
- d) For suspended appliances which are installed in air craft hangers, parking structures, and repair garages must be installed in accordance with the standard on air craft hangers, ANSl/NFPA 409, the standard for parking structures. ANSI/NFPA 88a, the standard for repair garages, ANSI/NFPA 88b, and with the CAN I-B149 codes,

CLEARANCE TO COMBUSTIBLE MATERIALS in inches (mm)

MODEL	TOP	FRONT	BACK	FLOOR	SIDES	FLUE
HTDM 200	0 (0)	0 (0)	0 (0)	3(76)	0 (0)	18(457)
HTDM 400	6(152)	6(152)	4(102)	3(76)	4(102)	18(457)
HTDM 600	6(152)	6(152)	4(102)	3(76)	4(102)	18(457)
HTDM 1000	6(152)	6(152)	6(152)	3(76)	6(152)	18(457)
HTDM 1500	6(152)	6(152)	6(152)	3(76)	6(152)	18(457)

All units installed on the floor has a minimum clearance of 3" (76mm) provided by the base frames of each individual unit.

For service it is advisable to maintain a minimum 24' clearance on the side opposite the controls side (note: not valid for the HTDM 200), and 42" clearance on the control side. If this unit is to be operated within a confined space or within a building of unusually tight construction, air for combustion and ventilation must be obtained from outdoors or other spaces freely communicating with the outdoors. Refer to current United States and Canadian Fuel Codes.

Ducts connected to the furnace shall have removable access panels on both the upstream and downstream sides of the furnace. These openings shall be accessible when the furnace is installed and shall be sized to allow the observation of smoke or reflected light inside the casing to indicate the presence of leaks in the heat exchanger. The covers for the openings shall be attached in such manner as to prevent leaks.

The furnace must not be operated in the presence of chlorinated vapours. When such vapours mix with products of combustion, highly corrosive compounds result, which will result in the premature failure of the heat exchanger and other components. In such an event the warranty is void.

CONNECTING THE FLUE (VENTING)

When making flue connection to the unit, observe the following general recommendations. In addition, the HTDM series of units are approved and must use recognized type "8" vent and/or vent connector. All connections must conform to the requirements of current United States and Canadian codes (gas fires units), and be in accordance with local authorities, which include but are not limited to:

- a) The flue must be securely attached to the unit with tight joints.
- b) The pipe from the unit to the flue should rise at least 1/4" per foot, (76.2 mm).
- c) The flue must be sized to have a cross-sectional area not less than that of the flue collar at the unit.
- d) Other appliances must not be connected so as to vent through the flue of this unit.
- e) Do not support the weight of the stack on the flue connection of the heating section.
- f) Minimize connecting pipe length and the number of bends by locating the unit as close to the flue pipe as possible.
- g) Maintain clearances between the flue pipe and combustible material that are acceptable to the local authorities having jurisdiction.
- h) For indoor/outdoor application the flues condensate disposal pipe, located on the unit, shall be piped to prevent accumulation of condensate on or around the unit.

The HTDM series are approved for use with type "B" venting. The venting must be of recognized type. For type "B" vent use with the HTDM 1000 and HTDM 1500 models a draft hood must be connected in series with the type "B" vent. The Draft hood must

be installed between the unit's flue connection and the type "B" vent.

NOTE: For venting diagram see Appendix C.

ELECTRICAL CONNECTIONS

- a) This unit has been examined and tested for compliance with CSA C22.2 no.0, CSA C22.2 no.3 and the NED code.
- b) All electrical work must conform to the requirements of the current NEC and CSA standard C22.1, Canadian Electric Code part I, and local ordinances.
- c) Control voltage is as indicted on the rating plate.
- d) Follow the wiring diagram supplied with the unit.
- e) If a space thermostat is used with the furnace, locate the thermostat so the cold drafts and hot discharge air streams do not affect the performance of the unit. Do no mount the thermostat on the casing of the unit, as it will be affected by radiated and conducted heat. Refer to the instruction furnished with the thermostat for further details.
- f) If any of the original wires as supplied with the unit must be replaced, it must be replaced with type TEW 105 degrees or its equivalent except where noted.
- g) Temperature controllers, limit controllers, remote selector switches, door switches or any other auxiliary electrical items must be connected to the terminals provided as shown on the wiring diagram.
- h) For units shipped in multiple sections, electrical connections between sections are to be made by the installer in the field.
- i) Field wiring to be done by the installer is denoted by doted lines on the wiring diagram. Solid lines on the wiring diagram indicate factory wiring by the manufacturer.
- j) The unit must be electrically grounded in accordance with local codes, or in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, and/or the CSA.C22.1 Canadian Electrical code.

NOTE: Due to the nature of transport check all bolts and fasteners for tightness.

GAS PIPING

All gas piping should be in accordance with NFPA, National Gas Code, and CAN 1-B149 with the regulation of local authorities having jurisdiction. An emergency manual shut down valve shall

be provided upstream of the piping to unit and should be labelled for quick identification. Colour coding of gas piping is also recommended.

In addition:

- a) Carefully check the unit rating plate for fuel type and supply pressure.
- b) If required, locate the high-pressure regulator at least five feet from the unit.
- c) Gas lines must not be located in such a way as to hinder access to the unit.
- d) A minimum 1/8" NPT plugged tapping, accessible for test gauge connection, must be installed immediately upstream of the gas supply connection to the appliance.

GAS VENT

High gas pressure regulator (if required), low pressure regulator, pilot pressure regulator, gas pressure switch (if supplied), and normally open vent valve (if supplied) must be vented outside of building for an indoor unit (check with authorities having jurisdiction).

DUCT FURNACES

- a) A duct furnace shall be installed with an inlet duct, which will provide air distribution equivalent to a straight run of duct having the same cross-section area as the inlet connection and not less than two equivalent diameters in length.
- b) The ducts connected to the duct furnace must have removable access panels on both upstream and downstream sides of the duct. The opening must be accessible, and shall be of such size, that smoke or reflected light may be observed inside the casing to indicate the presence of leaks in the heating element. The cover for the opening shall be attached in such a manner as to prevent leaks.
- c) The installation of the duct furnace must be adjusted to obtain an air throughout within the range specified on the appliance rating plate.
- d) If a duct furnace is connected to a return air duct or any other inlet air restoration; the duct furnace shall be installed on the positive pressure side of the air-circulating blower.

COOLING

When installed downstream from a refrigeration system. Condensation will form and provisions shall be made to dispose of condensate.

HIGH ALTITUDE

As per June I, 1998 all HTDM units are derated four percent of maximum input of each 1000ft(305m) elevation above sea level.

INDOOR UNITS

Install an indoor unit in such that the gas ignition control system is not directly exposed to water spray, rain or dripping water.

GENERAL OPERATING INSTRUCTION

- a) Refer to the rating plate for fuel input and supply pressures.
- b) Do not attempt to start the burner if the unit is full of vapour gas, or if the combustion chamber is very hot.
- c) Do not leave combustible material near the unit.
- d) Shut off the manual fuel supply valve if the burner has been shut down for an extended period of time.
- e) Ensure clean-out doors are in place before starting the burner.
- f) Do not start the burner unless the blower access doors are securely in place.
- g) Refer to literature regarding controls, gas valves and other components.

START-UP PROCEDURES

1. PRECAUTIONS

- a) Ensure the main disconnect switch is in the "off" position.
- b) Ensure the burner on-off switch is in the "off" position.
- c) Check all electrical and gas connections and tighten if necessary
- d) Check main fans (by rotating fan shaft by hand), bearing set screws, and pulley set screws. Ensure blowers are free to turn, vibration isolation shipping blocks are removed (if equipped), shipped loose items (if supplied), are removed from inside blower sections.

- e) Lubricate (if necessary) the burner and main fan motors. The specification on the motors for grease and oil shall be adhered to.
- f) Check heater outlets for obstruction.
- g) Check all fuse blocks to determine that all fusing is installed.
- h) Set the operating controls (e.g. thermostat, remote panel switches) so as to allow heating operation of the unit.
- i) Reset the motor starter by pushing the reset button, if so equipped. Ensure all blowers are rotating in the correct rotation.
- j) Check building system gas supplies and be sure all lines are purged of air.
- k) Check building system gas supply pressure.

2. CAUTION-GAS UNITS

At maximum input the supply gas pressure must fall within the range specified on the unit rating plate.

- a) Check all piping for tightness and correct any signs of leaks.
- b) Ensure purge timer is set to 70 seconds.

3. START-UP

- a) Refer to start-up check list and field report for correct settings that are to be checked on the unit.
- b) Check the supply fan motor thermal overload setting against the rating plate figure.
- c) Ensure burner on-off switch is in the "off"
- d) Verify units sequence of operation corresponds to sequence provided in the supplied literature.
- e) Check supply fan motor amps against rating plate figure. If actual figure varies by +/-20% from rating plate value, take corrective actions with respect to duct work and accessories external to the unit or blower/motor drive adjustments making sure to follow manufactures rating for blower rotational speeds.
- f) The thermal overloads must be set to appropriate motor performance after all adjustments have been make.
- g) Follow sequence and perform necessary steps to initiate burner activation.
- h) Once flame is detected the controller goes into "Power" and "Heat" mode.
- i) Check unit performance as described on the factory test report, (include items such as stack temperature. CO-2 level,

flame signals etc.) Readings obtained in the field should not deviate significantly from those obtained at the factory.

SHUT DOWN

1. EMERGENCY SHUT DOWN

- a) Set disconnect switch to "off" position.
- b) Close the manual main fuel valve.
- c) Set the burner on-off switch to "off".

2. SERVICE SHUT DOWN

- a) Set the burner toggle switch to "off" position.
- b) Close the manual main fuel valve.
- c) Set the operating controls, (e.g. thermostat, remote panel switches), so as to prevent heating operation.

MAINTENANCE

Regular maintenance is necessary to ensure the efficient operation and long life of this unit. This maintenance should be performed by or supervised by qualified service personnel. A maintenance schedule should be prepared for the unit based on its application and location.

1. RECOMMENDED QUARTERLY MAINTENANCE

- a) Check for loose connections in the wiring.
- b) Check the voltage at the unit while it is in operation.
- c) Check motor amperage draws against rating plate values.
- d) Inspect all contactors to ensure that they are clean and making good contact.
- e) Check all fittings valves and lines for leaks.
- f) Check for proper combustion. Adjust if necessary.
- g) Check the flame sensor signal (1.5-6.0 mA), clean if necessary.
- h) Check the fuel supply pressure to the unit.
- i) On gas fired units check the manifold pressure.
- j) Clean or replace air filters if necessary. Replace filters only with type equivalent to those supplied with the unit by the factory.
- k) Check all dampers, linkages and damper actuators; adjust and tighten as required.
- l) Check all belts. Adjust or replace as necessary.
- m) Check all bearings and lubricate if necessary.
- n) Check operation of all safety controls.

- o) Oil burner fan.
- p) Check all bearing to ensure tightness on shaft and lubricate if necessary.
- q) Check ignition spark and adjust gap if necessary.

2. RECOMMENDED YEARLY MAINIENANCE

- a) Perform the monthly quarterly maintenance recommended.
- b) Inspect blower wheels and housing, clean if necessary.
- c) Inspect all set screw on blower wheels and pulleys to ensure that they are secured to their respective shafts
- d) Check flame supervisor controller.
- e) Inspect all operating and safety controls. clean and replace if necessary.
- f) Inspect and clean the collection and disposal systems to ensure proper drainage.

NOTE: If ignition controller is replaced ensure the control system is not exposed to water spray, rain or dripping water. Refer to individual manufacturer's literature provided for maintenance requirements of optional equipment.

Power Venter Installation

The HTDM series may be equipped with a power vent system. Whnre installing ensure that the factory supplied diverter box is install on the unit, in series with the power venter.

- a) Diverter box relief opening must be installed 10" from walls and restrictions.
- b) Mount power venter in desired location. NOTE: Refer to manufactures installation instructions for vent length and sizing.
- c) Power venter must operate for the individual unit only.
- d) Wire power venter and safeties according to supplied diagram.
- e) Verify all safeties. In the event of venter failure the burner must become in active.

NOTE: For venting diagram see Appendix C.

PHOENIX PRODIGY SMC-1108

OPERATORS MANUAL



I. NORMAL START-UP SEQUENCE

1) Call for Heat

SMC-1108 will indicate power by illuminating the RUN LED. The combustion blower is ramped to full speed. Upon proof of closer of the modulating gas valve the Relay 1 is energized during the purge time. Upon the timing out of the purge timer the combustion blower will ramp to minimum speed for trial for ignition.

2) Trial for Ignition

Upon timing out the combustion blower drops to low speed and the ignition controller is powered. The pilot line solenoid is powered opening the pilot gas flow to the burner. Simultaneously the ignition controller initiates spark. Upon proof of flame ignition controller opens the main gas valves allowing gas to flow to the modulating gas valve, and the PLC will enter System Preheat.

3) System Preheat

During this stage SMC-1108 will ramp the firing valve and combustion blower to midrange without energizing the main supply fan. Preheat lasts approximately 60 seconds. Upon completion of the system pre-heat the main supply fan energizes and the unit will begin to operate in one of the following modulation modes.

II. HEAT MODES

1) Maintain Discharge Temperature.

The unit will adjust the firing rate to maintain discharge temperature. This option can be selected by CONTROL BY OTHERS/DISCHARGE TEMP. CONTROL BUTTON on NOVA SMC-108 Display main screen. Remote setpoint selection signal can be adjust discharge temperature setpoint with 0-10VDC or 4-20mA signal. The setpoint range is 0-40DegC. Terminal 18 and 19 is increase setpoint(10DegC) override command and terminal 18 and 15 is decrease setpoint(5DegC) override command.

2) **External Modulation Control**

SMC-1108 is capable of responding to a 0-10Vdc or 4-20mA signals. To configure SMC-1108 to respond to an external signal the CONTROL BY OTHERS/DISCHARGE TEMP. CONTROL button on NOVA SMC-1108 Display main screen must not be selected. The control signal connects to terminals 9 and 10. SMC-1108 will remain in control of errors and will lock out if any error condition occurs. The BMS has complete control over the discharge temperature.

The BMS supplier must supply SMC-1108 with either 0- 10 VDC or 4-20 mA signal. The signal is to be supplied to terminals 9 and 10. After normal startup sequence is finished. The unit will now only respond to the BMS signal and is unable to self adjust to changes in conditions.

SMC-1108 will respond to the incoming signals and modulate to a corresponding firing rate. The firing curve is composed of discrete steps. Each step is controlled by a trigger voltage or current that once reached the combustion will move to the next combustion step. When tuning a the BMS system the following points must be consider:

How the SMC-1108 Responds to External Modulation Control

SMC-1108 automatically scales the incoming signal to the internal combustion curve that has been programmed at the factory. The curve is made of discrete steps. There are dead- bands in the signal in which the unit will not modulate with an increase or decrease in the control signal.

Once a signal is received the controller will modulate to the corresponding firing point. During this transition SMC-1108 will not respond to changes in the control signal. As a result the Control system must be tuned for a very slow response. Poor temperature control will result if the system is not tuned correctly.

Switching From a mA control signal to VDC

When using a 4-20 mA signal, put a 500 Ω register between terminal 9 and 10. Remove a 500 Ω register between terminal 9 and 10, when using 0-10Vdc signal.

III. Other Operations (Software controlled)

1) *Low Limit*

The unit will shut down the supply fan if the duct temperature falls below the factory set point.

2) *System Preheat*

The unit can use a built in time delay before the contacts to the main supply fan are energized. This will allow a preheating of the heat exchanger to insure that only warm air will be supplied to the space. Preheat operation begins with a normal trial for ignition. Once flame has proven the unit will modulate to the midpoint of the firing range. The unit will remain at the midpoint until the preheat cycle is ended. Once ended the main supply fan contacts will energize and normal heat mode operation will begin.

3) *Standby mode*

Standby mode is to be used in conjunction with an on/off thermostat or when periodic heating is required. In Standby mode SMC-1108 is continually powered. In this mode the heat cycle will remain powered down until there is a call for heat from indicated by a 24VAC signal on terminal 21. Upon a call for heat a normal start up sequence is run and the unit will then enter heat mode. Once the call for heat is satisfied and the 24VAC signal is lost on terminal 21 SMC-1108 will exit heat. The unit will enter a post heat purge. During this time the combustion blower and firing valve are ramped to full fire. Upon completion of the post heat purge the burner and combustion blower are shut down. The main supply fan will remain in operation for a period of time to allow for cooling of the heat exchanger.

4) *Fan on in Standby Mode*

With this option the main supply fan will remain in operation regardless of the call for heat when the Standby option is selected. During transition between heat and standby operation the supply fan may cycle on and off for a short duration.

IV. ERROR SIGNALS

1) High Limit Error

This condition will occur when SMC-1108 has a duct temperature greater than the factory set point. This condition is indicated by the blinking of Alarm indication light 5 times(one short and four long blinking) every 10 seconds. The unit will indicate the high limit error and will lock until reset. The main supply blower will remain energized. Upon completion of the post heat purge the burner and combustion blower are shut down.

2) Air Proving Error

Air proving error occurs when the air proving switch is opened. This condition is indicated by the blinking of Alarm indication light 3 times(one short and two long blinking) every 10 seconds. The fan operation must be checked as well as the function of the air proving switch itself. Improper operation will cause poor and irregular combustion. The unit must be reset to reinitiate.

3) Flame Error

Flame error occurs when the flame signal is lost to SMC-1108. Lock occurs after the fourth attempt during trial for ignition and in any instance in which flame is lost after heat mode has been achieved. This condition is indicated by the blinking of Alarm indication light 4 times(one short and three long blinking) every 10 seconds. The unit must be reset to reinitiate.

4) Valve Error

Valve error occurs when SMC-1108 loses communication with the modulating gas valve or abnormal operation of the modulating gas valve has been detected. This condition is indicated by the blinking of Alarm indication light 2 times(one short and one long blinking) every 10 seconds. The unit will lock out and will require resetting to reinitiate.

V. Trouble Shooting

AIR PROVING ERROR	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 has lost the Air proving signal <input type="checkbox"/> Check combustion blower operation <input type="checkbox"/> Check air proving switch operation
FLAME ERROR	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 has lost the 24 VAC on terminal 20 <input type="checkbox"/> Check gas supply <input type="checkbox"/> Check ignition module for proper operation <input type="checkbox"/> Check all fail safes for proper operation <input type="checkbox"/> Check valves, manual and solenoid, for proper operation
HIGH LIMIT ERROR	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 has received a temperature reading above the factory set value. <input type="checkbox"/> Check main blower and dampers for proper operation. <input type="checkbox"/> Check discharge sensor for correct attachment.
LOW LIMIT ERROR	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 has detected a temperature below that set by the as the low limit. <input type="checkbox"/> Check unit for proper operation. <input type="checkbox"/> Check discharge sensor for correct attachment. Open contacts on the Discharge sensor terminals will cause indication of a low limit condition.
VALVE ERROR	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 has lost communication with the modulating gas valve. <input type="checkbox"/> Check that valve is powered and operating correctly. <input type="checkbox"/> Check for signal (0-10VDC) on terminal 24. The unit will not fire until valve has proven closed (≤ 2.0 VDC signal on terminal 11)

NO DISPLAY ON PLC CONTROLER	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 requires 120VAC on terminal 2 for operation. Check fuses on both the control panel and Circuit board and replace as necessary. <input type="checkbox"/> Verify correct wiring, wiring connections and grounding of the electrical components.
BOARD WILL NOT ENTER HEAT MODE	<ul style="list-style-type: none"> <input type="checkbox"/> SMC-1108 requires 24VAC on terminal 21 to enter heat mode. <input type="checkbox"/> SMC-1108 requires a 2.0 VDC signal on terminal 24 before initiating trial for ignition. <input type="checkbox"/> Flame has not proven. SMC-1108 requires a 24VAC signal on terminal 20 before entering heat mode. The controller will use 4 trials for ignition before indicating "flame error".
UNIT WILL NOT MODULATE	<ul style="list-style-type: none"> <input type="checkbox"/> Check for free rotation of the modulating valve <input type="checkbox"/> Check for correct feedback signal
SUPPLY FAN DOES NOT INGAGE	<ul style="list-style-type: none"> <input type="checkbox"/> Check for power on terminal 5 on the SMC-1108. If power is trace unit wiring as per diagram to determine fault. <input type="checkbox"/> Check for power on terminal 6. If power is not present trace wiring as per diagram to determine fault. <input type="checkbox"/> If power is present on 5 but not 6 the system is not calling for the supply air.

VI. Wiring

1	120VAC Neutral
2	120VAC Power
5	24VAC for purge timer common
6	Normally open contact to purge timer
7	Modulating gas valve control signal (2-10 VDC)
8	Solid State Relay (-VDC)
9	Building Management System signal or Remote setpoint selection signal(common)
10	Building Management System signal or Remote setpoint selection signal (0-10VDC/4-20mA)
11	Solid State Relay (+VDC)
12	Temperature sensor 24VDC power
13	Temperature sensor signal(0-10VDC)
14	Temperature sensor 24VDC common
15	Decrease setpoint override command
16	Air proving switch common
17	Air proving switch normally open contact
18	Increase/Decrease setpoint override command
19	Increase setpoint override command
20	Flame detect in (24VAC)
21	Heat mode/Standby (Switched 24VAC)
24	Modulating gas valve feedback signal (2-10 VDC)

Appendix A

Configuring Phoenix Prodigy SMC-1108

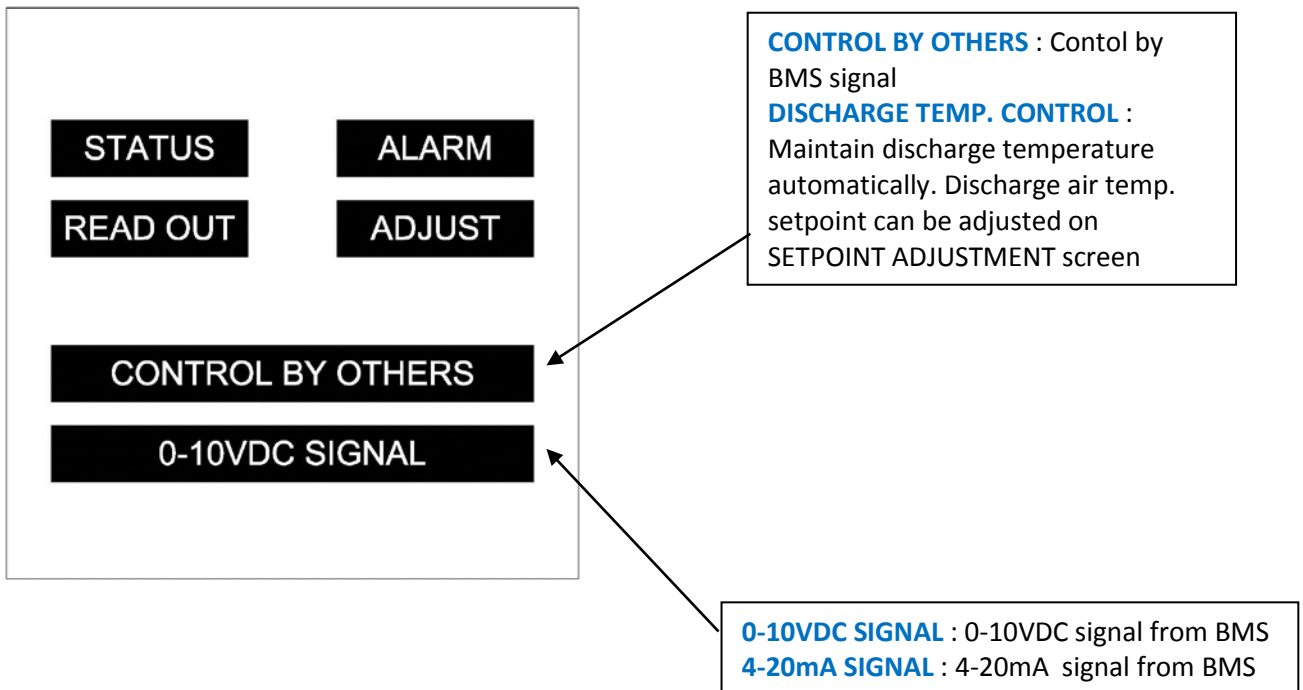
To correctly configure SMC-1108 NOVA SMC-1108 Display must be used to communicate with the controller. Factory training is required. Changes to the control configuration can cause poor combustion, improper or undesired operation.

Setting up NOVA SMC-1108 Display

To establish communication between SMC-1108 Display and SMC-1108 use Ethernet cable and connect 24VDC power (terminal 16) and 24VDC common (terminal 9) to SMC-1108 Display.

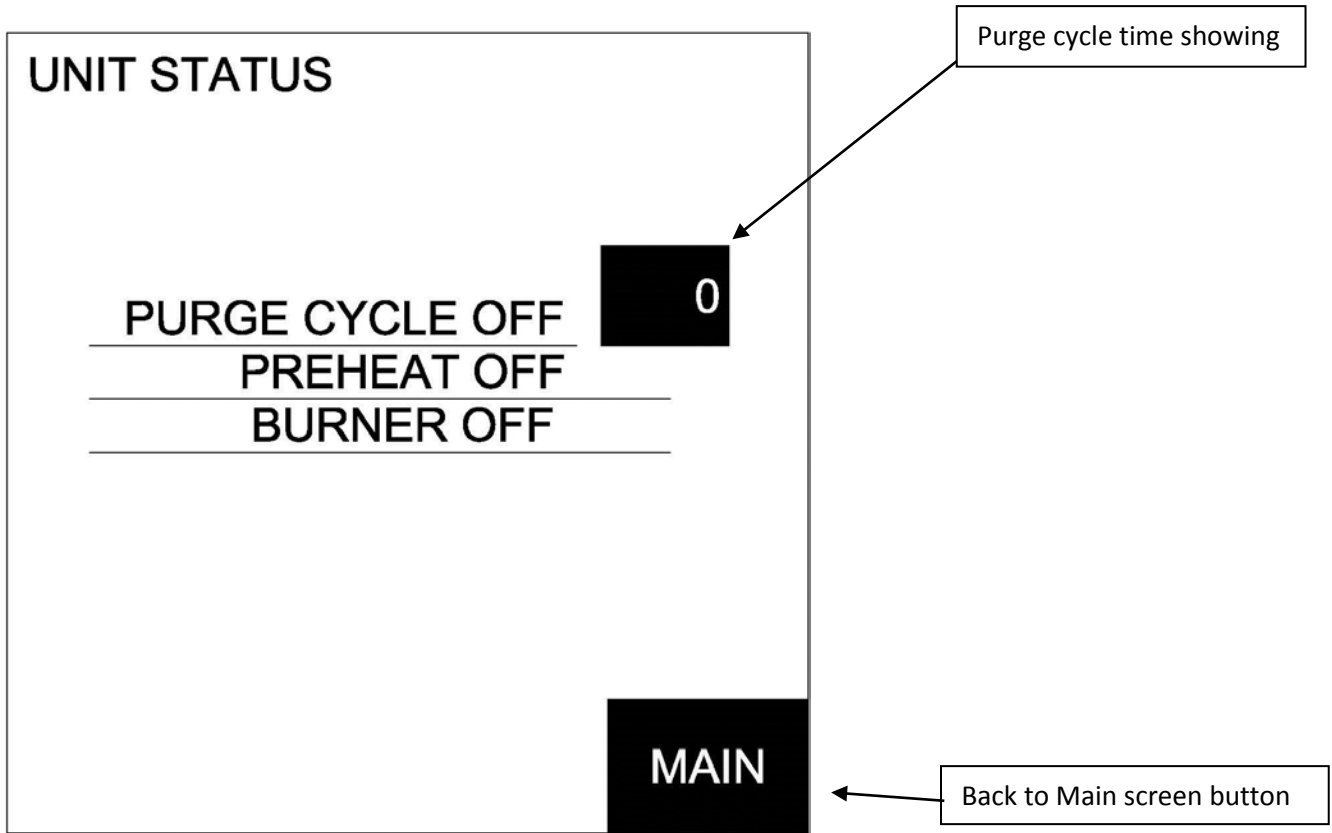
Main screen on NOVA SMC-1108 Display

This screen provides STATUS/ALARM/READ OUT/ADJUST screen access buttons, burner control type selection and control signal type selection.



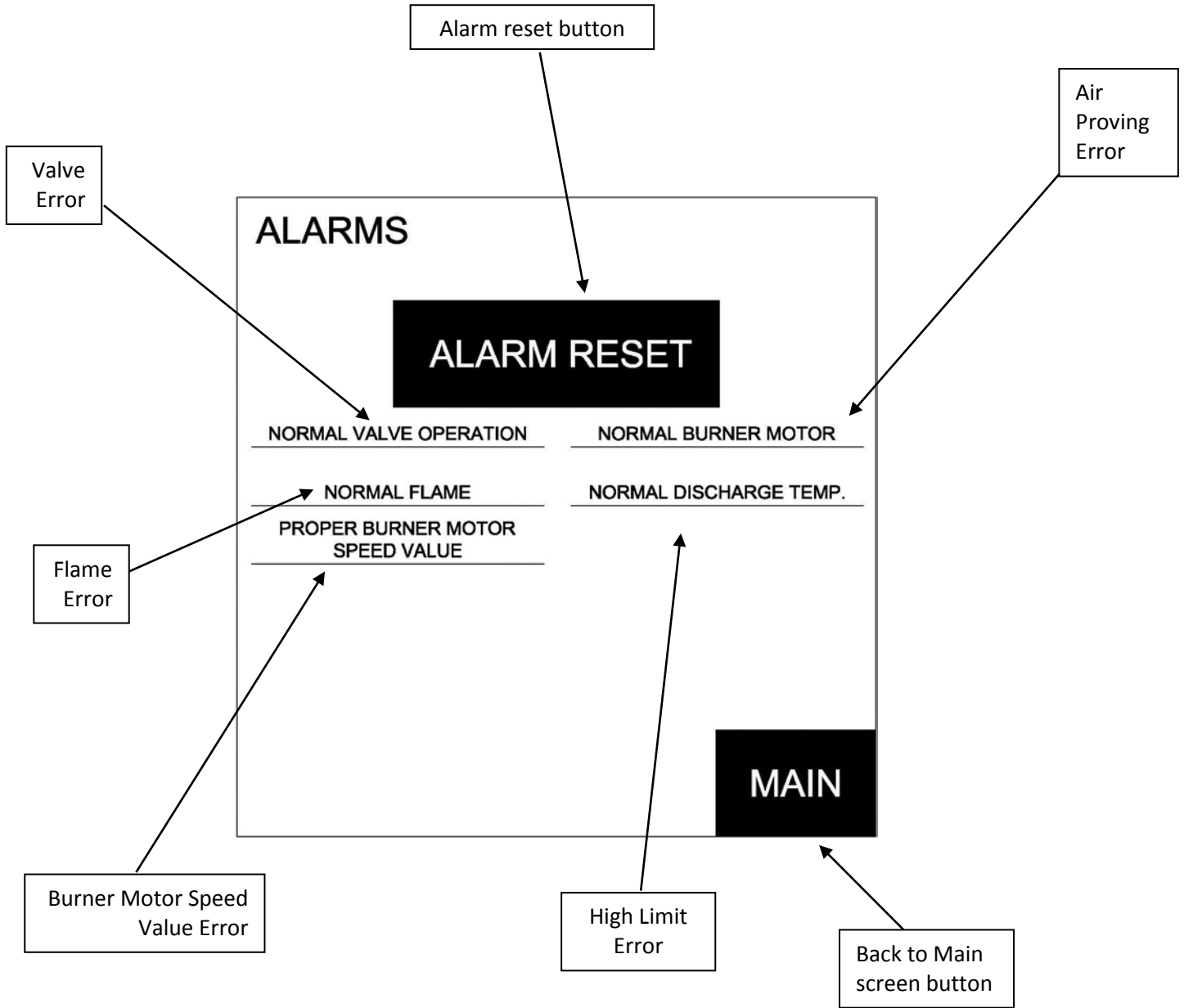
UNIT STATUS screen on NOVA SMC-1108 Display

This screen provides a view of PURGE CYCLE/PREHEAT/BURNER status.



ALARMS screen on NOVA SMC-1108 Display

This screen shows VALVE ERROR/AIR PROVING ERROR/FLAME ERROR /HIGH LIMIT ERROR/BURNER MOTOR SPEED VALUE ERROR. See IV. ERROR SIGNALS page for detail information of each alarm. BURNER MOTOR SPEED VALUE ERROR will occur when burner motor speed value entered incorrectly.



TEMP (DegC)/VALVE/SPEED READ OUT screen on NOVA SMC-1108 Display

This screen shows DISCHARGE AIR TEMPERATURE (DegC)/BRUENR VALVE CONTROL SIGNAL (0-10VDC)/BURNER VALVE FEEDBACK SIGNAL (2-10VDC)/BURNER MOTOR SPEED SIGNAL (0-10VDC).

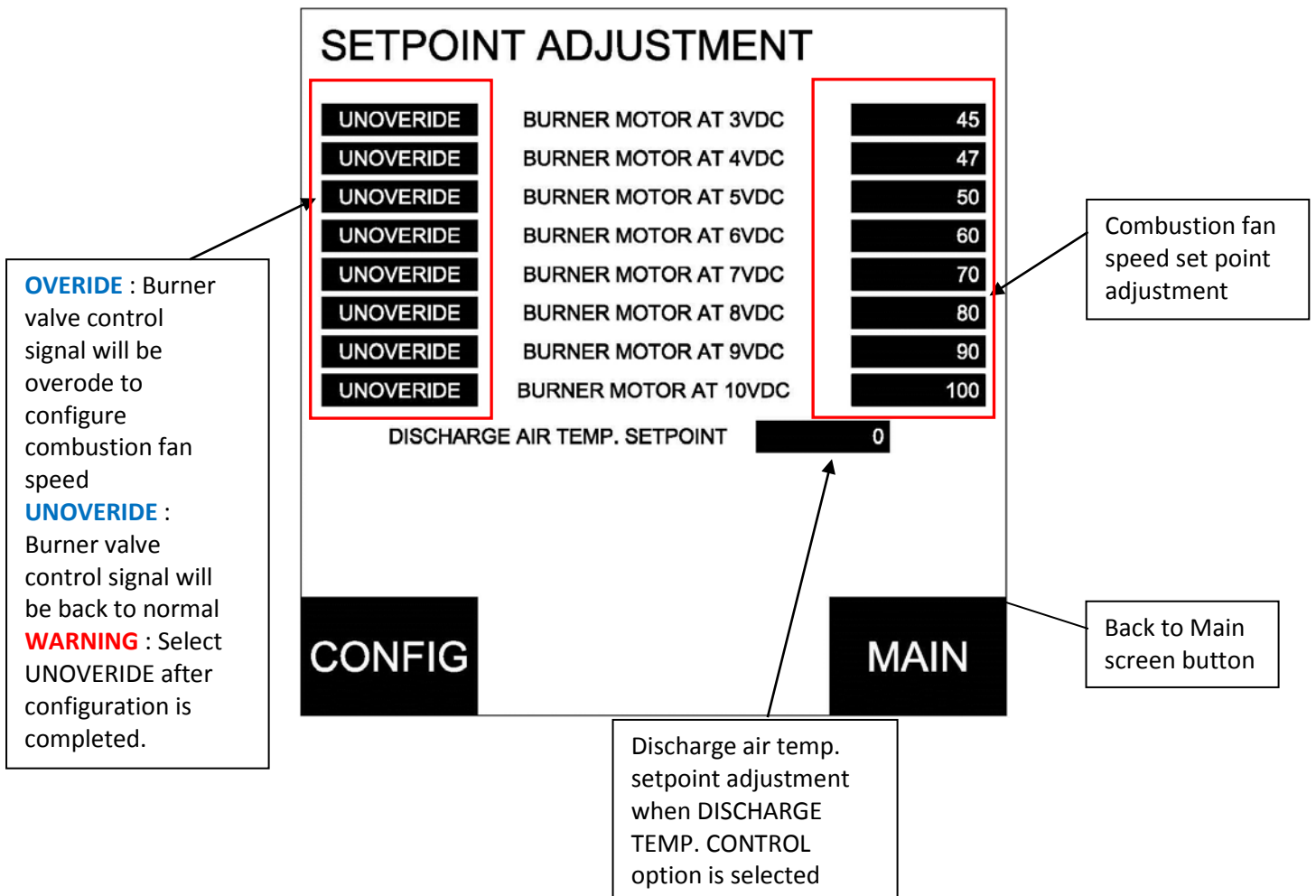
The screenshot displays a screen titled "TEMP(DegC) / VALVE / SPEED READ OUT". It features four data rows, each with a label and a numerical value in a black box:

DISCHARGE AIR TEMP.	22
BURNER VALVE CONTROL SIGNAL	0
BURNER VALVE FEEDBACK SIGNAL	18
BURNER MOTOR SPEED SIGNAL	0

At the bottom right of the screen is a black button labeled "MAIN". An arrow points from a text box labeled "Back to Main screen button" to this button.

SETPOINT ADJUSTMENT screen on NOVA SMC-1108 Display

This screen provides to configure eight combustion set points.



Combustion fan speed signal is 0-10VDC(0-60Hz). Value 45 is 4.5VDC signal. So the last digit is decimal digit. If combustion fan speed set points have been incorrectly configured, BURNER MOTOR SPEED VALVE ERROR will occur. Once this rough curve has been established override this system to high fire. Open the firing valve and set the manifold pressure. Shut the firing valve and force the system to low fire. Reopen the firing valve when the system is at low fire. Walk the system through each point in the combustion curve and check combustion making adjustments to the gas valve voltage as necessary. Once complete exit system tune and recheck complete curve. High fire should be running between 5-7% oxygen, 7-9% CO₂ while at low fire that number will vary from 18-20% oxygen, 0.1-1% CO₂. Remember as the dirt accumulates the combustion fan performance will drop off so allow excess oxygen during initial factory set up.

Appendix B

