



**SBC 1.0AC
SINGLE BURNER CONTROL
DUAL FUEL, PILOT IGNITED
CONTROL SYSTEM**



WARNING

These instructions are intended for use only by experienced, qualified combustion start-up personnel. Adjustment of this equipment and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

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These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.



WARNING

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

A. GENERAL INFORMATION

This control panel provides flame supervision and temperature control for a single gas or oil fired pilot ignited burner. A Kromschroder IFD258 flame relay in combination with a UVS10 UV detector monitors the burner flame for safe system operation.

A Hauck 1161 series high temperature limit instrument monitors furnace temperature and will shutdown the burner if the measured temperature exceeds the instrument's setpoint. Once tripped, the instrument must be manually reset before the burner can be re-ignited.

Temperature control is provided by a Honeywell UDC3200 series temperature controller and a burner control actuator. After the main burner flame has been established, the air control actuator will modulate in response to the output of the temperature controller.

The control system is housed in a 24" wide by 30" high by 12" deep wall mounted enclosure. All control relays, circuit breakers, fuses and terminal blocks, mount on a sub-panel inside the enclosure. An alarm horn annunciates limit and burner flame failures. Reference Hauck drawing Y8578 for panel dimensions and a list of component parts.

B. APPLICABLE HAUCK DRAWINGS

- Y8578 Panel Assembly
- Y8587 System Schematic, 4-20mA Control
- Y8589 System Schematic, Position Proportional Control
- Y8591 External Component Wiring Diagram

C. RECEIVING AND INSPECTION

Upon receipt, check each item on the bill of lading and/or invoice to determine that all equipment has been received. Examine all parts to determine if there has been any damage in shipment. If equipment is to be stored prior to installation, provide a dry storage area.

D. INSTALLATION (REF. WIRING DIAGRAM, Y8591)

IMPORTANT

For optimum use of the Hauck panel, Hauck suggests that the drawings provided be referred to for limit switch and valve installation. In the event a recommended limit switch is not utilized, it will be necessary to connect jumper wire(s) between appropriate terminals in the control panel. Such determination remains the responsibility of the Customer, based upon the application, accepted safe installation and operating procedures, and any applicable governmental regulations.

1. Mount the control panel on a firm support isolated from vibration. The panel should not be exposed to direct flame radiation or ambient temperatures above 130 deg. F.
2. Install a heavy gauge (#12 AWG min.) ground wire between the panel equipment ground connector and Earth ground.
3. Install and wire the burner and system limit switches, control motor, fuel and air valves, ignition transformers, and flame detector as shown on the drawings provided.

IMPORTANT

Thermocouples, flame detectors, and 4-20mA control signals must be run separately from all other power and control wiring. If these signals are run with other cables, stray currents could cause erroneous readings and burner shutdowns.

4. Be sure all equipment and components have been installed according to the manufacturer's instructions and drawings.
5. Be sure all traps and filters in the system, which may have accumulated dirt or other foreign material, are cleaned.
6. Make a final check of all fuel supply lines for leaks caused by loose fittings, unions, valves, etc.
7. Carefully check all wiring before apply power to the system.

E. ADJUSTMENTS

CAUTION
**EXERCISE CAUTION TO AVOID CONTACT WITH EXPOSED
TERMINALS AND WIRING.**

1. Final adjustment of the pressure and flow limit switches should be made at the time of the initial start-up. Refer to vendor literature for the correct method of switch adjustment.
2. Verify settings of the burner control limit switches. The low fire limit switch should CLOSE when the motor is in the low fire position and OPEN when the valve is opened slightly. The purge air pressure switch (or high fire limit switch) should CLOSE when the air valve is driven fully open for purge.
3. Set the purge timer, for the desired purge time (minimum 30 seconds, maximum 10 minutes). **A MINIMUM OF FOUR COMPLETE AIR CHANGES MUST BE SUPPLIED.** Multiply the total system volume (furnace and exhaust ducts in cubic feet) by four. Divide this value by the total burner air capacity in cubic feet per minute. The result will be the required purge time in minutes.

IMPORTANT
Purge the system before igniting the burner. Purging the system will remove possible accumulation of combustible gases. **Improper purging may result in the potential of an explosion.**

F. PANEL OPERATION (Ref. **SYSTEM SCHEMATIC Y8587 or Y8589**)

The following steps provide a general overview of the burner operation. This section emphasizes the function of the flame supervision and burner management controls supplied by Hauck.

1. Open all necessary manual shutoff cocks to supply fuel to the system.
2. Twist to release the panel E-STOP pushbutton.
 - a. Power will be supplied to the burner control panel.
 - b. The flame relay and temperature instruments will perform their self-test procedures.
3. Verify the position of the FUEL SELECTOR switch and the setpoints of the high temperature limit and temperature controller; then move the BURNER CONTROL selector switch to the LOW FIRE position.
4. Start the combustion air blower and all other equipment required for burner operation. Provided that all safety limits have closed the LIMITS SET indicator will flash.
5. Momentarily press the LIMITS SET pushbutton.
 - a. Limits Set relay, CR114, will be energized and the LIMITS SET button will stop flashing and remain on.
 - b. Purge relay, CR117, will be energized and the burner control motor will drive open in preparation for purge.
 - c. Alarm enable relay, CR201, will be energized and the alarm circuit will become active.

6. After the burner control motor driven open and the purge air pressure switch (or high fire limit switch) has closed:
 - a. Low Fire relay, CR200, will be de-energized.
 - b. The PURGING indicator will illuminate.
 - c. Purge timer, TD119, will be energized and begin timing.
7. When the Purge Timer has completed its timed delay;
 - a. Purge Latch relay, CR122, will be energized.
 - b. Purge relay, CR117, will be de-energized and the burner control motor will drive to low fire to prepare for burner ignition.
8. When the burner control motor reaches the low fire position.
 - a. The low fire limit switch contact will close and Low Fire relay, CR200, will energize.
 - b. The PURGING indicator will go out.
 - c. The START pushbutton will begin flashing.
9. Press and hold the START pushbutton to initiate the burner ignition sequence.
 - a. The flame relay will be energized and begin its 10-second trial for ignition sequence.
 - b. The ignition transformer and pilot gas valves will be energized.
 - c. Burner Run relay, CR160, will be energized.
 - d. The START pushbutton will remain on indicating that the START pushbutton may be released.
10. After approximately 6 seconds, the ignition transformer will be de-energized.
11. Provided that a satisfactory flame is detected:
 - a. Flame On relay, CR163, will be energized.
 - b. The FLAME ON indicator will illuminate.
 - c. The burner gas or oil valves will be energized
 - d. The purge timer will be de-energized and reset.
 - e. Pilot Timer, TD165, will be energized and begin timing.
12. After the pilot timer has completed its 10-second delay.
 - a. The pilot gas valves will be de-energized.
 - b. The burner control circuit will be enabled.
13. Move the BURNER CONTROL selector to the CONTROL position.
 - a. Control relay, CR124, will be energized.
 - b. The burner control motor will be released from low fire and respond to the output of the temperature controller.
14. To override the temperature controller and hold the burner control motor at low fire, move the BURNER CONTROL selector to LOW FIRE.
 - a. Control relay, CR124, will be de-energized.
 - b. The burner control motor will drive to its low fire position.
15. To terminate burner operation, move the BURNER CONTROL selector to OFF.
 - a. The flame relay and all fuel valves will be de-energized and the burner flame will go out.
 - b. The burner control motor will drive to its low fire position.

G. FAULTS AND FAILURES

1. If a flame failure occurs or a satisfactory flame signal is not detected during the pilot or main burner ignition sequence.
 - a. The Flame Relay will lockout and a fault code will flash on the display.
 - b. The ignition transformer and fuel valves will de-energize.
 - c. Fault relay, CR167, will energize.
 - d. The RESET pushbutton will be illuminated.
 - e. The alarm horn will sound.

⇒ Press the ALARM SILENCE pushbutton to quiet the alarm horn. Investigate the cause of the pilot or main flame failure then press the RESET pushbutton to reset the flame relay and restart the system purge sequence.
2. Momentary interruption of any of the following safety limits will cause immediate burner shutdown and alarm.

TERM.	DEVICE
103A	Combustion Air Interlock
104	Combustion Air Pressure Switch
106	Low Gas Pressure Switch
106A	High Gas Pressure Switch
107	Low Oil Pressure Switch
107A	High Oil Pressure Switch
107B	Atomizing Air Pressure
108	Compressed Air Supply Pressure
109	Low Oil Temperature
109A	High Oil Temperature
112A	High Temperature Limit
112B & 112C	Auxiliary Limits

The burner shutdown sequence is as follows:

- a. All fuel valves will de-energize.
 - b. The flame relay will de-energize.
 - c. The Limits Set and Purge Latch relays will be de-energized.
 - d. The burner control motor will be forced to low fire.
 - e. The alarm horn will sound.
- ⇒ Press the ALARM SILENCE pushbutton to quiet the alarm horn. Investigate and correct the cause of the limit failure to restart the system purge sequence.
- ⇒ **NOTE:** if burner shut down is due to an over temperature condition, the High Limit Instrument must be manually reset by pressing its RESET button after the temperature has dropped below the high temperature setpoint. If burner shut down is caused by a momentary interruption of one of the safety limits, the LIMITS SET pushbutton will begin flashing as soon as the limits series is reestablished.

H. RECOMMENDED SPARE PARTS

PART No.#	QTY	DESCRIPTION
62823	1	High temperature limit instrument
84621460	1	Flame relay, IFD258
17292	3	Relay, 3PDT
61961	1	Purge timer
40744	1	Timer, 10 second solid state
58876	1	Block, contact, 1NO
58877	1	Block, contact, 1NC
84315205	1	Detector, UV, UVS10D2

APPENDIX A: Temperature Controller Configuration Record

CONFIGURATION

Press **SETUP** to access the configuration group then press the **FUNCTION** key to step through the parameters. Use the ▼/▲ keys to change values if required.

SET UP GROUP	LOWER DISPLAY (FUNCTION)	FACTORY CONFIGURATION	FINAL SETTING
TUNING			
	GAIN	1.000	
	RATE MIN	0.00	
	RESET RPM	1.00	
	SECURITY	0	
	LOCKOUT	NONE	
	AUTO MAN	ENABLE	
	RUN HOLD	DISABLE	
	SP SEL	ENABLE	
SP RAMP			
	SP RAMP	DISABLE	
	SP RATE	DISABLE	
ACCU TUNE			
	FUZZY	DISABLE	
	ACCU TUNE	DISABLE	
ALGORITHM			
	CONT ALG	PID A	
	TIMER	DISABLE	
	IN ALG 1	NONE	
OUT ALG			
<i>For Position</i>	OUT ALG	POSITN	
<i>For Current</i>	OUT ALG	CURRENT	
<i>For Current</i>	CO RANGE	4-20mA	
INPUT 1			
	IN 1 TYPE	J TC L or K TC H	
	IN 1 HIGH	<i>read only</i>	
	IN 1 LOW	<i>read only</i>	
	RATIO 1	1.000	
	BIAS IN 1	0.0	
	FILTER 1	1	
	BURNOUT 1	UP	
INPUT 2			
<i>For Position</i>	IN 2 TYPE	SLIDEW	
<i>For Current</i>	IN 2 TYPE	DISABLE	
CONTROL			
	PV SOURCE	INPUT 1	
	PID SETS	1 ONLY	
	LSP'S	1 ONLY	
	RSP SRC	NONE	

SET UP GROUP	LOWER DISPLAY (FUNCTION)	FACTORY CONFIGURATION	FINAL SETTING
	SP TRACK	NONE	
	POWER MODE	A LSP	
	SP HI LIMIT	<i>per TC selection</i>	
	SP LO LIMIT	<i>per TC selection</i>	
	ACTION	REVERSE	
CONTROL	OUT RATE	DISABLE	
	OUT HI LIM	100.0	
	OUT LO LIM	0.0	
	I HI LIM	100.0	
	I LO LIM	0.0	
	DROPOFF	0.0	
	DEADBAND	2.0	
	FAILSAFE	0.0	
	FAILMODE	NO LATCH	
	MAN OUT	0.0	
	AUTO OUT	0.0	
	PB OR GAIN	GAIN	
	MIN OR RPM	RPM	
ALARMS			
	A1S1 TYPE	NONE	
	A1S2 TYPE	NONE	
	A2S1 TYPE	NONE	
	A2S2 TYPE	NONE	
	ALARM HYST	0.1	
	ALM OUT 1	NO LAT	
	BLOCK	DISABLE	
	DIAGNOS	DISABLE	
DISPLAY			
	DECIMAL	NONE	
	TEMPUNIT	DEG F	
	PWR FREQ	60 HZ	
	LANGUAGE	ENGLISH	

APPENDIX B: HIGH TEMPERATURE LIMIT



Front Face of High Temperature Limit

Upper Display: Normally displays process temperature. Also displays parameter values or selections when in the set up mode.

Lower Display: Shows value of set point. Also displays function groups and parameters when in the set up mode.

Error / Fault Indications

Parameter	Upper Display	Lower Display	Description
Over Range	[HH]	Normal	Input > 5% over-range
Under Range	[LL]	Normal	Input > 5% under-range
Sensor Break	OPEN	Normal	Break in input sensor or wiring
Option 1 Error	ERR	OPn1	Option 1 module fault
Option 2 Error	ERR	OPn2	Option 2 module fault
Option 3 Error	ERR	OPn3	Option 3 module fault
Option A Error	ERR	OPnA	Auxiliary Option module fault

▼: Used to decrease the setpoint or configuration values.

▲: Used to increase the setpoint or configuration values.

SET UP: Used in conjunction with the ▲ key to enter the set up and configuration modes. Also used to advance through the parameters.

CONFIGURATION

Press and hold the **SETUP** key then press the ▲ arrow. **OPtr** will appear in the upper display. Press the ▲ arrow key again until the upper display reads **ConF**, then press **SETUP**.

ULoc will appear in the lower display. Press the ▲ arrow until upper display reads 20 then press the **SETUP** key to enter the configuration mode.

Use the **SETUP** key to step through the configuration menu. Use the ▼/▲ keys to change values if required. After each parameter change, the display will blink until the **RESET** button is pressed to accept the new value.

LOWER DISPLAY (FUNCTION)	FACTORY CONFIGURATION	FINAL SETTING
InPt	J.F or KF	
ruL	Range Max	
rLL	Range Min	
OFFS	0.0	
Ctrl	Hi	
SPuL	Range Max	
SPLL	Range Min	
ALA1	nonE	
ALA2	nonE	
USE2	A1_d	
USE3	A2_d	
diSP	EnAb	
CLoc	20	

After your have completed the Configuration cycle power to reset or wait 2 minutes for the unit to reset to the run mode.

CHANGING THE SET POINT

Press and hold the **SETUP** key then press the ▲ arrow. **OPtr** will appear in the upper display. Press the ▲ arrow key again until the upper display reads **SEtP**, then press **SETUP**.

ULoc will appear in the Lower Display. Press the ▲ arrow until Upper display reads 10 then press the **SETUP** key to enter the setup mode.

Set the parameters as shown in the following table.

LOWER DISPLAY (FUNCTION)	FACTORY CONFIGURATION	FINAL SETTING
SP	70	
hYSt	0.1	
FiLt	2	
SLoc	10	

To return to normal operation, press and hold the **SETUP** key then press the ▲ arrow until **OPtr** appears in the upper display; then press **SETUP**.

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