

WIRING CONNECTIONS

Table 3. Wiring Connections (Class 2, Low Voltage).		
Terminal Type	Connection (see Fig. 4)	Connects S9200U1000 to:
6-position screw terminal (#5 screw)	D/1 (optional)	EnviraCOM™ Data Connection (if used)
	C/3	24 volt ground
	R/2	24 volt hot - Thermostat
	W	Thermostat Heat Input
	G	Thermostat continuous fan input
	Y	Thermostat cool input / cooling contactor output for EnviraCOM thermostats
Polarized 3-pin connector	E-COM	EnviraCOM™ diagnostic or communications device
12-pin connector	Main Harness Connector	See Table 2 on page 7.
Straight Spade Quick Connect	24 VAC	Transformer - 24 Vac
	COM	Transformer - Common
Fuse Block	Fuse	Fuse - Automotive Type - 3.0 Amps

Table 4. Wiring Connections (Class 1, Line Voltage).		
Terminal Type	Connection (see Fig. 4)	Connects S9200U1000 to:
4-pin connector (male terminals)	• Igniter-Inducer Harness Connector	See Table 3 on page 8
Straight Spade Quick Connect	COOL	Circulator cool speed output
	EAC	Electronic Air Cleaner 120 Vac Output
	HEAT	Circulator heat speed output
	CONT	Continuous circulation
	XFMR	Transformer 120 Vac Output
	L1	Line 120 Vac hot power supply
	HUM	Humidifier 120 Vac output
Straight Spade Quick Connect	PARK	Circulator Motor Park 120 Vac Input
	PARK	Circulator Motor Park 120 Vac Input
Straight Spade Quick Connect	Neutrals	120 Vac Input Neutral, Transformer Neutral, Electronic Air Cleaner Neutral, Circulator Neutral, Humidifier Neutral NOTE: Any connector can be used.
	Flame	Flame Sense - Signal Input (90 Vac, current limited)

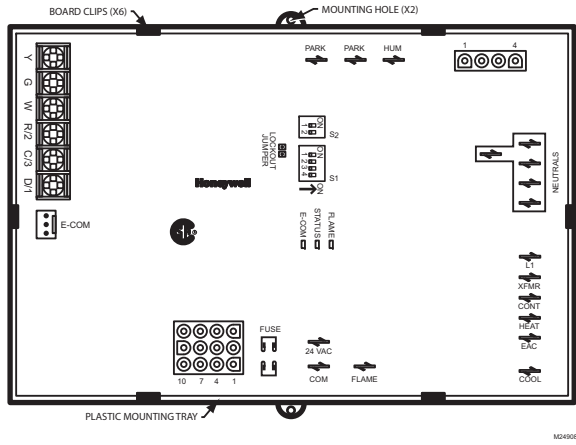


Fig. 1. Typical Mounting Orientation showing wiring connections to the S9200U1000

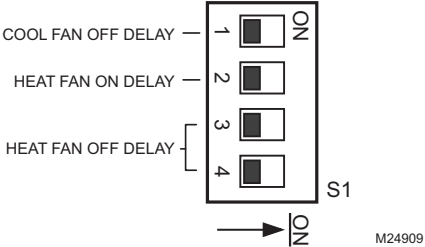


Fig. 2. DIP Switch (S1) Shown with factory default settings; all off

NOTE: FIELD SETTINGS (Page 11)

The field settings can be changed whenever necessary. The change takes effect for the next situations which are being influenced by that change. If for example a particular delay is in progress and settings are changed, the current delay setting is not influenced by that change. The field settings are not considered safety critical therefore, changes to these parameters can be made at any time during and after installation.

NOTE: See "DIP Switch S1 - Field Settings" on page 11.

Fixed parameters are those settings which may not be adjusted at any time.

Table 5. Fixed Parameters	
Fixed Parameter	Setting
Pre-Purge	30 seconds
Inter-trial Purge	60 seconds
Postpurge	15 seconds
Cool Fan ON Delay	5 seconds
Ignition Retries	2 retries (3 retries total)
Ignition Recycles	3 recycles (4 cycles total)
Auto Restart Delay	1 hour

Fixed Parameter	Setting
Flame Failure Response Time	2 seconds (maximum)
Fault De-bouncing Time	2 seconds
Compressor Short Cycle Delay	5 minutes
False Flame Recognition Period	20 seconds
Heat Cycles to Safety Timings Selection Lock	10 cycles

DIP Switch (S1 and S2) settings
The following field and safety parameters may be set using DIP switches S1 and S2. Refer to Fig. 4 on page 9 for the location of the two DIP switch blocks.

Table 6. DIP Switch (S1) settings - Field settings.				
DIP Switch S1 Descriptions	Individual Switches			
	SW1	SW2	SW3	SW4
Cool Fan OFF Delay - 0 seconds	OFF			
Cool Fan OFF Delay - 60 seconds	ON			
Heat Fan ON Delay - 30 seconds		OFF		
Heat Fan ON Delay - 60 seconds		ON		
Heat Fan OFF Delay - 120 seconds			OFF	OFF
Heat Fan OFF Delay - 180 seconds			OFF	ON
Heat Fan OFF Delay - 90 seconds			ON	OFF
Heat Fan OFF Delay - 60 seconds			ON	ON

DIP Switch S2 – Safety Timings
Table 7. DIP Switch (S2) settings - Safety timings

DIP Switch S2 Descriptions	Individual Switches	
	SW1	SW2
HSI Igniter Warm-up Time = 17/27 ⁸ seconds Trial For Ignition = 4 seconds - Ignition Activation Period = 1 second - Flame Recognition Period = 3 seconds This is the default setting.	OFF	OFF
HSI Igniter Warm-up Time = 17/27 ⁸ seconds Trial For Ignition = 6 seconds - Ignition Activation Period = 3 seconds - Flame Recognition Period = 3 seconds	OFF	ON
HSI Igniter Warm-up Time = 30/30 seconds Trial For Ignition = 6 seconds - Ignition Activation Period = 3 seconds - Flame Recognition Period = 3 seconds	ON	OFF
HSI Igniter Warm-up Time = 30/30 seconds Trial For Ignition = 8 seconds - Ignition Activation Period = 5 seconds - Flame Recognition Period = 3 seconds	ON	ON

^a The shorter of the two periods listed (17 seconds) applies to the first trial only, while the longer period (27 seconds) applies to the subsequent trials during the same call for heat.

LED INDICATORS

The S9200U1000 provides three indicating LEDs (See Fig. 4 on page 9 for location on board):

- **Flame - Amber:** indicates flame status
- **Status - Red:** indicates general system status and error codes.

— **E-COM - Green:** indicates EnviraCOM™ bus activity

See "Troubleshooting" on page 19 for information about specific flash codes as referenced in the checkout procedures.

Use the following procedures only for the integrated furnace control; see individual component instructions for additional checkout procedures.

Table 8. Flame status Codes		
Flash Code ^a	Amber LED Status Code and Error Description	Check / Repair
OFF	Control powered- No flame	Not Applicable (normal operation)
Heartbeat	Control powered- Call for heat - Flame present	Not Applicable (normal operation)
Periodic Blink ^b	Call for heat - Low flame current	Check: Flame rod for contamination or loose wiring; low gas pressure.
Heartbeat	Call for heat - Flame sense out of sequence - Flame still present	Check/Repair: Flame at burners, if present replace gas valve.
OFF	All other conditions	Not Applicable

^a Flash Code Descriptions:
- Pulse: A 0.25 second flash followed by 3.75 seconds of off time.
- Heartbeat: Constant 0.5 second bright 0.5 second dim cycles.
- Periodic Blink: 0.5 second on, 0.5 second off. During local history recall, this fault is flashed as a 1 + 2 pattern.
^b During local history recall, this fault is flashed as a 1 + 2 pattern.

Table 9. Control Status Codes		
Flash Code ^a	Red LED Status Code and Error Description	Check / Repair
Pulse	Control powered (Standby; No Call for Heat)	Not Applicable
Heartbeat	Call for Heat - Normal operation	Not Applicable (normal operation)
Pressure Switch Codes		
2	Pressure Switch failed Open	Check: If inducer is running, inducer could be broken or disconnected, or inducer relay K4 may have failed. Check/Repair: Low line voltage; Pressure switch wiring loose; hose disconnected or leaking; water in hose; venting blocked or obstructed.
3	Pressure Switch failed Closed	Check: If inducer is off; inducer relay (K4) could be welded. Check/Repair: Terminal wiring (shorted); pressure switch contacts (closed when should be open); pressure switch hoses have water build-up or obstruction.
4	Pressure Switch opened during Trial For Ignition or Run Mode	Check: See if inducer is running. Check/Repair: Restricted venting; low input voltage; water in horizontal vent length.
Limit Code		
5	Limit switch open	Check: Wiring; restricted airflow through heat exchanger; clogged filters; slow circulator fan speed. Repair: Remove restrictions. Increase airflow through furnace (increase motor speed, open more ducts, add more returns).
Flame Code		
6	Unexpected flame - Waiting for flame to be off after the 20 second delay	Check/Repair: Gas valve leakage.
Soft Lockout Codes		

Flash Code ^a	Red LED Status Code and Error Description	Check / Repair
2 + 1	Soft Lockout - Exceed maximum number of retries	Check/Repair: Gas supply (pressure, supply, shut-off valves, gas valve); ignition (HSI element not properly positioned and glowing); flame sensing (lead-wire broken or grounded, flame rod not properly positioned, or flame rod contamination); low line voltage.
2 + 3	Soft Lockout - Exceeded maximum number of recycles or retries where the last recycle/retry was due to the pressure switch opening	Check/Repair: Pressure switch wiring; slow inducer; restricted, excessive, or obstructed venting; unstable line voltage.
2 + 4	Soft Lockout - Exceeded maximum number of recycles where the last recycle was due to a flame failure	Check/Repair: Gas supply; flame sensor wiring.
2 + 5	Soft Lockout - Exceeded maximum number of recycles where the last recycle was due to the limit circuit opening or the limit remained open longer than three minutes	Check: Wiring; restricted airflow through heat exchanger; clogged filters; slow circulator fan speed. Repair: Remove restrictions. Increase airflow through furnace (increase motor speed, open more ducts, add more returns).
2 + 6	Soft Lockout - Gas Valve Failed to Make	Check/Repair: Gas valve, Gas valve wiring, Replace S9200U1000 if problem persists.
Other Codes		
3 + 1	Low 24V (Control restarts if the error recovers)	Check/Repair: Low voltage transformer and circuit. Voltage should be nominally 24 Vac with 120 Vac on incoming line voltage. Verify low voltage under all thermostat request modes to insure there are no issues with other low voltage loads such as the outdoor unit 24 Vac contactor.
3 + 2	Bad Fuse	Check: Wiring (limit, rollout, pressure switch shorted to chassis; EnviraCOM bus); gas valve could be shorted. Turn off the power and replace the fuse with a fuse of the same type. Cycle power to appliance and run heating sequence. If this failure repeats, replace the control.
3 + 4	Gas valve error - Miswire or welded (Control restarts if the error recovers and it has not been detected five times yet)	Check/Repair: Gas valve wiring. Cycle power to appliance and run heating sequence. If this failure repeats, replace the control.
3 + 5	Control failed Self Check, internal error, or failed hardware (Control restarts if the error recovers.) This covers hardware errors like flame sense circuit faults, pin shorts, etc.	Cycle power to appliance and run heating sequence. If this failure repeats, replace the control.
3 + 6	Reversed Line Voltage Polarity or Poor Earth Ground (Control restarts if the error recovers within 5 minutes after the fault has cleared.)	Check: 1. Line voltage input wiring. Assume line voltage hot lead is attached to L1. 2. Ground wire from control to appliance and appliance earth ground. 3. Voltage between line volt Neutral and appliance chassis. If over 10 volts, repair the wiring or move the furnace to another circuit with a good earth ground. Repair: Reverse line voltage inputs if line volt hot lead is not attached to the L1 input.
Hard Lockout Codes		

Flash Code ^a	Red LED Status Code and Error Description	Check / Repair
4 + 1	Hard Lockout - Rollout circuit open or previously opened.	Check/Repair: Flue restrictions; heat exchanger restricted Check burner. Check Rollout Switch including switch cables. Reset rollout if necessary. Do not operate until repairs are made. Cycle power to appliance and run heating sequence. If this failure repeats, replace the control.
4 + 2	Hard Lockout - Gas valve welded relay detected for five times	Check/Repair: Gas valve wiring. Cycle power to appliance and run heating sequence. If this failure repeats, replace the control.

^a Flash Code Descriptions:

- Pulse: A 0.25 second flash followed by 3.75 seconds of off time.
- Heartbeat: Constant 0.5 second bright, 0.5 second dim cycles.
- During start-up the STATUS LED blinks fast for approximately 2 seconds. If the S9200U1000 continues blinking fast (8 pulses/second), the control has failed and must be replaced.
- Standard LED Fault Pattern (Single X Flash): LED flashes X times at 2HZ, then off for 3 seconds.
- Advanced LED Fault Pattern (X + Y Flash): LED flashes X times at 2Hz, remains off for one second, flashes Y times at 2Hz, remains off for three seconds, and then repeats.

Table 10. E-Com Status Codes		
Flash Code	Green LED Status Code and Description ^a	Check / Repair
Rapid Flashing	Bus Activity - Message being transmitted	Not Applicable (normal operation)
Single Blink	Bus Activity - Received message acknowledgment	Not Applicable (normal operation)
Off	No Bus Activity	Check/Repair: Disconnect the S9200U1000 from the external bus wiring, cycle power and check the bus activity. If there is activity, repair external bus wiring/devices before reconnecting the S9200U1000 back. If there is still no activity, replace the control.

^a This LED is active even if a conventional thermostat is controlling the appliance.

STATUS CODES HISTORY

The S9200U1000 stores the ten (10) most recent error codes. These codes can be recalled for viewing during troubleshooting and cleared if necessary.

Recalling the Status Code History

You may perform the following procedure multiple times to confirm that you have viewed all the currently stored error codes.

To recall the error code history and display it via the red status LED, perform the following:

1. Jumper the thermostat screw-terminal R/2 to terminal D/1.
 - Within 0.5 seconds, the red status LED stops normal operation and turns on solid to indicate that the jumper is sensed.
2. Keep the thermostat screw-terminal R/2 to D/1 jumpered.
 - After a 5 second time-out, the red status LED turns off, indicating that error code recall is pending.
3. Within 10 seconds of the red status LED turning off, remove the thermostat screw-terminal R/2 to terminal D/1 jumper.
 - This activates the error code recall.

IMPORTANT

If the R/2 to D/1 terminal jumper is not removed within the 10 seconds, the history will be erased.

4. Each saved error code blinks once on the red status LED, starting with the most recently stored error code.
5. After last error code displays, the red status LED returns to normal operation.

NOTE: If there are no error codes to display, the red status LED immediately returns to normal operation.

ENVIRACOM COMMUNICATIONS

EnviraCOM™ communication is a standard feature on the S9200U1000. EnviraCOM™ can be used to control system operation by way of an EnviraCOM™ enabled thermostat and perform advanced diagnostics when connected to EnviraCOM™ enabled diagnostic tools such as the web based EnviralNK® remote diagnostics application, the OnWatch QuickLook™ 72 and the W8735D Telephone Access Module (TAM). In addition to alarms, key information such as state and flame current can be sent over the EnviraCOM™ bus. See Table 13.

Table 11. S920001000 EnviraCOM Alarms		
Alarm Description	Alarm Number	Comment
This device has no alarms	0	Not Applicable
Pressure switch failed to close in the ignition sequence	1	Display/Diagnostics
Pressure switch failed to open in the ignition sequence	3	Display/Diagnostics
The pressure switch opened in run or trial for more than the allowable time	98	Display/Diagnostics
Limit switch open	26	Display/Diagnostics
Flame detected out of sequence	34	Display/Diagnostics
Soft lockout due to flame current	5	Display/Diagnostics
Soft Lockout due to recycle; last recycle was from pressure switch open	85	Display/Diagnostics
The maximum number of flame loss incidents has been exceeded	22	Display/Diagnostics
Soft Lockout due to recycle; last recycle was from limit switch open	86	Display/Diagnostics
Gas valve failed to energize	17	Display/Diagnostics/EnviraLNK®/TAM
Low voltage is detected on 24 Vac input	125	Display/Diagnostics/EnviraLNK®/TAM
A bad fuse has been detected (NOTE: This alarm is stored in the Status Code History)	92	Display/Diagnostics/EnviraLNK®/TAM
The gas valve relay was sensed as closed when it should be open	100	Display/Diagnostics/EnviraLNK®/TAM
Electronics down	18	Display/Diagnostics/EnviraLNK®/TAM
Reversed line polarity	33	Display/Diagnostics/EnviraLNK®/TAM
Earth ground problem	88	Display/Diagnostics/EnviraLNK®/TAM
A manual reset is required due to Rollout Limit	87	Display/Diagnostics/EnviraLNK®/TAM
A manual reset is required due to gas valve welded condition being detected more times than allowed maximum	124	Display/Diagnostics/EnviraLNK®/TAM
Flame current caution level while running	4	Display/Diagnostics

TEST MODE

The S9200U1000 is equipped with a Test Mode feature which allows the control to test and verify several critical parameters. During Test Mode, the S9200U1000 alters the selected Safety Timings as described in Table 14.

Table 12. Test Mode Parameters	
Test Mode Parameter	Modified Timing
Pre-Purge	5 seconds
HSI Warm-up	17 seconds
Ignition Activation	3 seconds
Flame Recognition	1 second
Trial for Ignition	4 seconds
Heat Fan ON Delay	15 seconds
Heat Fan OFF Delay	0 seconds
Post-Purge	5 seconds
Cool Fan ON Delay	2 seconds
Cool Fan OFF Delay	0 seconds

S9200U1000 Universal Hot Surface Ignition Integrated Furnace Control

TECHNICIAN'S QUICK REFERENCE GUIDE

This following service procedure provides a quick overview for the S9200U IFC. For more information, refer to form 69-2075.

WIRING HARNESSES

Table 1. Main harness plug connector 12-pin (Class 2, Low Voltage).	
Pin #	Function
1	High Limit Out
2	Flame Sense - Flame Signal Input (90 Vac, current limited)
3	24 Vac Hot
4	Not Used (TBD)
5	Rollout Switch Out
6	24 Vac Common
7	High Limit In + Pressure Switch Out
8	Chassis Ground
9	Main Valve Common
10	Pressure Switch In
11	Rollout Switch In
12	Main Valve

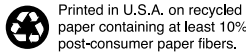
Igniter/Inducer Harness Plug Connections

Table 2. Igniter/Inducer harness plug Connector 4-Pin		
Pin #	Reference Lettering	Function
1	IND-HOT	Inducer 120 Vac
2	IGN-HOT	Igniter 120 Vac
3	IND-NEUTRAL	Inducer Neutral
4	IGN-NEUTRAL	Igniter Neutral

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69-2087 J.Z. 08-07



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