WHITE-RODGERS

50M56U-843 with Black Cover

Universal Integrated Single Stage
120V Hot Surface Ignition Control Kit

INSTALLATION INSTRUCTIONS

FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

PARTS INCLUDED

- **50M56-843 Integrated Furnace Control**
- **21D64-2 HotRod Universal Ignitor Kit (120V)**
- **3 - Main Harness Assemblies (A, B, M)**
- **4 - Ignitor/Inducer Harness Assemblies (C, D, E, H)**
- **1 - Rollout Shunt Jumper**
- **1 - Carrier Blower Motor Neutral Adapter (L)**
- **4 - White 8.5" Long Wiring Extensions**
- **4 - Plastic Mounting Standoffs (use without control cover)**
- **4 – 1" Sheet Metal Mounting Screws (use with control cover)**
- **3 – ½" Sheet Metal Mounting Screws (use with mounting tabs)**
- **2 - Wire Ties**
- **Installation Instructions**

INSTALLER MUST READ

SPECIAL REPLACEMENT INSTRUCTIONS FOUND ON PAGE 2

DESCRIPTION

The 50M56U-843 is an aftermarket universal replacement control kit for single stage furnace products with PSC blower motors.

TWINNING: 50M56U-843 can be twinned. Both control boards must be from the same manufacturer for proper functionality.

SPECIFICATIONS

ELECTRICAL RATINGS:

Input Voltage: 25 VAC, 50/60 Hz

Max Input Current: 0.45 A @ 25 VAC

Relay Contact Ratings:

Gas Valve: 1.5 A 0.6 PF @ 30 VAC
Ignitor Relay: 1.2 A @ 120 VAC
Inducer Relay: 2.8 A @ 120 VAC
Circulator Relay: 10 FLA, 25 LRA @ 120 VAC
Humidifier Load: 1.0 A @ 24 or 120 VAC
Electronic Air Cleaner: 1.0 A @ 120 VAC

Flame Current Requirements:

Minimum current to ensure flame detection: 0.25 µA DC*
Maximum current for non-detection: 0.1 µA DC
Maximum allowable leakage resistance: 100 M ohms

* Measuring with a DC voltmeter (1VDC = 1 µA)

Flame Establishing Time: 0.8 seconds maximum

Flame Failure Response Time: 2.0 seconds maximum

OPERATING TEMPERATURE RANGE:

-40° to 176°F (-40° to 80°C)

HUMIDITY RANGE:

5 to 95% relative humidity (non-condensing)

AGENCY APPROVALS: CSA USA / Canada

GASES APPROVED: Natural, Manufactured, Mixed, Liquid Petroleum, and LP Gas Air Mixtures.

⚠ CAUTION



Risk of Electric Shock. Disconnect electric power to system until installation is complete. Do not use on circuit exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.





This control is not intended for use in locations where it may come in contact with water.



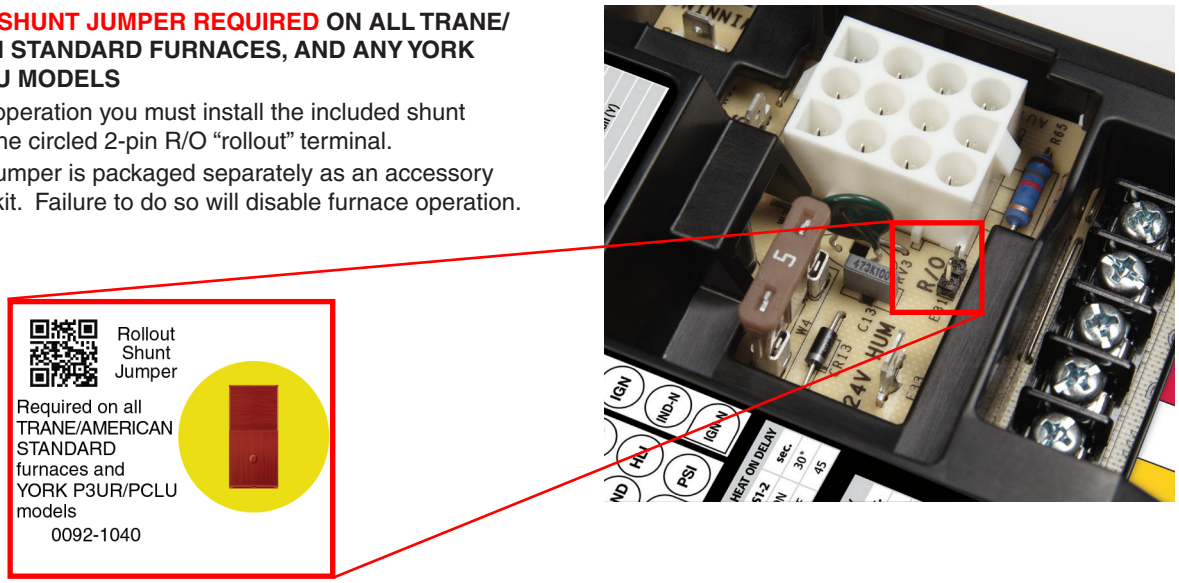
May cause flame rollout. Shut off main gas to heating system until installation is complete.

SPECIAL REPLACEMENT INSTRUCTIONS

ROLLOUT SHUNT JUMPER REQUIRED ON ALL TRANE/ AMERICAN STANDARD FURNACES, AND ANY YORK P3UR/PCLU MODELS

For proper operation you must install the included shunt jumper on the circled 2-pin R/O "rollout" terminal.

The shunt jumper is packaged separately as an accessory item in the kit. Failure to do so will disable furnace operation.



IGNITOR UPDATE Required on all 80V HSI systems. See Cross References shaded orange on outside of color box.

FLAME SENSOR KIT Required on RHEEM/RUUD Models (1994 and earlier)

If the control being replaced has 2 greens lights (no amber light), and a date code of 3294 or earlier, a Flame Sensor Kit, RHEEM part number 62-24044-71 is required (not available through White-Rodgers).

HARNESS UPDATE Required on existing White-Rodgers 50M56U-843 Control with white cover

If a furnace has already been retrofitted with an original White-Rodgers 50M56U-843 control (white cover) and is being changed out to a new 50M56U-843 (black cover), it is **required** to also update/replace the Main wire harness adapter that plugs into the 12-pin connector since some control pinouts are different.

White Control Harness Removed	Black Control Harness Replacement
A	New A
B	New B
F	None, plug factory harness into 50M56U-843
K	New M

HARNESS SELECTION TABLE AND DESCRIPTIONS

Most furnaces are serviced by simply installing the new 50M56U-843 control board and included 120V ignitor.

Some furnaces will require the use of an adapter harness for the main system wiring and/or the ignitor/inducer wiring. Use table on page 3 to determine which wire harness(es) in this kit are needed.

If the equipment brand or control P/N does not appear in the table, no harness is required. Plug OEM wiring directly onto 50M56U-843 and proceed with installation and checkout.

HARNESS SELECTION TABLE

CARRIER/ICP BRANDS					
MAIN HARNESS/OTHER **M**		**L**		IGNITOR/INDUCER HARNESS **None**	
HK42FZ004	HK42FZ007	HK42FZ008	HK42FZ009	HK42FZ011	HK42FZ016

FEDDERS & WHITE-RODGERS					
MAIN HARNESS **None**			IGNITOR/INDUCER HARNESS **E**		
194300330001	50A55-250	50A50-285			

GOODMAN/AMANA BRANDS (9-pin main connector)					
MAIN HARNESS **A**			IGNITOR/INDUCER HARNESS **C**		
1012-83-9336AHSC1		1012-83-9337A	1012933D	1012-933D	41F-5
50T35-730	50T35-730-1	50T35-743	B1809906	B1809906S	B1809908
B1809908S	B18099-13	B1809913S	CNT04664	CNT4664	

GOODMAN/AMANA BRANDS (12-pin main connector)					
MAIN HARNESS **None**			IGNITOR/INDUCER HARNESS **E**		
10207701	10207702	102077-02	10207703	102077-03	10207704
102077-04	10207706	102077-06	102077-09	10207710	102077-10
10207714	102077-14	10207715	10207718	10207719	102077-19
20394001	50A50-207	50A50-288	50A50-298	50A55-288	50A55-288-05
50M56-281	50M56-291	50T55-288	PCB00117	PCBBF117	PCBBF117S
PCBBF134	PCBBF135	PCBBF135S	PCBBF136	PCBBF138	PCBBF138S
PCBBF140	PCBBF140S	RF000129			

ICM					
MAIN HARNESS **A**			IGNITOR/INDUCER HARNESS **C**		
ICM280					

NORDYNE BRANDS					
MAIN HARNESS **B**			IGNITOR/INDUCER HARNESS **H**		
1012-83-9559B	1012955A	1012-955A	624557	6245570	624564
6245640	624591	624591-A	624591-B	624591-C	624591-D
624628	624628-0	6246310	624631-0	624631A	624631-A
624631B	624631-B	624690	624742	624844	710128A
902378	902696	903106	904840	920915	

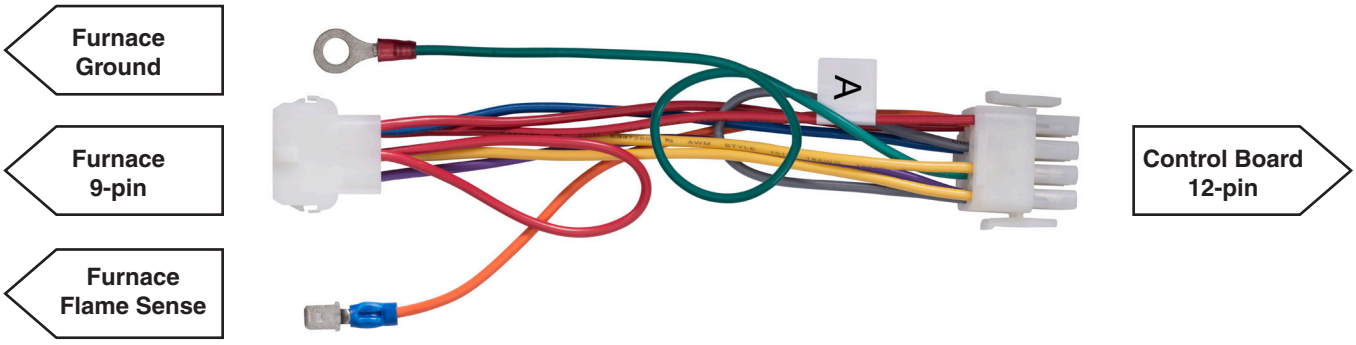
RHEEM/RUUD BRANDS					
MAIN HARNESS **B**			IGNITOR/INDUCER HARNESS **D**		
1012-925A	1012-925B	1012-925C	62-22694-01	62-22694-02	62-22694-03
62-22694-11	62-22694-12	62-22694-82	62-22694-83	62-22694-91	62-22737-06
62-22737-07	62-22737-08	62-22737-10	62-22737-87	62-22737-88	62-24044-01
62-24044-81	62-24044-91	62-24045-01	62-24046-01	62-24084-01	62-24084-02
62-24084-71	62-24084-82	62-24084-91	62-24084-92	62-24268-01	62-24268-02
62-24268-03	695-200				

NOTE: All other controls install without a harness

MAIN HARNESS ADAPTERS A, B, & M

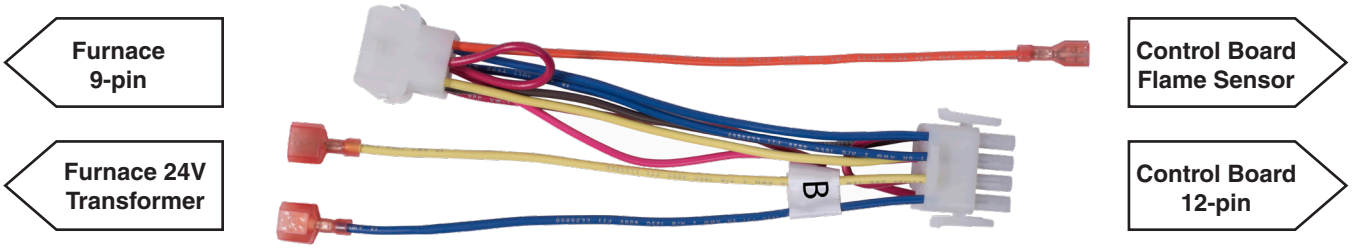
A

Goodman/Amana Brands, ICM (50T35 variants)



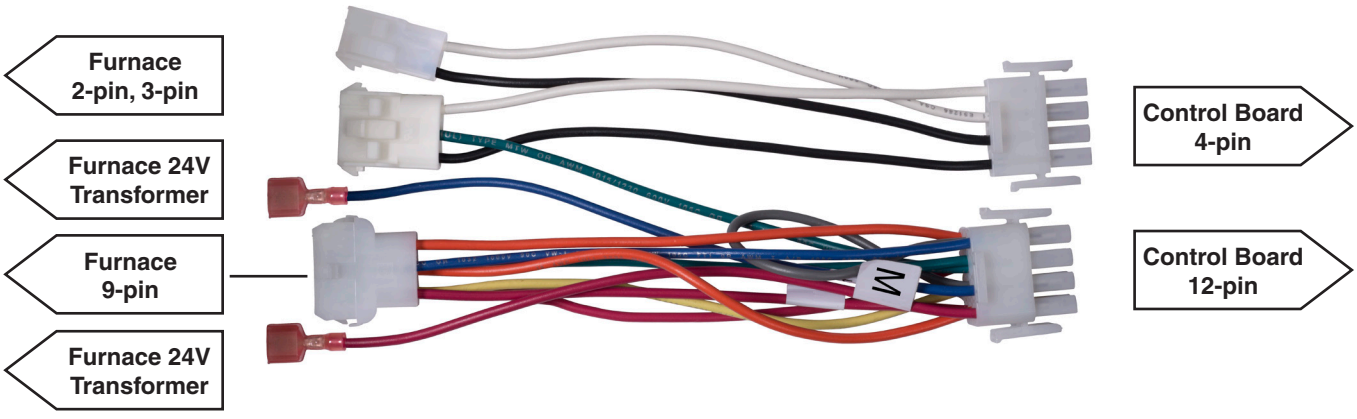
B

Nordyne Brands, Rheem/Ruud Brands



M

Carrier/ICPBrands



IGNITOR/INDUCER HARNESS ADAPTERS C, D, E, & H

C

Goodman/Amana Brands, ICM (50T35 variants)

Furnace ¼" Spades

Inducer Hot
Ignitor Hot

Inducer Neutral
Ignitor Neutral



Control Board 4-pin

D

Rheem/Ruud Brands

Furnace 6-pin/4-wire



Control Board 4-pin

E

Goodman/Amana Brands, Fedders, White-Rodgers

Furnace 2-pin



Control Board 4-pin/2-wire

H

Nordyne Brands

Furnace 6-pin/4-wire



Control Board 4-pin

CARRIER/ICP BRANDS BLOWER MOTOR NEUTRAL ADAPTER

L

Furnace 3/16" Neutral

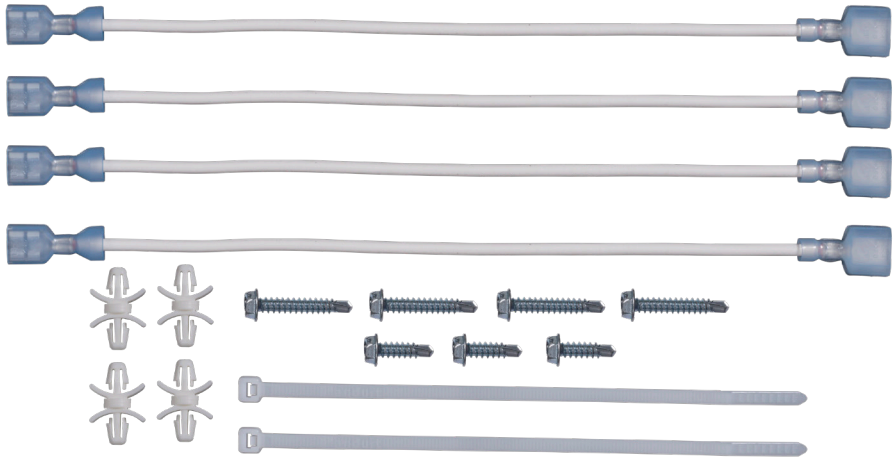


Control Board ¼" Neutral

INSTALLATION ACCESSORIES

- Wiring Extensions can be used if any existing wires do not reach the new control board, for example blower motor leads or transformer wiring
- Plastic Standoffs can be used if mounting the control without plastic cover
- Mounting Screws can be used with the plastic cover CORNER HOLES or MOUNTING TABS
- Wire Ties can be used to secure any wiring as needed

¼" x ¼" Spade Wire Extensions 8.5" Length



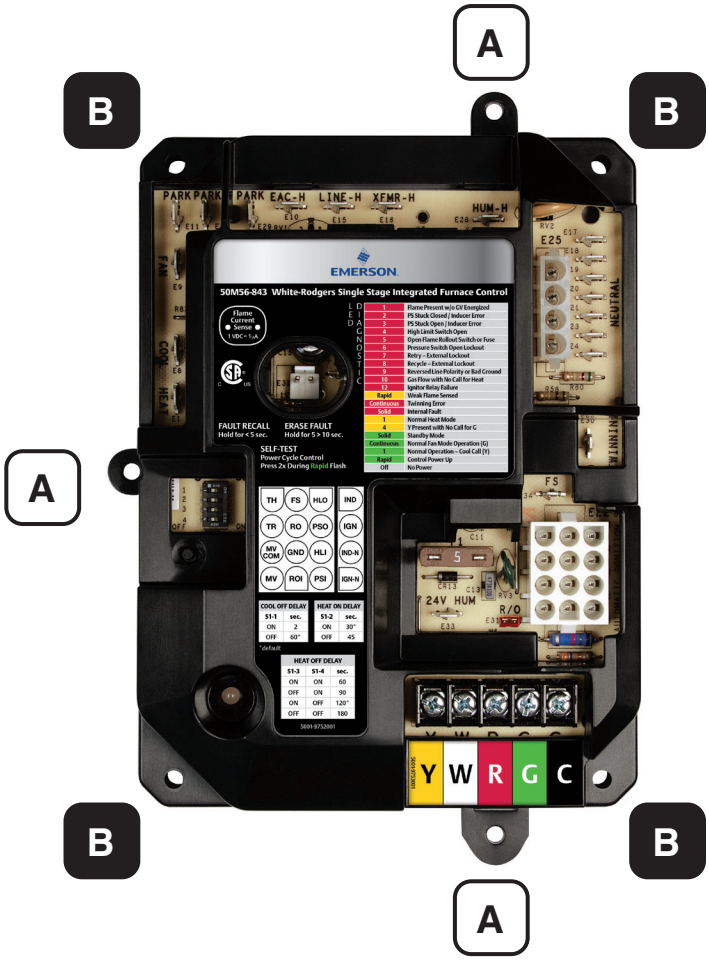
INSTALLATION

MOUNTING AND WIRING

NOTE: All wiring should be installed according to local and national electrical codes and ordinances

1. Disconnect electrical power and gas supply to unit, then remove unit access panels.
2. Mark and disconnect all wires from the existing control, then remove existing control.
3. 50M56U-843 can be mounted in any orientation. Select a location that will not damage, obstruct or place any stress on the terminations or harnesses.
4. Mount 50M56U-843 in the unit using one of the three mounting options noted on page 7. Be certain not to damage any components such as transformers, wire harness or blower wheels when drilling or installing screws.
5. Refer to **Harness Selection Table** and select the proper wire adapter(s) needed to replace the board (if applicable).
6. Connect all the wires back onto 50M56U-843 control board referencing **Harness Descriptions** and **Wiring Diagram** as needed.
7. **Replace existing ignitor with the new 120V HotRod ignitor furnished in the kit. See box for 80V HSI systems which MUST be updated.**
8. Ensure all wires are secure to the control board and unused blower speed wires are attached to the PARK terminals. Apply wire ties as needed to secure wiring.
9. Verify Cool Off Delay, Heat On Delay, and Heat Off Delay Dipswitch settings.
10. Reinstall unit access panels and reconnect electric power and gas supply to the unit.
11. Verify unit operation in heating, cooling, and fan only modes.

INSTALLATION

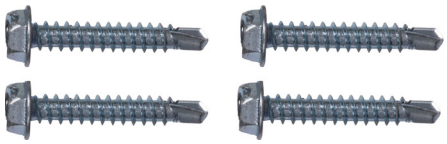


Mounting Options

A Carrier Tabs for OEM direct drop-in mounting. Use ½" screws. Tabs can be cut off for fit in other applications if needed.



B Corner Drill Holes. Use cover as template. Use care when drilling and driving 1" screws.



C Standoffs: Remove control from cover, use supplied standoffs.



DIPSWITCH CONFIGURATION

Cool Off Delay (sec.)	Heat On Delay (sec.)	Heat Off Delay (sec.)
2 (1 ON) OFF ON	30* (2 ON) OFF ON	60 (3, 4 ON) OFF ON; 90 (3, 4 ON) OFF ON
60* (1 ON) OFF ON	45 (2 ON) OFF ON	120* (3, 4 ON) OFF ON; 180 (3, 4 ON) OFF ON

*default

NOTES: Cycle power after changes are made.

SELF-TEST

50M56U-843 is equipped with a self-test routine used during the control's installation. Self-Test checks the functionality of the control, ignitor, inducer, and blower to verify they are in proper working order. Ensure thermostat is turned OFF or thermostat wires are disconnected to enable.

ENTER SELF-TEST BY:

- Turn on power and/or manually close blower door switch
- Wait 1 second
- Slowly double-click "SELECT" button within 3 seconds

SEQUENCE IS AS FOLLOWS:

- LED will flash in red the five (5) last stored fault codes
- Afterward, the LED will slowly flash alternate colors (red, amber, green) to indicate Self-Test is active and continue until Self-Test is complete
- Inducer motor will turn ON and continue running until Self-Test is complete

NOTE

Self-Test is available after power up and until a solid green LED is present (5 seconds after power up). During this time, the control will ignore all active calls. If a solid green LED is present, disconnect power for 10 seconds before starting Self-Test routine.

- After 15 seconds, the ignitor will turn ON for 17 seconds, then OFF
- Blower motor operates on HEAT speed for 10 seconds
- Blower motor operates on COOL speed for 10 seconds
- Blower motor turns OFF
- Inducer motor turns OFF
- The Self-Test is complete and the LED will display solid green to indicate Standby mode

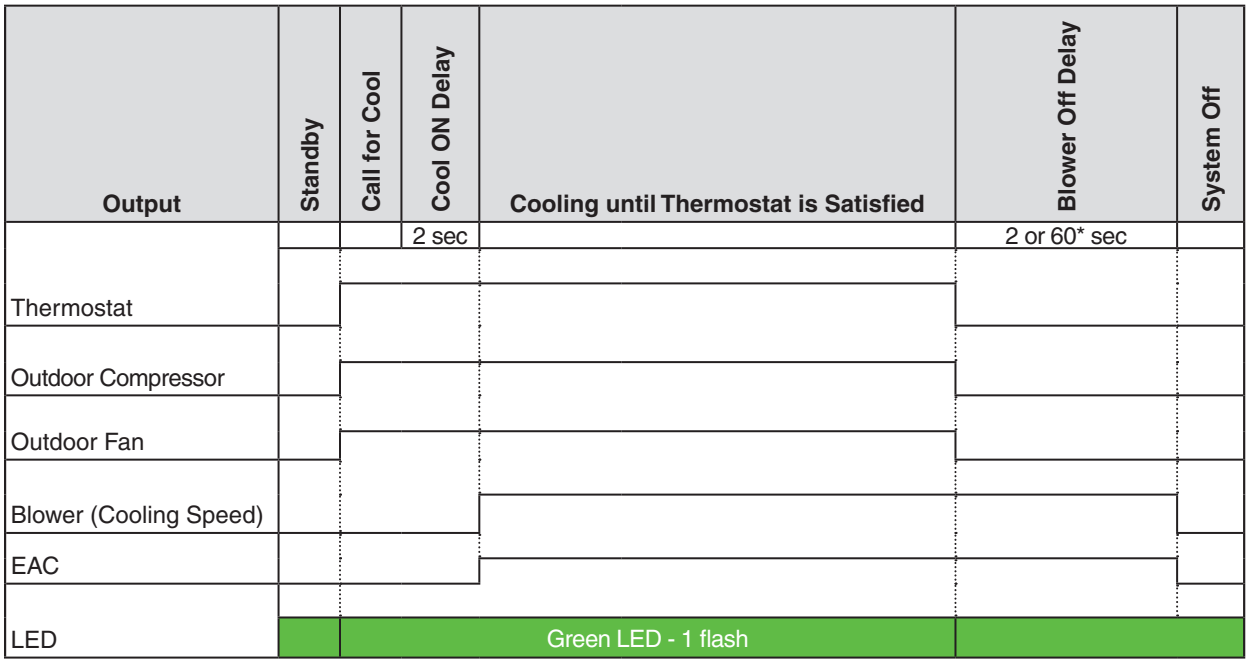
OPERATION

HEATING MODE

Output	Standby	Call for Heat	Self-Check	Pre-Purge	Ignitor Warm-Up	Ignition Activation Period	Heat ON Delay	Heating until Thermostat is Satisfied	Post-Purge	Blower Off Delay	System Off
				15 s	17-19 s	< 5 s	30*, 45 s		15 s	60, 90, 120*, 180 s	
Thermostat - W											
Inducer											
Pressure Switch											
Ignitor (HSI)											
Gas Valve											
Flame Sensor (FS)											
Blower (Heating Speed)											
Humidifier (24V)											
EAC											
LED		Amber LED - 1 flash									

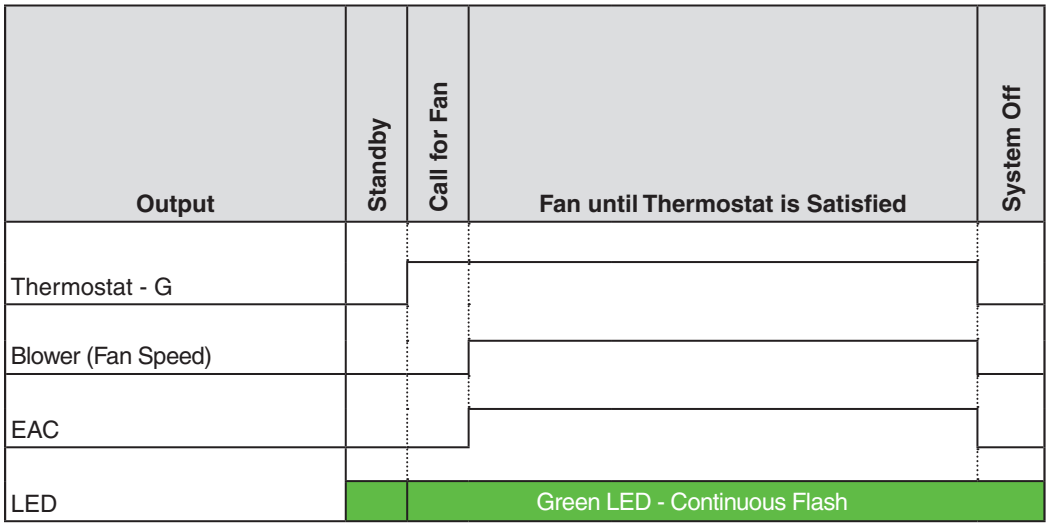
*default

COOLING MODE



*default

FAN MODE



*default

Humidifier Options

50M56U-843 is compatible with either 120 VAC or 24 VAC humidifiers, see **WIRING DIAGRAM**

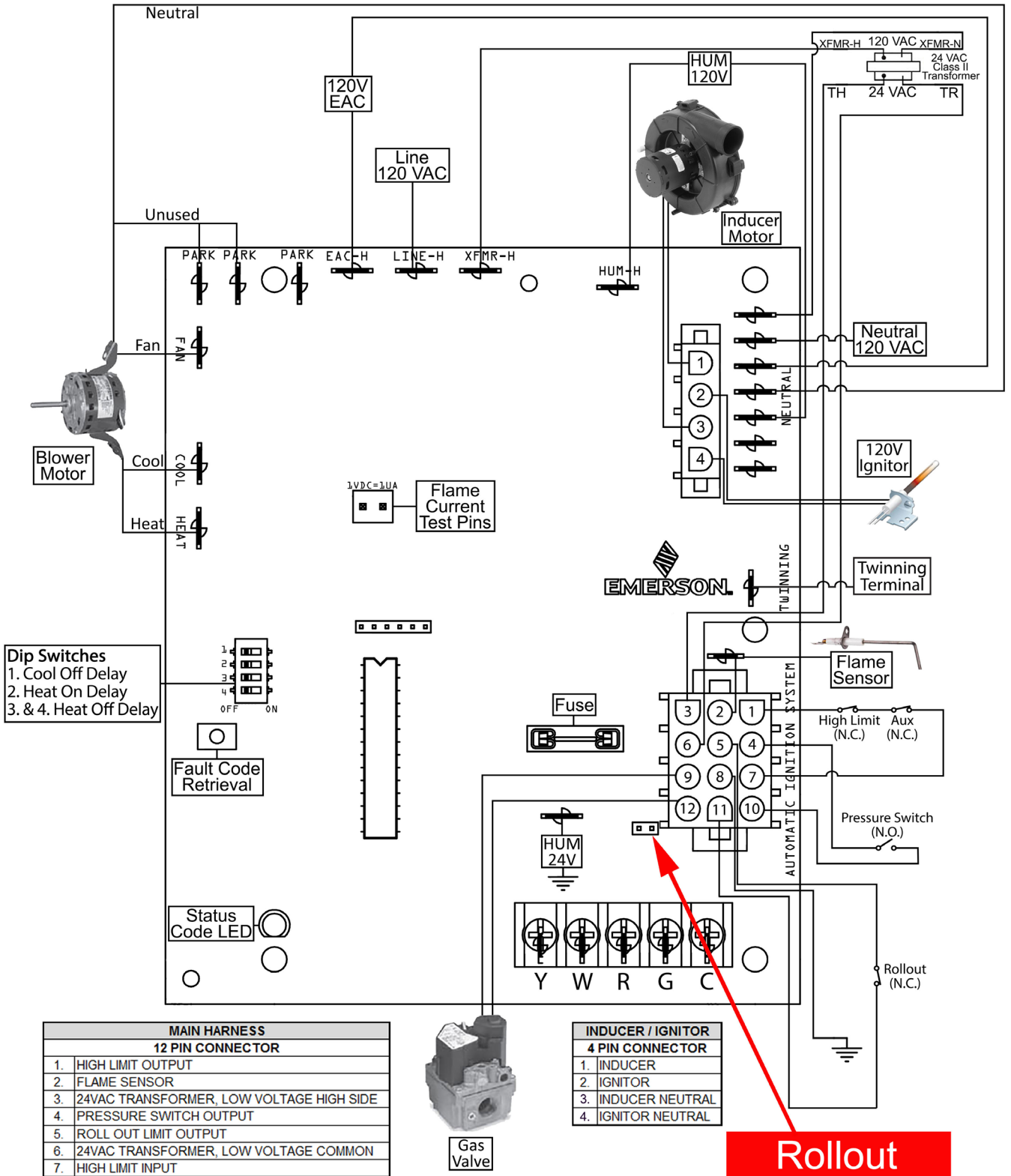
- The 120 VAC humidifier output is energized with the inducer relay
- The 24 VAC humidifier is energized after the pressure switch contacts close

Flame Sensor Options

50M56U-843 is compatible with furnaces having the flame sensor connected through the 12-pin main harness (pin 2) or connected to the parallel 3/16" flame sense male spade, see **WIRING DIAGRAM**

- Most units will connect through the main harness
- If the unit has a separate flame sensor wire with 3/16" female spade please connect it to **"FS"** (E34) located directly above the 12-pin connector
- Goodman boards with 9-pin main connector (B1809913S and previous versions) have the flame sensor connected to the orange wire / ¼" male spade of Harness A.

WIRING DIAGRAM



MAIN HARNESS	
12 PIN CONNECTOR	
1.	HIGH LIMIT OUTPUT
2.	FLAME SENSOR
3.	24VAC TRANSFORMER, LOW VOLTAGE HIGH SIDE
4.	PRESSURE SWITCH OUTPUT
5.	ROLL OUT LIMIT OUTPUT
6.	24VAC TRANSFORMER, LOW VOLTAGE COMMON
7.	HIGH LIMIT INPUT
8.	GROUND - MUST BE ATTACHED TO CHASSIS
9.	GAS VALVE COMMON
10.	PRESSURE SWITCH INPUT
11.	ROLL OUT LIMIT INPUT
12.	GAS VALVE MAIN

INDUCER / IGNITOR	
4 PIN CONNECTOR	
1.	INDUCER
2.	IGNITOR
3.	INDUCER NEUTRAL
4.	IGNITOR NEUTRAL

FAULT AND STATUS CODES

The LED will indicate fault or status codes as shown in the table below:

Green LED Flash	Amber LED Flash	Red LED Flash	Error / Condition
Up to 5 Flash Codes stored in memory (Auto-Erased after 14 days)			
		1	Flame Present without Gas Valve Energized
		2	Pressure Switch Stuck Closed / Inducer Error
		3	Pressure Switch Stuck Open / Inducer Error
		4	High Limit Switch Open
		5	Open Flame Rollout Switch or Fuse
		6	Pressure Switch Open Lockout
		7	Retry - External Lockout
		8	Recycle - External Lockout
		9	Reversed 120VAC Line Polarity or Bad Ground
		10	Gas Flow with No Call for Heat
		12	Ignitor Relay Failure
Flash codes NOT stored into memory			
	Rapid		Weak Flame Sensed (< 0.5 µA)
		Continuous	Twinning Error
		Solid ON	Internal Fault
	1		Normal Heat Mode
	4		Y Present with No Call for G
Solid ON			Standby Mode
Continuous			Normal Fan Mode Operation (G)
1			Normal Operation with a Call for Cool (Y + G)
2 Sec. ON then OFF			Control Power Up Display Indication
Off	Off	Off	No Power
Note: Continuous blink uses 250ms ON time and 250ms OFF time. Rapid blink uses 100ms ON – OFF.			

FAULT RECALL

When the control is in Standby mode (no call for heat or cool), press the fault recall button for approximately 2 to 5 seconds or until the diagnostic LED turns off. Up to 5 fault codes are stored. **NOTE:** While displaying the stored fault codes, the control will ignore any new call for heat, cool or fan.

FAULT CODE RESET

When the control is in Standby mode (no call for heat or cool), press the fault recall button for 5 to 10 seconds or until the diagnostic LED begins to rapid flash.

NOTE: If the switch is held pressed for over 10 seconds the rapid flash will stop and the LED will be on to indicate return to normal status.

CONTROL RESET

Control automatically resets after 1 hour in lockout. Removing 24VAC power to the control for greater than 10 seconds will reset the control.

FLAME CURRENT TEST

Set meter to DC volt scale and place leads on 50M56U-843 tall test pins with burners on.

Reading results: 0.5–1.0 = marginal, 1.0–5.0 = good.

TECHNICAL SUPPORT: 1-888-725-9797

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WHITE-RODGERS

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