WHITE RODGERS

Intelligent Gas Valve Retrofit Kit For ICP & Lennox Brand Systems

INSTALLATION INSTRUCTIONS

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

• 50I56-905 120V HSI IP Furnace Control Board

by COPELAND

- 1 Main CONTROL Harness (0115-0339)
- 1 Gas VALVE Harness (0115-0336)
- 1 Ignitor/Inducer C Harness (0115-0256)
- 1 791Q-905KT1 120V Ignitor + Flame Sensor Kit for Pilot Assembly
- 1 36G33-905 IP Gas Valve

- 4 1" Sheet Metal Mounting Screws
- 4 Wire Ties
- 2 1/4" Female Crimp-on Spades
- 2 7/8" Sheet Metal Wire Grommets
- Unit Retrofit Label
- Installation Instructions
- Troubleshooting Label on Control Cover

- DESCRIPTION

SPECIFICATIONS

- PARTS INCLUDED

The 50I56D-905 Retrofit Kit is an aftermarket service solution for popular ICP and Lennox brand furnaces using SV9500, SV9501 and SV9502 Intelligent Valves and Fan Timer Control boards. Upgrades system from 24V to 120V hot surface pilot ignition and utilizes reliable standard IP gas valve. For single stage furnaces with PSC inducer and blower motors.

ELECTRICAL RATINGS:

Input Low Voltage: 25 VAC, 60 Hz

Input Line Voltage: 120 VAC, 60 Hz

Max. Input Current: .45A @ 25 VAC

Flame Current Requirements:

Minimum current to insure flame detection: 0.25 μ a DC* Maximum current for non-detection: 0.1 μ a DC Maximum allowable leakage resistance: 100 M ohms *Measuring with a DC voltmeter (1VDC = μ A)

Relay Contact Ratings:

Inducer Output: 2.2 FLA @ 120 VAC 3.5 LRA Blower Output: 14.5 FLA @ 120 VAC

25 LRA Gas Valve Output: 1.5A @ 25 VAC 0.6 pf Ignitor Output: 6.0A @ 120 VAC (resistive) Hum and EAC Load: 1.0A @ 120 VAC

OPERATING TEMPERATURE RANGE:

-40° to 176°F (-40° to 80°C)

HUMIDITY RANGE:

5 to 95% relative humidity (non-condensing)

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

🛦 WARNING 💹 🔐 🦉

Failure to comply with the following warnings could result in personal injury or property damage.

- Installation should be done by a qualified heating and air conditioning contractor or licensed electrician.
- All wiring must conform to local and national electrical codes and ordinances.
- Following installation or replacement, follow manufacturer's recommended installation/service instructions to ensure proper operation.

FIRE HAZARD

- Do not exceed the specified voltage.
- Protect control from direct contact with water (dripping, spraying, rain, etc.).
- If the control has been in direct contact with water, replace the control.
- Label all wires before disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.
- Route and secure wiring away from flame.

SHOCK HAZARD

- Disconnect electric power before servicing.
- Ensure proper earth grounding of appliance.
- Ensure proper connection of line neutral and line hot wires.

EXPLOSION HAZARD

Shut off main gas to appliance until installation is complete.

50I56D-905

INSTALLATION -

REMC	VE PARTS TO PREPARE FOR RETROFIT	
STEP	DETAILS	
Warning: I	Disconnect unit electrical & gas supply.	
1	Remove access panels.	
2	Take pictures before removing any wiring.	
3	Label existing wiring as necessary.	
4	Disconnect both 4-pin plugs and pilot tubing, remove gas valve & discard.	
5	Disconnect pilot assembly. Remove 24V HSI ignitor + sensor & clip from assembly.	
6	Unwire fan timer, remove & discard.	

NOTE on removal step 5: discard existing 24V ignitor + sensor and clip. Use new clip for best fit.

RE	TROFIT NEW PARTS INTO FURNACE		IGNITOR + FLAME SENSOR & CLIP
STEP	DETAILS		STEP: 3
Warning: Avoid damaging components when drilling or driving screws. All wiring should be installed according to local and national code.			
1	Mount 50I56-905 control in blower area using cover as drill template and using 4 x 1" screws.		
2	Install 36G33-905 gas valve in furnace. See instructions in box.	Wire passes through grommet easiest this way.	
3	Install 791Q-905 120V HSI Ignitor + sensor into pilot assembly <u>using new clip</u> . Reinstall pilot assembly and connect gas supply tubing to new gas valve.		New Clip
NOTE	Some new wiring such as ignitor + sensor, pressure switch, and MV wire (Armstrong) will be run from the burner area to the blower control board area.		EXTENSION HARNESS
4	Locate an existing wire passage between the burner and blower areas or drill 7/8" hole(s) and install wire grommet(s).		IGN
5	Plug 3-pin EXTENSION harness into ignitor + sensor, route wires from burner area to blower control board area.	IGN N	
6	Plug orange flame sensor wire onto control board 3/16" FS spade, see page 4.	FS	
7	Plug 4-pin Ignitor/Inducer C harness into control board connector E25, see page 4.	STEPS: 5, 6, 8	

- INSTALLATION

			C HARNESS / 0115-0256
		STEPS: 7	8,9
8	Connect Ignitor hot (IGN) and neutral (IGN N) from EXTENSION harness to C harness leads 2 & 4, see control board label.		Inducer
9	Connect Inducer hot (IND) and neutral (IND N) to C harness leads 1 & 3, see control board label.	New Control	
	Plug main CONTROL harness into control board 12-pin connector E22, see page 4.	Board	Ignitor
	• Route blue PS pressure switch wire from control board to burner area.		CONTROL HARNESS / 0115-0339
10	• Connect green GROUND wire to chassis.	STEPS: 10	11 12 Transformer
	 For Armstrong (or similarly wired units – see ID IMAGE below), route black MV* wire from control board to burner area and read NOTE below. 	New	SEC X
ΙΟΤΕ	Armstrong MV* / High Limit Wiring: See page 5 Special Replacement Instructions to complete MV* wiring from STEP 9.	Control Board	Factory 6-pin
	Connect transformer to CONTROL harness.		Wiring
11	• Secondary to blue 24V SEC X wire.		
12	Common to yellow 24V XFMR C wire. Connect OEM factory wiring 6-pin plug into CONTROL harness.		
	Plug 4-pin VALVE harness into factory 4-pin square plug removed from gas valve.	Ground	
10	Connect black MV harness spade to gas valve M terminal.		
15	Connect orange PV harness spade to gas valve P terminal.		VALVE HARNESS / 0115-0336
	Connect white COM harness spade to gas valve C terminal.	STEPS: 1	3, 14 MV
14	Connect blue PS wire previously routed from CONTROL board harness to burner area to PS spade of VALVE harness.		New PV Gas Valve COM
NE NE	ANTRAL XELSS	Factory Gas Valve Wiring	PS

Armstrong type MV* wiring can be ID'd by noting only 5 wires present in factory 6-pin plug.

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INSTALLATION -

FINISH INSTALLATION AND TEST UNIT			
STEP	DETAILS		
15	Connect line voltage hot to LINE-H, then connect LINE NEUTRAL.		
16	Connect transformer hot to XFMR-H, then connect transformer neutral to LINE NEUTRAL.		
17	 Connect blower leads. Cool speed to COOL-H. Heat speed to LO HEAT-H. Unused leads on PARK, PARK. Neutral to LINE NEUTRAL. 		
18	Connect thermostat wires to screw terminal block.		
19	Verify dipswitch setting using cover label and DIPSWITCHES section below.		
20	Option - connect 120V humidifier to HUM-H and LINE NEUTRAL. Option - connect 120V EAC to EAC-H and LINE NEUTRAL.		
21	Apply wire ties as needed to secure wiring and install Unit Retrofit label.		
22	Reinstall access panels, reconnect gas supply and electric power.		
23	Verify unit operation in HEAT, COOL, and FAN modes.		
NOTE	See Wiring Diagrams, Timings & Wiring Designators, and Operation sections for additional details.		



DIPSWITCHES -

	1	140 sec.
Heat On 60 sec.	2	30 sec.
Cool On 4 sec.	3	30 sec.
		Default Settings

Notes:

- Cool Off is 30 sec. non-adjustable.
- Cycle power after making any changes.

Blower Delay	Most ICP Units	Other ICP Units	Most Lennox Armstrong Ducane Units	Other Lennox Armstrong Ducane Units
Heat Off	140 sec	100 sec	100 sec	140 sec
Heat On	30 sec	60 sec	30 sec	30 sec
Cool On	30 sec	4 sec	4 sec	4 sec

Blue shading = A change from default may be required. See unit information or match existing control.

- SPECIAL REPLACEMENT INSTRUCTIONS



Armstrong MV* / High Limit Wiring

- 1. Remove the double red wire/single spade from limit.
- 2. Clip off the single spade terminal.
- 3. Strip both red wires and crimp on provided ¼" female spade terminals to each wire.
- 4. Plug the red wire from the control board wiring (9-pin plug between the burner and blower sections of furnace) back onto the limit.
- 5. Plug the red wire from the original gas valve (4-pin square plug) to the long black MV* lead of CONTROL harness 0115 0339 (remove cap from the black wire to connect).



NOTE: Control will flash fault code 4 if red wires in steps 4 & 5 are reversed.

OPERATION



WIRING DIAGRAMS -



- WIRING DIAGRAMS



TIMINGS & WIRING DESIGNATORS -

50I56-905 Timings		Wiring Designator Conversions		
Pre-purge	15 sec	Connection	ST Fan Timers	50156-905
Ignitor Warm-up (turned on simultaneously with pilot)	0 sec	Neutrals	NEUTRAL	LINE NEUTRAL
Flame Failure Response	2 sec max	Unused Motor Leads	M1/2/3, UNUSED	PARK
Trial for Ignition	90 sec	Humidifier, Air Cleaner	HUM, EAC	HUM-H, EAC-H
Post-purge	5 sec	Cool Blower		COOL-H
Energize Main Valve after Pilot Proven	2.5 sec	Speed	COOL	
Heat Off Delay	100/140* sec	Heat Blower	HEAT	LO HEAT-H
Heat On Delay	60/30* sec	Speed		
Cool On Delay	4/30* sec	Continuous Blower	CONT	N/A
Cool Off Delay	30 sec	Thermostat	C,G,Y,W,R	C,G,Y,W,R
Ignition Retries	Continuous,	Line Input	L1, S, S1-S3	LINE-H
Ignition Recycles	5 times,	Line - Transformer	L1, S, S1-S3	XFMR-H
(flame lost after successful ignition)	8 sec delay	Transformer 24V	SEC. X	24V SEC, X
Ignition Lockout	5 min			(CONTROL harness)
* Default dipswitch setting		Transformer 24V Common	XFMR, C	24V XFMR, C (CONTROL harness)
See OPERATION flowchart for additional details.		Inducer Hot	IND, DI	E25 plug (C harness)

TROUBLESHOOTING -

FAULT RECALL

When the control is in Standby mode (no call for heat or cool), press the SELECT 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 ERASE & RESET

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

NOTE: If the button is pressed for over 10 seconds the rapid flash will stop and the control will return to Standby.

CONTROL LOCKOUT RESET

Remove 24 VAC power to the control for greater than 10 seconds to reset. An example would be to reset & troubleshoot a unit with flash code 1 that is in a 5-min. lockout / delay.

FLASH CODES:

- **1** Ignition Lockout (5 min. Delay)
- 2 Pressure Switch Stuck Closed
- **3** Pressure Switch Stuck Open
- 4 Open Limit Switch
- 5 Flame Sensed with Gas Valve Off
- 6 Open Fuse or Circuit (pin 5-11)
- 7 Low Flame Sense Signal
- 8 Ignitor Relay Fault

Rapid Flash	Reverse Polarity
Continuous On	Normal Operation
Off	No Power

NOTE: Control will flash fault code 4 if Armstrong limit wiring is reversed, see Special Replacement Instructions.

TECHNICAL SUPPORT: 1-888-725-9797