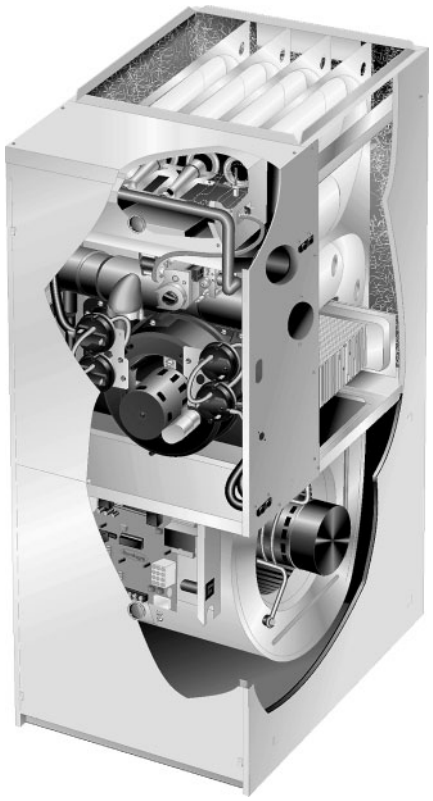
G61MPV SERIES UNITS

G61MPV series units are high-efficiency multi-position (upflow, downflow, horizontal right and left) gas furnaces manufactured with Lennox Duralok Plus™ heat exchangers formed of an aluminized steel primary with a stainless steel secondary condensing coil. G61MPV units are available in heating capacities of 44,000 to 132,000 Btuh (13.0.0 to 38.6 kW) and cooling applications from 2 to 5 tons (7.0 kW to 17.5 kW). Refer to Engineering Handbook for proper sizing.



Units are factory equipped for use with natural gas. Kits are available for conversion to LPG operation. G61MPV model units are equipped with the two-stage variable speed integrated SureLight® control. All G61MPV units meet the California Nitrogen Oxides (NO_x) Standards and California Seasonal Efficiency requirements. All units use a redundant gas valve to assure safety shut-off as required by C.S.A.

All specifications in this manual are subject to change. Procedures outlined in this manual are presented as a recommendation only and do not supersede or replace local or state codes. In the absence of local or state codes, the guidelines and procedures outlined in this manual (except where noted) are recommendations only and do not constitute code.

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⚠ IMPORTANT

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

⚠ WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

⚠ WARNING

Sharp edges.
Be careful when servicing unit to avoid sharp edges which may result in personal injury.

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SPECIFICATIONS

		Model No.	G61MPV -36B-045	G61MPV -36B-070	G61MPV -36B-071	G61MPV -36C-090
Gas Heating Performance	**High Fire**	Input - Btuh	44,000	66,000	66,000	88,000
		Output - Btuh	39,000	61,000	62,000	79,000
		Temperature rise range - °F	20 - 50	45 - 75	45 - 75	70 - 100
		Gas Manifold Pressure (in. w.g.) Natural Gas / LPG/Propane	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0
	Low Fire	Input - Btuh	30,000	45,000	45,000	60,000
		Output - Btuh	29,000	43,000	43,000	56,000
		Temperature rise range - °F	10 - 40	25 - 55	20 - 50	35 - 65
		Gas Manifold Pressure (in. w.g.) Natural Gas / LPG/Propane	1.7 / 4.9	1.7 / 4.9	1.7 / 4.9	1.7 / 4.9
		[1] AFUE	94.1%	94.1%	95.0%	94.3%
		High static (CSA) - in. w.g.	.80	.80	.80	.80
Connections in.		Intake / Exhaust Pipe (PVC)	2 / 2	2 / 2	2 / 2	2 / 2
		Condensate Drain Trap (PVC pipe) - i.d.	1/2	1/2	1/2	1/2
		with field supplied (PVC coupling) - o.d.	3/4	3/4	3/4	3/4
		hose with hose clamp - i.d. x o.d.	1-1/4 x 1	1-1/4 x 1	1-1/4 x 1	1-1/4 x 1
		Gas pipe size IPS	1/2	1/2	1/2	1/2
Indoor Blower		Wheel nominal diameter x width - in.	10 x 8	10 x 8	10 x 8	10 x 10
		Motor output - hp	1/2	1/2	1/2	1/2
		Tons (kW) of add-on cooling	2 - 3	2 - 3.5	2 - 3.5	2 - 3.5
		Air volume range - cfm	610 - 1420	625 - 1395	625 - 1395	600 - 1395
Shipping Data		lbs. - 1 package	128	151	151	170
Electrical characteristics			120 volts - 60 hertz - 1 phase (less than 12 amps)			

NOTE - Filters and provisions for mounting are not furnished and must be field provided.
[1] Annual Fuel Utilization Efficiency based on DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces.

		Model No.	G61MPV -60C-090	G61MPV -60C-091	G61MPV -60C-110	G61MPV -60C-111	G61MPV -60D-135
Gas Heating Performance	**High Fire**	Input - Btuh	88,000	88,000	110,000	110,000	132,000
		Output - Btuh	81,000	84,000	99,000	103,000	122,000
		Temperature rise range - °F	40 - 70	40 - 70	50 - 80	50 - 80	65 - 95
		Gas Manifold Pressure (in. w.g.) Natural Gas / LPG/Propane	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0	3.5 / 10.0
	Low Fire	Input - Btuh	60,000	60,000	75,000	75,000	90,000
		Output - Btuh	57,000	58,000	72,000	72,000	87,000
		Temperature rise range - °F	20 - 50	20 - 50	30 - 60	25 - 55	40 - 70
		Gas Manifold Pressure (in. w.g.) Natural Gas / LPG/Propane	1.7 / 4.9	1.7 / 4.9	1.7 / 4.9	1.7 / 4.9	1.7 / 4.9
		[1] AFUE	94.6%	95.0%	94.3%	95.0%	94.6%
		High static (CSA) - in. w.g.	.80	.80	.80	.80	.80
Connections in.		Intake / Exhaust Pipe (PVC)	2 / 2	2 / 2	2 / 2	2 / 2	3 / 3
		Condensate Drain Trap (PVC pipe) - i.d.	1/2	1/2	1/2	1/2	1/2
		with field supplied (PVC coupling) - o.d.	3/4	3/4	3/4	3/4	3/4
		hose with hose clamp - i.d. x o.d.	1-1/4 x 1	1-1/4 x 1	1-1/4 x 1	1-1/4 x 1	1-1/4 x 1
		Gas pipe size IPS	1/2	1/2	1/2	1/2	1/2
Indoor Blower		Wheel nominal diameter x width - in.	11-1/2 x 10	11-1/2 x 10	11-1/2 x 10	11-1/2 x 10	11-1/2 x 10
		Motor output - hp	1	1	1	1	1
		Tons (kW) of add-on cooling	3.5 - 5	3.5 - 5	3.5 - 5	3.5 - 5	3.5 - 5
		Air volume range - cfm	895 - 2215	895 - 2215	740 - 2210	740 - 2210	915 - 2190
Shipping Data		lbs. - 1 package	180	180	188	188	207
Electrical characteristics			120 volts - 60 hertz - 1 phase (less than 12 amps)				

NOTE - Filters and provisions for mounting are not furnished and must be field provided.
[1] Annual Fuel Utilization Efficiency based on DOE test procedures and according to FTC labeling regulations. Isolated combustion system rating for non-weatherized furnaces.

OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

			"B" Width Models	"C" Width Models	"D" Width Models
FILTER KITS					
[1] **Air Filter and Rack Kit**	Horizontal (end)	Size of filter - in.	**87L96 -** 18 x 25 x 1	**87L97 -** 20 x 25 x 1	**87L98 -** 25 x 25 x 1
	Side Return	Single	**44J22**	**44J22**	**44J22**
		Ten Pack	**66K63**	**66K63**	**66K63**
		Size of filter - in.	16 x 25 x 1	16 x 25 x 1	16 x 25 x 1
EZ Filter Base	Catalog No. - Ship. Wt. - lbs.		**73P56** - 7	**73P57** - 8	**73P58** - 10
	Size of field provided filter - in.		16 x 25 x 1	20 x 25 x 1	24 x 24 x 1
CABINET ACCESSORIES					
Down-Flow Additive Base			**11M60**	**11M61**	**11M62**
Horizontal Support Frame Kit			**56J18**	**56J18**	**56J18**
Return Air Base			**98M60**	**98M58**	**98M59**
CONDENSATE DRAIN KITS					
Condensate Drain Heat Cable		6 ft.	**26K68**	**26K68**	**26K68**
		24 ft.	**26K69**	**26K69**	**26K69**
		50 ft.	**26K70**	**26K70**	**26K70**
Heat Cable Tape	Fiberglass - 1/2 in. x 66 ft.		**39G04**	**39G04**	**39G04**
	Aluminum foil - 2 in. x 60 ft.		**39G03**	**39G03**	**39G03**
Condensate Trap Alternate Location Kit - Up-Flow Only			**76M20**	**76M20**	**76M20**
CONTROLS					
SignatureStat™ Home Comfort Control			**81M27**	**81M27**	**81M27**
TERMINATION KITS - See Installation Instructions for specific venting information.					
[2] **Termination Kits Direct Vent Applications Only**	**Concentric**	2 in.	**71M80**	**69M29**	**- - -**
		3 in.	**- - -**	**60L46**	**60L46**
	Wall - Close Couple	2 in.	**22G44**	**- - -**	**- - -**
		3 in.	**44J40**	**44J40**	**44J40**
	Close Couple WTK	2 in.	**30G28**	**- - -**	**- - -**
		3 in.	**81J20**	**81J20**	**81J20**
[2] **Termination Kits - Direct or Non-Direct Vent**	**Roof**	2 in.	**15F75**	**15F75**	- - -
	Wall - Wall Ring Kit	2 in.	**15F74**	**15F74**	[3] **15F74**
[2] **Roof Termination Flashing Kit - Direct or Non-Direct Vent -** Contains two flashings.			**44J41**	**44J41**	**44J41**

[1] Cleanable polyurethane frame type filter.
[2] Kits contain enough parts for two, non-direct vent installations.
[3] Non-direct vent only.

GAS HEAT ACCESSORIES

Input	High Altitude Orifice Kit Natural Gas Only	High Altitude Pressure Switch Kit ORDER TWO EACH			LPG/Propane Kit		LPG/Propane to Natural Gas Kit	
	7501-10,000 ft.	2001-4500 ft.	4501-7500 ft.	7501-10,000 ft.	0-7500 ft.	7501-10,000 ft.	0-7500 ft.	[1] 7501-10,000 ft.
-045	**59M17**	**- - -**	**- - -**	**- - -**	**59M13**	**59M14**	**59M87**	**59M87**
-070	**59M17**	**- - -**	**- - -**	**56M23**	**59M13**	**59M14**	**59M87**	**59M87**
-071	**59M17**	**75M22**	**75M22**	**56M21**	**59M13**	**59M14**	**59M87**	**59M87**
-090	**59M17**	**- - -**	**75M22**	**56M21**	**59M13**	**59M14**	**59M87**	**59M87**
-090 (036C-9 and later models)	**59M17**	**- - -**	**24W51**	**24W49**	**59M13**	**59M14**	**59M87**	**59M87**
-091	**47M82**	**26W85**	**26W85**	**26W86**	**59M13**	**59M14**	**59M87**	**59M87**
-110	**59M17**	**- - -**	**56M23**	**75M22**	**59M13**	**59M14**	**59M87**	**59M87**
-111	**47M82**	**56M22**	**56M22**	**56M23**	**59M13**	**59M14**	**59M87**	**59M87**
-135	**59M17**	**- - -**	**56M93**	**56M93**	**59M13**	**59M14**	**59M87**	**59M87**

[1] High Altitude Orifice Kit is required and must be ordered separately for applications from 7501 to 10,000 ft.

BLOWER DATA

G61MPV-36B-045 BLOWER PERFORMANCE (less filter)
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	915	1070	1320	1370	1055	1235	1330	1420
[1] NORM	830	965	1205	1255	945	1100	1185	1295
—	740	860	1055	1095	840	970	1050	1150
"ADJUST" Switch Positions	First Stage "HEAT" Speed - cfm				First Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	830	970	1210	1255	720	820	890	970
[1] NORM	755	880	1080	1120	665	745	795	875
—	690	795	950	995	610	685	725	785

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 442 cfm.

G61MPV-36B-045 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	70	90	115	135	155	175	200	220	245	95	120	145	175	190	210	230	255	280
	Tap 2	125	145	165	185	205	225	255	280	305	155	175	200	225	255	290	310	335	360
	Tap 3	220	250	280	310	340	365	390	415	440	305	335	370	400	435	465	480	495	510
	Tap 4	225	260	300	345	375	410	430	450	470	330	360	395	430	460	485	510	530	550
"COOL" Speed	Tap 1	55	70	90	110	125	140	160	175	195	140	165	200	230	255	280	305	325	350
	Tap 2	70	90	110	130	155	175	200	220	240	230	260	295	330	360	390	415	435	460
	Tap 3	90	110	135	160	185	205	225	245	265	280	315	350	390	430	465	485	505	525
	Tap 4	115	135	160	185	210	235	255	280	300	370	410	450	490	520	555	560	565	570
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	65	80	95	110	135	155	170	190	210	80	95	115	135	155	175	200	220	240
	Tap 2	85	105	125	150	175	195	220	245	270	110	135	160	185	210	230	255	275	295
	Tap 3	150	175	205	230	265	295	320	345	365	205	230	260	295	330	370	390	415	440
	Tap 4	165	195	230	265	290	315	340	370	400	240	270	310	345	370	395	425	455	485
"COOL" Speed	Tap 1	45	60	75	95	115	130	145	160	175	110	130	155	185	205	230	250	275	295
	Tap 2	60	80	100	115	135	155	175	195	215	165	190	215	240	275	305	330	355	380
	Tap 3	70	85	110	130	150	165	190	210	230	195	225	260	290	320	350	375	400	425
	Tap 4	85	105	135	160	175	190	215	240	265	265	300	340	380	410	440	460	485	505
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	50	65	85	100	120	140	155	170	185	55	70	90	110	135	155	170	190	205
	Tap 2	70	90	105	125	145	165	185	205	230	85	100	125	145	175	200	220	235	250
	Tap 3	110	130	155	185	205	225	250	270	290	150	170	195	220	240	265	295	320	350
	Tap 4	125	145	170	200	220	240	265	295	320	160	185	215	245	265	290	315	335	360
"COOL" Speed	Tap 1	40	55	70	85	100	120	130	145	160	80	95	115	135	160	185	205	230	255
	Tap 2	55	65	80	95	115	135	150	165	185	115	140	170	195	215	235	260	280	300
	Tap 3	55	70	90	105	125	145	160	180	195	140	165	195	225	250	270	295	320	345
	Tap 4	75	90	105	125	140	155	180	200	225	180	205	235	265	295	325	355	380	410

BLOWER DATA

G61MPV-36B-070 BLOWER PERFORMANCE (less filter)
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	895	1025	1290	1340	1015	1190	1280	1395
[1] NORM	820	940	1155	1210	930	1065	1155	1270
—	N/A	840	1020	1055	830	950	1010	1105
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	820	930	1160	1210	730	815	865	935
[1] NORM	760	865	1045	1090	680	755	795	855
—	N/A	775	930	965	625	695	730	775

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-36B-070 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	70	85	105	130	150	170	190	205	225	110	115	135	155	175	195	215	240	260
	Tap 2	100	120	145	165	190	215	235	260	280	130	155	180	205	230	255	280	300	325
	Tap 3	185	210	240	270	290	310	345	375	405	250	280	310	340	370	400	425	450	475
	Tap 4	200	230	265	295	325	355	385	410	440	285	310	340	365	400	430	455	485	510
"COOL" Speed	Tap 1	55	70	90	110	130	145	160	175	190	135	155	175	200	220	245	270	295	320
	Tap 2	75	90	110	130	150	170	190	205	220	185	215	250	285	315	345	370	395	420
	Tap 3	85	100	120	145	165	185	205	225	250	235	265	300	335	370	400	425	455	480
	Tap 4	105	125	150	170	190	210	235	255	280	315	340	370	395	440	480	510	540	570
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	65	75	95	110	130	150	170	185	200	75	90	110	125	150	170	190	205	225
	Tap 2	85	100	120	140	160	180	200	225	245	100	120	145	165	190	210	230	250	270
	Tap 3	130	155	180	205	235	265	285	305	325	195	210	230	250	280	315	340	370	395
	Tap 4	145	170	200	230	255	280	305	330	355	200	225	255	280	315	355	375	400	425
"COOL" Speed	Tap 1	45	60	80	95	115	130	145	160	175	100	120	140	165	190	215	235	255	275
	Tap 2	60	75	95	110	130	145	165	180	200	140	165	190	220	245	265	290	315	340
	Tap 3	65	85	105	125	140	155	175	195	215	175	200	230	260	285	310	340	365	390
	Tap 4	85	100	120	140	160	180	200	220	240	230	260	295	325	360	390	410	435	455
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 2	60	75	100	120	140	160	175	195	210	70	90	115	135	160	185	200	220	235
	Tap 3	95	120	145	170	190	210	230	245	265	140	160	180	205	225	245	270	295	325
	Tap 4	110	130	155	185	205	225	245	270	290	145	165	190	215	235	255	280	305	330
"COOL" Speed	Tap 1	40	55	70	85	100	120	130	145	160	75	90	110	125	150	175	190	210	225
	Tap 2	45	60	80	95	115	135	145	160	175	95	120	150	175	200	220	240	260	285
	Tap 3	50	65	85	105	125	145	160	175	190	125	150	175	195	220	240	265	290	320
	Tap 4	60	75	95	115	135	150	170	190	215	165	190	215	245	265	485	315	340	370

BLOWER DATA

G61MPV-36B-071 BLOWER PERFORMANCE (less filter)
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	925	1065	1305	1345	1055	1225	1305	1405
[1] NORM	840	970	1185	1230	955	1100	1185	1280
—	775	875	1050	1085	855	975	1040	1140
"ADJUST" Switch Positions	First Stage "HEAT" Speed - cfm				First Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	840	965	1190	1235	745	835	895	970
[1] NORM	765	880	1070	1115	695	770	815	875
—	705	795	955	990	645	705	740	790

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-36B-071 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																
		First Stage									Second Stage							
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	70	90	110	135	160	180	195	215	240	100	120	140	165	190	210	235	255	275
	Tap 2	115	135	160	185	205	230	250	270	295	160	185	210	230	255	275	295	315	330
	Tap 3	205	230	265	295	325	355	380	410	425	290	320	350	380	415	440	465	490	480
	Tap 4	220	250	290	325	360	390	425	455	455	310	345	375	410	445	475	500	525	515
"COOL" Speed	Tap 1	55	70	90	110	130	145	165	185	200	145	170	195	220	245	270	295	320	345
	Tap 2	70	90	115	135	160	180	200	220	240	225	255	285	315	350	375	400	425	445
	Tap 3	90	105	130	150	170	195	220	240	260	265	300	340	375	415	440	465	490	505
	Tap 4	110	130	155	180	205	230	250	270	295	360	390	425	460	495	515	540	560	535
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	60	75	95	115	135	155	175	195	215	75	95	115	140	160	180	200	220	240
	Tap 2	80	100	125	150	180	200	220	240	255	110	135	165	190	220	240	255	275	290
	Tap 3	150	170	200	225	250	275	300	325	350	210	235	260	285	315	345	375	405	425
	Tap 4	165	190	220	250	280	310	335	360	385	230	260	290	325	355	380	405	430	435
"COOL" Speed	Tap 1	45	60	80	95	115	130	150	165	185	110	130	155	180	205	225	245	265	285
	Tap 2	60	75	95	115	135	155	170	190	215	160	185	215	245	280	305	330	355	375
	Tap 3	70	85	105	130	150	170	190	215	235	205	230	260	290	320	350	380	410	420
	Tap 4	80	100	125	150	170	195	215	240	260	260	290	320	355	390	415	440	470	480
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	50	65	85	100	120	140	155	175	195	70	90	105	125	145	165	185	205	215
	Tap 2	65	80	100	120	140	165	185	205	225	90	110	130	155	175	195	215	235	250
	Tap 3	105	125	150	180	205	225	245	265	290	145	170	195	225	255	270	290	305	325
	Tap 4	115	135	165	190	215	240	260	285	310	160	185	215	240	270	290	310	330	350
"COOL" Speed	Tap 1	40	55	70	85	100	120	135	155	170	75	95	120	140	165	185	205	225	245
	Tap 2	45	60	80	100	115	135	150	170	185	115	135	160	190	215	235	255	270	295
	Tap 3	55	70	90	110	130	150	165	185	205	140	165	190	215	245	265	290	315	340
	Tap 4	60	75	100	120	140	165	185	205	225	180	205	235	265	295	320	345	365	390

BLOWER DATA

G61MPV-36C-090 BLOWER PERFORMANCE (less filter)
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	N/A	1040	1285	1340	1020	1185	1275	1395
[1] NORM	N/A	915	1150	1200	905	1060	1145	1270
—	N/A	N/A	1020	1055	800	925	1010	1100
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	N/A	940	1160	1210	705	790	845	920
[1] NORM	N/A	840	1040	1075	650	730	770	830
—	N/A	N/A	915	945	600	670	705	750

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 479 cfm.

G61MPV-36C-090 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 2	75	90	110	130	155	185	205	225	250	90	110	140	165	185	205	235	260	290
	Tap 3	125	150	175	200	230	260	290	325	355	170	195	230	265	290	330	360	395	425
	Tap 4	130	160	200	235	265	295	325	355	385	185	220	255	290	325	360	395	430	460
"COOL" Speed	Tap 1	35	50	70	90	105	125	140	160	175	85	110	135	160	185	205	235	265	295
	Tap 2	45	60	80	100	125	150	170	185	205	125	155	185	220	245	275	305	330	360
	Tap 3	60	75	95	110	135	160	180	200	220	165	195	230	265	300	330	355	380	410
	Tap 4	65	85	110	135	160	180	205	225	245	210	245	285	325	360	390	425	460	495
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 2	50	65	90	110	135	155	175	200	220	60	80	105	130	155	185	205	220	240
	Tap 3	90	110	145	175	200	225	245	270	290	110	135	170	205	230	250	285	320	355
	Tap 4	90	120	155	190	205	225	250	280	305	140	165	190	220	255	290	315	335	360
"COOL" Speed	Tap 1	35	45	60	75	95	115	130	145	160	60	80	110	135	155	175	195	215	235
	Tap 2	40	55	70	90	110	130	150	165	185	105	125	145	170	200	225	250	270	295
	Tap 3	45	60	80	95	115	135	155	175	195	115	140	175	205	235	265	290	315	335
	Tap 4	50	65	85	105	130	155	180	200	220	155	185	220	255	285	315	345	380	415
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 3	65	85	105	130	155	180	200	225	250	85	105	135	160	185	205	230	250	270
	Tap 4	75	95	120	140	165	190	210	230	250	90	115	140	170	190	215	245	275	305
"COOL" Speed	Tap 1	30	40	55	75	90	105	120	135	150	55	65	85	105	125	150	170	190	210
	Tap 2	40	50	65	80	100	120	130	145	160	65	90	120	145	165	185	205	225	250
	Tap 3	40	55	70	90	105	125	140	160	180	85	105	135	165	185	210	235	260	285
	Tap 4	45	60	75	90	115	135	155	170	190	105	125	150	175	210	240	275	305	335

BLOWER DATA

G61MPV-60C-090 BLOWER PERFORMANCE (less filter)

Bottom Return Air, Return Air from Both Sides or Return Air from Bottom and One Side.

0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1500	1675	1880	2090	1605	1710	1925	2165
[1] NORM	1355	1545	1720	1900	1440	1560	1755	1960
—	1194	1365	1540	1695	1275	1380	1590	1755
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1360	1560	1730	1910	1105	1185	1355	1545
[1] NORM	1220	1405	1585	1740	995	1080	1205	1345
—	1105	1235	1410	1570	890	960	1090	1215

[1] Factory default jumper setting.

NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 449 cfm.

G61MPV-60C-090 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	190	215	245	275	305	340	365	390	420	245	275	315	350	380	410	440	475	510
	Tap 2	265	300	340	380	415	450	480	510	540	350	385	420	455	490	525	555	580	610
	Tap 3	380	415	450	485	520	555	595	630	665	485	520	555	595	640	685	720	755	790
	Tap 4	495	535	580	625	660	700	735	770	805	650	695	750	800	850	900	925	955	985
"COOL" Speed	Tap 1	115	135	160	185	205	230	255	275	300	305	340	375	410	440	475	505	535	565
	Tap 2	145	165	190	215	240	265	285	305	325	355	390	430	470	510	550	580	610	635
	Tap 3	170	200	240	275	305	335	370	400	430	510	555	600	645	690	730	765	795	830
	Tap 4	265	295	330	365	400	435	465	500	535	725	780	835	895	935	975	1005	1035	1065
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	150	170	195	220	245	270	295	325	350	180	210	245	280	305	330	365	400	430
	Tap 2	200	230	270	305	330	355	385	415	450	265	295	335	375	405	430	465	500	535
	Tap 3	270	310	355	395	425	460	490	525	560	370	400	435	470	515	555	585	615	645
	Tap 4	390	420	455	490	525	555	595	630	670	495	530	570	605	645	685	720	755	795
"COOL" Speed	Tap 1	90	110	130	155	175	195	215	235	255	220	250	285	320	350	385	415	450	485
	Tap 2	110	130	155	180	200	220	245	265	285	270	305	345	385	420	455	485	515	545
	Tap 3	145	165	190	215	245	270	295	320	340	390	425	465	500	540	580	610	640	670
	Tap 4	180	205	240	270	300	330	365	395	430	540	580	625	670	710	755	795	830	870
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	110	135	165	190	215	235	255	280	300	155	175	195	215	245	270	295	315	340
	Tap 2	155	175	200	225	255	285	310	335	365	190	215	250	285	310	335	365	395	425
	Tap 3	200	230	270	305	335	365	395	420	450	255	290	335	375	400	430	465	495	530
	Tap 4	270	305	345	385	415	450	480	515	545	345	385	425	465	495	530	565	605	645
"COOL" Speed	Tap 1	70	85	105	125	145	165	185	205	225	160	190	220	255	275	300	330	360	390
	Tap 2	80	100	120	140	165	190	210	225	245	195	225	260	295	325	350	385	415	450
	Tap 3	110	130	160	185	205	225	250	275	300	295	330	365	400	430	460	495	535	570
	Tap 4	155	175	195	220	245	270	295	315	340	400	435	470	510	545	585	610	640	665

BLOWER DATA

G61MPV-60C-090 BLOWER PERFORMANCE (less filter)
Side Return Air with Optional RAB Return Air Base
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1440	1630	1810	2015	1525	1655	1860	2100
[1] NORM	1300	1485	1655	1830	1385	1500	1695	1905
—	1155	1310	1480	1640	1240	1320	1510	1695
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1320	1490	1665	1840	1060	1135	1285	1455
[1] NORM	1180	1345	1515	1680	960	1035	1165	1310
—	1055	1180	1340	1490	865	920	1050	1165

[1] Factory default jumper setting.

NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 449 cfm.

G61MPV-60C-090 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	180	205	235	260	290	320	350	380	410	230	260	290	320	355	390	420	445	475
	Tap 2	250	280	315	350	385	425	455	485	515	325	360	400	435	465	495	530	565	595
	Tap 3	345	380	415	455	485	515	550	580	615	460	490	520	550	595	640	675	715	750
	Tap 4	465	505	545	585	625	660	695	730	760	665	685	710	735	775	820	860	900	940
"COOL" Speed	Tap 1	110	130	150	175	195	215	240	265	290	275	305	340	380	410	440	470	505	540
	Tap 2	130	155	175	200	220	245	265	290	315	360	390	420	455	485	515	550	590	625
	Tap 3	160	190	220	255	280	305	335	360	390	490	530	570	610	645	680	715	750	785
	Tap 4	220	255	295	330	365	400	430	460	490	695	750	805	855	895	935	965	995	1025
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	145	165	190	210	235	260	285	310	335	170	195	230	260	290	320	350	375	400
	Tap 2	195	220	250	275	305	335	365	395	420	255	285	315	345	370	395	430	465	500
	Tap 3	280	305	335	360	395	425	455	485	515	340	375	410	450	480	510	545	580	615
	Tap 4	370	400	430	460	495	530	565	595	625	465	500	535	575	610	645	685	725	765
"COOL" Speed	Tap 1	80	95	120	140	165	190	210	235	255	190	225	265	305	330	355	390	420	455
	Tap 2	100	120	140	165	190	215	235	255	275	265	295	325	355	390	420	455	495	530
	Tap 3	140	160	185	205	235	260	285	305	325	375	410	440	475	500	530	570	610	650
	Tap 4	180	205	240	270	300	325	350	380	405	520	560	605	645	685	720	760	805	845
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	100	125	150	175	200	220	245	265	290	135	155	180	200	225	250	275	300	330
	Tap 2	150	165	185	205	235	265	290	310	335	170	200	235	265	290	320	350	375	405
	Tap 3	210	230	255	275	310	345	370	400	425	255	285	315	350	370	390	430	470	510
	Tap 4	260	290	320	350	390	430	455	480	505	340	375	410	445	475	510	535	565	590
"COOL" Speed	Tap 1	70	85	105	125	140	160	180	200	220	155	175	200	225	255	290	315	340	365
	Tap 2	80	95	115	135	155	175	200	220	245	185	210	235	260	295	325	355	385	415
	Tap 3	105	125	150	175	200	220	240	265	290	255	290	330	365	400	430	460	490	520
	Tap 4	135	160	185	215	235	260	285	305	330	370	400	440	475	505	530	565	600	635

BLOWER DATA

G61MPV-60C-090 BLOWER PERFORMANCE (less filter)
Single Side Return Air - Air volumes in bold require field fabricated transition to accommodate 20 x 25 x 1 in. cleanable air filter in order to maintain proper air velocity across the filter.
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1450	1640	**1820**	**2055**	1575	1690	**1895**	**2135**
[1] NORM	1320	1510	1700	**1870**	1405	1530	1735	**1935**
—	1165	1320	1500	1665	1250	1355	1560	1735
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1315	1510	1695	**1875**	1080	1160	1315	1490
[1] NORM	1190	1365	1545	1715	985	1060	1185	1330
—	1075	1205	1370	1520	865	930	1065	1185

[1] Factory default jumper setting.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 449 cfm.

G61MPV-60C-090 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	170	200	230	265	295	325	355	385	415	225	255	290	325	360	390	425	455	490
	Tap 2	255	285	320	355	390	425	455	490	520	330	370	410	455	485	515	540	560	585
	Tap 3	345	385	430	475	515	555	585	610	640	445	480	520	560	610	660	700	735	775
	Tap 4	470	515	560	610	650	685	725	765	800	650	695	745	800	840	885	915	950	980
"COOL" Speed	Tap 1	110	130	155	180	205	225	245	270	290	285	320	355	390	430	465	500	535	565
	Tap 2	125	150	175	205	225	250	275	300	325	355	390	430	470	500	530	570	605	645
	Tap 3	170	195	230	260	290	325	355	385	415	515	550	590	625	670	710	750	795	840
	Tap 4	240	275	315	355	380	405	445	485	525	740	785	835	885	920	955	990	1020	1050
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	145	165	190	215	240	265	290	315	345	175	200	235	265	300	330	360	385	415
	Tap 2	195	225	255	290	320	345	375	405	435	260	290	325	355	390	425	455	490	520
	Tap 3	265	300	335	370	405	435	470	505	540	360	395	435	470	515	555	585	620	650
	Tap 4	385	420	460	495	525	555	590	625	660	475	515	560	600	640	685	720	760	800
"COOL" Speed	Tap 1	85	100	125	145	170	200	215	235	255	200	230	270	310	340	370	400	430	460
	Tap 2	105	125	150	170	195	220	240	260	280	260	295	330	365	400	440	470	500	530
	Tap 3	135	160	185	215	240	270	290	315	335	410	440	470	500	540	580	610	640	670
	Tap 4	170	200	235	265	305	340	365	390	415	550	585	620	655	695	740	780	825	865
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	105	130	155	180	205	225	245	270	290	130	155	180	204	230	260	285	310	335
	Tap 2	145	165	195	220	250	280	305	335	360	170	195	230	265	295	325	355	385	420
	Tap 3	190	220	250	285	315	345	375	405	440	245	280	315	350	385	420	450	485	520
	Tap 4	270	295	325	355	395	430	465	500	530	340	375	415	455	490	525	560	595	625
"COOL" Speed	Tap 1	65	80	100	120	140	160	180	205	225	155	180	215	245	265	290	320	345	375
	Tap 2	75	90	110	130	155	180	200	220	245	190	220	250	275	305	335	370	400	430
	Tap 3	100	120	150	175	200	220	245	265	290	290	320	355	385	415	445	485	520	560
	Tap 4	135	160	185	215	240	265	290	315	335	405	435	465	495	540	585	610	640	665

BLOWER DATA

G61MPV-60C-091 BLOWER PERFORMANCE (less filter)

Bottom Return Air, Return Air from Both Sides or Return Air from Bottom and One Side.

0 through 1.00 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1560	1770	1895	2110	1665	1790	1990	2175
[1] NORM	1400	1575	1745	1930	1515	1625	1815	2020
—	1245	1400	1565	1745	1340	1445	1645	1800
"ADJUST" Switch Positions	First Stage "HEAT" Speed - cfm				First Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1420	1625	1780	1965	1240	1245	1410	1585
[1] NORM	1280	1465	1615	1790	1060	1125	1270	1430
—	1145	1290	1445	1610	940	1015	1145	1270

[1] Factory default jumper setting.

N/A - First and second stage HEAT positions shown cannot be used on this model.

NOTES - The effect of static pressure is included in air volumes shown.

First stage HEAT is approximately **91%** of the same second stage HEAT speed position.

First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.

Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.

Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-60C-091 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	255	280	305	330	355	390	420	450	475	305	340	375	415	450	475	505	530	560
	Tap 2	325	360	390	425	460	500	540	580	615	395	440	490	540	585	620	655	690	730
	Tap 3	495	525	555	590	620	650	680	710	710	615	645	675	705	740	755	775	790	765
	Tap 4	625	660	700	740	780	815	855	890	890	800	840	880	920	960	985	1005	1030	1000
"COOL" Speed	Tap 1	180	200	225	250	280	300	320	345	370	390	420	455	485	520	550	585	615	640
	Tap 2	200	225	250	280	305	330	350	375	395	485	520	555	590	625	655	680	710	735
	Tap 3	245	270	300	335	365	390	420	445	470	655	700	740	785	830	860	890	925	930
	Tap 4	355	380	405	435	465	495	520	550	585	930	960	990	1020	1050	1060	1070	1045	1005
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	185	210	235	265	290	315	340	365	390	230	260	290	320	350	375	405	430	460
	Tap 2	240	270	305	340	375	410	445	475	505	300	335	370	410	450	485	520	560	595
	Tap 3	385	410	435	455	480	510	540	656	595	465	495	530	565	595	625	650	680	690
	Tap 4	480	510	540	570	600	605	670	705	740	585	626	670	710	750	785	820	855	870
"COOL" Speed	Tap 1	110	130	155	180	205	230	250	275	295	285	315	350	380	415	440	465	490	525
	Tap 2	140	160	185	205	230	250	265	285	310	345	380	420	460	495	525	550	580	615
	Tap 3	185	210	235	265	290	320	350	380	395	485	525	565	610	650	680	715	745	775
	Tap 4	245	275	305	335	365	395	420	450	480	680	720	765	810	855	885	910	940	960
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	145	165	190	210	235	255	280	300	320	175	195	225	250	275	295	320	340	365
	Tap 2	175	200	225	255	280	305	335	360	385	220	250	280	315	350	375	400	430	460
	Tap 3	275	305	330	360	385	410	435	460	485	365	390	410	435	460	485	510	535	555
	Tap 4	340	370	405	440	475	505	535	570	600	460	490	520	550	580	610	640	675	700
"COOL" Speed	Tap 1	90	105	125	145	165	185	205	225	245	215	240	270	300	325	350	375	395	425
	Tap 2	105	125	150	170	195	215	235	255	270	255	285	315	345	380	405	430	455	495
	Tap 3	145	165	190	215	235	260	280	305	325	385	410	440	470	495	535	570	605	630
	Tap 4	190	215	240	265	290	315	345	370	395	485	520	555	590	625	660	700	735	765

BLOWER DATA

G61MPV-60C-091 BLOWER PERFORMANCE (less filter)
Side Return Air with Optional RAB Return Air Base
0 through 1.00 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1490	1690	**1850**	**2050**	1590	1695	**1905**	**2035**
[1] **NORM**	1345	1520	1700	**1870**	1445	1535	1740	**1900**
—	1195	1345	1525	1675	1280	1370	1580	1700
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1360	1550	1720	**1880**	1125	1195	1370	1530
[1] **NORM**	1225	1400	1540	1715	1030	1085	1230	1380
—	1100	1225	1385	1540	915	980	1110	1225

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-60C-091 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	210	235	265	295	325	350	380	405	435	265	295	330	365	400	425	450	480	500
	Tap 2	270	300	340	380	415	450	485	520	555	355	395	445	490	535	570	610	645	675
	Tap 3	430	455	490	520	550	580	610	645	675	530	656	600	640	675	700	730	755	775
	Tap 4	525	560	600	635	675	710	750	790	825	680	725	775	820	870	905	935	970	995
"COOL" Speed	Tap 1	145	165	185	210	230	255	275	295	315	353	380	410	440	470	500	530	555	580
	Tap 2	175	195	220	245	270	290	315	335	360	445	475	510	540	575	600	625	650	675
	Tap 3	230	260	285	315	345	370	395	420	450	640	680	725	765	810	840	870	905	890
	Tap 4	335	365	390	415	445	470	500	525	560	855	885	915	940	970	970	965	965	935
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	160	185	210	235	260	280	305	325	355	195	225	255	285	320	345	365	390	420
	Tap 2	205	235	265	295	330	355	385	415	450	250	285	325	365	405	435	465	495	530
	Tap 3	325	350	375	400	430	455	475	500	530	415	445	475	505	540	570	605	635	665
	Tap 4	410	445	475	510	545	575	605	640	670	505	545	585	625	660	700	740	780	815
"COOL" Speed	Tap 1	105	125	150	170	195	220	240	261	280	260	285	315	345	375	400	420	445	475
	Tap 2	135	155	180	200	225	240	260	275	300	320	350	385	420	455	480	505	530	565
	Tap 3	175	200	225	250	275	305	330	360	375	475	515	555	595	635	665	695	730	760
	Tap 4	235	260	290	320	350	375	405	430	460	625	665	705	750	790	815	840	865	855
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	120	140	165	190	215	235	260	285	305	150	170	195	220	245	270	295	320	345
	Tap 2	145	170	200	225	255	285	315	345	370	185	210	240	270	305	330	360	390	425
	Tap 3	230	255	285	315	345	370	395	420	445	310	335	365	390	415	445	470	495	520
	Tap 4	280	315	350	385	420	450	480	515	540	385	415	445	480	515	545	580	610	640
"COOL" Speed	Tap 1	85	100	120	140	160	180	195	215	235	195	220	245	270	295	315	335	360	385
	Tap 2	100	120	145	165	190	210	230	250	265	235	260	290	320	345	370	395	420	455
	Tap 3	140	155	180	200	225	245	265	285	305	375	400	430	455	485	520	555	590	620
	Tap 4	180	205	230	255	280	305	330	355	380	450	480	515	545	580	610	645	675	705

BLOWER DATA

G61MPV-60C-091 BLOWER PERFORMANCE (less filter)
Single Side Return Air - Air volumes in bold require field fabricated transition to accommodate 20 x 25 x 1 in. cleanable air filter in order to maintain proper air velocity across the filter.
0 through 1.00 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1510	1720	**1810**	**2065**	1615	1735	**1900**	**2055**
[1] **NORM**	1365	1535	1725	**1880**	1465	1575	1735	**1915**
—	1210	1360	1520	1700	1300	1400	1575	1715
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1385	1560	1755	**1900**	1150	1220	1385	1545
[1] **NORM**	1240	1400	1570	1750	1050	1105	1245	1395
—	1125	1260	1410	1560	930	995	1125	1240

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-60C-091 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	230	255	285	315	350	375	400	425	455	285	315	350	385	420	450	485	515	545
	Tap 2	290	325	365	405	445	480	510	545	585	370	410	455	500	545	585	625	670	705
	Tap 3	475	505	545	580	620	645	670	695	695	560	595	625	660	695	720	745	770	755
	Tap 4	570	610	655	700	740	775	805	835	835	750	790	835	880	925	960	995	1025	1010
"COOL" Speed	Tap 1	155	175	200	225	250	275	295	320	345	385	415	450	485	515	545	580	610	635
	Tap 2	175	200	225	250	275	300	320	340	370	470	500	535	570	600	630	655	685	710
	Tap 3	240	265	295	325	355	385	410	435	465	645	685	730	770	815	845	875	905	890
	Tap 4	355	380	410	440	465	495	525	555	590	905	935	965	995	1025	1025	1020	1020	985
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	160	190	220	250	280	305	325	350	375	215	240	270	300	330	360	390	415	445
	Tap 2	205	235	275	315	350	380	415	445	475	270	305	345	385	420	455	495	530	565
	Tap 3	360	385	415	440	465	490	515	540	570	450	480	515	545	580	605	630	660	690
	Tap 4	455	485	520	550	585	615	650	680	715	555	590	630	675	715	745	780	810	850
"COOL" Speed	Tap 1	115	135	160	185	210	235	260	280	300	285	315	345	380	410	435	460	485	520
	Tap 2	135	160	180	205	230	245	265	280	305	335	365	405	440	480	505	530	560	595
	Tap 3	180	205	230	260	285	315	345	370	390	475	515	555	595	640	670	700	730	760
	Tap 4	245	275	305	335	370	395	425	450	485	660	705	750	790	835	865	890	915	905
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	135	155	175	200	225	250	275	300	320	160	185	205	230	255	280	310	335	360
	Tap 2	160	185	215	240	270	300	335	365	390	200	225	255	285	310	345	380	415	445
	Tap 3	270	295	320	345	375	400	420	445	475	330	355	385	410	435	460	485	510	535
	Tap 4	325	355	385	420	450	480	510	535	575	420	450	485	515	550	580	610	640	670
"COOL" Speed	Tap 1	90	110	130	150	170	195	215	235	250	215	240	270	295	325	345	370	390	420
	Tap 2	105	125	145	170	195	215	235	255	270	245	275	305	335	365	390	415	440	475
	Tap 3	145	165	185	210	235	255	275	300	320	375	400	430	460	490	525	560	595	620
	Tap 4	190	215	240	265	290	320	345	375	400	475	510	545	575	610	645	680	715	745

BLOWER DATA

G61MPV-60C-110 BLOWER PERFORMANCE (less filter)
Bottom Return Air, Return Air from Both Sides or Return Air from Bottom and One Side.
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1505	1710	1915	2130	1625	1745	1990	2210
[1] NORM	1370	1565	1765	1945	1465	1580	1790	1995
—	1205	1380	1565	1740	1290	1405	1605	1790
"ADJUST" Switch Positions	First Stage "HEAT" Speed - cfm				First Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1370	1570	1760	1945	1150	1215	1380	1540
[1] NORM	1235	1420	1600	1780	1050	1125	1265	1430
—	1105	1250	1420	1580	935	1000	1140	1255

[1] Factory default jumper setting.

NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 463 cfm.

G61MPV-60C-110 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	165	195	230	265	300	336	370	400	430	210	245	290	330	365	395	435	470	510
	Tap 2	245	285	325	370	400	435	470	505	540	330	365	405	445	480	520	560	600	640
	Tap 3	365	395	430	465	510	550	590	630	670	450	490	535	580	625	665	700	735	770
	Tap 4	480	520	565	610	645	685	725	770	810	625	670	715	760	805	850	890	930	970
"COOL" Speed	Tap 1	110	130	160	185	210	230	255	280	305	280	315	350	390	430	475	510	550	585
	Tap 2	135	155	180	210	230	255	285	315	350	340	380	425	465	505	545	575	610	645
	Tap 3	180	210	250	285	310	340	370	400	425	510	545	585	620	675	735	770	805	840
	Tap 4	235	270	310	350	380	420	450	480	515	710	755	805	855	905	950	980	1010	1035
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	150	170	190	205	245	280	305	335	365	170	200	235	270	300	330	365	400	430
	Tap 2	195	220	255	285	320	360	390	420	445	240	275	320	365	400	430	465	500	530
	Tap 3	265	300	335	370	410	445	480	520	555	360	395	435	475	510	550	585	620	650
	Tap 4	370	410	455	495	525	550	590	630	670	460	500	545	590	635	675	720	760	805
"COOL" Speed	Tap 1	100	115	135	150	180	210	235	255	275	205	235	275	310	345	380	415	450	485
	Tap 2	110	130	150	175	200	235	260	280	300	250	285	325	360	400	440	470	505	540
	Tap 3	155	180	200	225	250	280	310	340	370	375	410	445	485	530	575	605	635	670
	Tap 4	190	220	255	290	320	350	380	410	440	510	550	595	640	685	725	770	815	860
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	105	130	155	180	210	235	260	285	305	140	160	180	200	235	265	295	320	350
	Tap 2	140	165	195	225	250	280	310	345	375	165	195	230	265	300	335	370	405	440
	Tap 3	185	220	255	290	325	355	390	420	450	250	285	325	360	395	430	465	500	530
	Tap 4	250	290	335	375	410	445	480	520	560	340	375	420	460	495	530	565	605	645
"COOL" Speed	Tap 1	70	90	110	130	150	175	200	220	240	155	180	210	240	270	295	325	355	385
	Tap 2	80	100	120	145	170	200	220	240	260	185	215	245	280	315	345	380	415	450
	Tap 3	110	130	155	180	205	235	260	280	310	265	300	345	385	425	465	500	535	570
	Tap 4	160	180	200	225	250	275	300	330	360	375	415	455	495	535	575	615	650	690

BLOWER DATA

G61MPV-60C-110 BLOWER PERFORMANCE (less filter)
Single Side Return Air - Air volumes in bold require field fabricated transition to accommodate 20 x 25 x 1 in. cleanable air filter in order to maintain proper air velocity across the filter.
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1485	1675	**1870**	**2080**	1585	1700	**1905**	**2135**
[1] NORM	1350	1525	1725	**1895**	1435	1535	1740	**1930**
—	1175	1335	1505	1670	1280	1385	1570	1755
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1325	1505	1695	**1870**	1140	1215	1345	1490
[1] NORM	1195	1365	1550	1720	1005	1085	1220	1380
—	1080	1205	1365	1530	930	1000	1105	1220

[1] Factory default jumper setting.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 463 cfm.

G61MPV-60C-110 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	155	185	220	255	285	320	350	380	410	205	240	280	320	355	390	420	450	480
	Tap 2	215	255	300	345	370	395	430	465	500	320	350	380	410	455	495	530	565	595
	Tap 3	335	375	415	455	490	530	570	605	645	445	475	510	545	590	630	670	710	750
	Tap 4	450	490	535	580	615	645	690	730	775	580	625	680	735	770	810	850	890	930
"COOL" Speed	Tap 1	105	130	160	190	210	230	260	280	310	255	295	345	390	430	470	510	545	580
	Tap 2	125	150	175	200	225	250	280	310	335	340	375	415	455	490	525	570	615	660
	Tap 3	170	195	230	265	295	325	355	380	410	455	500	555	610	650	695	750	800	850
	Tap 4	215	250	295	340	375	405	440	470	500	650	710	770	835	880	920	960	995	1035
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	140	160	185	210	235	265	285	310	330	155	185	220	250	285	320	350	380	410
	Tap 2	170	200	235	270	305	340	370	400	430	220	260	300	345	370	395	430	465	500
	Tap 3	250	290	330	370	400	430	465	505	540	355	385	415	450	485	520	555	595	630
	Tap 4	360	395	430	465	510	550	580	605	635	460	490	525	560	605	645	685	730	770
"COOL" Speed	Tap 1	80	100	120	145	170	195	220	245	275	195	230	270	305	345	380	415	455	490
	Tap 2	95	115	140	165	190	220	240	270	295	225	265	315	360	400	440	475	515	555
	Tap 3	140	160	190	215	240	265	295	320	350	365	400	445	485	525	565	610	650	690
	Tap 4	175	205	240	270	305	340	370	400	430	495	535	580	625	675	725	770	815	860
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	105	125	150	175	195	215	240	265	290	135	155	180	205	225	245	275	300	330
	Tap 2	145	165	190	210	240	265	290	315	340	170	195	225	255	290	325	355	385	410
	Tap 3	175	200	235	265	300	335	370	400	430	230	260	295	335	370	405	440	475	510
	Tap 4	240	275	320	360	390	420	450	485	515	325	365	410	455	490	520	550	575	600
"COOL" Speed	Tap 1	60	80	100	125	150	170	195	220	245	155	180	205	235	270	305	340	370	400
	Tap 2	75	95	115	140	160	185	210	235	260	170	200	240	275	315	355	390	420	450
	Tap 3	105	125	150	175	200	225	250	275	295	250	290	330	375	410	445	485	525	570
	Tap 4	140	160	190	215	240	265	300	330	360	365	405	450	490	535	575	615	655	690

BLOWER DATA

G61MPV-60C-110 BLOWER PERFORMANCE (less filter)
Side Return Air with Optional RAB Return Air Base
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1475	1670	1865	2070	1555	1685	1895	2130
[1] NORM	1345	1500	1695	1865	1415	1540	1735	1930
—	1180	1345	1510	1685	1245	1350	1545	1725
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1330	1510	1695	1875	1085	1155	1310	1475
[1] NORM	1195	1375	1550	1725	955	1050	1185	1335
—	1080	1210	1370	1520	850	920	1070	1195

[1] Factory default jumper setting.

NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 463 cfm.

G61MPV-60C-110 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																
		First Stage									Second Stage							
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	170	195	225	255	290	320	350	380	410	215	250	285	320	355	390	425	455	490
	Tap 2	230	265	305	345	380	415	445	480	515	315	355	400	445	480	510	540	575	605
	Tap 3	350	385	420	460	495	525	560	595	630	460	490	525	555	605	655	690	730	770
	Tap 4	450	490	535	580	610	640	680	720	760	590	630	680	725	785	840	880	915	955
"COOL" Speed	Tap 1	105	125	150	175	200	220	245	265	290	250	285	320	360	395	435	470	500	535
	Tap 2	130	150	175	200	220	240	270	295	320	335	365	405	445	480	515	550	590	630
	Tap 3	165	190	220	250	275	305	335	370	400	470	505	545	585	630	670	710	755	800
	Tap 4	205	240	285	330	360	390	420	450	485	655	695	745	790	840	885	925	965	1005
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	150	170	190	215	240	265	290	315	340	155	190	225	265	295	325	355	385	420
	Tap 2	185	215	245	275	310	340	370	400	430	230	265	300	335	370	400	440	475	515
	Tap 3	255	285	325	365	400	440	465	495	525	335	370	410	450	490	530	560	595	625
	Tap 4	345	385	430	475	510	545	575	605	635	460	490	520	550	595	645	680	715	750
"COOL" Speed	Tap 1	75	90	115	135	160	185	205	225	250	190	220	255	290	325	360	395	430	460
	Tap 2	100	120	145	165	185	205	230	255	280	250	285	325	360	390	420	455	485	520
	Tap 3	135	155	175	200	230	260	280	305	330	355	395	435	475	510	545	580	620	660
	Tap 4	170	195	225	255	290	320	350	375	405	475	515	565	610	655	705	745	785	825
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	110	130	150	175	195	215	240	265	290	135	155	180	210	230	250	275	300	325
	Tap 2	145	165	190	210	240	270	295	315	340	170	195	230	265	295	325	355	390	420
	Tap 3	175	205	240	280	310	340	370	400	430	220	255	295	335	370	405	440	475	515
	Tap 4	245	280	320	355	390	420	455	490	525	325	360	400	440	475	510	540	565	590
"COOL" Speed	Tap 1	55	70	90	110	135	155	175	195	220	150	170	200	225	255	285	315	340	370
	Tap 2	65	80	105	130	150	170	195	215	240	165	195	230	265	300	330	360	390	420
	Tap 3	100	125	150	180	200	220	240	260	280	240	280	320	360	400	435	470	505	540
	Tap 4	140	160	180	200	230	260	285	305	330	350	385	420	455	500	540	575	610	645

BLOWER DATA

G61MPV-60C-111 BLOWER PERFORMANCE (less filter)

Bottom Return Air, Return Air from Both Sides or Return Air from Bottom and One Side.

0 through 1.00 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1585	1810	1950	2170	1635	1750	1965	2195
[1] NORM	1430	1635	1770	1970	1480	1605	1805	2015
—	1265	1440	1600	1780	1290	1400	1605	1800
"ADJUST" Switch Positions	First Stage "HEAT" Speed - cfm				First Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1450	1650	1790	1990	1120	1195	1380	1560
[1] NORM	1295	1475	1630	1810	1020	1095	1225	1385
—	1165	1330	1470	1635	900	970	1105	1245

[1] Factory default jumper setting.

N/A - First and second stage HEAT positions shown cannot be used on this model.

NOTES - The effect of static pressure is included in air volumes shown.

First stage HEAT is approximately **91%** of the same second stage HEAT speed position.

First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.

Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.

Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-60C-111 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	210	235	270	300	335	365	395	425	455	275	305	345	380	415	445	475	505	535
	Tap 2	265	305	345	385	425	465	505	545	585	350	395	440	485	530	570	605	645	685
	Tap 3	425	460	490	525	560	590	615	645	675	575	605	640	670	700	730	765	795	800
	Tap 4	540	580	625	665	710	745	780	815	850	730	770	805	845	885	925	965	1005	1015
"COOL" Speed	Tap 1	120	140	165	190	215	235	260	285	305	325	355	390	425	460	490	520	550	580
	Tap 2	145	165	190	215	235	260	290	315	340	390	425	465	500	540	570	600	630	660
	Tap 3	190	220	250	285	320	345	375	400	425	545	585	630	670	715	755	790	830	865
	Tap 4	275	305	340	375	410	440	470	505	535	775	815	860	900	945	975	1010	1040	1060
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	160	185	215	245	270	295	320	345	370	200	225	260	290	325	355	385	415	445
	Tap 2	205	235	275	310	350	380	410	445	475	255	290	330	375	415	455	490	530	570
	Tap 3	325	350	380	410	440	470	500	530	550	425	455	490	520	555	580	610	635	665
	Tap 4	410	445	480	520	555	595	630	670	700	540	575	620	660	700	735	770	805	840
"COOL" Speed	Tap 1	90	110	135	160	185	200	220	235	260	225	255	290	325	360	390	425	455	485
	Tap 2	105	130	155	180	205	230	250	270	290	295	325	360	395	430	465	495	525	560
	Tap 3	145	165	195	220	250	275	295	320	350	435	465	505	540	575	605	635	665	700
	Tap 4	190	220	250	280	315	345	370	400	430	590	625	665	705	745	790	830	875	905
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	120	140	165	195	220	240	265	290	310	150	175	200	225	250	275	305	330	355
	Tap 2	155	180	215	245	280	310	340	370	395	195	220	255	285	315	355	390	425	455
	Tap 3	240	265	290	320	345	370	395	420	445	315	340	370	395	425	450	475	500	525
	Tap 4	305	335	370	405	440	470	500	535	565	400	430	465	500	535	570	600	630	665
"COOL" Speed	Tap 1	75	90	110	130	150	170	190	215	230	165	190	220	245	275	305	330	360	390
	Tap 2	85	105	125	145	165	190	210	230	255	200	230	260	295	325	355	385	415	445
	Tap 3	115	135	160	185	205	230	250	270	295	305	335	370	405	440	470	505	540	570
	Tap 4	155	175	205	230	260	285	310	335	360	425	460	495	530	570	595	625	655	690

BLOWER DATA

G61MPV-60C-111 BLOWER PERFORMANCE (less filter)
Side Return Air with Optional RAB Return Air Base
0 through 1.00 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1490	1695	1875	2080	1565	1655	1890	2060
[1] NORM	1345	1530	1700	1890	1410	1515	1730	1900
—	1210	1380	1530	1700	1230	1325	1545	1695
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1365	1555	1730	1925	1090	1155	1335	1505
[1] NORM	1235	1410	1575	1750	995	1060	1190	1335
—	1115	1270	1410	1565	875	935	1070	1200

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-60C-111 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	165	190	225	255	290	320	355	385	410	210	245	280	320	355	385	410	440	470
	Tap 2	210	245	285	330	370	410	450	490	525	270	310	360	405	455	490	525	560	600
	Tap 3	385	415	445	475	505	535	570	600	625	490	520	560	595	630	660	690	720	745
	Tap 4	490	525	565	600	640	680	720	760	790	620	660	705	750	795	835	870	910	945
"COOL" Speed	Tap 1	115	130	155	180	205	225	250	270	290	310	335	365	390	415	445	470	500	525
	Tap 2	145	160	185	210	230	255	280	305	330	360	390	425	460	495	525	550	580	605
	Tap 3	180	210	240	270	300	330	355	380	405	530	570	615	655	700	735	775	810	845
	Tap 4	265	295	325	360	390	420	450	480	510	715	750	795	835	875	900	930	960	960
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	140	160	185	205	230	255	285	310	340	155	185	215	250	280	310	340	365	395
	Tap 2	175	205	235	265	295	330	360	395	435	200	235	275	320	360	395	435	470	505
	Tap 3	295	320	350	380	405	430	455	485	505	360	390	425	460	490	520	550	585	610
	Tap 4	375	405	445	480	515	545	580	610	640	460	495	540	580	620	660	700	740	770
"COOL" Speed	Tap 1	85	105	130	150	175	190	210	225	250	200	230	260	295	325	355	385	410	440
	Tap 2	105	125	150	175	200	220	240	265	285	270	300	330	365	395	425	455	485	515
	Tap 3	135	160	185	210	235	260	280	305	330	425	455	490	525	560	590	620	650	685
	Tap 4	180	210	240	270	300	330	355	385	415	545	580	615	651	690	730	770	810	835
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	105	125	150	170	195	220	240	265	285	135	155	175	200	225	250	275	300	325
	Tap 2	135	160	190	220	250	280	310	340	365	170	195	226	255	285	320	350	385	420
	Tap 3	210	230	255	280	305	335	365	395	420	275	300	325	350	375	400	430	455	485
	Tap 4	265	295	325	355	390	425	465	500	530	350	380	410	440	475	510	545	580	610
"COOL" Speed	Tap 1	70	85	105	120	140	160	180	205	220	150	170	195	220	250	275	300	325	350
	Tap 2	85	100	120	140	160	185	205	225	245	195	220	245	270	300	325	355	380	410
	Tap 3	110	130	150	175	195	215	235	255	280	300	330	360	395	430	460	495	530	560
	Tap 4	145	170	195	220	245	270	295	320	345	395	425	455	490	525	550	580	605	635

BLOWER DATA

G61MPV-60C-111 BLOWER PERFORMANCE (less filter)
Single Side Return Air - Air volumes in bold require field fabricated transition to accommodate 20 x 25 x 1 in. cleanable air filter in order to maintain proper air velocity across the filter.
0 through 1.00 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1525	1740	**1905**	**2115**	1585	1695	**1880**	**2080**
[1] **NORM**	1370	1560	1720	**1915**	1430	1555	1725	**1915**
—	1225	1395	1555	1730	1250	1355	1540	1710
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1395	1590	1730	1920	1110	1175	1355	1520
[1] **NORM**	1255	1430	1590	1765	1010	1075	1200	1350
—	1130	1285	1430	1590	895	955	1085	1215

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 458 cfm.

G61MPV-60C-111 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	190	220	250	280	310	345	375	410	430	260	290	320	350	380	415	445	480	510
	Tap 2	245	280	320	360	400	440	480	520	555	335	370	410	445	485	530	570	615	650
	Tap 3	390	425	460	495	530	560	590	615	650	540	580	615	655	695	725	755	785	805
	Tap 4	490	535	580	630	675	710	745	780	820	685	730	780	830	880	920	960	995	1015
"COOL" Speed	Tap 1	120	145	170	195	220	245	270	295	315	315	350	385	420	455	485	515	545	575
	Tap 2	145	165	190	210	235	260	285	310	340	375	410	445	485	520	550	580	610	635
	Tap 3	185	215	250	280	315	340	370	395	420	535	575	615	660	700	740	775	815	845
	Tap 4	280	310	345	375	410	445	475	505	535	755	795	840	880	925	955	985	1015	1015
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	155	175	200	230	255	275	300	320	350	180	205	240	270	300	330	360	390	420
	Tap 2	200	225	260	290	325	355	385	410	450	230	265	305	345	385	425	460	500	535
	Tap 3	315	340	375	405	440	460	485	510	535	390	425	460	495	530	560	590	615	645
	Tap 4	395	435	475	515	555	585	615	645	675	495	535	580	625	670	705	745	780	815
"COOL" Speed	Tap 1	95	115	140	165	190	205	225	245	270	220	250	285	320	360	390	420	450	480
	Tap 2	105	130	155	180	205	225	250	270	290	285	315	350	380	415	445	475	505	540
	Tap 3	140	165	190	220	245	270	290	315	345	425	460	495	530	565	595	625	655	690
	Tap 4	190	220	250	285	315	345	375	405	435	575	610	650	690	725	770	810	855	885
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	115	135	160	185	210	230	250	270	300	145	165	190	215	235	265	290	315	345
	Tap 2	150	175	205	235	265	295	320	250	385	185	210	245	275	305	335	370	405	440
	Tap 3	235	260	285	310	335	360	380	405	435	295	325	350	380	410	440	470	495	515
	Tap 4	300	330	360	390	420	455	485	515	550	375	410	445	485	520	555	590	630	655
"COOL" Speed	Tap 1	75	90	110	130	150	175	195	220	235	165	185	215	245	275	300	330	355	385
	Tap 2	85	100	125	145	165	185	210	230	250	195	225	255	285	315	340	370	400	430
	Tap 3	115	135	155	180	205	225	245	265	290	300	330	365	395	430	465	495	530	560
	Tap 4	155	180	205	235	260	285	310	340	365	415	450	485	520	555	585	610	640	675

BLOWER DATA

G61MPV-60D-135 BLOWER PERFORMANCE (less filter)

Bottom Return Air, Return Air from Both Sides or Return Air from Bottom and One Side.

0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1505	1705	1900	2110	1615	1730	1945	2190
[1] NORM	1365	1550	1740	1920	1455	1580	1780	1985
—	1225	1380	1545	1720	1305	1400	1600	1780
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1385	1570	1760	1930	1135	1205	1365	1540
[1] NORM	1250	1425	1595	1775	1025	1105	1235	1390
—	1135	1265	1430	1585	915	985	1115	1235

[1] Factory default jumper setting.

NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 470 cfm.

G61MPV-60D-135 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	155	185	220	255	285	315	340	365	390	215	225	265	305	335	365	400	435	465
	Tap 2	215	250	285	325	360	390	425	455	490	275	315	360	400	440	475	505	540	575
	Tap 3	315	350	390	430	460	490	530	565	605	405	440	475	515	550	585	630	670	715
	Tap 4	435	465	500	530	575	615	655	695	735	530	575	620	670	725	780	825	870	915
"COOL" Speed	Tap 1	95	120	145	170	190	215	240	265	290	250	285	320	360	390	420	450	485	515
	Tap 2	115	135	160	185	210	235	260	290	315	290	330	375	420	455	490	525	565	605
	Tap 3	145	175	215	250	275	300	330	355	385	425	465	505	550	590	635	670	710	750
	Tap 4	205	240	280	320	350	380	410	445	480	615	655	700	745	800	855	900	940	980
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	130	155	180	205	235	260	285	305	330	155	180	210	245	270	300	330	355	385
	Tap 2	165	195	230	265	300	330	360	385	415	215	250	295	335	360	385	420	455	490
	Tap 3	240	270	310	345	380	415	440	470	500	305	340	380	420	455	490	520	545	575
	Tap 4	335	365	405	440	480	515	550	585	620	405	445	485	530	570	610	650	690	735
"COOL" Speed	Tap 1	80	95	115	135	160	190	210	230	255	185	215	245	280	310	335	370	400	430
	Tap 2	90	115	140	165	190	215	230	250	265	230	260	295	335	370	405	435	470	500
	Tap 3	130	150	170	195	225	255	275	300	320	315	355	400	445	480	515	555	590	625
	Tap 4	150	180	220	255	285	315	345	375	405	445	485	530	580	625	670	705	740	775
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	100	120	140	165	190	215	240	265	290	125	150	175	200	225	245	270	295	320
	Tap 2	130	155	180	210	235	265	285	310	330	155	185	215	250	280	305	335	365	395
	Tap 3	170	200	235	270	300	330	360	390	420	220	250	280	315	350	390	425	460	490
	Tap 4	225	260	300	335	375	410	435	465	490	295	325	360	395	435	470	505	545	580
"COOL" Speed	Tap 1	65	80	100	120	140	160	180	195	215	145	170	195	225	250	280	305	330	355
	Tap 2	70	90	110	130	155	175	200	220	240	160	190	225	255	285	315	345	380	415
	Tap 3	95	120	145	170	190	215	235	250	270	245	280	315	355	385	415	445	480	515
	Tap 4	135	155	175	200	220	245	270	300	325	325	365	405	445	485	520	550	580	610

BLOWER DATA

G61MPV-60D-135 BLOWER PERFORMANCE (less filter)
Single Side Return Air - Air volumes in bold require field fabricated transition to accommodate 20 x 25 x 1 in. cleanable air filter in order to maintain proper air velocity across the filter.
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1470	1650	**1845**	**2040**	1585	1705	**1905**	**2130**
[1] NORM	1325	1495	1680	**1865**	1430	1545	1765	**1975**
—	N/A	1335	1505	1670	1275	1370	1565	1755
"ADJUST" Switch Positions	**First Stage "HEAT" Speed - cfm**				**First Stage "COOL" Speed - cfm**			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1335	1510	1695	1870	1105	1180	1330	1500
[1] NORM	1210	1370	1540	1710	990	1075	1210	1355
—	N/A	1225	1375	1515	890	950	1085	1210

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 470 cfm.

G61MPV-60D-135 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	150	175	210	240	270	300	330	360	390	180	215	255	295	330	365	400	430	465
	Tap 2	205	235	275	310	355	395	430	465	500	275	315	360	400	435	470	510	550	585
	Tap 3	315	345	385	420	460	495	535	570	610	415	450	490	525	565	600	640	675	715
	Tap 4	430	460	495	530	575	620	665	705	750	535	585	640	695	730	765	810	860	905
"COOL" Speed	Tap 1	90	110	140	170	195	220	240	265	290	230	265	310	355	390	425	460	490	525
	Tap 2	105	130	165	195	215	235	260	290	315	285	330	380	430	455	485	525	565	605
	Tap 3	150	175	205	235	270	300	330	360	385	425	465	515	560	605	645	685	730	770
	Tap 4	195	230	270	305	340	375	410	445	480	605	650	695	740	800	855	900	945	985
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	120	140	170	200	225	255	280	305	330	150	175	210	240	270	300	335	365	400
	Tap 2	155	185	220	255	295	335	365	395	425	205	240	275	315	350	385	422	460	495
	Tap 3	235	265	300	330	370	405	440	470	500	290	330	380	430	460	485	515	545	575
	Tap 4	320	355	390	430	465	505	540	575	610	395	440	485	530	575	620	660	700	740
"COOL" Speed	Tap 1	70	90	115	135	165	190	210	230	245	170	200	235	265	305	345	380	420	455
	Tap 2	80	100	130	160	185	210	230	255	275	245	270	305	335	370	410	440	470	505
	Tap 3	120	140	170	195	225	255	280	305	330	350	385	420	455	495	530	570	610	645
	Tap 4	145	175	215	250	280	315	345	375	410	455	500	555	605	645	680	725	770	810
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 2	125	150	175	195	230	265	290	310	335	150	175	210	240	255	290	330	370	405
	Tap 3	155	185	215	250	285	320	355	385	420	205	235	270	305	345	380	420	455	490
	Tap 4	205	240	285	325	355	385	420	460	495	290	325	360	400	440	480	515	545	580
"COOL" Speed	Tap 1	60	75	95	115	135	150	175	195	220	140	160	185	205	240	280	305	335	360
	Tap 2	60	75	100	125	150	175	195	215	235	145	180	215	250	290	325	355	385	420
	Tap 3	90	110	140	165	190	215	235	255	270	230	265	305	345	380	420	450	480	510
	Tap 4	120	140	170	195	225	255	275	300	325	330	365	405	445	485	525	560	595	635

BLOWER DATA

G61MPV-60D-135 BLOWER PERFORMANCE (less filter)
Side Return Air with Optional RAB Return Air Base
0 through 0.80 in. w.g. External Static Pressure Range

"ADJUST" Switch Positions	Speed Switch Positions							
	Second Stage "HEAT" Speed - cfm				Second Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1445	1635	1825	2025	1550	1660	1875	2105
[1] NORM	1305	1475	1660	1840	1400	1510	1720	1920
—	N/A	1315	1480	1650	1250	1345	1530	1715
"ADJUST" Switch Positions	First Stage "HEAT" Speed - cfm				First Stage "COOL" Speed - cfm			
	1	[1] 2	3	4	1	2	3	[1] 4
+	1315	1490	1675	1855	1080	1155	1310	1478
[1] NORM	1195	1365	1530	1695	985	1055	1190	1325
—	N/A	1210	1360	1500	875	945	1060	1190

[1] Factory default jumper setting.
N/A - First and second stage HEAT positions shown cannot be used on this model.
NOTES - The effect of static pressure is included in air volumes shown.
First stage HEAT is approximately **91%** of the same second stage HEAT speed position.
First stage COOL (two-stage air conditioning units only) is approximately 70**%** of the same second stage COOL speed position.
Continuous Fan Only speed is approximately **38%** of the same second stage COOL speed position - minimum 500 cfm.
Lennox Harmony III™ Zone Control Applications - Minimum blower speed is 470 cfm.

G61MPV-60D-135 BLOWER MOTOR WATTS

Jumper Speed Positions		Motor Watts @ Various External Static Pressures - in. wg.																	
		First Stage									Second Stage								
		0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
"+" (Plus) SETTING ("Adjust" Jumper at "+" Setting)																			
"HEAT" Speed	Tap 1	145	175	205	235	265	295	325	355	385	195	225	260	290	330	370	400	435	470
	Tap 2	205	235	270	305	340	375	415	450	485	275	310	355	400	430	460	495	535	570
	Tap 3	285	325	370	410	450	490	525	565	600	420	445	470	495	545	590	630	675	715
	Tap 4	385	430	480	530	570	610	650	690	725	535	580	625	670	710	755	800	845	890
"COOL" Speed	Tap 1	90	110	140	165	190	210	235	260	285	235	265	305	340	380	415	450	480	515
	Tap 2	105	130	160	190	210	230	255	285	310	290	325	370	410	450	490	515	545	575
	Tap 3	145	170	205	235	265	290	325	355	390	420	460	510	555	595	640	680	715	755
	Tap 4	200	230	270	305	345	385	415	445	480	580	630	690	745	800	850	895	935	975
"NORM" (Normal) SETTING ("Adjust" Jumper at "NORM" Setting)																			
"HEAT" Speed	Tap 1	130	150	170	190	225	260	285	305	330	150	175	205	235	265	295	325	355	385
	Tap 2	160	190	225	260	290	325	355	390	420	200	230	265	300	345	385	410	440	465
	Tap 3	235	265	300	335	370	400	435	470	500	290	330	375	415	450	485	515	540	570
	Tap 4	310	350	390	435	470	500	540	575	610	405	440	485	525	560	590	635	680	725
"COOL" Speed	Tap 1	70	90	115	140	165	190	210	230	250	170	200	235	270	305	335	370	400	430
	Tap 2	90	105	125	150	175	200	225	250	270	200	230	270	310	355	400	435	465	495
	Tap 3	115	140	170	195	225	250	275	300	325	330	365	400	440	485	525	555	585	615
	Tap 4	145	175	205	240	270	295	330	365	395	435	480	530	580	625	675	715	750	790
"-" (Minus) SETTING ("Adjust" Jumper at "-" Setting)																			
"HEAT" Speed	Tap 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tap 2	125	145	170	195	225	255	280	300	325	150	175	210	240	265	290	325	365	400
	Tap 3	160	190	220	250	285	320	350	380	410	200	230	270	305	350	395	420	445	475
	Tap 4	200	235	275	310	355	395	425	460	490	285	320	355	395	435	475	510	545	580
"COOL" Speed	Tap 1	60	75	95	115	135	155	175	195	215	135	155	180	205	240	280	305	330	355
	Tap 2	70	90	110	130	150	170	195	215	235	160	185	215	240	275	310	345	375	410
	Tap 3	85	105	130	155	180	205	230	250	270	220	255	295	335	370	410	440	475	510
	Tap 4	120	140	170	195	220	240	270	295	325	330	365	400	440	480	525	555	585	615

G61MPV PARTS ARRANGEMENT

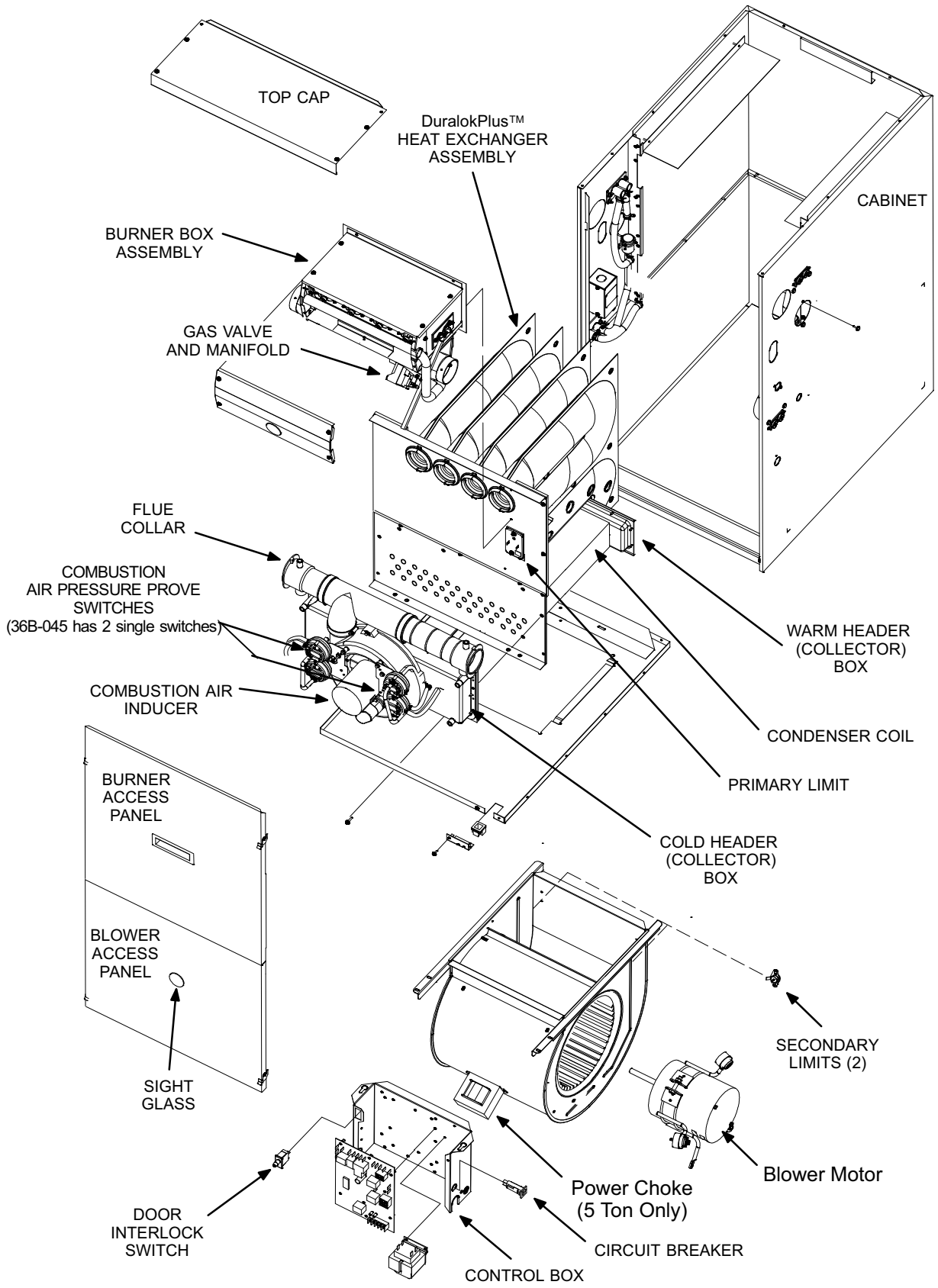


FIGURE 1

I-UNIT COMPONENTS

G61MPV unit components are shown in figure 1. The gas valve, combustion air inducer and burners can be accessed by removing the burner access panel. Electrical components are in the control box (figure 2) found in the blower section.

G61MPV units are factory equipped with a bottom return air panel in place. The panel is designed to be field removed as required for bottom air return. Markings are provided for side return air and may be cut out in the field.

ELECTROSTATIC DISCHARGE (ESD)
Precautions and Procedures

⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during furnace installation and service to protect the furnace's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the furnace, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface, such as the gas valve or blower deck, before performing any service procedure.

A-Control Box

1. Control Transformer (T1)

A transformer located in the control box provides power to the low voltage section of the unit. Transformers on all models are rated 40VA with a 120V primary and a 24V secondary.

2. Door Interlock Switch (S51)

A door interlock switch rated 14A at 125VAC is wired in series with line voltage. When the blower door is removed the unit will shut down.

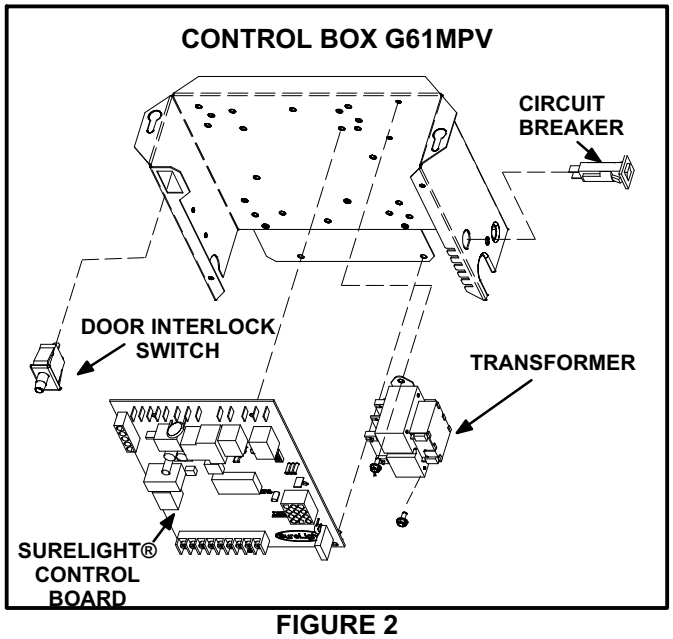


FIGURE 2

3. Circuit Breaker (CB8)

A 24V circuit breaker is also located in the control box. The switch provides overcurrent protection to the transformer (T1). The breaker is rated 3A at 32V. If the current exceeds this limit the breaker will trip and all unit operation will shutdown. The breaker can be manually reset by pressing the button on the face. See figure 3.

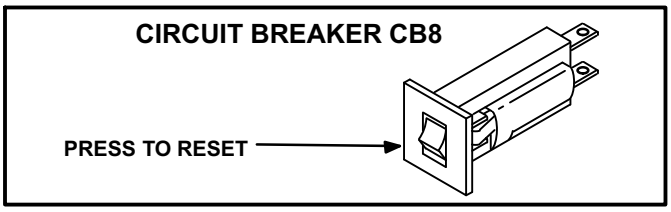


FIGURE 3

⚠ WARNING

Shock hazard.

Disconnect power before servicing. Integrated Control Board is not field repairable. If control is inoperable, simply replace entire control.

Can cause injury or death. Unsafe operation will result if repair is attempted.

4. Integrated Control Board (A92) SureLight Board 49M59

G61MPV units are equipped with the Lennox two-stage, variable speed integrated SureLight® control. The system consists of a ignition / blower control (figure 4 with control terminal designations in tables 1 through 4) and ignitor (figure 12). The control and ignitor work in combination to ensure furnace ignition and ignitor durability. The SureLight integrated board controls all major furnace operations. The control features two LED lights, (DS1 and DS2) for troubleshooting and four LED lights (DS3, DS6, DS7 and DS8) to show furnace status. The control also has two accessory terminals rated at (1) one amp each. See table 5 for status code and table 6 for troubleshooting diagnostic codes.

Electronic Ignition

At the beginning of the heat cycle the SureLight control monitors the first stage and second stage combustion air inducer prove switch. The control will not begin the heating cycle if the first stage or second stage prove switch is closed (jumpered). Likewise the control will not begin the second stage heating cycle if the second stage prove switch is closed, and will remain in first stage heat. However, if the second stage prove switch closes during the first stage heat pre-purge, the control will allow second stage heat. Once the first stage prove switch is determined to be open, the combustion air inducer is energized on low (first stage) heat speed. When the differential in the prove switch is great enough, the prove switch closes and a 15-second pre-purge begins. If the switch is not proven within 2-1/2 minutes, the control goes into Watchguard-Pressure Switch mode for a 5-minute re-set period.

After the 15-second pre-purge period, the SureLight ignitor warms up for 20 seconds after which the gas valve opens for a 4-second trial for ignition. The ignitor energizes during the trial until flame is sensed. If ignition is not proved during the 4-second period, the control will try four more times with an inter-purge and warm-up time between trials of 35 seconds. After a total of five trials for ignition (including the initial trial), the control goes into Watchguard mode. After a 60-minute reset period, the control will begin the ignition sequence again.

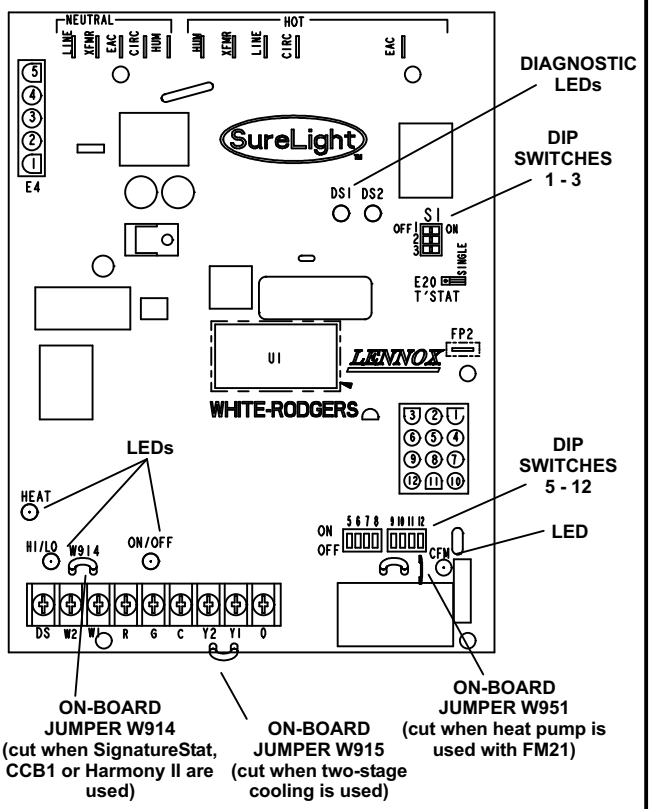
The SureLight control has an added feature that prolongs the life of the ignitor. After a successful ignition, the SureLight control utilizes less power to energize the ignitor on successive calls for heat. The control continues to ramp down the voltage to the ignitor until it finds the lowest amount of power that will provide a successful ignition. This amount of power is used for 255 cycles. On the 256th call for heat, the control will again ramp down until the lowest power is determined and the cycle begins again.

Two Stage Operation / Thermostat Selection Jumper

The control can be utilized in two modes: SINGLE-STAGE thermostat or TWO-STAGE thermostat. The thermostat selection jumper E20, located just below dip switches 1 through 3 (figure 4), must be positioned for the particular application. The jumper is factory set on "TWO" for use with a two-stage thermostat with two stage heat. Re-position jumper to "SINGLE" for use with a single stage thermostat with two stage heat.

While in the single-stage thermostat mode (*single* jumper setting), the burners will always fire on first-stage heat. The combustion air inducer will operate on low speed and indoor blower will operate on low heat speed. After a 10 minute recognition period, the unit will switch to second stage heat. While in the two-stage thermostat mode (*two* jumper setting) the burners will fire on first-stage heat. The combustion air inducer will operate on low speed and indoor blower will operate on low heat speed. The unit will switch to second-stage heat on call from the indoor thermostat. If there is a simultaneous call for first and second stage heat, the unit will fire an first stage heat and switch to second stage heat after 30 seconds of operation. See Sequence of Operation flow charts in the back of this manual for more detail.

TWO-STAGE, VARIABLE SPEED INTEGRATED CONTROL BOARD



THERMOSTAT CONNECTIONS (TB1)

DS= DEHUMIDIFICATION SIGNAL
W2= HEAT DEMAND FROM 2ND STAGE T'STAT
W1= HEAT DEMAND FROM 1ST STAGE T'STAT (WHITE)
R= CLASS 2 VOLTAGE TO THERMOSTAT
G= MANUAL FAN FROM T'STAT (GREEN)
C= THERMOSTAT SIGNAL GROUND CONNECTED TO TRANSFORMER GROUND (TR) & CHASIS GROUND (GRD)
Y1= THERMOSTAT 1st STAGE COOL SIGNAL
Y2= THERMOSTAT 2nd STAGE COOL SIGNAL
O= THERMOSTAT SIGNAL TO HEAT PUMP REVERSING VALVE

DIP SWITCH FUNCTIONS

DIP SWITCH(ES)	FUNCTION
1 and 2	Blower Off Delay
3	Second Stage ON Delay (Single-stage t'stat)
4	Not used
5 and 6	Cooling Mode Blower Speed
7 and 8	Blower Speed Adjustment
9 and 10	Cooling Mode Blower Ramping Profile
11 and 12	Heating Mode Blower Speed

FIGURE 4

TABLE 1

SureLight Control / Blower Control Terminals	
LINE	Line 120VAC Neutral
XFMR	Transformer 120VAC Neutral
EAC	Electronic Air Cleaner 120VAC Neutral
CIRC	Indoor Blower 120VAC Neutral
HUM	Humidifier 120VAC Neutral
HUM	Humidifier 120VAC Hot
XMFR	Transformer 120VAC Hot
LINE	Line 120VAC Hot
CIRC	Indoor Blower 120VAC Hot
EAC	Electronic Air Cleaner 120VAC Hot

TABLE 2

SureLight Control 5 Pin Terminal Designation	
PIN #	**Function**
1	Ignitor
2	Combustion Air Inducer High Speed
3	Combustion Air Inducer Low Speed
4	Combustion Air Inducer Neutral
5	Ignitor Neutral

TABLE 3

SureLight Control 12Pin Terminal Designation	
PIN #	**Function**
1	Gas Valve High Fire
2	Second Stage Pressure Switch
3	Not Used
4	Ground
5	24V Hot
6	**Primary Limit In**
7	Gas Valve Low Stage
8	Gas Valve Common
9	24V Neutral
10	Ground
11	Primary Limit Out
12	1st Stage Pressure Switch

TABLE 4

SureLight Control 16 Pin Blower Control Terminals	
PIN #	**Function**
1	Ground
2	Low Heat Speed
3	Ground
4	“DELAY” Dip Switch Selection
5	“COOL” Dip Switch Selection
6	“Y1” Signal
7	“ADJUST” Dip Switch Selection
8	Ground
9	“0” From Thermostat
10	“DS” Output Signal
11	“HEAT” Dip Switch Selection
12	24 VAC
13	HIGH HEAT Speed
14	“Y2” Signal
15	“G”
16	CFM LED

TABLE 5

STATUS CODES		
STATUS LED	**COLOR**	**FUNCTION**
DS3 “ON / OFF ’	GREEN	DS3-ON indicates that the motor has a demand to operate. (This LED must be on in all modes).
DS6 “CFM”	GREEN	DS6-blinking indicates the airflow (CFM) demand in the motor. The air flow is determine by counting blinks between two (2) second pauses. One blink equals approximatley 100 CFM.
DS7 “HI / LO”	YELLOW	DS7-ON indicaties the “DS to R” jumper has not been cut. When the jumper is cut the system will be operating with LENNOX HARMONY II™ (See Harmony Installation Instructions) or with the CCB1 Efficiency Plus control. CCB1: When ON, a 24 VAC is being applied and when OFF, it has been removed. This on/off operation varies the indoor blower’s performance so dehumidification can be enhanced.
DS8 “HEAT”	YELLOW	DS8-ON indicates the system is in HEAT mode.

TABLE 6

DIAGNOSTIC CODES **Diagnostic LEDs are labeled DS1 and DS2. See figure 4 for location of diagnostic LEDs.**		
DS1	**DS2**	**DESCRIPTION**
SIMULTANEOUS SLOW FLASH	SIMULTANEOUS SLOW FLASH	Power on - Normal operation. Also signaled during cooling and continuous fan.
SIMULTANEOUS FAST FLASH	SIMULTANEOUS FAST FLASH	Normal operation - signaled when heating demand initiated at thermostat.
SLOW FLASH	ON	Primary, secondary, backup secondary or rollout limit switch open. Limits must close within 3 minutes or unit goes into 1 hour Watchguard.
OFF	SLOW FLASH	Low prove switch open; OR: Blocked inlet/exhaust vent; OR: Low prove switch closed prior to activation of combustion air inducer.
OFF	FAST FLASH	High prove switch open; OR: Blocked inlet/exhaust vent; OR: High prove switch closed prior to activation of combustion air inducer.
ALTERNATING SLOW FLASH	ALTERNATING SLOW FLASH	Watchguard -- burners failed to ignite; OR limit open more than 3 minutes; OR lost flame sense 5 times in one heating cycle; OR pressure switch opened 5 times in one heating cycle.
SLOW FLASH	OFF	Flame sensed without gas valve energized.
ON ON OFF	ON OFF ON	Circuit board failure or control wired incorrectly. Check 24 and 115 volts to board.
FAST FLASH	SLOW FLASH	Main power polarity reversed. Switch line and neutral.
SLOW FLASH	FAST FLASH	Low flame signal. Measures below 0.23 microAmps. Replace flame sense rod.
ALTERNATING FAST FLASH	ALTERNATING FAST FLASH	The following conditions are sensed during the ignitor warm-up period only: 1) Improper main ground; 2) Broken ignitor; OR: Open ignitor circuit; 3) Line voltage below 75 volts. (If voltage lower than 75 volts prior to ignitor warm-up, control will signal waiting on call from thermostat, and will not respond.

NOTE - Slow flash rate equals 1 Hz (one flash per second). Fast flash rate equals 3 Hz (three flashes per second). Low flame sense current = 0.17-0.22 microAmps.

Dip Switch Settings

Switches 1 and 2 -- Blower Off Delay -- The blower-on delay of 45 seconds is not adjustable. The blower-off delay (time that the blower operates after the heating demand has been satisfied) can be adjusted by moving switches 1 and 2 on the integrated control board. The unit is shipped from the factory with a blower-off delay of 90 seconds. The blower off delay affects comfort and is adjustable to satisfy individual applications. Adjust the blower off delay to achieve a high fire supply air temperature between 90° and 110°F at the exact moment that the blower is de-energized. Longer off delay settings provide lower supply air temperatures; shorter settings provide higher supply air temperatures. The table below provides the blower off timings that will result from different switch settings.

TABLE 7
Blower Off Delay Switch Settings

Blower Off Delay (Seconds)	Switch 1	Switch 2
60	Off	Off
90	Off	On
120	On	Off
180	On	On

Switch 3 -- Second Stage Delay (Used with Single-Stage Thermostat Only) -- This switch is used to determine the second stage on delay when a single-stage thermostat is being used. The switch is factory-set in the ON position, which provides a 10-minute delay before second-stage heat is initiated. If the switch is toggled to the OFF position, it will provide a 15-minute delay before second-stage heat is initiated. This switch is only activated when the E20 thermostat selector jumper is positioned for SINGLE-stage thermostat use.

Switch 4 -- Not used in G61MPV application.

Switches 5 and 6 -- Cooling Mode Blower Speed -- Switches 5 and 6 are used to select second stage cooling blower motor speed (first stage cooling speed is 70% of second stage). The unit is shipped from the factory with the dip switches positioned for high speed (4) indoor blower motor operation during the cooling mode. The table below provides the cooling mode blower speeds that will result from different switch settings. Refer to blower data tables at the front of this manual for corresponding cfm values.

TABLE 8
Cooling Mode Blower Speeds

Speed	Switch 5	Switch 6
1 - Low	On	On
2 - Medium Low	Off	On
3 - Medium High	On	Off
4 - High (Factory)	Off	Off

Switches 7 and 8 -- Blower Speed Adjustment -- Switches 7 and 8 are used to select blower speed adjustment settings. The unit is shipped from the factory with the dip switches positioned for NORMAL (no) adjustment. The dip switches may be positioned to adjust the blower speed by +10% or -10% to better suit the application. The table below provides blower speed adjustments that will result from different switch settings. Refer to blower data tables at the front of this manual for corresponding cfm values.

TABLE 9
Blower Speed Adjustment

Adjustment	Switch 7	Switch 8
+10% (approx.)	On	Off
NORMAL (Factory)	Off	Off
-10% (approx.)	Off	On

Switches 9 and 10 -- Cooling Mode Blower Speed Ramping -- Switches 9 and 10 are used to select cooling mode blower speed ramping options. Blower speed ramping may be used to enhance dehumidification performance. The switches are factory set at option A which has the greatest effect on blower motor performance. The table below provides the cooling mode blower speed ramping options that will result from different switch settings. The cooling mode blower speed ramping options are detailed below.

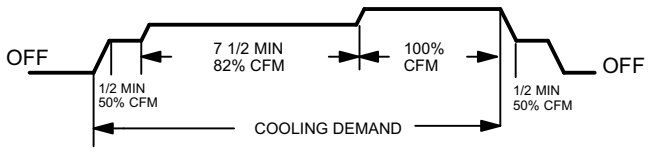
TABLE 10
Cooling Mode Blower Speed Ramping

Ramping Option	Switch 9	Switch 10
A (Factory)	Off	Off
B	On	Off
C	Off	On
D	On	On

COOLING MODE RAMPING OPTIONS

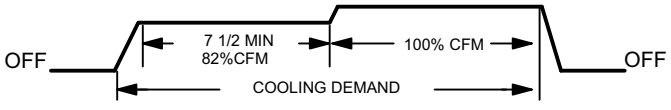
Ramping Option A (Factory Selection)

- Motor runs at 50% for 30 seconds.
- Motor then runs at 82% for approximately 7-1/2 minutes. If demand has not been satisfied after 7-1/2 minutes, motor runs at 100% until demand is satisfied.
- Once demand is met, motor runs at 50% for 30 seconds then ramps down to stop.



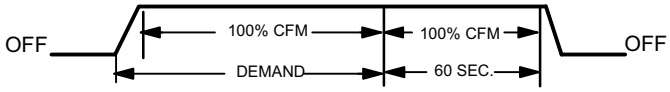
Ramping Option B

- Motor runs at 82% for approximately 7-1/2 minutes. If demand has not been satisfied after 7-1/2 minutes, motor runs at 100% until demand is satisfied.
- Once demand is met, motor ramps down to stop.



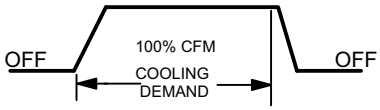
Ramping Option C

- Motor runs at 100% until demand is satisfied.
- Once demand is met, motor runs at 100% for 60 seconds then ramps down to stop.



Ramping Option D

- Motor runs at 100% until demand is satisfied.
- Once demand is met, motor ramps down to stop.



Switches 11 and 12 -- Heating Mode Blower Speed -- Switches 11 and 12 are used to select second stage heating mode blower motor speed (first stage heating blower speed is 91% of second stage). The unit is shipped from the factory with the dip switches positioned for medium low (2) speed indoor blower motor operation during the heating mode. The table below provides the heating mode blower speeds that will result from different switch settings. Refer to blower data tables at the front of this manual for corresponding cfm values.

TABLE 11
Heating Mode Blower Speeds

Speed	Switch 11	Switch 12
1 - Low	On	On
2 - Medium Low (Factory)	Off	On
3 - Medium High	On	Off
4 - High	Off	Off

On-Board Jumper W914
On-board jumper W914, which connects terminals DS and R on the integrated control board, must be cut when the furnace is installed with the Harmony II zone control board, the CCB1 EfficiencyPlus humidity control or the Lennox SignatureStat.™ If the jumper is left intact the PMW signal from the Harmony II control will be blocked and also lead to control damage. The SignatureStat and CCB1 will not operate unless the jumper is cut. Refer to table 21 for operation sequence in applications including a G61MPV, CCB1 and single-speed outdoor unit. Table 22 gives the operation sequence in applications with a two-speed outdoor unit. See table 23 for applications for a G61MVP, SignatureStat and single-speed outdoor unit and table 24 for applications with a two-speed outdoor unit.

On-Board Jumper W951
On-board jumper W951, which connects terminals R and O on the integrated control board, must be cut when the furnace is installed in applications which include a heat pump unit and the FM21 FuelMaster control board. If the jumper is left intact, terminal "O" will remain energized eliminating the HEAT MODE in the heat pump.

On-Board Jumper W915
On-board jumper W915, which connects terminals Y1 and Y2 on the integrated control board, must be cut if two-stage cooling will be used. If the jumper is not cut the outdoor unit will operate in first-stage cooling only.

Diagnostic LEDs (DS1 and DS2)
Two diagnostic LEDs are located on the two-stage, variable speed integrated control just to the left of the first bank of dip switches. These flashing lights correspond with diagnostic codes detailed on page 52.

Status LEDs (HEAT, HI/LO, ON/OFF and CFM)
The integrated control includes four LEDs which indicate operating status. The green ON/OFF LED is lit any time the blower is operating. The green CFM LED indicates the blower motor speed. Count the number of blinks between the two-second pauses to determine the CFM. Each blink represents approximately 100 CFM. The yellow HI/LO LED is lit when the W914 (DS to R) jumper **has not** been clipped for SignatuteStat, CCB1 or Harmony operation. The yellow HEAT LED is lit when the indoor blower is operating at the HEATING speed.

⚠ WARNING

Shock hazard.

Disconnect power before servicing. Integrated Control Board is not field repairable. If control is inoperable, simply replace entire control.

Can cause injury or death. Unsafe operation will result if repair is attempted.

5. Integrated Control Board(A92) SureLight Board 100870

G61MPV -7 and later units are equipped with the Lennox two-stage, variable speed integrated SureLight control board. The system consists of a ignition / blower control board (figures 5 and 6) with control pin designations in tables 12, 13 and 14 and ignitor (figure 13). The board and ignitor work in combination to ensure furnace ignition and ignitor durability. The SureLight integrated board controls all major furnace operations. The board features a red LED light, for furnace status and troubleshooting. The LED flashes in "X" + "Y" codes. For example using table 15 under "PRESSURE SWITCH CODES", if the red LED flashes 2 times, then off for 2 seconds then flashes 3 times, the low pressure switch is failed open. Two green LEDs show indoor blower status and CFM. See Page 35 for more detail. The board also has two 120 volt accessory terminals rated at (1) one amp each. In addition there is a 24 volt accessory terminal located on TB1.

Electronic Ignition

At the beginning of the heat cycle the SureLight control monitors the first stage and second stage combustion air inducer prove switch. The control will not begin the heating cycle if the first stage prove switch is closed (by-passed). Likewise the control will not begin the second stage heating cycle if the second stage prove switch is closed, and will remain in first stage heat. However, if the second stage prove switch closes during the first stage heat pre-purge, the control will allow second stage heat. Once the first stage prove switch is determined to be open, the combustion air inducer is energized on low (first stage) heat speed. When the differential in the prove switch is great enough, the prove switch closes and a 15-second pre-purge begins. If the switch is not proven within 2-1/2 minutes, the control goes into Watchguard-Pressure Switch mode for a 5-minute reset period.

After the 15-second pre-purge period, the SureLight ignitor warms up for 20 seconds after which the gas valve opens for a 4-second trial for ignition. The ignitor energizes during the trial until flame is sensed. If ignition is not proved during the 4-second period, the control will try four more times with an inter purge and warm-up time between trials of 35 seconds. After a total of five trials for ignition (including the initial trial), the control goes into Watchguard-Flame Failure mode. After a 60-minute reset period, the control will begin the ignition sequence again.

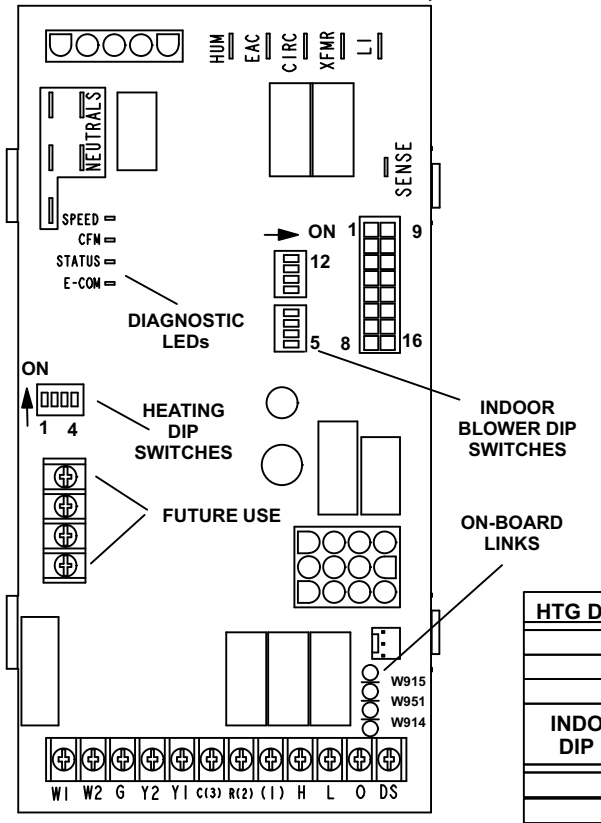
NOTE - Board 100870 provides a regulated 95 volts the ignitor.

Two Stage Operation / Thermostat Selection Jumper

The control can be utilized in two modes: SINGLE-STAGE thermostat or TWO-STAGE thermostat. The thermostat selection is made using a dip switch (figure 4) and must be positioned for the particular application. The dip switch is factory set on "TWO" for use with a two-stage thermostat with two stage heat. Re-position dip switch to "SINGLE" for use with a single stage thermostat with two stage heat.

While in the single-stage thermostat mode (*single* dip switch setting), the burners will always fire on first-stage heat. The combustion air inducer will operate on low speed and indoor blower will operate on low heat speed. After a factory default 10 minute recognition period, the unit will switch to second stage heat. While in the two-stage thermostat mode (*two* dip switch setting) the burners will fire on first-stage heat. The combustion air inducer will operate on low speed and indoor blower will operate on low heat speed. The unit will switch to second-stage heat on call from the indoor thermostat. If there is a simultaneous call for first and second stage heat, the unit will fire an first stage heat and switch to second stage heat after 30 seconds of operation. See Sequence of Operation flow charts in the back of this manual for more detail.

TWO-STAGE, VARIABLE SPEED INTEGRATED CONTROL BOARD



1/4" QUICK CONNECT TERMINALS

HUM = 120 VAC OUTPUT TO HUMIDIFIER
XMFR = 120 VAC OUTPUT TO TRANSFORMER
LI = 120 VAC INPUT TO CONTROL
CIRC = 120 VAC OUTPUT TO CIRCULATING BLOWER
EAC = 120 VAC OUTPUT TO ELECTRONIC AIR CLEANER
NEUTRALS= 120 VAC NEUTRAL

THERMOSTAT CONNECTIONS (TB1)

DS= DEHUMIDIFICATION SIGNAL
W2= HEAT DEMAND FROM 2ND STAGE T'STAT
W1= HEAT DEMAND FROM 1ST STAGE T'STAT
R= CLASS 2 VOLTAGE TO THERMOSTAT
G= MANUAL FAN FROM T'STAT
C= THERMOSTAT SIGNAL GROUND CONNECTED TO TRANSFORMER GROUND (TR) & CHASIS GROUND (GRD)
Y1= THERMOSTAT 1st STAGE COOL SIGNAL
Y2= THERMOSTAT 2nd STAGE COOL SIGNAL
O= THERMOSTAT SIGNAL TO HEAT PUMP REVERSING VALVE
H= 24V HUMIDIFIER OUTPUT
L= LENNOX SYSTEM OPERATION MONITOR
1= FUTURE USE

DIP SWITCH FUNCTIONS

HTG DIP SWITCH(ES)	FUNCTION
1	T'stat Heat Stages (single or two-stage)
2	Second Stage ON Delay (single-stage t'stat)
3 and 4	Heating Fan OFF Delay
INDOOR BLOWER DIP SWITCH(ES)	**FUNCTION**
5 and 6	Cooling Mode Blower Speed
7 and 8	Blower Speed Adjustment
9 and 10	Cooling Mode Blower Ramping Profile
11 and 12	Heating Mode Blower Speed

FIGURE 5

TABLE 12

SureLight Board 5 Pin Terminal Designation	
PIN #	**Function**
1	Ignitor
2	Combustion Air Inducer High Speed
3	Combustion Air Inducer Low Speed
4	Combustion Air Inducer Neutral
5	Ignitor Neutral

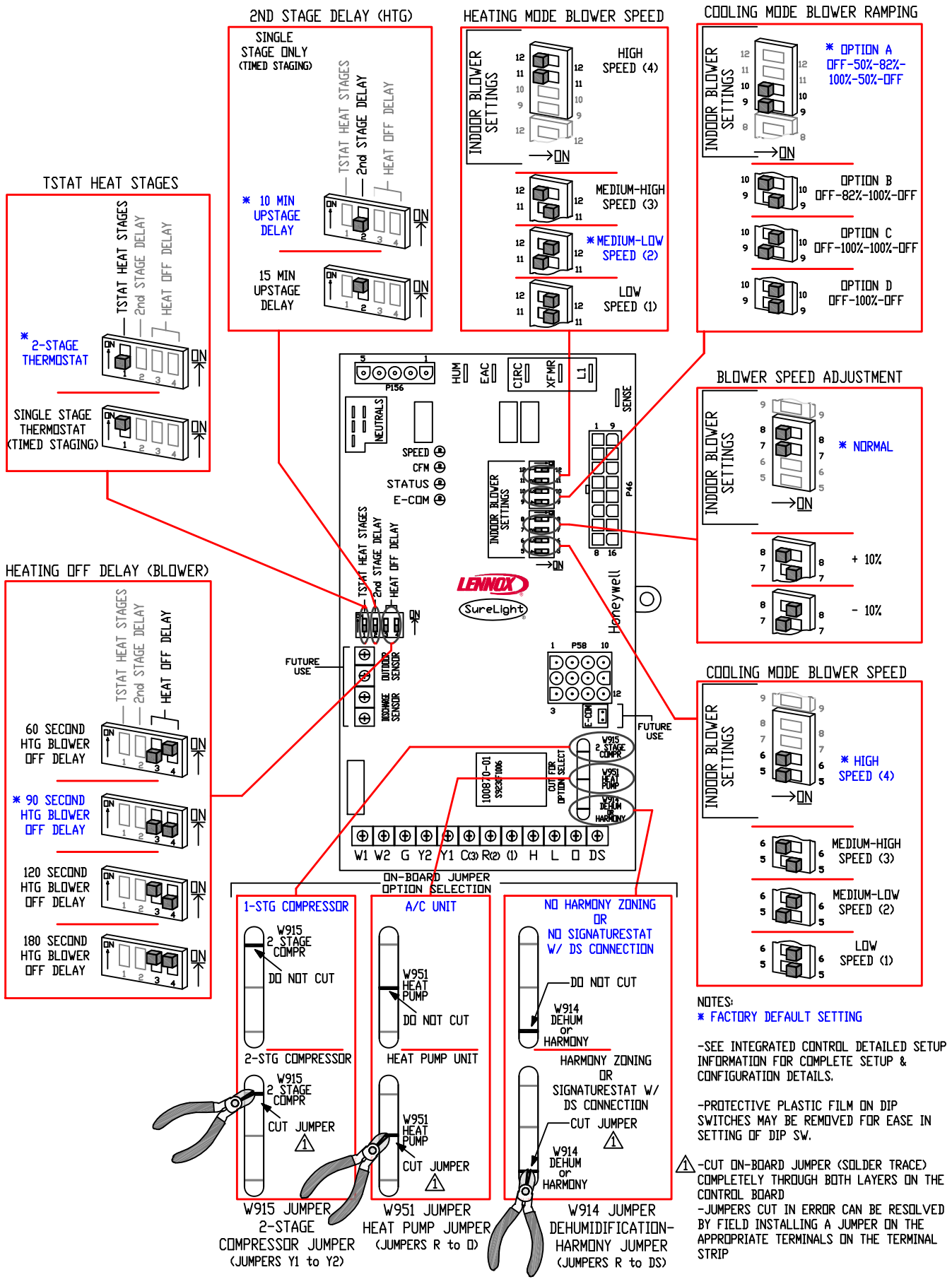
TABLE 13

SureLight Board 12Pin Terminal Designation	
PIN #	**Function**
1	Gas Valve High Fire
2	Second Stage Prove Switch
3	Rollout In
4	Ground
5	24V Hot
6	**Primary Limit In**
7	Gas Valve Low Stage
8	Gas Valve Common
9	24V Neutral
10	Ground
11	Rollout Switch Out
12	1st Stage Prove Switch

TABLE 14

SureLight Board 16 Pin Blower Control Terminals	
PIN #	**Function**
1	Ground
2	Low Heat Speed
3	Ground
4	"DELAY" Dip Switch Selection
5	"COOL" Dip Switch Selection
6	"Y1" Signal
7	"ADJUST" Dip Switch Selection
8	Ground
9	"0" From Thermostat
10	"DS" Output Signal
11	"HEAT" Dip Switch Selection
12	24 VAC
13	HIGH HEAT Speed
14	"Y2" Signal
15	"G"
16	CFM LED

G61MPV INTEGRATED CONTROL CONFIGURATION GUIDE



NOTES:
* FACTORY DEFAULT SETTING

-SEE INTEGRATED CONTROL DETAILED SETUP INFORMATION FOR COMPLETE SETUP & CONFIGURATION DETAILS.

-PROTECTIVE PLASTIC FILM ON DIP SWITCHES MAY BE REMOVED FOR EASE IN SETTING OF DIP SW.

⚠1 -CUT ON-BOARD JUMPER (SOLDER TRACE) COMPLETELY THROUGH BOTH LAYERS ON THE CONTROL BOARD
-JUMPERS CUT IN ERROR CAN BE RESOLVED BY FIELD INSTALLING A JUMPER ON THE APPROPRIATE TERMINALS ON THE TERMINAL STRIP

FIGURE 6

TABLE 15

FLASH CODE (X + Y)	STATUS / ERROR DESCRIPTION
FLASH CODE DESCRIPTIONS	
Pulse	A 1/4 second flash followed by four seconds of off time.
Heartbeat	Constant 1/2 second bright and 1/2 second dim cycles.
X + Y	LED flashes X times at 2Hz, remains off for two seconds, flashes Y times at 2Hz, remains off for four seconds, then repeats.
Pulse	Power on - Standby.
Heartbeat	Normal operation - signaled when heating demand initiated at thermostat.
FLAME CODES	
1 + 2	Low flame current -- run mode.
1 + 3	Flame sensed out of sequence -- flame still present.
PRESSURE SWITCH CODES	
2 + 3	Low pressure switch failed open.
2 + 4	Low pressure switch failed closed.
2 + 5	High pressure switch failed open.
2 + 6	High pressure switch failed closed.
2 + 7	Low pressure switch opened during ignition trial or heating demand.
LIMIT CODE	
3 + 1	Limit switch open.
WATCHGUARD CODES	
4 + 1	Watchguard -- Exceeded maximum number of retries.
4 + 2	Watchguard -- Exceeded maximum number of retries or last retry was due to pressure switch opening.
4 + 3	Watchguard -- Exceeded maximum number of retries or last retry was due to flame failure.
4 + 5	Watchguard -- Limit remained open longer than three minutes.
4 + 6	Watchguard -- Flame sensed out of sequence; flame signal gone.
4 + 7	Ignitor circuit fault -- Failed ignitor or triggering circuitry.
4 + 8	Low line voltage.
HARD LOCKOUT CODES	
5 + 1	Hard lockout -- Rollout circuit open or previously opened.
5 + 2	Control failed self check, internal error (control will restart if error recovers).
5 + 3	No Earth ground (control will restart if error recovers).
5 + 4	Reversed line voltage polarity (control will restart if the error recovers).
5 + 6	Low secondary (24VAC) voltage.

Error Code Storage

The ignition control stores the last ten error codes in memory. The codes are retained in case of power loss.

Error Code Review

1 - Short R (2) to (1). Within 1/2 second, the STATUS LED will stay lit continuously to indicate that the short was sensed.

2 - Continue to hold the short between R (2) to (1). After 5 seconds, STATUS LED will go from being continuously lit to off. This indicates that error code review is pending.

3 - Remove R (2) to (1) short within ten seconds of STATUS LED turning off. This activates error code review.

4 - Last ten error codes will be flashed on the STATUS LED.

5 - After final error code is indicated, STATUS LED will flash to indicate normal operation.

Clearing Error Codes

1 - Short R (2) to (1). Within 1/2 second, the STATUS LED will stay lit continuously to indicate that the short was sensed.

2 - Continue to hold the short between R (2) to (1). After 5 seconds, STATUS LED will go from being continuously lit to off.

3 - Continue to hold the short between R (2) to (1) beyond ten seconds after STATUS LED has turned off. STATUS LED will turn on, indicating that error codes have been cleared.

4 - Remove R (2) to (1) short. STATUS LED will flash to indicate normal operation.

Dip Switch Settings

Heating Operation DIP Switch Settings

Switch 1 -- Thermostat Selection -- This unit may be used with either a single-stage or two-stage thermostat. The thermostat selection is made using a DIP switch which must be properly positioned for the particular application. The Dip switch is factory-positioned for use with a two-stage thermostat. If a single-stage thermostat is to be used, the DIP switch must be repositioned.

a - *Select "OFF"* for two-stage heating operation controlled by a two-stage heating thermostat (factory setting);

b - *Select "ON"* for two-stage heating operation controlled by a single-stage heating thermostat. This setting provides a timed delay before second-stage heat is initiated.

Switch 2 -- Second Stage Delay (Used with Single-Stage Thermostat Only) -- This switch is used to determine the second stage on delay when a single-stage thermostat is being used. The switch is factory-set in the OFF position, which provides a 10-minute delay before second-stage heat is initiated. If the switch is toggled to the ON position, it will provide a 15-minute delay before second-stage heat is initiated. This switch is only activated when the thermostat selector jumper is positioned for SINGLE-stage thermostat use.

Switches 3 and 4 -- Blower-Off Delay -- The blower-on delay of 45 seconds is not adjustable. The blower-off delay (time that the blower operates after the heating demand has been satisfied) can be adjusted by moving switches 3 and 4 on the integrated control board. The unit is shipped from the factory with a blower-off delay of 90 seconds. The blower off delay affects comfort and is adjustable to satisfy individual applications. Adjust the blower off delay to achieve a supply air temperature between 90° and 110°F at the exact moment that the blower is de-energized. Longer off delay settings provide lower supply air temperatures; shorter settings provide higher supply air temperatures.Table 16 provides the blower off timings that will result from different switch settings.

TABLE 16
Blower Off Delay Switch Settings

Blower Off Delay (Seconds)	Switch 3	Switch 4
60	Off	On
90	Off	Off
120	On	Off
180	On	On

Indoor Blower Operation DIP Switch Settings

Switches 5 and 6 -- Cooling Mode Blower Speed -- Switches 5 and 6 are used to select cooling blower motor speed. The unit is shipped from the factory with the DIP switches positioned for high speed (4) indoor blower motor operation during the cooling mode. The table below provides the cooling mode blower speeds that will result from different switch settings. Refer to blower tables at the front of this manual for corresponding cfm values.

TABLE 17
Cooling Mode Blower Speeds

Speed	Switch 5	Switch 6
1 - Low	On	On
2 - Medium Low	Off	On
3 - Medium High	On	Off
4 - High (Factory)	Off	Off

Switches 7 and 8 -- Blower Speed Adjustment -- Switches 7 and 8 are used to select blower speed adjustment settings. The unit is shipped from the factory with the DIP switches positioned for NORMAL (no) adjustment. The DIP switches may be positioned to adjust the blower speed by +10% or -10% to better suit the application. The table below provides blower speed adjustments that will result from different switch settings. Refer to blower tables at the front of this manual for corresponding cfm values.

TABLE 18
Blower Speed Adjustment

Adjustment	Switch 7	Switch 8
+10% (approx.)	On	Off
NORMAL (Factory)	Off	Off
-10% (approx.)	Off	On

Switches 9 and 10 -- Cooling Mode Blower Speed Ramping -- Switches 9 and 10 are used to select cooling mode blower speed ramping options. Blower speed ramping may be used to enhance dehumidification performance. The switches are factory set at option A which has the greatest effect on blower motor performance. Table 19 provides the cooling mode blower speed ramping options that will result from different switch settings. The cooling mode blower speed ramping options are detailed on Page 28.

NOTE - The off portion of the selected ramp profile also applies during heat pump operation in dual fuel applications.

TABLE 19
Cooling Mode Blower Speed Ramping

Ramping Option	Switch 9	Switch 10
A (Factory)	Off	Off
B	On	Off
C	Off	On
D	On	On

Switches 11 and 12 -- Heating Mode Blower Speed -- Switches 11 and 12 are used to select heating mode blower motor speed. The unit is shipped from the factory with the dip switches positioned for medium low (2) speed indoor blower motor operation during the heating mode. The table below provides the heating mode blower speeds that will result from different switch settings. Refer to blower tables at the front of this manual for corresponding cfm values.

TABLE 20
Heating Mode Blower Speeds

Speed	Switch 11	Switch 12
1 - Low	On	On
2 - Medium Low (Factory)	Off	On
3 - Medium High	On	Off
4 - High	Off	Off

On-Board Link W914

On-board link W914 is a clippable connection which connects terminals DS and R on the integrated control board. W914 must be cut when the furnace is installed with either the Harmony III zone control board or a thermostat which features humidity control. If the link is left intact the PWM signal from the HARMONY III control will be blocked and also lead to control damage. Refer to table 21 (CCB1) and table 23 (SignatureStat™) for operation sequence in applications including G60DFV, a thermostat which features humidity control and a single-speed outdoor unit. Table 22 (CCB1) and table 24 (SignatureStat) gives the operation sequence in applications with a two-speed outdoor unit.

On-Board Link W951

On-board link W951 is a clippable connection which connects terminals R and O on the integrated control board. W951 must be cut when the furnace is installed in applications which include a heat pump unit and a thermostat which features dual fuel use. If the link is left intact, terminal "O" will remain energized eliminating the HEAT MODE in the heat pump.

On-Board Link W915

On-board link W915 is a clippable connection which connects terminals Y1 and Y2 on the integrated control board. W915 must be cut if two-stage cooling will be used. If the link is not cut the outdoor unit will operate in second stage cooling only.

Status LEDs (SPEED, CFM, E-COM)

The green SPEED LED indicates circulating blower speed in response to the DS signal. The LED is lit during normal blower operation and is off during a dehumidification demand. In Harmony III applications, the brightness of the LED indicates the requested blower speed.

The green CFM LED indicates the blower air flow. Count the number of blinks between the two-second pauses to determine the CFM. Each blink represents approximately 100 CFM.

The green E-COM LED indicates that the control is receiving and processing of commands and inputs. The LED may flash rapidly or may display a single flash, depending upon the activity.

TABLE 21
G61MPV, CCB1 and Single-Speed Outdoor Unit

OPERATING MODE	SYSTEM DEMAND		SYSTEM RESPONSE	
System Condition	Thermostat Demand	*Relative Humidity (Efficiency*Plus* Lights)	Blower CFM (COOL)	Comments
Normal operation	Y1	No demand. Humidity level is acceptable	COOL	Compressor demand and indoor blower speed controlled by thermostat demand.
*Call for humidity removal during cooling demand	Y1	Humidity level rises above setpoint. Demand initiated.	70% of COOL	Call for dehumidification initiated by CCB1 control. Indoor blower speed reduced by CCB1 control.
Dehumidification demand satisfied during cooling demand.	Y1	Humidity level falls below setpoint. No demand	COOL	When humidity demand is satisfied, blower speed immediately increases to the COOL CFM to hasten the end of the cycle.
Call for cooling after call for humidity removal.	None	Humidity level above setpoint. Demand initiated.	Off	Dehumidification mode begins when relative humidity is greater than setpoint.
	Y1	Humidity level above setpoint. Demand initiated.	70% of COOL	
Humidity demand satisfied between thermostat demands (unit off cycle).	None	Over setpoint (1 or more)	Off	While unit is not operating (no thermostat demand), slide switch is moved down and back up. Blower operates at COOL CFM.
	Y1	Change to acceptable	COOL	

NOTE - When changing unit mode of operation from cooling to heating, indicating lights that are on will stay on until the first thermostat heating demand.

** Reduced blower speed is 70% of COOL*

TABLE 22
OPERATING SEQUENCE
G61MPV, CCB1 and Two-Speed Outdoor Unit

OPERATING MODE	SYSTEM DEMAND		SYSTEM RESPONSE		
System Condition	**Thermostat Demand**	***Relative Humidity (Efficiency*Plus* Lights)**	****Compressor Speed**	**Blower CFM (COOL)**	**Comments**
Normal operation	Y1	No demand. Acceptable	Low	**49% of HIGH COOL	Compressor demand and indoor blower speed controlled by thermostat demand
	Y2	No demand. Acceptable	High	HIGH COOL	
Call for humidity removal during 1st-stage cooling demand	Y1	No demand. Acceptable	Low	**49% of HIGH COOL	Dehumidification mode does not begin until after initial thermostat demand is satisfied and new cooling demand is initiated.
	Y1	Humidity level rises slightly (1) above setpoint. Demand initiated.	Low	**49% of HIGH COOL	
	Demand satisfied	Humidity level remains slightly (1) above setpoint. Demand continues.	Off	Off	
	Y1	Humidity level remains slightly (1) above setpoint. Demand continues.	High	***70%of HIGH COOL	
Significant increase in humidity during thermostat cooling demand.	Y1	No demand. Acceptable	Low	**49% of HIGH COOL	If humidity rises significantly above setpoint, or if slide switch is moved significantly, unit will immediately go into dehumidification mode (in presence of thermostat demand).
	Y1	Humidity level rises significantly (2 or more) above setpoint. Demand initiated.	High	***70% of HIGH COOL	
Humidity demand satisfied during thermostat demand.	Y1	Humidity level above setpoint.	High	***70% of HIGH COOL	When humidity demand is satisfied, blower immediately shifts to the COOL CFM in order to hasten the end of the cycle. Unit can only shift out of high speed compressor operation at beginning of next cycle.
	Y1	Humidity level falls below setpoint. No demand.	High	HIGH COOL	
	None	No demand. Acceptable	Off	Off	
	Y1	No demand. Acceptable	Low	**49% of HIGH COOL	
Call for humidity removal during 2nd stage thermostat demand	Y2	No demand. Acceptable	High	HIGH COOL	Blower immediately changes speed in response to thermostat demand.
	Y2	Humidity level rises slightly (1) above setpoint. Demand initiated.	High	***70% of HIGH COOL	
	Y2	No demand. Acceptable	High	HIGH COOL	
*Call for 1st stage cooling after call for humidity removal.	None	Humidity level is slightly (1) above setpoint.	Off	Off	Dehumidification mode (high speed compressor) begins with next thermostat demand after initial demand is satisfied.
	Y1	Humidity level is slightly (1) above setpoint.	Low	**49% of HIGH COOL	
Call for 2nd stage cooling after call for humidity removal	None	Humidity level is slightly (1) above setpoint.	Off	Off	Reduced blower speed (dehumidification speed) begins immediately with thermostat demand
	Y2	Humidity level is slightly (1) above setpoint.	High	***70% of HIGH COOL	
Call for cooling after significant increase in humidity	None	Humidity level is significantly above setpoint (2 or more).	Off	Off	If humidity increases significantly over setpoint, or if slide switch is moved, unit immediately goes into dehumidification mode (in presence of thermostat demand).
	Y1 or Y2	Humidity level is significantly above setpoint (2 or more).	High	***70% of HIGH COOL	
Humidity demand satisfied between thermostat demands (unit off cycle).	None	Humidity level is slightly (1) above setpoint.	Off	Off	While unit is not operating (no thermostat demand), slide switch is moved down and back up. Blower and compressor operate at high speed until next thermostat demand.
	Y1 or Y2	Humidity level falls below setpoint. No demand.	High	HIGH COOL	

NOTE - When changing unit mode of operation from cooling to heating, indicating lights that are on will stay on until the first thermostat heating demand.

**IMPORTANT - If power to unit is turned on with CCB1 calling for humidity removal, outdoor unit may be locked into high speed indefinitely. To reset, move humidity slide switch all the way down then back up to desired setpoint (with unit running)*
*** Reduced blower speed is 49% HIGH COOL speed.*
**** Reduced blower speed is 70% HIGH COOL speed.*
*****If the two-speed control on a two-speed outdoor unit is set for LATCH 2 (15 minutes) or LATCH 3 (30 minutes), the compressor will latch into high speed after a Y1 demand has occurred for that period of time.*

TABLE 23
G61MPV, SignatureStat™ and SINGLE STAGE OUTDOOR UNIT

OPERATING SEQUENCE		SYSTEM DEMAND								SYSTEM RESPONSE		
System Condition	Step	Thermostat Demand						Relative Humidity		Compres-sor	Blower CFM (COOL)	Comments
		Y1		O	G	W 1		Status	D			
NO CALL FOR DEHUMIDIFICATION												
Normal Operation	1	On		On	On			Acceptable	24 VAC	High	100%	Compressor and indoor blower follow thermostat demand
BASIC MODE (only active on a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	High	100%	SignatureStat energizes Y1 and de-energizes D on a call for de-humidification
Dehumidification Call	2	On		On	On			Demand	0 VAC	High	70%*	
PRECISION MODE (operates independent of a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	High	100%	Dehumidification mode begins when humidity is greater than set point
Dehumidification call	2	On		On	On			Demand	0 VAC	High	70%*	
Dehumidification call ONLY	1	On		On	On			Demand	0 VAC	High	70%*	SignatureStat will try to maintain room humidity setpoint by allowing the room space to maintain a cooler room thermostat setpoint**
	Jumpers at indoor unit with a single stage outdoor unit With Condensing unit - Cut W914 (R to DS) on SureLight board With Heat Pump - Cut W914 (R to DS) & W951 (R to O) on SureLight board											

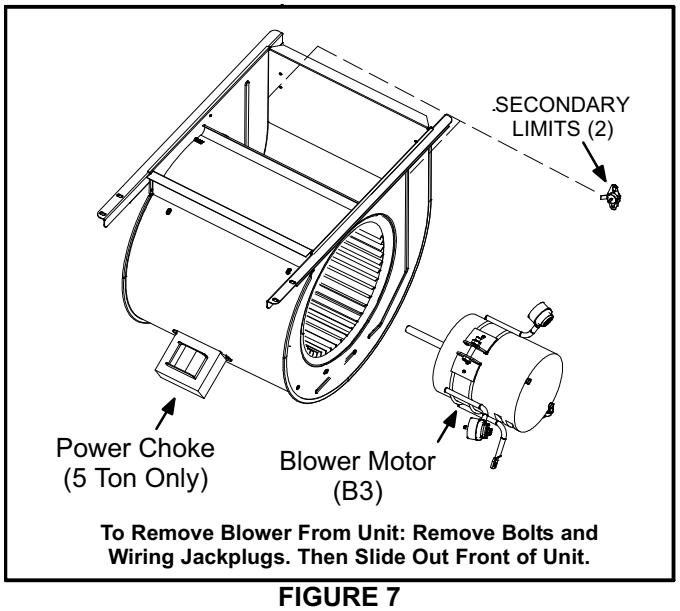
Dave Lennox SignatureStat to use for this application - 51M26 1 heat / 1 cool or 51M28 - 2 heat / 2 cool for heat pumps
**Dehumidification blower speed is 70% of COOL speed.*
***In Precision mode, SignatureStats built before 10-2003 will maintain room temperature up to 3°F(1.8°C) cooler than room setting. SignatureStats built 10-2003 and later will maintain room temperature up to 2 °F (1.2°C) cooler than room setting.*

TABLE 24
G61MPV, SignatureStat™ and TWO STAGE OUTDOOR UNIT

OPERATING SEQUENCE		SYSTEM DEMAND								SYSTEM RESPONSE		
System Condition	Step	Thermostat Demand						Relative Humidity		Compressor	Blower CFM (COOL)	Comments
		Y1	Y2	O	G	W 1	W 2	Status	D			
NO CALL FOR DEHUMIDIFICATION												
Normal Operation - Y1	1	On		On	On			Acceptable	24 VAC	Low	70%*	Compressor and indoor blower follow thermostat demand
Normal Operation - Y2	2	On	On	On	On			Acceptable	24 VAC	High	100%	
ROOM THERMOSTAT CALLS FOR FIRST STAGE COOLING												
BASIC MODE (only active on a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	Low	70%*	SignatureStat energizes Y2 and de-energizes D on a call for de-humidification
Dehumidification Call	2	On	On	On	On			Demand	0 VAC	High	70%*	
PRECISION MODE (operates independent of a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	Low	70%*	Dehumidification mode begins when humidity is greater than set point
Dehumidification call	2	On	On	On	On			Demand	0 VAC	High	70%*	
Dehumidification call ONLY	1	On	On	On	On			Demand	0 VAC	High	70%*	SignatureStat will try to maintain room humidity setpoint by allowing the room space to maintain a cooler room thermostat setpoint**
ROOM THERMOSTAT CALLS FOR FIRST AND SECOND STAGE COOLING												
BASIC MODE (only active on a Y1 thermostat demand)												
Normal Operation	1	On	On	On	On			Acceptable	24 VAC	High	100%	SignatureStat energizes Y2 and de-energizes D on a call for de-humidification
Dehumidification Call	2	On	On	On	On			Demand	0 VAC	High	70%*	
PRECISION MODE (operates independent of a Y1 thermostat demand)												
Normal Operation	1	On		On	On			Acceptable	24 VAC	Low	70%*	Dehumidification mode begins when humidity is greater than set point
Dehumidification call	2	On	On	On	On			Demand	0 VAC	High	70%*	
Dehumidification call ONLY	1	On	On	On	On			Demand	0 VAC	High	70%*	SignatureStat will try to maintain room humidity setpoint by allowing the room space to maintain a cooler room thermostat setpoint**
	Jumpers at indoor unit with a two stage outdoor unit Cut factory jumper from Y1 to Y2 or cut W915 (Y1 to Y2) With Condensing unit - Cut W914 (R to DS) on SureLight board With Heat Pump - Cut W914 (R to DS) & W951 (R to O) on SureLight board											

Dave Lennox SignatureStat to use for this application - 51M27 2 heat / 2 cool or 51M28 - 2 heat / 2 cool for heat pumps
**Normal operation first stage cooling blower speed is 70% of COOL speed.*
***In Precision mode, SignatureStats built before 10-2003 will maintain room temperature up to 3°F(1.8°C) cooler than room setting. SignatureStats built 10-2003 and later will maintain room temperature up to 2 °F (1.2°C) cooler than room setting.*

B-Blower Compartment Figure 7



To Remove Blower From Unit: Remove Bolts and Wiring Jackplugs. Then Slide Out Front of Unit.

FIGURE 7

Secondary Limt (S21)

The secondary limits (S21) on G61MPV units are located in the blower compartment on the back side of the blower housing. See figure 7. All G61MPV units are equipped with two secondary limts. When excess heat is sensed in the blower compartment, the limit will open. If the limit is open, the furnace control energizes the supply air blower and closes the gas valve. The limit automatically resets when unit temperature returns to normal. The switch is factory set to open at 125°F and cannot be adjusted.

Blower Motor (B3)

G61MPV units use a three-phase, electronically controlled D.C. brushless motor (controller converts single phase a.c. to three phase D.C.), with a permanent-magnet-type rotor (figure 8). Because this motor has a permanent magnet rotor it does not need brushes like conventional D.C. motors.

Internal components are shown in figure 9. The stator windings are split into three poles which are electrically connected to the controller. This arrangement allows motor windings to turn on and off in sequence by the controller.

A solid-state controller is permanently attached to the motor. The controller is primarily an A.C. to D.C. converter. Converted D.C. power is used to drive the motor. The controller contains a microprocessor which monitors varying conditions inside the motor (such as motor workload).

G61MPV BLOWER MOTOR B3

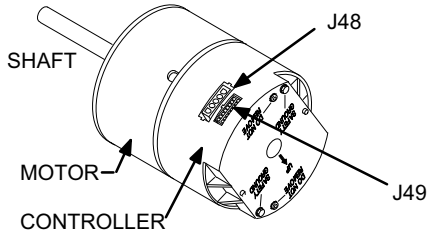


FIGURE 8

G61MPV BLOWER MOTOR COMPONENTS

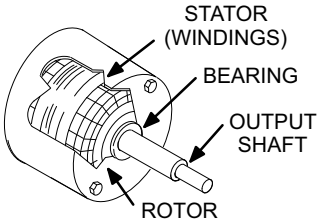


FIGURE 9

The controller uses sensing devices to sense what position the rotor is in at any given time. By sensing the position of the rotor and then switching the motor windings on and off in sequence, the rotor shaft turns the blower.

All G61MPV blower motors use single phase power. An external run capacitor is not used. The motor uses permanently lubricated ball-type bearings.

Internal Operation

Each time the controller switches a stator winding (figure 9) on and off, it is called a “pulse.” The length of time each pulse stays on is called the “pulse width.” By varying the pulse width (figure 11), the controller varies motor speed (called “pulse-width modulation”). This allows for precise control of motor speed and allows the motor to compensate for varying load conditions as sensed by the controller. In this case, the controller monitors the static workload on the motor and varies motor rpm in order to maintain constant airflow (cfm).

The motor controller is driven by the Two-stage Variable Speed Integrated control board. The board receives its demand (PWM signal or fixed 24 VAC or VDC signal) from optional controls such as the Harmony zone control system, Efficiency Plus Humidity Control (CCB1) or a conventional thermostat.

Motor rpm is continually adjusted internally to maintain constant static pressure against the blower wheel. The controller monitors the static work load on the motor and motor amp-draw to determine the amount of rpm adjustment. Blower rpm may be adjusted any amount in order to maintain a constant cfm as shown in Blower Ratings Tables. The cfm remains relatively stable over a broad range of static pressure. Since the blower constantly adjusts rpm to maintain a specified cfm, motor rpm is not rated. Hence, the terms “cool speed” , “heat speed ” or “speed tap” in this manual, on the unit wiring diagram and on blower B3, refer to blower cfm regardless of motor rpm.

When Harmony is used, speed taps are overridden and a PWM signal generated by the Harmony controller continuously varies motor speed based upon zone demands.

Initial Power Up

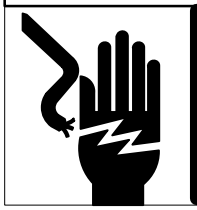
When line voltage is applied to B3, there will be a large inrush of power lasting less than 1/4 second. This inrush charges a bank of DC filter capacitors inside the controller. If the disconnect switch is bounced when the disconnect is closed, the disconnect contacts may become welded. Try not to bounce the disconnect switch when applying power to the unit.

Motor Start-Up

When B3 begins start-up, the motor gently vibrates back and forth for a moment. This is normal. During this time the electronic controller is determining the exact position of the rotor. Once the motor begins turning, the controller slowly eases the motor up to speed (this is called “soft-start”). The motor may take as long as 10-15 seconds to reach full speed. If the motor does not reach 200rpm within 13 seconds, the motor shuts down. Then the motor will immediately attempt a restart. The shutdown feature provides protection in case of a frozen bearing or blocked blower wheel. The motor may attempt to start eight times. If the motor does not start after the eighth try, the controller locks out. Reset controller by momentarily turning off power to unit.

The DC filter capacitors inside the controller are connected electrically to the speed tap wires. The capacitors take approximately 5 minutes to discharge when the disconnect is opened. For this reason it is necessary to wait at least 5 minutes after turning off power to the unit before attempting to change speed taps.

⚠ DANGER



Disconnect power from unit and wait at least five minutes to allow capacitors to discharge before attempting to adjust motor speed tap settings. Failure to wait may cause personal injury or death.

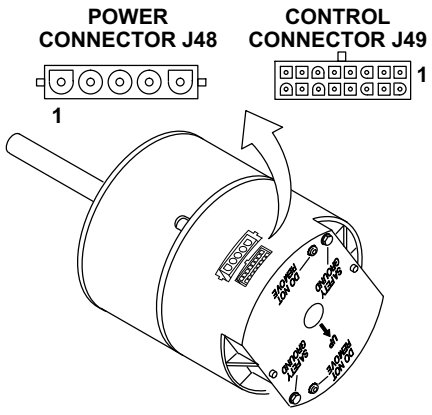
External Operation (Speed Tap Priority)

Figure 10 shows the two quick-connect jacks (J48 and J49) which connect the motor to the G61MPV. Jack J48 is the power plug and jack J49 connects the unit controls to the motor.

Line voltage must be applied to J48 pin 5 in order for the motor to operate. When using 120VAC pins 1 and 2 must be jumpered. When control voltage is applied to J49 pin 3 and 15, the motor is energized on the continuous fan mode.

When voltage is applied to J49 pin 2 in addition to pin 3 and 15 (first stage heating), the blower is energized on the low speed heating tap. When voltage is applied to J49 pin 13 in addition to pin 3 and 15 (second stage heating), the blower is energized on the high speed heating tap. The motor assigns priority to J49 pin 2 so that if a call for cooling and a call for heating are concurrent, heating call overrides and the blower operates on high speed heating tap.

BLOWER B3 HARNESS CONNECTORS



J49
PIN 1 - C1
PIN 2 - W / W1
PIN 3 - C2
PIN 4 - Delay
PIN 5 - Cool
PIN 6 - Y1
PIN 7 - Adjust
PIN 8 - 0ut
PIN 9 - 0
PIN 10 - DS(PWM)
PIN 11 - Heat
PIN 12 - R
PIN 13 - EM / W2
PIN 14 - Y / Y2
PIN 15 - G
PIN 16 - Out +

J48
PIN 1 - Jumper PIN 1 to PIN2 for 120VAC line input only.
PIN 2 - Jumper PIN 1 to PIN2 for 120VAC line input only.
PIN 3 - Ground
PIN 4 - AC Line
PIN 5 - AC Line

FIGURE 10

Power Choke (L13)

A choke coil is used on G61MPV 5 ton 1 hp units. The choke is located on the blower housing and is used to supress transient current spikes.

Precautions

If the G61MPV or its electronically controlled blower motor is improperly or inadequately grounded, it may cause television interference (commonly known as RFI or radio frequency interference).

This interference is caused by internal switching frequencies of the motor controller. TV interference may show up as small specks or lines which randomly appear on the TV screen accompanied by pops or clicks in the sound. Before attempting any service, make sure the indoor unit is causing the interference. To check, disconnect power to indoor unit then check TV for continued signs of interference.

TV interference may be stopped by making sure the motor is solidly grounded to the cabinet (metal to metal) and by making sure the cabinet is solidly grounded. If TV interference persists, make sure the television (and all affected RF appliances) are moved away from the G61MPV. Also make sure affected appliances are connected to a separate electrical circuit.

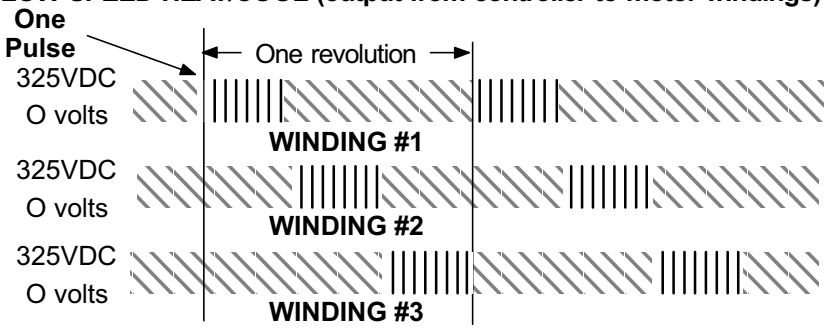
MOTOR SPEED CONTROL WITH D.C. PULSE-WIDTH MODULATION

Motor speed is determined by the size of the electrical pulse sent to the motor windings. The longer the pulse, the faster the motor.

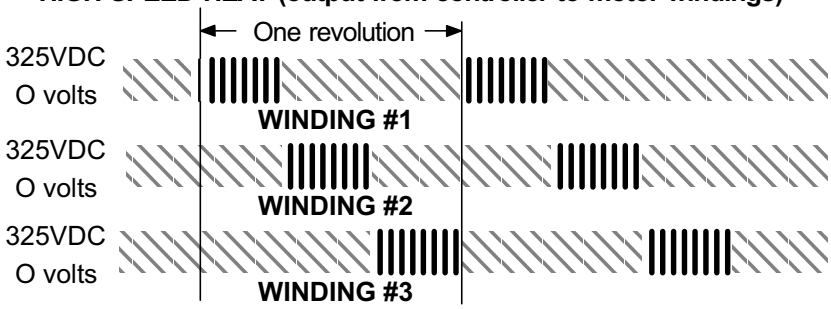
OUTPUT FROM CONTROLLER TO MOTOR WINDINGS	
WINDINGS TURNED OFF	**WINDINGS TURNED ON**
	ON PULSE **OFF PULSE**

The frequency of the pulses to the windings is 20KHz.
DO NOT ATTEMPT TO MEASURE THESE VOLTAGES.

LOW SPEED HEAT/COOL (output from controller to motor windings)



HIGH SPEED HEAT (output from controller to motor windings)



HIGH SPEED COOL (output from controller to motor windings)

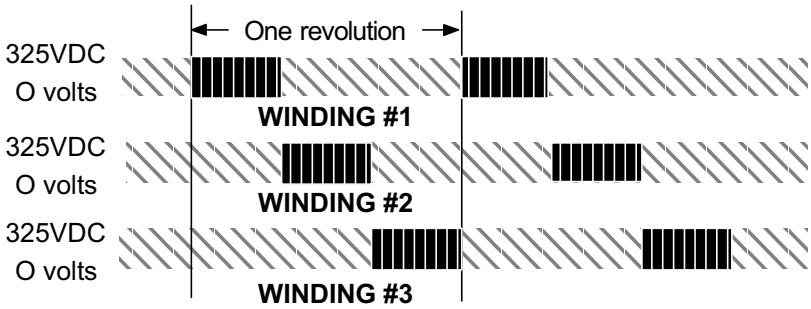


FIGURE 11

C-Heating Components

6. Ignitor

The SureLight ignitor is made of durable silicon nitride. Ignitor longevity is enhanced by controlling voltage to the ignitor. Board 49M59 finds the lowest ignitor temperature which will successfully light the burner, thus increasing the life of the ignitor. Due to this feature of the board, voltage cannot be measured so ignitor must be ohmed. Board 100870 provides a regulated 95 volts to the ignitor for consistent ignition and long ignitor life. Ohm value for ignitors with SureLight board 49M59 should be 10.9 to 19.7. Ohm value for ignitors with board 100870 should be 25 to 47. Ignitors not interchangeable between boards. See figure 12 and 13 (make note of control board used) for ignitor location.

NOTE - The G60DFV(X) furnace contains electronic components that are polarity sensitive. Make sure that the furnace is wired correctly and is properly grounded.

7. Flame Sensor

A flame sensor is located on the left side of the burner support. See figure 14 and 15 (make note of control board used). The sensor is mounted on the flame rollout plate and the tip protrudes into the flame envelope of the left-most burner. The sensor can be removed for service without removing any part of the burners. During operation, flame is sensed by current passed through the flame and sensing electrode. The SureLight control allows the gas valve to remain open as long as flame signal is sensed.

SureLight Board 49M59 Ignitor Location

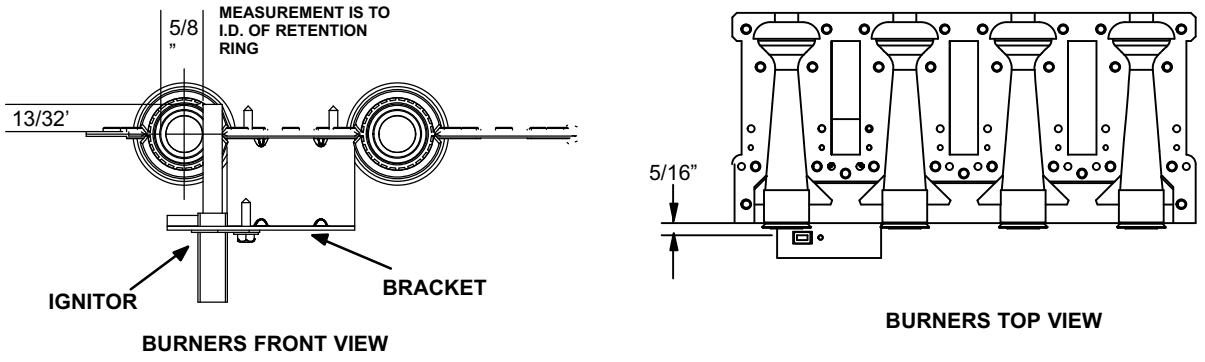


FIGURE 12

SureLight Board 100870 Ignitor Location

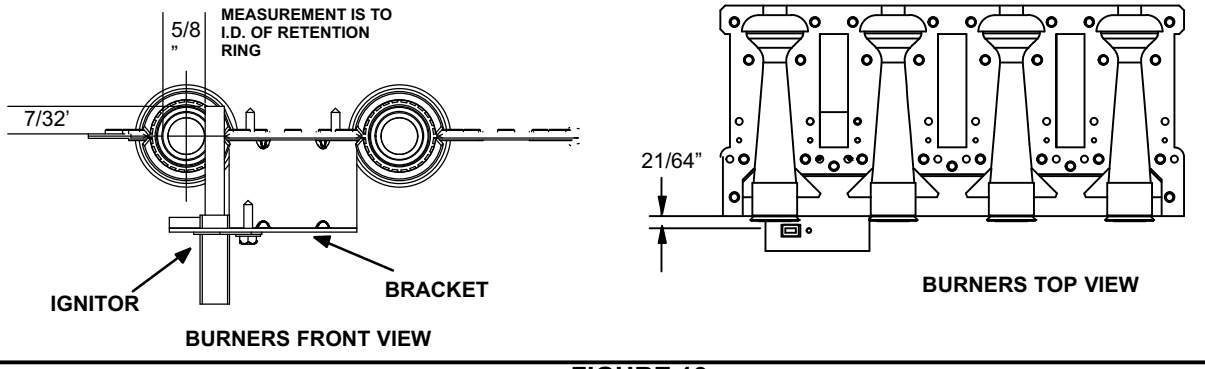


FIGURE 13

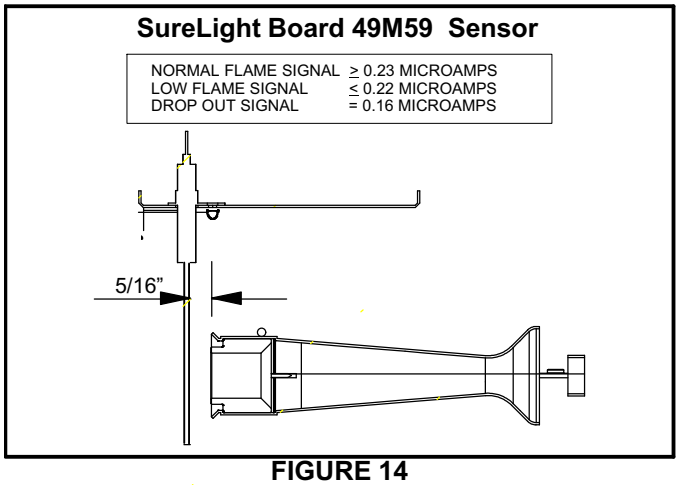


FIGURE 14

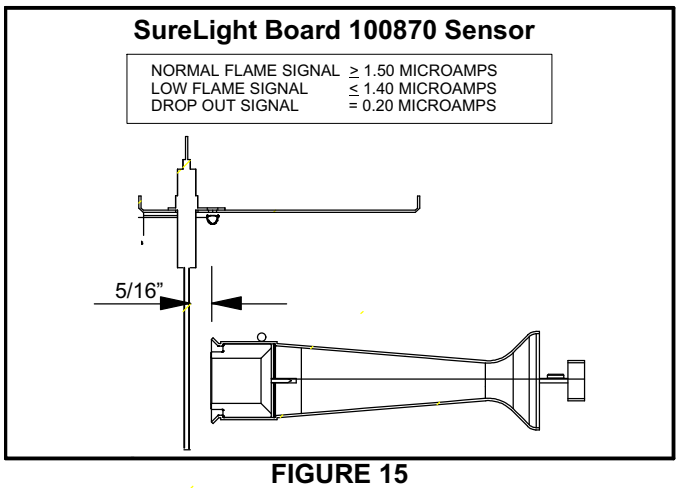


FIGURE 15

8. Clamshell Heat Exchanger

G61MPV units use an aluminized steel primary and stainless steel secondary heat exchanger assembly. Heat is transferred to the air stream from all surfaces of the heat exchanger. The shape of the heat exchanger ensures maximum efficiency.

The combustion air inducer pulls fresh air through the burner box. This air is mixed with gas in the burner venturi and at the corbel orifices. The gas / air mixture is then burned at the entrance of each clamshell. Combustion gases are then pulled through the primary and secondary heat exchangers and exhausted out the exhaust vent pipe.

9. Flame Rollout Switches (S47)

Flame rollout switch S47 is a high temperature limit located on each side of the burner box. Each furnace is equipped with two identical switches. The limit is a N.C. SPST manual-reset limit connected in series with the primary limit S10. When S47 senses rollout, the circuit breaks and the ignition control immediately stops ignition and closes the gas valve.

If unit is running and flame rollout is detected, the gas valve will close and ignition control will be disabled. Rollout can be caused by a blocked heat exchanger, flue or lack of combustion air. The switch is factory set to trip (open) at 250°F and cannot be adjusted. The switch can be manually reset. To manually reset a tripped switch, push the reset button located on the control.

10. Primary Limit Control (S10)

Figure 16 shows the primary limit (S10) used on G61MPV units located in the heating vestibule panel. S10 is provided with a shield on some models (figure 16) and must not be removed. Note orientation of shield and limit if limit is replaced. When excess heat is sensed in the heat exchanger, the limit will open. Once the limit opens, the furnace control energizes the supply air blower and de-energizes the gas valve. The limit automatically resets when unit temperature returns to normal. The switch is factory set and cannot be adjusted.

11. Backup Secondary Limit Control (S113) (G61MPV-090, 110, 135 only)

Backup secondary limit control S113 is a N.C. auto-reset switch located on the combustion air inducer. S113 acts as a backup to primary limit S10 in the event of an indoor blower failure. S113 contacts open when temperature on the CAI reaches 142°.

12. Gas Valve (GV1)

The G61MPV uses a two-stage gas valve manufactured by Honeywell (figure 44) or White Rodgers (figure 45). The valves are internally redundant to assure safety shut-off. If the gas valve must be replaced, the same type valve must be used.

24VAC terminals and gas control knob or switch are located on the valve. All terminals on the gas valve are connected to wires from the electronic ignition control. 24V applied to the terminals energizes the valve.

Inlet and outlet pressure taps are located on the valve. A regulator adjustment screw is located on the valve.

LPG change over kit s are available from Lennox. Kits include burner orifices and a gas valve regulator conversion kit.

The burner box is sealed and operates under a negative pressure. A pressure hose is connected from the burner box to the gas valve. The gas valve senses the pressure in the burner box and changes gas valve outlet (manifold) pressure based on changes in the burner box pressure. The intent is to compensate for different vent configurations which can greatly affect the rate of the unit.

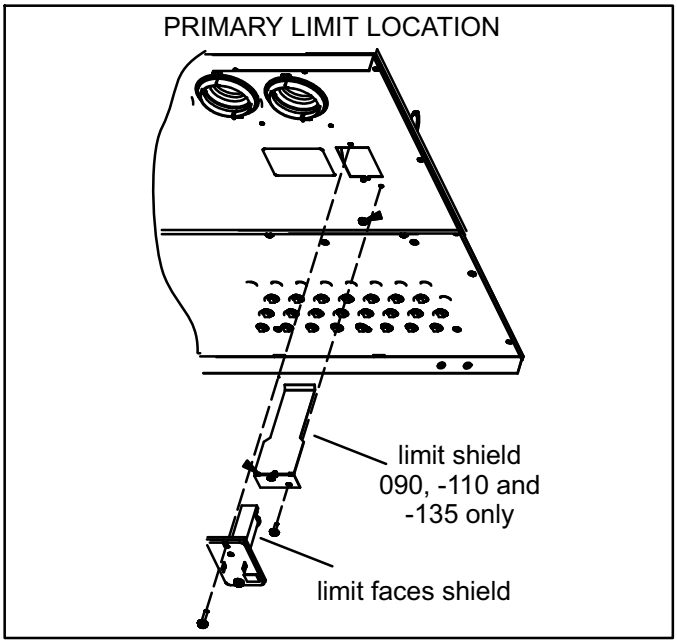


FIGURE 16

13. Combustion Air Inducer Prove Switch (S18)

All G61MPV units are equipped with combustion air prove switches located on the combustion air inducer housing. G61MPV-070, -071, -090, -091, -110, -111 and -135 model units are equipped with *two* dual prove switch "assemblies" consisting of two switches. See figure 17. The G61MPV-045 units have two single swithes as shown in figure 18. The switches are connected to the cold end header box by means of a flexible hose that monitors negative air pressure in the cold end header box.

The switches are a single-pole single-throw proving switch electrically connected to the furnace control. The purpose of the switch is to prevent burner operation if the combustion air inducer is not operating or if the flue becomes obstructed.

On heat demand (first or second stage) the switch senses that the combustion air inducer is operating. It closes a circuit to the furnace control when pressure inside the cold end header box decreases to a certain set point. Set points vary depending on unit size. See tables 26 through 31. The pressure sensed by the switch is negative. If the air intake vent pipe or outlet vent pipe becomes obstructed during operation, the switch senses a change of negative pressure and opens the circuit to the furnace control and gas valve. A bleed port on the switch allows relatively dry air in the vestibule to purge switch tubing, to prevent condensate build up.

The switch is factory set and is not field adjustable. If switch is closed or jumpered, the control will not initiate ignition at start up.

⚠ WARNING

The prove switch is a safety shut-down control in the furnace and must not be jumpered for any reason.

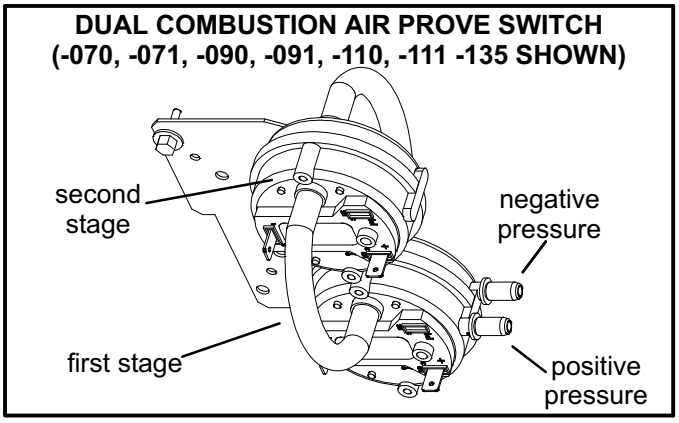


FIGURE 17

To troubleshoot the prove switches, temporarily jumper them. The unit will not fire with the switches jumpered. Therefore, the prove switches must be bypassed after the combustion air inducer is activated. This will determine if the prove switches and furnace are operating properly. However, this may not indicate if the sealed combustion system is operating properly.

Checks of pressure differential can aid in troubleshooting. When measuring the pressure differential, readings should be taken at the prove switch. Lack of differential usually indicates problems in the intake or exhaust piping, but may indicate problems in the heat exchanger, condensing coil, header boxes, combustion inducer or other components.

Measuring pressure differential Figures 18 and 19

The differential pressure is the difference in pressure measured across the cold end header box orifice.

1 - Remove thermostat demand and allow unit to cycle off.
2 - Install a tee in the negative (-) line and a tee in the positive (+) line running from one of the prove switches to the cold end header box.
3 - Install a manometer with hose from the negative (-) side of the manometer to the tee installed in the negative (-) line and with hose from the positive (+) side of the manometer to the tee in the positive (+) line.

NOTE - Both sides of the cold end header box are negative. However the (+) port reads less negative pressure than the (-) port.

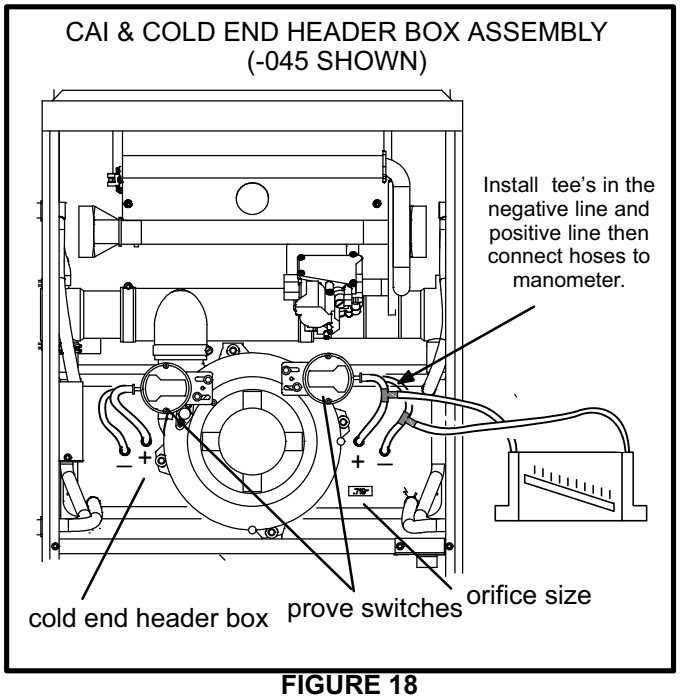


FIGURE 18

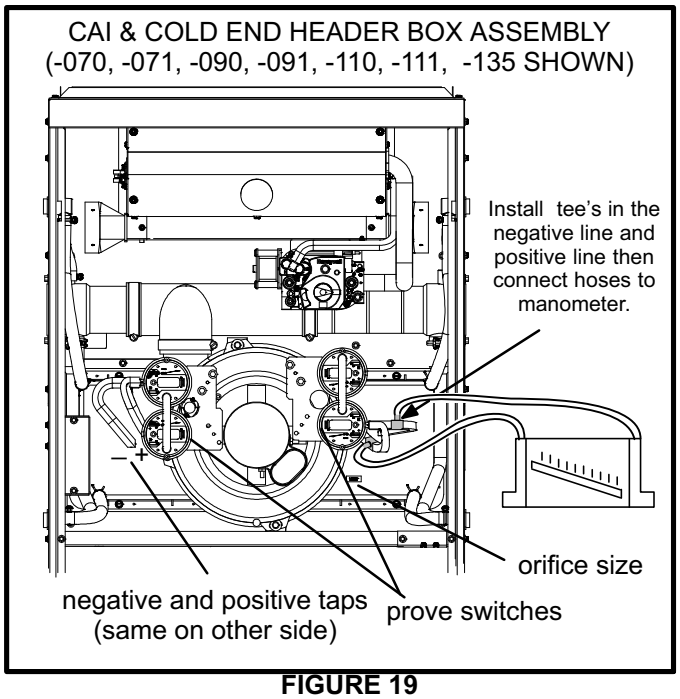


FIGURE 19

4 - Operate unit and observe manometer reading. *Readings will change as heat exchanger warms.*
a. Take one reading immediately after start-up.
b. Take a second reading after unit has reached steady state (approximately 5 minutes). This will be the pressure differential.

The pressure differential should be greater than those listed in tables 26 through 31.

5 - Remove thermostat demand and allow to cycle off.
6 - Remove manometer and tee's. Reinstall combustion air sensing hoses to the prove switch.
7 - Repeat steps 1 through 6 for the other prove switch.

14. Combustion Air Inducer (B6)

All G61MPV units use a two-speed combustion air inducer (CAI) to move air through the burners and heat exchanger during heating operation. The inducer uses a PSC 120VAC motor. The motor operates during all heating operation and is controlled by the ignition control A92. Inducer operates continuously while there is a call for heat. The burner ignition control will not proceed with the ignition sequence until combustion air inducer operation is sensed by the proving switches.

The CAI is installed on the cold end header box. The cold end header box is a single piece made of hard plastic. The box has an internal channel where the combustion air inducer creates negative pressure at unit start up. The channel contains an orifice used to regulate flow created by the CAI. The box has pressure taps for the CAI prove switch hoses.

The prove switches measure the pressures across the CAI orifice or difference in the channel and the box. A window is provided on the bottom right hand side of the box to indicate orifice size. See figure 19. See table 25 for orifice size per unit. **If replacement is necessary the gaskets used to seal the box to the vestbule panel and the CAI to the box, must also be replaced.**

TABLE 25

G61MPV Unit	C.A.I. Orifice Size
-045	0.719”
-070	0.938”
-071	0.880”
-090	1.063”
36C-090 *only* -9 and later	0.985”
-091	0.985”
-110	1.313”
-111	1.250”
-135	1.688”

TABLE 26
0’ to 4500’

G61MPV Unit	Set Point Second Stage	Set Point First Stage
-045	0.95”	0.95”
-070	0.95”	0.55”
-090	0.85”	0.50”
-110	0.95”	0.55”
-135	0.60”	0.35”

TABLE 27
0’ to 2000’ 95% Furnaces

G61MPV Unit	Set Point Second Stage	Set Point First Stage
-071	1.05”	0.70”
-091	1.50”	0.90”
-111	1.15”	0.65”

TABLE 28
2001’ to 7500’ 95% Furnaces

G61MPV Unit	Set Point Second Stage	Set Point First Stage
-071	0.85”	0.70”
-091	1.30”	0.90”
-111	0.95”	0.55”

TABLE 29
7501’ to 10,000’ 95% Furnaces

G61MPV Unit	Set Point Second Stage	Set Point First Stage
-071	0.75”	0.70”
-091	1.20”	0.90”
-111	0.85”	0.50”

TABLE 30*
4501’ to 7500’

G61MPV Unit	Set Point Second Stage	Set Point First Stage
-045	0.95”	0.95”
-070	0.95”	0.55”
-090	0.75”	0.50”
-110	0.85”	0.50”
-135	0.55”	0.35”

**Unit may require conversion kit at this altitude. See High Altitude table.*

TABLE 31*
7501’ to 10,000’

G61MPV Unit	Set Point Second Stage	Set Point First Stage
-045	0.95”	0.95”
-070	0.85”	0.50”
-090	0.60”	0.35”
-110	0.85”	0.50”
-135	0.55”	0.35”

**Unit may require conversion kit at this altitude. See High Altitude table.*

TABLE 32
OUTDOOR TERMINATION KITS AND CORRESPONDING EQUIVALENCIES

UNIT MODEL	VENT PIPE DIA. (in.)	Vent Pipe Length Equivalency (feet)								
		Outdoor Exhaust Accelerator (Dia. X Length)	Outdoor Exhaust Accelerator (Dia. X Length)	1-1/2" Concentric Kit	2" Concentric Kit	3" Concentric Kit	2" Wall Plate Kit	3" Wall Plate Kit	2" Wall Kit with Vent Extension	2" Wall Ring Kit
		1-1/2" X 12"	2" X 12"	71M80	60M29	60L46	22G44	44J40 81J20	30G28	15F74
36B-045	2	4	**Not Allowed**	**12**	**Not Allowed**	**Not Allowed**	4	4*	**4**	**4**
	2-1/2	5	**Not Allowed**	**15**	**Not Allowed**	**Not Allowed**	5	5*	**5**	**5**
	3	7	**Not Allowed**	**21**	**Not Allowed**	**Not Allowed**	7	7*	**7**	**7**
	4	14	**Not Allowed**	**42**	**Not Allowed**	**Not Allowed**	14	14*	**14**	**14**
36B-070 36B-071	2	**4**	**Not Allowed**	12	**Not Allowed**	**Not Allowed**	**4**	**4***	4	4
	2-1/2	**5**	**Not Allowed**	15	**Not Allowed**	**Not Allowed**	**5**	**5***	5	5
	3	**8**	**Not Allowed**	24	**Not Allowed**	**Not Allowed**	**8**	**8***	8	8
	4	**14**	**Not Allowed**	42	**Not Allowed**	**Not Allowed**	**14**	**14***	14	14
60C-090 60C-091	2	**Not Allowed**	**1**	**Not Allowed**	3	3	**Not Allowed**	**1**	**Not Allowed**	1**
	2-1/2	**Not Allowed**	**2**	**Not Allowed**	6	6	**Not Allowed**	**2**	**Not Allowed**	2**
	3	**Not Allowed**	**2**	**Not Allowed**	6	6	**Not Allowed**	**2**	**Not Allowed**	2**
	4	**Not Allowed**	**4**	**Not Allowed**	12	12	**Not Allowed**	**4**	**Not Allowed**	4**
60C-110 60C-111	2-1/2	**Not Allowed**	2	**Not Allowed**	**6**	**6**	**Not Allowed**	2	**Not Allowed**	**2***
	3	**Not Allowed**	2	**Not Allowed**	**6**	**6**	**Not Allowed**	2	**Not Allowed**	**2***
	4	**Not Allowed**	4	**Not Allowed**	**12**	**12**	**Not Allowed**	4	**Not Allowed**	**4***
60D-135	3	**Not Allowed**	6	**Not Allowed**	**Not Allowed**	15	**Not Allowed**	6	**Not Allowed**	6***
	4	**Not Allowed**	10	**Not Allowed**	**Not Allowed**	25	**Not Allowed**	10	**Not Allowed**	10***

**Requires field-provided and installed 1-1/2" exhaust accelerator.*
***Requires field-provided and installed 2" exhaust accelerator.*
****For use only in non-direct vent applications, when snow riser is not required. Requires field-provided and installed 2" exhaust accelerator.*

A-Vent Piping Guidelines

The G61MPV can be installed as either a Non-Direct Vent or a Direct Vent gas central furnace.

NOTE - In Non-Direct Vent installations, combustion air is taken from indoors and flue gases are discharged outdoors. In Direct Vent installations, combustion air is taken from outdoors and flue gases are discharged outdoors.

Intake and exhaust pipe sizing in Direct Vent applications and exhaust pipe sizing in Non-Direct Vent applications -- Size pipe according to tables 33 and 34. Table 33 lists the *minimum* equivalent vent pipe lengths permitted. Table 34 lists the *maximum* equivalent pipe lengths permitted.

Maximum vent length is defined as:

Total length (linear feet) of pipe,
Plus Equivalent length (feet) of fittings,
Plus Equivalent length (feet) of termination.
NOTE - Include ALL pipe and ALL fittings, both in doors and outdoors.

Regardless of the diameter of pipe used, the standard roof and wall terminations described in section *Exhaust Piping Terminations* should be used. Exhaust vent termination pipe is sized to optimize the velocity of the exhaust gas as it exits the termination. Refer to table 35.

NOTE - The exhaust pipe should be offset a minimum of 12 inches to avoid the possibility of water droplets being released from the exhaust termination. The minimum exhaust vent length is 15 ft. Shorter exhaust vent lengths may result in the discharge of water droplets from the exhaust termination, in spite of the 12-inch vertical offset.

Each 90° elbow (including those provided with the furnace) of any diameter is equivalent to 5 feet (1.52m) of vent pipe of the same diameter. Two 45° elbows are equivalent to one 90° elbow of the same diameter. One 45° elbow is equal to 2.5 feet (.76m) of vent pipe of the same diameter.

In some applications which permit the use of several different sizes of vent pipe, a combination vent pipe may be used. Contact the Application Department for assistance in sizing vent pipe in these applications.

NOTE - The flue collar on all models is sized to accommodate 2" Schedule 40 flue pipe. When vent pipe which is larger than 2" must be used in an upflow application, a 2" elbow must be applied at the flue collar in order to properly transition to the larger diameter flue pipe. This elbow must be added to the elbow count used to determine acceptable vent lengths. Assign an equivalent feet value to this elbow according to the larger size pipe being used. Contact the Application Department for more information concerning sizing of vent systems which include multiple pipe sizes.

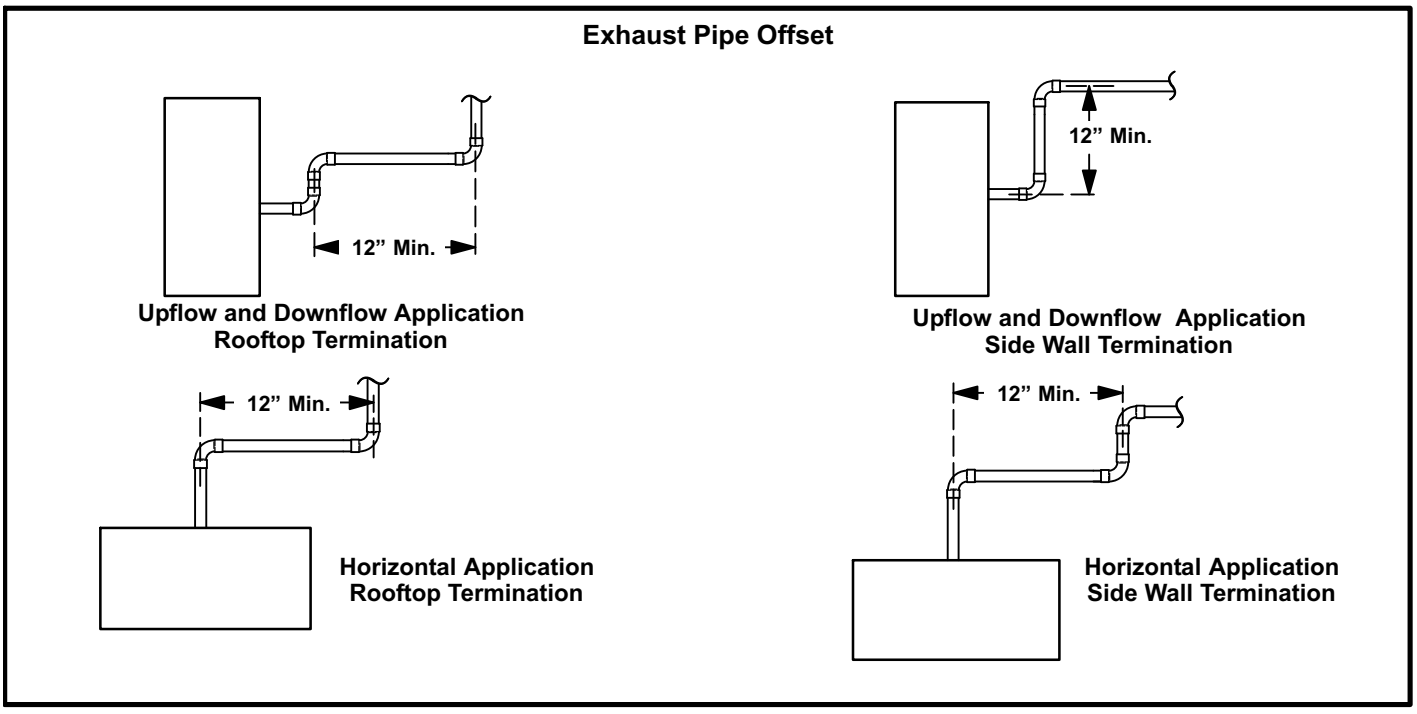


FIGURE 20

Use the following steps to correctly size vent pipe diameter.

1 - Determine the vent termination and its corresponding equivalent feet value according to table 32.

2 - Determine the number of 90° elbows required for both indoor and outdoor (e.g. snow riser) use. Calculate the corresponding equivalent feet of vent pipe.

3 - Determine the number of 45° elbows required for both indoor and outdoor use. Calculate the corresponding equivalent feet of vent pipe.

4 - Determine the length of straight pipe required.

5 - Add the total equivalent feet calculated in steps 1 through 4 and compare that length to the maximum values given in table 34 for the proposed vent pipe diameter. If the total equivalent length required exceeds the maximum equivalent length listed in the appropriate table, evaluate the next larger size pipe.

⚠ IMPORTANT

Do not use screens or perforated metal in exhaust terminations. Doing so will cause freeze-ups and may block the terminations.

TABLE 33
MINIMUM VENT PIPE LENGTHS

G61MPV MODEL	MIN. EQUIV. VENT LENGTH	EXAMPLE
045, 070, 071, 090, 091	15 ft.*	5 ft. plus 2 elbows of 2", 2-1/2", 3" or 4" diameter pipe
110, 111**		5 ft. plus 2 elbows of 2-1/2" 3" or 4" diameter pipe
135***		5 ft. plus 2 elbows of 3" or 4" diameter pipe

**Any approved termination may be added to the minimum equivalent length listed.*

***G61MPV-60C-110 must have 90° street ell (supplied) installed directly into unit flue collar.*

****G61MPV-60D-135 must have 3" to 2" reducing ell (supplied) installed directly into unit flue collar.*

TABLE 34
MAXIMUM VENT PIPE LENGTHS

ALTITUDE	G61MPV MODEL	MAXIMUM EQUIVALENT VENT LENGTH FEET			
		2" dia.	2-1/2" dia.	3" dia.	4" dia.
0 - 4500 (0 - 1371 m)	045	59	65	77	234
	070	59	65	78	214
	071†	59	65	78	214
	090	26	42	72	204
	091†	26	42	72	204
	110*	n/a	32	72	179
	111†	n/a	32	72	179
	135**‡	n/a	n/a	61	160
4501-7500 (1372-2286 m)	045	59	65	77	234
	070	59	65	78	214
	0701†	59	65	78	214
	090	26	42	72	204
	091†	26	42	72	204
	110*	n/a	32	72	179
	111†	n/a	32	72	179
	135**‡	n/a	n/a	46	160
7501 - 10000 (2287 - 3048 m)	045	59	65	77	234
	070	59	65	78	214
	071†	59	65	78	214
	090	26	42	72	204
	091†	26	42	72	204
	110*	n/a	32	72	179
	111†	n/a	32	72	179
	135**‡	n/a	n/a	46	160

n/a -- Not allowed.

**G61MPV-60C-110 must have 90° street ell (supplied) installed directly into unit flue collar.*

***G61MPV-60D-135 must have 3" to 2" reducing ell (supplied) installed directly into unit flue collar.*

†On G61MPV-071, -091 and -111 units, sweep elbows must be used for all 90° elbows in the venting system when 2", 2-1/2" or 3" vent pipe is used. Sweep elbows are recommended for use in vent systems of other G61MPV units.

‡ On G61MPV-60D-135 units, sweep elbows must be used for all 90° elbows in the vent system when 3" pipe is used.

B-PVC Joint Cementing Procedure

All cementing of joints should be done according to the specifications outlined in ASTM D 2855.

⚠ WARNING

DANGER OF EXPLOSION!

Fumes from PVC glue may ignite during system check. Allow fumes to dissipate for at least 5 minutes before placing unit into operation.

1 - Measure and cut vent pipe to desired length.

2 - Debur and chamfer end of pipe, removing any ridges or rough edges. If end is not chamfered, edge of pipe may remove cement from fitting socket and result in a leaking joint.

3 - Clean and dry surfaces to be joined.

4 - Test fit joint and mark depth of fitting on outside of pipe.

5 - Uniformly apply liberal coat of PVC primer for PVC or ABS cleaner for ABS to inside socket surface of fitting and male end of pipe to depth of fitting socket.

6 - Promptly apply solvent cement to end of pipe and inside socket surface of fitting. Cement should be applied lightly but uniformly to inside of socket. Take care to keep excess cement out of socket. Apply second coat to end of pipe.

NOTE - Time is critical at this stage. Do not allow primer to dry before applying cement.

7 - Immediately after applying last coat of cement to pipe, and while both inside socket surface and end of pipe are wet with cement, forcefully insert end of pipe into socket until it bottoms out. Turn pipe 1/4 turn during assembly (but not after pipe is fully inserted) to distribute cement evenly.

NOTE - Assembly should be completed within 20 seconds after last application of cement. Hammer blows should not be used when inserting pipe.

8 - After assembly, wipe excess cement from pipe at end of fitting socket. A properly made joint will show a bead around its entire perimeter. Any gaps may indicate a defective assembly due to insufficient solvent.

9 - Handle joints carefully until completely set.

C- Venting Practices

The thickness of construction through which vent pipes may be installed is 24" (610mm) maximum and 3/4" (19mm) minimum. If a G61MPV furnace replaces a furnace which was commonly vented with another gas appliance, the size of the existing vent pipe for that gas appliance must be checked. Without the heat of the original furnace flue products, the existing vent pipe is probably oversized for the single water heater or other appliance. The vent should be checked for proper draw with the remaining appliance.

1. Use recommended piping materials for exhaust piping.
2. Secure all joints so that they are gas-tight using approved cement.

   Suspend piping using hangers at a minimum of every 5 feet (1.52m) for schedule 40 PVC and every 3 feet (.91m) for ABS-DWV, PVC-DWV, SPR-21 PVC, and SDR-26 PVC piping. A suitable hanger can be fabricated by using metal or plastic strapping or a large wire tie.

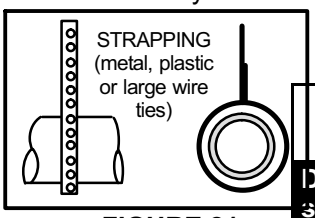


FIGURE 21

3. In areas where piping penetrates joists or interior walls, hole must be large enough to allow clearance on all sides of pipe through center of hole using a hanger.
4. Isolate piping at the point where it exits the outside wall or roof in order to prevent transmission of vibration to the structure.
5. When furnace is installed in a residence where unit is shut down for an extended period of time, such as a vacation home, make provisions for draining condensate collection trap and lines.

Exhaust Piping (Figures 22 and 23)

NOTE - A 2" diameter street ell is strapped to the blower deck of 60C-110 units. Street ell ***must be*** *glued directly into the unit flue collar. See figure 22. A 3" to 2" reducing ell is strapped to the blower deck of the 60D-135 units.* ***In upflow or downflow applications,*** *the reducing ell* ***must be*** *glued directly into the unit flue collar.*

1. Choose the appropriate side for venting in upflow or downflow positions. Exhaust piping exits from the top of the unit in horizontal air discharge applications. Glue the field-provided exhaust vent pipe (or provided street ell or reducing ell in upflow or downflow applications) to the flue collar. All cement joints should be made according to the specifications outlined in ASTM D 2855. Refer to pipe and fittings specifications and gluing procedures.

⚠ IMPORTANT

Exhaust piping and condensate trap must be installed on the same side of the unit in upflow and dowflow applications.

2. All horizontal runs of exhaust pipe must slope back toward unit. A minimum of 1/4" (6mm) drop for each 12" (305mm) of horizontal run is mandatory for drainage. Horizontal runs of exhaust piping must be supported every 5 feet (1.52m) using hangers.

   NOTE - Exhaust piping should be checked carefully to make sure there are no sags or low spots.

3. On the opposite side of the cabinet, glue the provided 2" vent plug into the unused flue collar.
4. Route piping to outside of structure. Continue with installation following instructions given in piping termination section.

⚠ CAUTION

Do not discharge exhaust into an existing stack or stack that also serves another gas appliance. If vertical discharge through an existing unused stack is required, insert PVC pipe inside the stack until the end is even with the top or outlet end of the metal stack.

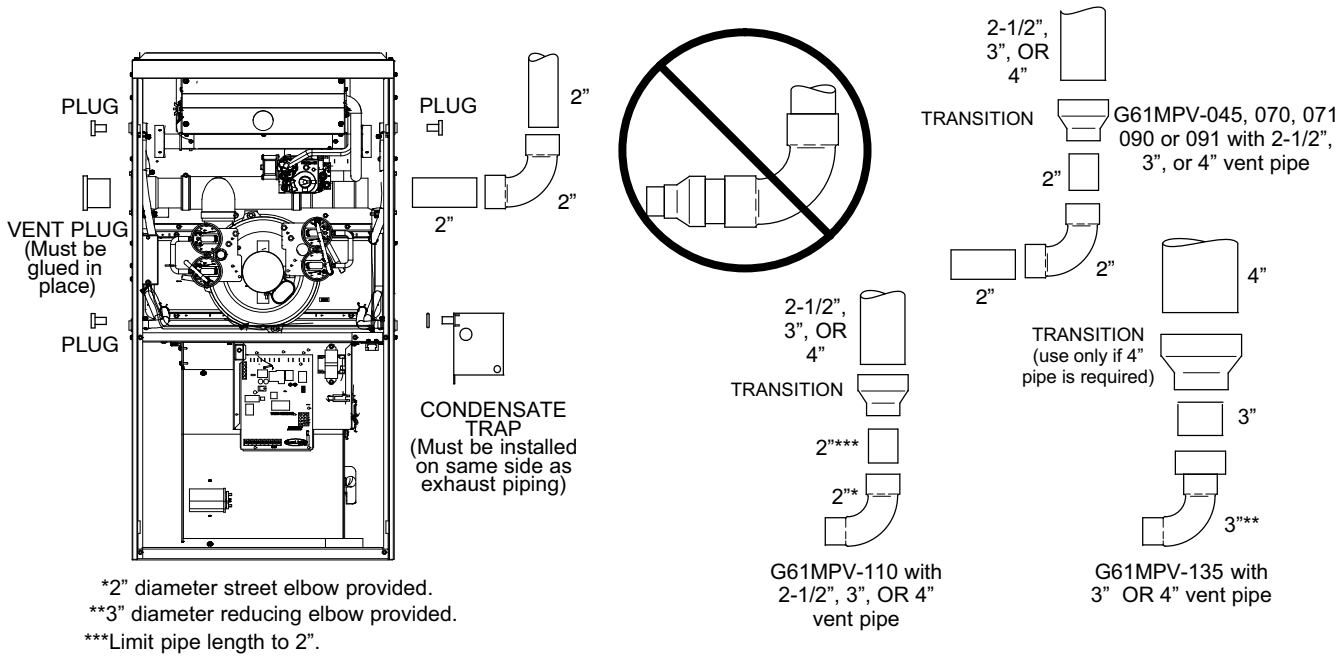
⚠ CAUTION

The exhaust vent pipe operates under positive pressure and must be completely sealed to prevent leakage of combustion products into the living space.

TYPICAL EXHAUST PIPE CONNECTIONS AND CONDENSATE TRAP INSTALLATION

IN UPFLOW OR DOWNFLOW DIRECT OR NON–DIRECT VENT APPLICATIONS

(Right–Hand Exit in Upflow Application Shown)



*2" diameter street elbow provided.
**3" diameter reducing elbow provided.
***Limit pipe length to 2".

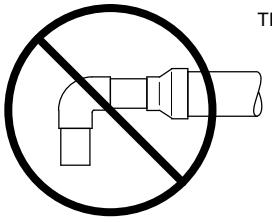
FIGURE 22

TYPICAL EXHAUST PIPE CONNECTIONS

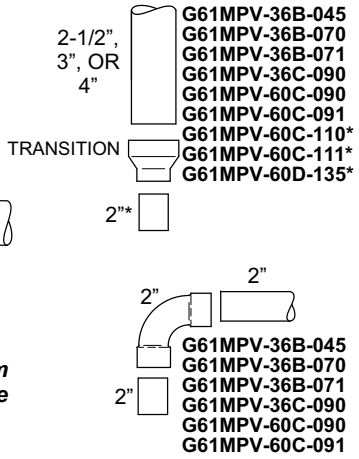
HORIZONTAL DIRECT OR NON–DIRECT VENT APPLICATIONS

(Horizontal Right–Hand Air Discharge Application Shown)

**Limit pipe length to 2" in G61MPV-110 and -135 applications.*



DO NOT transition from smaller to larger pipe size in horizontal runs.



G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091
G61MPV-60C-110*
G61MPV-60C-111*
G61MPV-60D-135*

G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091

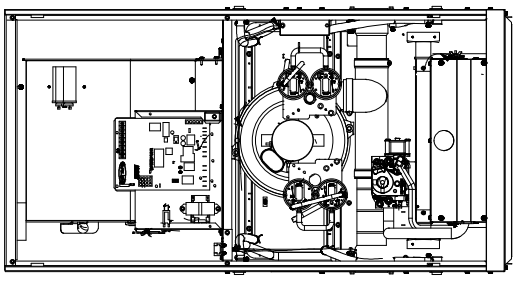


FIGURE 23

Intake Piping

The G61MPV furnace may be installed in either **direct vent** or **non-direct vent** applications. In non-direct vent applications, when intake air will be drawn into the furnace from the surrounding space, the indoor air quality must be considered and guidelines listed in Combustion, Dilution and Ventilation Air section must be followed.

The G61MPV unit is designed for either left-side or right-side air intake connections in either upflow or downflow applications. In horizontal applications, air intake must be brought in through the top. Intake air piping is independent of exhaust piping.

Follow the next four steps when installing the unit in **direct vent applications,** where combustion air is taken from outdoors and flue gases are discharged outdoors. **The provided air intake screen must not be used in direct vent applications.**

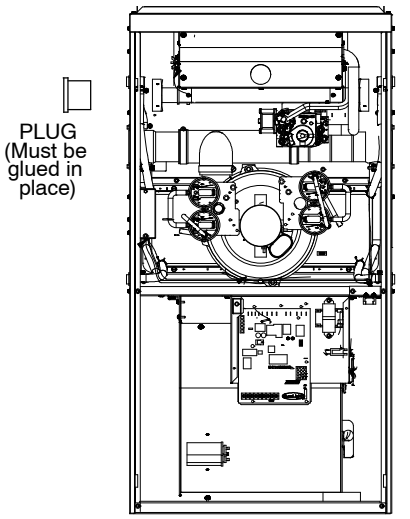
1 - Cement intake piping in slip connector located on the side of the burner box.

2 - Use a sheet metal screw to secure the intake pipe to the connector, if desired. A pilot indentation is provided in the slip connector to assist in locating and starting the fastener.

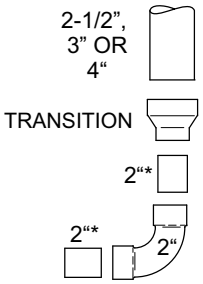
3 - Glue the provided 2" plug into the unused air intake connector on the opposite side of the cabinet.

4 - Route piping to outside of structure. Continue with installation following instructions given in general guide lines for piping terminations and in intake and exhaust piping terminations for direct vent sections. Refer to figure 24 for pipe sizes.

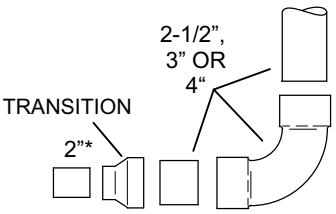
TYPICAL AIR INTAKE PIPE CONNECTIONS
UPFLOW OR DOWNFLOW DIRECT VENT APPLICATIONS
(Right−Hand Exit in Upflow Application Shown)



G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091



G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091
G61MPV-60C-110*
G61MPV-60C-111*



G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091
G61MPV-60C-110*
G61MPV-60C-111*
G61MPV-60D-135*

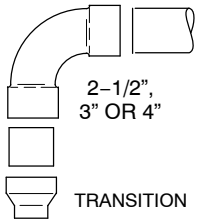
**Limit pipe length to 2” in G61MPV-110, -111 and -135 applications.*

FIGURE 24

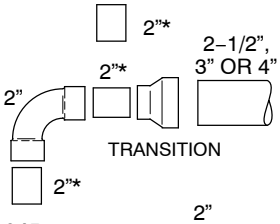
TYPICAL AIR INTAKE PIPE CONNECTIONS
HORIZONTAL DIRECT VENT APPLICATIONS
(Horizontal Right−Hand Air Discharge Application Shown)

**Limit pipe length to 2” in G61MP-110, -111 and -135 applications.*

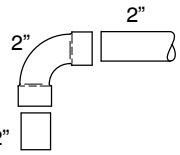
G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091
G61MPV-60C-110*
G61MPV-60C-111*
G61MPV-60D-135*



G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091
G61MPV-60C-110*
G61MPV-60C-111*



G61MPV-36B-045
G61MPV-36B-070
G61MPV-36B-071
G61MPV-36C-090
G61MPV-60C-090
G61MPV-60C-091



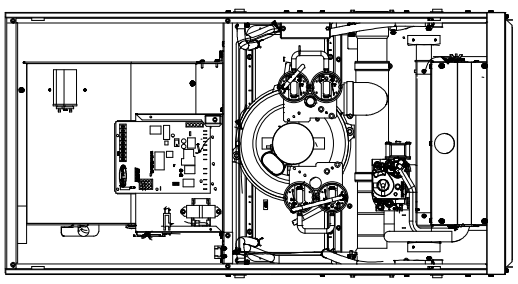
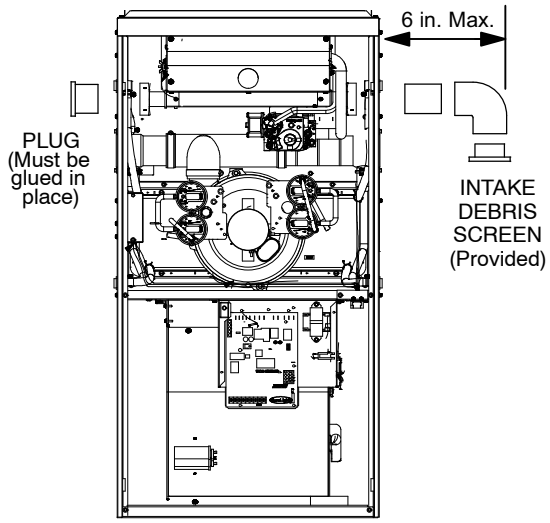


FIGURE 25

Follow the next three steps when installing the unit in **Non-Direct Vent applications** where combustion air is taken from indoors and flue gases are discharged outdoors**.**

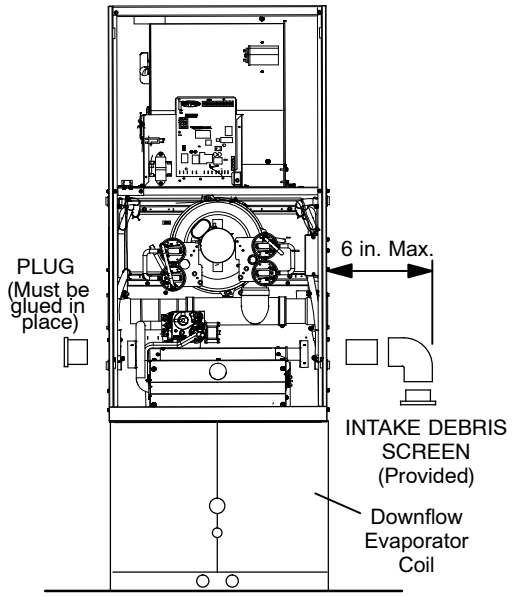
TYPICAL AIR INTAKE PIPE CONNECTIONS
UPFLOW OR HORIZONTAL NON−DIRECT VENT APPLICATIONS
(Right−Hand Exit in Upflow Application Shown)

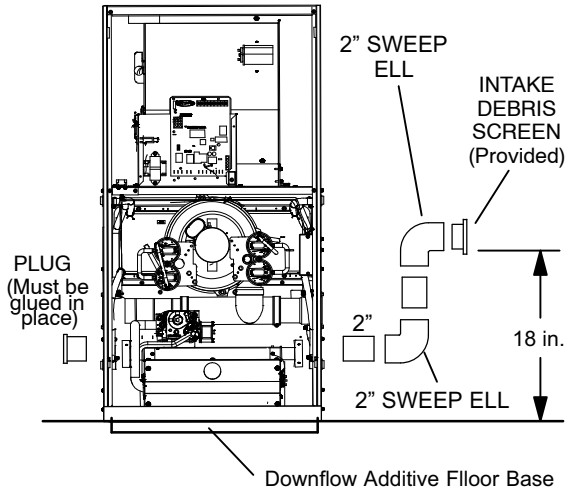


NOTE - Debris screen and elbow may be rotated, so that screen may be positioned to face forward, backward or downward.

FIGURE 26

TYPICAL AIR INTAKE PIPE CONNECTIONS
DOWNFLOW NON−DIRECT VENT APPLICATIONS
(Right−Hand Exit in Downflow Applications Shown)





NOTE - Debris screen and sweep ell may be rotated, so that screen may be positioned to face forward, backward or to the side.

FIGURE 27

1 - Use field-provided materials and the factory-provided air intake screen to route the intake piping as shown in figures 26 and 27. Maintain a minimum clearance of 3" (76mm) around the air intake opening. The air intake opening (with the protective screen) should always be directed either downward or straight out. Use 2" pipe and fittings only and make sure that the air intake does not extend more than 6" beyond the G61MPV cabinet. **The air intake connector must not be located near the floor. To avoid this complication in downflow applications which do not include a downflow evaporator coil,** the intake air routing should be modified as shown in figure 27.

2 - Use a sheet metal screw to secure the intake pipe to the connector, if desired. A pilot indentation is provided in the slip connector to assist in locating and starting the fastener.

3 - Glue the provided 2" plug into the unused air intake connector on the opposite side of the cabinet.

Testing for Proper Venting and Sufficient Combustion Air (Non-Direct Vent Applications Only)

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD!

Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.
The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation.

After the G61MPV gas furnace has been started, the following test should be conducted to ensure proper venting and sufficient combustion air has been provided to the G61MPV, as well as to other gas-fired appliances which are separately vented. The test should be conducted while all appliances (both in operation and those not in operation) are connected to the venting system being tested. If the venting system has been installed improperly, or if provisions have not been made for sufficient amounts of combustion air, corrections must be made as outlined in the previous section.

1 - Seal any unused openings in the venting system.

2 - Visually inspect the venting system for proper size and horizontal pitch. Determine there is no blockage or restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.

3 - To the extent that it is practical, close all building doors and windows and all doors between the space in which the appliances connected to the venting system are located and other spaces of the building.

4 - Close fireplace dampers.

5 - Turn on clothes dryers and any appliances not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan.

6 - Follow the lighting instruction to place the appliance being inspected into operation. Adjust thermostat so appliance will operate continuously.

7 - Use the flame of a match or candle to test for spillage of flue gases at the draft hood relief opening after 5 minutes of main burner operation.

8 - If improper venting is observed during any of the above tests, the venting system must be corrected or sufficient combustion/make-up air must be provided. The venting system should be re-sized to approach the minimum size as determined by using the appropriate tables in appendix G in the current standards of the National Fuel Gas Code ANSI-Z223.1/NPFA 54 in the U.S.A., and the appropriate Natural Gas and Propane appliances venting sizing tables in the current standard of the CSA-B149 Natural Gas and Propane Installation Codes in Canada.

9 - After determining that each appliance remaining connected to the common venting system properly vents when tested as indicated in step 3, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous condition of use.

General Guidelines for Vent Terminations for Non-Direct Vent Installations.

In Non-Direct Vent applications, combustion air is taken from indoors and the flue gases are discharged to the outdoors. The G61MPV is then classified as a non-direct vent, Category IV gas furnace. In Non-Direct Vent applications, the vent termination is limited by local building codes. In the absence of local codes, refer to the current National Fuel Gas Code ANSI Z223-1/NFPA 54 in U.S.A., and current CSA-B149 Natural Gas and Propane Installation Codes in Canada for details.

Position termination end according to location given in figure 28. In addition, position termination end so it is free from any obstructions and above the level of snow accumulation (where applicable). The termination should be at least 12 inches (305mm) from any opening through which flue products could enter the building.

At vent termination, care must be taken to maintain protective coatings over building materials (prolonged exposure to exhaust condensate can destroy protective coatings). It is recommended that the exhaust outlet not be located within 6 feet (1.8m) of a condensing unit because the condensate can damage the painted coating.

NOTE - If winter design temperature is below 32°F (0°C), exhaust piping should be insulated with 1/2" (13mm), Armaflex or equivalent when run through unheated space. Do not leave any surface area of exhaust pipe open to outside air; exterior exhaust pipe should be insulated with 1/2" (13mm) Armaflex or equivalent. In extreme cold climate areas, 3/4" (19mm) Armaflex or equivalent may be necessary. Insulation on outside runs of exhaust pipe must be painted or wrapped to protect insulation from deterioration. Exhaust pipe insulation may not be necessary in some specific applications.

NOTE - During extremely cold temperatures, below approximately 20°F (6.7°C), units with long runs of vent pipe through unconditioned space, even when insulated, may form ice in the exhaust termination that prevents the unit from operating properly. Longer run times of at least 5 minutes will alleviate most icing problems. Also, a heating cable may be installed on exhaust piping and termination to prevent freeze-ups. Heating cable installation kit is available from Lennox. See Condensate Piping section for part numbers.

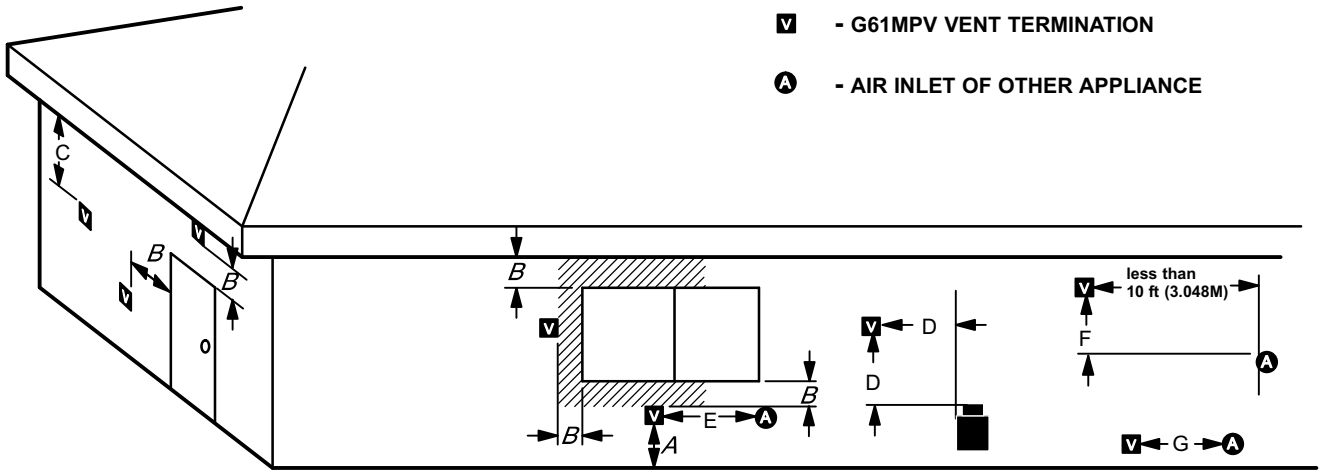
⚠ IMPORTANT

Do not use screens or perforated metal in exhaust terminations. Doing so will cause freeze-ups and may block the terminations.

⚠ IMPORTANT

For Canadian Installations Only:
In accordance to CSA International B149 installation codes, the minimum allowed distance between the combustion air intake inlet and the exhaust outlet of other appliances shall not be less than 12 inches (305mm).

VENT TERMINATION CLEARANCES FOR INSTALLATIONS IN THE USA AND CANADA*



A - *Clearance above grade* - 12 in. (305mm) minimum.

B - *Clearance to window or door* that may be opened -
for vent installations in USA - 12 in. (305mm) minimum.
for vent installations in Canada - 12 in. (305mm) minimum for appliances $\leq$ 100,000 Btuh (30 kW);
36 in. (0.9m) minimum for appliances > 100,000 Btuh (30 kW).

C - *Do not position terminations directly under roof eaves.*

D - *Clearance to electric meters, gas meters, regulators, and relief equipment* -
for vent installations in USA - 48 in (1219mm) minimum.
for vent installations in Canada - see current edition of CSA B149 Code.

E - *Clearance to non-mechanical air supply inlet or outlet*
for vent installations in USA - 48 in. (1219mm) minimum horizontal and below, 12 in. (305mm) minimum above.
for vent installations in Canada - 12 in. (305mm) minimum for appliances $\leq$ 100,000 Btuh (30 kW);
36 in. (0.9m) minimum for appliances > 100,000 Btuh (30 kW).

F - *Clearance to mechanical air supply inlet* --
for vent installations in USA - 36 in. minimum (914mm**).**

G - *Clearance to mechanical air supply inlet* --
for vent installations in Canada - 72 in. (1829mm) minimum.

H - *Do not point terminations into recessed areas such as window wells, stairwells or alcoves.*

J - *Do not position terminations directly above a walkway.*

* Note -
(I) Dimensions are from the current edition of The National Fuel Gas Code - ANSI-Z223.1/NFPA 54 for USA installations. In Canada, refer to current edition of CSA B149 installation codes. Local codes or regulations may require different clearances.

(II) In Non-Direct Vent installations, combustion air is taken from indoors and the flue gases are discharged to the outdoors.

FIGURE 28

Details of Intake and Exhaust Piping Terminations for Direct Vent Installations

NOTE - In Direct Vent installations, combustion air is taken from outdoors and flue gases are discharged to outdoors.

Intake and exhaust pipes may be routed either horizontally through an outside wall or vertically through the roof. In attic or closet installations, vertical termination through the roof is preferred. Figures 29 through 37 show typical terminations.

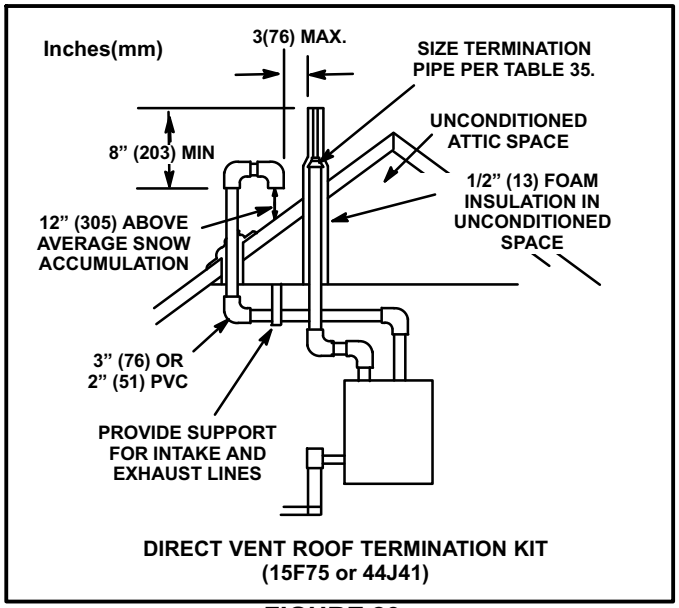
1. Exhaust and intake exits must be in same pressure zone. Do not exit one through the roof and one on the side. Also, do not exit the intake on one side and the exhaust on another side of the house or structure.
2. Intake and exhaust pipes should be placed as close together as possible at termination end (refer to illustrations). Maximum separation is 3" (76mm) on roof terminations and 6" (152mm) on side wall terminations.
3. If necessary, install a field-provided reducer to adapt larger vent pipe size to termination pipe size.
4. On roof terminations, the intake piping should terminate straight down using two 90° elbows (See figure 29).
5. Exhaust piping must terminate straight out or up as shown. In rooftop applications, a reducer may be required on the exhaust piping at the point where it exits the structure to improve the velocity of exhaust away from the intake piping. See table 35.

   NOTE - Care must be taken to avoid recirculation of exhaust back into intake pipe.
6. On field supplied terminations for side wall exits, exhaust piping should extend a maximum of 12 inches (305mm) beyond the outside wall unless supported. Intake piping should be as short as possible. See figure 30.
7. On field supplied terminations, a minimum separation distance between the end of the exhaust pipe and the end of the intake pipe is 8 inches (203mm).
8. If intake and exhaust piping must be run up a side wall to position above snow accumulation or other obstructions, piping must be supported every 3 ft. (.9m) as shown in figure 21. Refer to figure 33 for proper piping method. In addition, WTK wall termination kit must be extended for use in this application. See figure 36. When exhaust and intake piping must be run up an outside wall, the exhaust piping must be terminated with pipe sized per table 35. The intake piping may be equipped with a 90° elbow turndown. Using turndown will add 5 feet (1.5m) to the equivalent length of the pipe.
9. Based on the recommendation of the manufacturer, a multiple furnace installation may use a group of up to four termination kits WTK assembled together horizontally, as shown in figure 35.

TABLE 35
EXHAUST PIPE TERMINATION SIZE REDUCTION

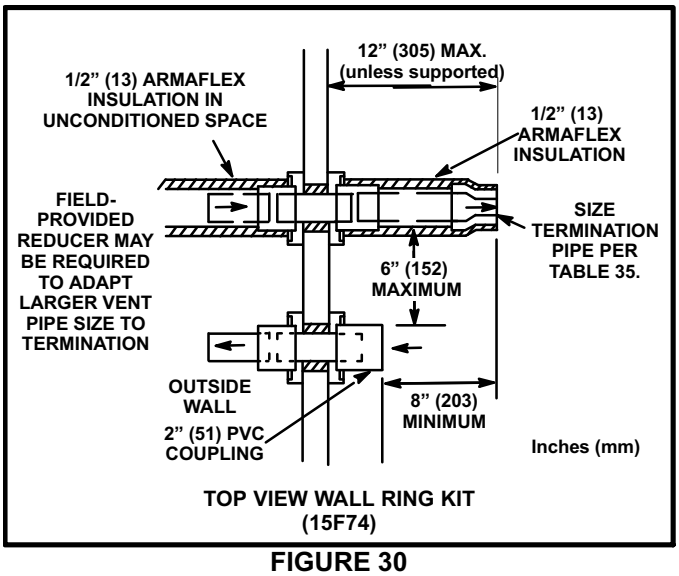
G61MPV MODEL	Exhaust Pipe Size	Termination Pipe Size
045, 070, -071	2", 2-1/2", 3" or 4"	1-1/2"
090, 091	2", 2-1/2", 3" or 4"	2"
110, 111	2-1/2", 3" or 4"	2"*
135	3" or 4"	2"*

**Approved 3" concentric termination kit terminates with 2-5/8" ID pipe.*



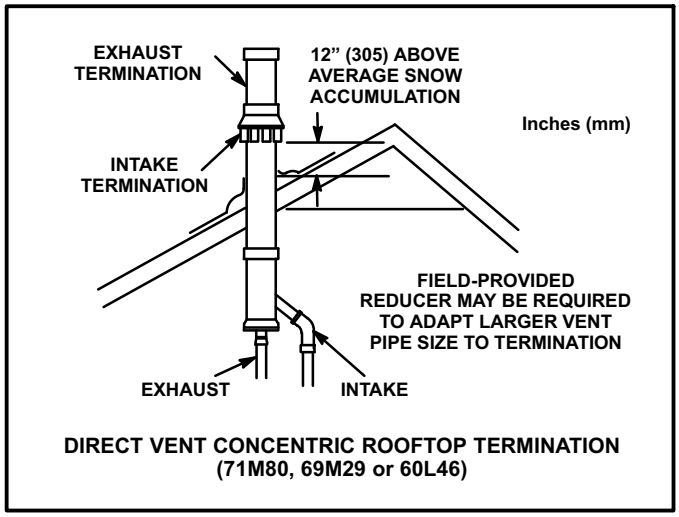
DIRECT VENT ROOF TERMINATION KIT (15F75 or 44J41)

FIGURE 29



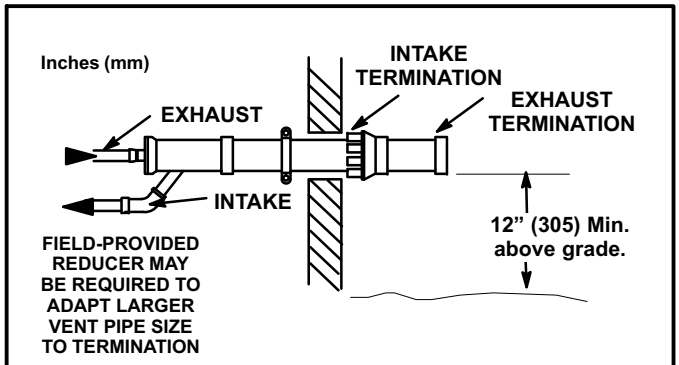
TOP VIEW WALL RING KIT (15F74)

FIGURE 30



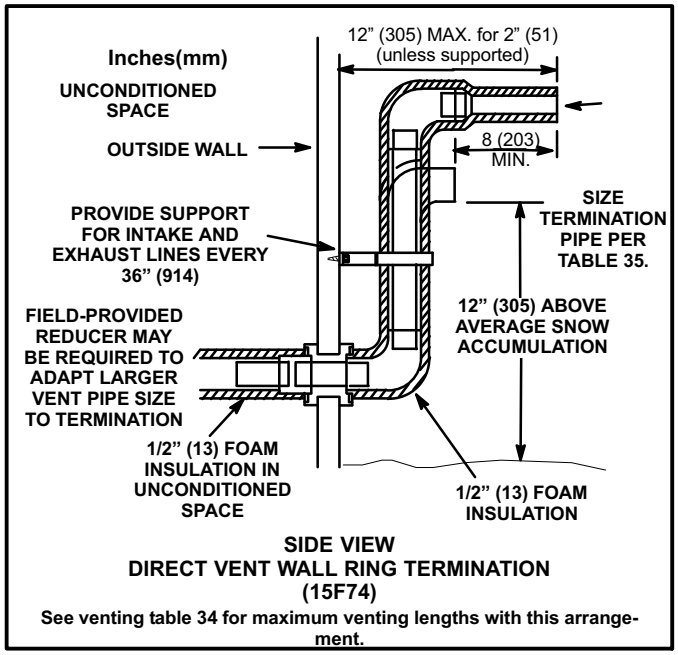
DIRECT VENT CONCENTRIC ROOFTOP TERMINATION (71M80, 69M29 or 60L46)

FIGURE 31



DIRECT VENT CONCENTRIC WALL TERMINATION (71M80, 69M29 or 60L46)

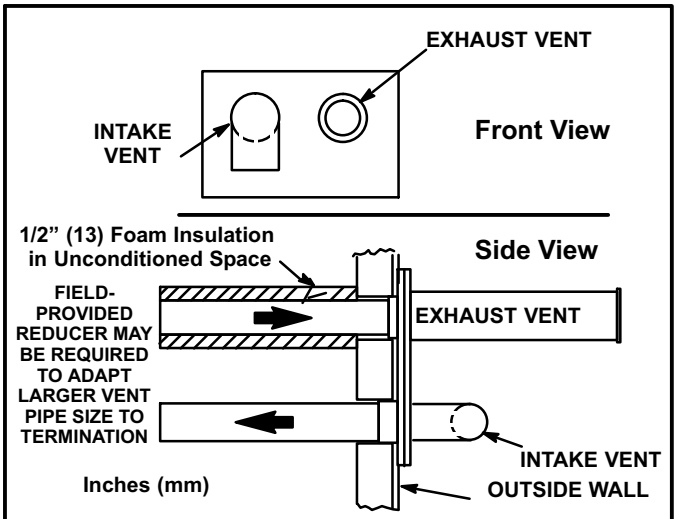
FIGURE 32



SIDE VIEW
DIRECT VENT WALL RING TERMINATION (15F74)

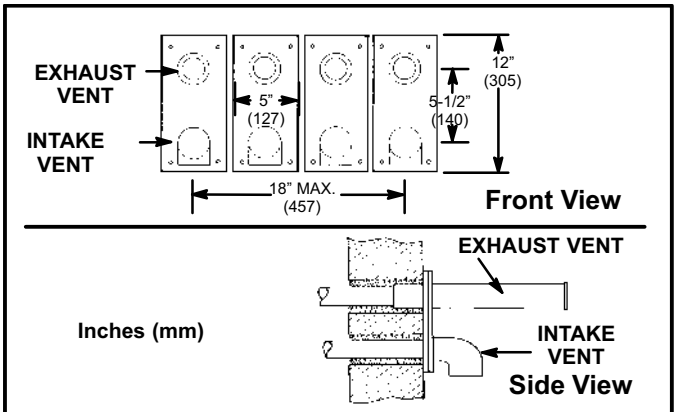
See venting table 34 for maximum venting lengths with this arrangement.

FIGURE 33



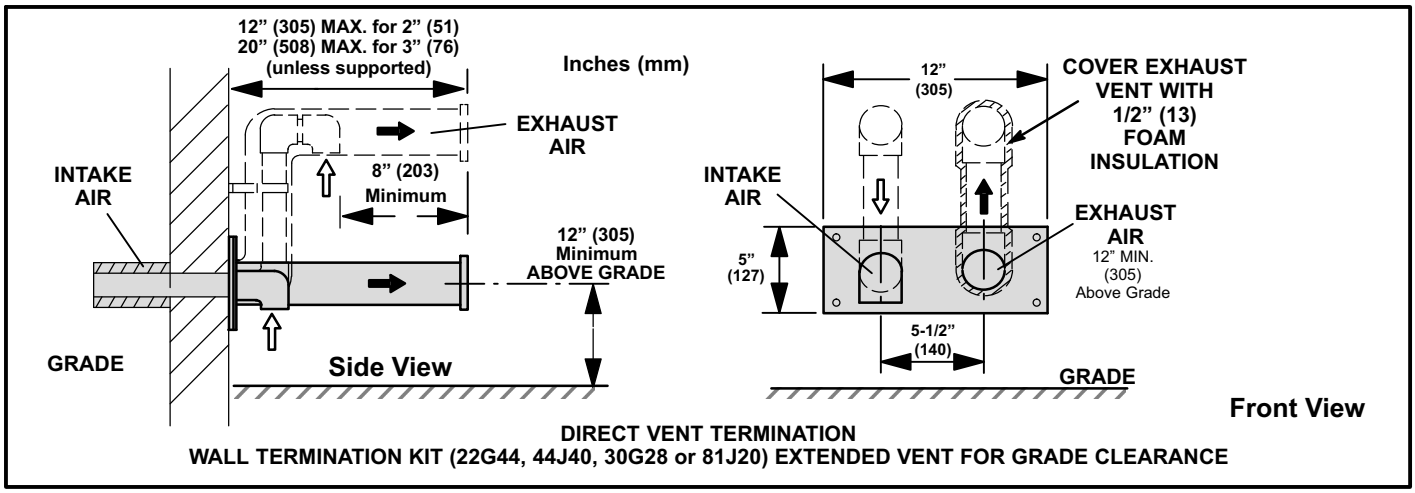
DIRECT VENT WALL TERMINATION KIT (22G44, 44J40, 30G28 or 81J20)

FIGURE 34



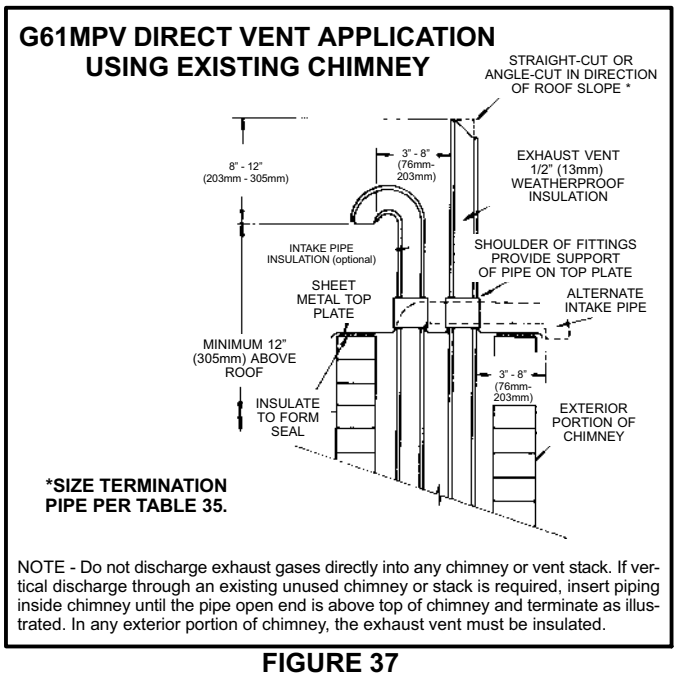
OPTIONAL VENT TERMINATION FOR MULTIPLE UNIT INSTALLATION OF DIRECT VENT WALL TERMINATION KIT WTK

FIGURE 35



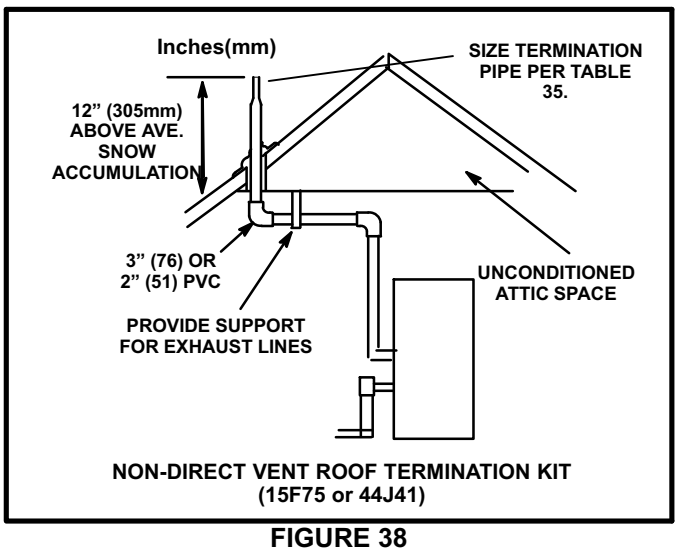
DIRECT VENT TERMINATION
WALL TERMINATION KIT (22G44, 44J40, 30G28 or 81J20) EXTENDED VENT FOR GRADE CLEARANCE

FIGURE 36



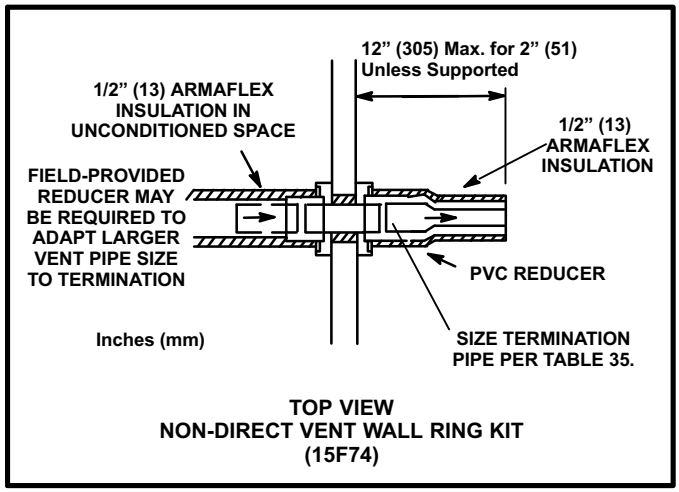
NOTE - Do not discharge exhaust gases directly into any chimney or vent stack. If vertical discharge through an existing unused chimney or stack is required, insert piping inside chimney until the pipe open end is above top of chimney and terminate as illustrated. In any exterior portion of chimney, the exhaust vent must be insulated.

FIGURE 37



NON-DIRECT VENT ROOF TERMINATION KIT
(15F75 or 44J41)

FIGURE 38



TOP VIEW
NON-DIRECT VENT WALL RING KIT
(15F74)

FIGURE 39

Details of Exhaust Piping Terminations for Non-Direct Vent Applications

Exhaust pipes may be routed either horizontally through an outside wall or vertically through the roof. In attic or closet installations, vertical termination through the roof is preferred. Figures 38 through 41 show typical terminations.

1. Exhaust piping must terminate straight out or up as shown. The termination pipe must be sized as listed in table 35.The specified pipe size ensures proper velocity required to move the exhaust gases away from the building.
2. On field supplied terminations for side wall exits, exhaust piping should extend a maximum of 12 inches (305mm) beyond the outside wall, unless support is provided in the horizontal section. See figure 39.
3. If exhaust piping must be run up a side wall to position above snow accumulation or other obstructions, piping must be supported every 3 feet (.9m) as shown in figure 21. Refer to figure 40 for proper piping method. When exhaust piping must be run up an outside wall, any reduction in exhaust pipe size must be done after the final elbow.

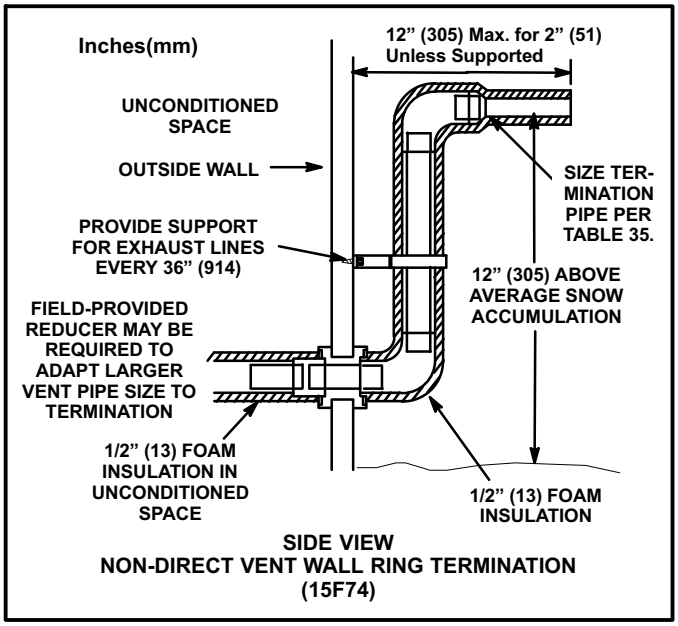
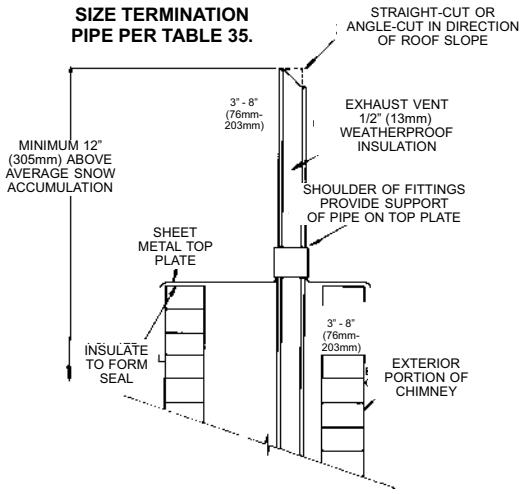


FIGURE 40

G61MPV NON-DIRECT VENT APPLICATION USING EXISTING CHIMNEY



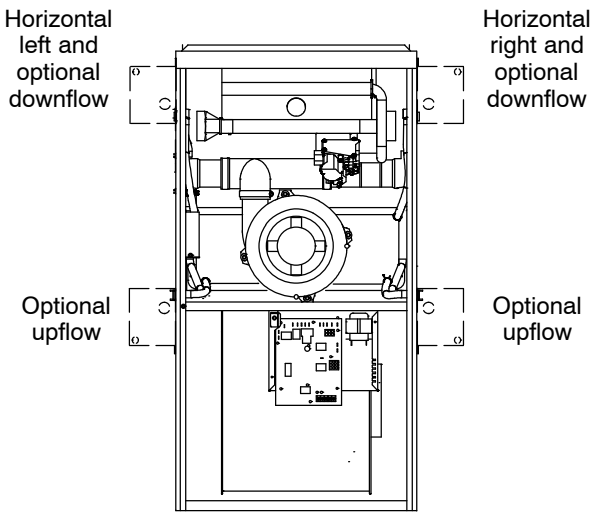
NOTE - Do not discharge exhaust gases directly into any chimney or vent stack. If vertical discharge through an existing unused chimney or stack is required, insert piping inside chimney until the pipe open end is above top of chimney and terminate as illustrated. In any exterior portion of chimney, the exhaust vent must be insulated.

FIGURE 41

Condensate Piping

This unit is designed for either right- or left-side exit of condensate piping in either upflow or downflow applications; however, it must be installed on the same side of the unit as the exhaust piping. In horizontal applications, the condensate trap should extend below the unit. A 5-1/2" service clearance is required for the condensate trap. Refer to figure 42 for condensate trap locations.

CONDENSATE TRAP LOCATIONS
(Unit shown in upflow position)



NOTE - In upflow applications where side return air filter is installed on same side as the condensate trap, filter rack must be installed beyond condensate trap to avoid interference.

FIGURE 42

1 - Determine which side condensate piping will exit the unit. Remove plugs from the condensate collar at the appropriate location on the side of the unit.

NOTE - The condensate trap is factory-shipped with two rubber O-rings and two rubber clean-out caps installed. Check to make sure that these items are in place before installing the trap assembly.

2 - Install condensate trap onto the condensate collar. Use provided HI/LO screws to secure two upper flanges of the trap to the collar. Use provided sheet metal screw to secure bottom trap flange to side of unit. See figure 43.

NOTE - In upflow and downflow applications, condensate trap must be installed on the same side as exhaust piping.

⚠ CAUTION

DO NOT use a power driver to tighten screws which secure condensate trap to cabinet. Screws should be hand-tightened using a screw driver to avoid the possibility of damage to the trap assembly.

3 - Glue the field-provided coupling or pipe to the trap. Install a tee and vent pipe near the trap.

NOTE - The condensate trap drain stubs (both sides) have an outer diameter which will accept a standard 3/4" PVC coupling. The inner diameter of each stub will accept standard 1/2" diameter PVC pipe.

NOTE - Vinyl tubing may be used for condensate drain. Tubing must be 1-1/4" OD X 1" ID and should be attached to the drain stubs on the trap using a hose clamp.

4 - Glue the field-provided drain line to the tee. Route the drain line to an open drain. As an alternate, clear vinyl tubing may be used to drain condensate away from the trap. Secure the vinyl tubing to the drain stubs on the trap using a hose clamp. Do not overtighten the hose clamp.

Condensate line must be sloped downward away from condensate trap to drain. If drain level is above condensate trap, condensate pump must be used. Condensate drain line should be routed within the conditioned space to avoid freezing of condensate and blockage of drain line. If this is not possible, a heat cable kit may be used on the condensate trap and line. Heating cable kit is available from Lennox in various lengths; 6 ft. (1.8m) - kit no. 26K68; 24 ft. (7.3m) - kit no. 26K69; and 50 ft. (15.2m) - kit no. 26K70.

⚠ CAUTION

Do not use copper tubing or existing copper condensate lines for drain line.

5 - If unit will be started immediately upon completion of installation, prime trap per procedure outlined in Unit Start-Up section.

6 - Glue the provided cap onto the unused condensate drain line stub.

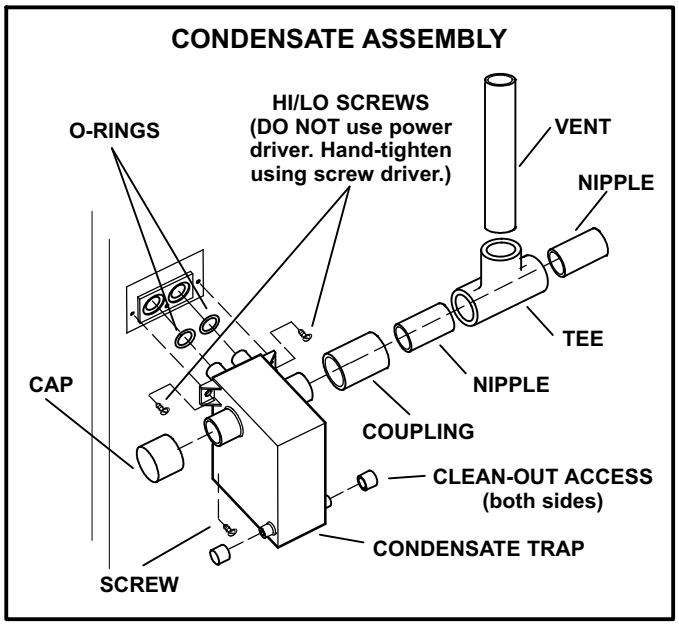


FIGURE 43

III-START-UP

A-Preliminary and Seasonal Checks

1 - Inspect electrical wiring, both field and factory installed for loose connections. Tighten as required.

2 - Check voltage at disconnect switch. Voltage must be within range listed on the nameplate. If not, consult the power company and have voltage condition corrected before starting unit.

B-Heating Start-Up

FOR YOUR SAFETY READ BEFORE OPERATING

⚠ WARNING

Shock and burn hazard.

G61MPV units are equipped with a hot surface ignition system. Do not attempt to light manually.

BEFORE LIGHTING the unit, smell all around the furnace area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

The gas valve on the G61MPV may be equipped with either a gas control knob or gas control lever. Use only your hand to push the lever or turn the gas control knob. Never use tools. If the the lever will not move or the knob will not push in or turn by hand, do not try to repair it. Force or attempted repair may result in a fire or explosion.

Placing the furnace into operation:

G61MPV units are equipped with a SureLight® ignition system. Do not attempt to manually light burners on this furnace. Each time the thermostat calls for heat, the burners will automatically light. The ignitor does not get hot when there is no call for heat on units with SureLight® ignition system.

Priming Condensate Trap

The condensate trap should be primed with water prior to start-up to ensure proper condensate drainage. Either pour 10 fl. oz. (300 ml) of water into the trap, or follow these steps to prime the trap:

1 - Follow the lighting instructions to place the unit into operation.

2 - Set the thermostat to initiate a heating demand.

3 - Allow the burners to fire for approximately 3 minutes.

4 - Adjust the thermostat to deactivate the heating demand.

5 - Wait for the combustion air inducer to stop. Set the thermostat to initiate a heating demand and again allow the burners to fire for approximately 3 minutes.

6 - Adjust the thermostat to deactivate the heating demand and again wait for the combustion air inducer to stop. At this point, the trap should be primed with sufficient water to ensure proper condensate drain operation.

⚠ WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or death.

Gas Valve Operation (Figures 44 and 45)

1 - **STOP**! Read the safety information at the beginning of this section.

2 - Set the thermostat to the lowest setting.

3 - Turn off all electrical power to the unit.

4 - This furnace is equipped with an ignition device which automatically lights the burners. Do **not** try to light the burners by hand.

5 - Remove the upper access panel.

6 - *Honeywell VR8205 Gas Valve* - Turn knob on gas valve clockwise ↷ to **OFF**. Do not force. See figure 44.

White Rodgers 36E Gas Valve - Switch gas valve lever to **OFF**. See figure 45 for the White Rodgers 36E valve.

7 - Wait five minutes to clear out any gas. If you then smell gas, STOP! Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas go to next step.

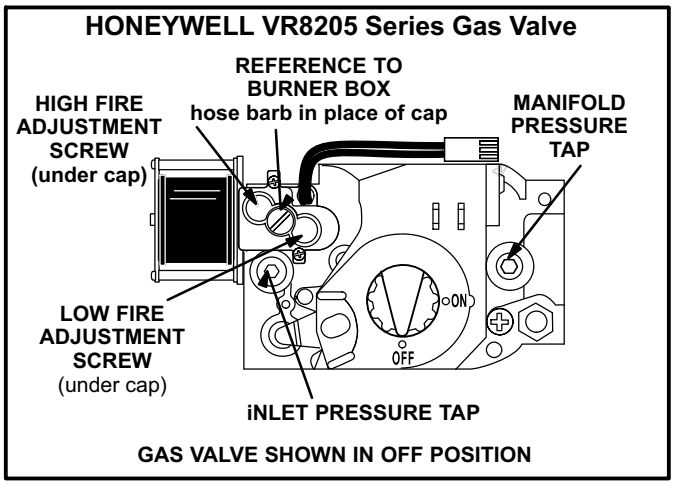


FIGURE 44

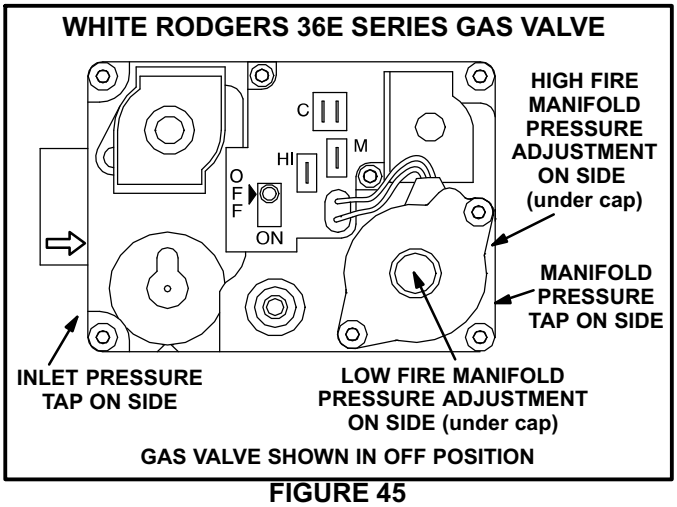


FIGURE 45

8 - *Honeywell VR8205 Gas Valve* - Turn knob on gas valve counterclockwise to **ON**. Do not force.
White Rodgers 36E Gas Valve - Switch gas valve lever to **ON**. See figure 45 for the White Rodgers 36E valve.

9 - Replace the upper access panel.

10- Turn on all electrical power to to the unit.

11- Set the thermostat to desired setting.

NOTE - When unit is initially started, steps 1 through 11 may need to be repeated to purge air from gas line.

12- If the appliance will not operate, follow the instructions "Turning Off Gas to Unit" and call your service technician or gas supplier.

Turning Off Gas to Unit

1 - Set the thermostat to the lowest setting.

2 - Turn off all electrical power to the unit if service is to be performed.

3 - Remove the upper access panel.

4 - *Honeywell VR8205 Gas Valve* - Turn knob on gas valve clockwise to **OFF**. Do not force.
White Rodgers 36E Gas Valve - Switch gas valve lever to **OFF**.

5 - Replace the upper access panel.

C-Safety or Emergency Shutdown

Turn off unit power. Close manual and main gas valves.

D-Extended Period Shutdown

Turn off thermostat or set to "UNOCCUPIED" mode. Close all gas valves (both internal and external to unit) to guarantee no gas leak into combustion chamber. Turn off power to unit. All access panels and covers must be in place and secured.

IV-HEATING SYSTEM SERVICE CHECKS

A-C.S.A. Certification

All units are C.S.A. (formally A.G.A. and C.G.A. combined) design certified without modifications. Refer to the G61MPV Installation Instruction.

B-Gas Piping

⚠CAUTION

If a flexible gas connector is required or allowed by the authority that has jurisdiction, black iron pipe shall be installed at the gas valve and extend outside the furnace cabinet.

⚠ WARNING

Do not exceed 600 in-lbs (50 ft-lbs) torque when attaching the gas piping to the gas valve.

Gas supply piping should not allow more than 0.5"W.C. drop in pressure between gas meter and unit. Supply gas pipe must not be smaller than unit gas connection.

Compounds used on gas piping threaded joints should be resistant to action of liquefied petroleum gases.

C-Testing Gas Piping

⚠ IMPORTANT

In case emergency shutdown is required, turn off the main shut-off valve and disconnect the main power to unit. These controls should be properly labeled by the installer.

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5psig (14" W.C.). See figure 46.

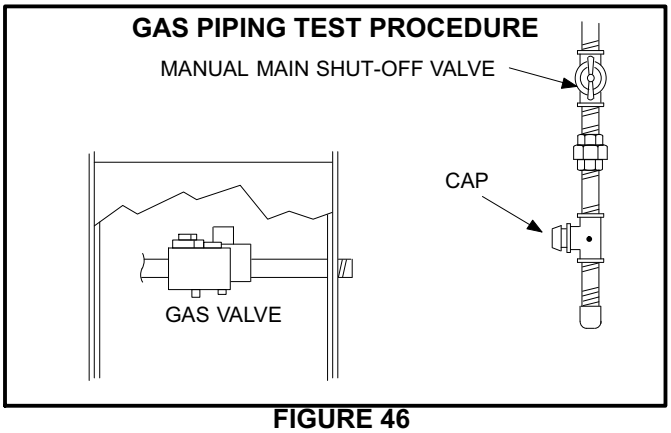


FIGURE 46

When checking piping connections for gas leaks, use preferred means. Kitchen detergents can cause harmful corrosion on various metals used in gas piping. Use of a specialty Gas Leak Detector is strongly recommended. It is available through Lennox under part number 31B2001. See Corp. 8411-L10, for further details.

Do not use matches, candles, flame or any other source of ignition to check for gas leaks.

D-Testing Gas Supply Pressure

When testing supply gas pressure, connect test gauge to inlet pressure tap on the gas valve. See figures and 44 and 45. Check gas line pressure with unit firing at maximum rate. Low pressure may result in erratic operation or underfire. High pressure can result in permanent damage to gas valve or overfire. See table 36 for operating pressure at unit gas connection (line).

On multiple unit installations, each unit should be checked separately, with and without units operating. Supply pressure must fall within range listed in table 36.

TABLE 36

All G61MPV Units	Natural	LP
Line Pressure WC"	4.5 - 10.5	11.0 - 13.0

E-Check Manifold Pressure

After line pressure has been checked and adjusted, check manifold pressure. Move pressure gauge to outlet pressure tap located on unit gas valve (GV1). Checks of manifold pressure are made as verification of proper regulator adjustment. Manifold pressure for the G61MPV can be measured at any time the gas valve is open and is supplying gas to the unit. See table 40 for manifold pressures.

⚠ IMPORTANT

For safety, connect a shut-off valve between the manometer and the gas tap to permit shut off of gas pressure to the manometer.

The gas valve is factory set and should not require adjustment. All gas valves are factory regulated *sensing atmospheric pressure.*

Manifold Pressure Measurement & Adjustment

NOTE - Pressure test adapter kit (10L34) is available from Lennox to facilitate manifold pressure measurement.

1 - Connect test gauge to outlet tap on gas valve.

2 - Disconnect pressure sensing hose from gas valve and plug hose using tape or equivalent. Leave hose barb on valve open.

3 - Start unit on low heat and allow 5 minutes for unit to reach steady state.

4 - While waiting for the unit to stabilize, notice the flame. Flame should be stable and should not lift from burner. Natural gas should burn blue.

5 - After allowing unit to stabilize for 5 minutes, record manifold pressure and compare to value given in table 40.

6 - Repeat steps 3, 4 and 5 on high heat.

NOTE - Shut unit off and remove manometer as soon as an accurate reading has been obtained. Take care to replace pressure tap plug.

NOTE - During this test procedure, the unit will be overfiring:

- Operate unit only long enough to obtain accurate reading to prevent overheating heat exchanger.
- Attempts to clock gas meter during this procedure will be inaccurate. Measure gas flow rate only during normal unit operation.

7 - When test is complete remove obstruction from hose and return hose to gas valve barbed fitting.

F- Proper Gas Flow (Approximate)

Furnace should operate at least 5 minutes before checking gas flow. Determine time in seconds for **two** revolutions of gas through the meter. (Two revolutions assures a more accurate time.) **Divide by two** and compare to time in table 37 below. If manifold pressure matches table 36 and rate is incorrect, check gas orifices for proper size and restriction.

NOTE- To obtain accurate reading, shut off all other gas appliances connected to meter.

TABLE 37

GAS METER CLOCKING CHART				
G61MPV Unit	Seconds for One Revolution			
	Natural		LP	
	1 cu ft Dial	2 cu ft Dial	1 cu ft Dial	2 cu ft DIAL
-45	82	164	205	410
-70, -071	55	110	136	272
-90, -091	41	82	102	204
-110, -111	33	66	82	164
-135	27	54	68	136
Natural-1000 btu/cu ft LP-2500 btu/cu ft				

⚠ IMPORTANT

For safety, shut unit off and remove manometer as soon as an accurate reading has been obtained. Take care to replace pressure tap plug.

G- Proper Combustion

Furnace should operate minimum 15 minutes with correct manifold pressure and gas flow rate before checking combustion. See sections E- and F-. Take combustion sample beyond the flue outlet and compare to the following tables. The maximum carbon monoxide reading should not exceed 100 ppm.

TABLE 38
High Heat

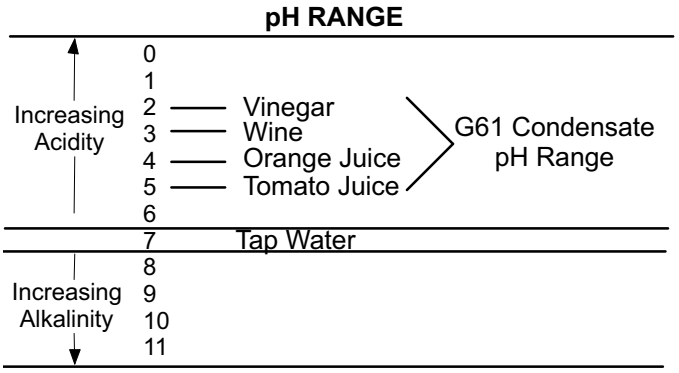
Unit	CO_2% For Nat	CO_2% For L.P.
G61MPV-36B-045	6.0 - 7.0	6.9 - 7.9
G61MPV-36B-070	6.5 - 7.6	7.4 - 8.4
G61MPV-36B-071	6.9 - 8.2	8.3 - 9.8
G61MPV-36C-090	6.9 - 8.0	7.8 - 8.8
G61MPV-60C-090	6.7 - 7.7	7.8 - 8.8
G61MPV-60C-091	7.6 - 8.9	8.7 - 10.2
G61MPV-60C-110	7.2 - 8.2	8.1 - 9.1
G61MPV-60C-111	7.5 - 8.8	8.7 - 10.2
G61MPV-60D-135	7.4 - 8.5	8.3 - 9.3

TABLE 39
Low Heat

Unit	CO_2% For Nat	CO_2% For L.P.
G61MPV-36B-045	4.3 - 5.3	4.8 - 5.8
G61MPV-36B-070	4.8 - 5.8	5.3 - 6.3
G61MPV-36B-071	5.0 - 6.2	5.7 - 7.0
G61MPV-36C-090	5.1 - 6.5	5.9 - 6.9
G61MPV-60C-090	5.1 - 6.5	5.9 - 6.9
G61MPV-60C-091	5.4 - 6.7	6.2 - 7.4
G61MPV-60C-110	5.3 - 6.5	6.1 - 7.1
G61MPV-60C-111	5.3 - 6.5	6.1 - 7.4
G61MPV-60D-135	6.5 - 7.5	6.7 - 7.7

H- Condensate pH Range

The condensate is mildly acidic and can be measured with pH indicators. The pH scale is a measurement of acidity and alkalinity. The following scale shows the relative pH of some common liquids as compared with condensate of G61MPV units. The concentration of the acidity of all these fluids including the condensate is very low and harmless.



I- High Altitude

NOTE - In Canada, certification for installations at elevations over 4500 feet (1372 m) is the jurisdiction of local authorities.

The manifold pressure may require adjustment to ensure proper operation at higher altitudes. Refer to tables 40, 41 and 42 for proper manifold pressure settings at varying altitudes and required pressure switch changes and conversion kits at varying altitudes.

The combustion air pressure switches are factory-set and require no adjustment.

NOTE - A natural to L.P. propane gas changeover kit is necessary to convert this unit. Refer to the changeover kit installation instruction for the conversion procedure.

TABLE 40
Conversion Kit Requirements and Manifold Pressures for Models -045, -070, -090, -110 and -135

Model Input Size	Gas	Altitude						Manifold Pressure at all altitudes			
		0-4500 ft. (0-1372 m)		4501-7500 ft. (1373-2286 m)		7501-10,000 (2287-3048 m)		Low Fire		High Fire	
		Required Conversion Kit	Pressure Switch	Required Conversion Kit	[1]Pressure Switch	Required Conversion Kit	[1]Pressure Switch	in. w.g.	kPa	in. w.g.	kPa
-045	Nat	N/A	No Change	N/A	No Change	59M17	No Change	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	No Change	59M14	No Change	4.9	1.22	10.0	2.5
-070	Nat	N/A	No Change	N/A	No Change	59M17	56M23	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	No Change	59M14	56M23	4.9	1.22	10.0	2.5
-090	Nat	N/A	No Change	N/A	75M22	59M17	56M21	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	75M22	59M14	56M21	4.9	1.22	10.0	2.5
36C-090-9 and later models	Nat	N/A	No Change	N/A	24W51	59M17	24W49	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	24W51	59M14	24W49	4.9	1.22	10.0	2.5
-110	Nat	N/A	No Change	N/A	56M23	59M17	56M23	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	56M23	59M14	56M23	4.9	1.22	10.0	2.5
-110-6 and later	Nat	N/A	No Change	N/A	56M23	59M17	75M22	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	56M23	59M14	75M22	4.9	1.22	10.0	2.5
-135	Nat	N/A	No Change	N/A	56M93	59M17	56M93	1.7	0.42	3.5	0.87
	LPG	59M13	No Change	59M13	56M93	59M14	56M93	4.9	1.22	10.0	2.5

Pressure switch is factory set. No adjustment necessary. All models use the factory installed pressure switch from 0-4500 feet (0-1370 m).
1 Oder two pressure switches for conversion

TABLE 41
Conversion Kit Requirements for Models -071, -091 and -111

Input Size	Gas	Altitude												
		0 - 2000 ft. (0 - 610 m)		2001 - 4500 ft. (611 - 1372 m)		4501 - 5500 ft. (1373 - 1676 m)		5501 - 6500 ft. (1677-1981 m)		6501 - 7500 ft. (1982 - 2286 m)		7501 - 10,000 (2287 - 3048 m)		
		Required Conversion Kit	Pressure Switch *	Required Conversion Kit	Pressure Switch *	Required Conversion Kit	Pressure Switch *	Required Conversion Kit	Pressure Switch *	Required Conversion Kit	Pressure Switch *	Required Conversion Kit	Pressure Switch *	Replacement Orifice Size
-071	Nat	N/A	No change	N/A	75M22	N/A	75M22	N/A	75M22	N/A	75M22	59M17	56M21	0.086
	LPG	59M13	No change	59M13	75M22	59M13	75M22	59M13	75M22	59M13	75M22	59M14	56M21	0.052
-091	Nat	N/A	No change	N/A	26W85	N/A	26W85	N/A	26W85	N/A	26W85	47M82	26W86	0.081
	LPG	59M13	No change	59M13	26W85	59M13	26W85	59M13	26W85	59M13	26W85	59M14	26W86	0.052
-111	Nat	N/A	No change	N/A	56M22	N/A	56M22	N/A	56M22	N/A	56M22	47M82	56M23	0.081
	LPG	59M13	No change	59M13	56M22	59M13	56M22	59M13	56M22	59M13	56M22	59M14	56M23	0.052

NOTE - Pressure switch is factory set. No adjustment necessary.
**Two pressure switch assemblies required per unit.*

TABLE 42
Manifold Pressures at Different Altitudes for Models -071, -091 and -111

Model Input Size	Gas	Altitude											
		0 - 2000 ft. (0 - 610 m)		2001 - 4500 ft. (611 - 1372 m)		4501 - 5500 ft. (1373 - 1676 m)		5501 - 6500 ft. (1677 - 1981 m)		6501 - 7500 ft. (1982 - 2286 m)		7501 - 10,000 (2287 - 3048 m)	
		Low Fire	High Fire	Low Fire	High Fire	Low Fire	High Fire	Low Fire	High Fire	Low Fire	High Fire	Low Fire	High Fire
-071	Nat	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5	1.7	3.5
	LPG	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0
-091	Nat	1.7	3.5	1.7	3.4	1.7	3.3	1.7	3.2	1.7	3.1	1.7	3.5
	LPG	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0
-111	Nat	1.7	3.5	1.7	3.4	1.7	3.3	1.7	3.2	1.7	3.1	1.7	3.5
	LPG	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0	4.9	10.0

J-Flame Signal

A microamp DC meter is needed to check the flame signal on the ignition control.

Flame (microamp) signal is an electrical current which passes from the furnace control through the sensor during unit operation. Current passes from the sensor through the flame to ground to complete a safety circuit.

To Measure Flame Signal - Ignition Control:

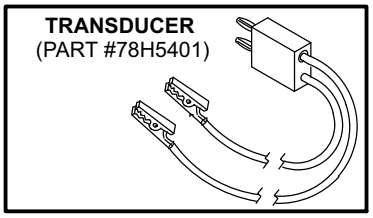


FIGURE 47

A transducer (Part #78H5401 available from Lennox Repair Parts) is required to measure flame signal if meter used will not read a low micro amp signal. See figure 47. The transducer converts microamps to volts on a 1:1 conversion. See figures 14 and 15 for flame signal. A digital readout meter must be used. The transducer plugs into most meters. See figure 48 for proper use of transducer.

1 - Set the volt meter to the DC voltage scale. Insert transducer into the VDC and common inputs. Observe correct polarities. Failure to do so results in negative (-) values.

2 - Turn off supply voltage to control.

3 - Disconnect ignition control flame sensor wire from the flame sensor.

4 - Connect (-) lead of the transducer to flame sensor.

5 - Connect (+) lead of transducer to the ignition control sensor wire.

6 - Turn supply voltage on and close thermostat contacts to cycle system.

7 - When main burners are in operation for two minutes, take reading. Remember 1 DC volt = 1 DC microamp.

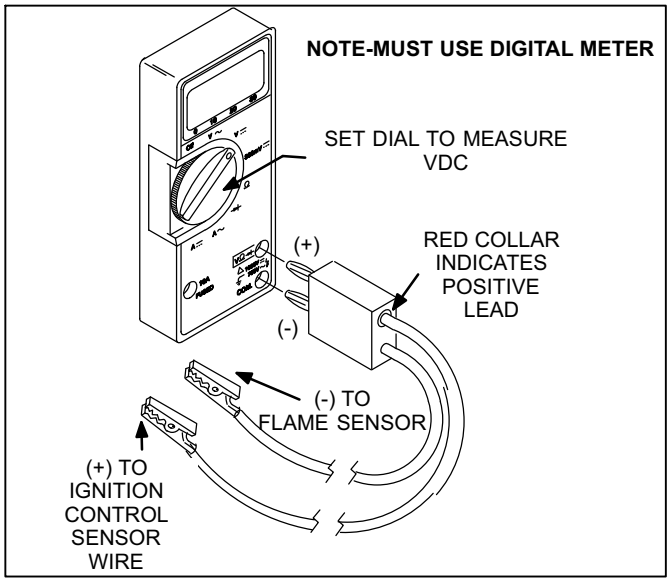


FIGURE 48

V-TYPICAL OPERATING CHARACTERISTICS

A-Blower Operation and Adjustment

1 - Blower operation is dependent on thermostat control system.

2 - Generally, blower operation is set at thermostat subbase fan switch. With fan switch in ON position, blower operates continuously. With fan switch in AUTO position, blower cycles with demand or runs continuously while heating or cooling circuit cycles.

3 - Depending on the type of indoor thermostat, blower and entire unit will be off when the system switch is in OFF position.

B-Temperature Rise

Temperature rise for G61MPV units depends on unit input, blower speed, blower horsepower and static pressure as marked on the unit rating plate. The blower speed must be set for unit operation within the range of "TEMP. RISE °F" listed on the unit rating plate.

To Measure Temperature Rise:

1 - Place plenum thermometers in the supply and return air plenums. Locate supply air thermometer in the first horizontal run of the plenum where it will not pick up radiant heat from the heat exchanger.

2 - Set thermostat for heat call. Unit must operate on second-stage heat. *If using a single-stage thermostat furnace must fire at least 10 minutes before switching to second-stage heat.*

3 - After plenum thermometers have reached their highest and steadiest readings, subtract the two readings. The difference should be in the range listed on the unit rating plate. If the temperature is too low, decrease blower speed. If temperature is too high, first check the firing rate. Provided the firing rate is acceptable, increase blower speed to reduce temperature. To change blower speed taps see tables 9 and 11.

C-External Static Pressure

1 - Tap locations shown in figure 49.

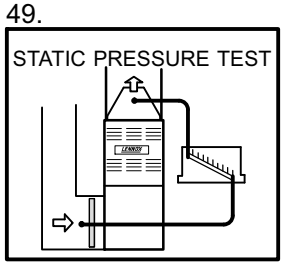


FIGURE 49

2 - Punch a 1/4" diameter hole in supply and return air plenums. Insert manometer hose flush with inside edge of hole or insulation. Seal around the hose with permagum. Connect the zero end of the manometer to the discharge (supply) side of the system. On ducted systems, connect the other end of manometer to the return duct as above. For systems with non-ducted returns, leave the other end of the manometer open to the atmosphere.

3 - With only the blower motor running and the evaporator coil dry, observe the manometer reading. Adjust blower motor speed to deliver the air desired according to the job requirements.

4 - External static pressure drop must not be more than 0.8" W.C.

5 - Seal around the hole when the check is complete.

VI-MAINTENANCE

⚠WARNING

ELECTRICAL SHOCK, FIRE, OR EXPLOSION HAZARD.

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.
Improper servicing could result in dangerous operation, serious injury, death, or property damage.
Before servicing, disconnect all electrical power to furnace.
When servicing controls, label all wires prior to disconnecting. Take care to reconnect wires correctly.
Verify proper operation after servicing.

At the beginning of each heating season, system should be checked as follows by a qualified service technician:

Blower

Check the blower wheel for debris and clean if necessary. The blower motors are prelubricated for extended bearing life. No further lubrication is needed.

⚠WARNING

The blower access panel must be securely in place when the blower and burners are operating. Gas fumes, which could contain carbon monoxide, can be drawn into living space resulting in personal injury or death.

Filters

Filters should be inspected monthly. Clean or replace the filters when necessary to ensure proper furnace operation. Replacement filters must be rated for high velocity airflow. Table 43 lists recommended filter sizes.

TABLE 43

Furnace Cabinet Size	Filter Size	
	Side Return	Bottom Return
17-1/2”	16 X 25 X 1 (1)	16 X 25 X 1 (1)
21”	16 X 25 X 1 (1)	20 X 25 X 1 (1)
24-1/2”	16 X 25 X 1 (2)	24 X 25 X 1 (1)

Exhaust and air intake pipes

Check the exhaust and air intake pipes and all connections for tightness and to make sure there is no blockage.

Electrical

1 - Check all wiring for loose connections.
2 - Check for the correct voltage at the furnace (furnace operating).
3 - Check amp-draw on the blower motor.
Motor Nameplate_____Actual_____

Winterizing and Condensate Trap Care

1 - Turn off power to the unit.
2 - Have a shallow pan ready to empty condensate water.
3 - Remove the drain plug from the condensate trap and empty water. Inspect the trap then reinstall the drain plug.

Cleaning Heat Exchanger

If cleaning the heat exchanger becomes necessary, follow the below procedures and refer to figure 1 when disassembling unit. Use papers or protective covering in front of furnace while removing heat exchanger assembly.

⚠ IMPORTANT

Safety glasses and surgical mask should be worn when cleaning heat exchanger and or burner assembly.

1 - Turn off electrical and gas supplies to the furnace.
2 - Remove the upper and lower furnace access panels.
3 - Mark all gas valve wires and disconnect them from valve.
4 - Remove gas supply line connected to gas valve. Remove gas valve/manifold assembly.
5 - Remove sensor wire from sensor. Disconnect 2-pin plug from the ignitor.
6 - Disconnect wires from flame roll-out switches.
7 - Remove burner box cover and remove four burner box screws at the vestibule panel and remove burner box. Set burner box assembly aside. G61MPV-135 only - Remove and discard two additional shipping screws. See figure 50.
NOTE - If necessary, clean burners at this time. Follow procedures outlined in Burner Cleaning section.
8 - Loosen three clamps and remove flexible exhaust tee.

G61MPV-135 ONLY

Remove and discard two shipping screws.

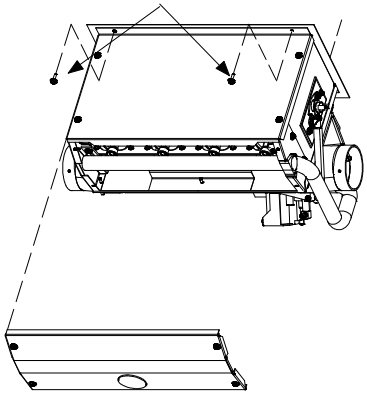


FIGURE 50

9 - Remove 3/8 inch rubber cap from condensate drain plug and drain. Replace cap after draining.

10 - Disconnect condensate drain line from the condensate trap. Remove condensate trap (it may be necessary to cut drain pipe). Remove screws that secure condensate collars to either side of the furnace and remove collars. Remove drain tubes from cold end header collector box.

11 - Disconnect condensate drain tubing from flue collar. Remove screws that secure both flue collars into place. Remove flue collars. It may be necessary to cut the exiting exhaust pipe for removal of the fittings.

12 - Mark and disconnect all combustion air pressure tubing from cold end header collector box.

13 - Mark and remove wires from pressure switches. Remove pressure switches. Keep tubing attached to pressure switches.

14 - Disconnect the 3-pin plug from the combustion air inducer. Disconnect the two wires to the backup secondary limit, if applicable. Remove four screws which secure combustion air inducer to collector box. Remove combustion air inducer assembly. Remove ground wire from vest panel.

15 - Remove electrical junction box from the side of the furnace.

16 - Mark and disconnect any remaining wiring to heating compartment components. Disengage strain relief bushing and pull wiring and bushing through the hole in the blower deck.

17 - Remove the primary limit from the vestibule panel.

18 - Remove two screws from the front cabinet flange at the blower deck. Spread cabinet sides slightly to allow clearance for removal of heat exchanger.

19 - Remove screws along vestibule sides and bottom which secure vestibule panel and heat exchanger assembly to cabinet. Remove two screws from blower rail which secure bottom heat exchanger flange. Remove heat exchanger from furnace cabinet.

20 - Back wash heat exchanger with soapy water solution or steam. **If steam is used it must be below 275°F (135°C) .**

21 - Thoroughly rinse and drain the heat exchanger. Soap solutions can be corrosive. Take care to rinse entire assembly.

22 - Reinstall heat exchanger into cabinet making sure that the clamshells of the heat exchanger assembly are resting on the support located at the rear of the cabinet. Remove the indoor blower to view this area through the blower opening.

23 - Re-secure the supporting screws along the vestibule sides and bottom to the cabinet.

24 - Reinstall cabinet screws on front flange at blower deck.

25 - Reinstall the primary limit on the vestibule panel.

26 - Route heating component wiring through hole in blower deck and reinsert strain relief bushing.

27 - Reinstall electrical junction box.

28 - Reinstall the combustion air inducer. Reconnect the 3-pin plug to the wire harness. Reconnect the two wires to the backup secondary limit, if applicable.

29 - Reinstall pressure switches and reconnect pressure switch wiring.

30 - Carefully connect combustion air pressure switch hosing from pressure switches to proper stubs on cold end header collector box.

31 - Reinstall condensate collars on each side of the furnace. Reconnect drain tubing to collector box.

32 - Reinstall condensate trap on same side as exhaust pipe. Reconnect condensate drain line to the condensate trap.

33 - Use securing screws to reinstall flue collars to either side of the furnace. Reconnect exhaust piping and exhaust drain tubing.

34 - Replace flexible exhaust tee on combustion air inducer and flue collars. Secure using three existing hose clamps.

35 - Reinstall burner box assembly in vestibule area.

36 - Reconnect flame roll-out switch wires.

37 - Reconnect sensor wire and reconnect 2-pin plug from ignitor.

38 - Secure burner box assembly to vestibule panel using four existing screws. **Make sure burners line up in center of burner ports.**

39 - Reinstall gas valve manifold assembly. Reconnect gas supply line to gas valve.

40 - Reinstall burner box cover.

41 - Reconnect wires to gas valve.

42 - Replace the blower compartment access panel.

43 - Refer to instruction on verifying gas and electrical connections when re-establishing supplies.

44 - Follow lighting instructions to light and operate furnace for 5 minutes to ensure that heat exchanger is clean and dry and that furnace is operating properly.

45 - Replace heating compartment access panel.

Cleaning the Burner Assembly

1 - Turn off electrical and gas power supplies to furnace. Remove upper and lower furnace access panels.

2 - Mark all gas valve wires and disconnect them from the valve.

3 - Disconnect the gas supply line from the gas valve. Remove gas valve/manifold assembly.

4 - Mark and disconnect sensor wire from the sensor. Disconnect 2-pin plug from the ignitor at the burner box.

5 - Remove burner box cover and remove four screws which secure burner box assembly to vest panel. Remove burner box from the unit. G61MPV-135 only - Remove and discard two additional shipping screws. See figure 50.

6 - Use the soft brush attachment on a vacuum cleaner to gently clean the face of the burners. Visually inspect the inside of the burners and crossovers for any blockage caused by foreign matter. Remove any blockage.

7 - Reconnect the sensor wire and reconnect the 2-pin plug to the ignitor wiring harness.

8 - Reinstall the burner box assembly using the existing four screws. Make sure that the burners line up in the center of the burner ports.

9 - Reinstall the gas valve manifold assembly. Reconnect the gas supply line to the gas valve. Reinstall the burner box cover.

10 - Reconnect the gas valve wires to the gas valve.

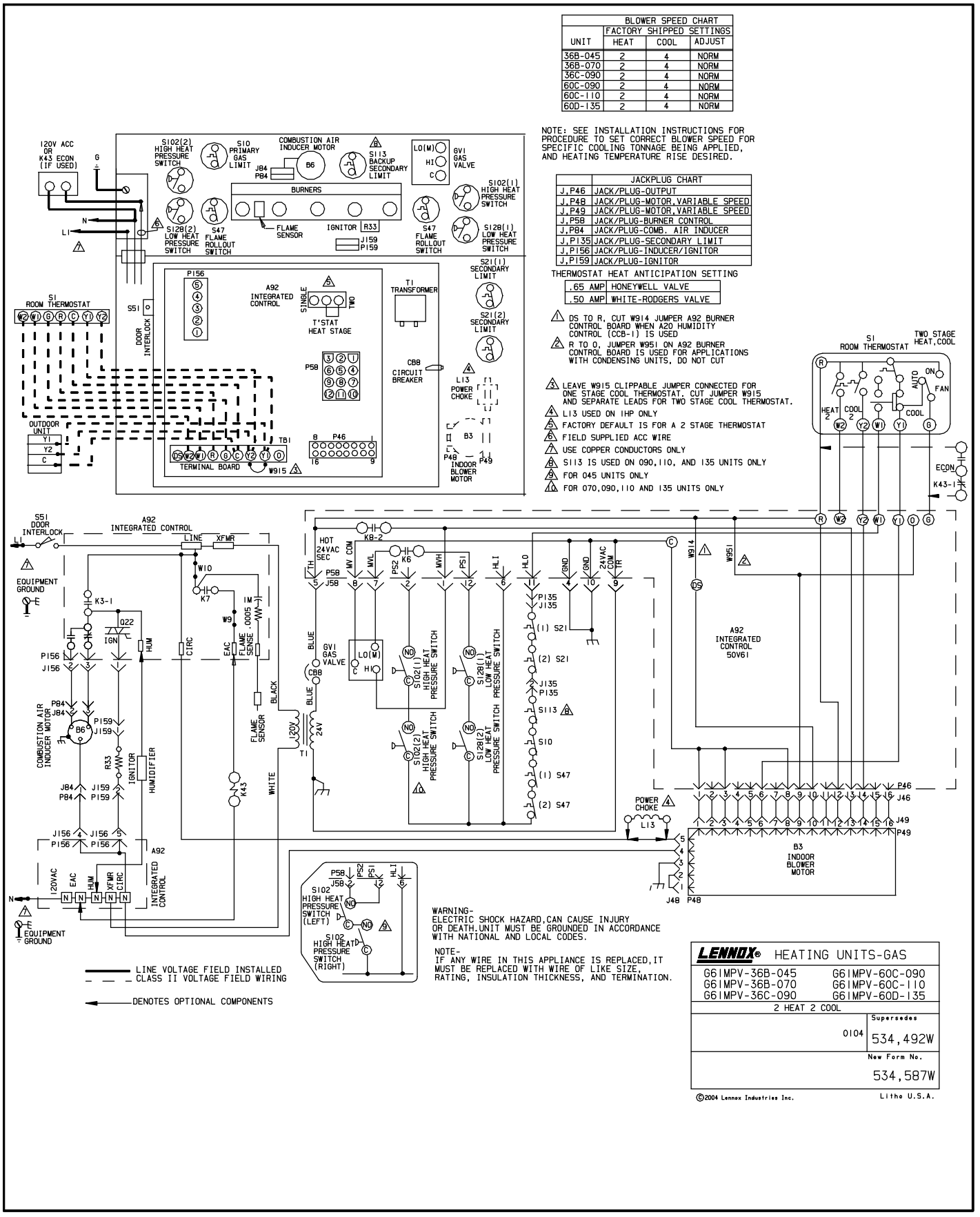
11 - Replace the blower compartment access panel.

12 - Refer to instruction on verifying gas and electrical connections when re-establishing supplies.

13 - Follow lighting instructions to light and operate furnace for 5 minutes to ensure that heat exchanger is clean and dry and that furnace is operating properly.

14 - Replace heating compartment access panel.

VII- Wiring and Sequence of Operation
A-SureLight Board 49M59



B-SureLight Board 49M59

Sequence depends on type thermostat used. G61MPV units are applicable for single stage or two stage thermostats. Both type thermostats are described below. Thermostat jumper E20 dictates which mode unit will operate in. See flow chart for more sequence detail.

SureLight Control Self Check

When there is a call for heat, the SureLight® integrated control runs a self check. The control checks for S10 primary limit, S21 secondary limit (s) and S47 rollout switch normally closed contacts. The control also checks for S102 high heat and S128 low heat prove switch normally open contacts. Once self check is complete and all safety switches are operational, heat call can continue.

Two-Stage Thermostat, Two-Stage Heat. Jumper E20 set at *"TWO".*

1- SureLight control energizes combustion air inducer B6 on low heat speed. Combustion air inducer runs until S128 low heat prove switch contacts close (switch must close within 2 1/2 minutes or control goes into Watchguard Pressure Switch mode. High heat prove switch S102 may also close). A 15 second pre-purge follows once S128 closes.

2- SureLight control begins 20 second ignitor warm up period.

3- Gas valve opens on first-stage for a 4 second trial for ignition. Ignitor stays energized during the trial or until flame sensed.

4- Flame is sensed, gas valve remains on first-stage heat, ignitor de-energizes.

5- After 45 second delay, indoor blower B3 is energized on low heat speed.

The furnace will stay in this mode until first-stage demand is satified OR a second-stage heat demand is initiated.

6- Second-stage heat demand initiated. A 30 second second-stage recognition period begins.

7- The combustion air inducer ramps up to high heat speed.

8- S102 high heat prove switch closes and the gas valve energizes second stage heat.

9- B3 indoor blower ramps up to high heat speed.

Single-Stage Thermostat, Two-Stage Heat. Jumper E20 set at "*SINGLE*"

1- SureLight control energizes combustion air inducer B6 on low heat speed. Combustion air inducer runs until S128 low heat prove switch contacts close (switch must close within 2 1/2 minutes or control goes into Watchguard Pressure Switch mode. High heat prove switch S102 may also close). A 15 second pre-purge follows once S128 closes.

2- SureLight control begins 20 second ignitor warm up period.

3- Gas valve opens on first stage for a 4 second trial for ignition. Ignitor stays energized during the trial or until flame sensed.

4- Flame is sensed, gas valve remains on first-stage heat, ignitor de-energizes.

5- After 45 second delay, indoor blower B3 is energized on low heat speed.

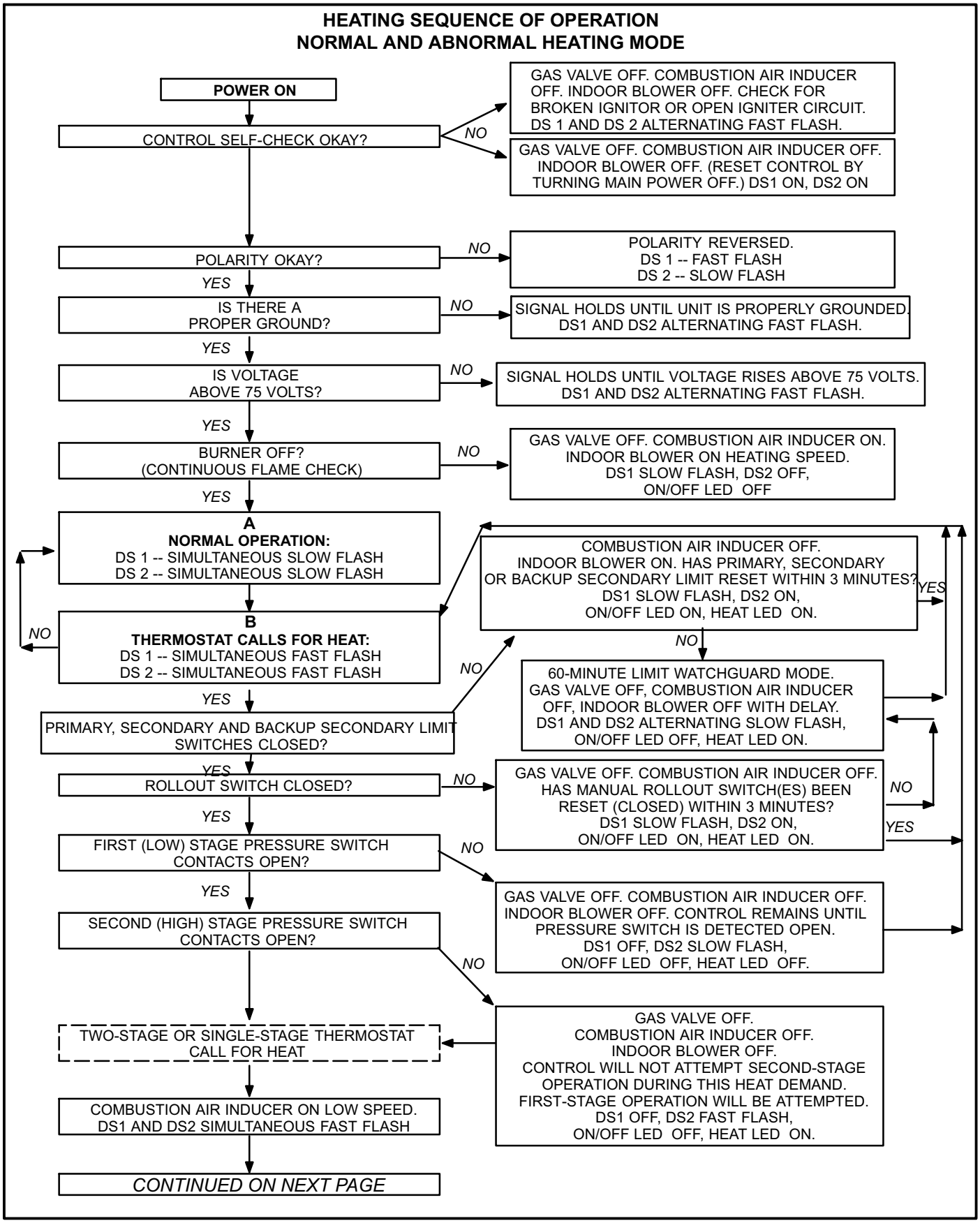
6- A 10 minute (factory set) or 15 minute (field set) second-stage heat delay period begins.

7- After the delay the combustion air inducer ramps up to high heat speed.

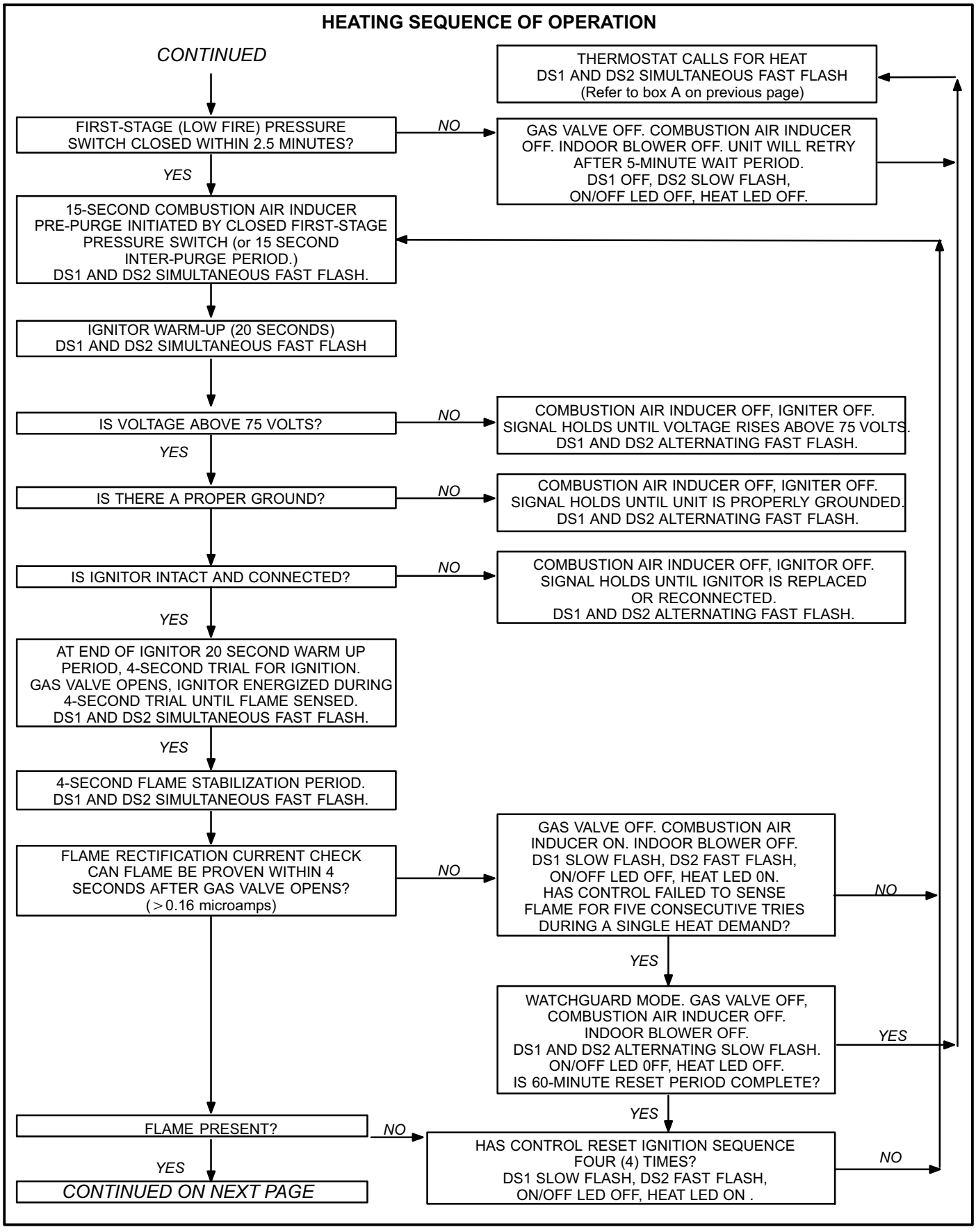
8- S102 high heat prove switch closes and the gas valve energizes second-stage heat.

9- B3 indoor blower ramps up to high heat speed.

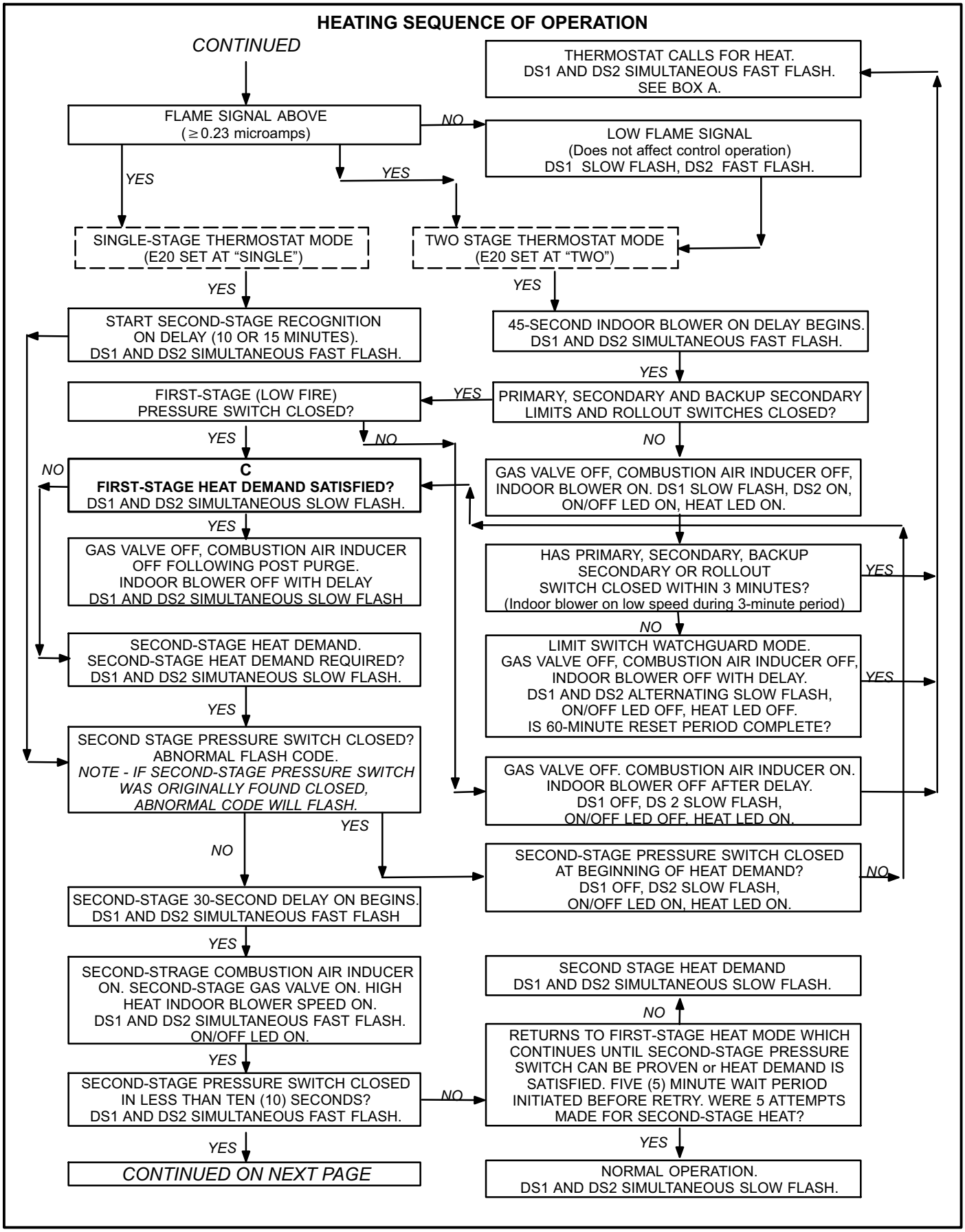
C-Flow Chart SureLight Board 49M59



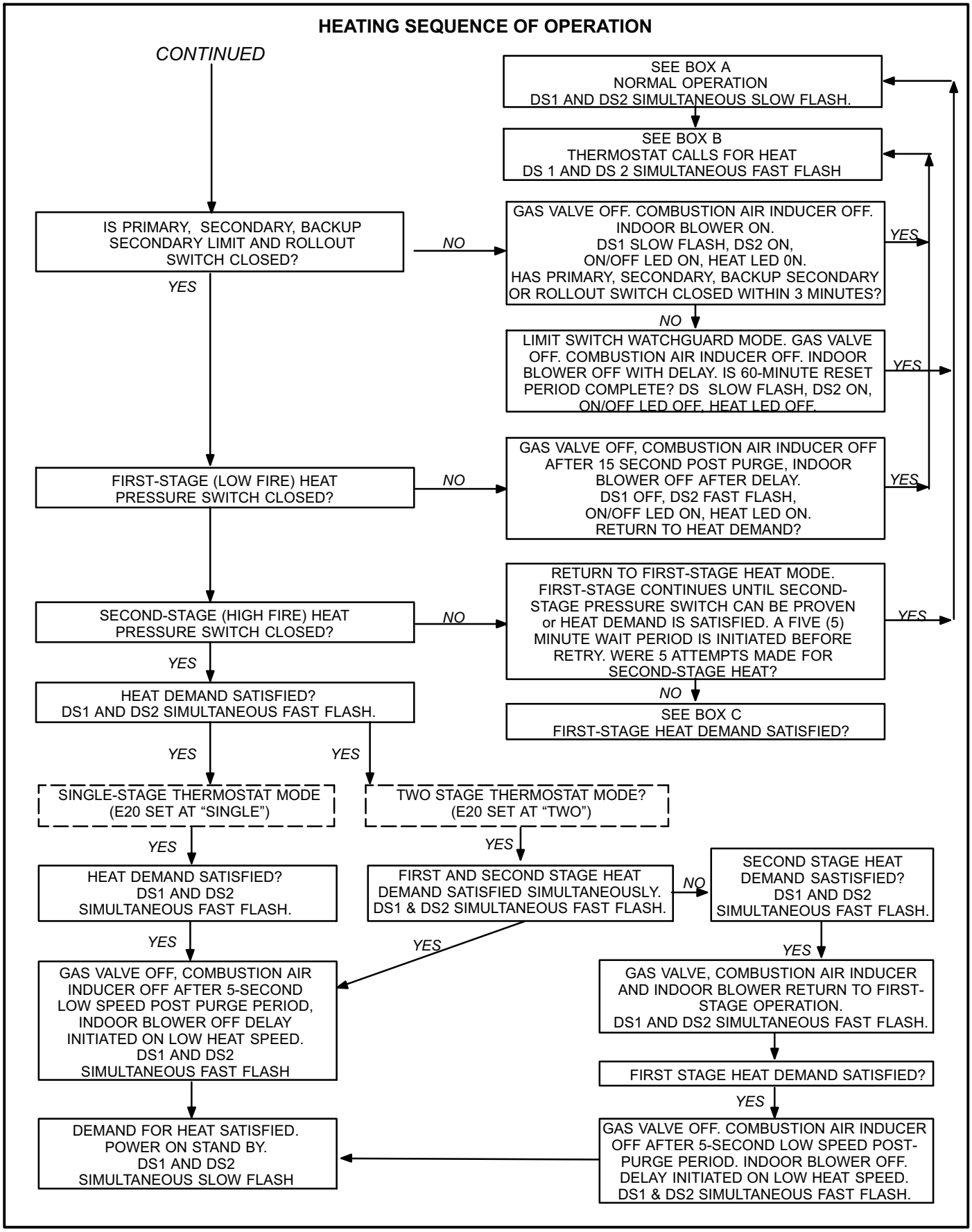
HEATING SEQUENCE OF OPERATION



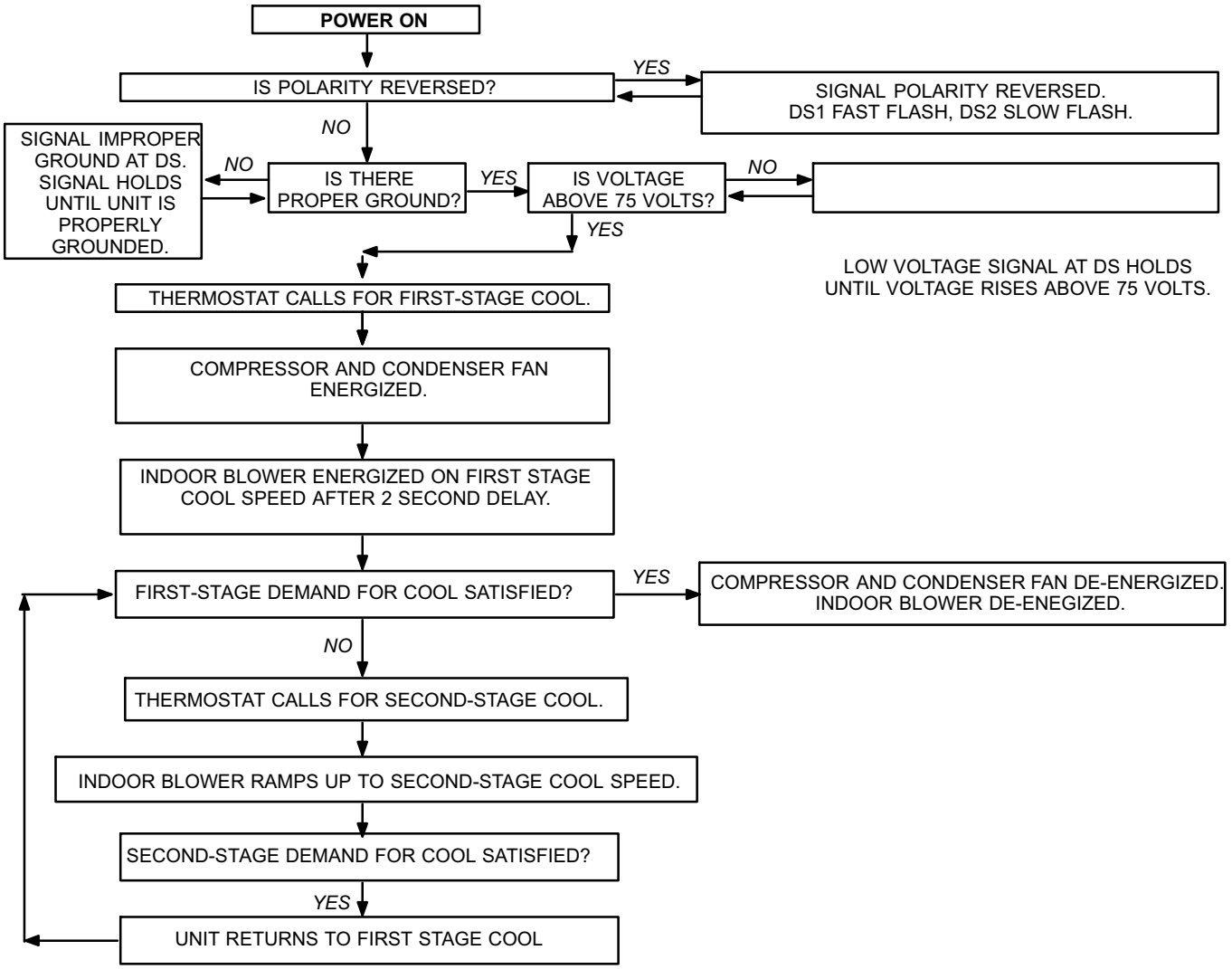
HEATING SEQUENCE OF OPERATION



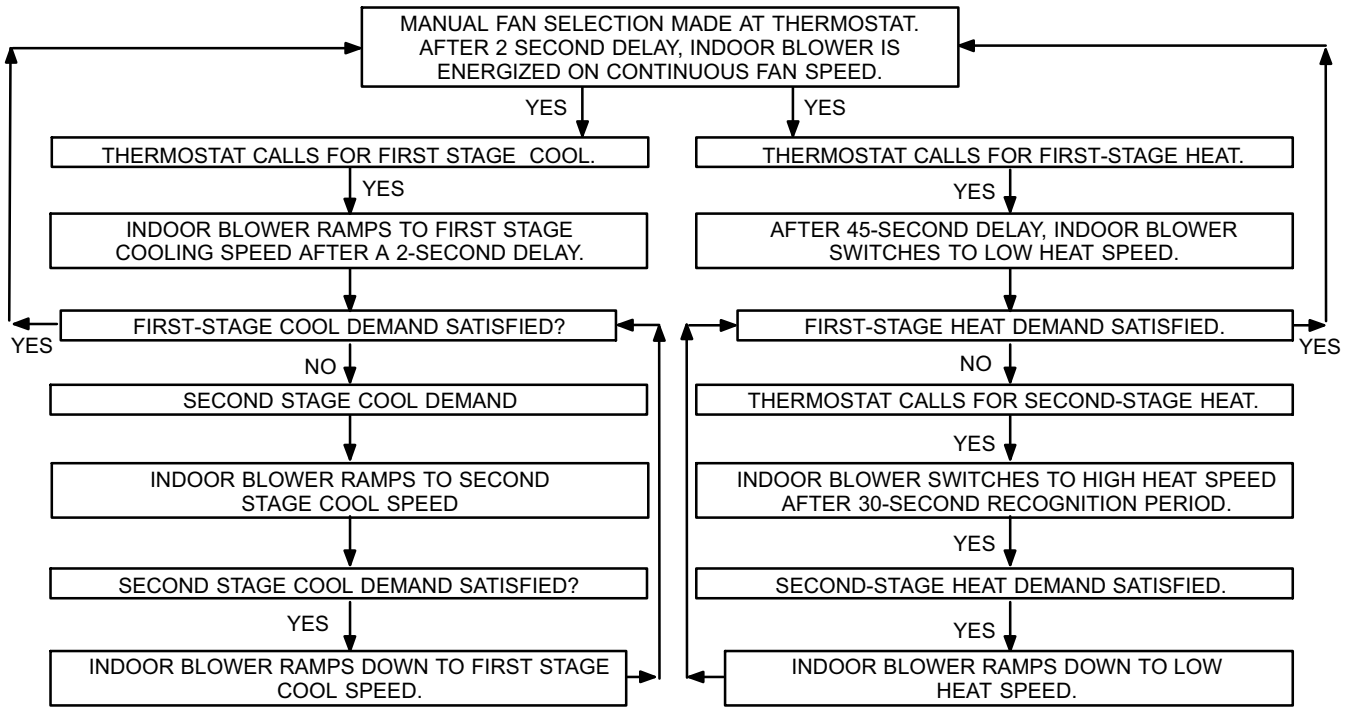
HEATING SEQUENCE OF OPERATION



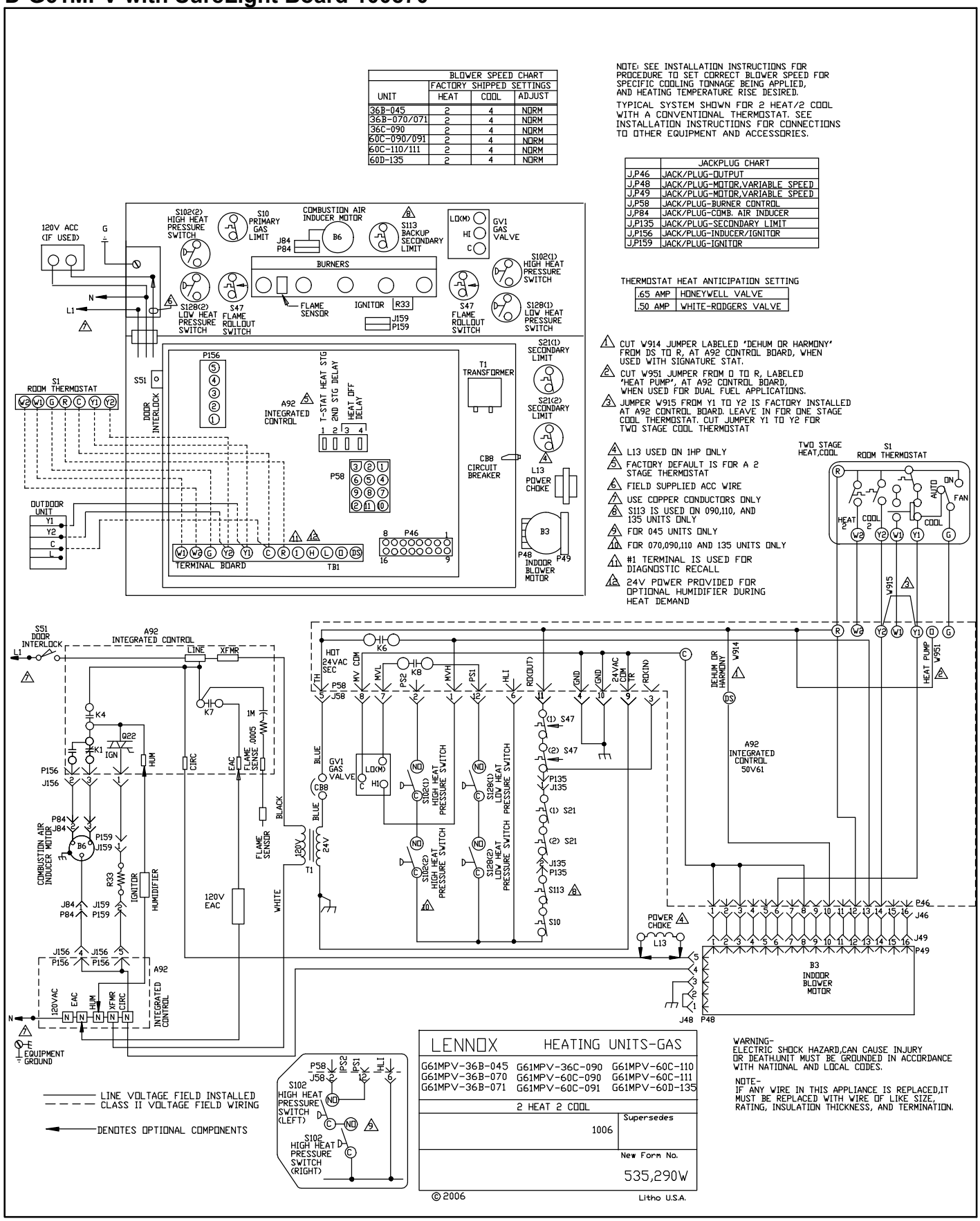
COOLING SEQUENCE OF OPERATION



CONTINUOUS LOW SPEED FAN SEQUENCE OF OPERATION



D-G61MPV with SureLight Board 100870



E-SureLight Board 100870

Sequence depends on type thermostat used. G61MPV units are applicable for single stage or two stage thermostats. Both type thermostats are described below. Thermostat dip switch selection dictates which mode unit will operate in. See flow chart for more sequence detail.

SureLight Control Self Check

When there is a call for heat, the SureLight integrated control runs a self check. The control checks for S10 primary limit, S21 secondary limit (s) and S47 rollout switch normally closed contacts. The control also checks for S102 high heat and S128 low heat prove switch normally open contacts. Once self check is complete and all safety switches are operational, heat call can continue.

Two-Stage Thermostat, Two Stage Heat. Dip Switch set at *"TWO".*

10- SureLight control energizes combustion air inducer B6 on low heat speed. Combustion air inducer runs until S128 low heat prove switch contacts close (switch must close within 2 1/2 minutes or control goes into Watchguard Pressure Switch mode. High heat prove switch S102 may also close). A 15 second pre-purge follows once S128 closes.

11- SureLight control begins 20 second ignitor warm up period.

12- Gas valve opens on first stage for a 4 second trial for ignition. Ignitor stays energized during the trial or until flame sensed.

13- Flame is sensed, gas valve remains on first stage heat, ignitor de-energizes.

14- After 45 second delay, indoor blower B3 is energized on low heat speed.

The furnace will stay in this mode until first stage demand is satisfied OR a second stage heat demand is initiated.

15- Second stage heat demand initiated. A 30 second second stage recognition period begins.

16- The combustion air inducer ramps up to high heat speed.

17- S102 high heat prove switch closes and the gas valve energizes second stage heat.

18- B3 indoor blower ramps up to high heat speed.

Single-Stage Thermostat, Two Stage Heat. Dip Switch set at "*SINGLE*"

1- SureLight control energizes combustion air inducer B6 on low heat speed. Combustion air inducer runs until S128 low heat prove switch contacts close (switch must close within 2 1/2 minutes or control goes into Watchguard Pressure Switch mode. High heat prove switch S102 may also close). A 15 second pre-purge follows once S128 closes.

2- SureLight control begins 20 second ignitor warm up period.

3- Gas valve opens on first stage for a 4 second trial for ignition. Ignitor stays energized during the trial or until flame sensed.

4- Flame is sensed, gas valve remains on first stage heat, ignitor de-energizes.

5- After 45 second delay, indoor blower B3 is energized on low heat speed.

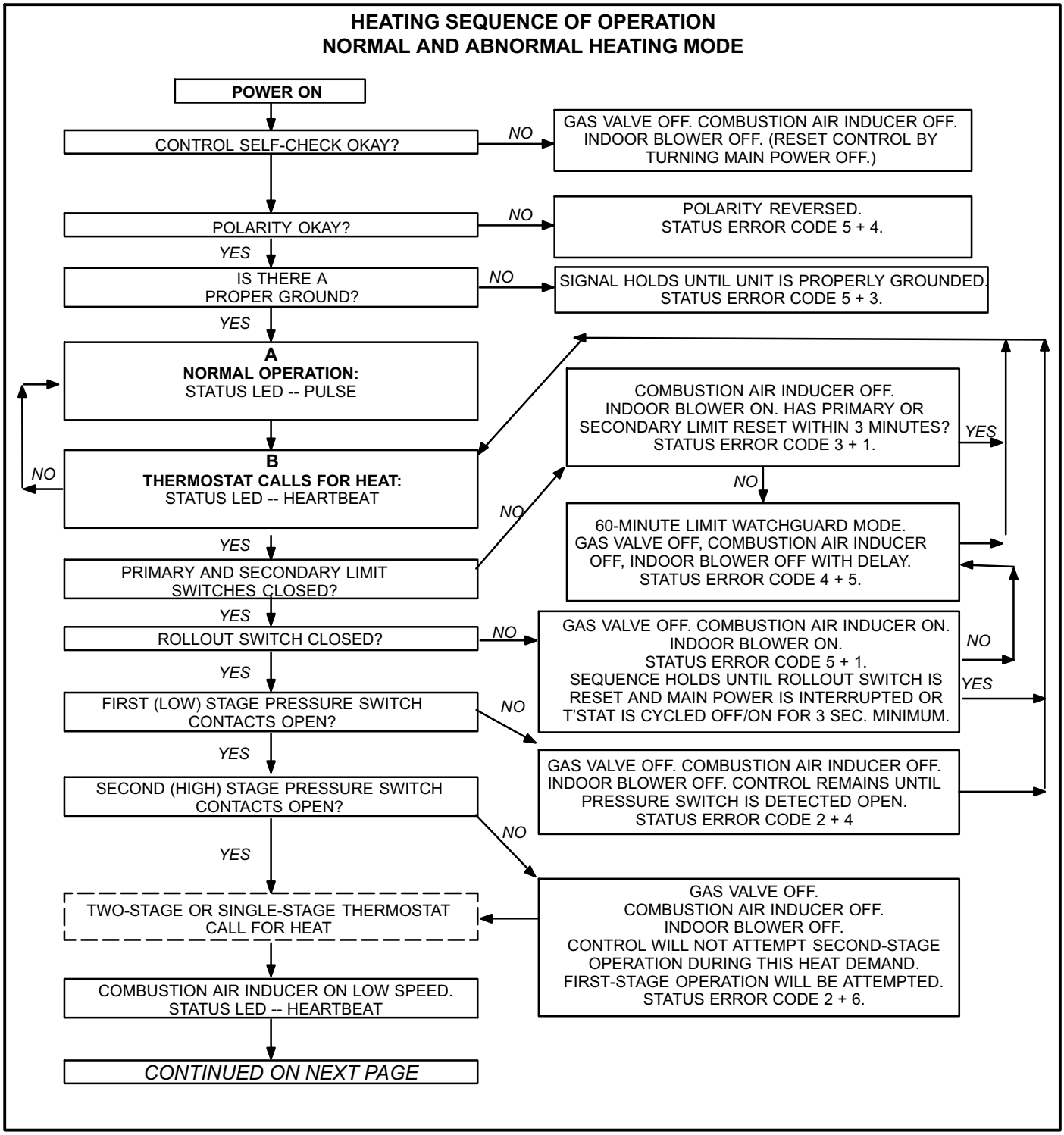
6- A 10 minute (factory set) or 15 minute (field set) second stage heat delay period begins.

7- After the delay the combustion air inducer ramps up to high heat speed.

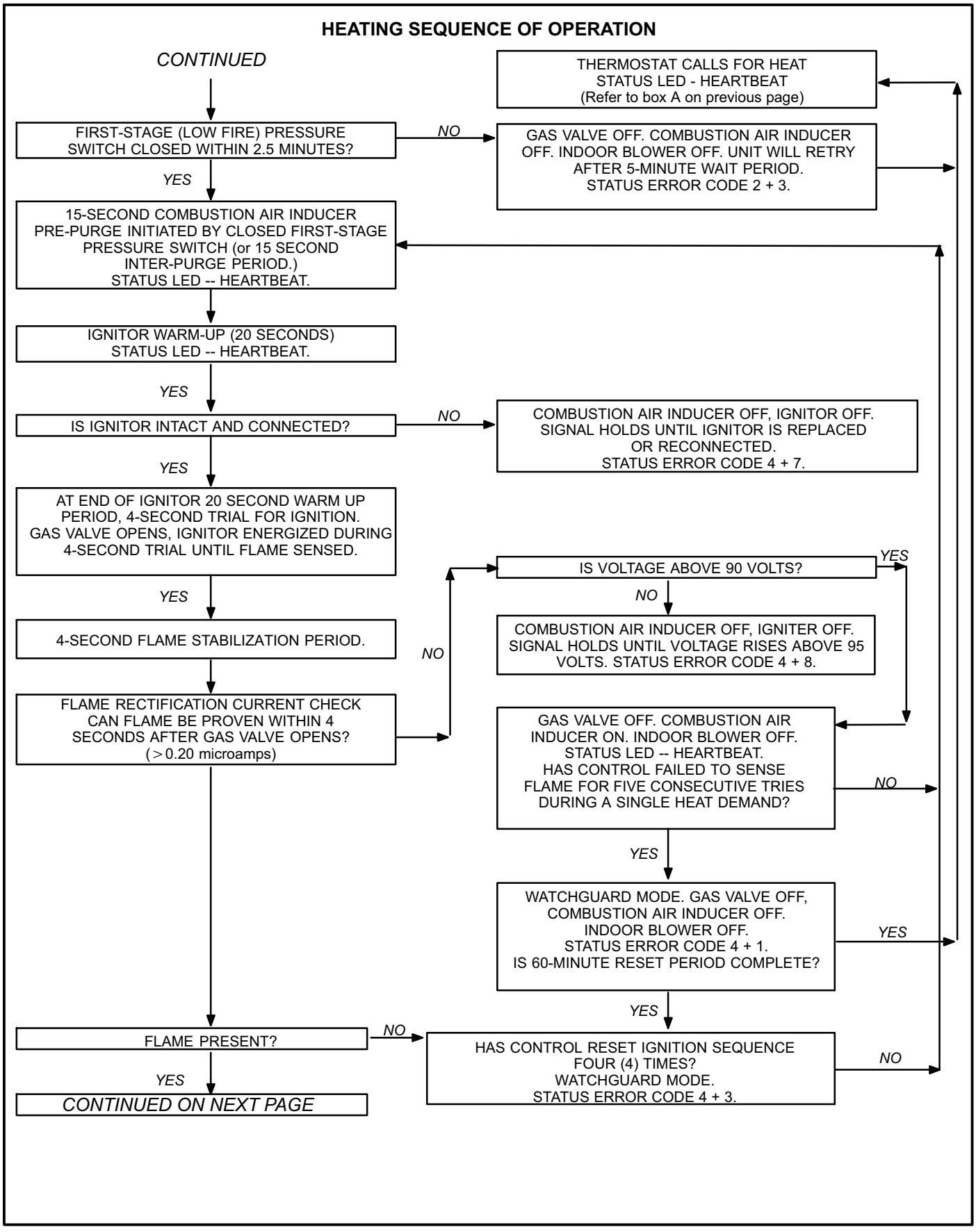
8- S102 high heat prove switch closes and the gas valve energizes second stage heat.

9- B3 indoor blower ramps up to high heat speed.

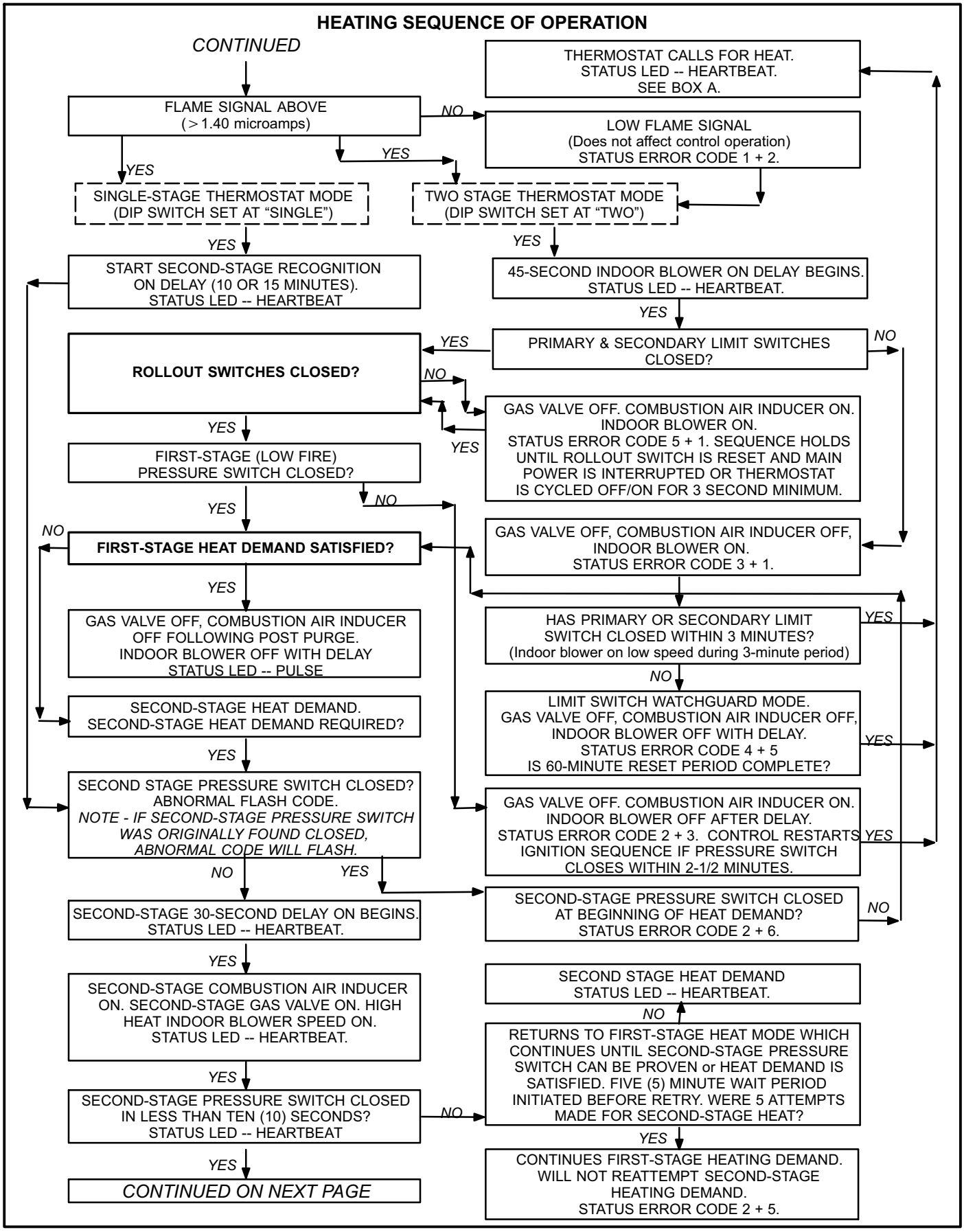
F-Flow Chart SureLight Board 100870



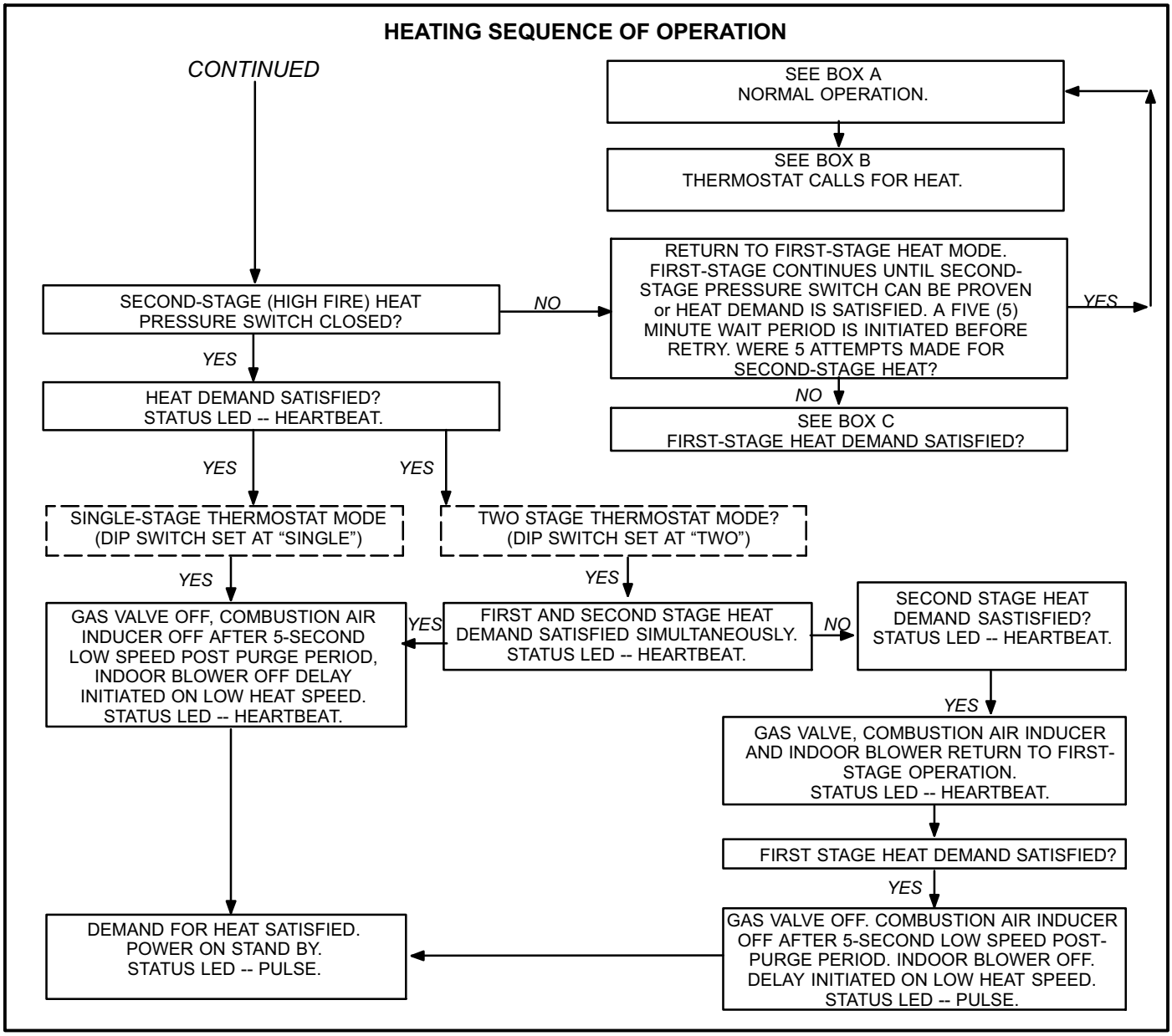
HEATING SEQUENCE OF OPERATION



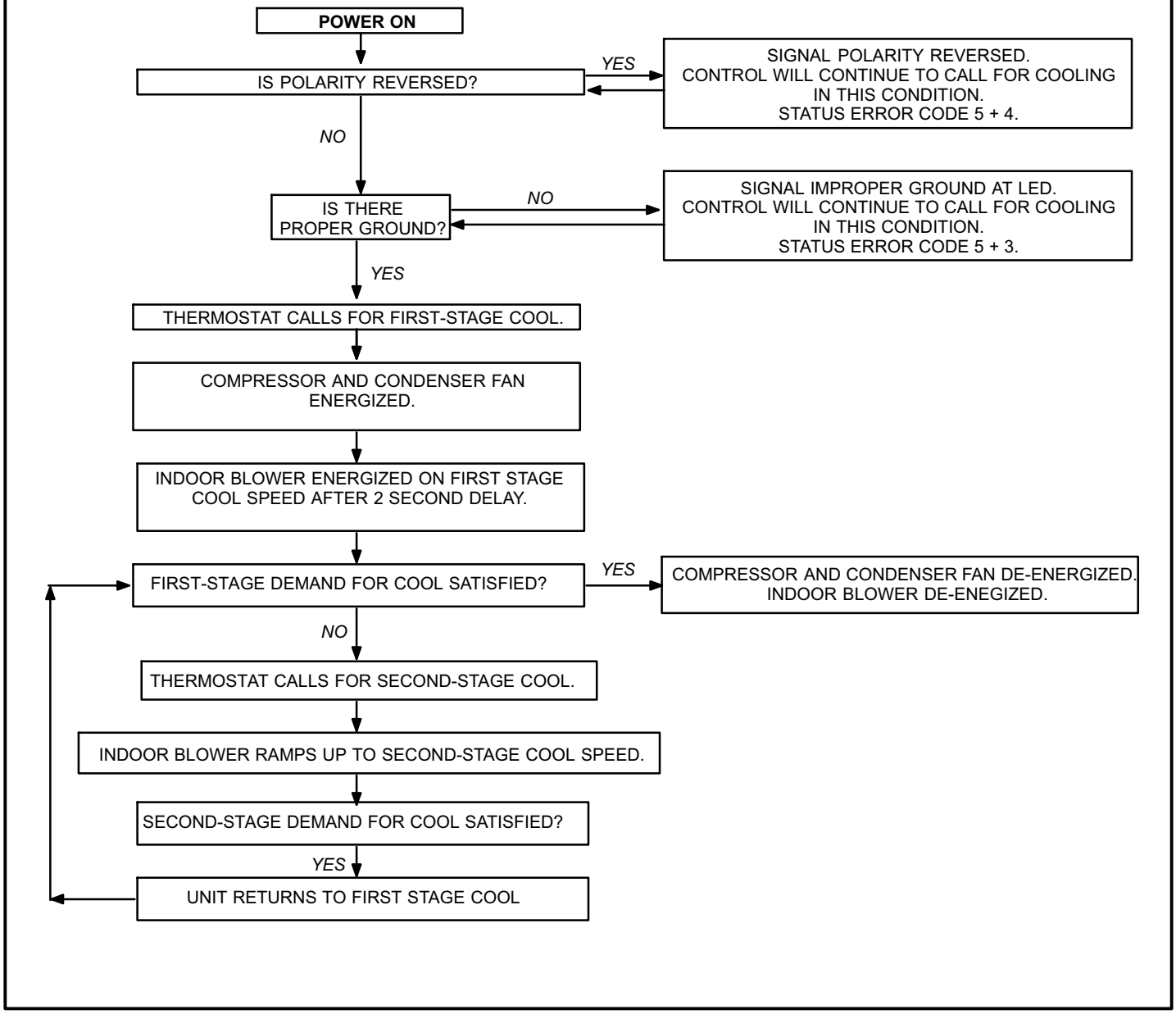
HEATING SEQUENCE OF OPERATION



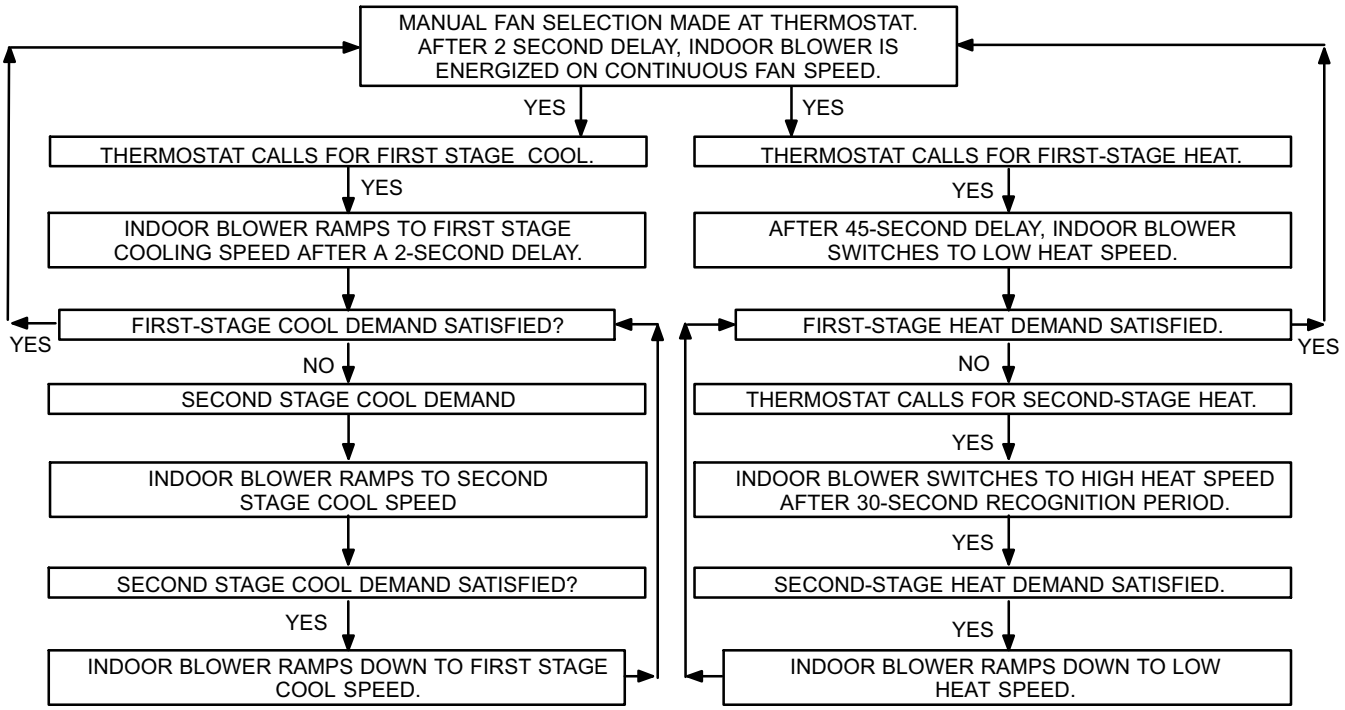
HEATING SEQUENCE OF OPERATION



COOLING SEQUENCE OF OPERATION



CONTINUOUS LOW SPEED FAN SEQUENCE OF OPERATION



VIII- Field Wiring Applications and Jumper Settings

A-SureLight Board 49M59

TABLE 44
Field Wiring Applications

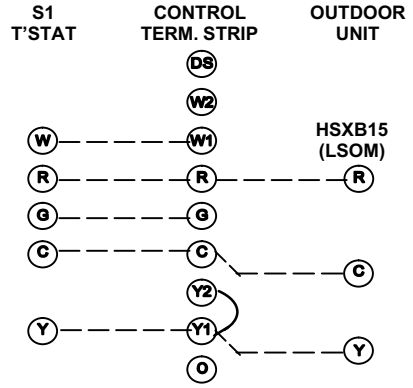
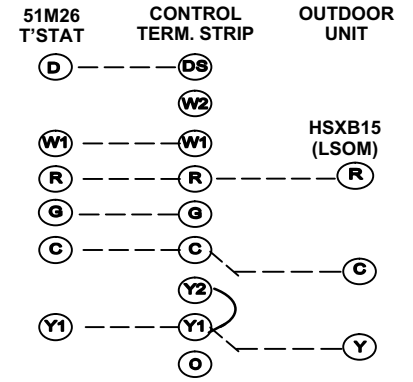
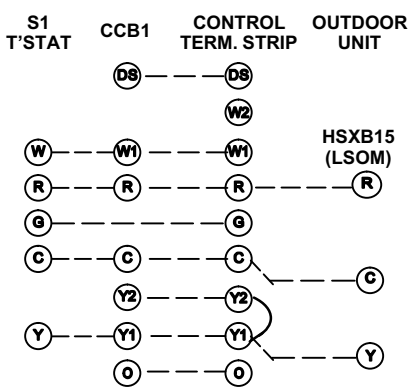
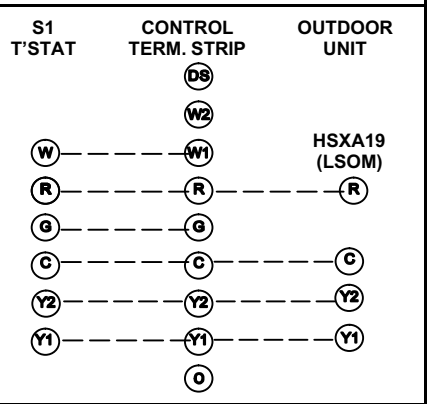
Thermostat	Jumper Settings (See figure 4)				Wiring Connections
	E20	W915	W914	W951	
1 Heat / 1 Cool *NOTE - Use dip switch 3 to set second-stage heat ON delay.* *ON-10 minutes.* *OFF-15 minutes.*	SINGLE	Intact	Intact	Intact	
51M26 SignatureStat NOTE - Use dip switch 3 to set second-stage heat ON delay. ON-10 minutes. OFF-15 minutes.	SINGLE	Intact	Cut	Intact	
1 Heat / 1 Cool with CCB1 *NOTE - Use dip switch 3 to set second-stage heat ON delay.* *ON-10 minutes.* *OFF-15 minutes.*	SINGLE	Intact	Cut	Intact	
1 Heat / 2 Cool *NOTE - Use dip switch 3 to set second-stage heat ON delay.* *ON-10 minutes.* *OFF-15 minutes.*	SINGLE	Cut	Intact	Intact	

TABLE 45
Field Wiring Applications (Continued)

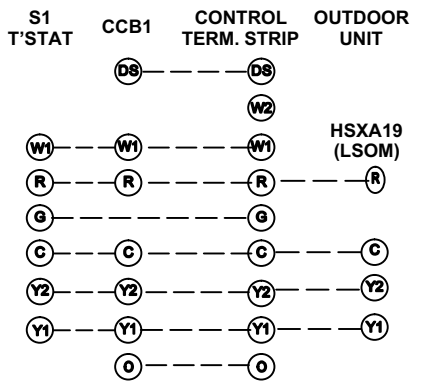
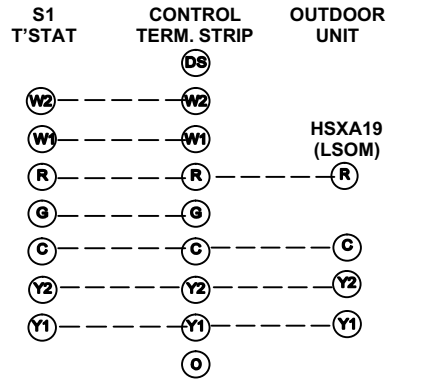
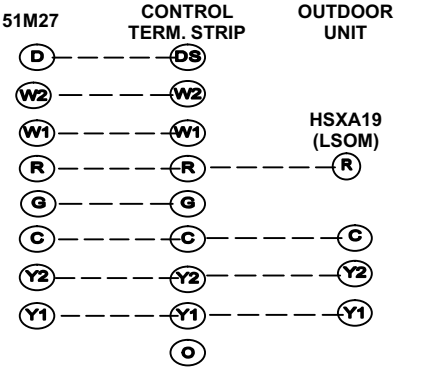
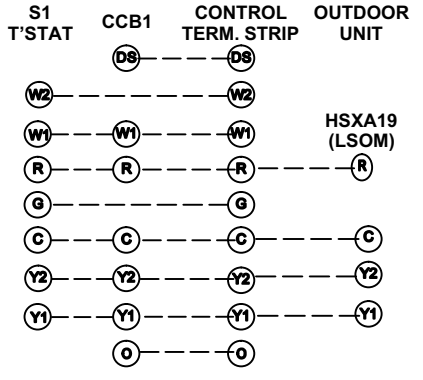
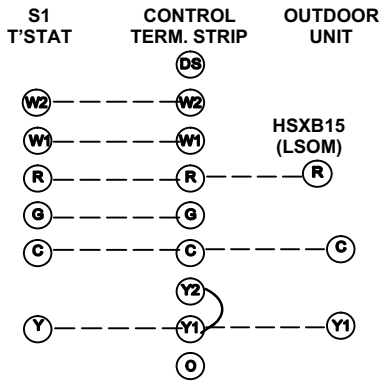
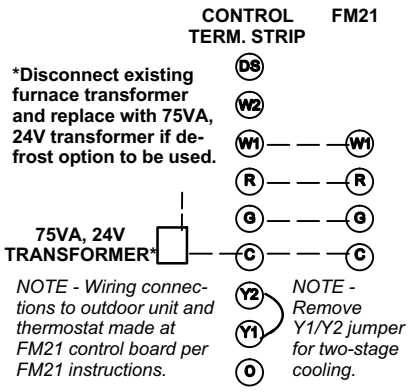
Thermostat	Jumper Settings (See figure 4)				Wiring Connections
	E20	W915	W914	W951	
1 Heat / 2 Cool with CCB1 *NOTE - Use dip switch 3 to set second-stage heat ON delay. ON-10 minutes. OFF-15 minutes.*	SINGLE	Cut	Cut	Intact	
2 Heat / 2 Cool	TWO	Cut	Intact	Intact	
51M27 SignatureStat	TWO	Cut	Cut	Intact	
2 Heat / 2 Cool with CCB1	TWO	Cut	Cut	Intact	

TABLE 46
Field Wiring Applications (Continued)

Thermostat	Jumper Settings (See figure 4)				Wiring Connections
	E20	W915	W914	W951	
2 Heat / 1 Cool	TWO	Intact	Intact	Intact	
FM21 Heat Pump / 1 Cool	SINGLE	Intact	Intact	Cut	

B-SureLight Board 100870

TABLE 47
Field Wiring Applications (Continued)

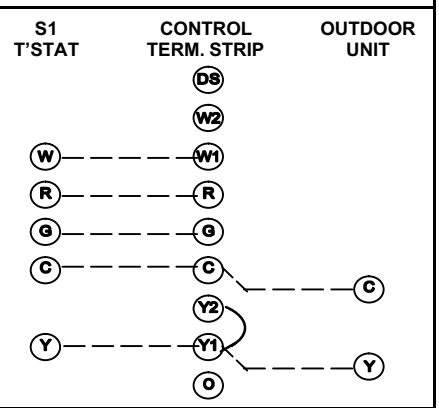
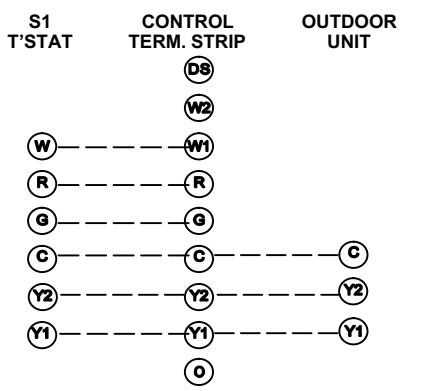
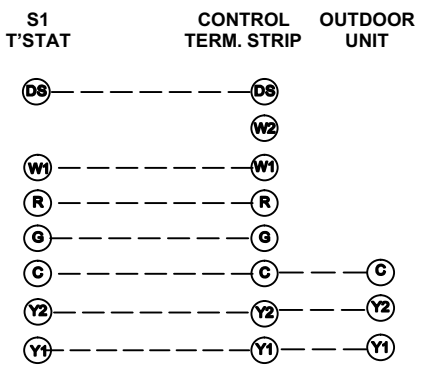
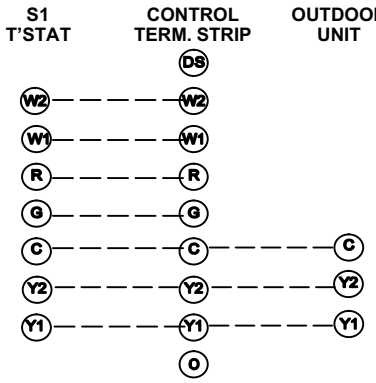
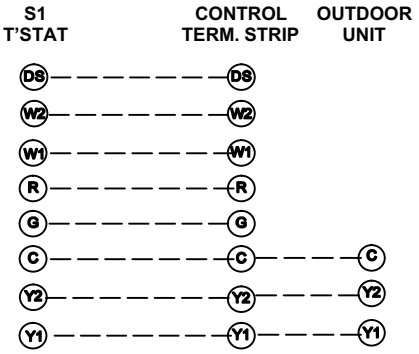
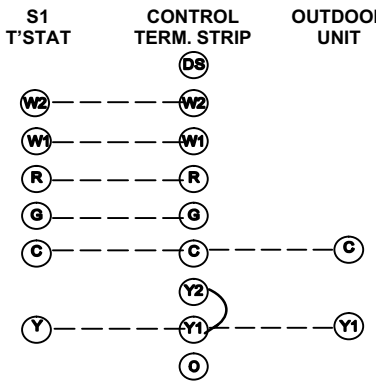
Thermostat	Jumper Settings (See figure 5)				Wiring Connections
	DIP Switch 1	W915 Two-Stage Cooling	W914 Dehu-midification or Harmony III	W951 Heat Pumps	
1Heat / 1 Cool *NOTE - Use DIP switch 2 to set second-stage heat ON delay. OFF-10 minutes. ON-15 minutes.*	ON	Intact	Intact	Intact	
1 Heat / 2 Cool *NOTE - Use DIP switch 2 to set second-stage heat ON delay. OFF-10 minutes. ON-15 minutes.*	ON	Cut	Intact	Intact	
1 Heat / 2 Cool with t'stat with humidity control *NOTE - Use DIP switch 2 to set second-stage heat ON delay. OFF-10 minutes. ON-15 minutes.*	ON	Cut	Cut	Intact	

TABLE 48
Field Wiring Applications (Continued)

Thermostat	Jumper Settings (See figure 5)				Wiring Connections
	DIP Switch 1	W915 Two-Stage Cooling	W914 Dehu-midification or Harmony III	W951 Heat Pumps	
2 Heat / 2 Cool	OFF	Cut	Intact	Intact	
2 Heat / 2 Cool with t'stat with humidity control	OFF	Cut	Cut	Intact	
2 Heat / 1 Cool	OFF	Intact	Intact	Intact	

IX- SURELIGHT® CONTROL TROUBLESHOOTING GUIDE

A-SureLight Board 49M59

UPON INITIAL POWER UP, REMOVE ALL THERMOSTAT DEMANDS TO THE UNIT

PROBLEM: 1 UNIT FAILS TO OPERATE IN THE COOLING, HEATING, OR CONTINUOUS FAN MODE		
Condition	**Possible Cause**	**Corrective Action / Comments**
1.1 - Both diagnostic lights fail to light up. LED#1-Off LED#2-Off	**1.1.1** Main voltage 120V not supplied to unit.	**ACTION 1 -** Check 120V main voltage. Determine cause of main power failure.
	1.1.2 Miswiring of furnace or improper connections.	**ACTION 1 -** Check for correct wiring of 120V to power make up box and transformer. **ACTION 2** - Check 24V wiring to control board.
	1.1.3 Blown fuse	**ACTION 1 -** Replace fuse. **ACTION 2 -** If fuse still blows, check for short.
	1.1.4 Door interlock switch failure.	**ACTION 1 -** Check that door switch is activated when door is closed. **ACTION 2 -** Check wire connections to switch, replace loose connectors. **ACTION 3 -** Check continuity of switch in closed position. Replace if defective.
	1.1.5 Transformer Failure.	**ACTION 1 -** Check that transformer output is 24V. Replace if defective.
	1.1.6 Failed control board.	**ACTION 1 -** If all the above items have been checked, replace board.
1.2 - Diagnostic lights flash the roll-out code. LED#1-On, LED#2-Slow Flash	**1.2.1** Roll-out switch open.	**ACTION 1 -** Manually reset the roll-out switch by pushing the top button. **ACTION 2 -** Determine the cause of the roll-out switch activation before leaving furnace.
	1.2.2 Roll-out switch failure.	**ACTION 1 -** Check continuity across roll-out switch. Replace roll-out switch if switch is reset but does not have continuity.
	1.2.3 Miswiring or improper connections at roll-out switch.	**ACTION 1 -** Check wiring connections to switch.
	1.2.4 9 pin connector failure	**ACTION 1 -** Check 9-pin connector for proper connection to control board. **ACTION 2 -** Check continuity of the multi plug pin.
1.3 - On initial power-up the comb. air inducer does not energize. - Diagnostic lights flash the reverse polarity code. LED#1-Fast Flash, LED#2-Slow Flash.	**1.3.1** 120V main power polarity reversed.	**ACTION 1 -** Check the 120V has line and neutral correctly input into control. **ACTION 2 -** Reverse the line and neutral at the 120V field connection.
1.4 - On initial power up the combustion air inducer does not energize. - Diagnostic lights flash normal power on operation. LED#1-Slow Flash LED#2-Slow Flash	**1.4.1** Open combustion air inducer motor circuit.	**ACTION 1 -** Check for 120V to combustion air inducer. If no power, check wire and connections.
	1.4.2 Failed combustion air inducer motor.	**ACTION 1 -** If power is present at blower, replace blower.

PROBLEM 1: UNIT FAILS TO OPERATE IN THE COOLING, HEATING, OR CONTINUOUS FAN MODE		
Condition	**Possible Cause**	**Corrective Action / Comments**
1.5 **-** Diagnostic lights flash the improper main ground. LED#1-Alternating Fast Flash LED#2-Alternating Fast Flash	**1.5.1** Improper ground to the unit.	**ACTION 1 -** Check that the unit is properly ground. **ACTION 2 -** Install a proper main ground to the unit
	1.5.2 6-Pin connector is improperly attached to the circuit board.	**ACTION 1 -** Check 6-pin connector for proper installation. Correctly insert connector into control.
	1.5.3 Line voltage is below 75V.	**ACTION 1 -** Check that the line voltage is above 75V. Determine cause of voltage drop and supply correct voltage to the control.
	1.5.4 Open ignitor circuit.	**ACTION 1 -** Check for correct wiring and loose connections in the ignitor circuit. Check mult-plug connections for correct installation.
	1.5.5 Broken or failed ignitor.	**ACTION 1 -** Unplug ignitor and read resistance across ignitor. If resistance does not read between 10.9 and 19.7 ohms, replace the ignitor.
PROBLEM 2: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER DOES NOT ENERGIZE		
Condition	**Possible Cause**	**Corrective Action / Comments**
2.1 **-** Unit operates with a cooling or continuous fan demand. **-** Combustion air inducer will not start with a Heating demand. - Diagnostic lights flash the limit failure mode. LED#1-Slow Flash, LED#2-On	**2.1.1** Primary, secondary or backup secondary (if equipped) limit open.	**ACTION 1 -** Check continuity across switch(es). Switches reset automatically upon cool down. **ACTION 2 -** Check for restrictions on blower inlet air (including filter) and outlet air. Determine cause for limit activation before placing unit back in operation.
	2.1.2 Miswiring of furnace or improper connections at limit switch(es).	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
2.2 - Unit operates with a cooling and continuous fan demand. - Combustion air inducer will not start with a Heating demand. **-** Diagnostic lights flash the pressure switch failure code. LED#1-Off, LED#2-Slow Flash	**2.2.1** Miswiring of furnace or improper connections to combustion air inducer.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	2.2.2 Prove switch stuck closed.	**ACTION 1 -** Check that the prove switch is open without the combustion air inducer operating. Replace if defective.

PROBLEM 2: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR INDUCER DOES NOT ENERGIZE (CONT.).		
Condition	**Possible Cause**	**Corrective Action/Comments**
2.3 - Unit operates with a cooling and continuous fan demand. - Combustion air inducer will not start with a Heating demand. - Diagnostic lights flash the pressure switch failure code 2.5 minutes after heating demand. LED#1-Off, LED#2-Slow Flash	**2.3.1** Miswiring of furnace or improper connections to combustion air inducer.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	2.3.2 Combustion air inducer failure.	**ACTION 1 -** If there is 120V to combustion air inducer and it does not operate, replace combustion air inducer.
PROBLEM 3: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR INDUCER ENERGIZES, IGNITOR IS NOT ENERGIZED.		
Condition	**Possible Cause**	**Corrective Action/Comments**
3.1 - Unit operates with a cooling and continuous fan demand. - Combustion air inducer energizes with a heating demand. - Diagnostic lights flash the pressure switch failure code 2.5 minutes after heating demand. LED#1-Off LED#2-Slow Flash	**3.1.1** Prove switch does not close due to incorrect routing of the pressure switch lines.	**ACTION 1 -** Check that the prove switch lines are correctly routed. Correctly route pressure switch lines.
	3.1.2 Prove switch does not close due to obstructions in the pressure lines.	**ACTION 1 -** Remove any obstructions from the the pressure lines and/or taps.
	3.1.3 Prove switch lines damaged	**ACTION 1 -** Check prove switch lines for leaks. Replace any broken lines.
	3.1.4 Condensate in prove switch line.	**ACTION 1 -** Check prove switch lines for condensate. Remove condensate from lines.
	3.1.5 Prove switch does not close due to a low differential pressure across the prove switch.	**ACTION 1 -** Check the differential pressure across the prove switch. This pressure should exceed the set point listed on the switch. **ACTION 2 -** Check for restricted inlet vent. Remove all blockage. **ACTION 3 -** Check for proper vent sizing and run length.
	3.1.6 Wrong prove switch installed in the unit, or prove switch is out of calibration.	**ACTION 1 -** Check that the proper prove switch is installed in the unit. Replace prove switch if necessary.
	3.1.7 Miswiring of furnace or improper connections at prove switch.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	3.1.8 Prove switch failure.	**ACTION 1 -** If all the above modes of failure have been checked, the prove switch may have failed. Replace prove switch and determine if unit will operate.

PROBLEM 4: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER ENERGIZES, IGNITOR IS ENERGIZED.		
Condition	**Possible Cause**	**Corrective Action/Comments**
4.1 - Unit operates with a cooling and continuous fan demand. - Combustion air inducer energizes with Heating demand. - Ignitor is energized but unit fails to light. LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash	**4.1.1** Check that gas is being supplied to the unit.	**ACTION 1 -** Check line pressure at the gas valve. Pressure should not exceed 13" WC for both natural and propane. Line pressure should read a minimum 4.5" WC for natural and 8.0"WC for propane.
	4.1.2 Miswiring of gas valve or loose-connections at multi-pin control amp plugs or valve.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	4.1.3 Defective gas valve or ignition control.	**ACTION 1 -** Check that 24V is supplied to the gas valve approximately 35 seconds after heat demand is initiated. **ACTION 2 -** Replace the valve if 24V is supplied but valve does not open. **ACTION 3 -** Replace the control board if 24V is not supplied to valve.
PROBLEM 5: BURNERS LIGHT WITH A HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY		
Condition	**Possible Cause**	**Corrective Action/Comments**
5.1 - Burners fire with a heating demand. - Burners light but unit shuts off prior to satisfying T-stat demand. - Diagnostic lights flash the pressure switch code. LED#1-Off LED#2-Slow Flash	**5.1.1** Low pressure differential at the prove switch.	**ACTION 1 -** Check for restricted intake and exhaust vent. Remove all blockage. **ACTION 2:** Check for proper vent sizing. See installation instructions.
	5.1.2 Wrong concentric vent kit used for terminating the unit.	**ACTION 1 -** Check vent termination kit installed. See Placement and Installation section.
	5.1.3 Condensate drain line is not draining properly.	**ACTION 1 -** Check condensate line for proper vent slope, and any blockage. Condensate should flow freely during operation of furnace. Repair or replace any improperly installed condensate lines.
	5.1.4 Low pressure differential at the prove switch.	**ACTION 1 -** Check for restricted intake and exhaust. Remove all blockage. **ACTION 2:** Check for proper vent sizing. See installation instructions.
5.2 - Combustion air inducer energizes with a heating demand. - Burners light but fail to stay lit. - After 5 tries the control diagnostics flash the watchguard burners failed to ignite code. LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash	**5.2.1** Sensor or sense wire is improperly installed.	**ACTION 1 -** Check that sensor is properly located and that the sense wire is properly attached to both the sensor and the control.
	5.2.2 Sensor or sense wire is broken.	**ACTION 1 -** Check for a broken sensor. **ACTION 2 -** Test continuity across the sense wire. If wire or sensor are damaged replace the component.
	5.2.3 Sensor or sensor wire is grounded to the unit.	**ACTION 1 -** Check for resistance between the sensor rod and the unit ground. **ACTION 2 -** Check for resistance between the sensor wire and the unit ground. **ACTION 3 -** Correct any shorts found in circuit.
	5.2.4 Control does not sense flame.	**ACTION 1 -** Check the microamp signal from the burner flame. If the microamp signal is below normal, check the sense rod for proper location or contamination. **ACTION 2 -** Replace, clean, or relocate flame sense rod. If rod is to be cleaned, use steel wool or replace sensor. DO NOT CLEAN ROD WITH SAND PAPER. SAND PAPER WILL CONTRIBUTE TO THE CONTAMINATION PROBLEM. **NOTE:** Do not attempt to bend sense rod.

PROBLEM 5: BURNERS LIGHT WITH HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY (CONT.)		
Condition	**Possible Cause**	**Corrective Action/Comments**
5.3 - Combustion air inducer energizes with a heating demand. - Burners light. - Roll-out switch trips during the heating demand. - Diagnostic lights flash roll-out failure. LED#1-On LED#2-Slow Flash	**5.3.1** Unit is firing above 100% of the nameplate input.	**ACTION 1 -** Check that the manifold pressure matches value listed on nameplate. See installation instructions for proper procedure. **ACTION 2 -** Verify that the installed orifice size match the size listed on the nameplate or installation instructions. **ACTION 3 -** Check gas valve sensing hose to insure no leaks are present. **ACTION 4 -** Check the input rate to verify rate matches value listed on nameplate.
	5.3.2 Gas orifices leak at the manifold connection.	**ACTION 1 -** Tighten orifice until leak is sealed. **NOTE:** Be careful not to strip orifice threads. **ACTION 2 -** Check for gas leakage at the threaded orifice connection. Use approved method for leak detection (see unit instructions).
	5.3.3 Air leakage at the connections between the primary heat exchanger, secondary heat exchanger, and combustion air blower.	**ACTION 1 -** Check for air leakage at all joints in the heat exchanger assembly. Condition will cause high CO2 with high CO. **ACTION 2 -** Seal leakage if possible, replace heat exchanger if necessary, tag and return heat exchanger to proper Lennox personnel.
	5.3.4 Insufficient flow through the heat exchanger caused by a sooted or restricted heat exchanger.	**ACTION 1 -** Check for sooting deposits or other restrictions in the heat exchanger assembly. Clean assembly as outlined in instruction manual. **ACTION 2 -** Check for proper combustion.
	5.3.5 Burners are not properly located in the burner box.	**ACTION 1 -** Check that the burners are firing into the center of the heat exchanger openings. Correct the location of the burners if necessary.
5.4 **-** Combustion air inducer energizes with a heating demand. - Burners light roughly and the unit fails to stay lit. - Diagnostic lights flash watchguard flame failure. LED#1-Alternating Slow Flash LED#2-Alternating Slow Flash	**5.4.1** Recirculation of flue gases. This condition causes rough ignitions and operation. Problem is characterized by nuisance flame failures.	**ACTION 1 -** Check for proper flow of exhaust gases away from intake vent. Remove any obstacles in front of the intake and exhaust vent which would cause recirculation. **ACTION 2 -** Check for correct intake and exhaust vent installation. See instructions
	5.4.2 Improper burner cross-overs	**ACTION 1 -** Remove burner and inspect the cross-overs for burrs, or any restriction or if crossover is warped. Remove restriction or replace burners.

PROBLEM 6: CONTROL SIGNALS LOW FLAME SENSE DURING HEATING MODE		
Condition	**Possible Cause**	**Corrective Action/Comments**
6.0 - Unit operates correctly but the diagnostic lights flash low flame sense code. LED#1-Slow Flash LED#2-Fast Flash	**6.1.1** Sensor rod is improperly located on the burner.	**ACTION 1 -** Check the sensor rod for proper location on the burner. Properly locate the sensor rod or replace if rod cannot be located correctly.
	6.1.2 Sensor rod is contaminated.	**ACTION 1 -** Check sensor rod for contamination or coated surface. Clean the sensor rod with steel wool or replace sensor. DO NOT USE SAND PAPER TO CLEAN ROD. SAND PAPER WILL CONTRIBUTE TO THE CONTAMINATION PROBLEM.
PROBLEM 7: INDOOR BLOWER FAILS TO OPERATE IN COOLING, HEATING, OR CONTINUOUS FAN MODE		
Condition	**Possible Cause**	**Corrective Action/Comments**
7.0 - Indoor blower fails to operate in continuous fan, cooling, or heating mode.	**7.1.1** Miswiring of furnace or improper connections at control or indoor blower motor.	**ACTION 1-** Correct wiring and/or replace any loose connections. Check for correct wiring and loose connections.
	7.1.2 120V is not being supplied to the indoor air blower or blower motor failure.	**ACTION 1 -** Check for 120V at the various calls for indoor blower by energizing ”Y”, ”G”, and ”W” individually on the low voltage terminal strip. Note that when ”W’ is energized, the blower is delayed 45 seconds. If there is 120V to each motor tap but the blower does not operate, replace the motor.
	7.1.3 Defective control board	**ACTION 1 -** If there is not 120V when ”Y”, ”G”, or ”W” is energized, replace the control.
	7.1.4 Defective run capacitor	**ACTION 1 -** Replace capacitor
PROBLEM 8: RF STATIC DURING TIME FOR IGNITION		
Condition	**Possible Cause**	**Corrective Action/Comments**
8.0 - AM radio interference.	**8.1.2** Ignitor operation	**ACTION 1 -** Call Technical Support, Dallas.

B-SureLight Board 100870

Two Stage Variable Speed Control Board 100870

UPON INITIAL POWER UP, REMOVE ALL THERMOSTAT DEMANDS TO THE UNIT

PROBLEM: 1 UNIT FAILS TO OPERATE IN THE COOLING, HEATING, OR CONTINUOUS FAN MODE		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action / Comments**
1.1 - Diagnostic lights fail to light up. LED OFF	**1.1.1** Main voltage 120V not supplied to unit.	**ACTION 1 -** Check 120V main voltage. Determine cause of main power failure.
	1.1.2 Miswiring of furnace or improper connections.	**ACTION 1 -** Check for correct wiring of 120V to power make up box and transformer. **ACTION 2** - Check 24V wiring to control board.
	1.1.3 Circuit breaker tripped or fails to close.	**ACTION 1 -** Replace circuit breaker if it is reset but does not have continuity. **ACTION 2 -** If circuit breaker still trips, check for short.
	1.1.4 Door interlock switch failure.	**ACTION 1 -** Check that door switch is activated when door is closed. **ACTION 2 -** Check wire connections to switch, replace loose connectors. **ACTION 3 -** Check continuity of switch in closed position. Replace if defective.
	1.1.5 Transformer Failure.	**ACTION 1 -** Check that transformer output is 24V. Replace if defective.
	1.1.6 Failed control board.	**ACTION 1 -** If all the above items have been checked, replace board.
1.2 Diagnostic light flashes the reverse polarity code. LED 5 + 4	**1.2.1** 120V main power polarity reversed.	**ACTION 1 -** Check the 120V has line and neutral correctly input into control. **ACTION 2 -** Reverse the line and neutral at the 120V field connection.
1.3 - Diagnostic light flash the improper main ground. LED 5 + 3	**1.3.1** Improper ground to the unit.	**ACTION 1 -** Check that the unit is properly ground. **ACTION 2 -** Install a proper main ground to the unit
1.4 - Diagnostic light flashes ignitor circuit fault. LED 4 + 7	**1.4.1** Open ignitor circuit.	**ACTION 1 -** Check for correct wiring and loose connections in the ignitor circuit. Check mult-plug connections for correct installation.
	1.4.2 Broken or failed ignitor.	**ACTION 1 -** Unplug ignitor and read resistance across ignitor. If resistance does not read between 25 and 47 ohms, replace the ignitor.
1.5 - Diagnostic light flashes low line voltage LED 4 + 8	**1.5.1** Line voltage is below 90V.	**ACTION 1 -** Check that the line voltage is above 90V. Determine cause of voltage drop and supply correct voltage to the control.

PROBLEM 2: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER DOES NOT ENERGIZE		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action / Comments**
2.1 Unit operates with a cooling or continuous fan demand. Combustion air inducer will not start with a Heating demand. Diagnostic lights flash the limit failure mode. LED 3 + 1	**2.1.1** Primary Limit or secondary limit (if equipped) open.	**ACTION 1 -** Check continuity across switch(es). Switches reset automatically upon cool down. **ACTION 2 -** Check for restrictions on blower inlet air (including filter) and outlet air. Determine cause for limit activation before placing unit back in operation.
	2.1.2 Miswiring of furnace or improper connections at limit switch(es).	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
2.2 Unit operates with a cooling and continuous fan demand. Combustion air inducer will not start with a Heating demand. Diagnostic lights flash the pressure switch failure code. LED 2 +4	**2.2.1** Miswiring of furnace or improper connections to combustion air inducer.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	2.2.2 Prove switch stuck closed.	**ACTION 1 -** Check that the prove switch is open without the combustion air inducer operating. Replace if defective.
2.3 Unit operates with a cooling or continuous fan demand. Combustion air inducer will not start with a Heating demand. Diagnostic lights flash the open rollout failure mode. LED 5 + 1	**2.3.1** Rollout Switch Open.	**ACTION 1 -** Check continuity across rollout switches. Rollout switches must be manually reset. **ACTION 2 -** Look for restrictions in vent pipe or combustion air inlet or heat exchanger. Determine cause before placing unit in operation.
PROBLEM 3: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR INDUCER DOES NOT ENERGIZE		
Condition	**Possible Cause**	**Corrective Action/Comments**
3.3 Unit operates with a cooling and continuous fan demand. Combustion air inducer will not start with a Heating demand. Diagnostic lights flash the pressure switch failure code 2.5 minutes after heating demand. LED 2 + 3	**3.3.1** Miswiring of furnace or improper connections to combustion air inducer.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	3.3.2 Combustion air inducer failure.	**ACTION 1 -** If there is 120V to combustion air inducer and it does not operate, replace combustion air inducer.

PROBLEM 4: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR INDUCER ENERGIZES, IGNITOR IS NOT ENERGIZED.		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action/Comments**
4.1 **-** Unit operates with a cooling and continuous fan demand. **-** Combustion air inducer energizes with a heating demand. - Diagnostic lights flash the pressure switch failure code 2.5 minutes after heating demand. LED 2 + 3	**4.1.1** Prove switch does not close due to obstruction in vent pipe.	**ACTION 1 -** Check for restricted vent. Remove all blockage. **ACTION 2:** Check for proper vent sizing. See installation instructions.
	4.1.2 Prove switch does not close due to incorrect routing of the prove switch line.	**ACTION 1 -** Check that the prove switch line is correctly routed. Correctly route prove switch line.
	4.1.3 Prove switch does not close due to obstructions in the prove switch line.	**ACTION 1 -** Remove any obstructions from the the prove switch line and/or taps.
	4.1.4 Prove switch line damaged	**ACTION 1 -** Check prove switch line for leaks. Replace broken line if required.
	4.1.5 Condensate in prove switch line.	**ACTION 1 -** Check prove switch line for condensate. Remove condensate from line.
	4.1.6 Prove switch does not close due to a low differential pressure across the prove switch.	**ACTION 1 -** Check the differential pressure across the prove switch. This pressure should exceed the set point listed on the switch. **ACTION 2 -** Check for restricted inlet vent. Remove all blockage. **ACTION 3 -** Check for proper vent sizing and run length. See installation instructions.
	4.1.7 Wrong prove switch installed in the unit, or prove switch is out of calibration.	**ACTION 1 -** Check that the correct prove switch is installed in the unit. Replace prove switch if necessary.
	4.1.8 Miswiring of furnace or improper connections at prove switch.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	4.1.9 Prove switch failure.	**ACTION 1 -** If all the above modes of failure have been checked, the prove switch may have failed. Replace prove switch and determine if unit will operate.

PROBLEM 5: UNIT FIRES ON LOW FIRE, FAILS TO GO TO HIGH FIRE OPERATION		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action/Comments**
5.1 **-** Unit light s normally during low fire **-** Call for high fire inducer switches to high fire for 10 seconds then back to low fire. - Diagnostic lights flash the high pressure switch failure to close. LED 2 + 5	**5.1.1** Prove switch does not close due to obstruction in vent pipe.	**ACTION 1 -** Check for restricted vent. Remove all blockage. **ACTION 2:** Check for proper vent sizing. See installation instructions.
	5.1.2 Prove switch does not close due to incorrect routing of the prove switch line.	**ACTION 1 -** Check that the prove switch line is correctly routed. Correctly route prove switch line.
	5.1.3 Prove switch does not close due to obstructions in the prove switch line.	**ACTION 1 -** Remove any obstructions from the the prove switch line and/or taps.
	5.1.4 Prove switch line damaged	**ACTION 1 -** Check prove switch line for leaks. Replace broken line if required.
	5.1.5 Condensate in prove switch line.	**ACTION 1 -** Check prove switch line for condensate. Remove condensate from line.
	5.1.6 Prove switch does not close due to a low differential prove across the prove switch.	**ACTION 1 -** Check the differential pressure across the prove switch. This pressure should exceed the set point listed on the switch. **ACTION 2 -** Check for restricted inlet vent. Remove all blockage. **ACTION 3 -** Check for proper vent sizing and run length. See installation instructions.
	5.1.7 Wrong prove switch installed in the unit, or prove switch is out of calibration.	**ACTION 1 -** Check that the correct prove switch is installed in the unit. Replace prove switch if necessary.
	5.1.8 Miswiring of furnace or improper connections at prove switch.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	5.1.9 Prove switch failure.	**ACTION 1 -** If all the above modes of failure have been checked, the prove switch may have failed. Replace prove switch and determine if unit will operate.

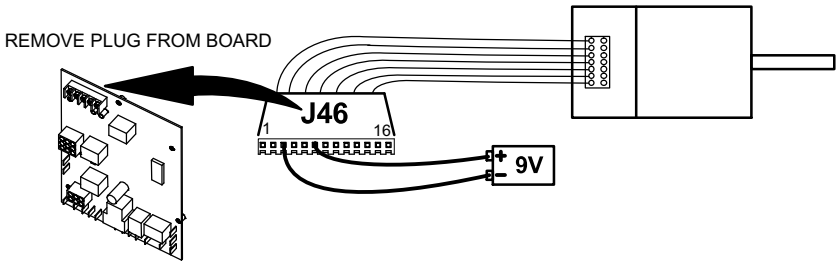
PROBLEM 6: UNIT FAILS TO FIRE IN THE HEATING MODE, COMBUSTION AIR BLOWER ENERGIZES, IGNITOR IS ENERGIZED.		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action/Comments**
6.1 Unit operates with a cooling and continuous fan demand. Combustion air inducer energizes with Heating demand. Ignitor is energized but unit fails to light. LED 4 + 1	**6.1.1** Check that gas is being supplied to the unit.	**ACTION 1 -** Check line pressure at the gas valve. Pressure should not exceed 13" WC for both natural and propane. Line pressure should read a minimum 4.5" WC for natural and 8.0"WC for propane.
	6.1.2 Miswiring of gas valve or loose connections at multi-pin control amp plugs or valve.	**ACTION 1 -** Check for correct wiring and loose connections. Correct wiring and/or replace any loose connections.
	6.1.3 Defective gas valve or ignition control.	**ACTION 1 -** Check that 24V is supplied to the gas valve approximately 35 seconds after heat demand is initiated. **ACTION 2 -** Replace the valve if 24V is supplied but valve does not open. **ACTION 3 -** Replace the control board if 24V is not supplied to valve.
PROBLEM 7: BURNERS LIGHT WITH A HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action/Comments**
7.1 Burners fire with a heating demand. Burners light but unit shuts off prior to satisfying T-stat demand. Diagnostic lights flash the prove switch code. LED 2 + 7	**7.1.1** Low pressure differential at the prove switch.	**ACTION 1 -** Check for restricted exhaust vent. Remove all blockage. **ACTION 2:** Check for proper vent sizing. See installation instructions.
7.2 Combustion air inducer energizes with a heating demand. Burners light but fail to stay lit. After 5 tries the control diagnostics flash the watchguard burners failed to ignite code. LED 4 + 3	**7.2.1** Sensor or sense wire is improperly installed.	**ACTION 1 -** Check that sensor is properly located and that the sense wire is properly attached to both the sensor and the control.
	7.2.2 Sensor or sense wire is broken.	**ACTION 1 -** Check for a broken sensor. **ACTION 2 -** Test continuity across the sense wire. If wire or sensor are damaged replace the component.
	7.2.3 Sensor or sensor wire is grounded to the unit.	**ACTION 1 -** Check for resistance between the sensor rod and the unit ground. **ACTION 2 -** Check for resistance between the sensor wire and the unit ground. **ACTION 3 -** Correct any shorts found in circuit.
	7.2.4 Control does not sense flame.	**ACTION 1 -** Check the microamp signal from the burner flame. If the microamp signal is below normal microamps, check the sense rod for proper location or contamination. **ACTION 2 -** Replace, clean, or relocate flame sense rod. If rod is to be cleaned, use steel wool or replace sensor. DO NOT CLEAN ROD WITH SAND PAPER. SAND PAPER WILL CONTRIBUTE TO THE CONTAMINATION PROBLEM. **NOTE:** Do not attempt to bend sense rod. **ACTION 3 -** Check that there is proper ground to burner box. Repair as necessary.

PROBLEM 7: BURNERS LIGHT WITH HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY (CONT.)		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action/Comments**
7.3 Combustion air inducer energizes with a heating demand. Burners light. Roll-out switch trips during the heating demand. Diagnostic lights flash roll-out switch failure. LED 5 + 1	**7.3.1** Unit is firing above 100% of the nameplate input.	**ACTION 1 -** Check that the manifold pressure matches value listed on nameplate. See installation instructions for proper procedure. **ACTION 2 -** Verify that the installed orifice size match the size listed on the nameplate or installation instructions. **ACTION 3 -** Check the input rate to verify rate matches value listed on nameplate.
	7.3.2 Gas orifices leak at the manifold connection.	**ACTION 1 -** Tighten orifice until leak is sealed. **NOTE:** Be careful not to strip orifice threads. **ACTION 2 -** Check for gas leakage at the threaded orifice connection. Use approved method for leak detection (see unit instructions).
	7.3.3 Insufficient flow through the heat exchanger caused by a sooted or restricted heat exchanger.	**ACTION 1** - Check for sooting deposits or other restrictions in the heat exchanger assembly. Clean assembly as outlined in instruction manual. **ACTION 2** - Check for proper combustion. See IV-Heating System Service Checks section G-.
	7.3.4 Burners are not properly located in the burner box.	**ACTION 1 -** Check that the burners are firing into the center of the heat exchanger openings. Correct the location of the burners if necessary.
	7.3.5 Poor Venting	**ACTION 1** -Check vent pipe and remove any obstructions **ACTION 2 -** Check for correct exhaust vent installation. See instructions
	7.3.6 Improper burner cross-overs	**ACTION 1 -** Remove burner and inspect the cross-overs for burrs, or any restriction or if crossover is warped. Remove restriction or replace burners.
7.4 Combustion air inducer energizes with a heating demand. Burners light roughly and the unit fails to stay lit. Diagnostic lights flash watchguard flame failure. LED 4 + 3	**7.4.1** Poor Venting	**ACTION 1** -Check vent pipe and remove any obstructions **ACTION 2 -** Check for correct exhaust vent installation. See instructions
	7.4.2 Improper burner cross-overs	**ACTION 1 -** Remove burner and inspect the cross-overs for burrs, or any restriction or if crossover is warped. Remove restriction or replace burners.
	7.4.3 Burrs in gas orifices	**ACTION 1 -** Remove gas orifices and inspect. Remove any burrs that are present or replace orifice.

PROBLEM 7: BURNERS LIGHT WITH HEATING DEMAND BUT UNIT SHUTS DOWN PREMATURELY (CONT.)		
Flash Code LED X + Y	**Possible Cause**	**Corrective Action/Comments**
7.5 Combustion air inducer energizes with a heating demand. - Burners light. Diagnostic lights flash watch guard flame failure. NOTE" Unit might go into 60 minute Watchguard mode depending on intermittent nature of sensor signal. LED 4 + 3	**7.5.1** Loose sensor wire connection causes intermittent loss of flame signal.	**ACTION 1 -** Check that the sensor is properly located. **ACTION 2 -** Check that the sense wire is properly attached to both the sensor and the control. Pay extra attention to the pin connectors.
	7.5.2 Poor ground to burner box	**ACTION 1 -** Check for proper ground and repair as necessary.
PROBLEM 8: CONTROL SIGNALS LOW FLAME SENSE DURING HEATING MODE		
Condition	**Possible Cause**	**Corrective Action/Comments**
8.0 Unit operates correctly but the diagnostic lights flash low flame sense code. LED 1 + 2	**8.1.1** Sense rod is improperly located on the burner.	**ACTION 1 -** Check the sense rod for proper location on the burner. Properly locate the sense rod or replace if rod cannot be located correctly.
	8.1.2 Sense rod is contaminated.	**ACTION 1 -** Check sense rod for contamination or coated surface. Clean the sense rod with steel wool or replace sensor. DO NOT USE SAND PAPER TO CLEAN ROD. SAND PAPER WILL CONTRIBUTE TO THE CONTAMINATION PROBLEM.
PROBLEM 9: INDOOR BLOWER FAILS TO OPERATE IN COOLING, HEATING, OR CONTINUOUS FAN MODE		
Condition	**Possible Cause**	**Corrective Action/Comments**
9.0 - Indoor blower fails to operate in continuous fan, cooling, or heating mode.	**9.1.1** Miswiring of furnace or improper connections at control or indoor blower motor.	**ACTION 1-** Correct wiring and/or replace any loose connections. Check for correct wiring and loose connections.
	9.1.2 120V is not being supplied to the indoor air blower or blower motor failure.	**ACTION 1 - PSC MOTORS** Check for 120V at the various calls for indoor blower by energizing "Y", "G", and "W" individually on the low voltage terminal strip. Note that when "W' is energized, the blower is delayed 45 seconds. If there is 120V to each motor tap but the blower does not operate, replace the motor. **ACTION 1 - VARIABLE SPEED MOTORS for operation of the VSM see Page 39**
	9.1.3 Defective control board	**ACTION 1 - PSC MOTORS** If there is not 120V when "Y", "G", or "W" is energized, replace the control.

ICM-2 WITH TWO STAGE VARIABLE SPEED CONTROL

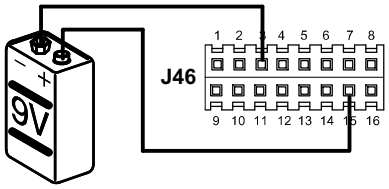
120V to the motor must not be interrupted. All connections for check out will be from the voltage source below (battery or 24V) to plug J46, after disconnecting from blower control board.



CHECK-OUT PROCEDURE USING BATTERY

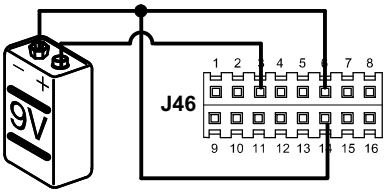
An ordinary 9 volt battery with maximum DC 20volts is recommended. A 9 volt battery will last for about one day of normal operation.

LOW COOL SPEED



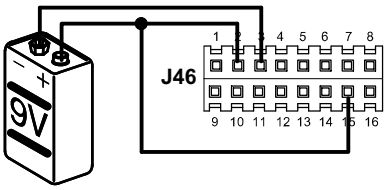
1 Disconnect power to unit.
2 Disconnect plug J46 from P46 located on the blower control board.
3 Connect voltage source as shown above.
4 Turn on power to unit. Blower should operate at low cool speed.

HIGH COOL SPEED



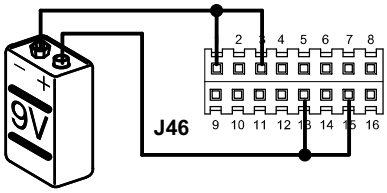
5 Disconnect power to unit.
6 Connect voltage source as shown above.
7 Turn on power to unit. Blower should operate at high cool speed.

LOW HEAT SPEED



8 Disconnect power to unit.
9 Connect voltage source as shown above.
10 Turn on power to unit. Blower should operate at low heat speed.

HIGH HEAT SPEED

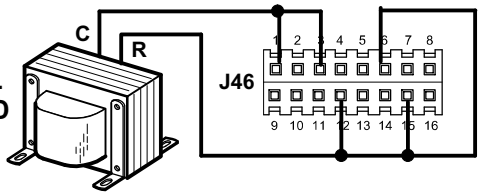


11 Disconnect power to unit.
12 Connect voltage source as shown above.
13 Turn on power to unit. Blower should operate at high heat speed.

CHECK-OUT PROCEDURE USING 24V SOURCE

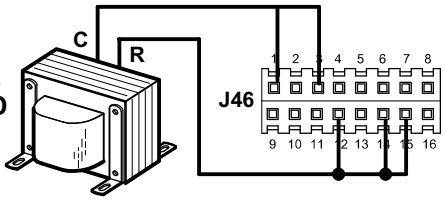
Unit transformer T1 with a maximum AC 30 volts may be used in lieu of a battery. If transformer T1 is used, double check all wiring connections before placing unit back in operation.

LOW COOL SPEED



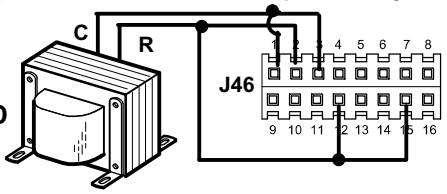
1 Disconnect power to unit.
2 Disconnect plug J46 from P46 located on the blower control board.
3 Connect voltage source as shown above.
4 Turn on power to unit. Blower should operate at low cool speed.

HIGH COOL SPEED



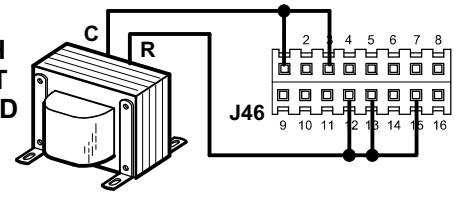
5 Disconnect power to unit.
6 Connect voltage source as shown above.
7 Turn on power to unit. Blower should operate at high cool speed.

LOW HEAT SPEED



8 Disconnect power to unit.
9 Connect voltage source as shown above.
10 Turn on power to unit. Blower should operate at low heat speed.

HIGH HEAT SPEED



11 Disconnect power to unit.
12 Connect voltage source as shown above.
13 Turn on power to unit. Blower should operate at high heat speed.